

TECHNICAL DATA SHEET

AA240U-59FKEA-R



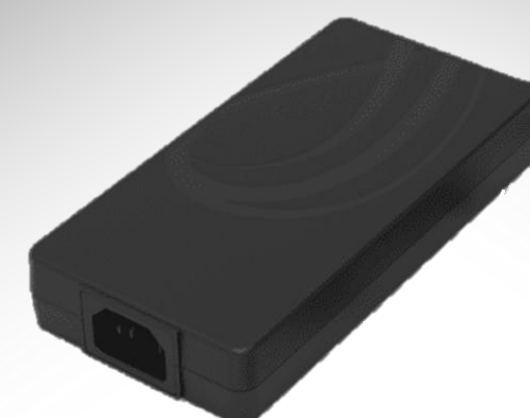
DESCRIPTION

This 240-watt USB-C Power Delivery 3.1 adapter comes in a splash-proof case and measures just 5.98 x 2.98 x 1.03 inches. It features an IEC 320 C14 inlet that accepts power cords worldwide and is terminated with a meter long output cable with a USB C plug at the end. The adapter is the ultimate choice to fast charge portable equipment, ultra-books and other consumer electronics.



FEATURES

- ✓ Class I Design
- ✓ Class B EMI
- ✓ High Efficiency Performance
- ✓ Maximum Power Available from USB C Power Delivery 3.1
- ✓ Over-Voltage, Over-Current, Short Circuit, & Over-Temperature Protection
- ✓ 5,000 Meters Operating Altitude



TECHNICAL DATA

Input

AC input voltage range	90 VAC to 264 VAC
AC input voltage rating	100VAC ~ 240VAC
AC input frequency	47Hz - 63 Hz
AC input current	3.5A (RMS) Max. at 100Vac
Leakage current	250uA Max. at 264Vac 50Hz
Inrush current	The inrush current should not blow fuse and rectifier diodes. The peak inrush current and I ² t shall be less than 85% of their maximum rated value of components at maximum input voltage, +/- 90o phase at 230Vac/50Hz @full load, Ta=25°C.

Output

DC Output voltage	5Vdc/ 9Vdc/ 15Vdc/ 20Vdc/ 28V/ 36V/ 48V				
DC Output Voltage Regulation (PPS & AVS: Iout +/- 5%)	Mode	O/P	Voltage range(V)	Current Range(A)	Note
	PD SPR	5V	4.75 - 5.25	3 max	
		9V	8.55 - 9.45	3 max	
		15V	14.25 -15.75	3 max	
		20V	19 - 21	5 max	
	PD EPR	28V	26.6 - 29.4	5 max	
		36V	34.2 - 37.8	5 max	
		48V	45.6 - 50.4	5 max	
	PPS		5 - 21 V	5 max	20mV/Step, 50mA/Step
	AVS		15 - 48 V	5 max	100mV/50mA
Noise Ripple NOTE : 1) Measurements shall be made with an oscilloscope with 20MHz Bandwidth. 2) Outputs should be bypassed at a connector with a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor (Low ESR). 3) Output ripple and noise will be tested at the end of a 100mQ type-C USB cable.).	PD	O/P Voltage	OP Current	Ripple/Noise	
	SPR	5Vdc	3A	≤200m,max	
		9Vdc	3A	≤200m,max	
		15Vdc	3A	≤200m,max	
		20Vdc	5A	≤200m,max	
	EPR	28Vdc	5A	≤300m,max	
		36Vdc	5A	≤300m,max	
		48Vdc	5A	≤300m,max	
Note: I/P 100Vac/60HZ and 240Vac/50Hz Capacitor 0.1uF+10uF					
Line Regulation	Must stay within specification item [DC Output Voltage Regulation] range over all line conditions.				
Load Regulation	Must stay within specification item [DC Output Voltage Regulation] range over all line conditions				

Overall Performance

Output Power	240 Watt Max	
Efficiency NOTE : Testing at 100%, 75%, 50%, 25% of rated current output and then computing the arithmetic average of these four values. Measure efficiency at 100%, 75%, 50%, 25% load after warm up with 100% load for 30 minutes. (Efficiency will be tested at the end of a 100mΩ type-C cable.)	5V - 3A, CoC V5 tier 2	9V - 3A, CoC V5 tier 2
	Average Efficiency > 81.84%	Average Efficiency > 87.30%
	10% Load Efficiency > 72.48%	10% Load Efficiency > 77.30%
	15V - 3A, CoC V5 tier 2	20V / 28V / 36V / 48V - 5A, CoC V5 tier 2
	Average Efficiency > 88.85%	Average Efficiency > 89%
	10% Load Efficiency > 78.85%	10% Load Efficiency > 79%
No Load Power Consumption	≤ 75mW @ 230Vac/50Hz at No-load.	
Turn on Delay Time	≤ 3Sec. at full load @100Vac/60Hz	
Rise time	≤ 275ms at full load @100Vac/60Hz. (with. 5V/9V/15V/20V, CR Mode test) ≤ 700ms at full load @100Vac/60Hz. (with. 28V/36V/48V, CR Mode test)	
Hold Up Time	≥ 8.3ms at full load @100Vac/60Hz.(Phase 90 degree)	
Transient Load Step Response	Output Voltage within +/- 10% 1) Input = 100Vac / 240Vac,2) Load = 0% - 50% & 50% - 100%, 1 kHz, 50% duty, 3) 1A/us Slew Rate	
Audible Noise	≤ 15 dBA at distance of 25cm. Across all loading conditions, from all (5) directions. Test environment referred to ISO7779.	
Surge Load	Adapter shall output at least 43.2V at 100Vac/60Hz. Test Condition: a. Peak current equals 150% Ioc for 1ms @ 5% duty cycle (low current equals 97% Ioc for 19ms) b. Peak current equals 125% Ioc for 2ms @ 10% duty cycle (low current equals 97% Ioc for 18ms) c. Peak current equals 110% Ioc for 10ms @ 50% duty cycle (low current equals 90% Ioc for 10ms)	



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Protection

Output Short Circuit Protection	No damage, Auto-recovery.
Over Current Protection	130% max., for 5V/ 9V/ 15V – 3A; Auto-recovery. 130% max., for 20V/ 28V/ 36V/ 48V – 5A; Auto-recovery
Over Voltage Protection	130% max., Auto-recovery.
Over Temperature Protection	Auto-recovery function. No damage @90Vac/60Hz & 264Vac/50Hz.

Other Specifications

Environmental Requirements	- Operating Temperature : 0°C to 35°C - Storage Temperature : -40°C to 85°C - Operating Relative Humidity : 20% - 95% RH - Storage Relative Humidity : 5% - 95% RH - Operation Altitude : 5000 M - E-Cap lifetime : > 2 years at full load, 115Vac & 230Vac.Ambient temperature = 25°C - MTBF : > 50K hours at 115Vac / 230Vac, Ambient=25°C/MIL-HDBK-217F - Burn In : Burn-in shall be at 48V/5A @ 220Vac.PP 100% burn in 24H/MP 100% burn in 2H.
Case surface temperature	≤ 77°C at ambient temperature 25°C
Drop test	Test condition: a. Height: 76 cm ; b. Material: Concrete ; c. Ambient Temperature: 25 deg C d. Humidity: 50 ± 5% RH; e. Orientation: One corner, three edges & Six surface, 1 cycle Test Criteria: As below situation is not accepted. a. Permanent damage. b. Crack on the case; c. Components loose or separate from PCB. d. Sound when shaking the charger

Safety and EMC

EMC	EMI: FCC part 15B Class B; EN55032 Class B(Design under 3dB) EMS : EN55035
	ESD: EN 61000-4-2(ESD) Contact discharges: +/- 4kV Criterion A. Air discharges: +/- 8kV Criterion A. Contact discharges: +/- 8kV Criterion C. Air discharges: +/- 15kV Criterion C.
	Radiated Immunity: EN 61000-4-3 (RS), 0-1000MHz, 3V/m, 80% AM (1 KHz), Criterion A.
	Electrical Fast Transients: EN 61000-4-4 (EFT) , 1kV, 5/50 Tr/Th ns, 100kHz, Criterion A.
	Surge: EN 61000-4-5 (Surge) ; Line to Line 1KV, Criterion A. Line to PG 2KV, Criterion A.
	Conducted Disturbances: EN 61000-4-6 (CS) 0.15-80MHz, 3V, 80% AM (1 kHz), Criterion A.
	Magnetic Field Immunity: EN 61000-4-8 (MS) 50 or 60Hz, 1A/m (rms), Criterion A.
	Voltage Dips and interruptions: EN 61000-4-11 (DIP) Criterion B
Safety	UL/IEC 62368-1 3rd





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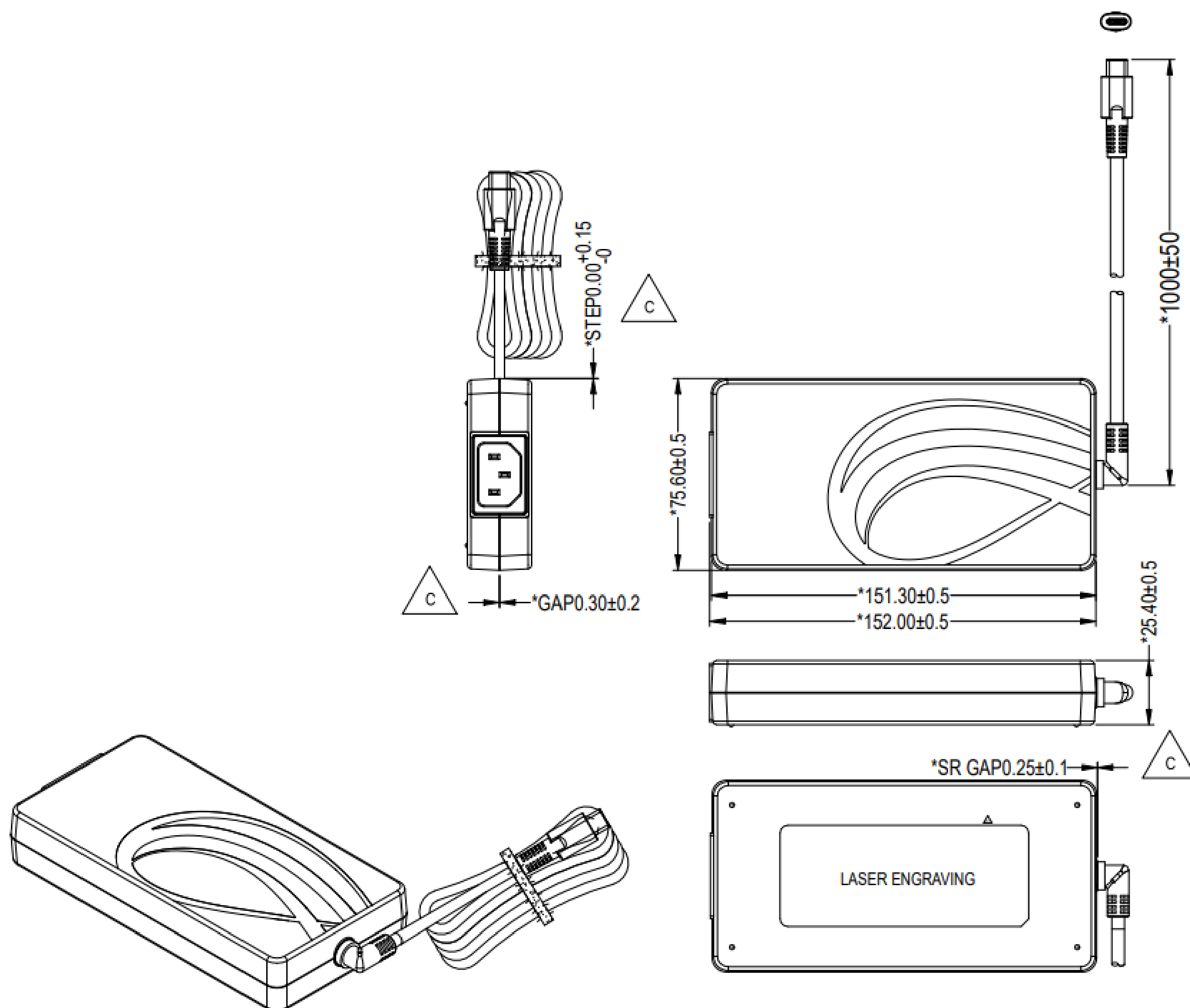
Test Items in Production Line

5V Output	Test Condition Input: 100V/60Hz	Measure Output Voltage(5V,0A)* Output Voltage(5V,3A) * Output Ripple & Noise(5V,3A) * OCP(5V)	Specification 4.75V~5.25V 4.75V~5.25V 200 mVp-p max ~ 3.9A max
	Input: 240V/50Hz	Output Voltage(5V,0A) * Output Voltage(5V,3A) * Output Ripple & Noise(5V,3A) * Reversible-plug connector test output Voltage(5V,3A)	4.75V~5.25V 4.75V~5.25V 200 mVp-p max 4.75V~5.25V
9V Output	Test Condition Input: 100V/60Hz	Measure Output Voltage(9V,0A) * Output Voltage(9V,3A) * Output Ripple & Noise(9V,3A) * OCP(9V)	Specification 8.55V~9.45V 8.55V~9.45V 200 mVp-p max ~ 3.9A max
	Input: 240V/50Hz	Output Voltage(9V,0A) * Output Voltage(9V,3A) * Output Ripple & Noise(9V,3A) *	8.55V~9.45V 8.55V~9.45V 200 mVp-p max
15V Output	Test Condition Input: 100V/60Hz	Measure Output Voltage(15V,0A) * Output Voltage(15V,3A) * Output Ripple & Noise(15V,3A) * OCP(15V)	Specification 14.25V~15.75V 14.25V~15.75V 200 mVp-p max ~ 3.9A max
	Input: 240V/50Hz	Output Voltage(15V,0A) * Output Voltage(15V,3A) * Output Ripple & Noise(15V,3A) *	14.25V~15.75V 14.25V~15.75V 200 mVp-p max
20V Output	Test Condition Input: 100V/60Hz	Measure Output Voltage(20V,0A) * Output Voltage(20V,5A) * Output Ripple & Noise(20V,5A) * OCP(20V)	Specification 19V~21V 19V~21V 200 mVp-p max ~ 6.5A max
	Input: 240V/50Hz	Output Voltage(20V,0A) * Output Voltage(20V,5A) * Output Ripple & Noise(20V,5A) *	19V~21V 19V~21V 200 mVp-p max
28V Output	Test Condition Input: 100V/60Hz	Measure Output Voltage(28V,0A) * Output Voltage(28V,5A) * Output Ripple & Noise(28V,5A) * OCP(28V)	Specification 26.6V~29.4V 26.6V~29.4V 300 mVp-p max ~ 6.5A max
	Input: 240V/50Hz	Output Voltage(28V,0A) * Output Voltage(28V,5A) * Output Ripple & Noise(28V,5A) *	26.6V~29.4V 26.6V~29.4V 300 mVp-p max
36V Output	Test Condition Input: 100V/60Hz	Measure Output Voltage(36V,0A) * Output Voltage(36V,5A) * Output Ripple & Noise(36V,5A) * OCP(36V)	Specification 34.2V~37.8V 34.2V~37.8V 300 mVp-p max ~ 6.5A max
	Input: 240V/50Hz	Output Voltage(36V,0A) * Output Voltage(36V,5A) * Output Ripple & Noise(36V,5A) *	34.2V~37.8V 34.2V~37.8V 300 mVp-p max
48V Output	Test Condition Input: 100V/60Hz	Measure Output Voltage(48V,0A) * Output Voltage(48V,5A) * Output Ripple & Noise(48V,5A) * OCP(48V)	Specification 45.6V~50.4V 45.6V~50.4V 300 mVp-p max ~ 6.5A max
	Input: 115V/60Hz Input: 240V/50Hz	Efficiency (48V/5A) Output Voltage(48V,0A) * Output Voltage(48V,5A) * Output Ripple & Noise(48V,5A) *	87% min. 45.6V~50.4V 45.6V~50.4V 300 mVp-p max

* at CPK > 1.33
Note: Production line efficiency measurements are performed in accordance with ISO PHG-Q3-PE04 Energy Efficiency Testing".
*Hi-pot test: 3600VAC/10mA/2sec.



Mechanical Outline Drawing



Since its founding in 1972, Phihong has emerged as a prominent power supply company, serving as a key supplier of solutions for consumer, mobile/portable, enterprise, telecom, datacom, and industrial applications.

