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ACBEL POLYTECH INC.

Approval Sheet

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Specification

Specification for 2000 Watts
Switching Power Supply
Model No.: FSJ014-7EAG
Marketing PN: R1CA2202B-P7EA
Revision: A1.5
AcBel Polytech Inc.

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1 Revision Log

Revision	Description	Approved	Date
A0	Initial		20180911
A1.1	Delete 6.2 Power Good rise time		20190107
A1.1	Delete 6.14 T_PSON_OFF_DELAY		20190107
A1.1	Modify 6.13 LED indicators		20190107
A1.2	Modify 4.17 Load Share Signal Characteristics table		20190110
A1.2	Modify 6.4 Load Share Signal table		20190110
A1.2	Modify 6.14 Timing T_AC_Fail_delay		20190110
A1.2	Modify 5.2.5 Over Temperature Protection table		20190110
A1.2	Modify 5.2.1 Current Limit & Power Protection table alert mode		20190110
A1.2	Modify 9.1.1 Normal Operating Ambient minimum CFM		20190110
A1.2	Modify 6.1 PSON		20190110
A1.3	Modify 4.18 DC Connector and Pin Assignment A21 B24 short PIN		20190321
A1.3	Modify 9.5 Acoustic		20190321
A1.4	Modify 6.14 T_AC_Fail_delay of diagram timing		20190713
A1.4	Modify 6.14 T_12VOUT_RISE		20190713
A1.5	Modify 4.6 Capacitive Loading 12V Min 2000uF		20200428
A1.5	Safety Mark and Standards CCC modify to CQC		20200428
A1.5	Nominal Output Voltage 12.00 → 12.20		20200428
A1.5	Added 8.1.1 Accuracy for VIN, IIN, PIN, 12VOUT, IOUT, POUT note 2		20200428
A1.5	Modify 6.7 AC_FAIL Signal table		20200512

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 two.

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	0.1 A	0.1 A
Maximum Operating Current	166.7 A	3 A

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 <small>(220~240Vac)</small> 12A <small>(200~240Vac)</small> 13A <small>(100~127Vac)</small>	$A_{AC,RMS}$
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 <small>(240Vdc)</small>	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 (220~240Vac) 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.

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.

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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.

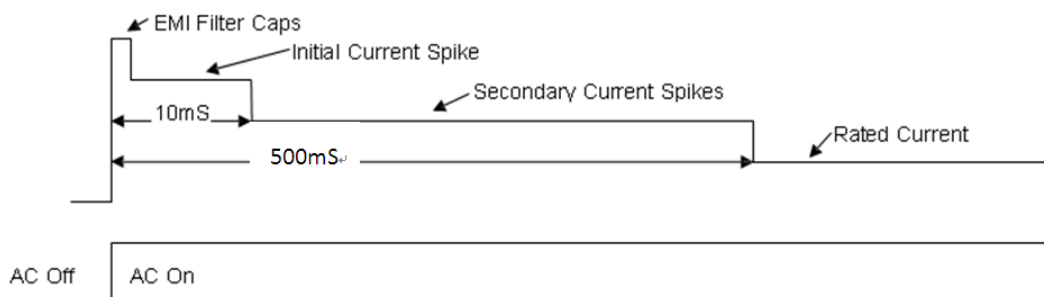
Loading during AC dropout / holdup	Holdup time / Dropout duration
75% of rated load	10 mSec

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).

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
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, Compliant 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.

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)

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	0.1	83	12.20V +/-5%
12V main (180-220V _{AC})	200 V _{AC}	1560	0.1	130	
12V main (220-230V _{AC})	220 V _{AC}	1944	0.1	162	
12V main (230-264V _{AC})	230 V _{AC}	2000	0.1	166.7	
12V main (180~220V _{DC})	200 V _{DC}	1560	0.1	130	
12V main (220~240V _{DC})	230 V _{DC}	1944	0.1	162	
12V main (240~300V _{DC})	240 V _{DC}	2000	0.1	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}	

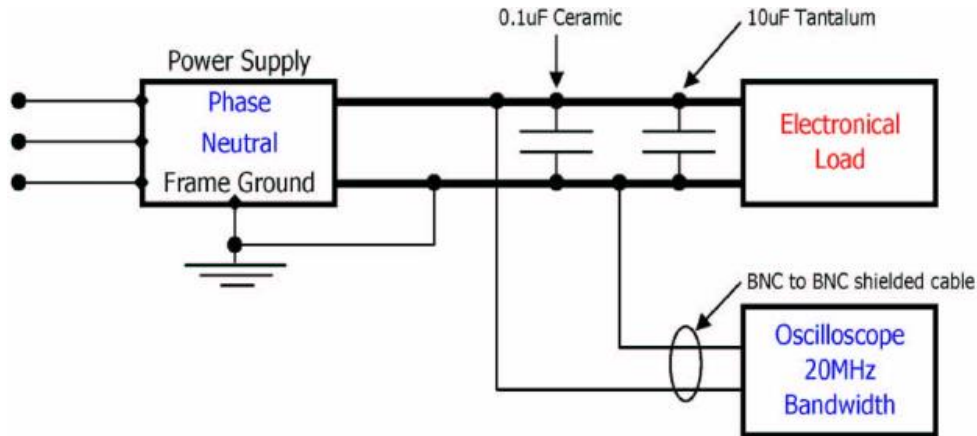


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Notes:

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 100 mV when AC voltage is applied and the PSON# signal is de-asserted.

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 0.3V

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.

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.



4.17 Load Share Signal Characteristics

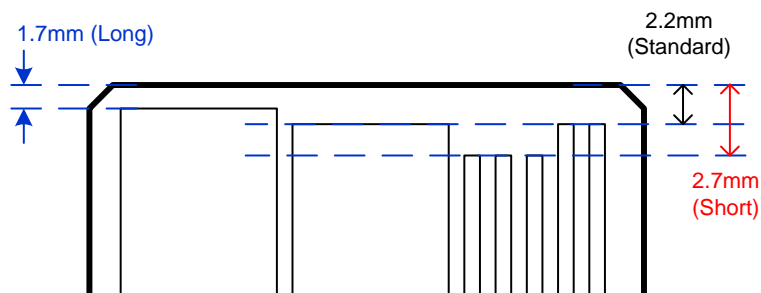
The load share signal is only for the load function. The load share signal characteristics are defined as below table.

Item	Description	Min	Nominal	Max
$V_{SHARE}; I_{OUT} = \text{Max}$	Voltage of load share bus at specified maximum output current	7.76 V	8.0 V	8.24 V
$\Delta V_{SHARE} / \Delta I_{OUT}; I_{OUT} > 1A$	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	AC fail	Output	Standard	Active low; Detect AC Power

Pin length definition is illustrated on below:



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. When the current limit is in OCP1, OCP2 or OCW2 status, the power supply shall shutdown and retry eight times to recover, and if the status still occurred that shall 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. V_{SB} 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 in OC Warning status.
	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	2. If power shut down, SMBAlert will keep latching until AC power cycle on/off or PS_ON cycle on/off.
	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 Warning1 status if OTP occurred.

5.2.2 Over and Under Voltage Protection

When the power supply is in $12V_{OUT}$ OVP or UVP status, the power supply shall shutdown and retry eight times to recover, and if the status still occurred that shall latch off.



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Outputs	Under Voltage		Over Voltage		Unit
	Minimum	Maximum	Minimum	Maximum	
V_{SB}	10	11	14	14.7	V
$12V_{OUT}$	10	11	14	14.7	V

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.

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, $V_{PSON} = \text{low}$		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	Open collector / drain output from power supply. Pull-up to 3.3 V located in system	
PWOK or P_Good = High	DC Outputs O.K.	
PWOK or P_Good = Low	DC Outputs N.G.	
	Minimum	Maximum
Logical Level Low, $I_{SINK} = 400 \mu A$	0 V	0.4V
Logical Level High, $I_{SOURCE} = 200 \mu A$	2.4V	3.46V
Sink current, PWOK = low		400 μA
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 Fall Time		100 μSec

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		100uSec

6.7 AC_FAIL Signal

This signal indicates that the power supply detects input voltage. This shall be asserted due to input voltage as 3.1. The signal shall activate brown out voltage.

Signal type	Open collector / drain output from power supply. Pull-up to 3.3 V located in system	
AC_FAIL = High	Line voltage Failure	
AC_FAIL = low	Line voltage ok	
	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, AC_FAIL # = low		4 mA
Sink current, AC_FAIL # = high		50 uA
AC_FAIL # fall time		100uSec



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6.8 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

6.9 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 I²C 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.

6.10 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.

6.12 Fan Speed Control

The power supply shall incorporate a 40 x28 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	AMBER Then 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.	GREEN
Power supply critical event causing a shutdown; failure, OCP, OVP, Fan Fail	AMBER
Power supply FW updating	1 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	15	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
T_{PSON_ON_DELAY}	Delay from PSON# active to output voltages within regulation limits.	5	400	mSec



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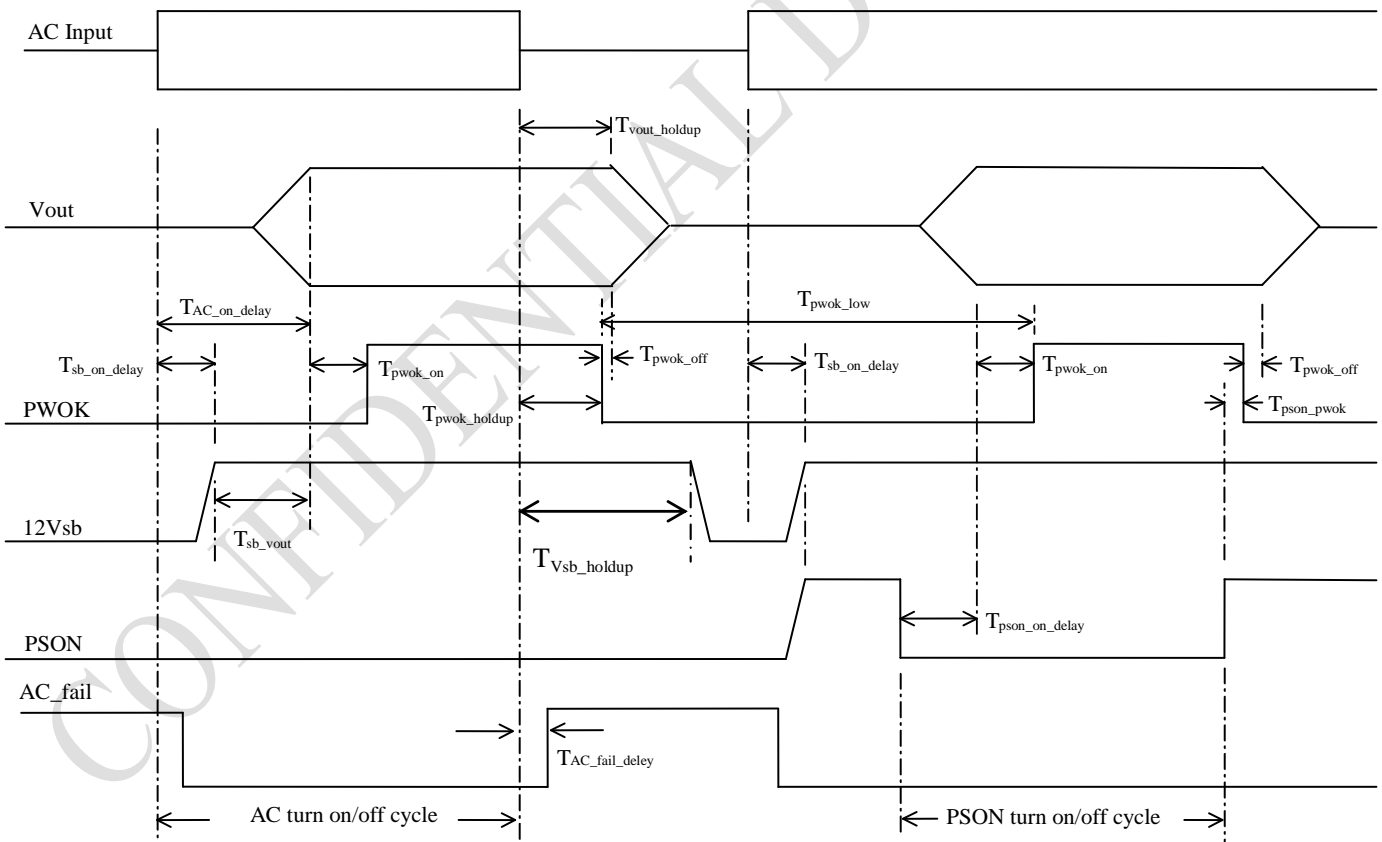
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T_{PSON_PWOK}	Delay from PSON# deactivate to PWOK being de-asserted.	--	5	mSec
T_{PWOK_ON}	Delay from output voltages within regulation limits to PWOK asserted at turn on.	100	500	mSec
T_{PWOK_OFF} (below 75% load)	Delay from PWOK de-asserted to output voltages dropping out of regulation limits.	3	--	mSec
T_{PWOK_OFF} (above 75% load)	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
T_{AC_Fail_delay}	Delay from loss of AC to AC_Fail.		5	mSec

Note

1: The item “T_{PSON_OFF_DELAY}” measured without cap load.



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. When the fan fault is removed, the power supply shall recover automatically.

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		

Note1: At nominal input voltage measurement.

Note2: The load is defined at Max. rated current / Power.

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 $P_{in} < 5W$ (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.

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 (ft³/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°C

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

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



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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	Device Type	Parameter		Stress Factor
Power Rectifiers	Reverse Voltage	V_R	80%	Aluminum Electrolytic	Voltage (Bulk Cap)	V_{max}	95%
	Forward Current	I_{Fmax}	80%		Ripple Current	I_{rated}	95%
	Junction Temp.	T_J	80%		Solid Electrolytic (Oscon)	Voltage (Others)	V_{max}
Schottky Diode	Reverse Voltage	V_R	95%	Temperature		T_{max}	90%
	Forward Current	I_{Fmax}	90%	Mag. Device Toroid		Flux density	B
	Junction Temp.	T_J	80%	Mag. Device Ferrite	Flux density	B	70%
FET	Breakdown Voltage (>400V)	V_{DSS}	95%				
	Drain Current	I_D	80%				
	Junction Temp.	T_J	80%				

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

UL/cUL, TUV, CB, CE, CQC, BSMI.

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

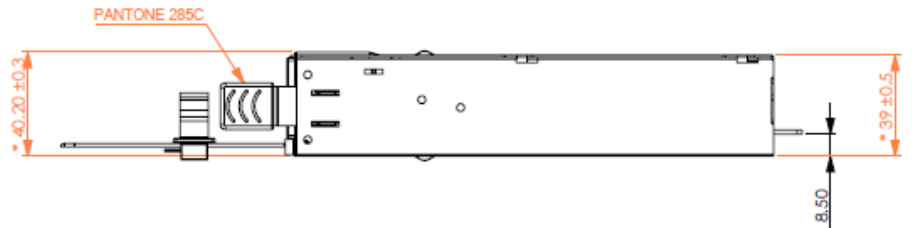
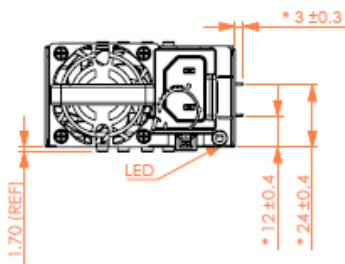
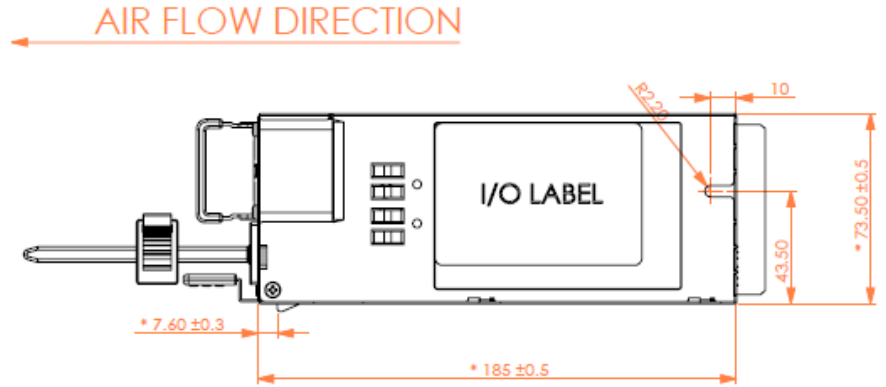
The power supply unit must pass a 2550 V_{DC} Residual Voltage test between primary to chassis ground. All production units must pass a 2550 Vdc Hi-Pot test between primary to chassis ground or follow safety agency requirement. The voltage must be ramped up to 2550 within 2.0S and it must be maintained 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.

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

以 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

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

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

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

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"

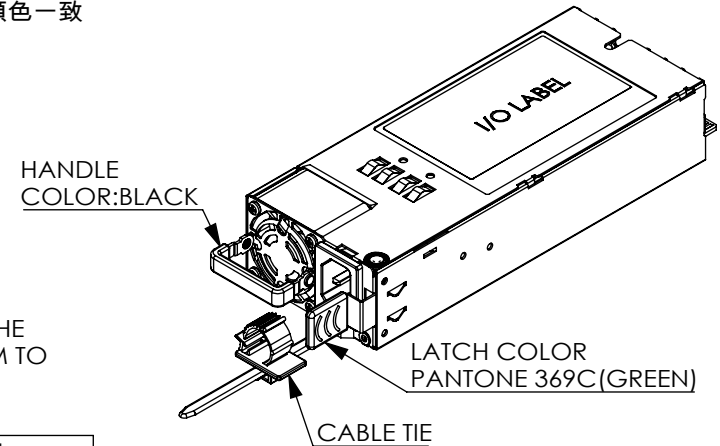
15 ALL REF DIMENSIONS MUST COMPLY TO FABRICATE REQUIREMENT
所有參考尺寸必須符合實際組裝要求

16 風扇外觀實物為主

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

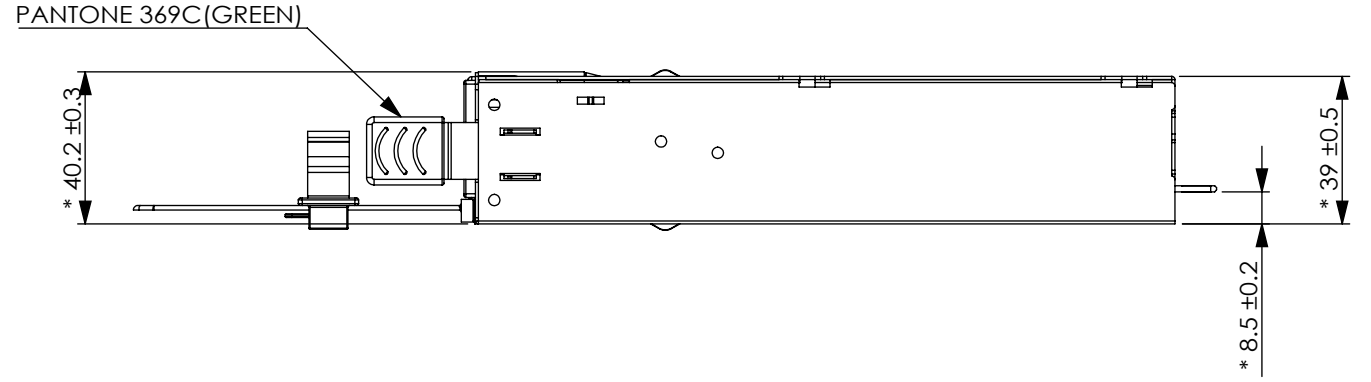
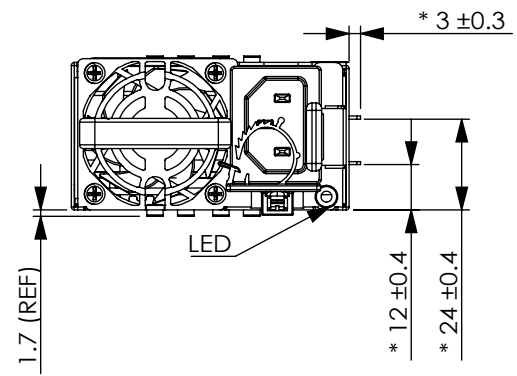
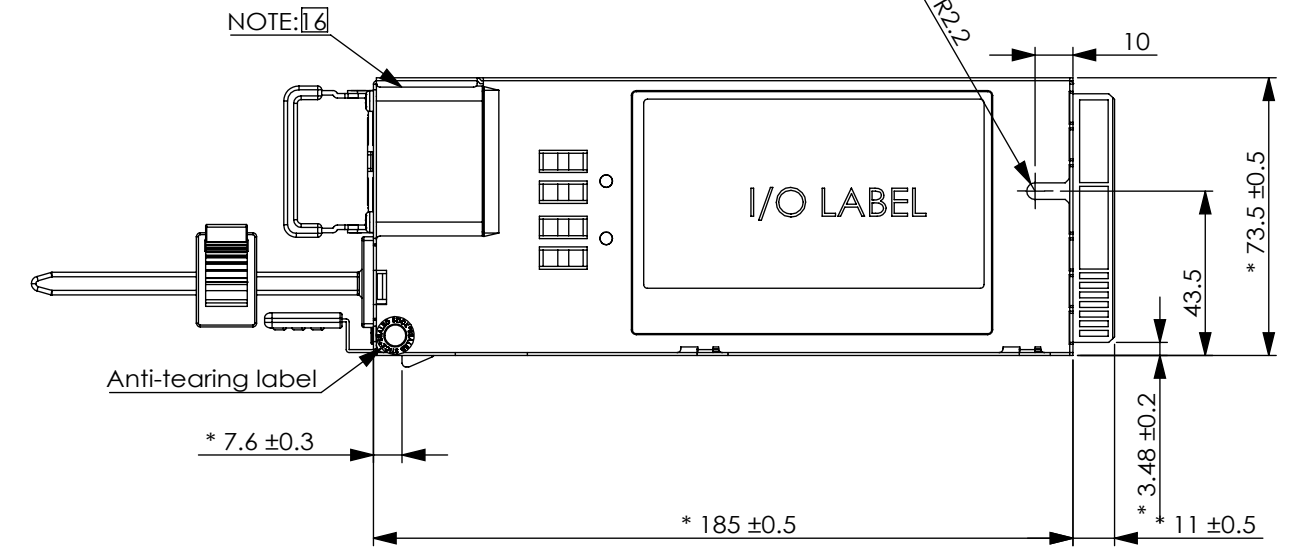
8 DO NOT ALLOW SCRATCH ON THE SURFACE. EXTRUDE PORTION SHOULD PREVENT THE DAMAGE OF THE ZINC PLATED LAYER AND OXIDATION
表面不允許刮傷,抽孔/擠出成型部份也必須防止電鍍層有氧化現象



REV	DESCRIPTION	DATE	BY
3	modify latch color 285C to 369C	20180426	EASON
2	Add Anti-tearing label	20180413	EASON
1	PRIMARILY	20180410	EASON

	DRAWINGS & SPEC. ARE THE EXCLUSIVE PROPERTY OF ACBEL POLYTECH INC. SAID ITEMS ARE ISSUED IN STRICT CONFIDENTIAL	MODEL NO. FSJ014-000G
		PART NO. MO-FSJ014-000G
	TOLERANCES UNLESS OTHERWISE NOTED ~6:±0.1, 6~120:±0.2, 120~315:±0.3, 315~:±0.5 ANGLES:±0.5°	DWG NO. MO-FSJ014-000G_3
Metric 	THIRD ANGLE PROJECTION 	TITLE: MECHANICAL OUTLINE
A4	SCALE: 1:3	DESIGNER: EASON 2018/11/30
	SHEET 1 OF 2	CHECKED:
		APPROVED: RAY 2018/11/30

AIR FLOW DIRECTION



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MODEL NO. FSJ014-000G
PART NO. MO-FSJ014-000G
DWG NO. MO-FSJ014-000G_3

SI

Metric

A4

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



TITLE:
MECHANICAL OUTLINE

DESIGNER	EASON	2018/11/30
CHECKED		
APPROVED	RAY	2018/11/30

SCALE : 1:2

SHEET 2 OF 2



康舒科技

ACBEL POLYTECH INC.

I/O Label Drawing

NOTES:

- UNIT : MM.
单位:毫米.
- MATERIAL :
2.1 FACE STOCK 底材 :
WHITE POLYESTER, THICKNESS = 0.05 MM.
白雾龙50#,厚度=0.05毫米
2.2 OVERLAMINATION 保护膜 :
 A TRANSPARENT FILM 透明胶膜 NONE 无
2.3 ADHESIVE 背胶 : PRESSURE SENSITIVE ACRYLIC 压克力压膜胶
THICKNESS 厚度 = 0.025 MM
2.4 BACKED WITH RELEASE LINER 背面附离型纸
2.5 LABEL TO BE AFFIXED TO AND MAXIMUM TEMPERATURE RATING 贴纸所贴附之材质与最大耐温等级 :
 GALVANIZED STEEL 镀锌钢 ALUMINUM 铝
 NICKEL PLATED METAL 镀镍金属
 ZINC PLATED METAL WITH CHROMATE POST TREATMENT 后处理之镀铬酸锌金属
 100°C 摄氏100度
2.6 MATERIAL MUST BE UL RECOGNIZED AND COMPLY TO UL 969 STANDARD.
材质必须符合 UL 认证,并且遵从 UL 969 标准.
- LABEL MUST BE MADE BY A UL RECOGNIZED AND CSA APPROVED VENDOR.
贴纸之制造商必须是 UL 与 CSA 所认证.
- TOLERANCE : XX = +/- 0.5 XX.X = +/- 0.2
XX.XX = +/- 0.15
公差: XX = +/- 0.5 XX.X = +/- 0.2
XX.XX = +/- 0.15
- "*" CRITICAL DIMENSION SYMBOL, SUPPLIER MUST INSPECT THIS DIMENSION FOR EVERY SHIPMENT
"*"表示该(尺寸/位置)为设计之重点尺寸,供应商每次出货前必须检验合格后,方可出货.
- ALL PRODUCTS MUST BE THE SAME AS ENGINEERING API MECHANICAL ENGINEERING APPROVED SAMPLES, ANY MODIFICATION MUST BE APPROVED BY ACBEL MECHANICAL ENGINEERING SECTION.
所有产品必须与认可的样品一致,任何的修改都必须经由康舒机构工程师同意及认可.
- LABEL MUST CONTAIN THE VENDOR'S ID MARK LOCATED IN THE AREA INDICATED. ID MARK LETTER HEIGHT TO BE 1.5MM.
贴纸必须印制厂商代码,代码字高为1.5毫米.
- CHARACTER HEIGHT : 1.5 MM ,UNLESS OTHERWISE SPECIFIED.
图面未标示之字体高度皆为 1.5 毫米
- PRINTED COLOR :
BLACK - TEXT, GRAPHICS, IMAGE, LOGO SURROUND SHAPE.
WHITE - BACKGROUND.
列印颜色:
黑色 - 文字、图形、图像、标志、外围图形 白色 - 背景

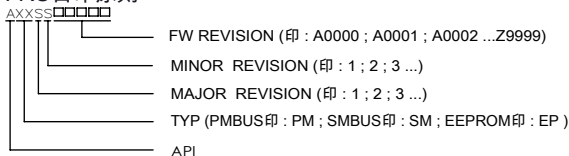
10. THESE MATERIAL/PART/ASSEMBLY MUST COMPLY TO ACBEL SPEC"CRITERIA FOR ENVIRONMENT-RELATED SUBSTANCES".
材质/零件/制程均必须符合康舒"环境管理物质规范".

11. BAR CODE FORMAT: CODE 128 / CPI : 13.64
THE NARROW ELEMENT DIMENSION (X DIMENSION) SHOULD BE WITHIN A RANGE OF 0.170MM(0.0067 INCH)
条码格式: CODE 128 / CPI 13.64 宽/窄比: 0.17毫米(0.0067英寸)

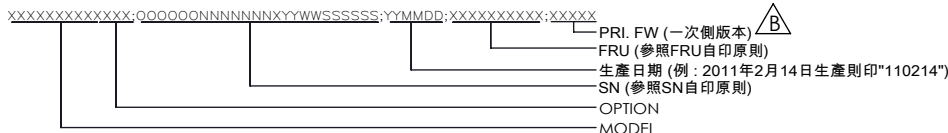
12. BAR CODE & SN & FRU & OPTION 厂内自印
13. REV : XXX (S1印: 0S1; S2印: 0S2; A印: A00)

14. DATE : XYYWW 为厂内自印, 4码 YYWW为制造周期, X为工厂代码*
工厂代码: 康舒东莞厂印B, 康展东莞厂印T, 康舒武汉厂印W

15. FRU自印原则



16. 条码自印原则



17. 条码及文字内容说明

编码: DATAMATRIX

18. 警告符号颜色定义如下:

PMC BlackC 黑色 - 文字、图形、图像、标志
PMC 108C 黄色 - 背景



19. 加入工厂代码, 如康舒东莞厂生产即印制(B)如图示, 如康展东莞厂生产即印制(T); 如康舒武汉厂生产即印制(W)

20. USES OF RED PHOSPHORUS MATERIAL IS PROHIBITED
禁止使用含有红磷材料

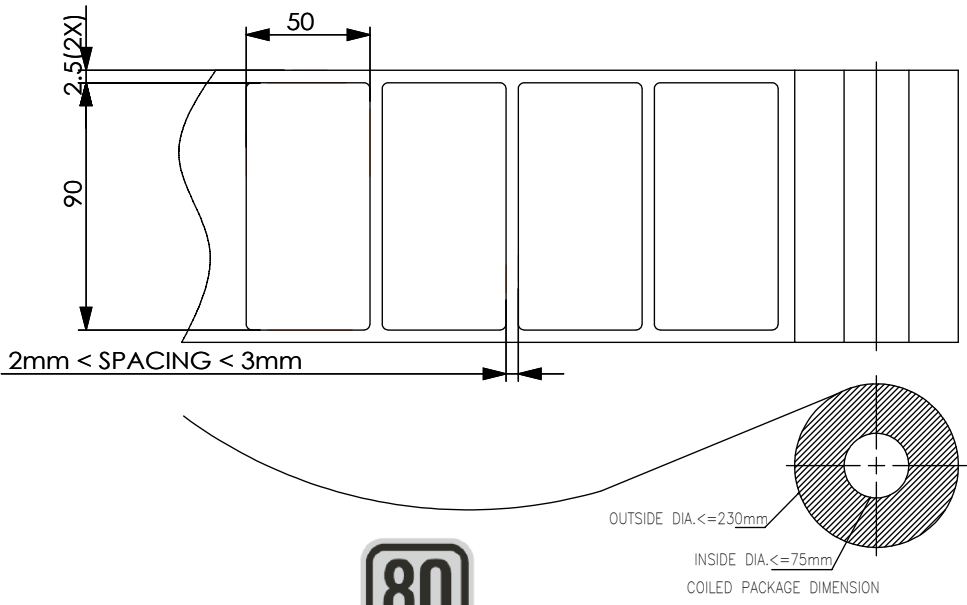
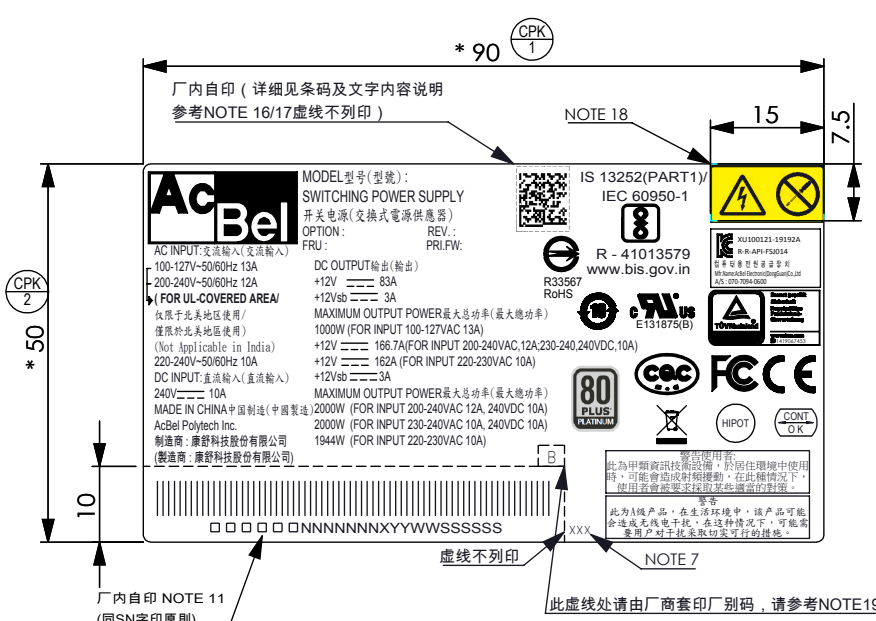
21. USES OF EU RoSH & RoSH 2.0 MATERIAL IS PROHIBITED (HBCDD/DEHP/BBP/DBP)
禁止使用 EU RoSH & RoSH 2.0 (HBCDD/DEHP/BBP/DBP) 物质

21. 一次侧PRI.FW:XXXXX,厂内自印

RELEASE			
正式發行圖面			REV:B
ENG.	EASON	APPR	RAY

B	MODIFY NOTE 16, ADDED PRI FW INFORMATION	20200602	EASON
A	RELEASE	20200528	EASON
1	PRIMARILY	20200525	EASON
REV	DESCRIPTION	DATE	BY
REVISION			

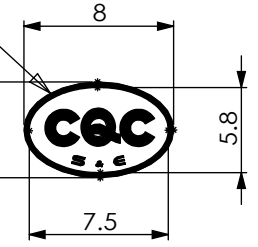
	DRAWINGS & SPEC. ARE THE EXCLUSIVE PROPERTY OF ACBEL POLYTECH INC. SAID ITEMS ARE ISSUED IN STRICT CONFIDENTIAL	MODEL NO.	FSJ014-7EAG
	TOLERANCES UNLESS OTHERWISE NOTED ~6:±0.1, 6-120:±0.2, 120-315:±0.3, 315-:±0.5 ANGLES:±0.5°	PART NO.	P01AAA-8497IA
	ACBEL POLYTECH INC. STRICT CONFIDENTIAL	DWG NO.	P01AAA-8497IA_B
Metric A4 THIRD ANGLE PROJECTION		TITLE:	I/O LABEL
SCALE: 1:1	SHEET 1 OF 2	DESIGNER	EASON 2020/6/2
		CHECKED	
		APPROVED	RAY 2020/6/2



文字不得小於Ariel 6號字體



BIS DETAIL SCALE ENLARGED



PRINTED COLOR: BLACK
80 PLUS LABEL COLOR :
PANTONE PMS : COOL GRAY 2C
RGB : 209 , 211 ,212

DETAIL B SCALE ENLARGED

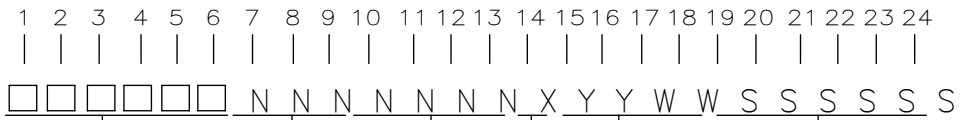


Bauart geprüft
Sicherheit
Regelmäßige
Produktions-
Überwachung

www.tuv.com
ID 1419067453

TUV DETAIL SCALE ENLARGED

SN自印原則:



SERIAL NO 000001~999999

DATE CODE(YY : YEAR WW:WEEK FOR EXAMPLE : 2012 13TH WEEK 則此4欄位為"1213")

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FSA035-001G印001G)

API REVISION CONTROL CODE (S1印: 0S1 ; S2印: 0S2 ; A印: A00)

API PART NUMBER (Ex. : 若機種FSA035-001G , 則印製"FSA035"於此6個欄位)

RELEASE			
正式發行圖面			REV:B
ENG.	EASON	APPR	RAY



ACBEL POLYTECH INC. STRICT CONFIDENTIAL

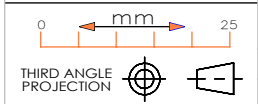


Metric



SCALE : 1:1

DRAWINGS & SPEC. ARE THE EXCLUSIVE PROPERTY OF ACBEL POLYTECH INC. SAID ITEMS ARE ISSUED IN STRICT CONFIDENTIAL TOLERANCES UNLESS OTHERWISE NOTED ~6:±0.1, 6~120:±0.2, 120~315:±0.3, 315~:±0.5 ANGLES:±0.5°



MODEL NO.	FSJ014-7EAG		
PART NO.	P01AAA-84971A		
DWG NO.	P01AAA-84971A_B		
TITLE:	I/O LABEL		

DESIGNER	EASON	2020/6/2
CHECKED		
APPROVED	RAY	2020/6/2

SHEET 2 OF 2

APPROVED

RAY 2020/6/2



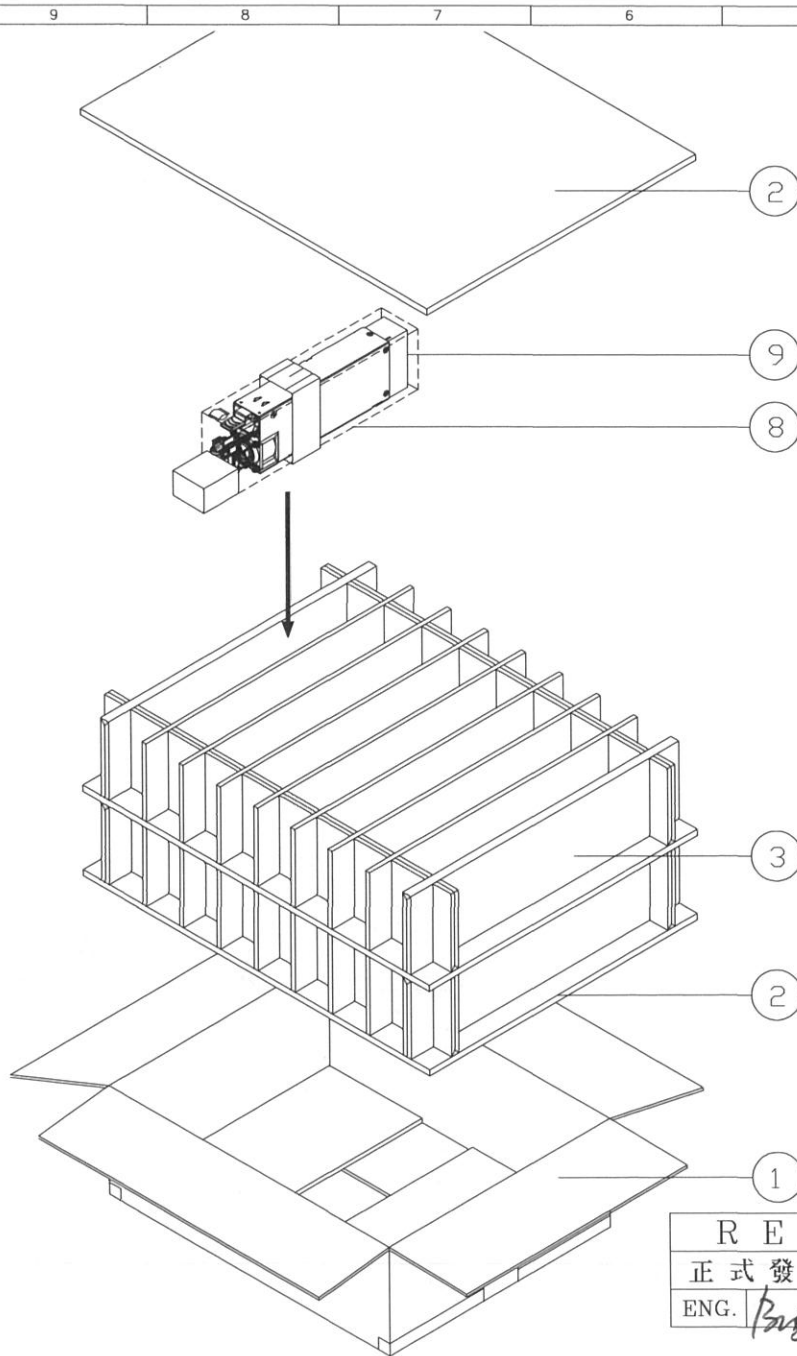
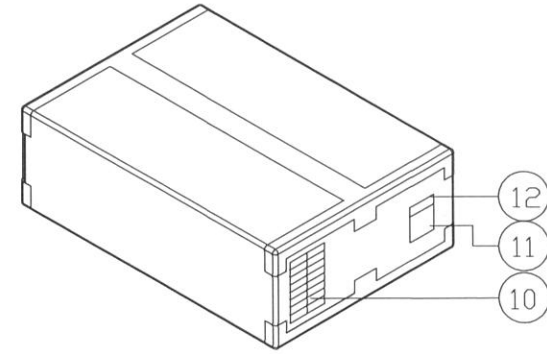
康舒科技

ACBEL POLYTECH INC.

Carton Drawing

NOTE : 1. 16 UNITS INSIDE ONE CARTON(16台/箱)

2. 包裝時塑膠袋勿拉緊，避免壓迫到塑膠線扣，封口不貼膠布
3. X01H00-2136I LABEL 須等出貨前由業務通知後，再由倉庫加貼
4. 序號標籤排列可自行決定，但是每批貼法須一致



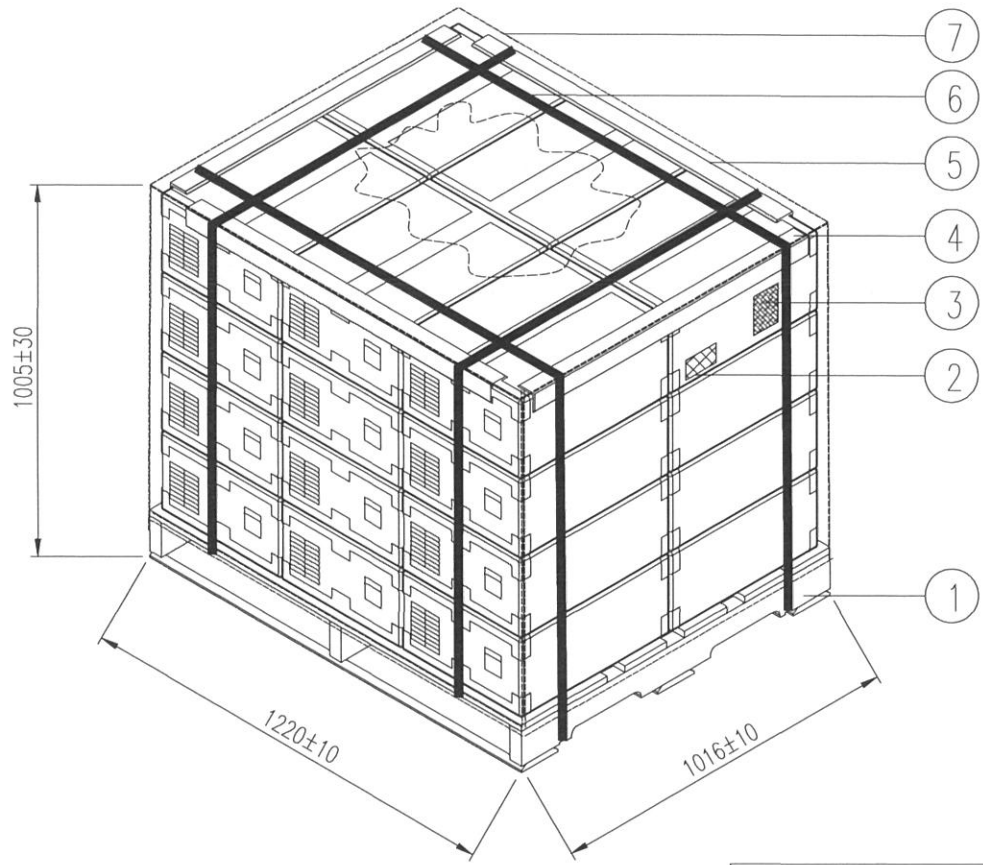
12	1	X01H00-2136I	CARTON LABEL
11	1	X01H00-1749I	CARTON LABEL
10	16	X01H00-2035I	S/N BARCODE LABEL
9	16	X1008-E7186I	ANTISTATIC EPE BOARD
8	16	R1008-B9411I	ANTISTATIC PE BAG
7	16	FSJ014-00AG	POWER SUPPLY
6	16	X1008-T9555I	DESICCATIVE
5	16	R1008-E7991IA	EPE BOARD
4	16	X1008-C1923I	KRAFT PAPER
3	2	X1008-C2543I-SA	PARTITION ASSEMBLY
2	3	X1008-C2523I	PAPER BOARD
1	1	X1008-C1958I	CARTON
NO.	Q'TY	PART NO.	DESCRIPTION
			MODEL NO. FSJ014-00AG
			PART NO. CA-FSJ014-00AG_A
			DWG. NO : CA-FSJ014-00AG_A
			TITLE : CARTON ASS'Y FOR FSJ014-00AG
		DESIGNER	BRIGITTE 11/14/18
		CHECKED	
		APPROVED	<i>Sum</i> 11/14/18
SCALE NONE		SHEET 1 OF 1	

RELEASE

正式發行圖面 REV: A

ENG. *Brigitte* APPR. *Sum Jean*

REVISIONS			
REV	DESCRIPTION	BY	DATE
A	RELEASE	BRIGITTE	11/14/18



- NOTES :
- 16 UNITS INSIDE ONE CARTONS (16台/箱)
 - 6 CARTONS ON ONE LAYER.(6箱/層)
 - 4 LAYERS PLACED ON SHIPPING PALLET.(4層/棧板)
 - 384 UNITS PER SHIPPING PALLET(384 台/棧板)
 - 紙箱標籤一律朝外側，方便客戶讀取資料
 - 說明書由機構工程師決定是否要放，若有需求，請放置於每一個棧板的第一箱中
 - X01H00-2136I LABEL 須等出貨前由業務通知後，再由倉庫加貼

REVISIONS	DESCRIPTION	BY	DATE
	RELEASE	BRIGITTE	11/14/18
	REV	A	

R E L E A S E

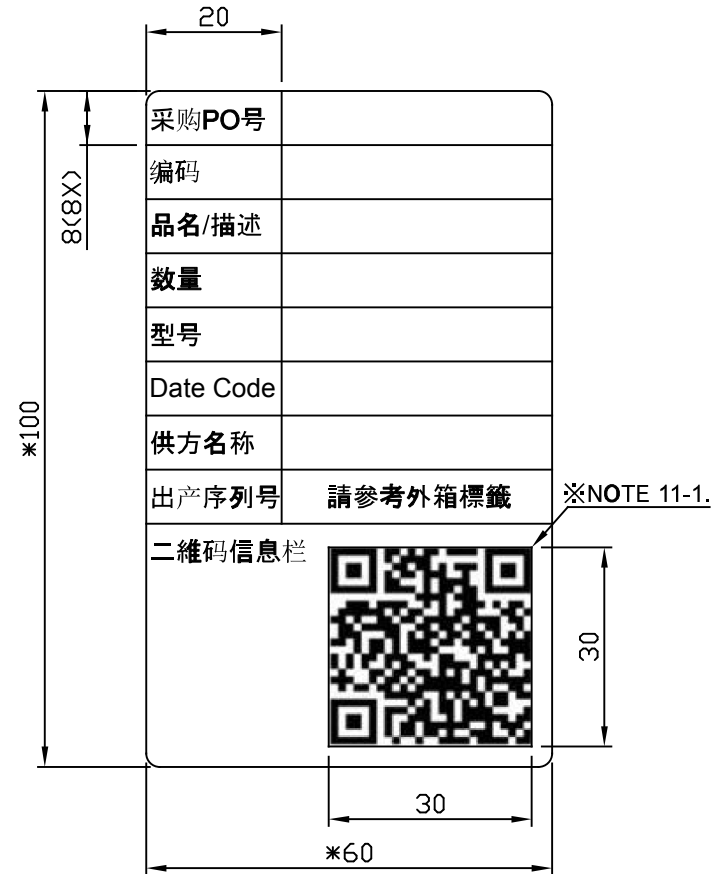
正式發行圖面 REV: A

ENG. *Brigitte* APPR. *Samjean*

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
NO.	Q'TY	PART NO.	DESCRIPTION



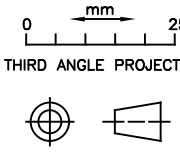
 ACBEL POLYTECH INC.		MODEL NO. FSJ014-00AG	
		PART NO. PA-FSJ014-00AG_A	
 Metric A3		DWG. NO : PA-FSJ014-00AG_A	
		TITLE PALLET ASS'Y FOR FSJ014-00AG	
SCALE NONE	SHEET 1 OF 1	DESIGNER	BRIGITTE 11/14/18
		CHECKED	<i>Sam</i> 11/14/18
		APPROVED	<i>Sam</i> 11/14/18

- Notes : 1. Font height : 3mm min. (文字的列印最小高度:3mm)
2. Printed color : Black (列印顏色:黑色)
3. 采购PO号 (Provide by sales or see PO ; 請由業務提供或看PO上之PO號碼)
4. 编码 (Provide by sales; 由業務提供)
-Text show(文字請印) : XXXXXXXX (範例:34010010)
5. 品名/描述 (Provide by sales; 由業務提供)
-Text show(文字請印) : XXXX XX XXXX (範例:CRPS AC 800W)
6. 数量 (數量 : Actual quantity of carton ; 請填入紙箱所裝載之單體數量)
-Text show(文字請印) : XXX (範例:8)
-For full load carton print XXX , if not show actual quantity
(滿整箱印:XXX,若未滿請依紙箱實際裝載數量列印)
7. 型号 (Provide by sales; 由業務提供)
-Text show(文字請印) : XXXXXXXXX-XXXX (範例:R1CA2801A-P7EB)
8. Date Code : YYWW
(生產週數 : YYWW (YY指生產年度西元後兩碼; WW指生產週期)
-Text show(文字請印) : YYWW (範例:1751)
9. 供方名称 (Provide by sales; 由業務提供)
- (範例:北京亿威腾达科技有限公司)
10. 出产序列号
-Text show(文字請印) : 請參考外箱標籤 (固定)
11. 二維碼信息栏
※11-1. QR Code size (QR Code條碼尺寸): L30*W30mm
- ECC(容錯等級): H ; -REV.(版本): V2(25*25) ; -解析度: >=300 DPI
- " ; " 分號來區隔, 有7個信息內容, 分隔之間不要有空格, 同時二維條碼需按下列順序來產生.
- Content of QR Code (二維條碼內容共7項"NOTE 3.4.5.6.7.8.9."如下):
- 采购PO号; 编码; 品名/描述; 数量; 型号; Date Code; 供方名称
(範例 : POXXXXXXXX; 34010010; CRPSAC800W; 8; R1CA2801A-P7EB; 1751; 北京亿威腾达科技有限公司)
12. Blank label P/N of this label (此張貼紙的空白貼紙料號為) : X0123T-0005I
-Material: Thermal paper 9003A with adhesive (材質: 熱敏紙9003A, 背膠)
13. "*" Critical dimension symbol, Supplier must inspect these dimensions for every shipment. ("*"為重點尺寸, 此為進料檢驗尺寸重點)
14. This material / part/ assembly must comply to ACBEL spec "Criteria for environment-related substances".
(遵守"環境管理物質規範"中所要求之含量標準及禁止使用1級環境管理物質)
15. 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.
15-1. RED PHOSPHORUS MATERIAL IS PROHIBITED. (禁止使用紅磷物質.)
16. Please follow ACBEL'S requirement for HF. (遵守康舒無鹵要求.)



REVISIONS	BY	DATE
DESCRIPTION	YAHUI	12/21/17
RELEASE		
REV	A	

RELEASE			
正式發行圖面			REV: A
ENG.		APPR.	

MATERIAL	SEE THE NOTE.		 ACBEL POLYTECH INC.		MODEL NO. FSE052-7EBG
SURFACE TREATMENT					PART NO. X01H00-2153I
TOLERANCES UNLESS NOTED	LINEAR ± 1 mm		SCALE NONE SHEET 1 OF 1		DWG. NO : X01H00-2153I_A
ANGLES ±					TITLE CARTON LABEL FOR FSE052-7EBG
					DESIGNER YAHUI 12/21/17
					CHECKED
					APPROVED