電氣規格書

ESD-00000038

FSP045-A1BR

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SPECIFICATION

Type C PD3.0 AC Power Adapter

FSP model: FSP045-A1BR

PD firmware version: RT7202AGS-AFAE1

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History

REV.	Description	Date	Drawn	Mechanical	Electrical	Approved
0.0	SPEC ISSUE	25-Jan-17	Vivian	Matisse	Johnny	Gerry
0.1	1. ErP tier 2 Efficiency revised 2. Item 5.3 revised	9-Mar-17	Vivian	Matisse	Johnny	Gerry
0.2	1.Item 2.9 revised	17-Mar-17	Vivian	Matisse	Johnny	Gerry
0.3	1.Item 4.13 Safety conforming: revised	05-Apr-17	Vivian	Matisse	Max	Gerry
0.4	1. 3.3 Over Power Protection: revised 2. 4.13 Safety conforming: revised 3. 5.3 Output Plug: revised	27-Jun-17	Vivian	Matisse	Max	Gerry
0.5	1. Cover page description revised 2. PD firmware version revised	28-Jun-17	Vivian	Matisse	Max	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	≤ 1.2A
1.5 Input Current Harmonic:		IEC61000-3-2
1.6 Efficiency: (Warm up 10 minutes later)	(1) 115Vac @ 20V / 2.25A (2) 230Vac @ 20V / 2.25A	≥ 87.5% ≥ 88.5%
	(1) 115Vac, 5V/9V/12V/15V/20V (Average efficiency of 4 point load / 25%, 50%, 75%, 100%) (2) 230Vac, 5V/9V/12V/15V/20V (Average efficiency of 4 point load / 25%, 50%, 75%, 100%)	Meet (1)【DOE】VI (2)【ErP】Tier 2
1.7 Power Saving:	115Vac, 230Vac / @ Type C connector plug out (no output) 115Vac, 230Vac / @ output load 0.25W	≤ 0.075W ≤ 0.5W
1.8 Inrush Current:	100Vac, 240Vac / output max. load	No damage I^2T Shall be less than 85% of the rating of adapter critical component (including rectifiers, fuse surge and current limiting device)

	5V	9V	12V	15V	20V
115Vac	81.39%	86.62%	87.4%	87.73%	87.73%
230Vac	81.84%	87.3%	88.3%	88.85%	88.85%

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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 / 2.25A
2.3 Output Voltage Setting:	at the output end of DC cable	Rated output voltage ± 5%
2.4 Output voltage over/under shoot	100Vac, 240Vac / Max. load	Rated output voltage ± 15%
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 ≤ 250mVp-p 15V, 20V ≤ 350mVp-p
2.6 Turn-On Delay Time:	At 100Vac / 5V output (initial status) output voltage shall remain regulation	≤ 3Sec
2.7 Hold Up Time:	At 100Vac or 240Vac / max. load, output voltage shall remain regulation	≥ 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	≤ 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	≤ 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 ± 15%
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 and enter auto-recovery mode at full AC input range and all output condition.	Shutdown and no damage
3.2 Over Voltage Protection:	The adapter will shut down and enter auto-recovery mode caused by internal fault.	Shutdown and no damage 5V: 9.5V max. 9V: 13.5V max. 12V: 18.5V max. 15V: 22.5V max. 20V: 27V 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 and enter auto-recovery mode.	Shutdown and no damage ≧ 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	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 IEC 61000-4-6 (2003+A1:2004) Conducted Radio Frequency Disturbance		Normal operation shall be continued
4.6 IEC 61000-4-8 (2001) Mag Field		Normal operation shall be continued
4.7 IEC 61000-4-11(2004) PLD		Normal operation shall be continued
4.8 Cooling:	Natural air cooling Case Surface Temperature Rise (Rated input voltage 115Vac and 20V/2.25A, Amb.: 25℃)	≤ 45℃
4.9 Reliability: 4.9.1 E-cap life	115Vac / Max. load / 25℃	≧16800Hrs
4.9.2 MTBF	115Vac / Max. load / 40℃ (SR-332)	≧100000Hrs
4.10 AC power cycles	AC input voltage: 90Vac, 264Vac Output load: PD initial output status (5V @ max. load) Power on 5sec., Power off 5sec.	4200
4.11 Burn-in	Rated input voltage, 80%~100% load , 40+/-5℃	
4.12 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.	CISPR22 EN55022 CLASS B (-4dB margin / QP mode))
4.13 Safety conforming:	IEC 60950-1/A2: 2013	CE, FCC, UL/CUL, CB, TUV/GS, CCC Reserve design for VCCI(CLASS I), BSMI, CSA
4.13.1 Drop test	The height of the drop: 1 meter 6 face, 8 corner	3times/1unit No damage, no safety issue

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4.13.2 Energy-related Products【ErP】 Department of Energy【DOE】		Comply with ErP standard (Tier 2) Comply with DOE standard (Level VI)
4.14 Altitude		5000 meters
4.15 Leakage Current:	240Vac / 50Hz	≤ 0.1mA
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 Insulation resistance: (IR)	Between AC input and secondary DC 0.5KV/ test time 1 minute	100MΩ (min.)
4.18 Temperature:	Operating Storage	0 to 40℃ -20 to +60℃
4.19 Humidity:	Operating Storage	10% ~ 85% 10% ~ 95%

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5. Mechanical Characteristics:

ITEM	CONDITION	SPECIFICATION
5.1 Dimension (Length x Width x Height):		66 X 66 X 28 mm
5.2 Input AC Type:		IEC60320-C6
5.3 Output Plug		Type C with 1000mm/ 18AWG power cable
5.4 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