

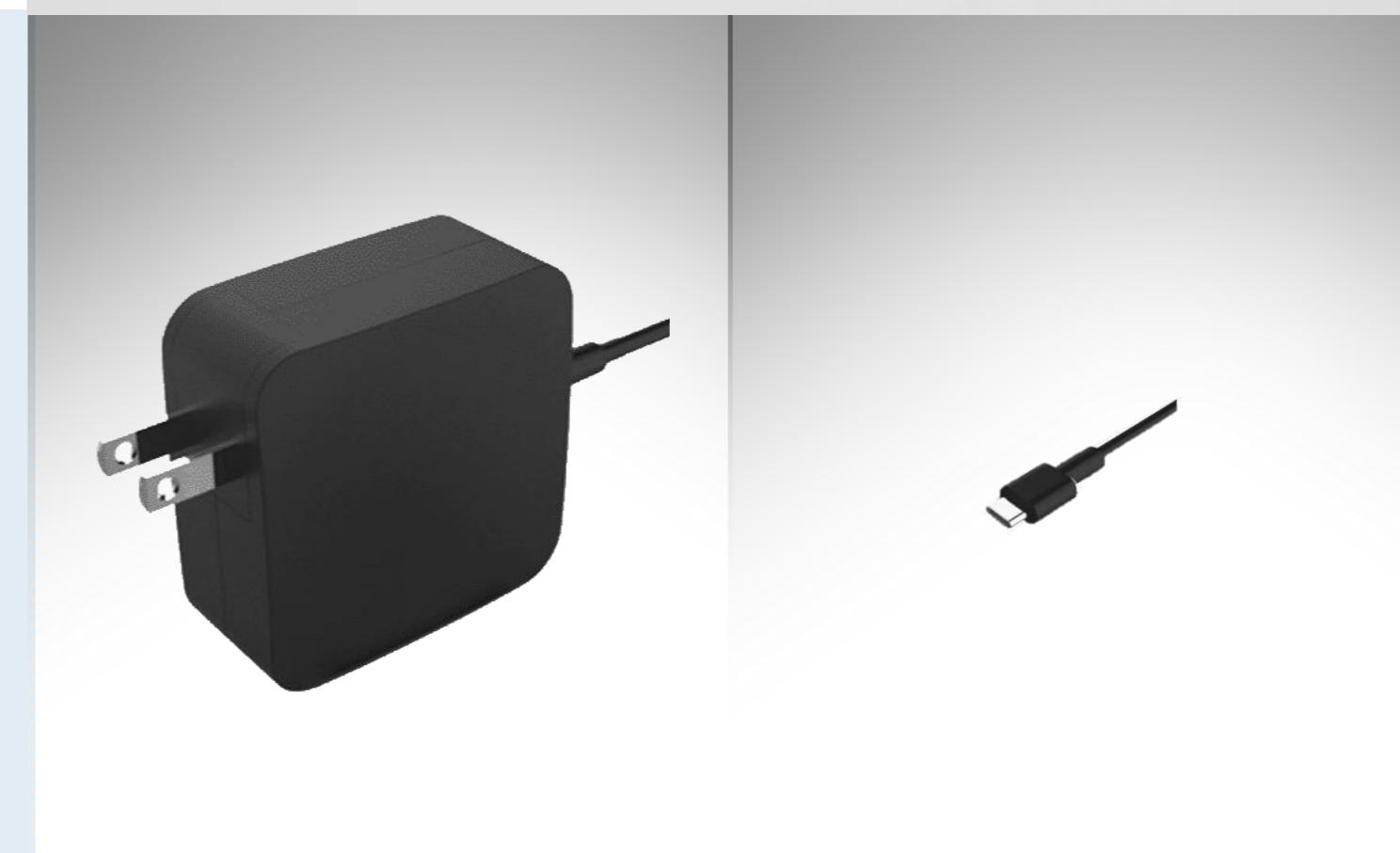
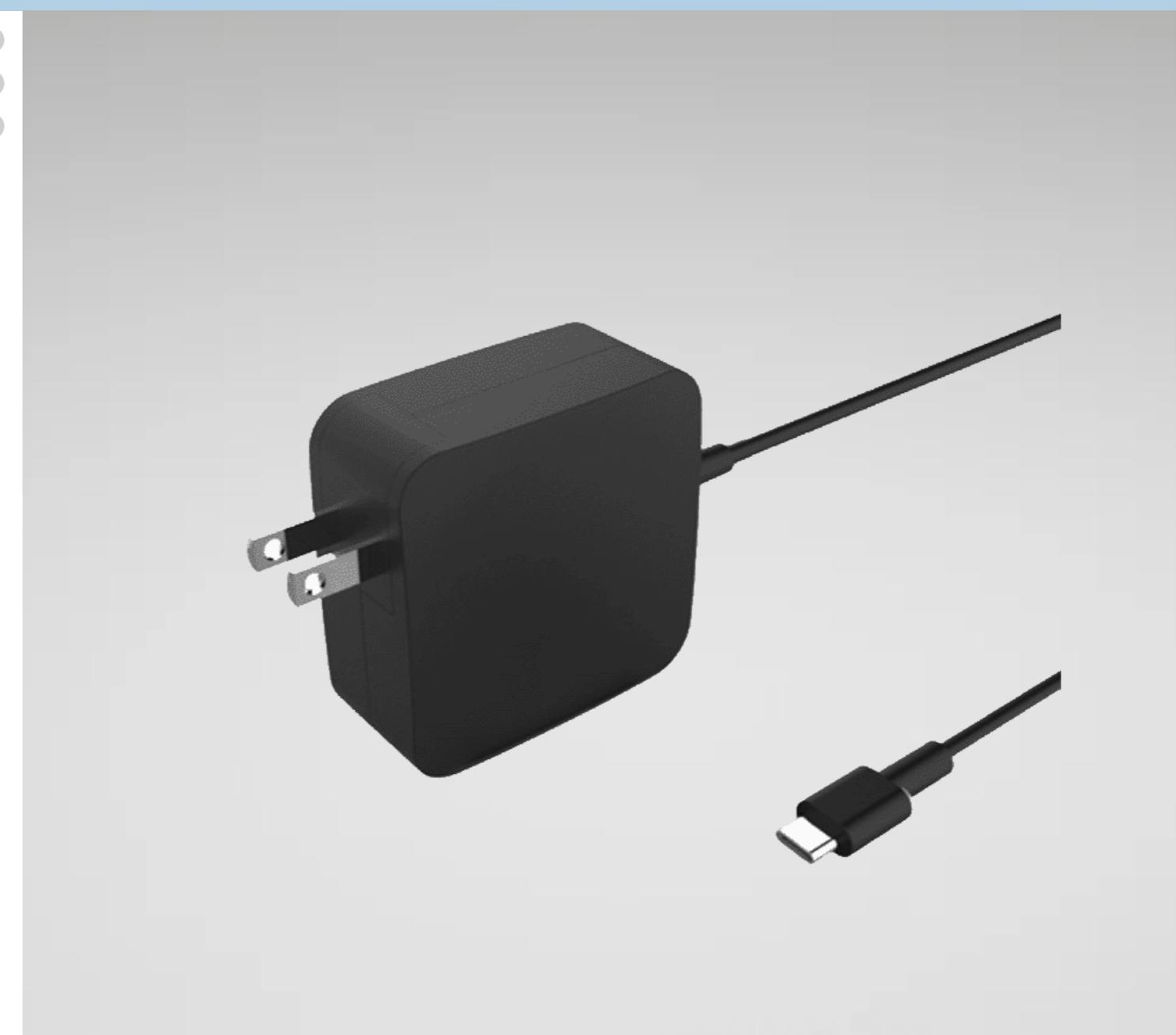
TECHNICAL DATA SHEET

AA100A-59FKC-R



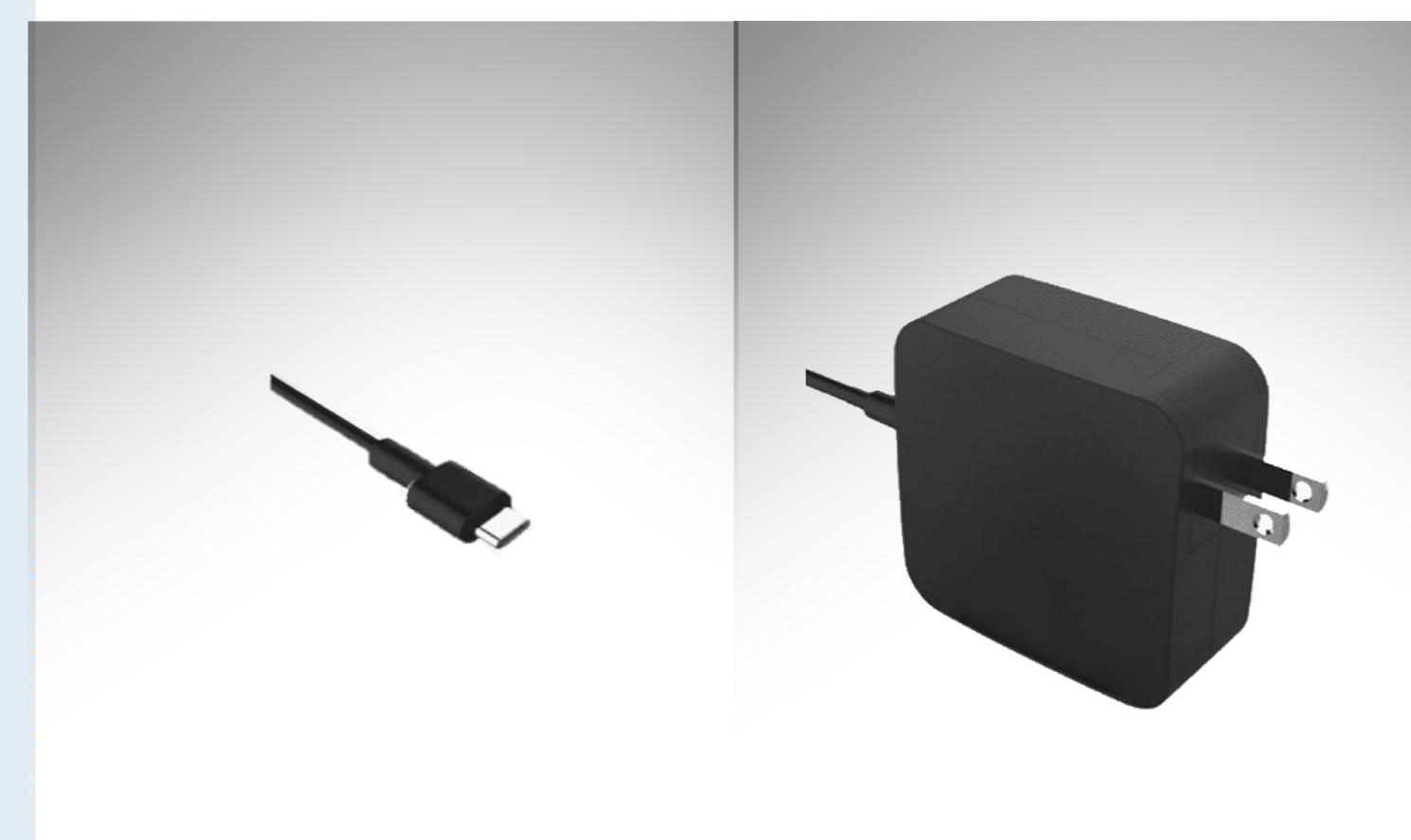
DESCRIPTION

This 100-watt Power Delivery 3.0 Adapter with USB-C Plug, designed for maximum versatility, this compact and lightweight charger delivers fast, reliable charging for smartphones, laptops, tablets, networking devices and more. Featuring a high-speed USB-C plug, ensuring safe, optimized performance every time.



FEATURES

-  Power Delivery 3.0
-  USB-C
-  US DoE Level VI Efficiency
-  OVP, SCP, OTP
-  Class B EMI



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	1.5A (RMS) Max. at 100Vac			
Leakage current	250uA Max. at 240Vac / 50Hz			
Inrush current	The I^2t shall less than 22% of the fuse, surge limiting device at maximum input voltage, +/- 90° phase, at 240Vac Ta=25°C.			
	Parameter Description	Min	Typ	Max
	Inrush current			150A @240Vac

DC Output

Output voltage	5V / 9V / 15V / 20V			
Output Voltage Regulation	$\pm 5\%$ (measured at cable end) For 5Vdc output : 4.75V to 5.25 V at output current 0A to 3A. For 9Vdc output: 8.55V to 9.45 V at output current 0A to 3A. For 15Vdc output: 14.25V to 15.75 V at output current 0A to 3A. For 20Vdc output: 19V to 21 V at output current 0A to 5A			
Maximum load current	0A to 3A continuous with 5Vdc ; 0A to 3A. continuous with 9Vdc 0A to 3A continuous with 15Vdc; 0A to 5A continuous with 20Vdc			
Ripple and noise	200mV (5V) / 250 mV (9V) / 300 mV (15,20V) at min-max load, 100Vac - 240Vac NOTE : 1) Measures at the cable end. 2) Measurements shall be made with an oscilloscope with 20MHz Bandwidth. 3) Outputs should be bypassed at a connector with a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor			

Overall Performance

Output Power	100 Watt Max																					
Efficiency for single output	-5V / 3A, CoC V5 tier 2 @230Vac Average Efficiency >81.835% 10% Load Efficiency > 72.480% -15V / 3A, CoC V5 tier 2 @230Vac Average Efficiency >88.852% 10% Load Efficiency > 78.852% -5V / 3A, DoE VI@115Vac Average Efficiency >81.385% -15V / 3A, DoE VI@115Vac Average Efficiency >87.727%																					
NOTE :	Measured at the cable end. (cable:1.8M 18AWG 100mΩMax). 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 burn in 30min.																					
Power Saving	< 0.15 W at 115Vac & 230Vac @Vo:5V Power saving requirement: -Vin=115Vac/60Hz and 230Vac/50Hz, @Vo:5V																					
	<table border="1"> <tr> <td>Output Power (W)</td> <td>Pin Power (W)</td> </tr> <tr> <td>18</td> <td>< 21</td> </tr> <tr> <td>11</td> <td>< 14</td> </tr> <tr> <td>5~6.5</td> <td>Eff. > 80%</td> </tr> <tr> <td>3</td> <td>< 5</td> </tr> <tr> <td>1.65</td> <td>< 3</td> </tr> <tr> <td>1.5</td> <td>< 2.2</td> </tr> <tr> <td>1</td> <td>< 1.6</td> </tr> <tr> <td>0.25</td> <td><0.47</td> </tr> </table>				Output Power (W)	Pin Power (W)	18	< 21	11	< 14	5~6.5	Eff. > 80%	3	< 5	1.65	< 3	1.5	< 2.2	1	< 1.6	0.25	<0.47
Output Power (W)	Pin Power (W)																					
18	< 21																					
11	< 14																					
5~6.5	Eff. > 80%																					
3	< 5																					
1.65	< 3																					
1.5	< 2.2																					
1	< 1.6																					
0.25	<0.47																					
AC Turn on Delay Time	< 3 sec Max.at 100Vac & 240Vac (with 5Vdc)																					
Hold Up Time	> 10 ms at 100Vac/60Hz & Max load.																					
Overshoot	The output overshoot at turn on shall not exceed 10% of normal voltage value with or without the load connected.																					
Output Rise Time	At turn on the rise time of output voltage shall be less than 40ms. *Measured from the 10% point to the 90% point of the normal.																					
Audible Noise	Input Condition: @ Vin: 90Vac~264Vac , Frequency : 47Hz to 63 Hz Load Condition: Static Load : From 0A to Full Load , 0.1A per step. Static Load: Wall mount Type : Microphone at a distance of 10cm from the surface and noise level is less than 25dBA																					

TECHNICAL DATA

Peak load (For 20V/15V)	Peak current equals 200% loc for 1ms @5% duty cycle (low current equals 95% loc for 19ms) Peak current equals 150% loc for 2ms @10% duty cycle (low current equals 94% loc for 18ms) <i>The adapter shall support below loading condition without any damage, safety issues and protection happened. The output voltage shall be more than 17.8V (20V Mode) / 13.0V,(15V Mode) at input voltage 100-240V/50Hz-60Hz.</i>
Hot Plugging	Plugging a live AC adapter into the system with 100uF (for 5V Mode) and 1000uF (for 15V/20V Mode) capacitance shall not trigger any protections or cause the adapter to shut down.
Voltage Dips (for 20V Mode)	Follow the test item " 30% reduction , 25 periods " in IEC 61000-4-11 Standard. Criteria : A (a) AC Input = 100Vac/50Hz (b) Load = 100W constant power (instead of constant current)

Protection

Over Current Protection (OCP)	The maximum constant current shall be less than 4.5A for $Vo < 15V$ The maximum constant current shall be less than 4.5A for $Vo = 15V$ The maximum constant current shall less than 7.5A for $Vo > 15V$ Auto recovery.
Over Voltage Protection (OVP)	Maximum output voltage can't be over 35% for $Vo \geq 15V$ and 50% for other Vo rating. Auto recovery.
Short Circuit Protection (SCP)	Auto recovery.
Over Temperature Protection (OTP)	Latch off.

Other Specifications

Environmental Requirements	Operating Temperature Storage Temperature Operating Relative Humidity Storage Relative Humidity Operation Altitude Surface Temperature rise	0°C to 35°C -30°C to 80°C 10% - 90% RH 5% - 95% RH 5000 M $\Delta T: 50^{\circ}\text{C}$ For Input 100Vac & Output 20V/100% Load Ambient 25°C.
Reliabilities	E-Cap lifetime @Ambient Temperature = 25°C	> 2 years E-Cap lifetime at 80% load 12hr/day, 115Vac or 230Vac
MTBF	The power supply shall be designed and produced to have a MTBF of 150,000 operation hours at 90% confidence – level while operating under the following condition @AC input voltage: 100 and 240Vrms @Ambient Temp.: 25°C	
Burn-in Test Condition	More than 4 hours at 35°C, normal input voltage. @AC on/off must be tested.	
Life/Power On Hours	The power supply must be designed to operate for 13,140 power on hours. @AC input voltage: 100 and 240Vrms @Ambient Temp. : 25°C	

Safety and EMC

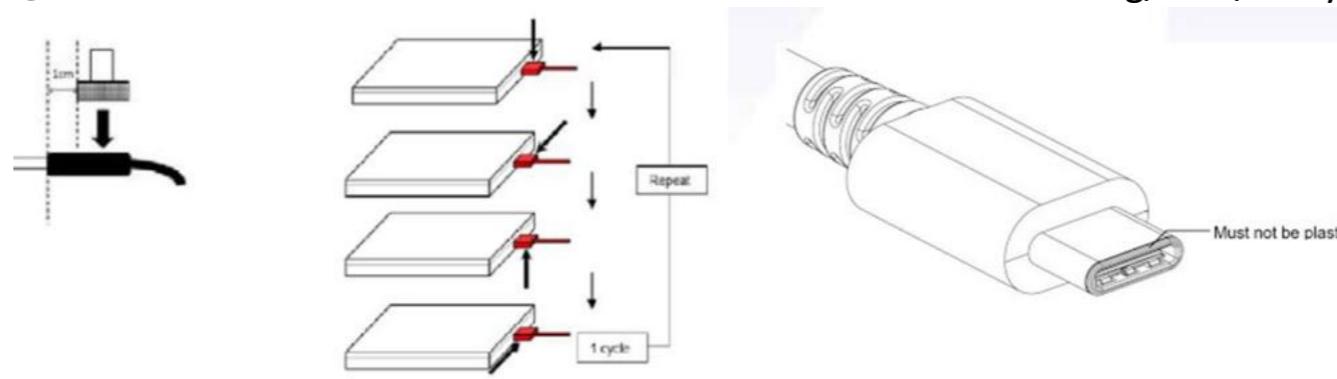
EMC	EMI: FCC part 15, Class B. CISPR22 , Class B. -ESD : EN 61000-4-2 (ESD) Contact discharges: +-8KV Air discharges: +-12KV Air discharge: +- 15KV	Criterion A; Criterion A; Criterion B
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TECHNICAL DATA

-Radiated Immunity: EN 61000-4-3 (RS)	80-1000MHz, 3V/m, 80% AM(1KHz), Criterion A
-Electrical Fast Transients: EN 61000-4-4 (EFT),	1kV, 5/50Tr/Th ns, 100 kHz, Criterion B
-Surge Lighting Surge: ±1kV (L-N)	Impulse Noise Test: 1kV , Criteria B
-Common Mode Noise (CMN):Vp-p Voltage ≤ 2 V	
-Conducted Disturbances: EN 61000-4-6 (CS)	0.15-80MHz, 3V, 80% AM(1kHz), Criterion A
-Magnetic Field Immunity: EN 61000-4-8 (MF)	50 or 60Hz, 1A/m(rms), Criterion A
-Voltage Dips and interruptions: EN 61000-4-11 (DIP)	
Dips: >95% reduction, 0.5 period, Criterion B	
30% reduction, 25 period, Criterion C	
Interruption: >95% reduction, 250 periods, Criterion C	
Voltage Fluctuations and Flicker	EN61000-3-3
Hi-POT test	Primary to Secondary : 3.0kVAC or 4242VDC for 1minute
Insulation Resistance	> 30M ohm at 500VDC between primary Live, Neutral and secondary

Mechanical Requirements

Bending test	Disconnection rate <= 10% between case to S/R Disconnection rate <= 30% between plug to coil Without damage to the insulations
Winding test	Disconnection rate of the wire shall be less than 30%
Drop Test	Electrical: The unit should meet all specification and no function error after test.1.1M testing Mechanical: There shall be no visual damage and safety concern after 1.3M testing
Tensile Test	The withdrawal of cord should be less than 2mm or without disconnection of cord
DC Power Cord Wire Push Test	After testing the V+ wire and Ground wire can't short
Type C Plug Requirements	Type-C plugs for use with devices must comply with the standard, with the following exceptions: Must demonstrate a minimum strength of 1.75 Nm in all 4 orientations, rather than 0.75 Nm as defined in section 3.8.1.7 (USB Type C Spec) @Can exceed the maximum plug strength of 2.0 and 3.5 Nm as defined in section 3.8.1.7 @Transverse overload force in all 4 orientations should meet 9Kg/1cm/50 cycles (as below)



Model Information

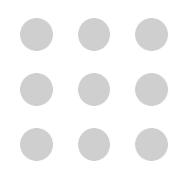
AA100A-59FKC-R	AC plug US Type	Output Terminal 1800mm (±80mm) Type-C Cable
Dimension	63x63x29mm	
Weight	250g for reference	

Test Items in Production Line

Output voltage measures at cable end, cable resistance = 100mΩ.

** at CPK > 1.33

5Vdc Output	Test Condition	Measure	Specification
	Input: 100V/60Hz	Output Voltage(5V,0A) *	4.75V~5.25V
		Output Voltage(5V,3.0A) *	4.75V~5.25V
		Output Ripple & Noise(5V,3.0A)	200 mVp-p max
		OCP(5V)	Max. 4.5A
	Input: 240V/50Hz	Output Voltage(5V,0A) *	4.75V~5.25V
		Output Voltage(5V,3.0A) *	4.75V~5.25V
		Output Ripple & Noise(5V,3.0A)	200 mVp-p max
		Reversible-plug connector test	4.75V~5.25V
		Output Voltage(5V,3.0A)	



TECHNICAL DATA

9Vdc Output	<i>Test Condition</i>	<i>Measure</i>	<i>Specification</i>
15Vdc Output	Input: 100V/60Hz1.	Output Voltage(9V,0A) *	8.55V~9.45V
		Output Voltage(9V,3A) *	8.55V~9.45V
		Output Ripple & Noise(9V,3.0A) *	250 mVp-p max
	Input: 240V/50Hz	OCP(9V)	< 4.5A.
		Output Voltage(9V,0A) *	8.55V~9.45V
		Output Voltage(9V,3A) *	8.55V~9.45V
20Vdc Output	Input: 100V/60Hz	Output Ripple & Noise(9V,3A) *	250mVp-p max
		Output Voltage(15V,0A) *	14.25V~15.75V
		Output Voltage(15V,3.0A) *	14.25V~15.75V
	Input: 240V/50Hz	Output Ripple & Noise(15V,3.0A) *	300 mVp-p max
		OCP(15V)	< 4.5A.
		Output Voltage(15V,0A) *	14.25V~15.75V
20Vdc Output	Input: 100V/60Hz	Output Voltage(15V,3.0A) *	14.25V~15.75V
		Output Ripple & Noise(15V,3.0A) *	300mVp-p max
		Output Voltage(20V,0A) *	19.0V~21.0V
	Input: 115V/60Hz	Output Voltage(20V,5.0A) *	19.0V~21.0V
		Output Ripple & Noise(20V,5.0A) *	300 mVp-p max
		OCP(20V)	< 7.5A.
20Vdc Output	Input: 240V/50Hz	Efficiency (20V/5.0A)	88.5% min.
		Output Voltage(20V,0A) *	19.0V~21.0V
		Output Voltage(20V,5.0A) *	19.0V~21.0V
	Input: 240V/50Hz	Output Ripple & Noise(20V,5.0A) *	300mVp-p max
		Output Voltage(20V,0A) *	19.0V~21.0V
		Output Ripple & Noise(20V,5.0A) *	300mVp-p max

*Hi-pot test:3600Vac/10Ma/2sec.

PHIHONG 50 YEARS OF HISTORY IN THE POWER SUPPLIES INDUSTRY

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.

