

電氣規格書



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FSP TECHNOLOGY INC.

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SPECIFICATION

Type C PD3.0 AC Power Adapter

FSP model: FSP090-A1BR3

PD firmware version: E7B5

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20-Mar-2020	Model	FSP model	
		FSP090-A1BR3	



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History

REV.	Description	Date	Drawn	Mechanical	Electrical	Approved
0.0	Preliminary SPEC ISSUE	04-Dec-17	Vicky	Angela	Joey	Gerry
0.1	Preliminary SPEC updated Item 1.5, 1.6, 1.6.1, 1.7, 2.4, 2.5, 2.6, 4.17	12-Dec-17	Vicky	Angela	Joey	Gerry
0.2	Output voltage profile change to 5V/9V/15V/20V	09-Feb-18	Vicky	Angela	Joey	Gerry
0.3	Item 4.5 revised	27-Apr-18	Vicky	Angela	Joey	Gerry
0.4	Item 1.4 revised	09-July-18	Vicky	Angela	Joey	Gerry
0.5	Item 4.17 revised	10-July-18	Vicky	Angela	Joey	Gerry
0.6	1.Output voltage profile change to 5V/9V/12V/15V/20V 2. Item 4.15 revised	16-Nov-18	Vicky	Angela	Joey	Gerry
0.7	Add item 5.2	9-Jan-19	Vicky	Angela	Joey	Gerry
0.8	1.Firmware version revised 2.Revise : 1.6 Energy Efficiency	30-Mar-20	Vicky	Angela	Joey	Gerry

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Electrical Requirements

1. Input Characteristics:

ITEM	CONDITION	SPECIFICATION	
1.1 Rated Input Voltage:		100Vac~240Vac	
1.2 Input Voltage Range:		90Vac to 264Vac	
1.3 Input Frequency Range:		47Hz to 63Hz	
1.4 Input Current:	100Vac, 240Vac / max. load	≤ 1.4A	
1.5 Input Current Harmonic:	Active power factor correction the power factor at 100% load and 100Vac/240Vac input (20V/4.5A)	PF ≥ 0.9 Meet IEC61000-3-2	
1.6 Energy Efficiency: (Warm up 10 minutes later)	(1) 115Vac @ 20V / 4.5A	≥ 87.5%	
	(2) 230Vac @ 20V / 4.5A	≥ 88.5%	
	(1) 115Vac, 5V/9V/12V/15V/20V (Average efficiency of 4 point load / 25%, 50%, 75%, 100%)	Meet	
		(1) 【DOE】 Level VI (2) 【ErP】 Level VI	
	(2) 230Vac, 5V/9V/12V/15V/20V (Average efficiency of 4 point load / 25%, 50%, 75%, 100%)		
1.6.1 No load / Light Load	115Vac, 230Vac / @ Type C connector plug out/ USB detach (no output)	≤ 0.15W	
	Output load		
	1. 0W	1. ≤ 0.21W	
	2. 0.25W	2. ≤ 0.5W	
	3. 0.5W	3. ≤ 1.0W	
	4. 1.0W	4. ≤ 1.7W	
	5. 1.5W	5. ≤ 2.4W	
1.7 Inrush Current:	100Vac, 240Vac / output max. load	No damage I ² T Shall be less than 29% of the rating of adapter critical component (including rectifiers, fuse surge and current limiting device)	

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2. Output Characteristics:

※Measured at the end of DC cable.

ITEM	CONDITION	SPECIFICATION
2.1 Output Rated Voltage:	Type C PD control	5V 9V 12V 15V 20V
2.2 Output Current:	at constant voltage mode	5V / 3A 9V / 3A 12V / 3A 15V / 3A 20V / 4.5A
2.3 Output Voltage Setting:	at the output end of DC cable	Rated output voltage \pm 5%
2.4 Output voltage over/under shoot	100Vac, 240Vac / Max. load	Rated output voltage \pm 5%
2.5 Output Voltage Ripple and Noise: (0.1uF Ceramic Cap. and 35V 47uF Aluminum Cap. Paralleled between the end of output cable)	100Vac, 240Vac / 0A and max load	5V, 9V, 12V, 15V, 20V \leq 380mVp-p
2.6 Turn-On Delay Time:	At 100Vac / 5V output (initial status) output voltage shall remain regulation	\leq 5Sec
2.7 Hold Up Time:	At 100Vac or 240Vac / max. load, output voltage shall remain regulation	\geq 5ms
2.8 Rise Time: (USB PD2.0)	At 100Vac / max. load, DC output rise time from 5V to 9V 5V to 12V 5V to 15V 5V to 20V	\leq 275ms
2.9 Fall Time: (USB PD2.0)	At 100Vac / max. load, DC output fall time from 9V to 5V 12V to 5V 15V to 5V 20V to 5V	\leq 275ms
2.10 Dynamic Load Change:	(1) Output load step is : 【1】 0 % ~50 % 【2】 50 %~100 % (2) S/R=0.5A/us (3) Frequency is 100Hz and 1KHz	Rated output voltage \pm 10%
2.11 Hot plugging requirements		Yes

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3. Protection Characteristics:

ITEM	CONDITION	SPECIFICATION
3.1 Short Circuit Protection:	When an internal fault occurs, or an external fault is applied to the power supply, such that an overload or short circuit is applied to the output, the power supply shall shut down at full AC input range and all output condition.	Shutdown and no damage
3.2 Over Voltage Protection:	The adapter will shut down caused by internal fault.	Shutdown and no damage 5V: 7.25V max. 9V: 13.05V max. 12V: 18.5V max. 15V: 21.75V max. 20V: 26.0V max.
3.3 Over Power Protection:	When an internal fault occurs, or an external fault is applied to the power supply, such that an overload or short circuit is applied to the output, the power supply shall shut down.	Shutdown and no damage $\geq 105\%$ of rated output current
3.4 Over Temperature Protection:	The power supply will enter into shut down while the abnormal thermal rise occurs.	No fire, no smoke No safety issue.

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4. Environmental Characteristics:

ITEM	CONDITION	SPECIFICATION
4.1 Electron Static Discharge: (Refer to IEC61000-4-2 Energy Storage Capacitor 150pF; Discharge Resistor 330Ω)	Air Discharge: ± 15 KV Contact Discharge: ± 8 KV Repetition: Once every 1 sec Discharge / test: 10 Polarity: +/-	Normal operation shall be continued
4.2 IEC 61000-4-3 (2002+A1:2002) RES		Normal operation shall be continued
4.3 Electric Fast Transients: Refer to IEC61000-4-4	Impulse: ±1kV applied to L,N	Normal operation shall be continued
4.4 Lightning Surge: Refer to IEC61000-4-5	±1kV applied differential mode ±2kV applied common mode	Normal operation shall be continued Normal operation shall be continued
4.5 Cooling:	Natural air cooling Case Surface Temperature Rise (Rated input voltage 115Vac and 20V/4.5A, Amb.: 35°C)	≤ 45°C
4.6 Reliability: 4.6.1 E-cap life	115Vac / Max. load / 25°C	≥ 11800Hrs
4.6.2 MTBF	115Vac / Max. load / 40°C (SR-332)	≥ 100000Hrs
4.7 AC power cycles	AC input voltage: 90Vac, 264Vac Output load: PD initial output status (5V @ max. load) Power on 5sec., Power off 5sec.	4200
4.8 Burn-in	Rated input voltage, 80%~100% load , 35+/-5°C	
4.9 EMI: Adapter comply with the following national standards: EMI Conducted Emission EMI Radiated Emission	1. Max. Load 2. The power supply with internal filter can meet.	CISPR32 EN55032 CLASS B FCC PART 15J CLASS B VCCI LEVEL II
4.10 Safety conforming: 4.10.1 L.P.S	IEC 60950-1/A2: 2013 IEC 62368-1	CE, FCC, UL/CUL, CB, TUV/GS Reserve design for VCCI(CLASS I), BSMI, CSA, CCC Meet IEC60950 limited power sources

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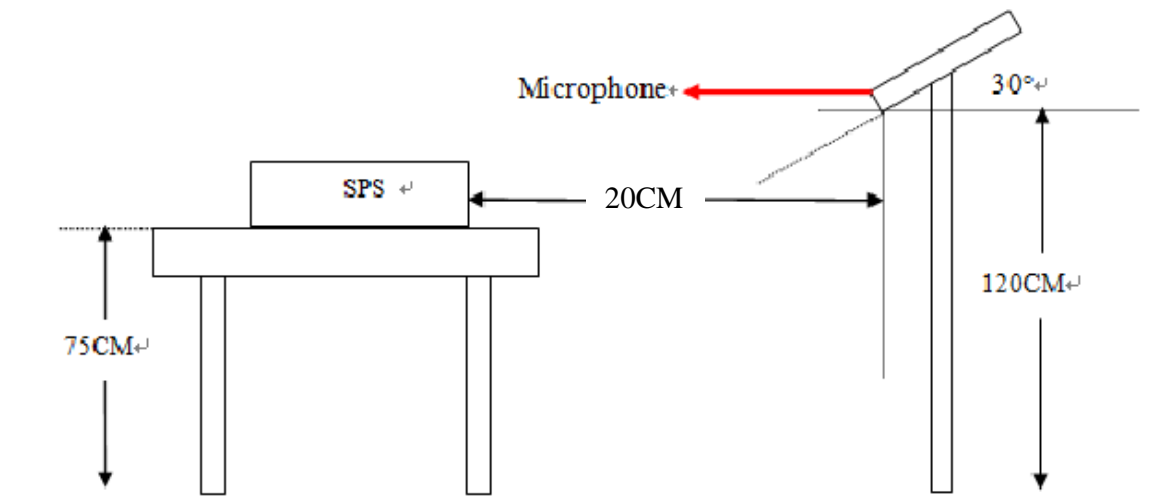
4.11 Drop test	36-inch drop onto hardwood surface	3times/1unit No damage, no safety issue
4.12 Energy-related Products 【ErP】 Department of Energy 【DOE】		Comply with ErP standard (Level VI) Comply with DOE standard (Level VI)
4.14 Altitude		5000 meters
4.15 Leakage Current:	240Vac / 50Hz	≤ 0.2mA
4.16 Dielectric Strength: (Hi-Pot)	Between AC input and secondary applied AC 3.0KV / test time 1 minute / cut off current shall be less than 10mA Product line: 3.0KV / test time 3 seconds	
4.17 Temperature:	Operating Storage	-5 to 40°C -20 to +85°C
4.18 Humidity:	Operating Storage (non-condensing)	10% ~ 85% 10% ~ 95%

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5. Mechanical Characteristics:

ITEM	CONDITION	SPECIFICATION
5.1 Dimension (Length x Width x Height):		140.1 X 65.1 X 25.4 mm
5.2 Adapter weight:		325g (typical)
5.3 Input AC Type:		IEC60320-C6
5.4 Output Plug		USB type C Vbus and GND with 1500mm/ 18AWG power cable
5.5 Acoustic Noise:	(1) Position the microphone 20 centimeters above the x-y center of the AC adapter (2) Input voltage:110Vac/60Hz 220Vac/50Hz	The EUT < 25dB

Note: Acoustic Noise test



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