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Approval Sheet

Model No. : FSJ014 Option 00AG
MKT Model No. : R1CA2202B Option P00A
Hardware Rev. : A02
Software Rev. : APM12V0303

Customer : **PCICASE UK LTD**
Customer PN PIZ2200R-92-ACB-S1

Approval by : Daniel Hsieh

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Date: 2024/05/23

Approval Sheet History Log

DATE	SECTION	ISSUE/ DESCRIPTION
2022/02/15		Original release
2024/02/29		Add picture of PSU & I/O label
2024/03/28		Update picture of PSU & I/O label
2024/05/23		Update I/O Label & Safety Cert.

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1. Specification
2. Mechanical Outline Drawing
3. I/O Label Drawing
4. Carton Drawing
5. Safety

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Specification

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ACBEL POLYTECH INC.

Specification for 2000 Watts Switching Power Supply

Model No.: FSJ014-00AG

Marketing PN: R1CA2202B-P00A

Revision: A1.9

AcBel Polytech Inc.

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1 Revision Log

Revision	Description	Approved	Date
A0	Initial		20180514
A1	Modified 2.1 AC Input & DC input		20180531
A1	Modified 3.1 Input Conditions and added note		20180531
A1	Modified 3.4 Input Connector		20180531
A1	Modified and added 3.10 Line Disturbance Note		20180531
A1	added 3.11 ITHD low line 115Vac		20180531
A1	added 3.14 EMI low line 115Vac		20180531
A1	Modified 4.1 Output Load and Status Regulation		20180531
A1	Modified 5.2.1 Current Limit & Power Protection		20180531
A1	Modified 5.2.2 Over and Under Voltage Protection		20180531
A1	Modified 5.2.5 Over Temperature Protection and added note		20180531
A1	Modified 6.3 PRESENT		20180531
A1	Modified 6.8 PMBus CLOCK_SCL & DATA_SDA		20180531
A1	Modified 6.13 LED indicators		20180531
A1	Modified 8.1.2 Smart Redundancy		20180531
A1	Delete 8.1.3 Black Box		20180531
A1.1	Modified 2.1 Power Supply Overview Maximum Operating Current		20180613
A1.1	Modified 3.1 Input Conditions Iin		20180613
A1.1	Modified 4.1 Output Load and Status Regulation and added note		20180613
A1.1	Modified 5.2.1 Current Limit & Power Protection content and added low line OC Warning2		20180613
A1.1	Modified 6.1 PSON content		20180613
A1.2	Modified 2 Scope		20181106
A1.2	Modified 3.1 Input Conditions		20181106
A1.2	Modified 3.2 Input Fuse		20181106
A1.2	Modified 3.3 Harmonic Current and Power Factor Correction		20181106
A1.2	Modified 3.8 Inrush Current		20181106
A1.2	Modified 3.9 Efficiency		20181106
A1.2	Modified 3.12 Leakage Current		20181106
A1.2	Modified 4.1 Output Load and Status Regulation		20181106
A1.2	Modified 4.7 Turn on/off Overshoot & Undershoot		20181106
A1.2	Modified 4.18 DC Connector and Pin Assignment		20181106
A1.2	Modified 5.2.1 Current Limit & Power Protection (OCP & OPP)		20181106

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A1.2	Modified 5.2.2 Over and Under Voltage Protection		20181106
A1.2	Modified 5.2.5 Over Temperature Protection		20181106
A1.2	Modified 7.2 FAN FAIL		20181106
A1.2	Modified chapter 9 & 10 & 11		20181106
A1.2	Modified 2.1 Power Supply Overview min current		20181112
A1.2	Modified 4.1 Output Load and Status Regulation min current		20181112
A1.3	Delete 6.14 T PSON_OFF_DELAY		20181206
A1.3	Delete 6.6 Alert rise time		20181206
A1.3	Modified 6.13 LED indicators		20190107
A1.3	Modify 4.17 Load Share Signal Characteristics table		20190110
A1.3	Modify 6.4 Load Share Signal table		20190110
A1.3	Modify 5.2.5 Over Temperature Protection table		20190110
A1.3	Modify 9.1.1 Normal Operating Ambient minimum CFM		20190110
A1.3	Modify 6.1 PSON		20190110
A1.4	Modify 4.18 DC Connector and Pin Assignment A21 B24 short PIN		20190321
A1.4	Modify 9. 5 Acoustic		20190321
A1.5	Modify 4.6 Capacitive Loading 12V Min 2000uF		20191112
A1.5	Safety Mark and Standards CCC modify to CQC		20191112
A1.5	Nominal Output Voltage12.00→12.20		20191112
A1.6	Modify 8.1.1 Accuracy for VIN, IIN, PIN, 12VOUT, IOUT, POUT note		20200116
A1.7	Update 11.1 Safety Mark and Standards		20201123
A1.7	Modify component derating table		20201123
A1.8	Modified 12 Mechanical Drawing		20210311
A1.9	Midofy 4.5 residual Voltage from 100mV to 500mV at PSU.		20240227

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2 Scope

This specification establishes the requirements for a custom “1U” form factor, 2000 Watts output, active power factor corrected, and wide-range power supply. Also, the approximate dimensions are 73.5mm (W) x 185mm (D) x 40mm (H). The power supply will be used in 3+1 redundant (load share) and must contain appropriate oring devices on all outputs. The number of PSU would be limited to four.

2.1 Power Supply Overview

Application	Sever System	
AC Input & DC input	100-240V_{AC}, 240V_{DC}	
Power Factor Correction	Active	
Output Power	2000 Watts maximum continuous	
EMC Classification	EN61000-4-5 2KV common mode, 1KV Differential mode	
Outputs	12V Main Output (12V_{OUT})	12V Standby (V_{SB})
Nominal Output Voltage	12.20 V	12.00 V
Voltage Regulation	± 5%	± 5%
Minimum Operating Current	1 A	0.1 A
Maximum Operating Current	166.7 A	3 A

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3 AC Input Requirements

3.1 Input Conditions

AC input Parameter	Minimum	Nominal	Maximum	Unit
Low Line V_{IN}	90	100-127	140	$V_{AC, RMS}$
High Line V_{IN}	180	200-240	264	$V_{AC, RMS}$
Frequency f_{AC}	47	50/60	63	Hz
I_{IN}			10A (220~240Vac) 12A (200~240Vac) 13A (100~127Vac)	$A_{AC, RMS}$
V_{BROWN_IN}	81	85	89	$V_{AC, RMS}$
V_{BROWN_OUT}	70	75	80	$V_{AC, RMS}$
V_{IN_OVP}	300			$V_{AC, RMS}$

DC input Parameter	Minimum	Nominal	Maximum	Unit
V_{IN}	180	240	300	V_{DC}
I_{IN}			10A ($_{240Vdc}$)	A_{DC}
V_{BROWN_IN}	166	170	175	V_{DC}
V_{BROWN_OUT}	156	160	165	V_{DC}
V_{IN_OVP}	310			V_{DC}

Note 1.Due to the C14 Inlet current limit, when operating in Maximum $V_{BROWN_IN/OUT}$, high/low line max load should derating to 70%.

2. The table above shows max I_{IN} 10A $_{(220\sim240Vac)}$ that is specified in section 4.1.

3.2 Input Fuse

A normal-fast-blow fuse must be placed in the single line fuse on the line/hot wire of the AC input. AC inrush does not cause the ac line fuse to blow under any condition. All protection circuits in the power supply do not cause the ac fuse to blow unless a component in the power supply has failed.

3.3 Harmonic Current and Power Factor Correction

The power supply shall incorporate universal power input with active power factor corrections, which shall reduce line harmonics in accordance with the EN61000-3-2 and JEIDA MITI standards.

The power factor lists as below:

Load	10%	20%	50%	100%
$P.F._{MIN}$	0.91	0.97	0.98	0.99

Tested at 230VAC & 240 VAC / 50Hz & 60Hz, 115VAC / 60Hz, measurement environment shall comply with 80+ or energy star regulation, and take the worst result from one of both.

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3.4 Input Connector

The AC input receptacle shall be an IEC-320 type C14 capable of at least 15A at $120V_{AC}$ rating and 10A at $240V_{AC}$ rating. This connector is located at the frond side of power supply. There is a retainer to fix the line cord to avoid accident disconnection.

3.5 AC Line Isolation Requirements

The power supply shall meet all safety agency requirements for dielectric strength. Additionally, power supply vendor must provide Intel with written confirmation of dielectric withstand test which includes: voltage level, duration of test and identification detailing how each power supply is marked to indicate dielectric withstand test had been completed successfully. Transformers' isolation between primary and secondary windings must comply with the $3000V_{AC}$ ($4242V_{DC}$) dielectric strength criteria. If the working voltage between primary and secondary dictates a higher dielectric strength test voltage the highest test voltage should be used. In addition the insulation system must comply with reinforced insulation per safety standard IEC 950. Separation between the primary and secondary circuits, and primary to ground circuits, must comply with the IEC 950 spacing requirements.

3.6 AC Line Dropout / Hold up time

An AC line dropout is defined to be when the AC input drops to $0V_{AC}$ at any phase of the AC line for any length of time. During an AC dropout the power supply must meet dynamic voltage regulation requirements. An AC line dropout of any duration shall not cause tripping of control signals or protection circuits. If the AC dropout lasts longer than the holdup time the power supply should recover and meet all turn on requirements. The power supply shall meet the AC dropout requirement over rated AC voltages and frequencies. A dropout of the AC line for any duration shall not cause damage to the power supply.

Loading during AC dropout / holdup	Holdup time / Dropout duration
75% of rated load	10 mSec

3.7 AC Line V_{SB} Hold-up time

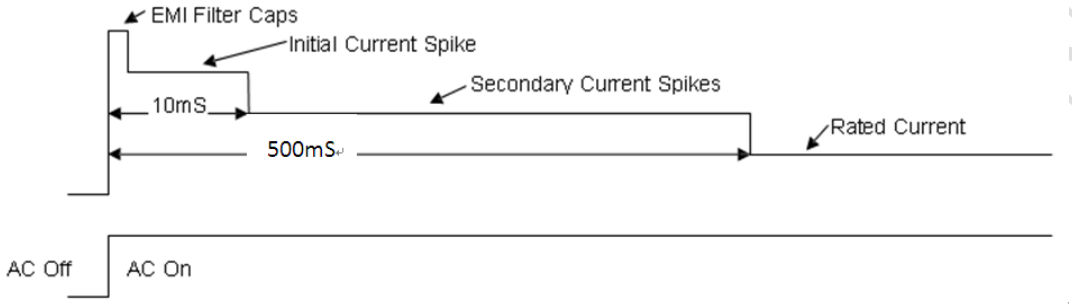
The V_{SB} output voltage should stay in regulation under its full load (static or dynamic) during an AC dropout of 70 mSec min (= V_{SB} holdup time) whether the power supply is in ON or OFF state (PSON asserted or de-asserted).

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3.8 Inrush Current

The power supply shall provide circuitry to limit the turn-on inrush current on any initial current surge or spike of 10ms or less will not exceed 30A peak, which called as first inrush current. Any additional inrush current surges or spikes in the form of AC cycles or multiple AC cycles greater than 10mSec, and less than 500 m Sec, must not exceed 25A peak, which called as second inrush current. After 1.2 Sec the AC input current must meet the requirements in section 3.1 & 8.1.



Notes:

1. The inrush current due to the EMI filter capacitors can be ignored.
2. All internal components (including the fuse, bulk rectifiers and surge limiting device) must be able to withstand the surge current without damage the power supply.
3. The inrush limiting circuitry shall be designed such that if the active bypass circuitry is not functional the remaining circuitry shall not cause any smoke/flame potential safety issue.
4. The inrush current must meet at cold / warm start.
5. For the time less than line drop output, the inrush current may exceed than 30A, the I2T of input current at this condition shall be less than I2T of first inrush current
6. For the repetitive ON/OFF inrush current performance, the minimize period is 10 sec, the AC available duty is 30% of 10sec.

3.9 Efficiency

The Power supply shall meet 80plus Platinum efficiency requirement at $230V_{AC}$, the measurement and validation shall complete follow 80 plus regulation.

Loading	10% of max Load	20% of max Load	50% of max Load	100% of max Load
Efficiency $_{MIN}$	87%	90%	94%	91%

Note:

1. Fan loading is not included for efficiency measurements. Efficiency to be measured at 20-25°C after supply has run for 30 minutes.
2. The power supply shall pass all efficiency measurements by 0.2% to guarantee design margins for production.

3.10 Line Disturbance

Line disturbance shall be defined as “sag” and “surge” conditions. “Sag” conditions are also commonly referred to as “brownout”, these conditions will be defined as the AC line voltage dropping below nominal voltage conditions. “Surge” will be defined to refer to conditions when the AC line voltage rises above nominal voltage.
The power supply shall meet the requirements under the following AC line sag and surge conditions.

Item	Sag	Input Voltage	Input Frequency	Performance Criteria

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0 - 1/2 cycle note 1	95%	Nominal AC Voltage Ranges	50 / 60 Hz	No loss of function or performance
> 1 AC cycle	> 30%	Nominal AC voltage Ranges	50 / 60 Hz	Loss of function acceptable, self-recoverable.

Item	Surge	Input Voltage	Input Frequency	Performance Criteria
Continuous	10%	Nominal AC voltage Ranges	50 / 60Hz	No loss of function or performance
0 - 1/2 cycle note 1	30%	Nominal AC voltage Ranges	50 / 60Hz	No loss of function or performance

Note:

1. During 0-1/2 cycle test condition as above, the load should be set to 75% maximum (follow holdup time requirement) and minimum load.
2. When test condition included high line to low line range, Maximum Load should be the rated current of the lower voltage range. If the output current larger than rated current of the lower voltage range, power supply may latch off due to output over current protection.

3.11 I_{THD}

This test shall be measured at $115V_{AC}$ & $230V_{AC}$ / 50Hz & 60Hz

Load	10%	20%	50%	100%
$I_{THD, MAX}$	20%	10%	8%	5%

3.12 Leakage Current

Maximum input leakage current at 264 V_{AC}, 60Hz, shall not exceed 0.875 mA.

3.13 AC Line Transient, Compliable with EMC Standard

Power supply shall operate within specifications under the followings conditions:

a) Transients as defined in IEC61000-4-4, Electrical Fast Transients standard, up to 1 KV at AC line.
b) Transients as defined in IEC61000-4-5, Electrical Surge standard.
Common mode 2.0 KV
Differential mode 1.0 KV
c) Power supply shall comply with IEC61000-4-2, Electrostatic Discharge standard, up to 8 KV with contact 15 KV with air discharge.
d) Power supply shall meet all the transient requirements for the CE mark designation.

3.14 EMI

The power supply shall comply with FCC and EN55022 (CISPR22) Class A for conducted and radiated emissions. It must comply at 100 - 120, 200 - 240VAC / 50Hz with 6dB margin as minimum.

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3.15 Voltage Interruptions

The power supply shall comply with the limits defined in EN55024: 1998/A1: 2001/A2: 2003 using the IEC 61000-4-11: Second Edition: 2004-03 test standard and performance criteria_C defined in Annex B of CISPR 24.

Performance criteria C, Temporary loss of function is allowed provided the function is self-recoverable or can be restored by the operation of the controls.

3.16 Power Recovery

The power supply shall recover automatically after an AC power failure. AC power failure is defined to be any loss of AC power that exceeds the dropout criteria. (follow 3.10)

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4 DC Output Requirements

4.1 Output Load and Status Regulation

The following table provides a summary of specifications for each individual output.

The output voltage must meet the below table and the V_{SB} output shall be present when an AC input greater than the power supply turn on voltage is applied.

Parameter	V_{in} Rating	Power Rating (W)	Min Current (A)	Max Current Rating (A)	Voltage Regulation
12V main (90-140V_{AC})	115 V_{AC}	996	1	**83**	12.20V +/- 5%
12V main (180-220VAC)	200 V_{AC}	1560	1	**130**	
12V main (220-230VAC)	220 V_{AC}	1944	1	**162**	
12V main (230-264VAC)	230 V_{AC}	2000	1	**166.7**	
12V main (180~220VDC)	200 V_{DC}	1560	1	**130**	
12V main (220~240VDC)	230 V_{DC}	1944	1	**162**	
12V main (240~300VDC)	240 V_{DC}	2000	1	**166.7**	
12Vsb	--	36	0.1	**3**	12.00V +/- 5%

Note: 1. With two power supplies in parallel, the power supplies must support 2000W at high line AC voltage range.

2. The table above shows max current rating that the input current maximum of the power supply is limited to 10A.

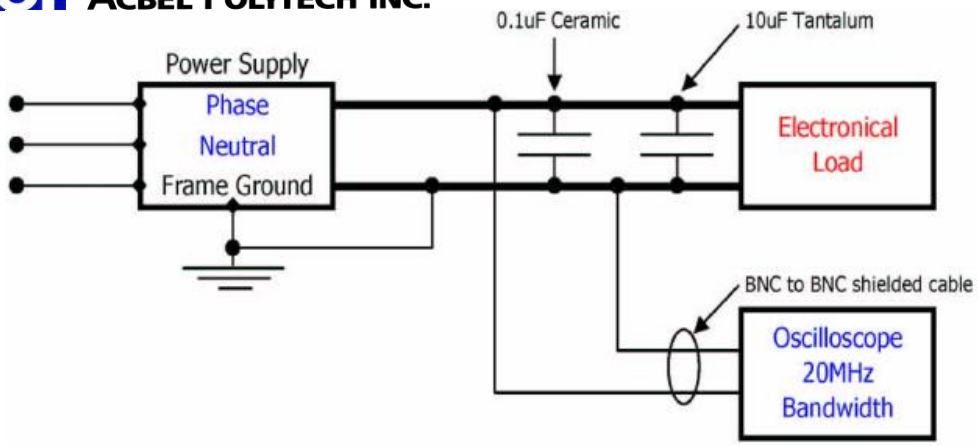
4.2 Ripple /Noise

The following output ripple/noise requirements will be met throughout the load ranges specified in section 4.1 and under all input voltage conditions specified in section 3.1 and temperature condition specified in section 9.1.

Outputs	Maximum	**Capacitive Load**
V_{SB}	120 mV $_{PK-PK}$	Min. Cap Load
12V_{OUT}	120 mV $_{PK-PK}$	

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Notes:

1. Output ripple & noise should be measured at the pins of the mating output connector.
2. Connect the probe with the input tip and ground as short as possible.
3. Output ripple & noise measured with only PSU capacitance plus 10 uF Tantalum and 0.1uF Ceramic capacitor.
4. Ripple & noise are defined as periodic or random signals over the frequency band of 10 Hz to 20 MHz.

4.3 Dynamic Regulation

The output voltage shall remain within the limits specification in section 4.1 Voltage Regulation for the step loading and within the limit specification in below table for the capacitive loading. The load transient repetition rate shall be tested between 50 Hz and 10 kHz at duty cycles ranging from 10% - 90%.

The load transient repetition rate is only a test specification. The step load may occur anywhere within the Min Load 1A to the Max Load show in below table. During $12V_{OUT}$ output load changes from minimum to maximum or maximum to minimum, the power supply must not shutdown.

Outputs[1]	Step Load Size	Slew Rate	Test Capacitor load
$12V_{OUT}$	60%	0.5 A/uS	2000 uF
V_{SB}	50%	0.5 A/uS	20 uF

4.4 Audible Noise

No abnormal audible noise is allowed to be generated by the power supply.

4.5 Immune Voltage

The PSU should be immune to any residual voltage placed on its outputs (typically a leakage voltage through the system from standby output) up to 500 mV. There shall be no additional heat generated, nor stressing of any internal components with this voltage applied to any individual or all outputs simultaneously. It also should not trip the protection circuits during turn on.

The residual voltage at the power supply outputs for no load condition shall not exceed 500 mV when AC voltage is applied and the PSON# signal is de-asserted.

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4.6 Capacitive Loading

The PSU will be able to power up and operate normally with the capacitive load on the DC outputs, the power supply shall be stable and meet all requirements with the following capacitive loadings.

Outputs	MIN	MAX	Units
V_{SB}	20	3,100	uF
$12V_{OUT}$	2000	25000	uF

4.7 Turn on/off Overshoot & Undershoot

During the turn-on or turn-off stage, the output voltage including the standby output, under any of the conditions specified in section 4.1 and temperature section 9.1, capacitive loading section 4.6 will less than 10% above the nominal voltage and will settle into the regulation band within 20 mSec.

The output voltage undershoot during turn-off of any of the output, including the Standby output, under any of the condition specified in section 4.1 and temperature section 9.1, capacitive loading section 4.6 shall not exceed than 0.5V

There must be a smooth and continuous ramp of each output voltage from 10% to 95% of its final set point within the regulation band. No voltage of opposite direction will be present on any output during turn-on or turn-off stage.

4.8 Grounding

The output ground of the pins of the power supply provides the output power return path. The output connector ground pins shall be connected to the safety ground (power supply enclosure). This grounding should be well designed to ensure passing the max allowed Common Mode Noise levels.

4.9 No Load Condition

This condition shall not trip any failure circuitry shutdown or cause any permanently damaged to the power supply. Also, the power supply shall normal operate when the power supply is turn on or when the power supply is already on at no load condition.

When the power supply is subsequently loaded, it must begin to regulate and source current without fault.

4.10 Close Loop Stability

The power supply shall be unconditionally stable under all line/load/transient load condition including capacitive load. A minimum of 45 degrees phase margin and -10dB gain margin is required.

The power supply manufacturer shall provide proof of the unit's closed-loop stability with local sensing through the submission of Bode plots.

Bode Plot documentation will have Phase and Gain margin data, line and load conditions, as well as the oscillator injection level. For verification purposes the plots will have the method of test and injection points clearly documented on a current schematic. Stability plots need to be provided at both the upper and lower operating temperature limits.

4.11 Remote ON/OFF

Differential (Single ended) remote sense is to be provided for the designated remote sense outputs. The remote sense must be able to compensate for the defined system output voltage drop over the system output resistance (after the output connector).

The remote sense lines must be protected such that if only the remote sense is connected to the load, or there is a short across the remote sense, the power supply is not damaged.

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4.12 Common Mode Noise

The Common Mode Noise on any output shall not exceed 350 mV $_{PK-PK}$ over the frequency band of 10 Hz to 20 MHz.

1. The measurement shall be made across a 100 Ω resistor between each of DC outputs, including ground at the DC power connector and chassis ground (power subsystem enclosure).
2. The test set-up shall use a FET probe such as Tektronix model P6046 or equivalent

4.13 Hot Swap Requirement

Hot swapping a power supply is the process of inserting and extracting a power supply from an operating system. During this process, the output voltage shall remain within the regulation limits specified in section 4.1 with capacitive load specified in section 4.6. The hot swap test must be conducted when the system is operating under static, dynamic condition and zero loading condition.

The power supply should use a latching mechanism to prevent insertion and extraction of the power supply when AC power cord is inserted into the power supply.

4.14 Output Isolation

All outputs have an isolating device to isolate the power supply from the system power during a power supply failure or during a hot swap operation. This device is located in power supply. This device is an oring diode or functional equivalent.

4.15 Soft Starting

The Power Supply shall contain control circuit which provides monotonic soft start for its outputs without overstress of the AC line or any power supply components at any specified AC line or load conditions.

4.16 Force Load Share

The 12V main will have active load sharing. The output will share within +/-5% at 50%-100% load, +/-10% at 20-50% load. The failure of a power supply should not affect the load sharing or output voltages of the other supplies still operating and does not cause these outputs to go out of regulation in the system. The power supplies must be able to load share with up to 2 power supplies in parallel.

The V_{SB} standby output is passive sharing. The V_{SB} of power supplies are connected together in the system, so that a failure or hot swap of a redundant power supply does not cause these outputs to go output of regulation in the system.

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4.17 Load Share Signal Characteristics

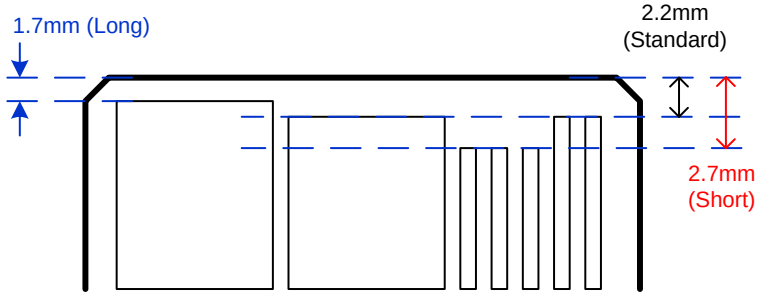
The load share signal is only for the load function. The load share signal characteristics are defined as below table.

Item	Description	Min	Nominal	Max
V_{SHARE}; I_{OUT}=Max	Voltage of load share bus at specified maximum output current	7.76 V	8.0 V	8.24 V
$\triangle V_{SHARE} / \triangle I_{OUT}$; I_{OUT} >1A	Slope of load share bus voltage with changing load		8.00 / I_{MAX} V/A	
I_{SHARE} sink; V_{SHARE} = 4.00V	Amount of current the load share bus output from each power supply sources.			0.5 mA
I_{SHARE} source V_{SHARE} = 4.00V	Amount of current the load share bus output from each power supply sinks.	4 mA		

4.18 DC Connector and Pin Assignment

Pin No.	Pin Name	Pin Type	Pin Length	Description
A1~A9 B1~B9	GND	12VOUT main & VSB Return	Long	12VOUT main & VSB Return
A10~A18 B10~B18	12VOUT	12VOUT main output	Standard	12VOUT main output
A19	SDA	I / O	Short	SMBus / PMBus Data
A20	SCL	I / O	Short	SMBus / PMBus Clock
A21	PSON	Input	Short	Active low; 12VOUT main output on/off control
A22	SMBAlert	Output	Short	Active high; I2C alert signal (interrupt)
A23	RETURN Sense	Analog Input	Standard	12VOUT main output Remote Sense -
A24	12VOUT Remote Sense	Analog Input	Standard	12VOUT main output remote sense +
A25	PWOK	Output	Standard	Active high; indicate 12VOUT main is valid
B19	A0	Input	Standard	PMBus address 0
B20	A1	Input	Standard	PMBus address 1
B21	12V Standby VSB	Aux Power	Standard	Standby voltage
B22	Smart Redundant Bus	I / O	Standard	Cold Redundancy Bus 1
B23	12VOUT Load Share Bus	Analog Output	Standard	12VOUT main output load current sharing
B24	Present	Input	Short	Power Supply Present
B25	Compatibility Bus		Standard	Compatibility Bus 1

Pin length definition is illustrated on below:



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4.19 Handle Retention

The power supply shall have a handle to assist extraction. The module shall be able to be inserted and extracted without the assistance of tools. The power supply shall have a latch which retains the power supply into the system and prevents the power supply from being inserted or extracted from the system when the AC power cord is pulled into the power supply.

The handle shall protect the operator from any burn hazard and be designed plastic handle or equivalent material.

4.20 LED Identification

The power supply shall use a bi-color LED; Amber [λ: 607-613 nm] & Green [λ: 562-568 nm]. Both LEDs luminance density is designed for 5 mcd.

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5 Protection Requirements

5.1 Primary Protection

The supply must have internal primary over current protection. A normal blow (fast blow), high-breaking-capacity fuse must be placed in the line side of the input circuit. This fuse is not to be considered replaceable for purposes of determining power supply reliability and life as specified in Section 10.

If any component on the line side of the fuse is shorted or opened, it shall not cause a fire or any other safety risk.

5.2 Secondary Protection

5.2.1 Current Limit & Power Protection (OCP & OPP)

The power supply shall have current limit to prevent the outputs from exceeding the values shown in table below. If the current limits are exceeded the power supply shall shutdown and latch off. The latch will be cleared by an AC power interruption or PS_ON cycle on/off. The power supply shall not be damaged from repeated power cycling in this condition. VSB will be auto-recovered after removing OCP limit.

Outputs	Status	Output Current Range		Minimum Keep time	SMBAlert	SMBAlert Mode
		Minimum	Maximum			
+12VSB	OCP	3.5 A	4.5 A	-	-	-
+12V (High line)	OC Warning1	172 A	176 A	continuous	10~30ms	1. SMBAlert will be asserted within asserting time. Afterward, SMBAlert is latched for 100ms and will be reset by PSU itself. 2. If power shut down, SMBAlert will keep latching until AC power cycle on/off or PS_ON cycle on/off.
	OCP1	176 A	184 A	50ms	-	
	OC Warning2	184 A	202 A	50ms	<20us	
	OPP/OCP2	202 A	208 A	500us	-	
+12V (Low line)	OC Warning	89 A	93 A	continuous	10~30ms	
	OCP1	93 A	101 A	50ms	-	
	OC Warning2	101 A	119 A	50ms	<20us	
	OPP/OCP2	119 A	125 A	500us	-	

Note: Power supply may shut down in OC Wanring1 status if OTP or IIN OCP occurred.

5.2.2 Over and Under Voltage Protection

When the power supply is in OVP or UVP status, the power supply shall shutdown.

Outputs	Under Voltage		Over Voltage		Unit
	Minimum	Maximum	Minimum	Maximum	
V_{SB}	10	11	13.5	14.5	V
$12V_{OUT}$	10	11	13.5	14.5	V

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Notes:

1. The above OV/UV test will be satisfied throughout AC input in section 3.1 and the entire operating temperature range in section 9.1
2. Standby output shall not latch off due to an under/over voltage condition.
3. A fault on any output other than Standby will not cause the Standby to turn off. Also, that fault on Standby will cause the other outputs to turn off but not latch off.
4. The power supply will provide latch mode except for Standby output.

5.2.3 Short Circuit Protection

A short circuit is considered to be resistance of 40m ohms or less, applied to any output during start-up or while running will not cause any damage to the power supply (connectors, components, PCB traces, etc.).The power supply shuts down and latches off for short on main outputs but recovers upon PS_ON assertion or AC toggle

When the Standby output V_{SB} is shorted the output, all outputs shuts down upon a short circuit of the V_{SB}. When the short is removed on V_{SB}, the power supply shall recover automatically.

5.2.4 Reset after Shutdown

If the power supply latches into a shutdown state due to a fault condition on any output, the power supply will return to normal operation only after the fault has been removed and the power supply has been power- cycled. Both methods of resetting the power supply shall be designed into the supply so that the user may choose which method to use.

Reset can be accomplished in one of two ways as below:

a) Removing AC input power, waiting for Standby output to drop below 1.0V, then reapplying AC power. The time it takes for Standby output to drop below 1.0V shall not exceed 15 seconds.

b) Cycling the state of PSON from on to off to on. The minimum cycle time will be 100 mSec.

5.2.5 Over Temperature Protection

The power supply will be protected against over temperature conditions caused by loss of fan cooling or excessive ambient temperature. In an OTP condition the PSU will shut down. When the power supply temperature drops to within specified limits, the power supply shall restore power automatically.

The OTP circuit must have built in hysteresis such that the power supply will not oscillate on and off due to temperature recovering condition. The OTP trip level shall have a minimum of 4 °C of ambient temperature hysteresis.

Ambient temperature	TYPICAL
Over Temp. warning (OTW)	57°C ± 5°C
Over Temp. Protection (OTP)	60°C ± 5°C

Notes:

1. When the power supply operates above 80% load, components hot spot OTP may occurred first.

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6 Signal Requirement

This requirement shall be met throughout the load regulation condition specified in section 4.1, under all input voltage condition specified in section 3.1 and temperature condition specified in section 9.1.

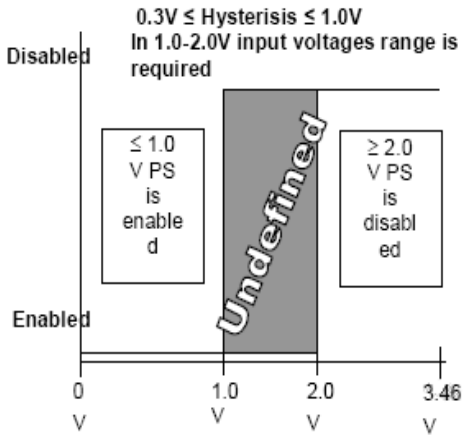
6.1 PSON

The PSON signal is required to remotely turn on/off the power supply. PSON is an active low signal that turn on the main power rails. When this signal is not pulled low by the system, or left open, the outputs turn off.

The power supply shall provide an internal pull-up to high. The power supply shall also provide de-bounce circuitry on PSON to prevent it from oscillating On/Off at startup when activated by mechanical switch.

PSON signal should be logic level low (PSU ON) when the voltage between 0V ~ 0.66V, and logic level high (PSU OFF) when the voltage between 2.64V ~ 3.46V.

Signal type	Accepts an open collector/drain input from the system Pull-up to internal 3.3V located in power supply	
PSON =Low	PSU ON	
PSON = Open or High	PSU OFF	
	MIN	MAX
Logic level low (PSU ON)	0 V	0.66 V
Logic level high (PSU OFF)	2.64 V	3.46 V
Source current, V_{PSON} = low		4 mA
Power up delay: $T_{PSON_ON_DELAY}$	5 mSec	400 mSec
Power off delay: T_{PSON_PWOK}		5 mSec



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6.2 Power Good (PWOK or P_GOOD)

This signal should be asserted high by the power supply to indicate that all outputs are within the regulation thresholds listed in section 4.1. Conversely, this signal should be de-asserted to a low state when any of the DC outputs voltage falls below its under voltage threshold, or when mains power has been removed for a time sufficiently long so that power supply operation can't be guaranteed.

This signal must be driven low at least 1ms before any of the outputs go out of regulation. Also, that will be defined and selected for inclusion from any variation of the following three items:

A.) AC Power Loss ; B.) Fan Failure ; C) Over Temperature

Signal type	Pull-up to internal 3.3V located in power supply	
PWOK or P_Good = High	DC Outputs O.K.	
PWOK or P_Good = Low	DC Outputs N.G.	
	Minimum	Maximum
Logical Level Low, I_{SINK} = 400 uA	0 V	0.4V
Logical Level High, I_{SOURCE} = 200 uA	2.4V	3.46V
Sink current, PWOK = low		400 uA
Source current, PWOK = high		2 mA
PWOK delay: T_{PWOK_ON}	100 mSec	500 mSec
Power down delay: T_{PWOK_OFF}	1 mSec	
PWOK or P_Good Rise & Fall Time		100 uSec

6.3 PRESENT

This pin will be tied to Standby return through a 0 ohms resistor. System side should have a pull-up resistor which limits the max current 4mA to go through from this signal pin to the power supply.

6.4 Load Share Signal

This input / output will allow two power supplies to share output current between them.

If one of the supplies fails the remaining supplies must pick up the entire load without any of the outputs dropping out of regulation. A defective supply that is connected to the output voltage bus will not have adverse effect on the operation of the remaining function supplies.

Total Load	Number of supplies	V_{LS} (V) Minimum	V_{LS} (V) Nominal	V_{LS} (V) Maximum
100%	2	3.85	4	4.15
50%	2	1.8	2	2.2
20%	2	0.64	0.8	0.96
100%	1	7.76	8	8.24
50%	1	3.8	4	4.2
20%	1	1.4	1.6	1.8
0%	1	0	0	0.3

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6.5 Sharing Accuracy

$12V_{OUT}$ output should share load tolerance the average output current from full load to 20% load.

Load	Sharing Accuracy
50 - 100%	±5%
20 - 50%	±10%

Note

1: Sharing accuracy is not measured under transient conditions, but under transient conditions a false over current fault must not occur.

2: Current sharing is not required power on of the outputs until the PWOK signal is asserted. (All outputs are valid)

6.6 SMBAlert

This signal indicates that the power supply is experiencing a problem that the user should investigate. This shall be asserted due to Critical events or Warning events. The signal shall activate in the case of critical component temperature reached a warning threshold, general failure, over-current, over-voltage, under-voltage, failed fan. This signal may also indicate the power supply is reaching its end of life or is operating in an environment exceeding the specified limits.

Signal type	Open collector / drain output from power supply. Pull-up to 3.3 V located in system	
SMBAlert = High	OK	
SMBAlert = low	Power Alert to system	
	Minimum	Maximum
Logical Level Low, I_{SINK} = 4 mA	0 V	0.4 V
Logical Level High, I_{SINK} = 50 uA	2.0 V	3.46 V
Sink current, Alert#=low		4 mA
Sink current, Alert# = high		50 uA
Alert# fall time		100 uSec

6.7 Address_A0 / A1

This signal is defined by end user system for PMBus communication, to allocate address of power supply unit in particular slot location

Signal type	Input pin, Pull-up to internal 3.3V located in power supply	
Adress_A0/A1 = high	Address 1	
Adress_A0/A1 = low	Address 0	
	Minimum	Maximum
Logical Level Low	0 V	0.4 V
Logical Level High	2.0 V	3.57 V

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6.8 PMBus CLOCK_SCL & DATA_SDA

SCL is the SMBus clock input to the supply, SDA is the bi-directional SMBus data path to /from the supply. Both have a pull-up resistor to 3.3 V internal located in power supply. The week pull-up must be diode isolated to prevent an unpowered/ faulted supply from loading the signal. It must be designed to not glitch bus during hot plug and unplugging.

The main pull-up resistors are provided by the system and may be connected to 3.3V or 5V.

The PMBus operation frequency is 100 kHz.

It shall conform to SMBus V2.0 signaling protocol standards. And this specification is based on the PMBus specification parts I and II, revision 1.2.

Note:

All I^2C devices will be powered from the outside of the standby Oring-device. This will allow the status to be read from a supply that is not powered on, or has some other fault.

Some types of protection must be provided so a fault within the supply does not take down the bus.

6.9 REMOTE SENSE + / REMOTE SENSE –

These signals are analog Input / Output $12V_{OUT}$ Main Voltage Sense. Both are analog input / output voltage sense lines to compensate for power path voltage drop. These low level analog signals should be isolated from digital circuit noise. When one or more remote sense lines are opened, regulation measured at the power supply output connector must be maintained within regulation defined, plus or minus an additional 200 mV.

If the REMOTE SENSE+ is shorted to DC_RETURN, the main $12V_{OUT}$ output shall go over-voltage and the power supply will shut down.

6.10 Smart Redundant Bus

This signal should be connected together at system board for smart redundant function.

Please refer to the PMBus specification for detail.

6.11 Standby Turn-off

Following removal of AC power, the Standby output will remain at its steady state value until such time as it begins to decrease in voltage. The decrease will be monotonic in nature dropping to 0.5 V or less. There will be no other perturbations of this voltage at, or following, removal of AC power.

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6.12 Fan Speed Control

The power supply shall incorporate a 40 x 28 mm fan for cooling the power supply when installed in the system. The airflow direction shall be from the card edge connector side to the AC inlet side of the power supply. The Fan speed control must have close loop algorithm based on both the critical component temperature and the ambient temperature. Thus ensure the PSU Fan will always ramp to maximum speed under any condition to protect the power supply from overheating. These conditions include high ambient temperatures; loading, AC input, and airflow impedance.

After the new load and/or cooling condition steady state is established, transition to the steady state fan speed shall take place within 60 Sec.

6.13 LED indicators

The power supply may have a single Bi-color (Green-Amber) Configuration.

Power Supply Condition	LED State
Output ON and OK	GREEN
No AC power to all power supplies	OFF
AC present / Only V_{SB} on (PS off) or PS in Smart redundant state / Off line mode	1 Hz Blink GREEN
AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power.	AMBER
Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan, UV.	1 Hz Blink Amber
Power supply critical event causing a shutdown; failure, OCP, OVP, Fan Fail	AMBER
Power supply FW updating	2 Hz Blink GREEN

6.14 Timing

These are the timing requirements for the power supply operation. All outputs must rise monotonically. Table below shows the timing requirements for the power supply being turned on and off via the AC input, with PSON held low and the PSON signal, with the AC input applied.

ITEM	DESCRIPTION	MIN	MAX	UNITS
T_{VSB_RISE}	Standby voltage rise time for V_{SB}	1	25	mSec
T_{12VOUT_RISE}	Output voltage rise time for $12V_{OUT}$	5	70	mSec
$T_{VSB_ON_DELAY}$	Delay from AC being applied to $12V_{SB}$ being within regulation.	--	1500	mSec
$T_{AC_ON_DELAY}$	Delay from AC being applied to $12V_{OUT}$ output voltage being within regulation.	--	3000	mSec
T_{12VOUT_HOLDUP}	Time $12V_{OUT}$ output voltage stay within regulation after loss of AC with 75% load.	11	--	mSec
T_{PWOK_HOLDUP}	Delay from loss of AC to de-assertion of PWOK with 75% load.	10	--	mSec

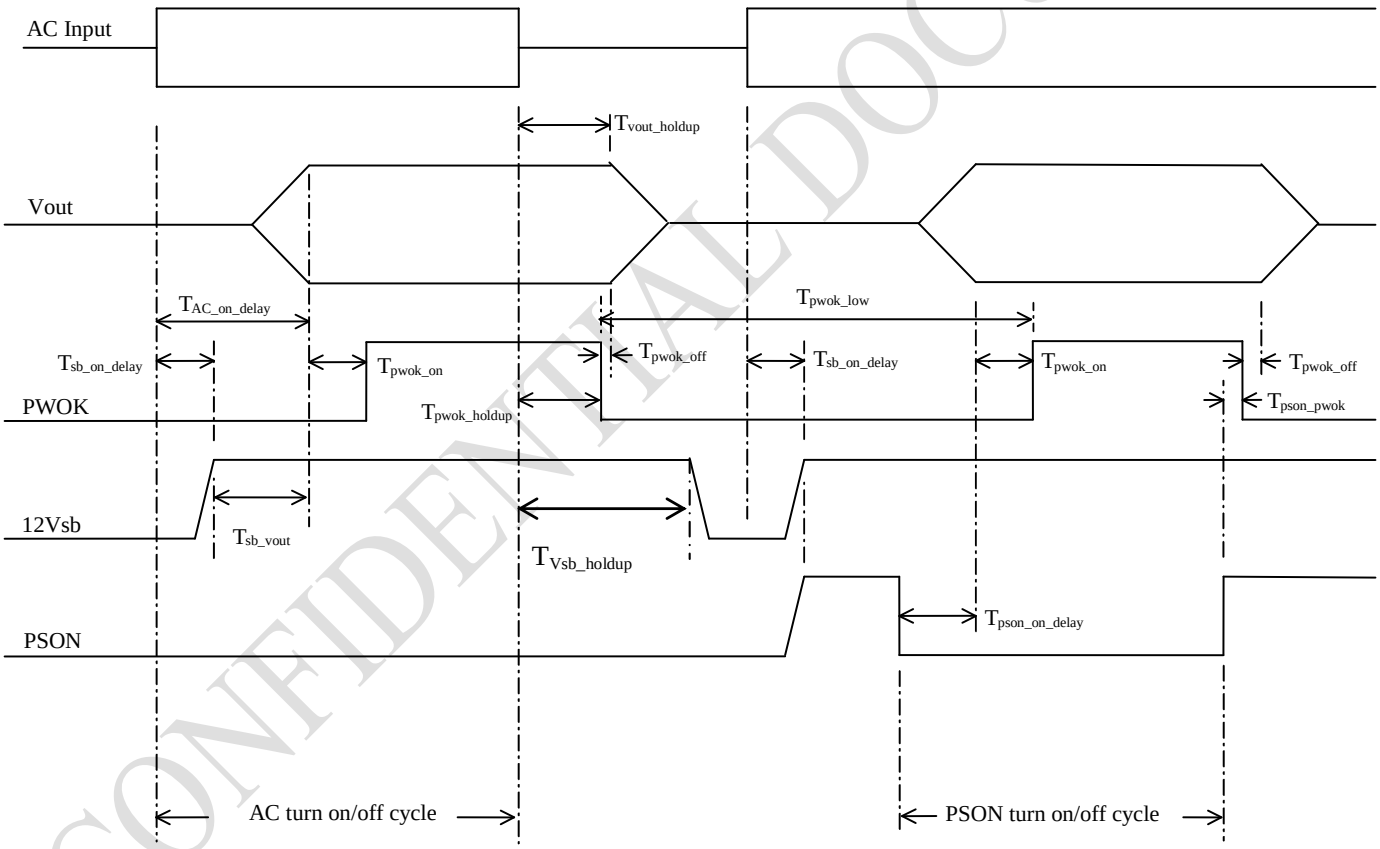
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T PSON_ON_DELAY	Delay from PSON# active to output voltages within regulation limits.	**5**	**400**	mSec
T PSON_PWOK	Delay from PSON# deactivate to PWOK being de- asserted.	**--**	**5**	mSec
T PWOK_ON	Delay from output voltages within regulation limits to PWOK asserted at turn on.	**100**	**500**	mSec
T PWOK_OFF	Delay from PWOK de-asserted to output voltages dropping out of regulation limits.	**1**	**--**	mSec
T PWOK_LOW	Duration of PWOK being in the de-asserted state during an off/on cycle using AC or the PSON signal.	**100**	**--**	mSec
T VSB_12VOUT	Delay from V_{SB} being in regulation to $12V_{OUT}$ output voltage being in regulation at AC turn on.	**50**	**1000**	mSec
T VSB_HOLDUP	Time the V_{SB} standby voltage stays within regulation after loss of AC.	**70**	**--**	mSec

Note

1: The item “T PSON_OFF_DELAY” measured without cap load.



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7 Additional Requirements

7.1 OTP

The power supply shall incorporate a thermal shutdown feature that turns off all outputs (except Standby output) When an over temperature condition occurs, the power supply will not be damaged and will automatically restart when the over temp condition no longer exists. Hysteresis shall be employed to prevent a frequent toggling on and off of the outputs.

The location of the OTP sensor should be on the component(s) most likely to overheat in the event of an abnormal ambient temperature or a blockage of airflow.

In normal operation, the OTP cannot activate when the power supply is operated in any of the specified operating conditions of sections 3.1, 4.1, and 9.1.

7.2 FAN FAIL

The fan(s) are running or the supply is in Standby mode. If there is a fan fault per section 6.12, the PSU is off and the PWOK must be low for at least 1mS before the main outputs go out of regulation, also the standby shall be protection itself due to thermal concern.

FAN FAIL will be latched and is reset per section 5.2.4.

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8 PMBus

8.1 PMBus requirement

8.1.1 Accuracy for V_{IN}, I_{IN}, P_{IN}, $12V_{OUT}$, I_{OUT}, P_{OUT}

Required Accuracy

	10% - 20% Load	> 20% - 50% Load	> 50% - 100% Load
P_{IN} / E_{IN}	+/- 5% or +/- 20W	+/- 5%	+/- 5%
V_{IN}	+/- 5%	+/- 5%	+/- 5%
I_{IN}	+/-5% or +/-0.05A	+/-5%	+/- 5%
FAN	+/- 500 rpm		
$12V_{OUT}$	+/- 5%	+/- 5%	+/- 5%
I_{OUT}	+/- 10%	+/- 5%	+/- 5%
P_{OUT}	+/- 5%	+/- 5%	+/- 5%
Temperature	+/- 5°C		

Note: At nominal input voltage measurement. (115Vac/230Vac/240Vdc), the Max. output different between low and high line, the load definition where is taken Max. output value.

8.1.2 Smart Redundancy

Redundant power supplies in a system shall power ON or OFF depending upon loading state. Power supply ON or OFF (in the Smart Standby state) shall power on quickly to maintain full redundancy in the system. PSU in Cold Standby state should keep a low consumption Pin < 5W (not included V_{SB} load), the measurement procedure and setting shall refer to 80 plus protocol.

8.1.3 Black Box

The power supply shall save the latest PMBus data and other pertinent data into nonvolatile memory when a critical event shuts down the power supply. This data shall be accessible via the SMBus interface with an external source providing power to the V_{SB} output.

8.1.4 System on-Line Bootloader

The power supply shall have the capability to update its firmware via the PMBus interface while it is in standby mode. This FW can be updated when in the system and in standby mode and outside the system with power applied to the V_{SB} pins.

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9 Environmental Requirements

9.1 Temperature

9.1.1 Normal Operating Ambient (At Sea Level)

Minimum: + 0 °C

Maximum: + 50 °C

Maximum rate of change is 10 °C /hr.

The PSU allows a power de-rating operating once the operating temperature is 5°C over specified temperature and the acceptable output load is 70% of output load.

The thermal performance is designed without any shield on air inlet, system shall offer minimum CFM 11.19 (ft^3/min) for PSU, if both conditions cannot be implemented, please offer the actually environment to Acbel for further evaluation.

9.1.2 Non-Operating Ambient (At Sea Level)

Minimum: - 40 °C

Maximum: + 70 °C

Maximum rate of change is 20 °C /hr.

9.2 Humidity

9.2.1 Operating

5 to 85% relative humidity. (Non-Condensing)

9.2.2 Non-Operating

Up to 95% relative humidity. (Non-Condensing)

9.3 Altitude

9.3.1 Operating

- 50 to 10,000 feet (3,048 meters). 5,000 meter is preferred.

NOTE:

1. The system ambient supports 50 °C at 950 m (3,000 feet) Altitude.
2. Maximum operating temperature is derated 1 °C per 125 m above 950 m.

9.3.2 Non-Operating

-50 to 50,000 feet (15,240 meters)

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9.4 Thermal shock (none-operating)

Minimum -40 °C to Maximum +70 °C, transition time not to exceed 5 minutes. Duration of exposure to temperature extremes will be 20 minutes

9.5 Acoustic

No abnormal audible noise is allowed to be generated by the PSU. The PSU is designed to fulfill the thermal system and PSU requirements with the lowest possible fan speed, the fan speed shall be smoothly increase with ambient and load. The sound level shall be within following table.

Test condition :

Temperature：22℃

Humidity：50%

DISTANCE : 100 CM

Load	AMB.(C)	dB
20% Load	25	<60
	35	<60
50% Load	25	<60
	35	<65
100% Load	25	<75
	35	<75

9.6 Mechanical Shock and Random Vibration

Mechanical Shock:

Non-operating: 50 G Trapezoidal Wave, Velocity change = 170 in. / sec.

Three drops in each of six directions are applied to each of the samples.

Random Vibration

Non-operating.

Sine sweep:

5Hz to 500Hz @ 0.5gRMS at 0.5 octave/min; dwell 15 min at each of 3 resonant points;

Random profile:

5Hz @ 0.01g²/Hz to 20Hz @ 0.02g²/Hz (slope up); 20Hz to 500Hz @ 0.02g²/Hz (flat);

Input acceleration = 3.13gRMS; 10 min. per axis for 3 axis on all samples

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康舒科技股份有限公司
159, Sec. 3, Tam-King Rd., Tamsui, Taipei, Taiwan, 251 R.O.C.
Tel :(02)2623-7904~10 • 2621-7672~9
Sales DID : (02)2623-2750 • 2622-4300
Fax : 886-2-2623-6530 • 2623-4156

10 Reliability

10.1 Reliability

The reliability requirements are based on the following product usage/application conditions.

AC Input Voltage Range	Refer to Section 3.1
DC Output Load	100% Maximum of rate output load
Temperature Range	Refer to Section 9.1
Relative Humidity	44% ±10% Non-condensing
Altitude	Sea Level
CMTBF	250K Hours @ 100% Load and 50 °C
Minimum Operating Life	5 Years @ 80% Load and 45 °C

10.2 E-Cap. Life

All used electrolytic caps must have a usefully life time which exceeds 43,800Hours at 80% load and normal input and 45°C power supply ambient temperature.

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10.3 Component De-rating

The component de-rating is designed to satisfy the latest revision of Acbel component design guideline, the document number is ELQZ-505-51. The key component de-rating is shown below:

Device Type	Parameter		Stress Factor
Power Rectifiers	Reverse Voltage	V_R	80%
	Forward Current	I_{Fmax}	80%
	Junction Temp.	T_J	80%
Schottky Diode	Reverse Voltage	V_R	95%
	Forward Current	I_{Fmax}	90%
	Junction Temp.	T_J	80%
FET	Breakdown Voltage (>400V)	V_{DSS}	95%
	Drain Current	I_D	80%
	Junction Temp.	T_J	80%

Device Type	Parameter		Stress Factor
Aluminum Electrolytic	Voltage (Bulk Cap)	Vmax	95%
	Ripple Current	Irated	95%
Solid Electrolytic (Oscon)	Voltage (Others)	Vmax	90%
	Temperature	Tmax	90%
Mag. Device Toroid	Flux density	B	80%
Mag. Device Ferrite	Flux density	B	70%

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Fax : 886-2-2623-6530 • 2623-4156

11 EMC and Safety Requirements

The power supply must comply with all regulatory requirements for its intended geographical market. Depending on the chosen market, regulatory requirements may vary. Although a power supply can be designed for worldwide compliance, there may be cost factors that drive different versions of supplies for different geographically targeted markets. The power supply meets below standard, and the mark.

11.1 Safety Mark and Standards

BIS, BSMI, EMC, CB, CQC, FCC, KC, KCC, TUV, UL

11.2 EMI Requirement

The power supply meet EMI standard as below, need margin 6dB

EN55022 Class A.

CISPR22 Class A.

FCC Class A.

11.3 Hi-pot

The power supply unit must pass a 2550 V_{DC} Residual Voltage test between primary to chassis ground. All production units must pass a 2550 Vdc Hi-Pot test between primary to chassis ground or follow safety agency requirement. The voltage must be ramped up to 2550 within 2.0S and it must be maintained at that level for a minimum of 1 sec. without failure, arc and breakdown or it must comply with safety requirement.

Test voltage	DC
Specify test voltage of Vdc	2550VDC
Current Sensitivity or Current Trip Setting	100uAdc
Ramp-Up Time	2S
Dwell time	1S
RAMP-HI	OFF
Arc fail	ON
Arc sense	5

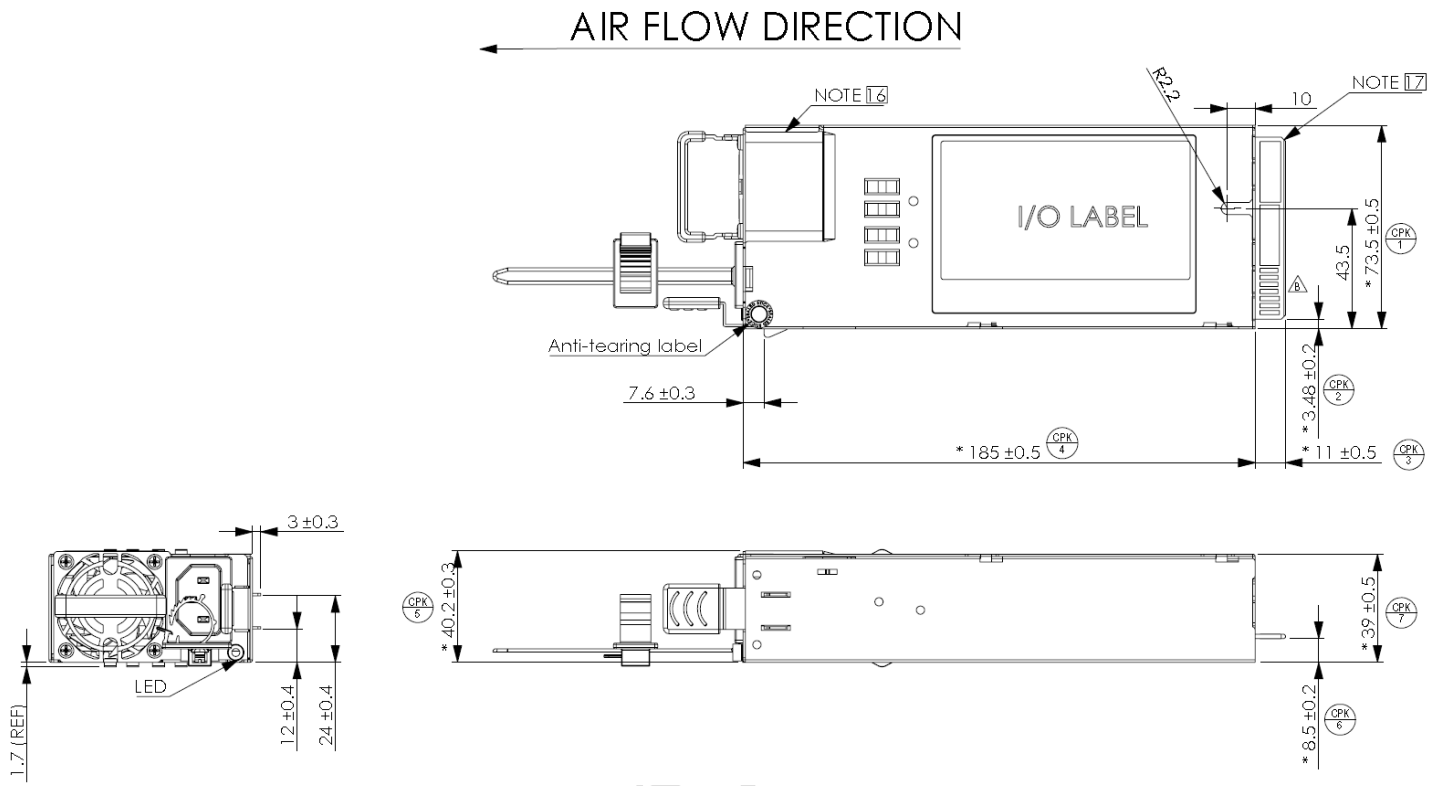
11.4 Ground Continuity

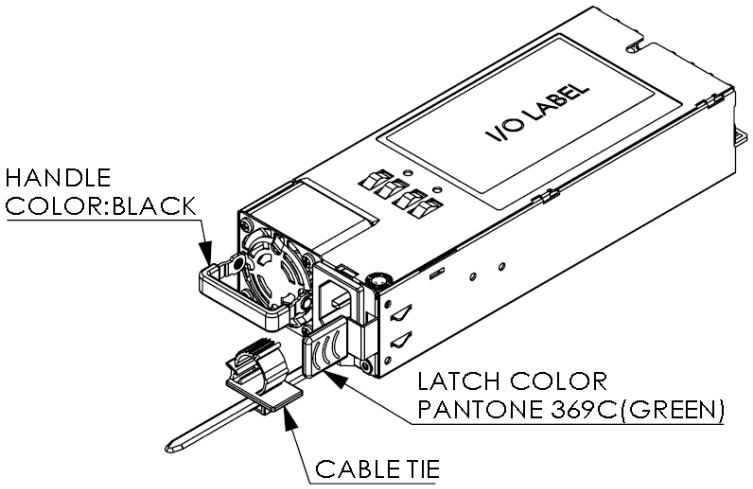
All production units must pass a ground continuity test with less than 0.1 ohm from the safety ground (third wire) input pin to the power supply chassis. Each unit must be marked to indicate it passed the test.

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12 Mechanical Drawing





End of document.

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Mechanical Outline Drawing

NOTE:

1 POWER SUPPLY MUST CONFORM TO CUSTOMER'S SPEC XXX-XXX-XXX
電源供應器必須符合客戶規格XXX-XXX-XXX

2 ENCLOSURE MATERIAL :
SGCC G30/G90(HOT-DIP ZINC-COATED STEEL SHEETS) 72 HOURS MINIMUM White RUST PROTECTION IN SALT SPRAY (ASTM B117),MATERIAL MUST MEET DC RESISTANCE 0.1 OHMS MAX.
FOR ELECTRICAL CONDUCTIVITY REQUIREMENTS
機殼材質:(熱浸鋅鋼板)G30/G90
至少72小時鹽霧防鏽處理(ASTM B117), 材料傳導率DC阻抗需小於 0.1 OHMS MAX

3 ALL EXPOSED EDGES MUST MEET HANDLING REQUIREMENTS SPECIFIED IN UL 1439 AND MUST NOT CUT THROUGH THE FIRST LAYER OF THE TESTER
所有可能被觸碰的邊緣必須符合 UL1439 觸摸安全需求, 不可以割破檢測物的第一層

4 OPENING IN CHASSIS FOR CABLES TO BE FORMED OR GROMMETED AND SEALED TO PREVENT AIR LEAKAGE AND TO PROTECT CABLES FROM DAMAGE. CABLES TO BE STRAIN RELIEVED
輸出線材孔需反摺或設計扣環型式來保護線材,且需避免漏風的情形.線材需消除應力

5 GROUND SYMBOL ⏚ LOCATED TO BE PERMANENTLY MARKED NEAR PRIMARY GROUND CONNECTION.
接地符號 ⏚ 需永久的位於一次側接地處

6 BARCODE LABEL, WARNING LABEL AND INFORMATION LABEL LOCATED ON NOTED SURFACE. BEFORE ADHERING LABELS, SHEETMETAL SURFACE MUST BE FREE OF ANY GREASE, OIL AND DIRT SHEETMETAL SURFACE MUST BE FREE OF ANY GREASE, OIL AND DIRT
標籤黏貼的位置如圖示.在黏貼前,金屬表面必須沒有任何的油污,油,或是塵土

7 " * " CRITICAL DIMENSION. THE FACTORY MUST BE INSPECTED THIS DIMENSION FOR EVERY SHIPMENT.
" * "表示該(尺寸/位置)為設計之重點尺寸,工廠每次出貨前必須檢驗合格後,方可出貨

8 DO NOT ALLOW SCRATCH ON THE SURFACE. EXTRUDE PORTION SHOULD PREVENT THE DAMAGE OF THE ZINC PLATED LAYER AND OXIDATION
表面不允許刮傷,抽孔/擠出成型部份也必須防止電鍍層有氧化現象

9 THE MANUFACTURER SHALL NOTIFY API PRIOR TO CHANGES IN MANUFACTURING LOCATION
製造商如需變更製造地,需事先通知API

10 COVER , CHASSIS & SIDE PANEL MUST BE THE SAME COLOR UNLESS OTHERWISE SPECIFIED.
除非有特別指示,否則上蓋、下蓋、邊嵌板必須顏色一致

11 NET WEIGHT: GRAMS ±3%
淨重： 克±3%

12 SCREW THREAD MUST BE WITHSTAND THE FOLLOWING TORQUE INDICATED :
螺紋鎖付扭轉抗力需大於下列數值:

M3 * 0.5	12Kgf-cm(MIN)
M3.5 * 0.6	15Kgf-cm(MIN)
#6-32	12Kgf-cm(MIN)

13 STUD AND CLINCH NUT MUST BE FLUSH ON THE NOTED SURFACE WHICH MUST BE CONFORM TO THE FOLLOWING TORQUE INDICATED :
鉚接螺栓或螺帽,需符合下表扭力值:

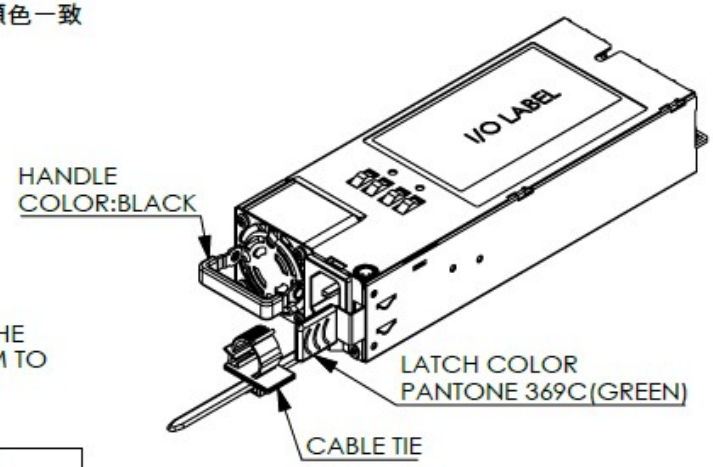
THREAD CODE 螺紋編號	SHEET THICKNESS 板厚(MM)	SHEET MATERIAL 鋼板材質	
		HOT-DIPPED SHEET 熱浸鋼板	
		PUSHOUT 推出抗力 (Kg MIN)	TORQUE OUT 扭轉抗力 (Kg MIN)
M3 * 0.5	0.8 ~ 1.0	47	15
#6-32		50	18
M4 * 0.7		50	30

14 THIS MATERIAL/PART/ASSEMBLY MUST COMPLY TO ACBEL SPEC "CRITERIA FOR ENVIRONMENT-RELATED SUBSTANCES"
材質/零件/製程均必須符合康舒"環境管理物質規範"

15 ALL REF DIMENSIONS MUST COMPLY TO FABRICATE REQUIREMENT
所有參考尺寸必須符合實際組裝要求

16 風扇外觀已實物為主

17 僅供參考. 以實物為準
FOR REFERENCE ONLY.SUBJECT TO ACTUAL PRODUCT



REV	DESCRIPTION	DATE	BY
B	UPDATE GOLD FINGER PAD DIMENSION	20190919	EASON
A	RELEASE	20190531	EASON
1	PRIMARILY	20180410	EASON

REVISIONS

RELEASE			
正 式 發 行 圖 面			REV:B
ENG.	EASON	APPR	RAY

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MODEL NO.	FSJ014-000G
PART NO.	MO-FSJ014-000G
DWG NO.	MO-FSJ014-000G_B
TITLE:	MECHANICAL OUTLINE

SI Metric A4

TOLERANCES UNLESS OTHERWISE NOTED ~6: ±0.1, 6~120: ±0.2, 120~315: ±0.3, 315~: ±0.5 ANGLES: ±0.5°

0 mm 25

THIRD ANGLE PROJECTION

DESIGNER	EASON	2019/10/30
CHECKED		
APPROVED	RAY	2019/10/30

SCALE : 1:3 SHEET 1 OF 2

API DCC

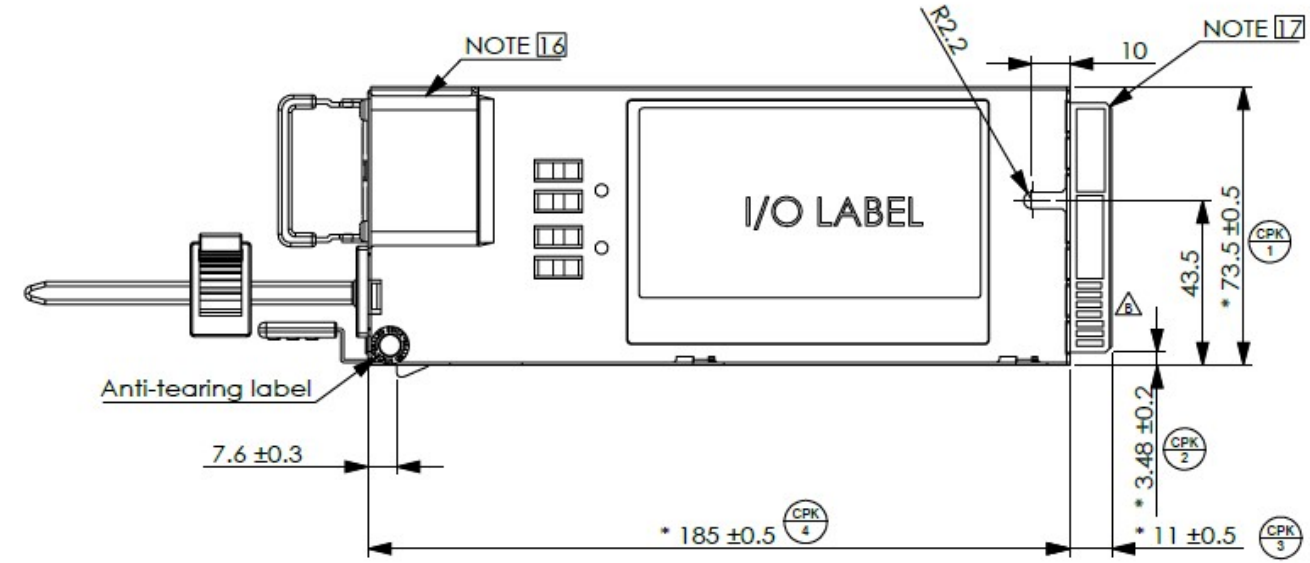
2019/11/21 10:38:33

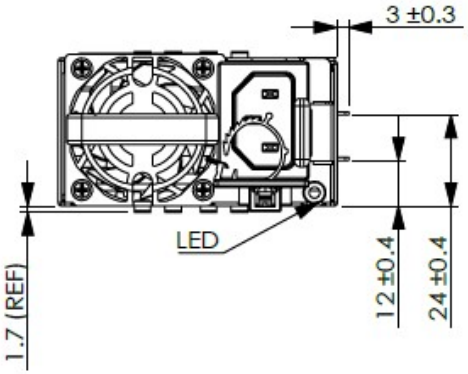
RELEASE

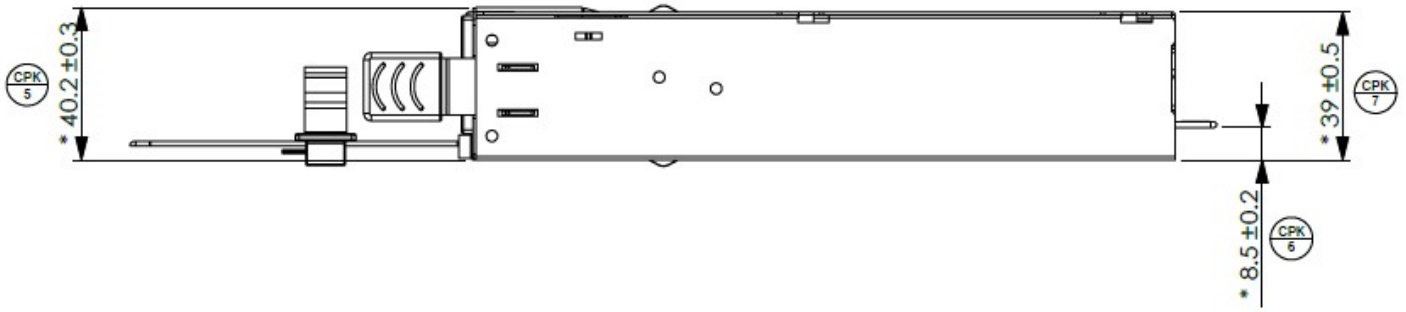
MO-FSJ014-000G_01

103088高立騰Eason_Kao

AIR FLOW DIRECTION







RELEASE			
正 式 發 行 圖 面			REV:B
ENG.	EASON	APPR	RAY

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SI Metric A4

TOLERANCES UNLESS OTHERWISE NOTED
~6:±0.1, 6~120:±0.2, 120~315:±0.3, 315~:±0.5 ANGLES: ±0.5°

0 mm 25

THIRD ANGLE PROJECTION

SCALE : 1:2 SHEET 2 OF 2

MODEL NO.	FSJ014-000G	
PART NO.	MO-FSJ014-000G	
DWG NO.	MO-FSJ014-000G_B	
TITLE:	MECHANICAL OUTLINE	
DESIGNER	EASON	2019/10/30
CHECKED		
APPROVED	RAY	2019/10/30

康舒科技
ACBEL POLYTECH INC.

I/O Label Drawing

NOTES:
1. UNIT: MM; 單位: 毫米

2. MATERIAL 材質:
2.1 FACE STOCK: WHITE POLYESTER 50#, THICKNESS = 0.05 MM
底材: 白霧龍 50#, 厚度 = 0.05MM
2.2 OVERLAMINATION 保護膜:
□ A TRANSPARENT FILM 透明膠膜
■ NONE 無
2.3 ADHESIVE 背膠:
PRESSURE SENSITIVE MESH ACRYLIC, THICKNESS = 0.035 MM
壓花膠, 厚度: 0.035 毫米
2.4 BACKED WITH RELEASE LINER 背面附離型紙
2.5 LABEL TO BE AFFIXED TO:
貼紙所貼附之材質:
■ GALVANIZED STEEL 鍍鋅鋼
□ ALUMINUM 鋁
□ NICKEL PLATED METAL 鍍鎳金屬
□ ZINC PLATED METAL WITH CHROMATE POST 後處理之鍍鉻酸鋅金屬
2.6 MAXIMUM TEMPERATURE RATING:
100°C 攝氏100度
2.7 MATERIAL MUST BE UL RECOGNIZED AND COMPLY TO UL 969 STANDARD.
材質必須符合 UL 認證, 並且遵從 UL 969 標準.

3. LABEL MUST BE MADE BY A UL RECOGNIZED AND CSA APPROVED VENDOR.
貼紙之製造商必須是 UL 與 CSA 所認證.

4. ALL PRODUCTS MUST BE THE SAME AS ENGINEERING APPROVED SAMPLES. ANY MODIFICATION MUST BE APPROVED BY API MECHANICAL ENGINEERING SECTION.
所有產品必須與認可的樣品一致, 任何的修改都必須經過康舒機構工程師同意及認可.

5. LABEL MUST CONTAIN THE VENDOR'S ID MARK LOCATED IN THE AREA INDICATED.
貼紙必須印製廠商代碼.

6. PRINTED COLOR 列印顏色:
BLACK - TEXT, GRAPHICS, IMAGE, LOGO SURROUND SHAPE
黑色 - 文字, 圖形, 圖像, 標誌, 外圍圖形
WHITE - BACKGROUND
白色 - 背景

7. FAI IS THE CRITICAL DIMENSION. FOR EVERY SHIPMENT, MUST FULLY INSPECT THREE SAMPLE PARTS AND PROVIDE A REPORT, THE REPORT MUST BE VALIDATED.
FAI尺寸為設計之重點尺寸, 每次出貨前須量測3PCS並提供FAI報告, 須合格方可出貨.

8. CPK IS THE DIMENSION PRODUCED BY STATISTICAL PROCESS CONTROL.FOR EVERY SHIPMENT, MUST FULLY INSPECT THIRTY SAMPLE PARTS AND PROVIDE A REPORT,
CPK表示該(尺寸/位置)為製程管控尺寸, 供應商每次出貨前須量測30 PCS並提供CPK報告,
須合格方可出貨.

9. THESE MATERIAL/PART/ASSEMBLY MUST COMPLY TO ACBEL SPEC "CRITERIA FOR ENVIRONMENT-RELATED SUBSTANCES".
材質/零件/製程均必須符合康舒"環境管理物質規範".

10. USES OF RED PHOSPHORUS MATERIAL IS PROHIBITED.
禁止使用含有紅磷材料.

11. USES OF EU RoHS & RoHS 2.0(HBCDD/DEHP/BBP/DBP) MATERIAL IS PROHIBITED
禁止使用EU RoHS & RoHS 2.0(HBCDD/DEHP/BBP/DBP)物質

12. PLEASE FOLLOW ACBEL'S REQUIREMENT FOR HF.
遵守康舒無鹵要求.

REV	DESCRIPTION	DATE	BY
F	UPDATE CCC/BSMI WARNING UPDATE LABEL LOGO TYPESETTING	2023/11/15	Eason
E	NOTE 11 ADD OPTION	2021/07/23	Eason
D	ADD UKCA LOGO,REMOVE CQC S&E	2021/05/03	Eason
C	ADD BIS LOGO & WARNINIG	2020/03/30	Eason
B	UPDATE KC LOGO	2019/06/26	Eason
A	RELEASE	2019/05/15	Eason
1	PRIMARILY	2018/07/03	LISHIN

REVISION

RELEASE			
正 式 發 行 圖 面			REV:F
ENG.	Eason	APPR.	Arthur

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MODEL NO.	FSJ014-000G
PART NO.	P01AAA-8247ETE
DWG NO.	P01AAA-8247ETE_F

SI Metric A4

TOLERANCES UNLESS OTHERWISE NOTED
0~6:±0.1, 6~120:±0.2, 120~315:±0.3,
315~:±0.5 ANGLES:±0.5°

0 mm 25

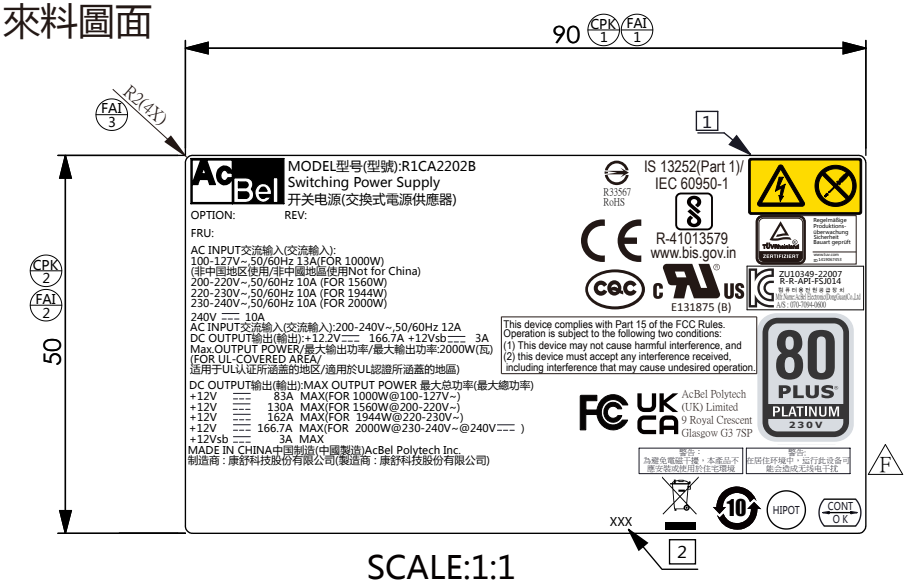
THIRD ANGLE PROJECTION

TITLE: I/O LABEL

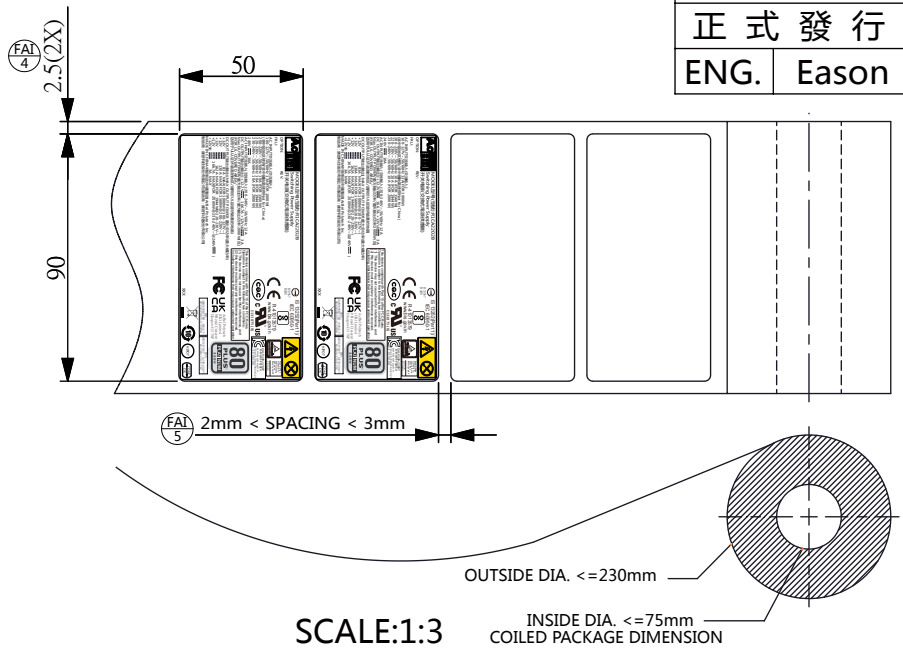
SCALE : 1:1 SHEET 1 OF 3

DESIGNER	Eason	2023/11/15
CHECKED	Joe	2023/11/15
APPROVED	Arthur	2023/11/15

來料圖面



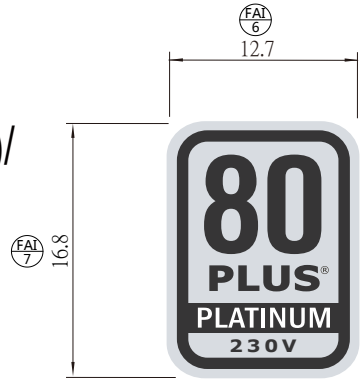
SCALE:1:1

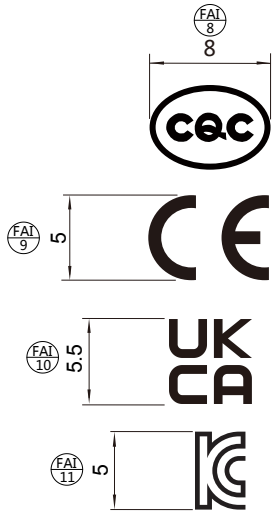


SCALE:1:3

RELEASE			
正 式 發 行 圖 面			REV:F
ENG.	Eason	APPR.	Arthur

SAFETY LOGO DETAIL
SCALE:2:1





IS 13252 (Part 1)/
IEC 60950-1

R-41013579
www.bis.gov.in

PRINTED COLOR: BLACK
80 PLUS LABEL COLOR :
PANTONE PMS : COOL GRAY 2
RGB : 230 , 231 ,232
MINIMUM WIDTH: .5"

BIS LOGO NOTE
1.字碼大小: 6pt
2.字型: Arial

1. 警告符號顏色定義如下:
PMC BlackC黑色 - 文字 . 圖形 . 圖像 . 標誌
PMC 108C黃色 - 背景



2. LABEL MUST CONTAIN THE VENDOR'S ID MARK LOCATED IN THE AREA INDICATED.
貼紙必須印製廠商代碼.

AcBel POLYTECH INC.

DRAWINGS & SPEC. ARE THE EXCLUSIVE PROPERTY OF ACBEL POLYTECH INC. SAID ITEMS ARE ISSUED IN STRICT CONFIDENTIAL

MODEL NO.	FSJ014-000G
PART NO.	P01AAA-8247ETE
DWG NO.	P01AAA-8247ETE_F

SI Metric A4

TOLERANCES UNLESS OTHERWISE NOTED
0~6:±0.1, 6~120:±0.2, 120~315:±0.3,
315~:±0.5 ANGLES:±0.5°

0 mm 25

THIRD ANGLE PROJECTION

TITLE: I/O LABEL

SCALE : 1:1 | SHEET 2 OF 3

DESIGNER	Eason	2023/11/15
CHECKED	Joe	2023/11/15
APPROVED	Arthur	2023/11/15

打印内容

1. FRU自印原則:

AXXSSNNNNN

- FW REVISION (印 : A0000 ; A0001 ; A0002 ...Z9999)
- MINOR REVISION (印 : 1 ; 2 ; 3 ...)
- MAJOR REVISION (印 : 1 ; 2 ; 3 ...)
- TYP (PMBUS印 : PM ; SMBUS印 : SM ; EEPROM印 : EP)
- API

2. BAR CODE FORMAT: CODE 128 / CPI : 13.64
THE NARROW ELEMENT DIMENSION (X DIMENSION)
SHOULD BE WITHIN A RANGE OF 0.170MM
條碼格式:CODE 128/CPI 13.64寬/窄:0.17毫米(0.0067英吋)

3. REV:XXX (S1印:0S1;S2印:0S2;A印:A00)

4. REV/BARCODE/DATAMATRIX/FRU provide by sales/PM
REV/一維/二維/FRU 內容由業務/PM 提供

5. AcBel一維SN自印原則 :

OOOOOONNNZZZZXYYWWSSSSSS

- SERIAL NO 000001~999999
- DATE CODE(YY:YEAR WW:WEEK)
- MFG. FACTORY CODE:(東莞康舒印: B ; 東莞康展印: T ; 武漢康舒印: W)
- ID CODE (EX:若機種為FSF050-00AG,則印製"00AG")
- API REVISION CONTROL CODE(S1印 : 0S1 ; S2印 : 0S2)
- API PN:(Ex.:若機種FSF050-00AG，則印製"FSF050"於此6個欄位)

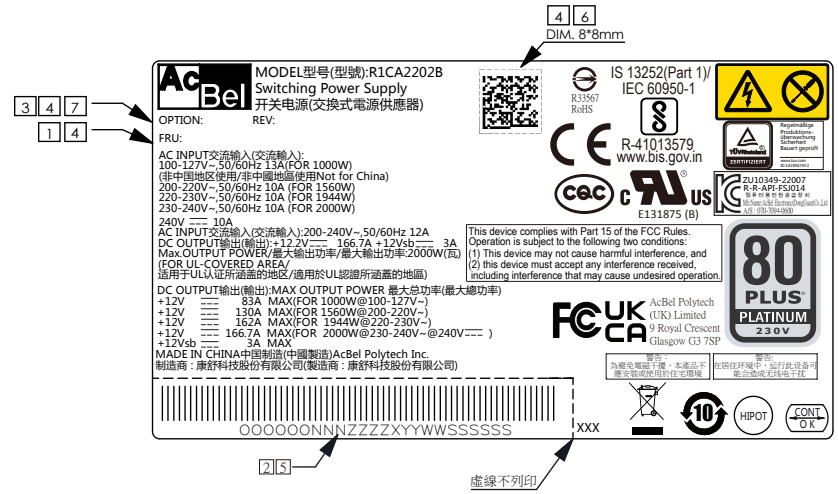
6. AcBel二維條碼自印原則:
條碼及文字內容說明
編碼:DATAMATRIX

XXXXXXXXXAAAA;OOOOOONNNZZZZXYYWWSSSSSS;YYMMDD;XXXXXXXXXX

- FRU (參照FRU自印原則)
- 生產日期 (例 : 2011年2月14日生產則印"110214")
- MFG. FACTORY CODE:(東莞康舒印: B ; 東莞康展印: T ; 武漢康舒印: W)
- OPTION
- MODEL

7. MODEL(型號)&OPTION PRINTED RULES:

機種	MODEL(型號)	OPTION
FSJ014-000G	R1CA2202B	P000
FSJ014-00AG	R1CA2202B	P00A
FSJ014-07AG	R1CA2202B	P07A
FSJ014-171G	R1CA2202B	P17A



RELEASE			
正 式 發 行 圖 面			REV:F
ENG.	Eason	APPR.	Arthur

ACBEL POLYTECH INC.

DRAWINGS & SPEC. ARE THE EXCLUSIVE PROPERTY OF ACBEL POLYTECH INC. SAID ITEMS ARE ISSUED IN STRICT CONFIDENTIAL

MODEL NO. FSJ014-000G
PART NO. P01AAA-8247ETE
DWG NO. P01AAA-8247ETE_F

SI Metric A4

TOLERANCES UNLESS OTHERWISE NOTED
0~6:±0.1, 6~120:±0.2, 120~315:±0.3,
315~:±0.5 ANGLES:±0.5°

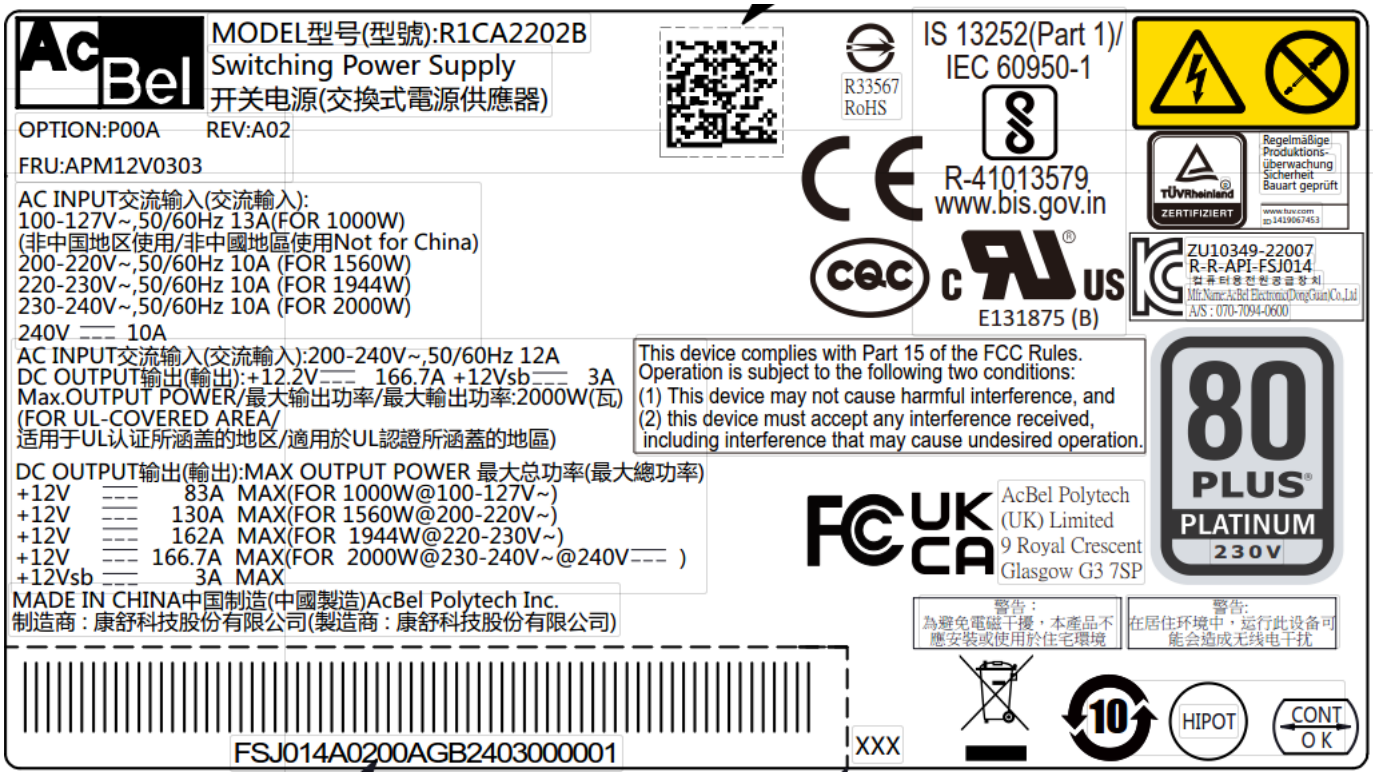
0 mm 25

THIRD ANGLE PROJECTION

TITLE: I/O LABEL

DESIGNER	Eason	2023/11/15
CHECKED	Joe	2023/11/15
APPROVED	Arthur	2023/11/15

SCALE : 1:1 SHEET 3 OF 3


MODEL型号(型號):R1CA2202B
Switching Power Supply
开关电源(交換式電源供應器)
OPTION:P00A REV:A02
FRU:APM12V0303
AC INPUT交流输入(交流輸入):
100-127V~,50/60Hz 13A(FOR 1000W)
(非中国地区使用/非中國地區使用Not for China)
200-220V~,50/60Hz 10A (FOR 1560W)
220-230V~,50/60Hz 10A (FOR 1944W)
230-240V~,50/60Hz 10A (FOR 2000W)
240V ⎓ 10A
AC INPUT交流输入(交流輸入):200-240V~,50/60Hz 12A
DC OUTPUT输出(輸出):+12.2V⎓ 166.7A +12Vsb⎓ 3A
Max.OUTPUT POWER/最大输出功率/最大輸出功率:2000W(瓦)
(FOR UL-COVERED AREA/
适用于UL认证所涵盖的地区/適用於UL認證所涵蓋的地區)
DC OUTPUT输出(輸出):MAX OUTPUT POWER 最大总功率(最大總功率)
+12V ⎓ 83A MAX(FOR 1000W@100-127V~)
+12V ⎓ 130A MAX(FOR 1560W@200-220V~)
+12V ⎓ 162A MAX(FOR 1944W@220-230V~)
+12V ⎓ 166.7A MAX(FOR 2000W@230-240V~@240V⎓)
+12Vsb ⎓ 3A MAX
MADE IN CHINA中国制造(中國製造)AcBel Polytech Inc.
制造商：康舒科技股份有限公司(製造商：康舒科技股份有限公司)
FSJ014A0200AGB2403000001
XXX
R33567
RoHS
IS 13252(Part 1)/
IEC 60950-1
R-41013579
www.bis.gov.in
E131875 (B)
ZU10349-22007
R-R-API-FSJ014
A/S : 070-7094-0600
This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received,
including interference that may cause undesired operation.
80 PLUS PLATINUM 230V
AcBel Polytech
(UK) Limited
9 Royal Crescent
Glasgow G3 7SP
HIPOT
CONT
O K


MODEL型号(型號):R1CA2202B
Switching Power Supply
开关电源(交換式電源供應器)
FSJ014A0200AGB2403000001
XXX
HIPOT
CONT
O K

打印内容

1. FRU自印原則:

AXXSSNNNNN

- FW REVISION (印 : A0000 ; A0001 ; A0002 ...Z9999)
- MINOR REVISION (印 : 1 ; 2 ; 3 ...)
- MAJOR REVISION (印 : 1 ; 2 ; 3 ...)
- TYP (PMBUS印 : PM ; SMBUS印 : SM ; EEPROM印 : EP)
- API

2. BAR CODE FORMAT: CODE 128 / CPI : 13.64
THE NARROW ELEMENT DIMENSION (X DIMENSION)
SHOULD BE WITHIN A RANGE OF 0.170MM
條碼格式:CODE 128/CPI 13.64寬/窄:0.17毫米(0.0067英吋)

3. REV:XXX (S1印:0S1;S2印:0S2;A印:A00)

4. REV/BARCODE/DATAMATRIX/FRU provide by sales/PM
REV/一維/二維/FRU 內容由業務/PM 提供

5. AcBel一維SN自印原則 :

OOOOOONNNZZZZXYYWWSSSSSS

- SERIAL NO 000001~999999
- DATE CODE(YY:YEAR WW:WEEK)
- MFG. FACTORY CODE:(東莞康舒印: B ; 東莞康展印: T ; 武漢康舒印: W)
- ID CODE (EX:若機種為FSF050-00AG,則印製"00AG")
- API REVISION CONTROL CODE(S1印 : 0S1 ; S2印 : 0S2)
- API PN:(Ex.:若機種FSF050-00AG , 則印製"FSF050"於此6個欄位)

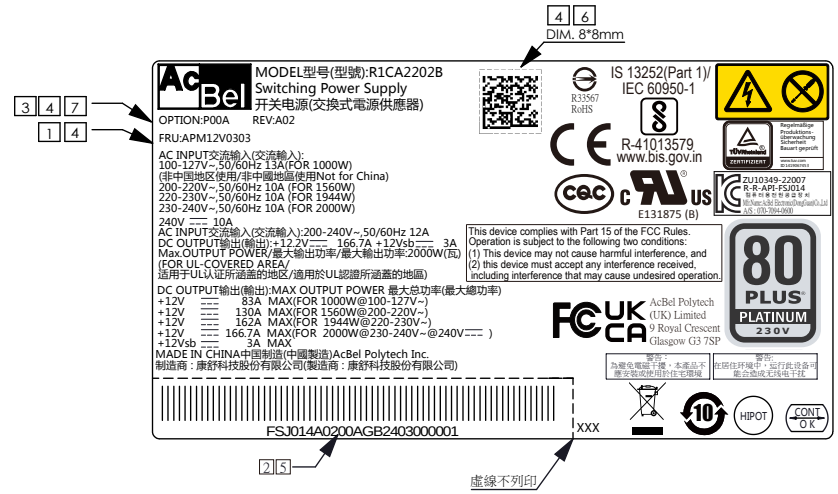
6. AcBel二維條碼自印原則:
條碼及文字內容說明
編碼:DATAMATRIX

XXXXXXXXXAAAA;OOOOOONNNZZZZXYYWWSSSSSS;YYMMDD;XXXXXXXXXX

- FRU (參照FRU自印原則)
- 生產日期 (例 : 2011年2月14日生產則印"110214")
- MFG. FACTORY CODE:(東莞康舒印: B ; 東莞康展印: T ; 武漢康舒印: W)
- OPTION
- MODEL

7. MODEL(型號)&OPTION PRINTED RULES:

機種	MODEL(型號)	OPTION
FSJ014-000G	R1CA2202B	P000
FSJ014-00AG	R1CA2202B	P00A
FSJ014-07AG	R1CA2202B	P07A
FSJ014-171G	R1CA2202B	P17A



RELEASE			
正 式 發 行 圖 面			REV:F
ENG.	Eason	APPR.	Arthur

ACBEL POLYTECH INC.

DRAWINGS & SPEC. ARE THE EXCLUSIVE PROPERTY OF ACBEL POLYTECH INC. SAID ITEMS ARE ISSUED IN STRICT CONFIDENTIAL

MODEL NO.	FSJ014-000G
PART NO.	P01AAA-8247ETE
DWG NO.	P01AAA-8247ETE_F

SI Metric A4

TOLERANCES UNLESS OTHERWISE NOTED
0~6:±0.1, 6~120:±0.2, 120~315:±0.3,
315~:±0.5 ANGLES:±0.5°

0 mm 25

THIRD ANGLE PROJECTION

TITLE: I/O LABEL

DESIGNER	Eason	2023/11/15
CHECKED	Joe	2023/11/15
APPROVED	Arthur	2023/11/15

SCALE : 1:1 SHEET 3 OF 3

康舒科技
ACBEL POLYTECH INC.

Carton Drawing

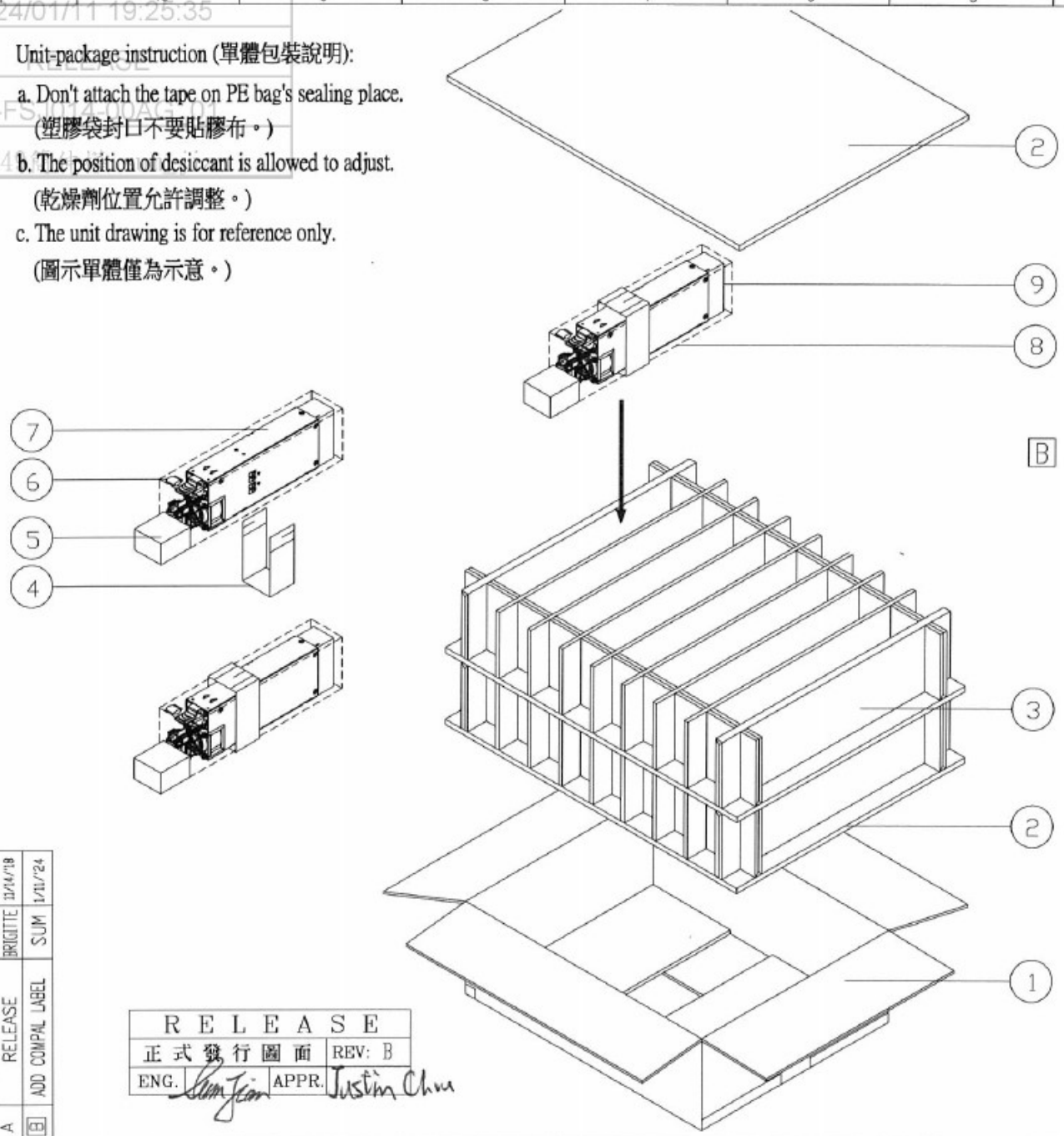
API DCC
2024/01/11 19:25:35
RELEASE
CA-FSJ014-00AG(1)

Unit-package instruction (單體包裝說明):

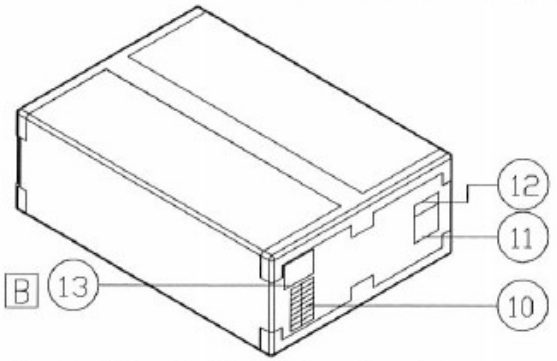
a. Don't attach the tape on PE bag's sealing place.
(塑膠袋封口不要貼膠布。)

b. The position of desiccant is allowed to adjust.
(乾燥劑位置允許調整。)

c. The unit drawing is for reference only.
(圖示單體僅為示意。)



Note: 1. 16 units/ carton (16台/箱)



The position of serial number labels is allowed to adjust.
(序號標籤位置允許調整。)

B The carton label (X01H00-2136I & X01H00-2161I) should be attached before shipment. And it is controlled by sales. (紙箱標籤 X01H00-2136I & X01H00-2161I 於出貨前貼,此紙箱標籤完全由業務控管。)

B	NO.	Q'TY	PART NO.	DESCRIPTION
	13	1	X01H00-2161I	COMPAL CARTON LABEL
	12	1	X01H00-2136I	CARTON LABEL
	11	1	X01H00-1749I	CARTON LABEL
	10	16	X01H00-2035I	S/N BARCODE LABEL
	9	16	X1008-E7186I	ANTISTATIC EPE BOARD
	8	16	R1008-B9411I	ANTISTATIC PE BAG
	7	16	FSJ014-00AG	POWER SUPPLY
	6	16	X1008-T9555I	DESICCATIVE
	5	16	R1008-E7991IA	EPE BOARD
	4	16	X1008-C1923I	KRAFT PAPER
	3	2	X1008-C2543I-SA	PARTITION ASSEMBLY
	2	3	X1008-C2523I	PAPER BOARD
	1	1	X1008-C1958I	CARTON

ACBEL POLYTECH INC.

MODEL NO. FSJ014-00AG
PART NO. CA-FSJ014-00AG
DWG. NO : CA-FSJ014-00AG_B

TITLE : CARTON ASS'Y FOR FSJ014-00AG

SI Metric A2 | 0 mm 25 | THIRD ANGLE PROJECTION

SCALE NONE | SHEET 1 OF 1

	DESIGNER	SUM	1/11/'24
	CHECKED		
	APPROVED	Justin	1/11/24

REVISIONS				
REV	DESCRIPTION	BY	DATE	
A	RELEASE	BRIGITTE	12/14/'18	
B	ADD COMPAL LABEL	SUM	1/11/'24	

RELEASE
正式發行圖面 REV: B
ENG. Sam Jian APPR. Justin Chu

API DCC
2024/01/11 19:27:37
RELEASE
PA-FSJ014-00AG_01
840349 Sum_Yan

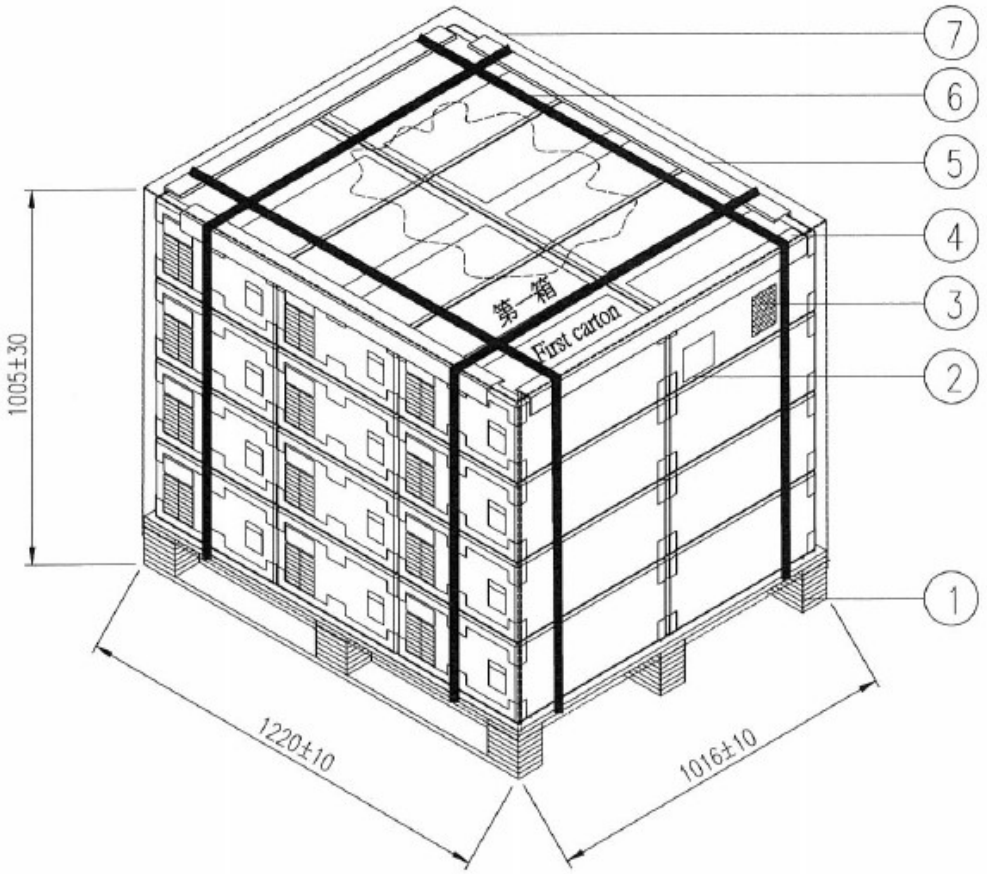
The requirement of labels and instructions: (標籤與說明書要求：)

a. The carton labels are always facing outwards. (紙箱標籤一律朝外。)

b. If there is any instruction in packaging BOM, please place it in the first carton.
(如果包裝 BOM中有說明書，請放置第一個紙箱中。)

B c. The carton label (X01H00-2136I & X01H00-2161I) should be attached before shipment. And it is controlled by sales. (紙箱標籤 X01H00-2136I & X01H00-2161I 於出貨前貼，此紙箱標籤完全由業務控管。)

Notes: 1. 16 units/ carton (16台/箱)
2. 6 cartons/ layer (6箱/層)
3. 4 layers/ pallet (4層/棧板)
4. 384 units/ pallet (384台/棧板)



REVISIONS			
REV	DESCRIPTION	BY	DATE
A	RELEASE	BRIGITTE	11/14/'18
B	MODIFY NOTE	SUM	1/11/'24

R E L E A S E			
正 式 發 行 圖 面		REV: B	
ENG.		APPR.	

NO.	Q'TY	PART NO.	DESCRIPTION
7	50M	X1008-8064I	PE FILM
6	20M	X1008-T9998I	PET PLASTIC STRIP
5	2	X1008-C8851I	EDGE PROTECTOR
4	2	X1008-C8852I	EDGE PROTECTOR
3	2	X01C32-1198I	SHIPPING LABEL
2	2	X01G50-0012I	WARNING LABEL
1	1	X1008-P9789I	PALLET

ACBEL POLYTECH INC.

MODEL NO. FSJ014-00AG
PART NO. PA-FSJ014-00AG
DWG. NO PA-FSJ014-00AG_B

SI Metric A3
THIRD ANGLE PROJECTION
SCALE NONE SHEET 1 OF 1

TITLE
PALLET ASS'Y FOR FSJ014-00AG

DESIGNER	SUM	1/11/'24
CHECKED		
APPROVED	Justin	

康舒科技
ACBEL POLYTECH INC.

Safety

Ref. Certif. No.

JPTUV-143149-A1

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product	Switching Power Supply
Name and address of the applicant	Acbel Polytech Inc. No. 159, Sec. 3, Danjin Rd., Tamsui Dist., New Taipei City 251 Taiwan
Name and address of the manufacturer	Acbel Polytech Inc. No. 159, Sec. 3, Danjin Rd., Tamsui Dist., New Taipei City 251 Taiwan
Name and address of the factory	See additional page(s)
Ratings and principal characteristics	Input : 1)(a) AC 100-127V/200-240V/220-240V; 50/60Hz; 13A/12A/10A, DC 240V; 10A MAX; Class I, (b) AC 100-127V/ 200-220V/220-230V; 50/60Hz; 13A (for 1000W, not for China)/ 10A (for 1560W, 1944W) for more input ratings, pls refer to the test report; Output: refer to the test report.
Trademark (if any)	AcBel
Customer's Testing Facility (CTF) Stage used	CTF Stage 1
Model / Type Ref.	1) FSJ014, R1CA2202B, FSJ023, R1CA2202C 2) FSH018, R1CA2162B, FSJ024, R1CA2162C 3) FSL010, R1CA2202D, 4) R1CA2202F, 5) FSM033, R1CA2202G 6) CRPS2000NC, R1CA1202G, 7) FSM039, CRPS1600NS, R1CA1162B 8) R1CA2162F, 9) FSM031, R1CA2132C
Additional information (if necessary may also be reported on page 2)	For model differences, refer to the test report Re-issue of JPTUV-143149 dated 2022-12-21, due to non-technical change.
A sample of the product was tested and found to be in conformity with	IEC 62368-1:2018 See Test Report for National Differences
As shown in the Test Report Ref. No. which forms part of this Certificate	CN22CVLM 002

This CB Test Certificate is issued by the National Certification Body

TÜVRheinland®

TÜV Rheinland Japan Ltd.
Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku
Yokohama 224-0021, Japan
Phone + 81 45 914-3888
Fax + 81 45 914-3354
Mail: info@jpn.tuv.com
Web : www.tuv.com

Date: 2023-01-16

Signature:

Dipl.-Ing. F. Stoelzel

10/0861 CB 06/2019 rk

Disclaimer: This is an electronically released document. The authenticity of this certificate can be verified on the IECEE Website "http://certificates.iecee.org"

1. AcBel Polytech(Philippines) INC.
   No. 2 Tagaytay Ridge Drive,
   Carmelray Industrial Park II,
   Km. 54 National Highway
   Calamba City, Laguna 4027, Philippines

2. ACBEL ELECTRONIC (WUHAN) CO., LTD
   No. 1, DuTai North Road
   Economic Development Zone
   XianTao City, HuBei Province
   P.R. China

3. Acbel Electronic (Dong Guan)
   Co., Ltd.
   No. 17-28, Horng Yeh Road, Horng
   Yeh Ind. District, Tang Xia Town
   Dongguan, Guangdong 523710, P.R. China

4. Acbel Polytech Inc.
   No. 159,
   Sec. 3, Danjin Rd., Tamsui Dist.,
   New Taipei City 251
   Taiwan

Additional information (if necessary) Report Ref. No. : CN22CVLM 002

Date: 2023-01-16 Signature: Dipl.-Ing. F. Stoelzel

10/061a CB 06/20v3 rk

Disclaimer: This is an electronically released document. The authenticity of this certificate can be verified on the IECEE Website "http://certificates.iecee.org"

Industrial Services, Mobility and Transport,
Product Safety and Quality, Education and
Consulting, IT Services and Innovation

TÜVRheinland®
Precisely Right.

Acbel Polytech Inc.
Mr. Kenny Lin

No. 159,
Sec. 3, Danjin Rd., Tamsui Dist.,
New Taipei City 251
Taiwan

Date : 23.02.2023
Our ref. : WYP ZTW1
Your ref.: T211239/Chaohong

Ref : R TÜV-Bauart-Zeichen o. Akkred. Nr.

Type of Equipment : Switching Power Supply
Model Designation : See Certificate
Certificate No. : R 50432279 0004
Report No. : 50225945 004

Dear Mr. Kenny Lin,

The above specified equipment has been tested and found to be in accordance with the relevant requirements.

Please find enclosed your certificate as specified above.

If cancellation of the certificate is submitted by 15 November in a given year, no fee will be charged for the following year.

The certificate is issued with the reservation that the license holder applies all information required in § 6 of the ProdSG related to name and address of the manufacturer or his authorized representative / importer, including their respective contact addresses on the product prior to marketing of the product in the European Economic Area.
In case you have a change regarding your involved local representative for the certificate, please inform us in due time.

With kind regards,

Certification Body

Dipl.-Ing. F. Stoelzel

Enclosure

TÜV RHEINLAND TAIWAN LTD.

11F., No. 758, Sec. 4, Bade Rd.,
Songshan Dist., Taipei City 105,
Taiwan
Tel. (02) 2172-7000
Fax (02) 2172-1322
http: //www.tuv.com

NEW TAIPEI BRANCH:
No. 458-18 & 458-19,
Sec. 2, Fenliao Rd., Linkou Dist.,
New Taipei City 244,
Taiwan
Tel. (02) 2172-1000
Fax (02) 2172-1322

TAICHUNG BRANCH:
3F., No. 497, Zhongming South Rd.,
West Dist., Taichung City 403,
Taiwan
Tel. (02) 2172-7000
Fax (02) 2172-1322

KAOHSIUNG BRANCH:
27F.-3, No.80, Minzu 1st Rd.,
Sanmin Dist., Kaohsiung City 807,
Taiwan
Tel. (07) 262-6000
Fax (07) 380-0577

Zertifikat *Certificate*

TÜVRheinland®

Zertifikat Nr. *Certificate No.*
R 50432279

Blatt *Sheet*
0001

Ihr Zeichen *Client Reference*	Unser Zeichen *Our Reference*	Ausstellungsdatum	*Date of Issue*
T180813_Randy	ZTW1-KKC-50225945 001	21.03.2019	*(day/mo/yr)*

Genehmigungsinhaber *License Holder*
Acbel Polytech Inc.
No. 159, Sec. 3, Danjin Rd.,
Tamsui Dist., New Taipei City 251
Taiwan

Fertigungsstätte *Manufacturing Plant*
Refer to latest revision
of the annex list of factories

Prüfzeichen *Test Mark*

TÜVRheinland® ZERTIFIZIERT
Regelmäßige Produktionsüberwachung
Sicherheit
Bauart geprüft
www.tuv.com
ID 1419067453

Geprüft nach *Tested acc. to*
EN 62368-1:2014+A11

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

Einbauschaltnetzteil (Switching Power Supply)

Bezeichnung (Type Designation)	: R1CA2202B(AcBel)	10
Eingang (Input)	: AC 100-127V; 50/60Hz; 13A, AC 200-240V; 50/60Hz; 12A, AC 220-240V; 50/60Hz; 10A, DC 240V, 10A MAX	
Ausgang (Output)	: siehe Aufbau-Übersicht (see constructional dataform)	
max. Umgebungstemperatur (max. Ambient Temperature)	: 50°C	
Schutzklasse (Protection Class)	: I	
Verschmutzungsgrad (Pollution Degree)	: 2	
max. Betriebshöhe (max. Operating Altitude)	: 5,000m	

10

ANLAGE (Appendix): 1

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

Zertifizierungsstelle

TÜV Rheinland LGA Products GmbH Zertifizierungsstelle

Dipl.-Ing. F. Stoelzel

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg
Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com
Fax: +49 221 806-3935 http://www.tuv.com/safety

10/020 d 04.08 ® TÜV, TUEV and TUV are registered trademarks. Utilisation and application requires prior approval.

Zertifikat *Certificate*

TÜVRheinland®

Zertifikat Nr. *Certificate No.*
R 50432279

Blatt *Sheet*
0002

Ihr Zeichen *Client Reference*	Unser Zeichen *Our Reference*	Ausstellungsdatum *Date of Issue*
T180813_Randy	ZTW1-KKC-50225945 001	21.03.2019 *(day/mo/yr)*

Genehmigungsinhaber *License Holder*
Acbel Polytech Inc.
No. 159, Sec. 3, Danjin Rd.,
Tamsui Dist., New Taipei City 251
Taiwan

Fertigungsstätte *Manufacturing Plant*
Refer to latest revision
of the annex list of factories

Prüfzeichen *Test Mark*

TÜVRheinland® ZERTIFIZIERT
Regelmäßige Produktions-überwachung
Sicherheit Bauart geprüft
www.tuv.com ID 1419067453

Geprüft nach *Tested acc. to*
EN 62368-1:2014+A11

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

Einbauschaltnetzteil (Switching Power Supply)

wie Blatt (as page) 01

Ergänzung
(Addition)

Bezeichnung (Type Designation)	:a) FSJ014(AcBel)	1
	b) FSH018(AcBel) , R1CA2162B(AcBel)	2
	FSJ024(AcBel) , R1CA2162C(AcBel)	2
	c) FSJ023(AcBel) , R1CA2202C(AcBel)	2
Eingang (Input)	: siehe Aufbau-Übersicht (see constructional dataform)	
Ausgang (Output)	: siehe Aufbau-Übersicht (see constructional dataform)	
max. Umgebungstemperatur (max. Ambient Temperature)	: a) 50°C	
	b) 55°C	
	c) 45°C	

7

ANLAGE (Appendix): 1

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

Zertifizierungsstelle

TÜV Rheinland LGA Products GmbH Zertifizierungsstelle

Dipl.-Ing. F. Stoelzel

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg
Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com
Fax: +49 221 806-3935 http://www.tuv.com/safety

10/020 d 04.08 ® TUV, TUEV and TUV are registered trademarks. Utilisation and application requires prior approval.

Zertifikat *Certificate*

Zertifikat Nr. *Certificate No.*
R 50432279

Blatt *Sheet*
0003

Ihr Zeichen *Client Reference*	Unser Zeichen *Our Reference*	Ausstellungsdatum	*Date of Issue*
T211239/Chaohong	ZTW1-WYP-50225945 003	03.01.2023	*(day/mo/yr)*

Genehmigungsinhaber *License Holder*
Acbel Polytech Inc.
No. 159,
Sec. 3, Danjin Rd., Tamsui Dist.,
New Taipei City 251
Taiwan

Fertigungsstätte *Manufacturing Plant*
Refer to latest revision
of the annex list of factories

Prüfzeichen *Test Mark*
TÜVRheinland ZERTIFIZIERT
Regelmäßige Produktions-überwachung
Sicherheit
Bauart geprüft
www.tuv.com
ID 1419067453

Geprüft nach *Tested acc. to*
EN IEC 62368-1:2020+A11

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

Einbauschaltnetzteil (Switching Power Supply)

wie Blatt (as page) 01
Änderung (Change)
Prüfgrundlage : siehe oben
(Test Requirement) (see above)
max. Umgebungstemperatur : 45°C (FSJ023, R1CA2202C)
(max. Ambient Temperature) 55°C (except FSJ023, R1CA2202C)
Ergänzung (Addition)
Bezeichnung : FSM033, R1CA2202G, CRPS2000NC,
(Type Designation) R1CA1202G, FSM039, CRPS1600NS,
R1CA1162B, R1CA2162F, FSM031, R1CA2132C (AcBel)
Eingang / Ausgang : siehe Aufbau-Übersicht
(Input)/(Output) (see Constructional Data Form)
Ergänzung für Bezeichnung (Addition for Type Designation)
Bezeichnung : FSJ014, R1CA2202B (AcBel)
(Type Designation)
Eingang / Ausgang : siehe Aufbau-Übersicht
(Input)/(Output) (see Constructional Data Form)

ANLAGE (Appendix): 1.1

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH Zertifizierungsstelle

Zertifizierungsstelle

Dipl.-Ing. F. Stoelzel

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg
http://www.tuv.com/safety E-mail: markcheck@tuv.com
Fax: +49 221 806-3935

10/020 d 04.08 ® TÜV, TUEV and TUV are registered trademarks. Utilisation and application requires prior approval.

Anlage Fertigungsstättenliste
/Attachment List of Factories

R 50432279 0001

Anlagenrevision / Annex revision 1

1 Acbel Polytech Inc.
No. 159,
Sec. 3, Danjin Rd., Tamsui Dist.,
New Taipei City 251
Taiwan

2 Acbel Electronic (Dong Guan)
Co., Ltd.
No. 17-28, Horng Yeh Road, Horng
Yeh Ind. District, Tang Xia Town
Dongguan, Guangdong 523710
P.R. China

3 ACBEL ELECTRONIC (WUHAN) CO., LTD
No. 1, DuTai North Road
Economic Development Zone
XianTao City, HuBei Province
P.R. China

4 AcBel Polytech(Philippines) INC.
No. 2 Tagaytay Ridge Drive,
Carmelray Industrial Park II,
Km. 54 National Highway
Calamba City, Laguna 4027
Philippines

Dieser Anhang ersetzt den Vorgänger vom/
This annex replaces the previous annex dated

Datum / Date 21.03.2019

Zertifizierungsstelle
/ Certification Body

Dipl.-Ing. F. Stoelzel

10/020 d 04.08 ® TÜV, TUEV and TUV are registered trademarks. Utilisation and application requires prior approval.

Zertifikat *Certificate*

TÜVRheinland®

Zertifikat Nr. *Certificate No.*
R 50432279

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0004

Ihr Zeichen *Client Reference*	**Unser Zeichen** *Our Reference*	**Ausstellungsdatum**	*Date of Issue*
T211239/Chaohong	ZTW1-WYP-50225945 004	23.02.2023	*(day/mo/yr)*

Genehmigungsinhaber *License Holder*
Acbel Polytech Inc.
No. 159,
Sec. 3, Danjin Rd., Tamsui Dist.,
New Taipei City 251
Taiwan

Fertigungsstätte *Manufacturing Plant*
Refer to latest revision
of the annex list of factories

Prüfzeichen *Test Mark*

TÜVRheinland® ZERTIFIZIERT
Regelmäßige Produktions-überwachung
Sicherheit
Bauart geprüft
www.tuv.com
ID 1419067453

Geprüft nach *Tested acc. to*
EN IEC 62368-1:2020+A11

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

Einbauschaltnetzteil (Switching Power Supply)

wie Blatt (as page) 01

Ergänzung für Bezeichnung : FSM039 (AcBel)
(Addition for Type Designation)

Bezeichnung : CRPS1600NC (AcBel)
(Type Designation)

ANLAGE (Appendix): 1.1

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH ® TÜVRheinland Zertifizierungsstelle

Zertifizierungsstelle

F. Stoelzel

Dipl.-Ing. F. Stoelzel

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg
http://www.tuv.com/safety E-mail: markcheck@tuv.com
Fax: +49 221 806-3935

10/020 d 04.08 ® TÜV, TUEV and TUV are registered trademarks. Utilisation and application requires prior approval.

NOTICE OF COMPLETION
AND
AUTHORIZATION TO APPLY THE UL MARK

March 6, 2023

MR. CHAO-HONG CHENG
ACBEL POLYTECH INC
No.159 Sec 3 Danjin Rd
TamSui District
New Taipei, 251, TW

Your Reference:	T230213	
Our Reference:	File E131875-Vol.12, Volume 12	Order: 14685450
		Project: 4790744191
Project Scope:	Switching Power Supply, add Model CRPS1600NC.	

Dear Mr. Chao-Hong Cheng:

UL has completed the investigation under the above project and confirmed compliance of your product(s) with UL requirements. We appreciate that you have a choice of certification providers and thank you for choosing UL**.**

This letter temporarily supplements the UL Follow-Up Services Procedure and serves as authorization to apply the UL Mark at the factory location(s) identified on the Authorization Page of UL File E131875-Vol.12, Volume 12. You are required to send a copy of this letter to all manufacturing locations authorized under UL File E131875-Vol.12, Volume 12.

The Follow-Up Services Procedure covering your product(s) will typically be provided by UL within 10 business days. Any information and documentation provided to you involving the UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Products that bear the UL Mark must be identical to those submitted to UL for evaluation and certification and must comply with the Follow-Up Services Procedure covering your product(s). Additional requirements related to the responsibilities of the Applicant and Manufacturer can be found under **Additional Resources** at https://www.ul.com/fus.

A UL certification is a valuable marketing tool meaning your product or company has successfully met stringent requirements. We encourage you to use your UL Mark and certification in your marketing activities. You can find information on how to accurately promote your UL certification at https://www.ul.com/marketing.

If you have any questions, please contact me or any of our customer service representatives. And, congratulations again on your achievement!

Sincerely,

Ann Lin
Project Handler I
Underwriters Laboratories Taiwan Co., Ltd.
Ann.Lin@ul.com

Deborah Jennings-Conner
VP Regulatory Services
UL LLC
Deborah.Jennings-Conner@ul.com

f6e78b4c2fe7414cb2b7bf5acba84707

CE Declaration of Conformity

For the following equipment：

Product：	Switching Power Supply
Type Designation：	FSJ014, R1CA2202B, FSJ023, R1CA2202C, FSH018, R1CA2162B, FSJ024, R1CA2162C, FSM033, R1CA2202G, CRPS2000NC, R1CA1202G, FSM039, CRPS1600NS, R1CA1162B, CRPS1600NC, R1CA2162F, FSM031, R1CA2132C
Trademark：	ACBel
Manufacturer‘s Name：	ACBEL POLYTECH INC.
Manufacturer‘s Address：	No.159, Sec. 3, Danjin Rd., Tamsui Dist., New Taipei City, Taiwan

Herewith confirmed to comply with the following legal requirements set out in the Official Journal of the European Union. Products sold in the European Economic Area (EEA) have been assessed to meet high safety, health and environmental protection requirements.

☒ Low-Voltage Directive 2014/35/EU：	EN IEC 62368-1:2020+A11:2020
☒ EMC Directive 2014/30/EU：	EN 55032:2015+A11:2020； EN 55035:2017+A11:2010； EN IEC 61000-3-2:2019+A1:2021； EN 61000-3-3:2013+A2:2021+AC:2022
☐ ErP directive Commission：Regulation (EU) 2019/1782	EN 50563:2011/A1:2013
☒ RoHS Directive 2011/65/EU ((EU) 2015/863)：	EN IEC 63000:2018
☒ Additional information：	DECISION No 768/2008/EC

Responsible for making this declaration is the :

☒ Manufacturer

☐ Authorized representative established within the EU

☐ Authorized representative established within the EU (if applicable)：

Company Name：

Company Address：

Person responsible for making this declaration

Name，Surname： Nat Liu

Position / Title： Safety Supervisor / Acbel Polytech Inc.

Taipei，Taiwan	2023-03-22	Nat Liu
Place	Date	Legal Signature

UK Declaration of Conformity

For the following equipment：

Product：	Switching Power Supply
Type Designation：	FSJ014, R1CA2202B, FSJ023, R1CA2202C, FSH018, R1CA2162B, FSJ024, R1CA2162C, FSM033, R1CA2202G, CRPS2000NC, R1CA1202G, FSM039, CRPS1600NS, R1CA1162B, CRPS1600NC, R1CA2162F, FSM031, R1CA2132C
Trademark：	ACBel
Manufacturer‘s Name：	ACBEL POLYTECH INC.
Manufacturer‘s Address：	No.159, Sec. 3, Danjin Rd., Tamsui Dist., New Taipei City, Taiwan

Herewith confirmed to comply with the following legal requirements. Products sold in the Great Britain (GB) have been assessed to meet high safety, health and environmental protection requirements.

☒	Electrical Equipment (Safety) Regulations 2016 :	BS EN IEC 62368-1:2020+A11:2020
☒	Electromagnetic Compatibility Regulations 2016 :	BS EN 55032:2015+A11:2020； BS EN 55035:2017+A11:2010； BS EN IEC 61000-3-2:2019+A1:2021； BS EN 61000-3-3:2013+A2:2021+AC:2022
☐	The Ecodesign for Energy-Related Products and Energy Information (Amendment) (EU Exit) Regulations 2019 :	BS EN 50563:2011/A1:2013
☒	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 :	BS EN IEC 63000:2018

Responsible for making this declaration is the :

☒ Manufacturer

☐ Authorized representative established within the UK

☐ Authorized representative established within the UK (if applicable)：

Company Name：

Company Address：

Person responsible for making this declaration

Name，Surname： Nat Liu

Position / Title： Safety Supervisor / Acbel Polytech Inc.

Taipei，Taiwan	2023-03-22	Nat Liu
Place	Date	Legal Signature

經 濟 部 標 準 檢 驗 局

BUREAU OF STANDARDS,METROLOGY AND INSPECTION,
MINISTRY OF ECONOMIC AFFAIRS

Product Certification
PCD01

商 品 驗 證 登 錄 證 書

CERTIFICATE OF THE REGISTRATION OF PRODUCT CERTIFICATION

證書號碼： CI338065677396 號 02
Certificate No.

茲據 康舒科技股份有限公司 申請驗證登錄，經審查結果符合規定，准予登錄並使用商品安全標章 及識別號碼： R33567 。其登錄事項如下：

The application made by for Registration of Product Certification has been reviewed and found to be in compliance with related regulations. Therefore, registration is granted with the Product Safety Mark and the Identification No. R33567 . Details of the registration are follows :

申 請 人 ：康舒科技股份有限公司 統一編號：12341051
Applicant Uniform No.

地 址 ：台北市松山區南京東路五段99號11樓
Address

生產廠場 ：詳如附表
Factory

廠 址 ：詳如附表
Factory Address

商品種類名稱：
Type/name of product

商品分類號列： 8504.40.91.00.7-A
C.C.C Code

中文名稱 ： 交換式電源供應器
Chinese name

英文名稱 ： SWITCHING POWER SUPPLY
English name

型 式： FSJ014
Type

系列型式 ： 詳如附表
Series of the type

依據標準 ： CNS15598-1（109年06月）、CNS15936（105年09月）、符合CNS 15663第5節「含有標示」規定（102年版）
Standards

標準檢驗局發證（發證地址：100臺北市中正區濟南路1段4號）
This certificate is issued by the BSMI. (No.4, Sec. 1, Jinan Rd., Zhongzheng Dist., Taipei City 100, Taiwan)

本證書以電子文件行之，所載內容若有不符之處，以標準檢驗局系統登錄資料為主，查詢證書資料網址:https://civil.bsmi.gov.tw

登錄日期：中華民國	108	年	04	月	16	日
Registration Date	2019	(year)	04	(month)	16	(day)
本證書有效期限至	114	年	04	月	15	日
Expiration Date	2025	(year)	04	(month)	15	(day)
發證日期：中華民國	112	年	04	月	17	日
Date of issue	2023	(year)	04	(month)	17	(day)

經濟部 標準檢驗局 BSMI

註1：持本證書進口驗證登錄商品時，進口人須與本證書名義人相同。
註2：次年度商品驗證登錄年費繳納期限為當年11月30日，逾期未繳納者，經限期繳納屆期未繳納，即依商品檢驗法第42條第7款規定廢止驗證登錄，並自次年度1月1日起生效。
註3：本證書僅代表完成檢驗程序，不作為其他(如產地)證明。

經 濟 部 標 準 檢 驗 局

BUREAU OF STANDARDS,METROLOGY AND INSPECTION,
MINISTRY OF ECONOMIC AFFAIRS

商 品 驗 證 登 錄 證 書

CERTIFICATE OF THE REGISTRATION OF PRODUCT CERTIFICATION

證書號碼： CI338065677396 號 02
Certificate No.

系列型式： CRPS1600NC
Series of the type

CRPS1600NS

CRPS2000NC

FSH018

FSJ023

FSJ024

FSM031

FSM033

FSM039

R1CA1162B

R1CA1202G

R1CA2132C

R1CA2162B

R1CA2162C

R1CA2162F

經 濟 部 標 準 檢 驗 局

BUREAU OF STANDARDS,METROLOGY AND INSPECTION,
MINISTRY OF ECONOMIC AFFAIRS

商 品 驗 證 登 錄 證 書

CERTIFICATE OF THE REGISTRATION OF PRODUCT CERTIFICATION

證書號碼： CI338065677396 號 02
Certificate No.

系列型式： R1CA2202B
Series of the type

R1CA2202C

R1CA2202G

（以下空白）

經 濟 部 標 準 檢 驗 局

BUREAU OF STANDARDS,METROLOGY AND INSPECTION,
MINISTRY OF ECONOMIC AFFAIRS

商 品 驗 證 登 錄 證 書

CERTIFICATE OF THE REGISTRATION OF PRODUCT CERTIFICATION

證書號碼： CI338065677396 號 02
Certificate No.

生產廠場：
Factory：

1. Acbel Polytech (Philippines) Inc.
   No.2, Tagaytay Ridge Drive, Carmelray Industrial Park II, Km 54 National Highway, Calamba City, Laguna, Philippines. 4027

2. 康舒科技股份有限公司
   新北市淡水區淡金路三段159號

3. 康舒電子(東莞)有限公司
   廣東省東莞市塘廈鎮宏業工業區宏業大道17-28號

4. ACBEL ELECTRONIC (WUHAN) CO., LTD
   No.1, DuTai North Road, Economic Development Zone, Xian Tao City, HuBei Province, P.R. China

（以下空白）

BSMI

BUREAU OF STANDARDS • METROLOGY AND INSPECTION • MINISTRY OF ECONOMIC AFFAIRS • REPUBLIC OF CHINA •
經濟部
標準檢驗局
BSMI

經濟部標準檢驗局

商品驗證登錄核備案件核准通知書

日期： 112/02/09

1. 貴公司/商工行號變更驗證登錄商品申請核准，經審查符合規定，獲准之核備資料如下：

證書號碼　　CI338065677396 - P2

商品分類號列8504.40.91.00.7-A

商品名稱　　交換式電源供應器

型　　式　　FSJ014

申准原因

1. 型號FSJ014, R1CA2202B 增加輸入及輸出規格
2. 型號FSJ014, R1CA2202B的最大環境變更為55 °C。
3. 變更零件(C36, Q4, Q5, Q6, Q8, Q30, Q37)規格, 詳見附表1.5.1
4. 增加光耦合器(M6, M7, M20), 洩放電阻(RHV1, RHV2, RHV3)及DC風扇廠家型號來源

核准內容

1. 型號FSJ014, R1CA2202B 增加輸入及輸出規格
2. 型號FSJ014, R1CA2202B的最大環境變更為55 °C。
3. 變更零件(C36, Q4, Q5, Q6, Q8, Q30, Q37)規格, 詳見附表1.5.1
4. 增加光耦合器(M6, M7, M20), 洩放電阻(RHV1, RHV2, RHV3)及DC風扇廠家型號來源

此致

申請人：　康舒科技股份有限公司

地　址：　台北市松山區南京東路五段99號11樓

代理人：

代理人地址：

經濟部 標準檢驗局 BSMI

本通知書以電子文件行之，所載內容若有不符之處，以標準檢驗局系統登錄資料為主

中国国家强制性产品认证证书

证书编号：2023010907593179

发证日期：2023 年 12 月 07 日
有效期至：2028 年 03 月 09 日

认证委托人名称及注册地址	康舒科技股份有限公司 中国台北市松山区南京东路 5 段 99 号 11 楼
产品生产者名称及注册地址	康舒科技股份有限公司 中国台北市松山区南京东路 5 段 99 号 11 楼
生产企业名称及生产地址	康舒电子（东莞）有限公司 中国广东省东莞市塘厦镇宏业工业区宏业大道 17-28 号
产品名称和系列、规格、型号	开关电源 见附件（仅适用于海拔 5000 米及以下）
产品标准和技术要求	GB 17625.1-2022（A 类);GB 4943.1-2022;GB/T 9254.1-2021(A 级)

上述产品符合 CNCA-C09-01:2023 认证规则的要求，特发此证。
证书有效期内本证书的有效性依据发证机构的定期监督获得保持。
经中国合格评定国家认可委员会认可 CNAS C001-P

可通过扫描下方二维码或登录国家认监委网站（www.cnca.gov.cn）查验证书信息

签发：谢肇煦

中国质量认证中心

中国国家强制性产品认证证书

证书编号：2023010907593179　　第 1 页 /共 2 页

本证书及附件应同时使用，信息查验说明见证书页　　纸号：

型号	输入	直流输出
FSJ014, R1CA2202B, FSJ023, R1CA2202C	（a）	
	220-230V～, 50/60Hz,10A	+12V/ 162A,+12Vsb/3A, 最大总功率: 1944W MAX.
	230-240V～, 50/60Hz 10A	+12V/ 166.7A, +12Vsb/ 3A, 最大总功率: 2000W MAX.
	直流输入: 240Vdc, 10A MAX.	
	（b）	
	200-220V～,50/60Hz,10A	+12V/ 130A MAX，+12Vsb/3A MAX 最大总功率: 1560W
	220-230V～,50/60Hz,10A	+12V/ 162A MAX.,+12Vsb/ 3A MAX., 最大总功率: 1944W
	230-240V～,50/60Hz 10A	+12V/ 166.7A MAX.,+12Vsb/ 3A MAX., 最大总功率: 2000W
	直流输入: 240Vdc, 10A	
FSH018, R1CA2162B, FSJ024, R1CA2162C	200-240V～,50/60Hz, 10A MAX	+12V/ 133.3A, +12Vsb/3A, 最大总功率: 1600W MAX.
	直流输入: 240Vdc,8A MAX	
FSL010, R1CA2202D	200-240V～， 50/60Hz, 11.5A	+12V/ 166.7A, +12Vsb/ 3A, 最大总功率: 2000W MAX.
	直流输入: 240Vdc,10A	
R1CA2202F	200-220V～, 50/60Hz, 10A	+12V/ 133.3A, +12Vsb/ 3A, 最大总功率: 1600W MAX.
	220-240V～, 50/60Hz, 10A	+12V/ 166.7A, +12Vsb/3A, 最大总功率: 2000W MAX.
	直流输入: 240Vdc, 10A	

中国质量认证中心

中国国家强制性产品认证证书

本证书及附件应同时使用，信息查验说明见证书页　　纸号：

FSM033, R1CA2202G	200-220V～,50/60Hz, 10A	+12.2V/ 147.5A MAX., +12Vsb/ 3A MAX., 最大总功率: 1800W
	220-240V～,50/60Hz, 10A	+12.2V/ 163.9A MAX.,+12Vsb/ 3A MAX., 最大总功率: 2000W
	直流输入: 240Vdc, 10A	
CRPS2000NC, R1CA1202G	200-220V～,50/60Hz, 10A	+12.2V/ 147.5A MAX.， 最大总功率: 1800W
	220-240V～,50/60Hz, 10A	+12.2V/ 163.9A MAX.， 最大总功率: 2000W
	直流输入: 240Vdc, 10A	
FSM039, CRPS1600NS, R1CA1162B, CRPS1600NC	200-240V～,50/60Hz, 10A	+12.2V/ 131.1A MAX.，最大总功率: 1600W
	直流输入: 240Vdc, 8A	
R1CA2162F	200-240V～,50/60Hz,10A	+12.2V/ 131.1A MAX., +12Vsb/ 3A MAX.， 最大总功率: 1600W
	直流输入: 240Vdc, 8A	
FSM031, R1CA2132C	200-240V～， 50/60Hz, 7.5A	+12.2V/ 106.5A MAX., +12Vsb/ 3.0A MAX.，最大总功率: 1300W
	直流输入: 240Vdc, 6.5A	

中国质量认证中心

CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

CERTIFICATE NO.: 2023010907593179

Valid from: Dec.07,2023

Valid until: Mar.09,2028

NAME AND REGISTERED ADDRESS OF THE APPLICANT	Acbel Polytech Inc. 11F., No.99, Sec. 5, Nan-King E. Road, Sungshan Chiu, Taipei, Taiwan, Province Of China.
NAME AND REGISTERED ADDRESS OF THE MANUFACTURER	Acbel Polytech Inc. 11F., No.99, Sec. 5, Nan-King E. Road, Sungshan Chiu, Taipei, Taiwan, Province Of China.
NAME AND LOCATION OF THE FACTORY	Acbel Electronic (Dong Guan) Co., Ltd. No. 17-28, Horng Yeh Road, Horng Yeh Industrial District, Tang Xia Town, Dong Guan City, Guang Dong Province, China
PRODUCT MODEL(S)	Switching Power Supply See Appendix (Altitude up to 5000m)
STANDARDS AND TECHNICAL REQUIREMENTS	GB 17625.1-2022(Class A);GB 4943.1-2022;GB/T 9254.1-2021(Class A)

This is to certify that the above mentioned product(s) complies with the requirements of implementation rules for compulsory certification(REFNO. CNCA-C09-01:2023)

The validity of the certificate is subject to positive result of the regular follow up inspection by issuing certification body until the expiry date.

Accredited by China National Accreditation Service for Conformity Assessment CNAS C001-P

The certificate information is available through the QR code below or CNCA's website: www.cnca.gov.cn

SIGNATURE: 谢肇煦

CHINA QUALITY CERTIFICATION CENTRE

CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

CERTIFICATE NO.：2023010907593179

paper:

This certificate and attachments shall be used at the same time, and the verification instructions can be found in the main certificate.

Model	Input	DC Output
FSJ014, R1CA2202B, FSJ023, R1CA2202C	（a）	
	220-230V～, 50/60Hz,10A	+12V/ 162A,+12Vsb/3A, Maximum total power: 1944W MAX.
	230-240V～, 50/60Hz 10A	+12V/ 166.7A, +12Vsb/ 3A, Maximum total power: 2000W MAX.
	DC input: 240Vdc, 10A MAX.	
	（b）	
	200-220V～,50/60Hz,10A	+12V/ 130A MAX，+12Vsb/3A MAX Maximum total power: 1560W
	220-230V～,50/60Hz,10A	+12V/ 162A MAX.,+12Vsb/ 3A MAX., Maximum total power: 1944W
	230-240V～,50/60Hz 10A	+12V/ 166.7A MAX.,+12Vsb/ 3A MAX., Maximum total power: 2000W
	DC input: 240Vdc, 10A	
FSH018, R1CA2162B, FSJ024, R1CA2162C	200-240V～,50/60Hz, 10A MAX	+12V/ 133.3A, +12Vsb/3A, Maximum total power: 1600W MAX.
	DC input: 240Vdc,8A MAX	
FSL010, R1CA2202D	200-240V～， 50/60Hz, 11.5A	+12V/ 166.7A, +12Vsb/ 3A, Maximum total power: 2000W MAX.
	DC input: 240Vdc,10A	
R1CA2202F	200-220V～, 50/60Hz, 10A	+12V/ 133.3A, +12Vsb/ 3A, Maximum total power: 1600W MAX.
	220-240V～, 50/60Hz, 10A	+12V/ 166.7A, +12Vsb/3A,

CHINA QUALITY CERTIFICATION CENTRE

CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

CERTIFICATE NO.：2023010907593179

paper:

This certificate and attachments shall be used at the same time, and the verification instructions can be found in the main certificate.

	DC input: 240Vdc, 10A	Maximum total power: 2000W MAX.
FSM033, R1CA2202G	200-220V～,50/60Hz, 10A	+12.2V/ 147.5A MAX., +12Vsb/ 3A MAX., Maximum total power: 1800W
	220-240V～,50/60Hz, 10A	+12.2V/ 163.9A MAX.,+12Vsb/ 3A MAX., Maximum total power: 2000W
	DC input: 240Vdc, 10A	
CRPS2000NC, R1CA1202G	200-220V～,50/60Hz, 10A	+12.2V/ 147.5A MAX.， Maximum total power: 1800W
	220-240V～,50/60Hz, 10A	+12.2V/ 163.9A MAX.， Maximum total power: 2000W
	DC input: 240Vdc, 10A	
FSM039, CRPS1600NS, R1CA1162B, CRPS1600NC	200-240V～,50/60Hz, 10A	+12.2V/ 131.1A MAX., Maximum total power: 1600W
	DC input: 240Vdc, 8A	
R1CA2162F	200-240V～,50/60Hz,10A	+12.2V/ 131.1A MAX., +12Vsb/ 3A MAX.， Maximum total power: 1600W
	DC input: 240Vdc, 8A	
FSM031, R1CA2132C	200-240V～， 50/60Hz, 7.5A	+12.2V/ 106.5A MAX., +12Vsb/ 3.0A MAX., Maximum total power: 1300W
	DC input: 240Vdc, 6.5A	

CHINA QUALITY CERTIFICATION CENTRE

产品认证证书

证书编号：CQC19001224665

申请人名称及地址

康舒科技股份有限公司

台北市松山区南京东路5段99号11楼

制造商名称及地址

康舒科技股份有限公司

台北市松山区南京东路5段99号11楼

生产企业名称及地址

康舒电子（东莞）有限公司(V008993)

中国广东省东莞市塘厦镇宏业工业区宏业大道17-28号

产品名称和系列、规格、型号

开关电源

见附件 (产品销售时不配电线组件，仅适用于海拔5000米及以下)

产品标准和技术要求

GB17625.1-2012;GB4943.1-2011;GB/T9254-2008(Class A)

认证模式

产品型式试验+获证后监督

上述产品符合CQC12-045670-2015认证规则的要求，特发此证。

发证日期：2019年08月02日　　有效期至：2028年04月13日

证书有效期内本证书的有效性依据发证机构的定期监督获得保持。

主任：

中国质量认证中心

中国．北京．南四环西路188号9区 100070

http://www.cqc.com.cn

C 0152069

PRODUCT CERTIFICATE

CERTIFICATE NO.: CQC19001224665

NAME AND ADDRESS OF THE APPLICANT

Acbel Polytech Inc.

11F., No.99, Sec. 5, Nan-King E. Road, Sungshan Chiu, Taipei, Taiwan, Province Of China.

NAME AND ADDRESS OF THE MANUFACTURER

Acbel Polytech Inc.

11F., No.99, Sec. 5, Nan-King E. Road, Sungshan Chiu, Taipei, Taiwan, Province Of China.

NAME AND ADDRESS OF THE FACTORY

Acbel Electronic (Dong Guan) Co., Ltd. (V008993)

No. 17-28, Horng Yeh Road, Horng Yeh Industrial District, Tang Xia Town, Dong Guan City, Guang Dong Province, China

PRODUCT NAME, MODEL AND SPECIFICATION

SWITCHING POWER SUPPLY

See annex (Sales without cord set， Altitude up to 5000m)

THE STANDARDS AND TECHNICAL REQUIREMENTS FOR THE PRODUCTS

GB17625.1-2012;GB4943.1-2011;GB/T9254-2008(Class A)

TYPE OF CERTIFICATION SCHEMES

Type Testing of Product + Follow up Factory Inspection

This is to certify that the above mentioned product(s) complies with the requirements of certification rules of CQC12-045670-2015 .

Valid from: Aug.02,2019 **Valid until:** Apr.13,2028

The validity of the certificate is subject to positive result of the regular follow up inspection by issuing certification body until the expiry date.

President: _____

Lu Mei

CHINA QUALITY CERTIFICATION CENTRE 中国质量认证中心

CHINA QUALITY CERTIFICATION CENTRE

Section 9,No.188,Nansihuan Xilu, Beijing 100070 P.R.China

http://www.cqc.com.cn

C 0152069

产品认证证书

附　　录　　第 1 页 共 1 页

证书编号：CQC19001224665　　纸　号：152069

1、型号: R1CA2202B, R1CA2202C；交流输入: 100- 127V~, 50/60Hz, 13A, 220-240V~, 50/60Hz, 10A; 直流输入: 240Vdc, 10A MAX; 直流输出: +12V/83A, +12Vsb/3A, 最大总功率: 1000W MAX. (对应 输入: 100-127VAC, 13A)； +12V/166.7A, +12Vsb/3A;, 最大总功率: 2000W MAX. (对应输入: 230-240VAC 10A, 240VDC, 10A), +12V/162A，+12Vsb/3A;, 最大总功率:,1944W MAX. (对应输入: 220-230VAC, 10A); 2、型号： R1CA2162B, R1CA2162C；交流输入: 100- 127V~, 50/60Hz, 12A, 200-240V~, 50/60Hz, 10A; 直流输入: 240Vdc, 8A MAX; 直流输出:+12V/83.33A，+12Vsb/3A; 最大总功率:1000W MAX (对 应输入:100-127VAC) +12V/133.3A +12Vsb/3A; 最大总功率: 1600W MAX. (对应输 入:200-240VAC, 240VDC)(

注：此附录与证书同时使用时有效。

主任：

CHINA QUALITY CERTIFICATION CENTRE 中国质量认证中心

中国质量认证中心

中国．北京．南四环西路 188 号 9 区 100070

http://www.cqc.com.cn

भारतीय मानक ब्यूरो
(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
BUREAU OF INDIAN STANDARDS
(Ministry of Consumer Affairs, Food & Public Distribution, Govt. of India)

मानक भवन, 9 बहादुर शाह जफ़र मार्ग, नई दिल्ली - 110002
Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi – 110002
दूरभाष/Phone: +91-11-23230856/2323010131/23233375/23239402
ई-मेल/E-mail: registration@bis.gov.in
वेबसाईट/Website: https://bis.gov.in/, https://www.crsbis.in/BIS/

Our Ref: REGISTRATION/CRS 2015-0272/R-41013579 Date:09-04-2020

Inclusion Id: 34982

Subject :Inclusion of Additional Model(s)

MANUFACTURING UNIT :	Acbel Electronics (Dong Guan) Co Ltd HORNG YEH INDUSTRIAL DISTRICT TANG XIA TOWN DONGGUAN GUANGDONG CHINA GUANGDONG,China-0 Andy_zhou@apitech.com.tw 8676987915950	

Dear Sir,

1. This has reference to your request for inclusion of models of **"Power Adapter for IT Equipment" as per IS 13252(Part 1):2010/ IEC 60950-1 : 2005 in Licence No. R-41013579** already granted to you which is valid upto 15-04-2024.

2. It is intimated that the additional Models as per details given below have been agreed to be included in your scope of Licence. **R-41013579 w.e.f. 09-04-2020:**

Product	Power Adapter for IT Equipment
IS No.	IS 13252(Part 1):2010/ IEC 60950-1 : 2005
Brand	ACBEL
Inclusion of Additional Models **(w.e.f. 09-04-2020)**	FSJ014,R1CA2202B
Factory Address	HORNG YEH INDUSTRIAL DISTRICT TANG XIA TOWN DONGGUAN GUANGDONG CHINA GUANGDONG,China-0

3. Other terms and conditions of the licence shall remain same.

4. This letter is being issued with the approval of competent authority.

Kindly acknowledge receipt of this letter.

Thanking you,

Yours faithfully,
(Sundeep Kumar)
Sc. C
Telfax : +91-11-23230856
E-mail: registration@bis.gov.in

Note: This is a system generated letter. Hence signature is not required.
To verify authentication of letter, kindly scan the QR code on this letter.

भारतीय मानक ब्यूरो
(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
BUREAU OF INDIAN STANDARDS
(Ministry of Consumer Affairs, Food & Public Distribution, Govt. of India)

मानक भवन, 9 बहादुर शाह जफ़र मार्ग, नई दिल्ली – 110002
Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi – 110002
दूरभाष/Phone: +91-11-23230856/2323010131/23233375/23239402
ई–मेल/E-mail: registration@bis.gov.in
वेबसाईट/Website: https://bis.gov.in/, https://www.crsbis.in/BIS/

Our Ref: REGISTRATION /CRS-2015-0272/R-41013579

Dated: 2024-03-12 17:54:20

RENEWAL ID : 24954

Subject : RENEWAL OF LICENCE R-41013579 AS PER IS 13252(Part 1):2010/ IEC 60950-1 : 2005

Acbel Electronics (Dong Guan) Co Ltd
HORNG YEH INDUSTRIAL DISTRICT TANG XIA TOWN DONGGUAN GUANGDONG CHINA
GUANGDONG, China, 0

Dear Sir/Madam,

With reference to your online application dated 12-03-2024 for renewal of the above mentioned licence; this is to inform you that the same has been renewed from **16-04-2024** to **15-04-2029**.

It may be noted that the said licence granted under clause (b) of sub section (2) of section 13 of the Act shall *expire* at the end of the period for which it is granted unless renewed or its renewal is deferred. You are, therefore, requested to apply for next renewal to BIS within three months before the expiration of the licence.

Thanking you.

Yours faithfully,

Registration Department
Bureau of Indian Standards,
9, Bahadur Shah Zafar Marg,
New Delhi-110002.
Telfax : +91-11-23230856
E-mail: registration@bis.gov.in

Note: This is a system generated letter. Hence signature is not required.
To verify authentication of letter, kindly scan the QR code on this letter.

For details information on BIS, consult the e-BIS Portal (www.manakonline. in).
Please use BIS CARE APP for verification of ISI-marked goods and hallmarked gold jewellery.

접수번호 : 20201105-0014

안 전 확 인 신 고 증 명 서
Confirmation Letter of Declaration

신고번호: (Application No.) XU100121-19192B

신고회사명: (Applicant) Acbel Electronic (Dongguan) Co.,Ltd.

주 소: (Address) No.17-28 (Hong Yeh Rd) Hong Yeh Industrial District, Tang Xia Town, Dongguan, Guangdong, China

제 품 명: (Product) 컴퓨터용 전원공급장치

기본모델명: (Basic Model) FSJ014

파생모델명 (Series Model):

R1CA2202B
R1CA2202C
FSJ023

정격/안전기준상의 모델구분: (Rating) I/P:100-127 V~,50/60 Hz,13 A, 200-240 V~,50/60 Hz,12(10) A DC O/P:+12 V/83 A,+12 Vsb/3 A. Total Power 1000 W Max.(I/P:100-127V~, 13 A), +12 V/166.7 A,+12 V/162 A(I/P:220-230Vac, 10 A) etc.

안전기준: (Standard) K 60950-1(2011-12)

본 확인신고는 **제 조 국 명:** 중국
제조업자명: Acbel Electronic (Dongguan) Co.,Ltd.
제조공장의 주소: No.17-28 (Hong Yeh Rd) Hong Yeh Industrial District, Tang Xia Town, Dongguan, Guangdong, China
의 제품에만 해당함

「전기용품 및 생활용품 안전관리법 시행규칙」 제28조제1항, 같은 조 제3항, 제29조제2항 또는 제34조제2항에 따라 안전확인신고 증명서를 발급합니다.

We issue this Confirmation Letter of Declaration of the Safety Confirmation for the above appliances in accordance with Article 28(1), 28(3), 29(2) or 34(2) of the Electrical Appliances and Consumer Products Safety Control Act.

2020 년 (Year) 12 월 (Month) 07 일 (Day)

한국기계전기전자시험연구원 KTC Certificate Korea Testing Certification

한국기계전기전자시험연구원장
Korea Testing Certification

※ 이 신고증명서는 「전기용품 및 생활용품 안전관리법」에 따른 제품의 안전성 확인에 한정된 것이며, 그 밖의 다른 법률이 적용되는 제품의 경우에는 해당 법률에 따라 추가로 인증·허가 등을 받아야 합니다.

첨부서류	1. 전기용품의 안전관리부품 및 재질목록 (List of Critical Components)(전기용품에 한정한다) 2. 기본모델·파생모델의 내용 (Descriptions of the basic and series model) 3. 안전확인신고 내용의 변경 현황 (Revisions Status)

기 술 문 서
Technical Document

안전인증번호: XU100121-19192B
(Certificate No)

접수번호: 20201105 - 0014
(Receipt No)

1.기본모델 · 파생모델의 내용(General Descriptions of Certified Products)

1.1 제품의 설명 (Product description)

인증제품의 개요는 다음과 같다.
(Information on certified basic model product is as follow)

구분(Section)	내 용 (Description)
용도 (Normal use)	Switching Power Supply for Computer (+12 Vsb//3 A. Total Power 2000 W Max. (For I/P: 200-240 Vac, 12 A, 240 Vdc, 10 A))
내부구조 (Internal construction)	Consisting of the primary and reinforced or double insulated SELV circuit.
외부구조 (External construction)	Provided with metal enclosure and appliance inlet. Class I,(JPTUV-094502-A1/M2)<Power cord sets are not evaluated with EUT>
기타(Others)	Total Power 2000 W Max. (For I/P: 230-240 Vac, 10 A, 240 Vdc, 10 A), Total Power 1944 W Max. (For I/P: 220-230 Vac, 10 A)

1.2 전기용품의 표시: 전기용품 및 생활용품 안전관리법 시행규칙 제37조(안전확인대상제품의표시)에 따라 표시한다.
(Marking of KC Mark: Marking shall comply with the Article 37 of the Enforcement Rule of the Electrical Appliances and Consumer Products Safety Control Act.)

1.3 등록모델 (Registered Models)

구 분 (Class)	모 델 명 및 정 격 (Model / Rating)		기본모델과의 차이점 (Difference between basic model and series model)
기본모델 (Basic model)	FSJ014	I/P:100-127 V~,50/60 Hz,13 A, 200-240 V~,50/60 Hz,12(10) A DC O/P:+12 V/83 A,+12 Vsb/3 A. Total Power 1000 W Max.(I/P:100-127V~, 13 A), +12 V/166.7 A,+12 V/162 A(I/P:220-230Vac, 10 A) etc.	
파생모델 (Series model)	R1CA2202B		Model name, DC Fan Out-blowing
	FSJ023		Model name, DC Fan In-blowing
	R1CA2202C		Model name, DC Fan In-blowing

안전인증번호: XU100121-19192B
(Certificate No)

접수번호: 20201105 - 0014
(Receipt No)

2.안전관리 부품 및 재질목록(List of Critical Components)

부품명(회로기호) Components(Part no.)	제조자(상표명) Manufacturer(Brand)	모델명(형식) Model(Type)	정격 또는 특성 (Technical Data)	인증규격 (Certification)
Inlet	Canal Electronic Co Ltd	KS series	10 A, 250 Vac / 15A, 125 Vac for UL/CUL	IEC
Inlet (Alt.)	Tecx-Unions Technology Corp.	TU-301 series (-A / AP / AP - A / S / SP)	10 A, 250 Vac / 15 A, 125 Vac for UL	IEC
Inlet (Alt.)	Inalways Corp (International All Ways Ind Co Ltd)	0711 series	10 A, 250 Vac / 15 A, 250 Vac for UL	IEC
Inlet (Alt.)	Rong Feng Industrial Co Ltd	SS-120	10 A, 250 Vac / 15 A, 250 Vac for UL	IEC
Inlet (Alt.)	SHENG MING ENTERPRISE CO LTD (WINTRON ENTERPRISE CO LTD)	S14-102	10 A, 250 Vac / 15 A, 250 Vac for UL/CUL	IEC
Inlet (Alt.)	Delta Electronics Inc	SK-1034B	10 A, 250 Vac / 15 A, 125 Vac for UL/CUL	IEC
Fuse (F1)	Conquer Electronics Co Ltd	GBP / GBP-A / GBM-A	F 15 A, 420 Vac	UL
Fuse (F1, Alt.)	Sleetech Enterprise Inc., Taiwan Electronical Protector Co Ltd (Sleek Co Ltd)	51FG	F 15 A, 420 Vac	UL
Fuse (F1, Alt.)	Hollyland Co Ltd	5HF, 5HFP	F 15 A, 420 Vac	IEC
Fuse (F1, Alt.)	Littelfuse Inc for UL, Suzhou Littelfuse OVS Ltd. For VDE	487	F 15 A, 420 Vac	IEC
Fuse (F1, Alt.)	Conquer Electronics Co Ltd	UBF-A	F 15 A, 420 Vac	IEC
Fuse (F3)	Littelfuse Inc (Littelfuse Ltd, Suzhou Littelfuse OVS Ltd, Littelfuse B V)	216 / 216SP	F 10 A, 250 Vac	IEC
Fuse (F3)	Schurter AG	SP 5x20	F 10 A, 250 Vac	IEC
Fuse (F3)	Bel Fuse Inc	5HF/5HFP	F 10 A, 250 Vac	IEC

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Fuse (F3)	Cooper Bussmann Inc.	S501 series	F 10 A, 250 Vac	IEC
Fuse (F3)	Conquer Electronics Co Ltd	UBM/ UBM-A	F 10 A, 250 Vac	IEC
Fuse (F3)	Conquer Electronics Co Ltd	UBM-P	F 10 A, 250 Vac	IEC
Fuse (F3)	Walter Electronic Co., Ltd.	FSC	F 10 A, 250 Vac	IEC
Fuse (F3)	Hollyland Co Ltd	50CF	F 10 A, 250 Vac	IEC
Fuse (F3)	Hollyland Co Ltd	5HF,5HFP	F 10 A, 250 Vac	IEC
Fuse (F3)	XC ELECTRONICS (SHENZHEN) CORP LTD	5C-series for VDE 5C for UL and CCC	F 10 A, 250 Vac	IEC
Fuse (F3)	Littelfuse Inc for UL, Suzhou Littelfuse OVS Ltd. For VDE	487	F 10 A, 250 Vac	IEC
Fuse (F3)	Conquer Electronics Co Ltd	UBF-A	F 10 A, 250 Vac	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional)	Kemet Electronics Italia SRL for UL, Arcotronics Italia SPA for IMQ-ENEC	R.46	250 Vac min., 110 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Hua Jung Components Co Ltd	MKP	250 Vac min., 110 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	SHENZHEN JINGHAO CAPACITOR CO LTD	CBB62B	250 Vac min., 110 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	YIMANFENG SCIENCE AND TECHNOLOGY LTD CO	MPX/MKP	250 Vac min., 110 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Okaya Electric Industries Co., Ltd	XF	250 Vac min., 110 ℃	IEC

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X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Strong Capacitor Co. Ltd.	Type MPX	250 Vac min., 110 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Vishay Capacitors Belgium NV	F1778	250 Vac min., 110 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Kemet Electronics Italia SRL for UL, Arcotronics Italia SPA for IMQ-ENEC	F861	250 Vac min., 110 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	ZHUHAI SUNG HO ELECTRONICS CO LTD	CMPP	250 Vac min., 105 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Okaya Electric Industries Co., Ltd	RE series	250 Vac min., 100 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Okaya Electric Industries Co Ltd	LE series	250 Vac min., 100 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Cheng Tung Industrial Co Ltd	CTX	250 Vac min., 100 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Epcos Electronic Components S.A.	B3292 series	250 Vac min., 100 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Vishay Capacitors Belgium NV	F1772	250 Vac min., 100 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	KEMET ELECTRONICS OY(Evox Rifa Group Oyj)	PHE840M	250 Vac min., 105 ℃	IEC

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X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Carli Electronics Co Ltd	MPX	250 Vac min., 100 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	Panasonic Corporation, Panasonic Corporation of North America for UL, Pansonic Corporation for VDE	ECQUL	250 Vac min., 100 ℃	IEC
X-Cap. (C4, C7, C197) C4 max. 1 uF C7 max. 0.47 uF C197 max. 0.1 uF (Optional, Alt.)	SHENZHEN SURONG CAPACITORS CO LTD	MPX/MKP	250 Vac min., 100 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional)	Murata Mfg Co Ltd	KX	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Murata Mfg Co Ltd	RA	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Murata Mfg Co Ltd	KH	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Murata Mfg Co Ltd	KY	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Murata Mfg Co Ltd	RA	250 Vac min., 125 ℃	IEC

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Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	TDK-EPC Corporation for VDE, TDK-EPC Corp. for UL	CD	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	TDK-EPC Corporation for VDE, TDK-EPC Corp. for UL	CS	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Walsin Technology Corp (Pan Overseas Electronic Co Ltd)	AH	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Walsin Technology Corp (Pan Overseas Electronic Co Ltd)	AC	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Success Electronics Co Ltd	SE	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Success Electronics Co Ltd	SB	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Success Electronics Co Ltd	SF	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Vishay Electronic GMBH for UL, Vishay Electronic GMBH Draloric for VDE, (Roederstein Electronics Inc)	VY1	250 Vac min., 125 ℃	IEC

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Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Vishay Electronic GMBH for UL, Vishay Electronic GMBH Draloric for VDE, (Roederstein Electronics Inc)	VY2	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Holy Stone Enterprise Co., Ltd.	SDC series	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	YINAN DON'S ELECTRONIC COMPONENT CO LTD	CT81	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	NAN JING YUYUE ELECTRONICS CO LTD	CT7 for VDE and CQC, CT7, 2B/ CT7, 2E/ CT7, 2F for UL	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Fenghua Advanced Technology (Holding) CO. LTD	CT7	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Murata Mfg Co Ltd	KL	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Kunshan Micro Capacitors Electronic Co Ltd	B series	250 Vac min., 125 ℃	IEC
Y-Cap. (C5, C6, C198, C199) C5, C6 max. 3 300 pF C198, C199 max. 1 000 pF (Optional, Alt.)	Kunshan Micro Capacitors Electronic Co Ltd	E series	250 Vac min., 125 ℃	IEC

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Bridge-Cap. (C16,C26) C16 max. 1 000pF, C26 max. 1 500 pF (Optional)	Murata Mfg Co Ltd	EA	250 Vac min., 125 ℃	IEC
Varistor (MOV1, Optional)	Lien Shun Electronics Co., Ltd. For VDE, Brightking (ShenZhen) Co Ltd for UL	xxDyyyK (xx: 14, 20, 25, yyy: 471, 511, 561, 621, 681, 751, 781, 821, 911, 102, 112, 122)	300, 320, 350, 385, 420, 460, 485, 510, 550, 625, 680, 750 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	IEC
Varistor (MOV1, Optional, Alt.)	Thinking Electronic Industrial Co Ltd (Wujin Thinking Electronic Co Ltd)	TVR10yyy-D series (yyy: 471, 511, 561, 621, 681, 751, 821, 911, 102, 112)	300, 320, 350, 395, 420, 465, 510, 550, 625, 680 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	IEC
Varistor (MOV1, Optional, Alt.)	Thinking Electronic Industrial Co Ltd (Wujin Thinking Electronic Co Ltd)	TVR10yyy-V series (yyy: 471, 511, 561, 621, 681, 751, 821, 911, 102, 112)	300, 320, 350, 395, 420, 465, 510, 550, 625, 680 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	IEC
Varistor (MOV1, Optional, Alt.)	Thinking Electronic Industrial Co Ltd (Wujin Thinking Electronic Co Ltd)	TVRxxyyy series (xx: 14, 20, yyy: 471, 511, 561, 621, 681, 751, 821, 911, 102, 112)	300, 320, 350, 395, 420, 465, 510, 550, 625, 680 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	IEC
Varistor (MOV1, Optional, Alt.)	Thinking Electronic Industrial Co Ltd (Wujin Thinking Electronic Co Ltd)	TVRxxyyy-M series (xx: 14, 20, yyy: 471, 511, 561, 621, 681, 751)	300, 320, 350, 395, 420, 465, 510, 550, 625, 680 Vac, 40 / 125 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	IEC
Varistor (MOV1, Optional, Alt.)	Joyin Co. Ltd	xxSyyyK (xx: 10,14, 20, yyy: 471, 511, 561, 621, 681, 751, 781, 821, 911, 102, 112)	300, 320, 350, 385, 420, 460, 485, 510, 550, 625, 680 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	IEC
Varistor (MOV1, Optional, Alt.)	Joyin Co. Ltd	xxNyyyK (xx: 10,14, 20, yyy: 471, 511, 561, 621, 681, 751, 781, 821, 911, 102, 112, 182)	300, 320, 350, 385, 420, 460, 485, 510, 550, 625, 680, 1 000 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	UL
Varistor (MOV1, Optional, Alt.)	Littelfuse Inc. for UL, DongGuan Littelfuse Electronics Co Ltd for VDE	CIII series / LA series VxxxLAyy series for UL (xxx: 300, 320, 385, 420, 460, 480, 510, 550, 575, 625, 660, 680; yy:10, 20, 40, 50, 80, 100)	300, 320, 385, 420, 460, 480, 510, 550, 575, 625, 660, 680 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	UL

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Varistor (MOV1, Optional, Alt.)	EPCOS (ZHUHAI FTZ) CO LTD (Epcos OHG (Siemens AG))	S (NF) xxKyyy (xx: 14, 20, yyy: 300, 320, 350, 385, 420, 440, 460, 510, 550, 625, 680, 1000)	300, 320, 350, 385, 420, 440, 460, 510, 550, 625, 680, 1 100 Vac, 40/85/56, 6 KV / 3 KA pulse test passed (coating V-0)	IEC
Varistor (MOV1, Optional, Alt.)	EPCOS (ZHUHAI FTZ) CO LTD (Epcos OHG (Siemens AG))	Q20Kyyy (yyy: 300, 320)	300, 320 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	UL
Varistor (MOV1, Optional, Alt.)	EPCOS (ZHUHAI FTZ) CO LTD (Epcos OHG(Siemens AG))	Q20Kyyy (yyy: 300, 320)	300, 320Vac, 40/85/56 6KV/3KA pulse test passed (coating V-0)	UL
Varistor (MOV1, Optional, Alt.)	EPCOS (ZHUHAI FTZ) CO LTD (Epcos OHG(Siemens AG))	S (NF) 10KyyyE2 K1 (yyy: 300, 320, 350, 385, 420, 460, 510, 550, 625, 680)	300, 320, 350, 385, 420, 440, 460, 510, 550, 625, 680 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	UL
Varistor (MOV1, Optional, Alt.)	BRIGHTKING (SHENZHEN) CO LTD	yyyKDxx (xx: 10, 14, 20, yyy: 471, 511, 561, 621, 681, 751, 781, 821, 911, 102, 112)	300, 320, 350, 385, 420, 460, 485, 510, 550, 625, 680 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	UL
Varistor (MOV1, Optional, Alt.)	NIPPON CHEMI-CON CORP	TND10SEyyyK / TNR10SEyyyK series (yyy: 621, 681, 751, 781, 821, 911, 102, 112, 182) TND12SEyyyK / TNR12SEyyyK series (yyy: 471, 511, 561, 621, 681, 751, 781, 821, 911, 102, 112, 182)	300, 320, 350, 395, 420, 465, 510, 550, 625, 680 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed	UL
Varistor (MOV1, Optional, Alt.)	SANADA KOA CORPORATION	NVF10Uxyz470 (x or y or z Can be A-Z)	300 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed	IEC
Varistor (MOV1, Optional, Alt.)	GUANGDONG FENGHUA ADVANCED TECHNOLOGY HOLDING CO LTD./ XIANHUA NEW SENSITIVE COMPONENTS BRANCH	FNR-14Kyyy (yyy: 471, 511, 561, 621, 681, 751, 781, 821, 911, 102, 112, 182)	300, 320, 350, 385, 420, 460, 485, 510, 550, 625, 680 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	UL

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Varistor (MOV1, Optional, Alt.)	Littelfuse Inc. for UL, DongGuan Littelfuse Electronics Co Ltd for VDE	E series VyyExxxP for UL (xxx:300, 320, 385, 420, 440, 460, 510, 550, 625, yy:14, 20)	300, 320, 385, 420, 440, 460, 510, 550, 625 Vac, 40 / 85 / 56, 6 KV / 3 KA pulse test passed (coating V-0)	UL
Optical Isolator (M6, M7, M20)	ANALOG DEVICES INC.	ADUM4223	Minimum 5 000 Vac Insulation thickness > 0.4 mm, thermal cycling tested by VDE, external creepage = 7.6 mm, 125 ℃	IEC
Optical Isolator (M6, M7, M20, Alt.)	ANALOG DEVICES INC.	ADUM2401AR WZ	Minimum 5 000 Vac Insulation thickness > 0.4 mm, thermal cycling tested by VDE, external creepage = 7.6 mm, 125 ℃	IEC
Optical Isolator (M6, M7, M20, Alt.)	TWXAS INSTRUMENTS TUCSON CORP.	ISO7841 ISO7741	Minimum 5 700 Vac Insulation thickness > 0.4 mm, thermal cycling tested by VDE, external creepage = 7.6 mm, 125 ℃	IEC
Optical Isolator (M6, M7, M20, Alt.)	SILICON LABORATORIES	Si8238AD-D-IS, Si8238BD-D-IS, Si8233BD series	Minimum 5 000 Vac Insulation thickness > 0.4 mm, thermal cycling tested by FIMKO, external creepage = 8.5 mm, 100 ℃	IEC
Optical Isolator (M6, M7, M20, Alt.)	SILICON LABORATORIES	SI8641ED-B-IS	Minimum 5 000 Vac Insulation thickness > 0.4 mm, thermal cycling tested by FIMKO, external creepage = 8.5 mm, 100 ℃	IEC
Optical Isolator (M6, M7, M20, Alt.)	TEXAS INSTRUMENTS INCORPORATED	UCC21540DWKR UCC2154x - (c) (c) - where x is any digit 0-9, except "5", may be followed by additional letters and/or numbers	Minimum 8 000 Vac Insulation thickness > 0.4 mm, thermal cycling tested by FIMKO, external creepage = 8.5 mm, 100 ℃	IEC
Optical Isolator (M202, M203)	Everlight Elertronic (China) Co., Ltd.	CNY series for UL. CNY-171 series.,CNY17F1 series., EL610. (. Can be blank, A-Z or numbers and denote different pin shape.)	Minimum 3 000 Vac, thermal cycling test passed by FIMKO, Insulation thickness = 0.5 mm, internal creepage = 6 mm, external creepage = 7.7 mm, 110 ℃	IEC

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Optical Isolator (M202, M203, Alt.)	Optical Isolator (M202, M203)	TCLT10xx series (xx can be 00-03, 06-09), TCLT11xx series (xx can be 01-03, 06-09), TCLT1600 series.	Minimum 4 800 Vac, Thermal cycling test passed by FIMKO, external creepage = 8.2 mm 100 ℃	IEC
Optical Isolator (M202, M203, Alt.)	RENESAS ELECTRONICS CORPORATION (NEC Electronics Corp Compound Semiconductor Device Div)	PS2381-1	Minimum 5 000 Vac Insulation thickness = 0.4 mm, thermal cycling test passed by SEMKO, external creepage 8 mm min. 115 ℃	IEC
Optical Isolator (M202, M203, Alt.)	Cosmo Electronics Corporation	KT1yxx series (y can be 0-4 and 6, xx can be CTR Rank, 00-zz)	Minimum 4 800 Vac, OVC II, Pollution Degree 2 and 2000 m. Insulation thickness = 0.7 mm, thermal cycling test passed by FIMKO, external creepage = 8.6 mm 115 ℃	IEC
Optical Isolator (M202, M203, Alt.)	Everlight Elertronic (China) Co., Ltd.	EL817 series	Minimum 3 000 Vac, thermal cycling test passed by NEMKO, Insulation thickness = 0.5 mm, internal creepage = 6 mm, external creepage = 7.7mm , 110 ℃	IEC
Optical Isolator (M202, M203, Alt.)	RENESAS ELECTRONICS CORPORATION (NEC Electronics Corp Compound Semiconductor Device Div)	PS2561 series	Minimum 5 000 Vac, Insulation thickness = 0.4 mm, thermal cycling test passed by FIMKO, external creepage = 7 mm 100 ℃	IEC
Optical Isolator (M202, M203, Alt.)	Cosmo Electronics Corporation	K1010 series	Minimum 5 000 Vac Insulation thickness = 0.5 mm, thermal cycling tested by FIMKO, external creepage = 6.5 mm 115 ℃	IEC
Optical Isolator (M202, M203, Alt.)	Vishay Semiconductor GMBH (Vishay Infrared Components Inc)	VOL617 series/ VOL618A series	Minimum 5 000 Vac Insulation thickness > 0.4 mm, thermal cycling tested by FIMKO, external creepage > 8.0 mm 110 ℃	IEC
Optical Isolator (M202, M203, Alt.)	Vishay Semiconductor GMBH (Vishay Infrared Components Inc)	VO617A series/ VO618A series	Minimum 5 000 Vac Insulation thickness > 0.4 mm, thermal cycling tested by FIMKO, external creepage > 7.5 mm 115 ℃	IEC

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Optical Isolator (M202, M203, Alt.)	Lite-on Technology Co. (Lite-on Electronic, Inc.)	LTV-817	Minimum 5 000 Vac Insulation thickness = 0.8 mm, internal creepage = 5.2 mm, external creepage = 7.8 mm 100 ℃	IEC
Optical Isolator (M202, M203, Alt.)	EVERLIGHT ELECTRONICS CO LTD	EL101 series	Minimum 3 000 Vac, thermal cycling test passed by NEMKO, Insulation thickness = 0.4 mm, external creepage = 8.1 mm , 110 ℃	IEC
Optical Isolator (M202, M203, Alt.)	LITE-ON TECHNOLOGY CORP	LTV-100x (x can be 0~9)	Minimum 5 000 Vac Insulation thickness > 0.4 mm, thermal cycling tested by FIMKO, external creepage = 8.3 mm 100 ℃	IEC
Optical Isolator (M202, M203, Alt.)	Changzhou Galaxy Century Micro-electronics Co., Ltd.	BL817	Minimum 6 000 Vac, thermal cycling test passed by VDE, Insulation thickness = 0.8 mm, external creepage = 7.4 mm , 125 ℃	IEC
Discharge Resistor (RHV1, RHV2, RHV3)	RALEC TECHNOLOGY (KUNSHAN) CO., LTD.	RTV05 series, RTV06 series, RTV12 series, RTV20 series, RTV25 series	1/4 W, 143 KΩ	IEC
Discharge Resistor (RHV1, RHV2, RHV3, Alt.)	TA-I Technology Co Ltd	RH10 series, RH12 series	1/4 W, 143 KΩ	IEC
Discharge Resistor (RHV1, RHV2, RHV3, Alt.)	Yageo Corp	RV1206 series	1/4 W, 143 KΩ	IEC
Discharge Resistor (RHV1, RHV2, RHV3, Alt.)	Kamaya Electric Co Ltd	RVC32 series	1/4 W, 143 KΩ	IEC
Discharge Resistor (RHV1, RHV2, RHV3, Alt.)	PROSPERITY DIELECTRICS CO LTD	FVF06...B series	1/4 W, 143 KΩ	UL
Discharge Resistor (RHV1, RHV2, RHV3, Alt.)	Viking Tech Corporation Kaoshiung Branch	HVR03 series, HVR05 series, HVR06 series, HVR0A series, HVR12 series	1/4 W, 143 KΩ	IEC
Discharge Resistor (RHV1, RHV2, RHV3, Alt.)	Yageo Corporation	RV0603 series, RV0805 series, RV1206 series	1/4 W, 143 KΩ	IEC
Relay (REL1, optional)	Good Sky Electric Co. Ltd.	EZ-SS-112DM	250 Vac, 16 A, 30 Vdc, 16 A	IEC

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Relay (REL1, optional, Alt.)	Good Sky Electric Co. Ltd.	GQ-SS/SH-112LM1	250 Vac, 10 A for TUV 125 / 250 Vac, 10 A for UL	IEC
Relay (REL1, optional, Alt.)	Song Chuan Precision Co Ltd	207 series/ 207H series	250 Vac, 17 A for VDE 277 Vac, 20 A for UL	IEC
Relay (REL1, optional, Alt.)	Song Chuan Precision Co Ltd	307HN-1AH/1AHA-	277 Vac, 10 A for UL, 250 Vac, 10 A for VDE	IEC
Relay (REL1, optional, Alt.)	Song Chuan Precision Co Ltd	507HN-1CH-F- C, 507HN-1AH-F-C	277 Vac, 17 A for UL, 250 Vac, 17 A for VDE	IEC
Relay (REL1, optional, Alt.)	Tyco Electronics (ShenZhen) Co. Ltd	OZ-SS-124LM1	240 Vac, 16 A, 24 Vdc, 16 A	IEC
Relay (REL1, optional, Alt.)	Tyco Electronics (ShenZhen) Co. Ltd	OZ-SS-112L	240 Vac, 16 A, 30 Vdc, 16 A	IEC
Relay (REL1, optional, Alt.)	Tyco Electronics (ShenZhen) Co. Ltd	OZ-SS-112LM1	240 Vac, 16 A, 30 Vdc, 16 A	IEC
Relay (REL1, optional, Alt.)	Tyco Electronics (ShenZhen) Co. Ltd	PCFN-112D2M	250 Vac, 25 A	IEC
Relay (REL1, optional, Alt.)	Good Sky Electric Co. Ltd.	RWH-SH- 112DM	250 Vac, 12 A, 24 Vdc, 15 A	IEC
Relay (REL1, optional, Alt.)	Panasonic Corporation	ADJ, followed by 1, 2, 3, followed by 1, 2, 3, 4, 5 or 6 , followed by 0 or 1, followed by 05* thru 48*	277 Vac, 16 A for UL, 250 Vac, 16 A for VDE	IEC
Relay (REL1, optional, Alt.)	Song Chuan Precision Co Ltd	891P-1A-F-C	277 Vac, 25 A for UL, 250 Vac, 25 A for TUV	IEC
Relay (REL1, optional, Alt.)	XIAMEN HONGFA ELECTROACO USTIC CO LTD	HF152F/ HF152F-T	250 Vac, 16 A	IEC
Relay (REL1, optional, Alt.)	XIAMEN HONGFA ELECTROACO USTIC CO LTD	HF32F-G series, HF32FV-G series	250 Vac, 10 A	IEC
Relay (REL1, optional, Alt.)	XIAMEN HONGFA ELECTROACO USTIC CO LTD	HF32FA series, HF32FA-G series	250 Vac, 5 A, 250 Vac, 10 A	IEC

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Relay (REL1, optional, Alt.)	XIAMEN HONGFA ELECTROACO USTIC CO LTD	HF158F-V series	160 Vac, 14.5 A for UL, VDE 180 Vac, 13 A for UL, VDE 180 Vdc, 16 A for UL, VDE, 12 A for CQC 277 Vac, 12 A for UL, 15 A for CQC 250 Vac, 12 A for VDE, 15 A for CQC 300 Vdc, 10 A for UL, VDE, CQC	IEC
Relay (REL1, optional, Alt.)	DONGGUAN GOLDEN	GI-1A-12LHF, GI series	250 Vac, 10 A	IEC
Choke (L1)	AcBel Polytech Inc.(API)	21M97	130 ℃ min.	-
Choke (L4)	AcBel Polytech Inc.(API)	21N31	130 ℃ min.	-
Choke (L5)	AcBel Polytech Inc.(API)	21N30	130 ℃ min.	-
Transformer (T201)	AcBel Polytech Inc.(API)	25L60	Class B	Tested with appliance
Triple wire (For T201)	Furukawa Electric Co Ltd	TEX-E	Electric strength: 3 000 Vrms, 130 ℃	IEC
Transformer (T301)	AcBel Polytech Inc.(API)	25N20	Class B	Tested with appliance
Triple wire (For T301)	Totoku Electric Co Ltd	TIW-2	Electric strength: 4 000 Vrms, 130 ℃	IEC
Transformer (T4)	AcBel Polytech Inc.(API)	25N19	Class F	Tested with appliance
Transformer (T4) (Alt.)	AcBel Polytech Inc.(API)	25Q97	Class F	Tested with appliance
Triple wire (For T4)	Totoku Electric Co Ltd	TIW-3	Electric strength: 4 000 Vrms, 155 ℃	IEC
Insulation tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CT, WF	Electric strength: 5 000 V, thickness: 0.025 mm	UL
Insulation tape (Alt.)	3M COMPANY ELECTRICAL MARKETS DIV (EMD)	1350F-1, 1350-1	Electric strength: 5 000 V, thickness: 0.025 mm	UL
Insulation tape (Alt.)	Chyun Yih Tape Co. Ltd	PB 416F	Electric strength: 5 000 V, thickness: 0.025 mm, 180 ℃	UL

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Insulation tape (Alt.)	3M COMPANY ELECTRICAL MARKETS DIV (EMD)	1350T-3	Electric strength: 5 500 V, thickness: 0.11 mm	UL
Fan	DONGGUAN PROTECHNIC ELECTRIC CO LTD	MGT4012PB- W28 MG(a)4012PB-(f)28 Above (a) may be A or T, (f) may be A through Z, a through z or blank.	12 V, 2 A, 30.12 CFM	IEC
Fan (Alt.)	ASIA VITAL COMPONENTS CO LTD	DBPK0428B2U P037, DBPK0428B2U (V), where (V) may be XXXX, where X may be A through Z, 0 through 9 or "_".	12 V, 2 A, 34.5 CFM	IEC
Fan (Alt.)	MINEBEAMITS UMI INC.	04028DA12TAK HA1, 04028D(i)-12T-(d)(e)H-(f), where (i) may be A, C, E, G, H, M or S, (d) may be A, B, C, E, F, G, S, T, U, W, Y or Z, (e) may be A, B, L, M, T, U, C, D, N, P, V, W, E, F, G, H, J, K, 1, 2, 3, 4, 5 or 6, (f) may be any alphanumeric characters.	12 V, 1.95 A, 36.0 CFM	IEC
Fan (Alt.)	NIDEC CORP	W40S12BS2E5-57T08A2, (a) 40S12BS2E (z) 5-(x)(y) where a may be V or W, (z) = A, B, C, D or Blank, (x) 07, 57, (y) Suffixes, may be xxxxxx, where x may be 0 through 9, A through Z, a through z or blank.	12 V, 1.61 A, 30.3CFM	IEC
Insulation Sheet (Betwwen PCB and Enclosure)	Formex, Div of Illinois Tool Works Inc, Formerly	FORMEX-18	min. 0.20 mm, VTM-0, min. 0.41 mm, V-0	UL

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Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	Formex, Div of Illinois Tool Works Inc, Formerly	FORMEX GK- (a)(b) (a) - One to three digit suffix indicating nominal thickness in mils. (b) - May have additional suffix letter(s) indicating color.	min. 0.05 mm, VTM-0, min. 0.37 mm, V- 0	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	SABIC INNOVATIVE PLASTICS B V/ SABIC INNOVATIVE PLASTICS US L L C / SABIC JAPAN L L C	FR700 / FR60	min. 0.051 mm, VTM-0 (CL), min. 0.13 mm, VTM-0 (CL,BK), min. 0.23 mm, V- 0 (All)	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	SABIC INNOVATIVE PLASTICS US L L C / SABIC JAPAN L L C	FR1	Min. 0.08 mm, VTM-2 (NC), min. 0.13 mm, VTM-0 (NC, BK), min. 0.63 mm V- 0 (All)	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	SABIC INNOVATIVE PLASTICS US L L C / SABIC JAPAN L L C	EFR95	min. 0.25 mm, VTM-0 (BK) min. 0.38 mm, V- 0 (BK) min. 0.43 mm, V- 0 (NC)	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	SUN DELTA CORP	VS(f), (f) - May be replaced by any digit 000-999, except 560 and 160	min. 0.2 mm, VTM-0 (NC,BK)	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	Toray Industries Inc	Lumirror (#) (#) - Followed by F60, F60C, L11, Q55 or (a)(b)(c)(d) , where, (a) can be one letter H,K,S,T or W. (b) denotes a one digit number 0 - 7. (c) may be one digit number 0 - 9 or one letter A - M. (d) may be one digit number 0-9 or one letter A,C,E,K,M,V,W or Z.	0.023 mm - 0.23 mm, VTM-2 (NC)	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	Yi-Hsin Plastech Co. Ltd	YIMEX PP-17	0.43 mm - 0.47 mm, V-0 (BK)	UL

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Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	Yi-Hsin Plastech Co. Ltd	HSINMEX PC - 175	min. 0.25 mm, V-0 (BK)	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	Shenzhen Bornsun Industrial Co Ltd	BN-ZD16	0.41 mm - 0.45 mm, V-0 (BK)	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	SHENZHEN BORNSUN INDUSTRIAL CO LTD	BN-FP	0.25 mm, V-0	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	JIANGSU YUXING FILM TECHNOLOGY CO LTD	6027	0.23 mm ~ 0.25 mm	UL
Insulation Sheet (Betwwen PCB and Enclosure, Alt.)	JIANGSU YUXING FILM TECHNOLOGY CO LTD	6027D	0.10 mm, 0.21 mm - 0.23 mm, VTM-2 (NC)	UL
PCB	PLOTECH CO LTD	4	V-0, 130 ℃	UL
PCB (Alt.)	EISO ENTERPRISE CO LTD	3/6	V-0, 130 ℃	UL
PCB (Alt.)	ELEC & ELTEK MULTILAYER PCB LTD	E3330FL	V-0, 130 ℃	UL
PCB (Alt.)	GOLD CIRCUIT ELECTRONICS LTD	D-V0A/T-V0A	V-0, 130 ℃	UL
PCB (Alt.)	GOLD CIRCUIT ELECTRONICS LTD	H	V-0, 130 ℃	UL
PCB (Alt.)	GUANG DONG ELLINGTON ELECTRONICS TECHNOLOGY CO LTD	ET856 / ET866 / ET566 / ET866A	V-0, 130 ℃	UL
PCB (Alt.)	NEW ERA ELECTRONICS CO LTD	TC/2M	V-0, 130 ℃	UL
PCB (Alt.)	PALWONN ELECTRONICS (SHENZHEN) CO LTD	M2 / M3 / M5 / M8	V-0, 130 ℃	UL
PCB (Alt.)	PLOTECH CO LTD	05월 06일	V-0, 130 ℃ for type 5 V-0, 140 ℃ for type 6	UL

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PCB (Alt.)	REMAPP INDUSTRIAL CO LTD	RM04TG	V-0, 130 ℃	UL
PCB (Alt.)	SHENZHEN KINWONG ELECTRONIC CO LTD	8B/8F	V-0, 130 ℃	UL
PCB (Alt.)	TREASURE ELECTRONIC TECHNOLOGY (SHENZHEN) LTD	T-M1	V-0, 130 ℃	UL
PCB (Alt.)	PALWONN ELECTRONICS (SHENZHEN) CO LTD	M6	V-0, 105 ℃	UL
PCB (Alt.)	APCB Inc (Competitor Printed Circuit Board)	77	V-0, 130 ℃	UL
PCB (Alt.)	SUNTAK MULTILAYER PCB CO LTD	STM-4 STM-6	V-0, 130 ℃	UL
PCB (Alt.)	ELEC & ELTEK MULTILAYER PCB LTD	E3330RN	V-0, 130 ℃	UL
PCB (Alt.)	PALWONN ELECTRONICS (SHENZHEN) CO LTD	M7	V-0, 130 ℃	UL
PCB (Alt.)	Multek Hong Kong Ltd	890/890K	V-0, 130 ℃	UL
PCB (Alt.)	FIRST HI-TEC ENTERPRISE CO LTD	HL1-V0A, HL9-V0, HL10-V0, HL11-V0, HL12-V0	HL1-V0A, HL9- V0, HL10-V0, HL11-V0, HL12- V0	UL
Insulation Tubing	3M COMPANY ELECTRICAL MARKETS DIV (EMD)	FP-301VW	VW-1, 125 ℃ (All colors except clear)	UL
Insulation Tubing (Alt.)	Changyuan Electronics (Shenzeng) Co Ltd	CB-HFT	VW-1, 125 ℃ (All colors except clear)	UL
Insulation Tubing (Alt.)	Hamburg Industries Co Ltd	H-2	VW-1, 125 ℃ (All colors except clear)	UL

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Insulation Tubing (Alt.)	SUMITOMO ELECTRIC FINE POLYMER INC (Sumitomo Electric Industries Ltd)	SUMITOMO ELECTRIC FINE POLYMER INC (Sumitomo Electric Industries Ltd)	VW-1, 125 ℃ (All colors except clear)	UL
Insulation Tubing (Alt.)	TYCO ELECTRONICS CORP (Raychem Corp)	VERSAFIT	VW-1, 125 ℃ (All colors except clear)	UL
Insulation Tubing (Alt.)	Kai Suh Suh Enterprise Co Ltd	K32	VW-1, 125 ℃ (All colors except clear)	UL
Insulation Tubing (Alt.)	SUMITOMO ELECTRIC FINE POLYMER INC	717 or Sumitube NHR2	VW-1, 125 ℃ (Pink, yellow, blue, green, red, gray, and black)	UL
Insulation Tubing (Alt.)	TYCO ELECTRONICS CORP	ZH2	VW-1, 125 ℃ (Black)	UL
Insulation Tubing (Alt.)	Shenzhen Woer Heat-shrinkable Material Co Ltd	RSFR-HPF	VW-1, 125 ℃ (All colors except clear)	UL
Insulation Tubing (Alt.)	CHANGYUAN ELECTRONICS (SHENZHEN) CO LTD	CYG-ZHP	VW-1, 600 V, 125 ℃ (All except clear)	UL
Insulation Tubing (Alt.)	DONGGUAN SALIPT CO LTD	SALIPT S-901-600	VW-1, 600 V, 125 ℃ (All except clear)	UL
Insulation Tubing (Alt.)	Changyuan Electronics (Shenzeng) Co Ltd	CB-300	VW-1, 300 V, 105 ℃ (Black)	UL
Insulation Tubing (Alt.)	Develop Electric Co Ltd	DEV-300	VW-1, 300 V, 105 ℃ (All colors)	UL
Insulation Tubing (Alt.)	Qifurui Electronics Co	QFR-PVC-300	VW-1, 300 V, 105 ℃ (Black)	UL
Insulation Tubing (Alt.)	Qifurui Electronics Co	QFR-PVC-600	VW-1, 600 V, 105 ℃ (Black)	UL
Insulation Tubing (Alt.)	Kai Suh Suh Enterprise Co Ltd	NHS	VW-1, 300 V & 600 V, 105 ℃ (All colors)	UL
Insulation Tubing (Alt.)	Shenzhen Gaoertai Electyonics Co., Ltd.	GET300	VW-1, 300 V, 105 ℃, (All colors)	UL
Insulation Tubing (Alt.)	Shenzhen Gaoertai Electyonics Co., Ltd.	GET600	VW-1, 600 V, 105 ℃, (All colors)	UL
Thermistor (RT1) (Optional)	Interchangeable	Interchangeable	50 Ω at 25 ℃, 38 A	-

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Thermistor (RT2, RT5, RT301, RT402)	Interchangeable	Interchangeable	10 KΩ at 25 ℃, NTC	-
Bridge Diode (BD1)	Interchangeable	Interchangeable	600 V min., 25 A min.	-
Electrolytic Capacitor (C36)	Interchangeable	Interchangeable	810, 850, 870, 910 uF, 105 ℃ min., 450 V min.	-
Transistor (Q4, Q5, Q6, Q8, Q30, Q37)	Interchangeable	Interchangeable	600 V min., 25 A min. for TUV 600 V min., 47 A ~ 25 A for UL	-
Metal Enclosure	Interchangeable	Interchangeable	0.8 mm min.	-

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3.전기용품안전인증의 변경현황(Status of Certificate Revisions)

일자(Date)	발급현황(Status of issues)
	변경내용(Modification of Contents)
2019/04/24	안전확인(기본+파생)
2020/12/07	안전확인(부품)

4.기타(Carefully Informed Note)

1) 안전관리부품 및 재질목록에 기재된 사항은 안전에 직접적인 영향을 주는 부분이므로 내용을 변경 또는 복수등재를 원하는 경우 안전인증변경신청 또는 안전확인변경신고를 하여야 합니다. 안전인증변경신청 또는 안전확인변경신고를 하지 않고 임의로 변경하는 경우에는 전기용품 및 생활용품 안전관리법에 따라 행정조치 될 수 있습니다.
The certificate holder should apply for a revision of the certificate if the registered critical components are to be changed, modified or alternated. Should the contents of Certificate are altered without the application for the modification, the administrative measures can occur according to the Electrical Appliances and Consumer Products Safety Control Act.

2) 공장주소(전화번호포함), 대표자, 상호 및 부품변경, 신고인정보 등 안전인증 또는 안전확인신고의 내용이 변경되었을 때, 안전인증변경신청 또는 안전확인변경신고를 하지 않을 경우에는 전기용품 및 생활용품 안전관리법에 따라 행정조치 될 수 있습니다.
Should a factory address, president name, manufacturer name and critical component are altered without the application for the modification, the administrative measures can occur according to the Electrical Appliances and Customer Products Safety Control Act.

3) 조건부 인증사항 (Conditional certification items):

AB9E-8EF0-3F43-9B2D

변경신고 처리결과 통보서

전자민원신청번호		202317210000051529	접수일자	2023-02-15
대상기기	상호 또는 성명	ACBEL POLYTECH INC.	적합성평가 분야	적합등록
	기자재 명칭	Switching Power Supply	기본모델명	FSJ014
	적합성평가 번호	R-R-API-FSJ014	적합성평가 연 월 일	2023-02-15

변경 사항	변경 전	변경 후
모델명	R1CA2202B,FSM039,FSJ024,R1CA2132C,CRPS1600NS,R1CA1162B,R1CA2202G,FSH018,R1CA2162B,FSJ023,R1CA2202C,FSM033,CRPS2000NC,R1CA1202G,R1CA2162C,FSM031,R1CA2162F	R1CA2202B,FSM039,FSJ024,R1CA2132C,CRPS1600NS,R1CA1162B,R1CA2202G,FSH018,R1CA2162B,FSJ023,R1CA2202C,FSM033,CRPS2000NC,R1CA1202G,R1CA2162C,FSM031,R1CA2162F,CRPS1600NC

「방송통신기자재등의 적합성평가에 관한 고시」 제16조에 따른 적합성평가 사항의 변경신고 건에 대하여 위와 같이 변경처리 되었음을 알려드립니다.

2023년(Year) 02월(Month) 15일(Date)

국립전파연구원장 국립전파연구원장인

7604-0068-3F2B-837A

방송통신기자재등의 적합등록 필증

Registration of Broadcasting and Communication Equipments

상호 또는 성명 Trade Name or Registrant	ACBEL POLYTECH INC.
기자재명칭(제품명칭) Equipment Name	Switching Power Supply
기기부호/추가 기기부호 Equipment code /Additional Equipment code	IMI31
기본모델명 Basic Model	FSJ014
파생모델명 Series Model	FSJ023, CRPS1600NC, R1CA2162C, R1CA2202G, R1CA1202G, R1CA2162F, CRPS2000NC, R1CA1162B, CRPS1600NS, FSM031, FSM033, FSM039, R1CA2132C, R1CA2162B, R1CA2202C, R1CA2202B, FSJ024, FSH018
등록번호 Registration No.	R-R-API-FSJ014
제조자/제조국가 Manufacturer/Country of	ACBEL POLYTECH INC., ACBEL ELECTRONIC(WUHAN) CO., LTD, AcTel Electronic (Dong Guan)Co., Ltd., Acbel Electronic (Dong Guan) Co., Ltd., Acbel Polytech (Philippines) INC./중국, 대만, 필리핀
등록연월일 Date of Registration	2019-04-22
기타 Others	

위 기자재는「전파법」제58조의2 제3항에 따라 등록되었음을 증명합니다.

It is verified that foregoing equipment has been registered under the Clause 3, Article 58-2 of Radio Waves Act.

2023년(Year) 02월(Month) 15일(Day)

국립전파연구원장 국립전파연구원장인

Director General of National Radio Research Agency

※ 적합등록 방송통신기자재는 반드시 **"적합성평가표시"** 를 부착하여 유통하여야 합니다.

위반시 과태료 처분 및 등록이 취소될 수 있습니다.

Certificate

Issue Date: March 13, 2023
Ref. Report No. ISL-19LE102FCCIC-1-R2

Product Name	:	Switching Power Supply
Main Model	:	FSJ014
Series Model	:	FSH018; R1CA2162B; FSJ024; R1CA2162C; R1CA2202B; FSJ023; R1CA2202C; FSM033; R1CA2202G; CRPS2000NC; R1CA1202G; FSM039; CRPS1600NS; R1CA1162B; R1CA2162F; CRPS1600NC; FSM031; R1CA2132C
Applicant	:	ACBEL POLYTECH Inc.
Address	:	No. 159, Sec. 3, Tam-King Rd., Tamsul, Taipei, Taiwan

We, **International Standards Laboratory Corp.**, hereby certify that:

The sample ISL received which bearing the trade name and model specified above has shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified. (refer to Test Report if any modifications were made for compliance). And Our laboratories is the accredited laboratories and are approved according to ISO/IEC 17025.

Standards:

FCC CFR Title 47 Part 15 Subpart B: Section 15.107 and 15.109
ANSI C63.4-2014
Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 7: 2020
Class A

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.
The determination of the test results is determined by customer agreement, regulations or standard document specifications.
The Laboratory evaluates measurement inaccuracies based on regulatory or standard document specifications and is listed in the report for reference. The quantitative project part judges the conformity of the test results based on the evaluation results of the standard cited uncertainty, and the qualitative project does not temporarily evaluate the measurement uncertainty.

Angus Chu

Angus Chu / Sr. Manager

International Standards Laboratory Corp. LT Lab.
TEL: +886-3-263-8888 FAX: +886-3-263-8899
No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan

ISL International Standards Laboratory Corp. http://www.isl.com.tw

TEST REPORT

of

CFR 47 Part 15 Subpart B Class A
&
Industry Canada Interference-Causing Equipment Standard ICES-003 Class A

Application Type: Supplier's Declaration of Conformity

Product:	**Switching Power Supply**
Main Model:	**FSJ014**
Series Model:	**FSH018; R1CA2162B; FSJ024; R1CA2162C; R1CA2202B; FSJ023; R1CA2202C; FSM033; R1CA2202G; CRPS2000NC; R1CA1202G; FSM039; CRPS1600NS; R1CA1162B; R1CA2162F; CRPS1600NC; FSM031; R1CA2132C**
Applicant:	**ACBEL POLYTECH Inc.**
Address:	**No. 159, Sec. 3, Tam-King Rd., Tamsul, Taipei, Taiwan**

Test Performed by:

International Standards Laboratory Corp. LT Lab.
TEL: +886-3-263-8888 FAX: +886-3-263-8899
No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan

Report No.: **ISL-19LE102FCCIC-1-R2**
Issue Date : **March 13, 2023**

Testing Laboratory
0997

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein. The uncertainty of the measurement does not include in consideration of the test result unless the customer required the determination of uncertainty via the agreement, regulation or standard document specification. This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory Corp.

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1. General

1.1 Certification of Accuracy of Test Data

Standards:	FCC CFR Title 47 Part 15 Subpart B: Section 15.107 and 15.109 ANSI C63.4-2014 Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 7: 2020 Class A
Equipment Tested:	Switching Power Supply
Main Model:	FSJ014
Series Model:	FSH018; R1CA2162B; FSJ024; R1CA2162C; R1CA2202B; FSJ023; R1CA2202C; FSM033; R1CA2202G; CRPS2000NC; R1CA1202G; FSM039; CRPS1600NS; R1CA1162B; R1CA2162F; CRPS1600NC; FSM031; R1CA2132C
Applicant:	ACBEL POLYTECH Inc.
Sample received Date:	December 21, 2022
Final test Date:	refer to the date of test data
Test Site:	Chamber 12; Conduction 02
Test Distance:	10m
Temperature:	refer to each site test data
Humidity:	refer to each site test data
Input power:	Conduction input power: AC 120 V / 60 Hz Radiation input power: AC 120 V / 60 Hz
Test Result:	**PASS**
Report Engineer:	Kelly YL Chen
Test Engineer:	Ted Fan Ted Fan
Approved By:	Benson Chen Benson Chen / Manager

1.2 Description of EUT

EUT

1.This report is based on the report: 19LE102FCCIC-1-R1.
2.This report is to add the model name. It will not inflect the original tests, so provide the original data in this report.

Description	Switching Power Supply
Main Model	FSJ014
Series Model	FSH018; R1CA2162B; FSJ024; R1CA2162C; R1CA2202B; FSJ023; R1CA2202C; FSM033; R1CA2202G; CRPS2000NC; R1CA1202G; FSM039; CRPS1600NS; R1CA1162B; R1CA2162F; **CRPS1600NC(add)**; FSM031; R1CA2132C
Condition	Pre-Production
Serial Number	N/A
Highest working frequency	64KHz
The radiation test should be tested till 1GHz	

Model Difference:

Model	Ambient temperature	An airflow direction	Output	Input
FSJ014 R1CA2202B	55 ℃	DC fan out-blowing	(a) +12V/83A +12Vsb/3A. TOTAL POWER 1000W MAX.(FOR INPUT 100-127VAC 13A) +12V/166.7A. +12V/162A.(FOR INPUT 220-230VAC 10A) +12Vsb/3A. TOTAL POWER 2000W MAX.(FOR INPUT 200-240VAC 12A, 240VDC 10A) TOTAL POWER 2000W MAX.(FOR INPUT 230-240VAC 10A, 240VDC 10A) TOTAL POWER 1944W MAX.(FOR INPUT 220-230VAC 10A) (b) +12V / 83A max (for 1000W @ 100-127V~); +12V / 130A max (for 1560W @ 200-220V~); +12V / 162A max (for 1944W @ 220-230V~); +12V / 166.7A max (for 2000W @ 230-240V~ or 240Vdc); +12Vsb / 3A max.	(a) 100-127V~, 50/60Hz, 13A; 200-240V~, 50/60Hz, 12A; 220-240V~, 50/60Hz, 10A; 240Vdc, 10A MAX (b) 100-127V~, 50/60Hz, 13A (for 1000W, not for China) ; 200-220V~, 50/60Hz, 10A (for 1560W); 220-230V~, 50/60Hz, 10A (for 1944W); 230-240V~, 50/60Hz, 10A (for 2000W); 240Vdc, 10A
FSJ023 R1CA2202C	45 ℃	DC fan in-blowing		

Model	Ambient temperature	An airflow direction	Output	Input
FSH018 R1CA2162B FSJ024 R1CA2162C	55 ℃	DC fan out-blowing DC fan in-blowing	+12 Vdc = 133.33 A (For Input 200-240 V~, 240 Vdc); +12 Vsb, 3 A Total Power 1600 W (For Input 200-240 V~, 240 Vdc);	200-240 V~, 50/60 Hz, 10 A; 240 Vdc, 8 A
FSM033 R1CA2202G	55 ℃	DC fan out-blowing	+12.2V / 81.96A max (for 1000W @ 100-127V~); +12.2V / 147.5A max (for 1800W @ 200-220V~); +12.2V / 163.9A max (for 2000W @ 220-240V~ or 240Vdc); +12Vsb / 3A max.	100-127V~, 50/60Hz, 13A (for 1000W, not for China); 200-220V~, 50/60Hz, 10A (for 1800W); 220-240V~, 50/60Hz, 10A (for 2000W) 240Vdc, 10A
CRPS2000NC R1CA1202G	55 ℃	DC fan out-blowing	+12.2V / 81.96A max (for 1000W @ 100-127V~); +12.2V / 147.5A max (for 1800W @ 200-220V~); +12.2V / 163.9A max (for 2000W @ 220-240V~ or 240Vdc).	100-127V~, 50/60Hz, 13A (for 1000W, not for China); 200-220V~, 50/60Hz, 10A (for 1800W); 220-240V~, 50/60Hz, 10A (for 2000W) 240Vdc, 10A
FSM039 CRPS1600NS R1CA1162B **CRPS1600NC (add)**	55 ℃	DC fan out-blowing	+12.2V / 81.96A max (for 1000W @ 100-127V~); +12.2V / 131.1A max (for 1600W @ 200-240V~ or 240Vdc).	100-127V~, 50/60Hz, 12A (for 1000W, not for China); 200-240V~, 50/60Hz, 10A (for 1600W) 240Vdc, 8A
R1CA2162F	55 ℃	DC fan out-blowing	+12.2V / 81.96A max (for 1000W @ 100-127V~); +12.2V / 131.1A max (for 1600W @ 200-240V~ or 240Vdc); +12Vsb / 3A max.	100-127V~, 50/60Hz, 12A (for 1000W, not for China); 200-240V~, 50/60Hz, 10A (for 1600W) 240Vdc, 8A
FSM031 R1CA2132C	55 ℃	DC fan out-blowing	+12.2V / 81.96A max (for 1000W @ 100-127V~); +12.2V / 106.5A max (for 1300W @ 200-240V~ or 240Vdc); +12Vsb / 3.0A max.	100-127V~, 50/60Hz, 12A (for 1000W, not for China); 200-240V~, 50/60Hz, 7.5A (for 1300W) 240Vdc, 6.5A
The series models are identical except for the input/output rating, the maximum working environment, and the direction of the DC fan airflow.				

Test Configuration:

Configuration	Model	Mode
1	R1CA2202B	Full load

EMI Noise Source:

Factory	Model	Point
AcBel Polytech Inc.(API)	25L60	T201
AcBel Polytech Inc.(API)	25N20	T301
AcBel Polytech Inc.(API)	25N19	T4
AcBel Polytech Inc.(API)	25S27(For FSM031, R1CA2132C)	T4

EMI Solution:
NA

1.3 Description of Support Equipment

No	Unit	Model/Serial No.	Brand	Power Cord	FCC ID
1	Load	N/A S/N：N/A	N/A	N/A	N/A

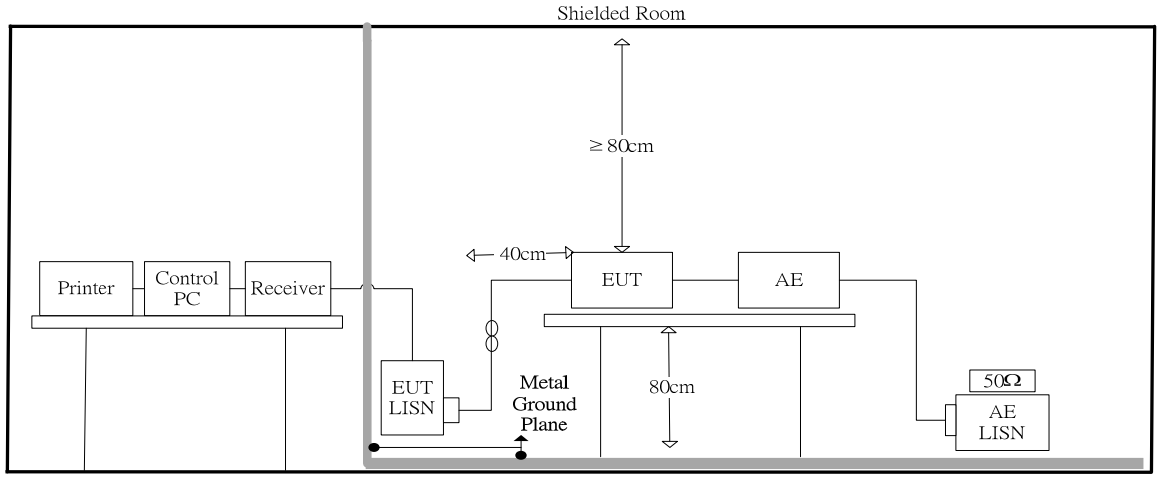
1.4 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	shielded	core	Remark
Power Cable	AC 100V~240V to EUT	1.5m	No	No	

2. Power Line Conducted Emissions

2.1 Test Setup and Procedure

2.1.1 Test Setup



2.1.2 Test Procedure

The measurements are performed in a shielded room test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured. All of the interface cables were manipulated according to ANSI C63.4 requirements.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

2.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150kHz~30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9kHz

2.1.4 Limit

Conducted emissions limits of Class_A equipment. (AC mains power terminals):

Frequency range (MHz)	Quasi-peak (dBμV)	Average (dBμV)
0.15-0.50	79	66
0.50-5.0	73	60
5.0-30	73	60

Note 1: Conducted emissions limits of FCC CFR Title 47 Part 15 Subpart B & Industry Canada Interference-Causing Equipment Standard ICES-003 are same.
Note2: The more stringent limit applies at transition frequencies.

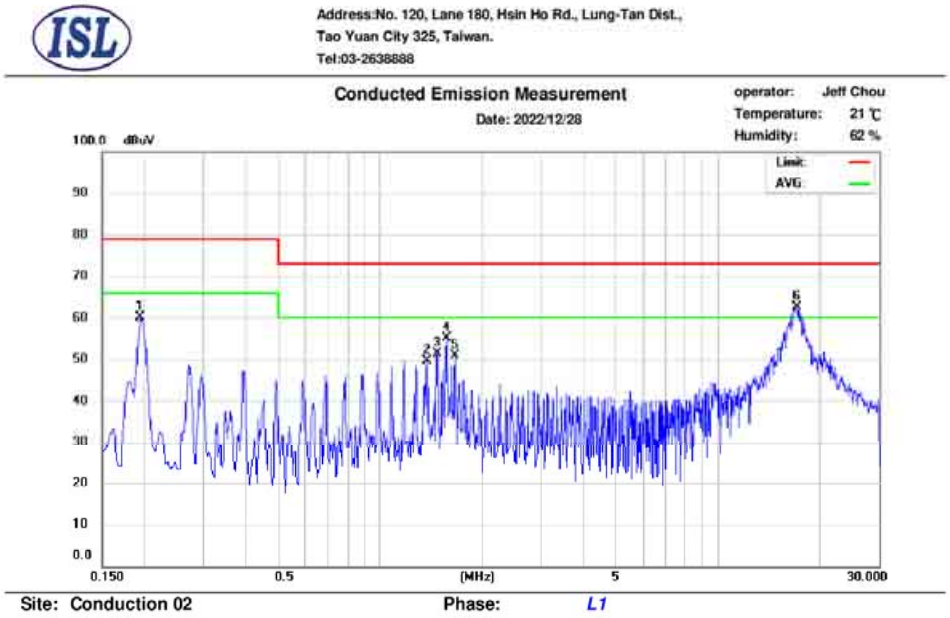
Conducted emissions limits of Class_B equipment. (AC mains power terminals):

Frequency range (MHz)	Quasi-peak (dBμV)	Average (dBμV)
0.15-0.50	66 to 56*	56-46*
0.50-5.0	56	46
5.0-30	60	50
*The limit level in dBμV decreases linearly with the logarithm of frequency.		

Note 1: Conducted emissions limits of FCC CFR Title 47 Part 15 Subpart B & Industry Canada Interference-Causing Equipment Standard ICES-003 are same.
Note2: The more stringent limit applies at transition frequencies.

2.2 Conduction Test Data: Configuration 1

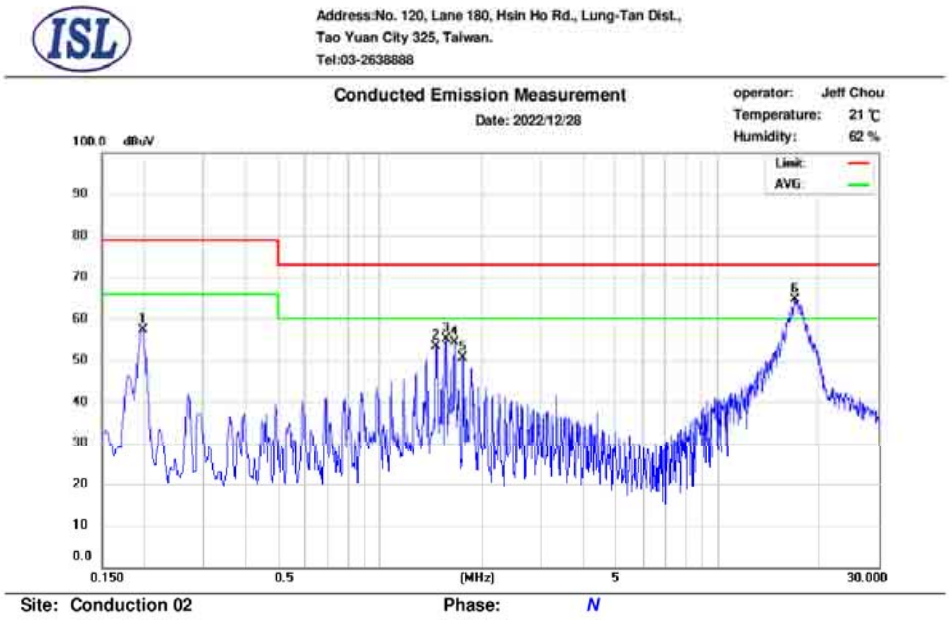
- Line



No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.194	50.00	46.68	9.64	59.64	79.00	-19.36	56.32	66.00	-9.68
2	1.374	39.82	35.37	9.69	49.51	73.00	-23.49	45.06	60.00	-14.94
3	1.474	40.37	34.12	9.69	50.06	73.00	-22.94	43.81	60.00	-16.19
4	1.570	44.33	39.36	9.71	54.04	73.00	-18.96	49.07	60.00	-10.93
5	1.666	39.67	34.64	9.71	49.38	73.00	-23.62	44.35	60.00	-15.65
6	17.162	50.31	40.04	9.92	60.23	73.00	-12.77	49.96	60.00	-10.04

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = QP_R/AVG_R + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.
If peak data can pass, it will be shown in “QP/AVG Correct” column, if not, QP/AVG data will instead.
The CISPR 22 limits would be applied to all FCC Part 15 devices.

- Neutral



No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.198	50.80	47.01	9.63	60.43	79.00	-18.57	56.64	66.00	-9.36
2	1.470	42.44	36.42	9.69	52.13	73.00	-20.87	46.11	60.00	-13.89
3	1.570	46.49	41.88	9.71	56.20	73.00	-16.80	51.59	60.00	-8.41
4	1.670	43.30	38.57	9.71	53.01	73.00	-19.99	48.28	60.00	-11.72
5	1.766	39.87	34.90	9.71	49.58	73.00	-23.42	44.61	60.00	-15.39
6	16.970	52.31	45.26	9.98	62.29	73.00	-10.71	55.24	60.00	-4.76

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = QP_R/AVG_R + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.
If peak data can pass, it will be shown in “QP/AVG Correct” column, if not, QP/AVG data will instead.
The CISPR 22 limits would be applied to all FCC Part 15 devices.

2.3 Test Setup Photo

Front View



Back View

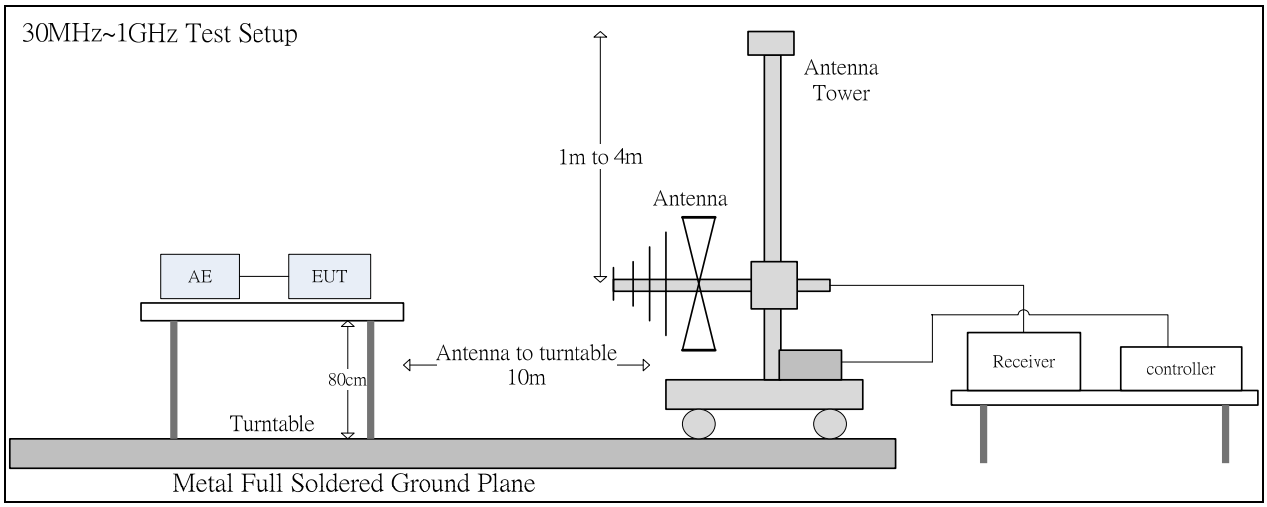


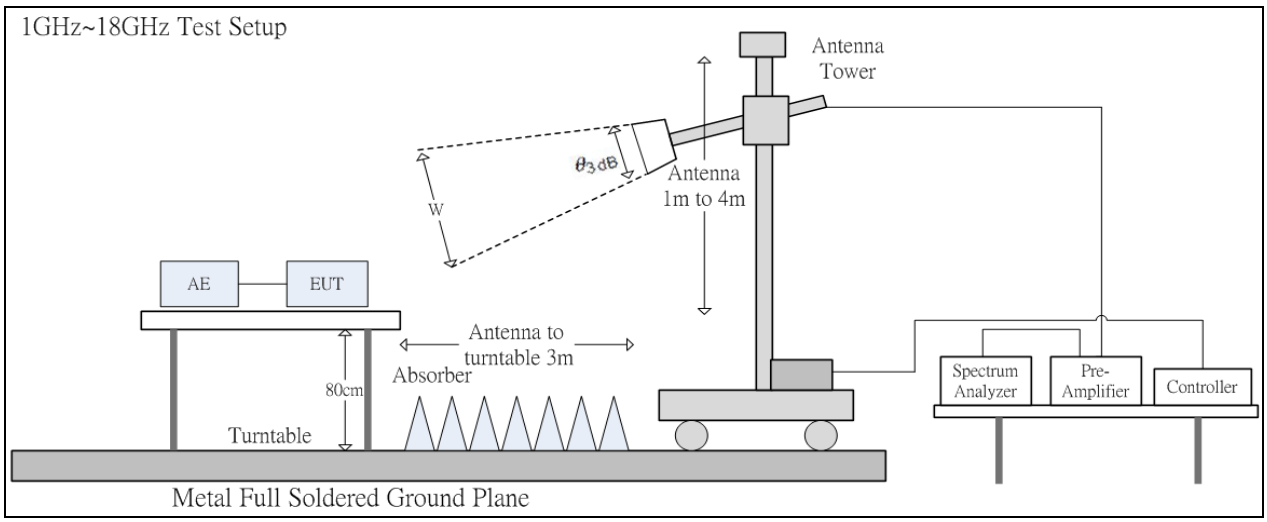


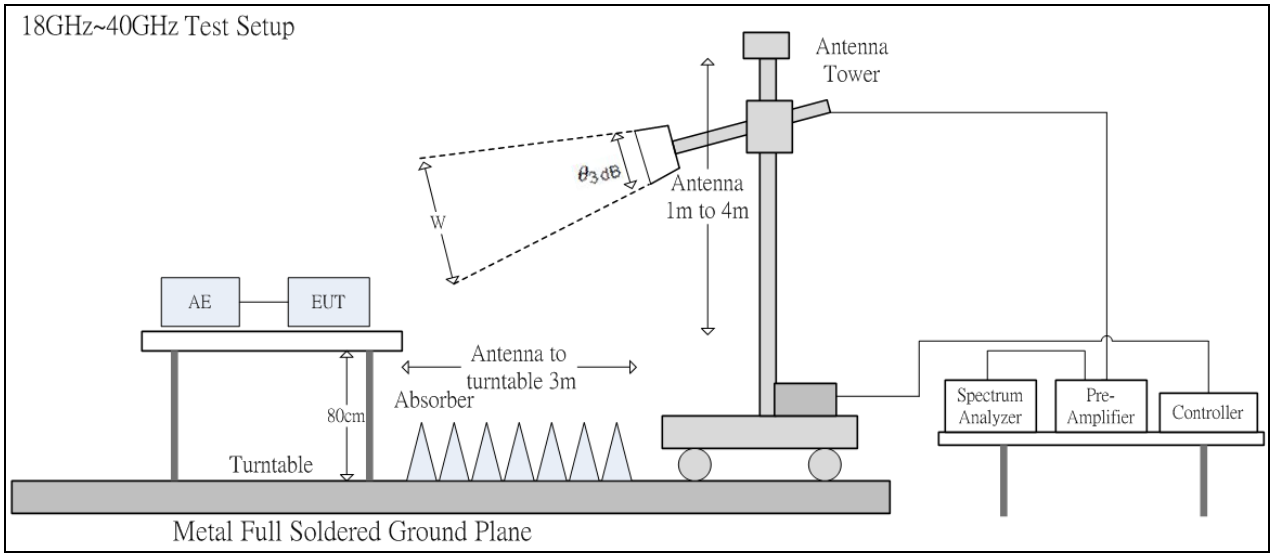
3. Radiated Emissions

3.1 Test Setup and Procedure

3.1.1 Test Setup







The 3dB beam width of the horn antenna used for the test is as shown in the table below.
1GHz~18GHz

Frequency GHz	E-plane	H-plane	$\theta_{3\,dB}$(min)	d= 3 m
				w (m)
1	88°	147°	88°	5.79
2	68°	119°	68°	4.04
3	73°	92°	73°	4.44
4	70°	89°	70°	4.20
5	55°	60°	55°	3.12
6	63°	62°	62°	3.60
7	48°	49°	48°	2.67
8	39°	46°	39°	2.12
9	32°	42°	32°	1.72
10	30°	39°	30°	1.61
11	32°	35°	32°	1.72
12	35°	32°	35°	1.89
13	34°	31°	31°	1.66
14	32°	27°	27°	1.44
15	36°	26°	26°	1.39
16	40°	28°	28°	1.50
17	43°	26°	26°	1.39
18	41°	22°	22°	1.17

18 GHz~26.5 GHz

Frequency GHz	E-plane	H-plane	$\theta_{3\,dB}$(min)	d= 1 m	d= 3 m
				w (m)	w (m)
18	11.4°	12.7°	11.4°	0.199	0.598
19	10.9°	12.4°	10.9°	0.190	0.572
20	10.8°	12.4°	10.8°	0.189	0.567
21	9.8°	12°	9.8°	0.171	0.514
22	9.7°	11°	9.7°	0.169	0.509
23	10°	11.8°	10°	0.174	0.524
24	9°	11°	9°	0.157	0.472
25	10°	12.3°	10°	0.174	0.524
26	9.9°	11.1°	9.9°	0.173	0.519
26.5	9.4°	11.3°	9.4°	0.164	0.493

26 GHz~40 GHz

Frequency GHz	E-plane	H-plane	$\theta_{3\,dB}$ (min)	d= 1 m	d= 3 m
				w (m)	w (m)
26	12°	12.2°	12°	0.210	0.631
27	13°	10.5°	10.5°	0.184	0.551
28	13.2°	12.3°	12.3°	0.216	0.647
29	11.5°	12.8°	11.5°	0.201	0.604
30	12°	8°	8°	0.140	0.420
31	11.5°	10.1°	10.1°	0.177	0.530
32	11.8°	10°	10°	0.175	0.525
33	11.8°	9.5°	9.5°	0.166	0.499
34	11.6°	10°	10°	0.175	0.525
35	10.9°	9.8°	9.8°	0.171	0.514
36	11.8°	8.6°	8.6°	0.150	0.451
37	12.9°	10.5°	10.5°	0.184	0.551
38	12°	10.3°	10.3°	0.180	0.541
39	11.8°	9.8°	9.8°	0.171	0.514
40	12.5°	11.2°	11.2°	0.196	0.588

3.1.2 Test Procedure

The radiated emissions test will then be repeated on the chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of 10 meter chamber. Desktop EUT are set up on a wooden stand 0.8 meter above the ground or floor-standing arrangement shall be placed on the horizontal ground reference plane. The test volume for a height of up to 30 cm may be obstructed by absorber placed on the ground plane.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. The highest emissions between 30 MHz to 1000 MHz were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. The highest emissions between 1 GHz to 40 GHz were analyzed in details by operating the spectrum analyzer in peak and average mode to determine the precise amplitude of the emissions.

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the antenna in the cone of radiation from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response. At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings. All of the interface cables were manipulated according to ANSI C63.4 requirements.

The highest internal source of the EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less.

3.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	30MHz--1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth:	120kHz

Frequency Range:	Above 1000MHz
Detector Function:	Peak/Average Mode
Resolution Bandwidth:	1MHz

3.1.4 Limit

Radiated emissions limits of Class_A equipment. (30 MHz to 1 GHz)

Frequency range (MHz)	FCC Part 15 Subpart B 15.109(g)	ICES-003
	at 10 m distance Quasi-peak (dBμV/m)	at 10 m distance Quasi-peak (dBμV/m)
30-88	40	40.0
88-216	40	43.5
216-230	40	46.4
230-960	47	47.0
960-1000	47	49.5

Note 1: The test limit in this report is based on FCC CFR Title 47 Part 15 Subpart B 15.109(g).
Note 2: The more stringent limit applies at transition frequencies.
Note 3: Test data in this report has been taken against the FCC CFR Title 47 Part 15 Subpart B 15.109(g) limit as it is the most stringent limit. By complying with the more restrictive Part 15 Subpart B 15.109(g) limit compliance with the Industry Canada Interference-Causing Equipment Standard ICES-003 limit is also demonstrated.

Radiated emission limits of Class_A equipment at 3 m distance (at and above 1 GHz)

Frequency range (GHz)	Average dB(μV/m)	Peak dB(μV/m)
1 – 40G	60	80

Note 1: Radiated emissions limits of FCC CFR Title 47 Part 15 Subpart B & Industry Canada Interference-Causing Equipment Standard ICES-003 are same.

Radiated emissions limits of Class_B equipment. (30 MHz to 1 GHz)

Frequency range (MHz)	FCC Part 15 Subpart B 15.109(g)	ICES-003
	at 10 m distance Quasi-peak (dBμV/m)	at 10 m distance Quasi-peak (dBμV/m)
30-88	30	30.0
88-216	30	33.1
216-230	30	35.6
230-960	37	37.0
960-1000	37	43.5

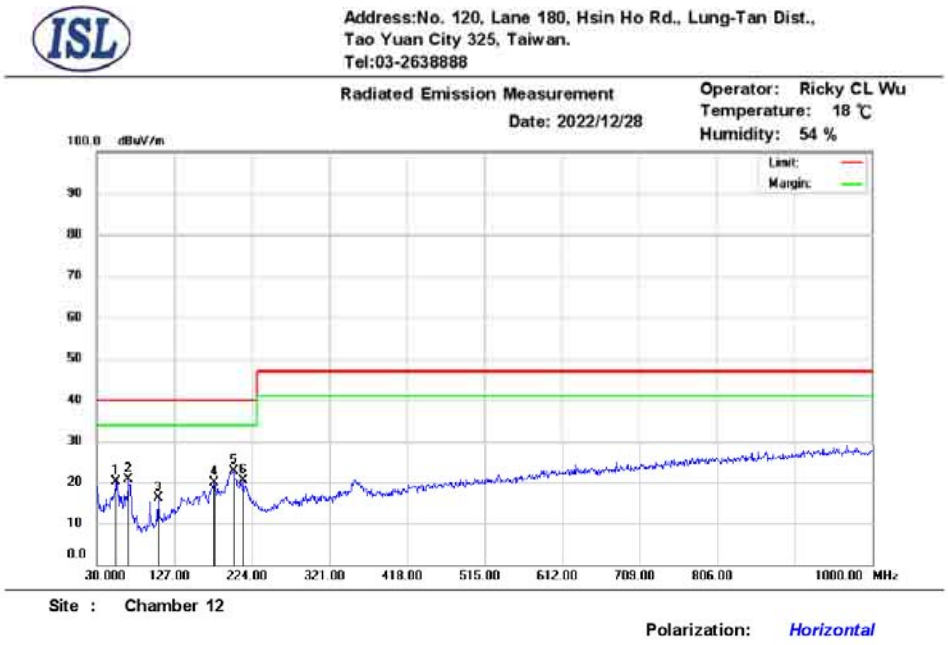
Note 1: The test limit in this report is based on FCC CFR Title 47 Part 15 Subpart B 15.109(g).
Note 2: The more stringent limit applies at transition frequencies.
Note 3: Test data in this report has been taken against the FCC CFR Title 47 Part 15 Subpart B 15.109(g) limit as it is the most stringent limit. By complying with the more restrictive Part 15 Subpart B 15.109(g) limit compliance with the Industry Canada Interference-Causing Equipment Standard ICES-003 limit is also demonstrated.

Radiated emission limits of Class_B equipment at 3 m distance (at and above 1 GHz)

Frequency range (GHz)	Average dB(μV/m)	Peak dB(μV/m)
1 – 40G	54	74

Note 1: Radiated emissions limits of FCC CFR Title 47 Part 15 Subpart B & Industry Canada Interference-Causing Equipment Standard ICES-003 are same.

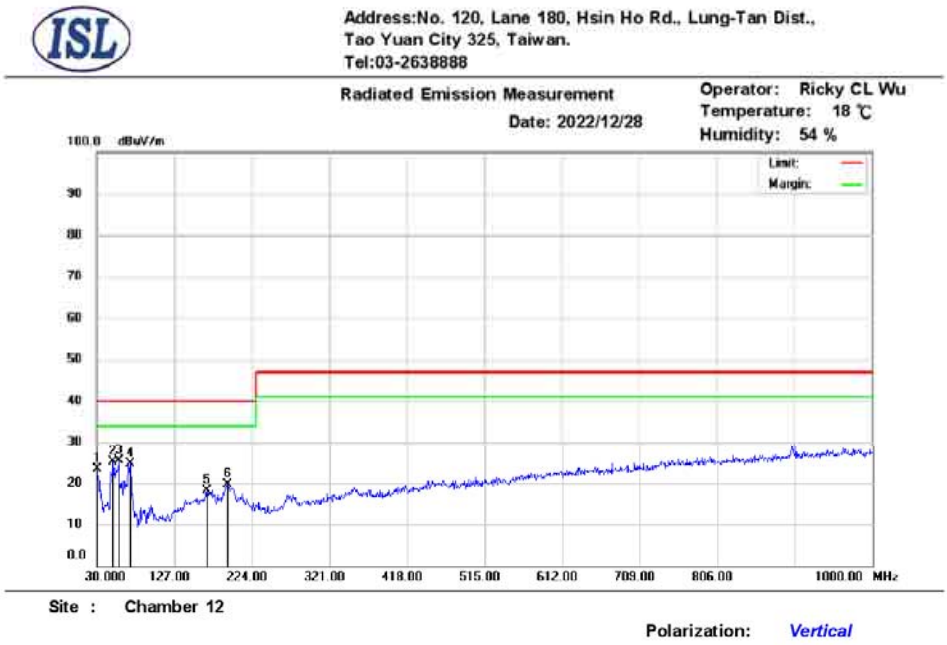
3.2 Radiation Test Data: Configuration 1
- Radiated Emissions (Horizontal)



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	54.25	36.24	-16.20	20.04	40.00	-19.96	400	303	peak
2	68.80	38.84	-18.31	20.53	40.00	-19.47	400	140	peak
3	106.63	35.95	-19.86	16.09	40.00	-23.91	300	120	peak
4	176.47	36.43	-16.67	19.76	40.00	-20.24	400	120	peak
5	200.72	41.05	-18.35	22.70	40.00	-17.30	400	80	peak
6	212.36	38.85	-18.39	20.46	40.00	-19.54	400	108	peak

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Antenna Distance: 10 meters
The CISPR 22 limits would be applied to all FCC Part 15 devices.
If the peak measured value meets the QP limit, The QP value is inherently compliant.

-Radiated Emissions (Vertical)



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	30.00	41.69	-18.29	23.40	40.00	-16.60	100	0	peak
2	50.37	41.25	-16.08	25.17	40.00	-14.83	200	148	peak
3	57.16	41.85	-16.44	25.41	40.00	-14.59	100	271	peak
4	71.71	43.23	-18.63	24.60	40.00	-15.40	200	44	peak
5	167.74	34.09	-15.97	18.12	40.00	-21.88	300	207	peak
6	193.93	37.79	-18.19	19.60	40.00	-20.40	200	168	peak

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Antenna Distance: 10 meters
The CISPR 22 limits would be applied to all FCC Part 15 devices.
If the peak measured value meets the QP limit, The QP value is inherently compliant.

3.3 Test Setup Photo

Front View (30MHz~1GHz)



Back View (30MHz~1GHz)



4. Appendix

4.1 Appendix A: (FCC)Warning Labels

Label Requirements

A Class A digital device subject to authorization under Supplier's Declaration of Conformity of FCC shall carry a label which includes the following statement:

*** * * W A R N I N G * * ***

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Devices subject to authorization under Supplier's Declaration of Conformity may be labeled with FCC logo on a voluntary basis as a visual indication that the product complies with the applicable FCC requirements

The sample label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.

When the device is so small or for such use that it is impracticable to label it with the statement specified under (§15.19 Labeling requirements) paragraph (a) of this section in a font that is four-point or larger, and the device does not have a display that can show electronic labeling, then the information required by this paragraph shall be placed in the user manual and must also either be placed on the device packaging or on a removable label attached to the device.

4.2 Appendix B: (FCC)Warning Statement

Statement Requirements

The operators' manual for a Class A digital device shall contain the following statements or their equivalent:

*** * * W A R N I N G * * ***

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

* * * * * * * * * *

If the EUT was tested with special shielded cables the operator's manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

4.3 Appendix C: (Canada ISED) Labelling and user manual requirements

The requirements specified in ICES-Gen shall apply. An example ISED compliance label, to be placed on each unit of an equipment model (or in the user manual, if allowed), is given below:

CAN ICES-003(*) / NMB-003(*)

* Insert either “A” or “B”, but not both, to identify the applicable Class of the device used for compliance verification.

The above label is only an example. The specific format is left to the manufacturer to decide, as long as the label includes the required information, in accordance with ICES-Gen.

4.4 Appendix D: Test Equipment

4.4.1 Test Equipment List

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction 02	EMI Receiver 14	ROHDE& SCHWARZ	ESCI	101034	05/25/2022	05/25/2023
Conduction 02	Conduction 02-1 Cable	WOKEN	CFD 300-NL	Conduction 02 -1	10/11/2022	10/11/2023
Conduction 02	LISN 26	R&S	ENV216	102378	12/08/2022	12/08/2023
Conduction 02	LISN 21	R&S	ENV216	101476	07/20/2022	07/20/2023

Location Chmb12	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation	BILOG Antenna 18	Schwarzbeck	Schwarzbeck VULB 9168+EMCI-N -6-05	646	03/09/2022	03/09/2023
Radiation	Preamplifier 26	EMCI	EMC9135	980297	02/23/2022	02/23/2023
Radiation	Coaxial Cable Chmb 12-10M-01	PEWC	CFD400-NL	Chmb 12-10M-01	10/04/2022	10/04/2023
Radiation	EMI Receiver 19	ROHDE & SCHWARZ	ESR3	102460	7/19/2022	7/19/2023

4.4.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

Site	Filename	Version
Conduction/Radiation	EZ EMC	ISL-03A2

4.5 Appendix E: Uncertainty of Measurement

The laboratory measurement uncertainty accordance with refers to CISPR 16-4-2. If Ulab is less than or equal to Ucispr in Table 1, then the test report may either state the value of Ulab or state that Ulab is less than Ucispr.
The coverage factor k = 2 yields approximately a 95 % level of confidence.

<Conduction 02>
AMN: ± 2.90dB

<Chamber 12 (10m)>
Horizontal
30MHz~200MHz: ±4.56dB
200MHz~1000MHz: ±4.20dB
Vertical
30MHz~200MHz: ±4.58dB
200MHz~1000MHz: ±4.78dB

4.6 Appendix F: Photographs of EUT

Please refer to the File of **ISL-19LE102P-1-R1**

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