

TECHNICAL DATA SHEET



AQ18A-59CFC-H AQ18E-59CFC-H AQ18K-59CFC-H



DESCRIPTION

This 18-watt Adapter is designed for USB Type-C PD device. It supports operation at altitudes up to 5,000 meters and meets ESD protection levels of $\pm 8\text{kV}$ (contact discharge) and $\pm 15\text{kV}$ (air discharge). With FCC compliance and robust charging capabilities, it's an ideal solution for fast-charging portable and consumer devices.



FEATURES

- ✓ Class B EMI
- ✓ High Efficiency Performance
- ✓ USB Type-C receptacle
- ✓ Over-Voltage, Over-Current, Short Circuit, & Over-Temperature Protection
- ✓ 5,000 Meters Operating Altitude





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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	0.5A (RMS) Max. at 100Vac
Leakage current	100uA Max.
Inrush current	The inrush current should not blow fuse and rectifier diodes. The peak inrush current and I _{2t} shall be less than 85% of their maximum rated value of components @maximum input voltage, +/- 90o phase, Ta=25oC.

Output

Output voltage	5V/9V/12V/15V
Output voltage regulation	± 5% (Line end) 4.75V – 5.25 V @ O/P current 0A – 3A (5V MODE) 8.55V – 9.45 V @ O/P current 0A – 2A (9V MODE) 11.4V – 12.6 V @ O/P current 0A – 1.5A (12V MODE) 14.25V – 15.75 V @ O/P current 0A – 1.2A (15V MODE)
Minimum load current	0A
Maximum load current	5V/3A 9V/2A 12V/1.5A 15V/1.2A
Ripple and noise	200mV (pk-pk)@max load <i>Note</i> (1) Measure at the end of 100m ohm cable. (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 (Low ESR) (4) Input voltage range:100Vac-240Vac (5) Measure at 25C

Overall Performance

Output Power	18Watt Max
Efficiency	5V / 3A DOE VII Average Efficiency > 81.835% COS V5 Tier 2 Average Efficiency > 81.835% 10% Load Efficiency > 72.48% 9V / 2A, 12V / 1.5A, 15V / 1.2A DOE VII Average Efficiency > 85.452% COS V5 Tier 2 Average Efficiency >85.452% 10% Load Efficiency > 75.452% <i>Note: Measure at the end of 100m ohm cable. 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 for 30min.</i>
Power saving	75mW @ 230VAC, No load after burn in 15 minute
AC turn on delay time	3Sec Max. @115Vac/60Hz & Max load(with 5V)
Hold Up Time	3mS Min. @115Vac/60Hz & Max load
Output rise time	300ms Max. @115Vac/230Vac(with 5V)
Transient Response	Vout is 4.5V-5.5V ,TH=5ms,TL=5ms,at 1.5A~3A step load change,0.15A/us slew rate. Vout is 4.5V-5.5V ,TH=5ms,TL=5ms,at 0.05A ~1.5A step load change,0.15A/us slew rate. Vout is 8.1V-9.9V ,TH=5ms,TL=5ms,at 1A~2A step load change,0.15A/us slew rate. Vout is 8.1V-9.9V ,TH=5ms,TL=5ms,at 0.05A ~1A step load change,0.15A/us slew rate. Vout is 10.8V-13.2V,TH=5ms,TL=5ms,at 0.75A ~ 1.5A step load change,0.15A/us slew rate. Vout is 10.8V-13.2V,TH=5ms,TL=5ms,at 0.05A ~ 0.75A step load change,0.15A/us slew rate. Vout is 13.5V-16.5V,TH=5ms,TL=5ms,at 0.6A ~ 1.2A step load change,0.15A/us slew rate. Vout is 13.5V-16.5V,TH=5ms,TL=5ms,at 0.05A ~ 0.6A step load change,0.15A/us slew rate. <i>*Measure at the end of cable@90Vac-264Vac & 25 °C</i>





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Protection

Short Circuit Protection	Auto-recovery function. The output can be shorted permanently without damage
Over Current Protection	Auto-recovery function. Trip point is 4.05A maximum with 5Vdc. Trip point is 2.7A maximum with 9Vdc. Trip point is 2.025A maximum with 12Vdc. Trip point is 1.62A maximum with 15Vdc.
Over Voltage Protection	Auto-recovery function. 5V/6.25V max., 9V/11.25V max. 12V/15V max., 15V/18.75V max
Over Temperature Protection	Latch off function -Case temperature shall not exceed 95°C. -No damage

Other Specifications

Environmental Requirements	<ul style="list-style-type: none">- Operating Temperature: 0°C to 40°C ; 0°C to 25°C (for altitude 5000M)- Storage Temperature: -30°C to 70°C- Operating Relative Humidity: 10%-90% RH- Storage Relative Humidity: 5%-95% RH- Operation Altitude: 5000 M (for operating temperature: 0°C to 25°C)- E-Cap lifetime: > 2 years E-Cap lifetime at 100% load , ambient temp. Ambient=25°C- MTBF: 1M hours min (Telcordia Issue 4 Quality Level I) At full load 25°C ambient temperature- Burn in: Burn-in shall be at full load, nominal input voltage and 25°C±5°C ambient temperature conditions.
Output Connector	USB Type-C receptacle.

Safety and EMC

Safety	IEC 62368-1:2014 (Second Edition) EN 62368-1:2014+A11:2017 UL 62368-1, 2nd Edition CAN/CSA C22.2 No. 62368-1-14, 2nd Edition
EMC	EMI: FCC Class B, EN55032 Class B EMS: EN55024, EN55035 ESD: EN 61000-4-2 ; Contact discharges: +-8KV Criterion B; Air discharges: +-15KV Criterion B 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, 5kHz, Criterion B Surge: EN 61000-4-5 (Surge); Line to Line 1KV Criterion A Conducted Disturbances: EN 61000-4-6 (CS); 0.5-80MHz, 3V, 80% AM(1kHz), 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) Dips: >95% reduction, 0.5 period, Criterion B 30% reduction, 25 period, Criterion C Interruption: >95% reduction, 250 periods, Criterion C
Harmonic	EN61000-3-2
Voltage fluctuations and flicker	EN61000-3-3
HI-POT test	Pri. to Sec. 3000VAC 3mA for 1 Minute
Insulation resistance	Pri. to Sec. >100 M ohm 500Vdc.
Altitude	Operation 0 ~ 5,000m Max.





AQ18A-59CFC-H AQ18E-59CFC-H AQ18K-59CFC-H
18W USB Type-C with Power Delivery Adapter

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Model Information

<i>Phihong P/N</i>	<i>Description</i>
AQ18A-59CFC-H	US plug
AQ18K-59CFC-H	UK plug
AQ18E-59CFC-H	EU Plug

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