CINCON ELECTRONICS

GETRONIC
Elektronische Bauelemente und Systeme

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MEDICAL
POWER SUPPLY CATALOG 2016

CINCON

Every day, 365 days a year Cincon makes a difference in people's lives throughout the world.

Design engineers and other power supply specifiers select our AC-DC and DC-DC convertors to power a wide range of products. Cincon power supplies are found in a myriad of applications, from medical equipment used to keep us healthy, to scurity systems working to keep us safe. Name an electronic device in any equipment category and it's likely you'll find a Cincon power supply inside. The communications, test instrumentation, entertainment, lighting, medical, computer, networking, industrial and transportation industries all use Cincon power supplies.

Cincon gives power supply specifiers what they need, speed and specification. Need a power supply fast? Designers can select from one of our 25,000 plus standard model numbers, many available off the shelf from distributors located around the globe. Give us a little more time and we can modify one of our standard products to your requirement. Need a full custom power supply? We do that also.

Using state of the art design tools, our power supplies are engineered with proven technology in one of our two Taiwan design laboratories. We focus heavily on reliability in the early stages of development to ensure a robust final product. Combined with extensive verification testing at the prototype and pilot production stages, Cincon is able to offer power supplies with long operational lives.

Cincon AC-DC and DC-DC power supplies are manufactured in one of our wholly owned, ISO 9001 and ISO 14001 certified, manufacturing facilities in Taiwan and China. Products are built using the latest manufacturing and quality assurance techniques on state of the art equipment; giving our customers not only high quality but also short lead times.

As a global designer and manufacturer of AC-DC and DC-DC power supplies, our products are certified to international safety, efficiency, hazardous substance and EMI standards where required. We also have capability to design and certify to application and country specific standards.

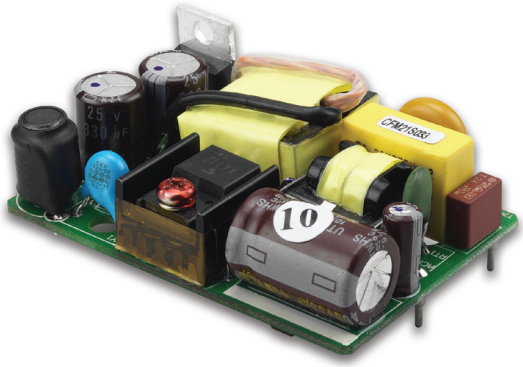
When you require an AC-DC or DC-DC power supply, standard or custom, and have little time, look to us for a solution. Let Cincon power your idea.

CONTENTS

CFM21 SERIES
20 WATT, LOW PROFILE 0.8"

Features

- Universal Input Range 90-264VAC
- Medical and ITE Safety Approvals
- Industry-Standard Pin Out
- Efficiency to 85%
- Continuous Short Circuit Protection
- Over Voltage Protection
- No Load Input Power < 0.3W
- Leakage Current < 0.1mA
- Safety Standard: UL60601-1/IEC60601-1/ EN60601-1/UL60950-1/IEC60950-1/EN60950-1
- Option for On-Board, Connecter, Screw Terminal and Encapsulated type



BAUART GEPRÜFT TYPE APPROVED

UL 60950-1 And CSA C22 No.60950-1-07 APPROVED

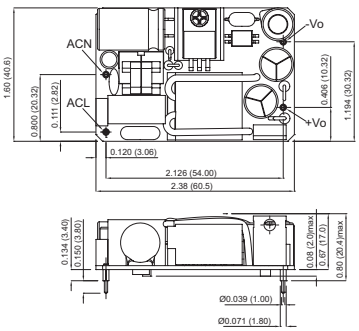
IEC 60601-1 EN 60601-1

E252331

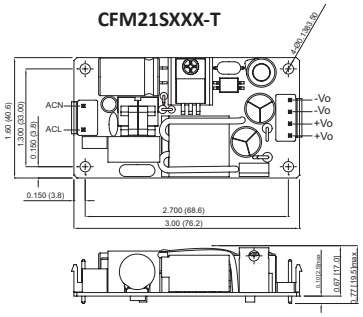
Mechanical Dimensions

All Dimensions in Inches (mm)
Tolerance Inches: X.XXX=±0.02 , X.XXX=±0.01
Millimeters: X.XX=±0.5 , X.XX=±0.25

CFM21SXXX



CFM21SXXX-T



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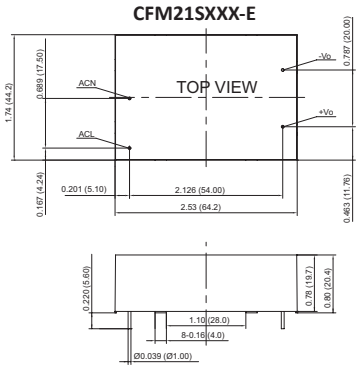
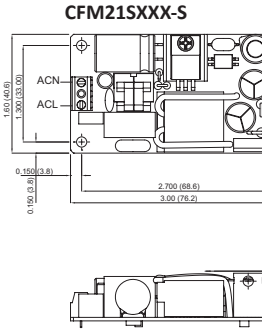
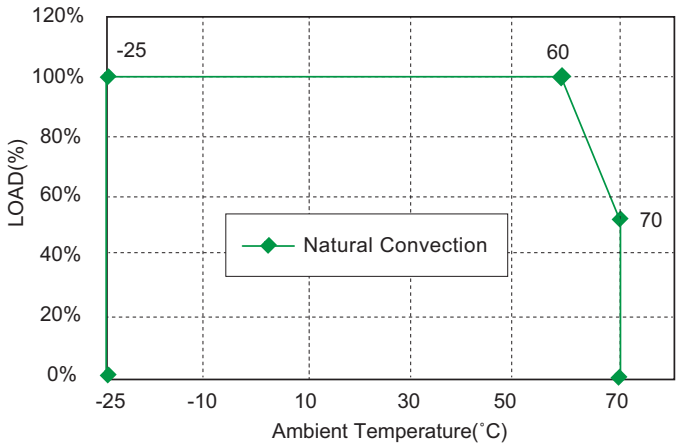


CFM21SXXX-S



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	MIN. LOAD	MAX. LOAD	OUTPUT RATED POWER	RIPPLE & NOISE	VOLTAGE ACCURACY	% EFF.
CFM21S033	90-264 VAC	3.3 V	0	4.0 A	13.2 W	50 mV	±1%	75%
CFM21S050	90-264 VAC	5 V	0	4.0 A	20.0 W	50 mV	±1%	80%
CFM21S090	90-264 VAC	9 V	0	2.3 A	20.7 W	90 mV	±1%	81%
CFM21S120	90-264 VAC	12 V	0	1.7 A	20.4 W	100 mV	±1%	83%
CFM21S150	90-264 VAC	15 V	0	1.4 A	21.0 W	100 mV	±1%	84%
CFM21S240	90-264 VAC	24 V	0	0.9 A	21.6 W	100 mV	±1%	85%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Input Current	0.3 to 0.5A
Inrush Current	Cold Start @25˚C 40A max. @230Vac
Leakage Current	0.1mA max.

OUTPUT SPECIFICATIONS

Voltage Accuracy:	±1.0% max.
Line Regulation (note 3)	±0.5% max.
Load Regulation (note 4)	±1.0% max.
Hold-up Time	10ms typ. @115Vac
Short Circuit Protection	Continuous
Over Voltage Protection (TVS)	115%-140% of nominal output voltage

SAFETY AND EMISSION

CE Directive	2004/108/EC, 93/42/EEC
Emissions	EN60601-1/EN61204-3/ EN55022/ CISPR Class B EN55024
Safety Approvals	Class II, UL60601-1, IEC60601-1, EN60601-1, UL60950-1, IEC60950-1, EN60950-1

GENERAL SPECIFICATIONS

Efficiency	see Table
Switching Frequency	100KHz typ.
Isolation	Input to output = 5656VDC
Operating Temperature	-25-70˚C (with de-rating)
Storage Temperature	-40-85˚C
Cooling	Natural Convection
Humidity	93% RH max. Non condensing
MTBF ..... MIL-STD-217F, GB	650Khrs min.
Dimensions	2.38 x 1.60 x 0.80 inches (60.5 x 40.6 x 20.4 mm) -T: 3.00 x 1.60 x 0.77 inches (76.2 x 40.6 x 19.5 mm) -E: 2.53 x 1.74 x 0.80 inches (64.2 x 44.2 x 20.4 mm) -S: 3.00 x 1.60 x 0.77 inches (76.2 x 40.6 x 19.5 mm)
Weight	50 g, 55 g (-T, -S), 105 g (-E)

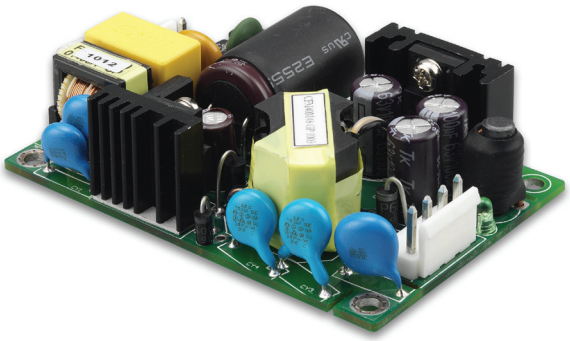
NOTE

1. Voltage accuracy is set of 100% rated load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation is measured from high line to low line with full load.
4. Load regulation is measured from 10% to 100% full load.
5. "T" Version Connection: JST B3P-VH / B4P-VH or equivalent.
6. "S" Version Connection: DECA MB332-381A or equivalent.

CFM40M SERIES
40 WATT, 2" X 3" OPEN FRAME

Features

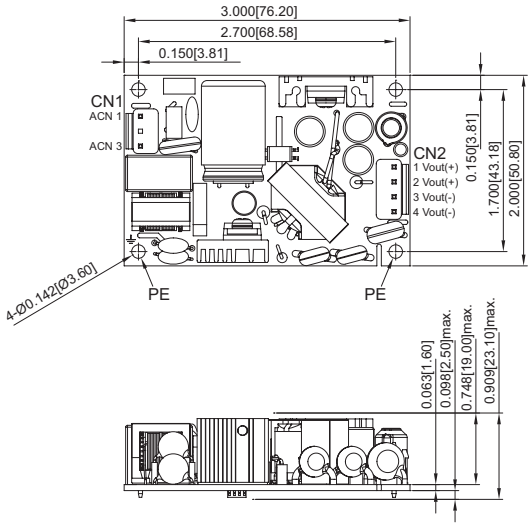
- Universal Input Range 90-264VAC
- Medical and ITE Safety Approvals
- Efficiency to 88% Typical
- Continuous Short Circuit Protection
- EN55011 and EN55022 Class B
- No Load Power Consumption < 0.3W
- 2" x 3" Package
- 2 MOPP



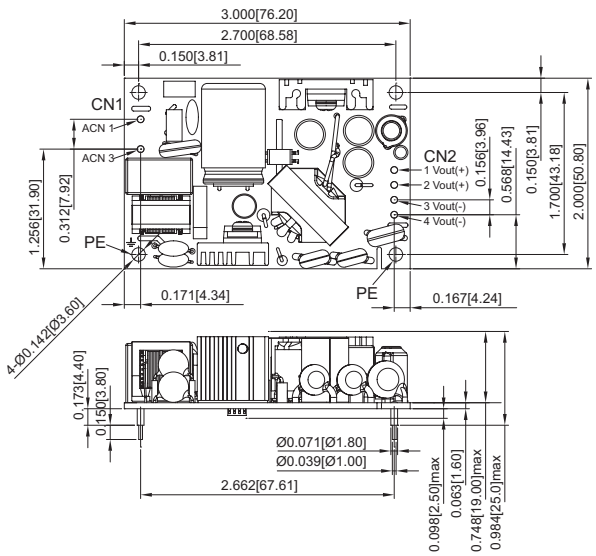
Mechanical Dimensions

All Dimensions in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5

CFM40MXXX

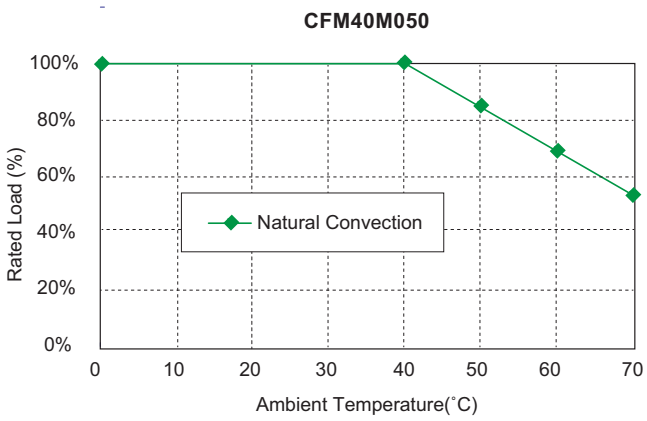


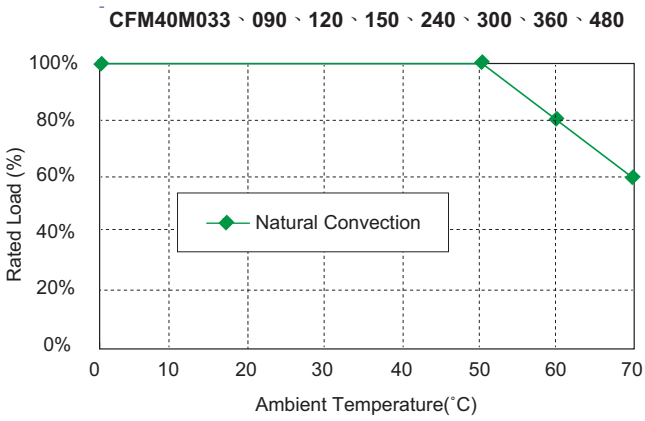
CFM40MXXX-P



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE (NOTE 2)	VOLTAGE ACCURACY (NOTE 1)	LINE REGULATION (NOTE 3)	LOAD REGULATION (NOTE 4)	% EFF. (Typ.) (NOTE 5)
CFM40M033	3.3 V	6 A	50 mV	±1%	±0.5%	±1%	76%
CFM40M050	5 V	6 A	1%	±1%	±0.5%	±1%	80%
CFM40M090	9 V	4.45 A	1%	±1%	±0.5%	±1%	84%
CFM40M120	12 V	3.34 A	1%	±1%	±0.5%	±1%	86%
CFM40M150	15 V	2.67 A	1%	±1%	±0.5%	±1%	87%
CFM40M240	24 V	1.67 A	1%	±1%	±0.5%	±1%	88%
CFM40M300	30 V	1.33 A	1%	±1%	±0.5%	±1%	88%
CFM40M360	36 V	1.11 A	1%	±1%	±0.5%	±1%	88%
CFM40M480	48 V	0.834 A	1%	±1%	±0.5%	±1%	88%

Derating Curve





Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	Cold start @25˚C 60A max. @240Vac
Input Current	100Vac/1A max 240Vac/0.55A max.
Leakage Current	100uA max.

OUTPUT SPECIFICATIONS

Hold-up Time	10ms typ. @115Vac
Short Circuit Protection	Hiccup Mode (Auto Recover)
Over Voltage Protection	TVS Component to Clamp
Temperature Coefficient	±0.05%/˚C

GENERAL SPECIFICATIONS

Isolation	Input to output = 5,656VDC
Operating Temperature	0˚C-70˚C (See Derating Curve)
Storage Temperature	-20˚C-85˚C
Humidity	93% RH max. Non condensing
Cooling	Natural Convection
Switching Frequency	65KHz Typical
MTBF ..... MIL-HDBK-217F, GB, 25˚C/115VAC	200Khrs min.
Altitude	3000m
Dimensions	3.00 x 2.00 x 0.91 inches (76.2 x 50.8 x 23.1 mm) CFM40XXX-P: 3.00 x 2.00 x 0.91 inches (76.2 x 50.8 x 23.1 mm)
Weight	90 g

SAFETY AND EMISSION

Emission and Immunity	EN55011, EN55022 Class B, EN55022, FCC CFR 47 Part 15,18 EN61204-3, EN61000-6-1, EN610006-3 EN60601-1-2, EN61000-3-2, EN61000-3-3
Safety	Class I, IEC60601-1:2005, EN60601-1:2006, UL ANSI/AAMI ES60601-1:2005, IEC60950-1, EN60950-1, UL60950-1

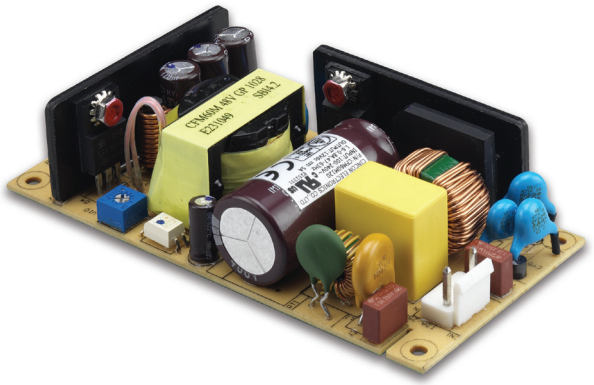
NOTE

1. Voltage accuracy is set at full load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for ripple & noise measurement @20MHz BW.
3. Line regulation is measured from 100VAC to 240VAC with full load.
4. Load regulation is measured from 10% to 100% full load.
5. Typical efficiency at 230VAC and full load 25˚C.
6. Standard input and output connectors (CN1 and CN2) wafer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST housing VHR series or equivalent.

CFM60M SERIES
60 WATT, 2" X 4" OPEN FRAME

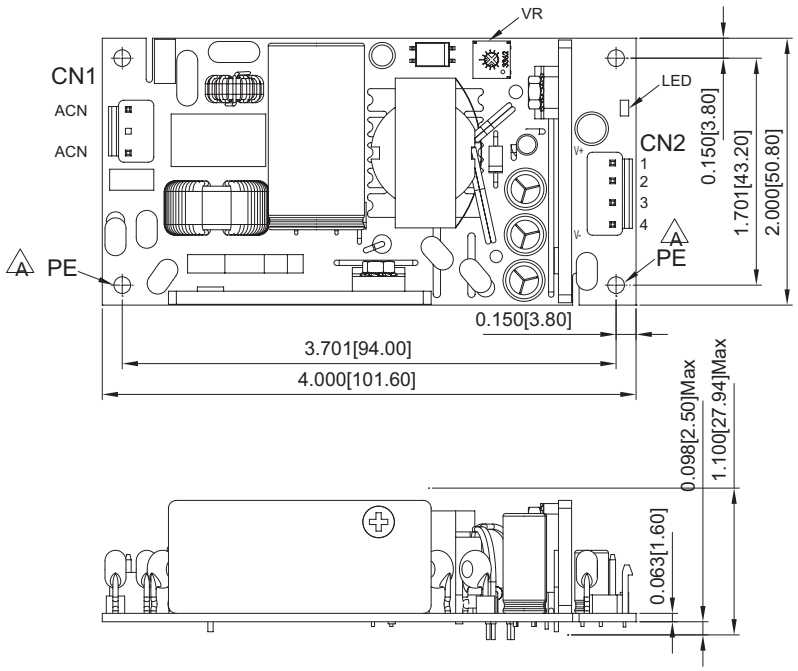
Features

- Universal Input Range 90-264VAC
- Medical and ITE Safety Approvals
- Efficiency to 90%
- Continuous Short Circuit Protection
- EN55011 and EN55022 Class B
- 2 MOPP
- No Load Power Consumption < 0.5W
- 2" x 4" Package



Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5

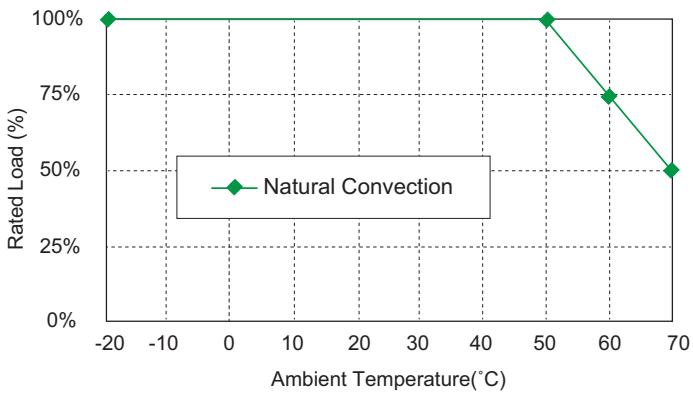


Input Connector CN1	
Pin 1	Line
Pin 2	Not Fitted
Pin 3	Neutral

Output Connector CN2	
Pin 1	+ Vout
Pin 2	+ Vout
Pin 3	- Vout
Pin 4	- Vout

MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE (NOTE 2)	VOLTAGE ACCURACY (NOTE 1)	VOLTAGE ADJ. Range	LINE REGULATION (NOTE 3)	LOAD REGULATION (NOTE 4)	% EFF. (Typ.) (NOTE 5)
CFM60M050	5 V	8 A	1%	±1%	4.75-5.25	±0.5%	±1%	82%
CFM60M120	12 V	5 A	1%	±1%	11.4-12.6	±0.5%	±1%	87%
CFM60M150	15 V	4 A	1%	±1%	14.25-15.75	±0.5%	±1%	88%
CFM60M240	24 V	2.5 A	1%	±1%	22.8-25.2	±0.5%	±1%	89%
CFM60M480	48 V	1.25 A	1%	±1%	45.6-50.4	±0.5%	±1%	90%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	Cold Start @25˚C 75A max. @240Vac
Input Current	100Vac/1.6A max., 240Vac/0.8Amax.
Leakage Current	100uA max.

OUTPUT SPECIFICATIONS

Hold-up Time	16ms typ. @115Vac
Short Circuit Protection	Hiccup Mode (Auto Recover)
Over Voltage Protection	TVS Component to Clamp
Temperature Coefficient	±0.05%/˚C

GENERAL SPECIFICATIONS

Isolation	Input to output = 4000VAC (5,656VDC)
Operating Temperature	-20-70˚C (See Derating Curve)
Storage Temperature	-20-85˚C
Humidity	93% RH max. Non-Condensing
Cooling	Natural Convection
Switching Frequency	65KHz Typical
MTBF ..... MIL-HDBK-217F, GB, 25˚C/115VAC	200Khrs min.
Altitude	3000m
Dimensions	4.000 x 2.000 x 1.100 inches (101.6 x 50.8 x 27.94 mm)
Weight	125 g

SAFETY AND EMISSION

Emission and Immunity	EN55011, EN55022 Class B, EN55024, FCC CFR 47 Part 15, 18 EN61204-3, EN61000-6-1, EN61000-6-3 EN60601-1-2, EN61000-3-2, EN61000-3-3
Safety	Class I, IEC60601-1:2005, EN60601-1:2006, UL ANSI/AAMI ES60601-1:2005, IEC60950-1, EN60950-1, UL60950-1

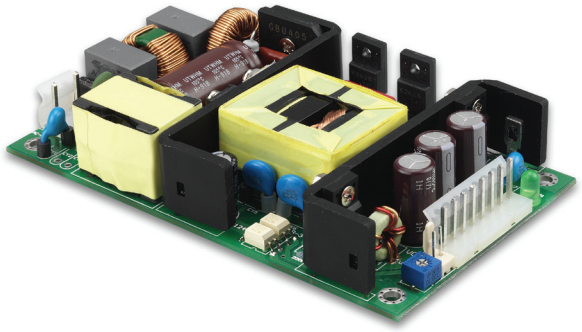
NOTE

1. Voltage accuracy is set at full load and 25˚C Ta.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation is measured from 100VAC to 240VAC with full load.
4. Load regulation is measured from 10% to 100% full load.
5. Typical Efficiency at 230VAC and Full Load at 25°C.
6. Standard input and output connectors (CN1 and CN2) wafer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST housing VHR series and JST SVH-21/41T-P1.1 series crimp terminal or Equivalent.
7. Optional input and output connectors (CN1 and CN2) wafer with LONG CHU P3060 series and mate with MOLEX housing 5195 series and MOLEX 5194 series crimp terminal or equivalent.

CFM100M SERIES
100 WATT, LOW PROFILE 1.05"

Features

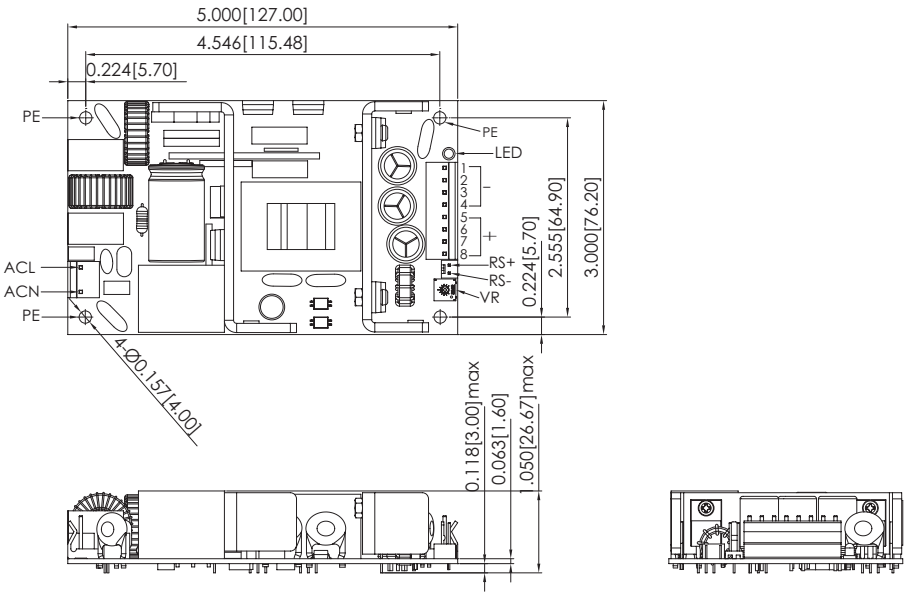
- Universal Input Range 90-264VAC
- Medical and ITE Safety Approvals
- 3" x 5" Package
- Low Profile 1.05"
- Industry Standard Pin Out
- Active PFC Meets EN61000-3-2
- High Efficiency up to 92%
- CISPR/FCC Class B
- Remote Voltage Sense
- Over Voltage Protection
- Continuous Short Circuit Protection
- No Load Power Consumption < 0.5W
- 2 MOPP



CE TÜV IEC 60601-1 EN 60601-1 TÜV BAUART GEPRÜFT TYPE APPROVED c UL us E252331 E176177

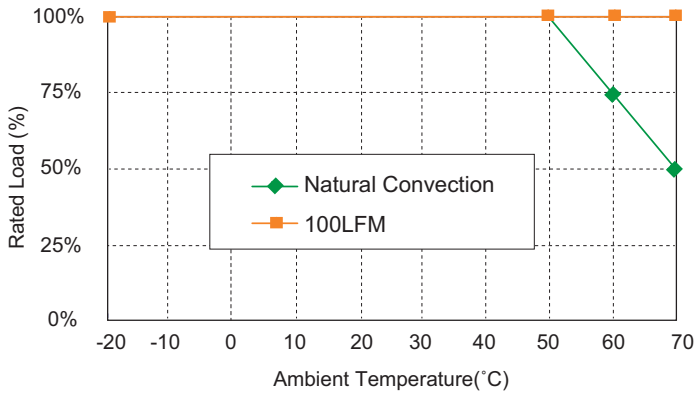
Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5



MODEL NUMBER	OUTPUT VOLTAGE	MAX. LOAD	MIN. LOAD	RIPPLE & NOISE (NOTE 1)	VOLTAGE ADJ. RANGE	VOLTAGE ACCURACY (NOTE 2)	LINE REGULATION (NOTE 3)	LOAD REGULATION (NOTE 4)	% EFF. (Typ.) (NOTE 5)
CFM100M050	5 V	20 A	0 A	2%	4.75-5.25	±1%	±0.5%	±1%	83%
CFM100M075	7.5 V	13.4 A	0 A	2%	7.13-7.88	±1%	±0.5%	±1%	87%
CFM100M090	9 V	11.2 A	0 A	1%	8.55-9.45	±1%	±0.5%	±1%	89%
CFM100M120	12 V	8.4 A	0 A	1%	11.4-12.6	±1%	±0.5%	±1%	89%
CFM100M150	15 V	6.7 A	0 A	1%	14.25-15.75	±1%	±0.5%	±1%	90%
CFM100M180	18 V	5.6 A	0 A	1%	17.1-18.9	±1%	±0.5%	±1%	90%
CFM100M240	24 V	4.2 A	0 A	1%	22.8-25.2	±1%	±0.5%	±1%	91%
CFM100M280	28 V	3.6 A	0 A	1%	26.6-29.4	±1%	±0.5%	±1%	90%
CFM100M360	36 V	2.8 A	0 A	1%	34.2-37.8	±1%	±0.5%	±1%	91%
CFM100M480	48 V	2.1 A	0 A	1%	45.6-50.4	±1%	±0.5%	±1%	92%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	80A max. @240Vac
Leakage Current	300uA max.

OUTPUT SPECIFICATIONS

Hold-up Time	16ms typ.
Short Circuit Protection	Hiccup mode (Auto Recovery)
Adjustment Range on Vout	±5%
Over Voltage Protection	Recycle AC input to restart
Temperature Coefficient	±0.05%/˚C

GENERAL SPECIFICATIONS

Isolation	Input to output = 5,656VDC
Operating Temperature	-20˚C-70˚C (see derating curve)
Storage Temperature	-20-85˚C
Humidity	93% RH max. Non condensing
Cooling	Natural Convection
Switching Frequency	90KHz Typical
MTBF ..... MIL-HDBK-217F, GB, 25˚C/115VAC	140Khrs min.
Altitude	3000m
Dimensions	5.000 x 3.000 x 1.050 inches (127.00 x 76.20 x 26.67 mm)
Weight	270 g (0.6 Pounds)

SAFETY AND EMISSION

Emission and Immunity	EN55024, EN61000-6-1, EN61204-3 EN60601-1-2, EN61000-3-2 Class A, B, C, D, EN61000-3-3 EN55011 Class B, EN55022 Class B, FCC Part15 Class B
Safety	Class I, IEC60601-1:2005, EN60601-1:2006, ANSI/AAMI ES60601-1:2005 IEC60950-1, EN60950-1, UL60950-1

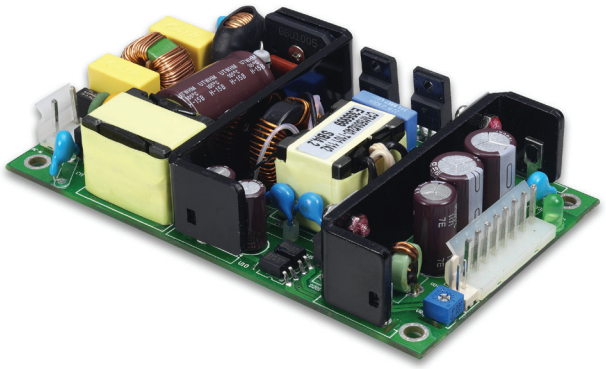
NOTE

1. CFM100M050: Add a 0.1μF ceramic capacitor and 220μF E.L. capacitor to output for ripple & noise measuring @20MHz BW. other model: add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 100% rated load and 25˚C Ta.
3. Line regulation is measured from high line to low line with full load.
4. Load regulation is measured from full to 10% load.
5. Typical efficiency at 230VAC and full load at 25˚C.
6. Standard input and output connectors wafer with LONG CHU P3060 series and mate with molex housing 09-50-1031 and 09-50-1081 or equivalent.
7. DC output pin 1, 2, 3, 4: Vout (-), DC output pin 5, 6, 7, 8: Vout (+).

CFM150M SERIES
150 WATT, LOW PROFILE 1.05"

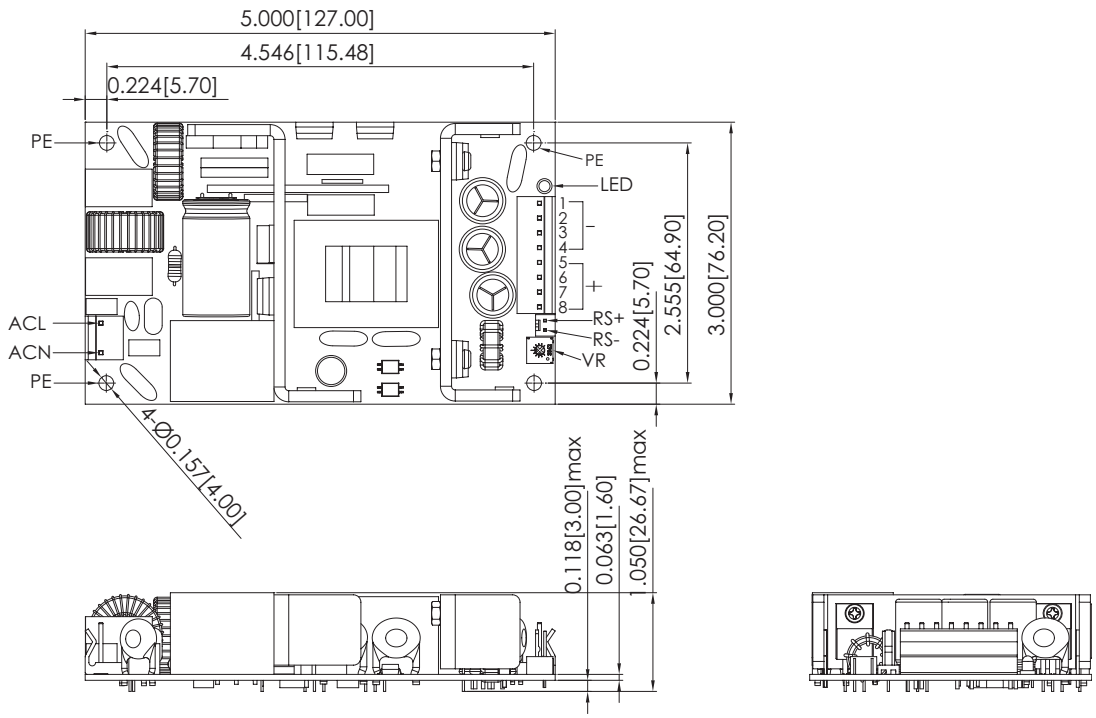
Features

- Universal Input Range 90-264VAC
- Medical and ITE Safety Approvals
- 3" x 5" Package
- Low Profile 1.05"
- Industry Standard Pin Out
- Active PFC Meets EN61000-3-2
- High Efficiency up to 93%
- CISPR/FCC Class B
- Remote Voltage Sense
- Over Voltage Protection
- Continuous Short Circuit Protection
- No Load Power Consumption < 0.5W
- 2 MOPP



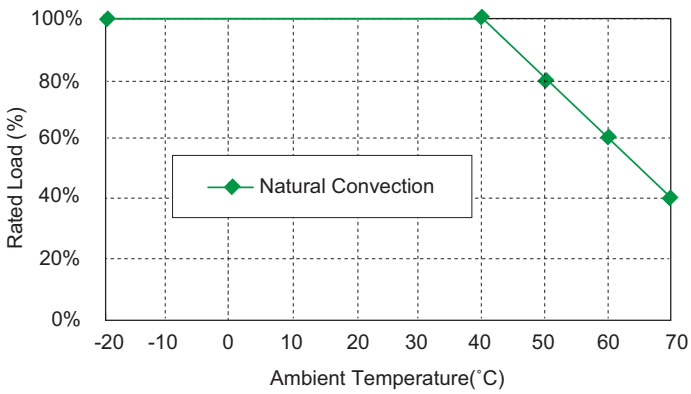
Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5



MODEL NUMBER	OUTPUT VOLTAGE	MAX. LOAD	MIN. LOAD	RIPPLE & NOISE (NOTE 1)	VOLTAGE ACCURACY (NOTE 2)	LINE REGULATION (NOTE 3)	LOAD REGULATION (NOTE 4)	% EFF. (Typ.) (NOTE 5)
CFM150M120	12 V	12.5 A	0 A	1%	±1%	±0.5%	±1%	90%
CFM150M240	24 V	6.25 A	0 A	1%	±1%	±0.5%	±1%	92%
CFM150M360	36 V	4.17 A	0 A	1%	±1%	±0.5%	±1%	92%
CFM150M480	48 V	3.13 A	0 A	1%	±1%	±0.5%	±1%	93%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	110A max. @240Vac
Leakage Current	300uA max.

OUTPUT SPECIFICATIONS

Hold-up Time	16ms typ.
Short Circuit Protection	Hiccup mode (Auto Recovery)
Adjustment Range on Vout	±5%
Over Voltage Protection	Recycle AC input to restart
Temperature Coefficient	±0.05%/˚C

GENERAL SPECIFICATIONS

Isolation	Input to output = 5,656VDC
Operating Temperature	-20˚C-70˚C (see derating curve)
Storage Temperature	-20-85˚C
Humidity	93% RH max. Non condensing
Cooling	Natural Convection
Switching Frequency	90KHz Typical.
MTBF ..... MIL-HDBK-217F, GB, 25˚C/115VAC	150Khrs min.
Altitude	3000m
Dimensions	5.000 x 3.000 x 1.050 inches (127.00 x 76.20 x 26.67 mm)
Weight	270 g (0.6 Pounds)

SAFETY AND EMISSION

Emission and Immunity	EN55011 Class B, FCC Part 15 Class B EN60601-1-2, EN61000-3-2 Class A, B, C, D, EN61000-3-3
Safety	Class I, IEC60601-1:2005, EN60601-1:2006, ANSI/AAMI ES60601-1:2005 IEC60950-1, EN60950-1, UL60950-1

NOTE

1. Add a 0.1μF ceramic capacitor and 10μF E.L.
   capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 100% rated load and 25˚C Ta.
3. Line regulation is measured from high line to low line with full load.
4. Load regulation is measured from full to 10% load.
5. Typical efficiency at 230VAC and full load at 25˚C.
6. Standard input and output connectors wafer with LONG CHU P3060
   series and mate with molex housing 09-50-1031 and 09-50-1081 or equivalent.
7. DC output pin 1, 2, 3, 4: Vout (-), DC output pin 5, 6, 7, 8: Vout (+).

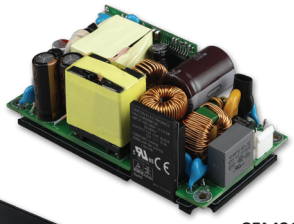
CFM200M SERIES
200 WATT, 2" X 4" WITH PFC

Features

- Universal Input Range 90-264VAC
- 2" x 4" Open Frame
- Open Frame Models Offer 150 Watts Output With Natural Convection
- U-Frame With Cover Models Offer 200 Watts Output With Natural Convection
- No Load Input Power Consumption < 0.3W
- +12V Fan Output
- Class I & Class II

Approval Pending

PRELIMINARY



CFM200MXXX (Open Frame)

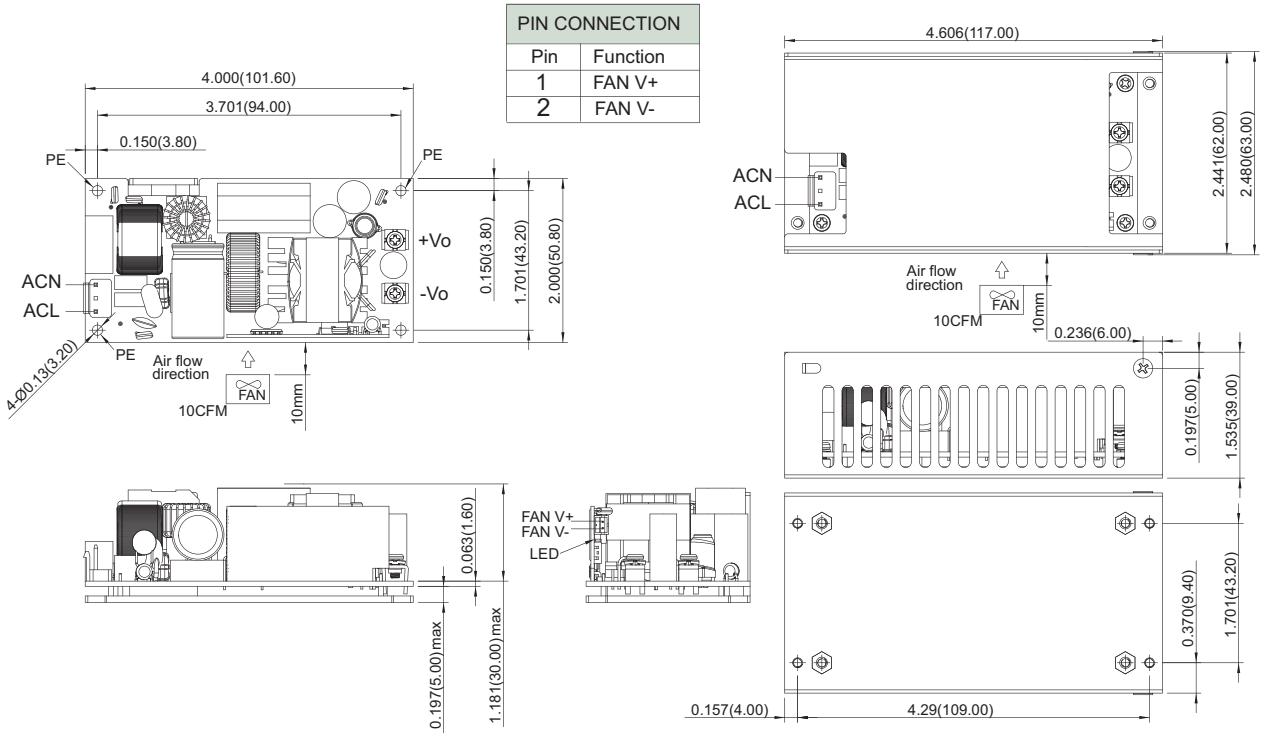
CFM200MXXXC (With Cover)

Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5

CN104:

PIN CONNECTION	
Pin	Function
1	FAN V+
2	FAN V-



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE (NOTE 1)	VOLTAGE ACCURACY (NOTE 2)	LINE REGULATION (NOTE 3)	LOAD REGULATION (NOTE 4)	% EFF. (Typ.) (NOTE)5
Main Output Voltage							
CFM200M120	+12 V	16.67 A	150 mVp-p	±2.0%	±0.5%	±1%	92.5%
CFM200M240	+24 V	8.33 A	240 mVp-p	±2.0%	±0.5%	±1%	93.5%
CFM200M480	+48 V	4.17 A	480 mVp-p	±2.0%	±0.5%	±1%	93.5%
Fan Output Voltage							
All	+12 V	0.5 A	-	-	-	-	-

Derating Curve

Specifications

All Specifications Typical At Nominal Line, Full Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

AC Input Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	100A max. @240Vac
Leakage Current @ 264Vac	300uA max.

OUTPUT SPECIFICATIONS

Total Rated Output Power	200W
Hold-up Time	10ms typ.
Over Voltage Protection	Recycle AC input to restart
Short Circuit Protection	Hiccup mode (Auto Recovery)
Temperature Coefficient	±0.05%/˚C

SAFETY AND EMISSION

Emission and Immunity	EN55011 Class B, FCC Part 15 Class B, EN60601-1-2, EN61000-3-2, EN61000-3-3
Safety	IEC60601-1: 2005, EN60601-1: 2006, ANSI/AAMI ES60601-1: 2005

GENERAL SPECIFICATIONS

Isolation	Input to output = 5656VDC
Operating Temperature	-20-60˚C (See Derating Curve)
Storage Temperature	-40-85˚C
Humidity	93% RH max. Non condensing
Altitude	3000m
Dimensions:	
Open Frame Versions	4.000 x 2.000 x 1.400 inches (101.60 x 50.80 x 35.60 mm)
Covered Versions	4.606 x 2.480 x 1.496 inches (117.00 x 63.00 x 38.00 mm)
Weight:	
Open Frame Versions	253 g (0.558 Pounds)
Covered Versions	314 g (0.692 Pounds)

NOTE

1. Add a 0.1μF ceramic capacitor and a 47μF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 60% rated load and 25˚C Ta.
3. Line regulation is measured from High Line to Low Line with rated load.
4. Load regulation is measured at 60%±40% rated.
5. Typical efficiency at 230VAC and full load at 25˚C.

CFM300M SERIES
300 WATT, 3" X 5" WITH PFC

Features

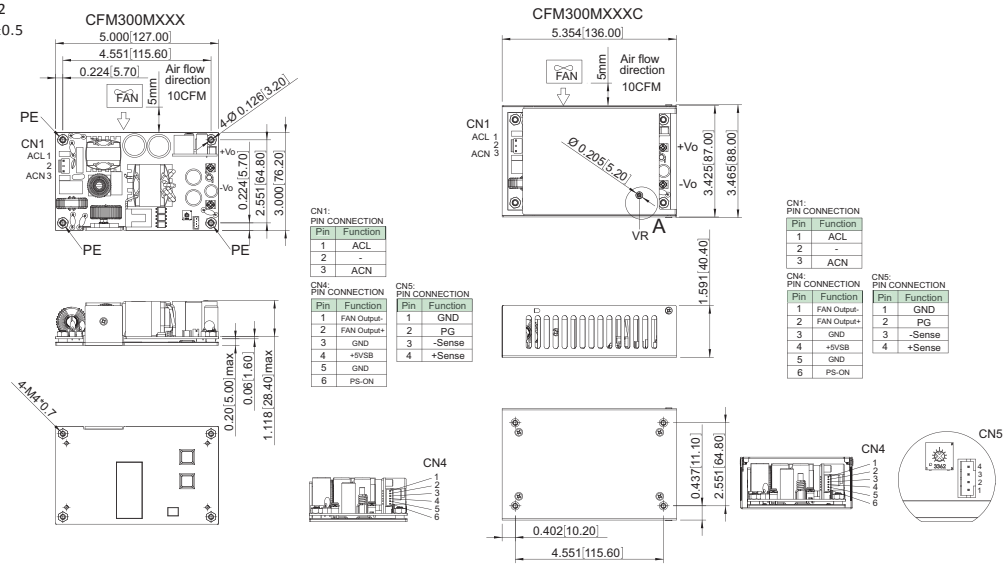
- Universal Input Range 90-264VAC
- Active PFC Meets EN61000-3-2
- High Efficiency up to 94%
- High Power Density up to 18W/in^3
- EN55011 and EN55022 Class B
- 2 MOPP
- Over Temperature Protection
- Continuous Short Circuit Protection
- Remote Voltage Sense
- PS On/Off Remote Control
- Power Good & Power Fail Signal
- +5V Stand-by Output Power
- 12V Fan Output
- No Load Power Consumption < 0.3W (note 6)

CFM300MXXX (Open Frame)

CFM300MXXXC (With Cover)

Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX=±0.02
Millimeters: X.XX=±0.5

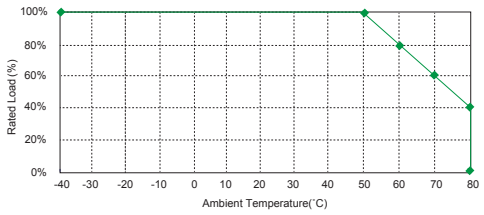


MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT RATED 1	OUTPUT CURRENT RATED 2	RIPPLE & NOISE (NOTE 1)	VOLTAGE ACCURACY (NOTE 2)	LINE REGULATION (NOTE 3)	Voltage ADJ. Range (NOTE 4)	LOAD REGULATION (NOTE 5)	% EFF. (Typ.)
Main Output Voltage									
CFM300M120	+12 V	25 A	16.67 A	120 mV	± 1%	± 0.5%	11.4-12.6	± 1%	92.5%
CFM300M240	+24 V	12.5 A	8.34 A	150 mV	± 1%	± 0.5%	22.8-25.2	± 1%	93.5%
CFM300M360	+36 V	8.34 A	5.56 A	150 mV	± 1%	± 0.5%	34.2-37.8	± 1%	93.5%
CFM300M480	+48 V	6.25A	4.17 A	150 mV	± 1%	± 0.5%	45.6-50.4	± 1%	94.0%
Stand-by Output Voltage									
All	+5 V	1 A	0.6 A	100 mV	± 3%	± 1%	--	± 5%	--
Fan Output Voltage									
All	+12 V		0.5 A	--	--	--	--	--	--

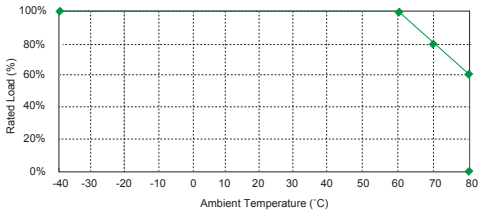
Rated 1: Forced air convection
Rated 2: Natural convection
For covered versions add "C" to model number or order part no. For example CFM300M120C

Derating Curve

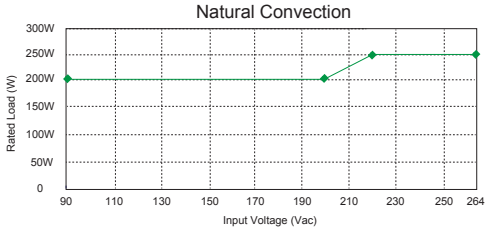
CFM300MXXX (Open Frame)

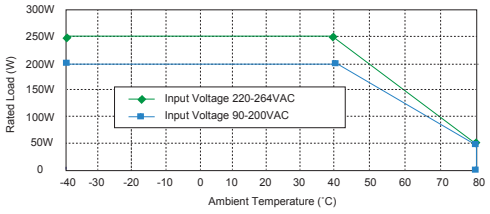


CFM300MXXXC (With Cover)

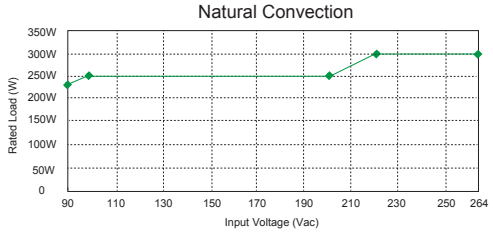


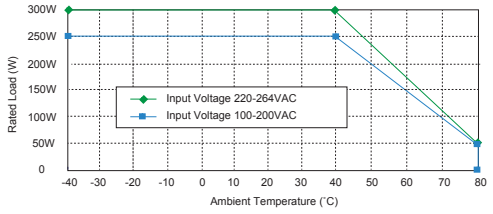
CFM300MXXX (Open Frame)





CFM300MXXXC (With Cover)





Specifications

All Specifications Typical At Nominal Line, Full Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

AC Input Voltage	90-264Vac
Input current	100Vac/4A max., 240Vac/1.8A max.
Frequency	47 to 63Hz
Inrush Current	Cold start @25˚C 30A max. @240Vac
Leakage Current	300uA max
Earth Leakage Current	275uA max.

OUTPUT SPECIFICATIONS

Isolation	Input to Output = 4000VAC
Hold-up Time	16ms typ @115Vac
Over Voltage Protection	Latch mode
Short Circuit Protection	Hiccup mode (Auto Recovery)
Temperature Coefficient	±0.05%/˚C

SAFETY AND EMISSION

Safety (Medical 3.1rd)	Class I, IEC60601-1, EN60601-1, UL60601-1
Emission and Immunity	EN55011, EN55022 Class B, EN55024, FCC Class B, EN61204-3, EN61000-6-1, EN61000-6-3, EN60601-1-2, EN61000-3-2, EN61000-3-3

GENERAL SPECIFICATIONS

Operating Temperature	-40-80˚C (see Derating Curve)
Storage Temperature	-40-85˚C
Over Temperature Protection	Auto Recovery
PS-On Signal	Power on: PS-ON= "Low" < 0-0.5V Power off: PS-ON= "Hi" >2-5V
Power Good/Power Fail (PG)	250ms>PG>50ms

The TTL goes high with 50ms to 250ms after power set up
The TTL goes low at least 5ms before Vo below 90% rated value

Humidity	93% RH max. non-condensing
Altitude	3000m
Cooling	Natural convection for 200W-250W (See Derating Curve) forced air convection (10CFM FAN) for 300W
Switching Frequency	60-80KHz typ. @ Full load
Dimensions:	
Open Frame	5.000 x 3.000 x 1.106 inches (127.00 x 76.20 x 28.10 mm)
With Cover	5.355 x 3.425 x 1.591 inches (136.00 x 87.00 x 40.40 mm)

NOTE

1. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at 100% rated load and 25˚C.Ta.
3. Line regulation is measured from high line to low line with rated load.
4. Load regulation is measured from full to 10% load.
5. Typical efficiency at 230 VAC and full load at 25°C.
6. No load power consumption < 0.3W by PS On/Off remote control.

CFM351M SERIES
350 WATT, OPEN FRAME

Features

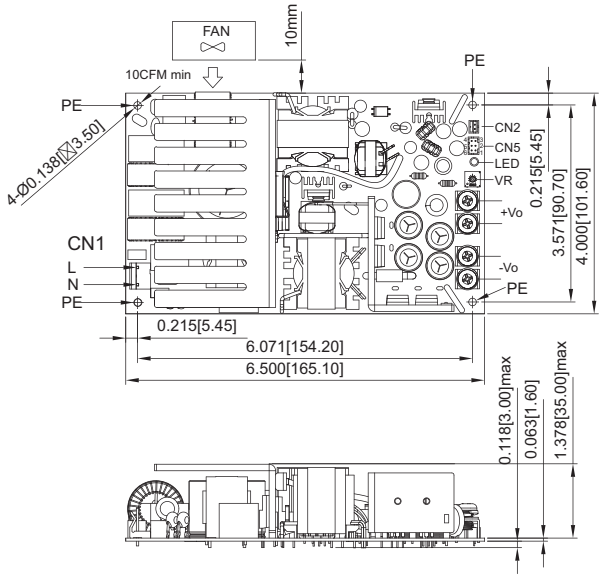
- Universal Input Range 90-264VAC
- EN60601-1 and EN55011 Class B
- 350W with Free Air Convection @ 220VAC
- Active PFC Meets EN61000-3-2 Class D
- High Efficiency Up to 93% Typical
- Remote Voltage Sense
- PS On/Off Remote Control
- +5V Stand-By Output Power
- 12V Fan Output
- 2 MOPP

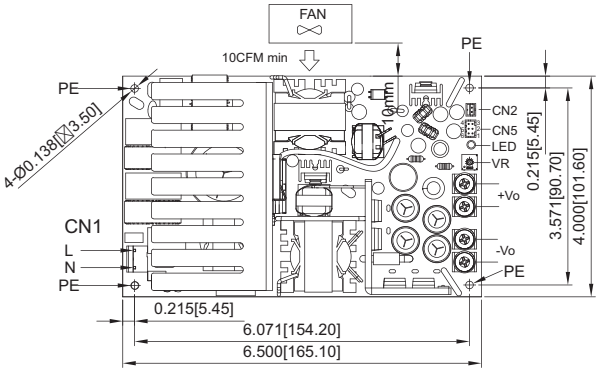
IEC 60601-1 EN 60601-1 TÜVRheinland

c UL us E252331

Mechanical Dimensions

All Dimensions in Inches (mm)
Tolerance Inches: X.XXX=±0.04, X.XXX=±0.010
Millimeters: X.X=±1.0, X.XX=±0.50.25





CN5:
PIN CONNECTION

Pin	Function	Pin	Function
1	GND	4	-SENSE
2	+5VSB	5	ENABLE
3	+SENSE	6	GND

CN2:
PIN CONNECTION

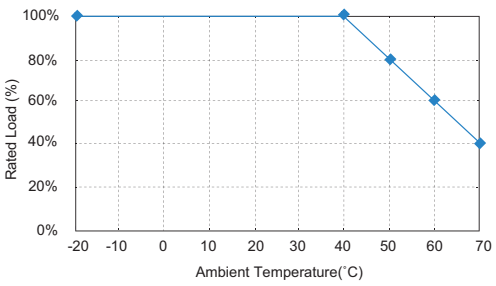
Pin	Function
1	FAN Output+
2	FAN Output-

MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT(A) RATED 1	OUTPUT CURRENT(A) RATED 2	RIPPLE & NOISE	VOLTAGE ADJ.RANGE	VOLTAGE ACCURACY	LINE REG.	LOAD REG.	% EFF. (Typ.)
Main Output Voltage									
CFM351M050	+5 V	60	40	100 mVp-p	4.75-5.25	±1.0%	±0.5%	±1%	88%
CFM351M120	+12 V	29.2	25	120 mVp-p	11.4-12.6	±1.0%	±0.5%	±1%	92%
CFM351M240	+24 V	14.6	12.5	150 mVp-p	22.8-25.2	±1.0%	±0.5%	±1%	93%
CFM351M480	+48 V	7.3	6.25	150 mVp-p	45.6-50.4	±1.0%	±0.5%	±1%	93%
Stand-by Output Voltage									
All	+5.0 V	0.3	0.3	----		----	----	----	
Fan Output Voltage									
All	+12.0 V	0.3	0.3	----		----	----	----	

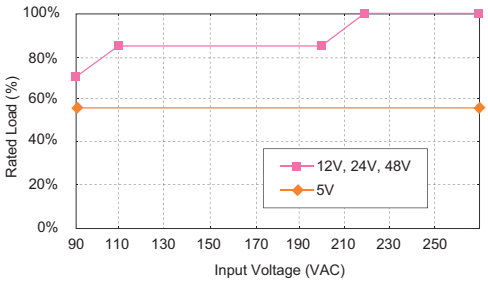
Note: 1. RATED1: 10CFM Air Flow
2. RATED2: Natural Convection (at 110 ~ 200 Vac, refer to derating curve)

Derating Curve

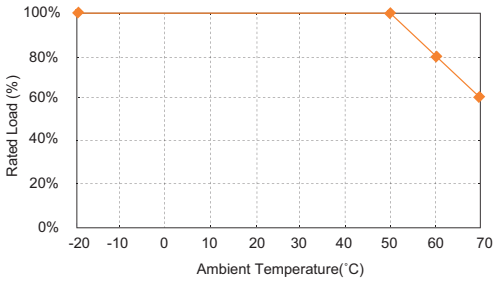
Natural Convection



Natural Convection



10CFM Air Flow



Specifications

All Specifications Typical At Nominal Line, Full Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

AC Input Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	50A max. @240Vac
Leakage Current @ 264Vac	300uA max.

OUTPUT SPECIFICATIONS

Total Rated Output Power	350W
Remote Voltage Sense	Compensates for Wire Voltage Drop
Adjustment Range on Vout	±5%
Hold-up Time	16ms typ.
Over Voltage Protection	Recycle AC Input to restart
Short Circuit Protection	Hiccup mode (Auto Recovery)
Temperature Coefficient	±0.05%/˚C

GENERAL SPECIFICATIONS

Isolation	Input to output = 5656VDC
Operating Temperature	-20-70˚C (See Derating Curve)
Storage Temperature	-40-85˚C
Humidity	93% RH max. Non condensing
Switching Frequency	55KHz Typical
MTBF …… MIL-HDBK-217F, GB, 25˚C/115VAC	100Khrs min.
Altitude	3000m
Dimensions	6.500 x 4.000 x 1.516 inches (165.00 x 101.60 x 38.60 mm)
Weight	640 g (1.42 Pounds)

SAFETY AND EMISSION

Emission and Immunity	EN55011 Class B, FCC Part 15 Class B, EN60601-1-2, EN61000-3-2, EN61000-3-3
Safety	Class I, IEC60601-1:2005, EN60601-1:2006, ANSI/AAMI ES60601-1:2005

NOTE

1. Add a 0.1μF ceramic capacitor and a 47μF E.L. capacitor to output for Ripple &Noise measuring @20MHz BW.
2. Voltage accuracy is set at 60% rated load and 25˚C.Ta.
3. Line regulation is measured from high line to low line with rated load.
4. Load regulation is measured at 60%±40% rated.
5. CN1: Molex 5273-03A Series or equivalent
   CN2: JST B2B-PH-K-S or equivalent
   CN5: Tyco 1470109-6 Series or equivalent

TR15RAM SERIES
15 WATT, MEDICAL SWITCHING ADAPTER

Features

- Universal Input Range 90-264VAC
- EN60601-1 and EN55011 Class B
- Continuous Short Circuit Protection
- Interchangeable AC Plugs
- Over Voltage Protection
- Efficiency & Standby Power Meet Level V (Output Cable Length ≦ 1800mm)
- 2 MOPP

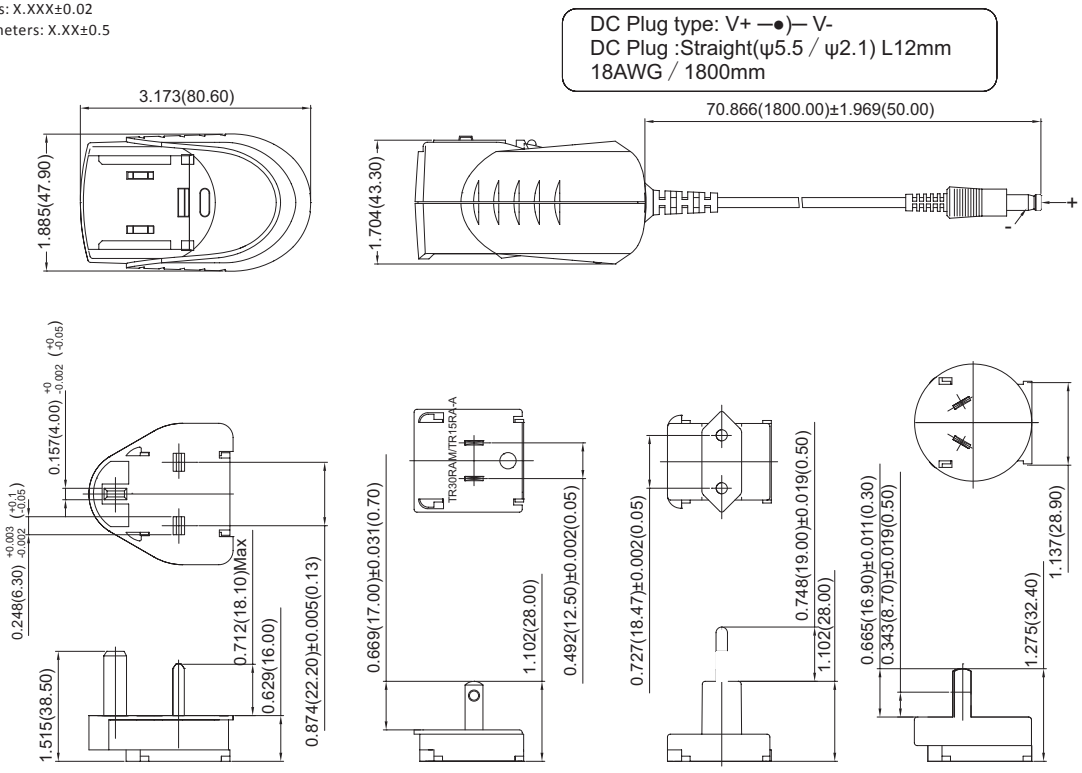
IEC 60601-1 EN 60601-1 E252331

Ordering information

TR15RAMXXX	-	XX	E	XX	-	XX	-BK
Model No.		DC Plug Type		DC Cable Length and Type 01: 720mm 02: 1220mm 03: 1800mm 11: 7200mm with Ferrite Core 12: 1220mm with Ferrite Core 13: 1800mm with Ferrite Core * 18AWG / UL1185		Color of Overmold Case BE: Blue GY: Gray RD: Red PE: Purple OR: Orange	

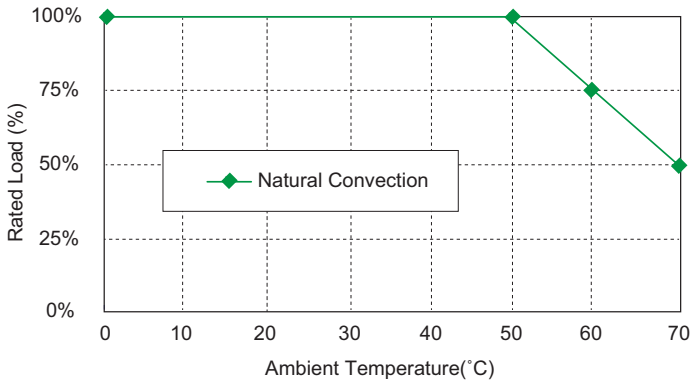
Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT (NOTE 1)	RIPPLE & NOISE (NOTE 2)	VOLTAGE ACCURACY (NOTE 3)	LINE REGULATION (NOTE 4)	LOAD REGULATION (NOTE 5)	% EFF. (Typ.)
TR15RAM050	5 V	2.0 A	1%	±3%	±1%	±4%	73%
TR15RAM120	12 V	1.1 A	1%	±2%	±1%	±2%	82%
TR15RAM150	15 V	1.0 A	1%	±2%	±1%	±2%	81%
TR15RAM240	24 V	625 mA	1%	±2%	±1%	±2%	82%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	50A max. @240Vac
Leakage Current	0.1mA max.

OUTPUT SPECIFICATIONS

Hold-up Time	10ms typ. @115Vac
Temperature Coefficient	±0.05%/°C
Short Circuit Protection	Continuous (Auto Recovery)
Over Voltage Protection	TVS Component to Clamp

GENERAL SPECIFICATIONS

Isolation	Input to output = 5,656VDC
Switching Frequency	95KHz typical
Operating Temperature	0-70˚C (See Derating Curve)
Storage Temperature	-20-85˚C
Cooling	Natural Convection
MTBF ……MIL-HDBK-217F, GB, at 25˚C/115VAC	200Khrs min.
Humidity	93% RH max. Non condensing
Altitude	3000m
Dimensions	3.173 x 1.885 x 1.704 inches (80.60 x 47.90 x 43.30 mm)
Weight	130 g (0.29 Pounds)

SAFETY AND EMISSION

Emission and Immunity	EN55011 Class B, FCC Part 15 Class B EN60601-1-2, EN61000-3-2, EN61000-3-3
Safety	Class II, IEC60601-1:2005, EN60601-1:2006, ANSI/AAMEI ES60601-1:2005

NOTE

1. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage setpoint at 60% full load.
3. Line regulation measured from 100VAC to 240VAC full load.
4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% load).
5. Typical efficiency at 230VAC and full load at 25˚C.

TR30RAM SERIES
30 WATT, MEDICAL SWITCHING ADAPTER

Features

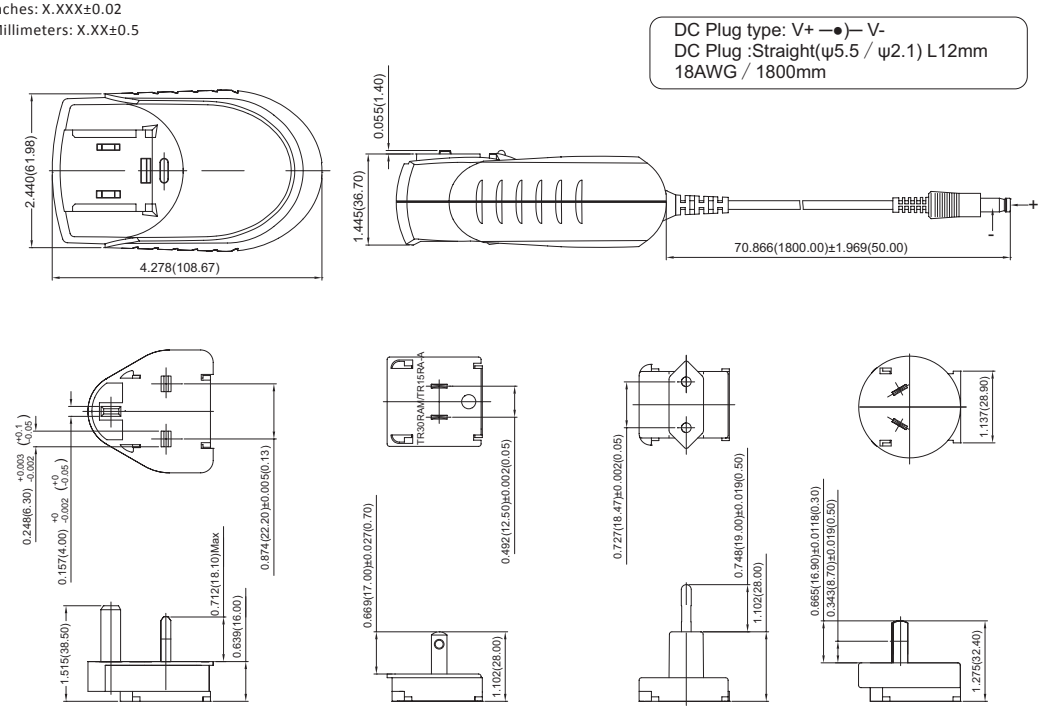
- Universal Input Range 90-264VAC
- Continuous Short Circuit Protection
- Over Voltage Protection
- EN60601-1 and EN55011 Class B
- 2 MOPP
- Efficiency & Standby Power Meet Level V (Output Cable Length ≦ 1800mm)
- Provide PSE Mark

Ordering information

TR30RAMXXX - XX		E	XX	-	XX	-BK
Model No.	DC Plug Type		DC Cable Length and Type 01: 720mm 02: 1220mm 03: 1800mm 11: 720mm with Ferrite Core 12: 1220mm with Ferrite Core 13: 1800mm with Ferrite Core * 18AWG / UL1185 * 16AWG / UL1185 for 5V, 9V		Color of Overmold Case BE: Blue GY: Gray RD: Red PE: Purple OE: Orange	

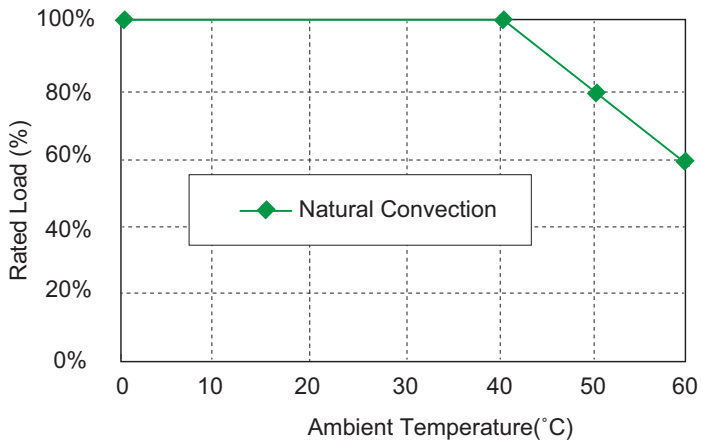
Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE (NOTE 1)	VOLTAGE ACCURACY (NOTE 2)	LINE REGULATION (NOTE 3)	LOAD REGULATION (NOTE 4)	% EFF. (Typ.) (NOTE 5)
TR30RAM050	5 V	4.0 A	1%	±2%	±1%	±6%	80%
TR30RAM090	9 V	3.0 A	1%	±2%	±1%	±3%	84%
TR30RAM120	12 V	2.5 A	1%	±2%	±1%	±2%	84%
TR30RAM150	15 V	2.0 A	1%	±2%	±1%	±2%	85%
TR30RAM180	18 V	1.67 A	1%	±2%	±1%	±2%	85%
TR30RAM240	24 V	1.25 A	1%	±2%	±1%	±2%	86%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Input Current	100Vac/0.8A max., 240Vac/0.4A max.
Inrush Current	Cold start@25˚C 100A max. @240Vac
Leakage Current	100µA max.

OUTPUT SPECIFICATIONS

Hold-up Time	10ms typ. @115Vac
Short Circuit Protection	Hiccup Mode (Auto Recovery)
Over Voltage Protection	TVS Component to Clamp
Temperature Coefficient	±0.05%/˚C

GENERAL SPECIFICATIONS

Isolation	Input to output = 4,000VAC (5,656VDC)
Operating Temperature	0-60˚C (See Drating Curve)
Storage Temperature	-20-85˚C
Humidity	93% RH max. Non condensing
Cooling	Natural Convection
Switching Frequency	70KHz Typical
MTBF …… MIL-HDBK-217F, GB, 25˚C/115VAC	200Khrs min.
Altitude	3000m
Dimensions	4.278 x 2.440 x 1.445 inches (108.67 x 61.98 x 36.70 mm)
Weight	300 g (0.67 Pounds)

SAFETY AND EMISSION

Emission and Immunity	EN55011 Class B, EN61000-3-2, EN61000-3-3, EN60601-1-2, IEC61000-4-2, 4, 5, 6, 8, 11 FCC CFR47 Part 18 Class B
Safety (Medical 3rd)	Class II, IEC60601-1:2005, EN60601-1:2006 UL ANSI/AAMI ES60601-1:2005

NOTE

1. Voltage accuracy is set at 60% load and 25˚C Ta.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation measured from 100VAC to 240VAC with full load.
4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% load)
5. Typical efficiency with 230VAC and max. load at 25°C.

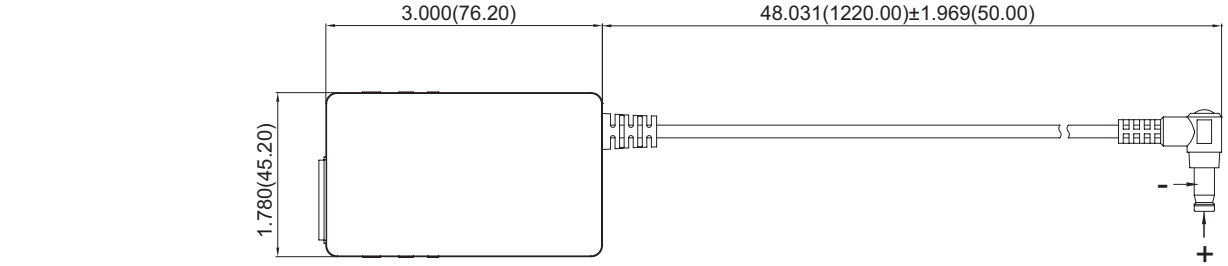
TRG21 SERIES
20 WATT, MEDICAL SWITCHING ADAPTER

Features

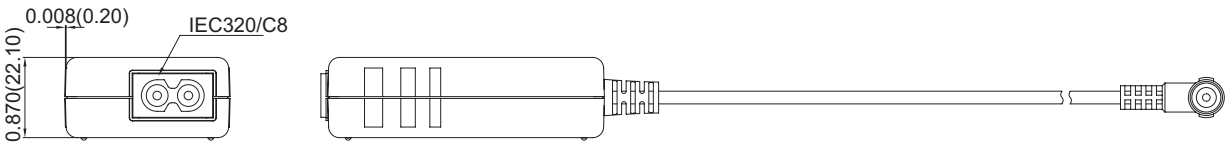
- Universal Input Range 90-264VAC
- Efficiency to 85%
- Continuous Short Circuit Protection
- Over Voltage Protection
- No Load Input Power < 0.3W
- Leakage Current < 0.1mA
- UL60601-1/IEC60601-1/EN60601-1 3rd Medical safety and IEC60950-1/EN60950-1 ITE Approved
- AC Inlet IEC320/C8
- 2 MOOP
- CEC and Erp Level V
  (Output Cable Length ≦ 1800mm 18AWG)
  (TRG21A050: Length ≦ 1200mm 18AWG)

Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5

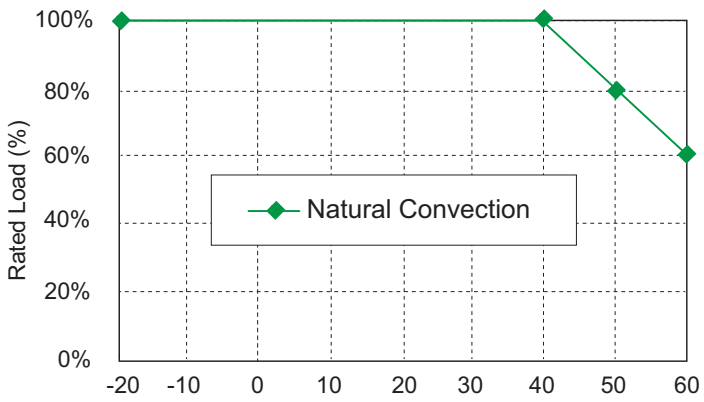


DC Plug type: V+ —●)— V-
DC Plug :Right Angle(ψ5.5 / ψ2.1) L12mm
18AWG / 1220mm



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT RATED POWER	RIPPLE & NOISE	VOLTAGE ACCURACY	LOAD REG.	% EFF.
TRG21A050	90-264 VAC	5 V	3.0 A	15.0 W	50 mV	±2%	±5%	75%
TRG21A090	90-264 VAC	9 V	2.3 A	20.7 W	50 mV	±2%	±4%	80%
TRG21A120	90-264 VAC	12 V	1.8 A	21.6 W	90 mV	±2%	±3%	81%
TRG21A150	90-264 VAC	15 V	1.4 A	21.0 W	100 mV	±2%	±3%	83%
TRG21A180	90-264 VAC	18 V	1.2 A	21.6 W	100 mV	±2%	±2%	84%
TRG21A240	90-264 VAC	24 V	0.9 A	21.6 W	100 mV	±2%	±2%	85%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, 75% Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Input Current	0.3 to 0.5A
Inrush Current	Cold Start @25˚C 40A max. @230Vac
Leakage Current	0.1mA max.

OUTPUT SPECIFICATIONS

Voltage Accuracy	±2.0% max.
Line Regulation (note 3)	±1.0% max.
Load Regulation (note 4)	see table
Hold-up Time	8ms typ. @115Vac
Short Circuit Protection	Continuous
Over Voltage Protection (TVS)	115%-140% of nominal output voltage

SAFETY AND EMISSION

CE Directive	2004/108/EC, 93/42/EEC
Emissions	EN60601-1/EN61204-3/ EN55022/CISPR Class B, EN55024
Safety Approvals	Class II, UL60601-1, IEC60601-1, EN60601-1 3rd, IEC60950-1, EN60950-1

GENERAL SPECIFICATIONS

Isolation	Input to output = 5,656VDC
Efficiency	see table
Switching Frequency	100KHz typ.
Operating Temperature	-20-60˚C (See Derating Curve)
Storage Temperature	-25-85˚C
Cooling	Natural Convection
Humidity	93% RH max. Non condensing
MTBF .... MIL-STD-217F, GB, at 25˚C/115VAC	400Khrs min.
Dimensions	3.000 x 1.780 x 0.870 inches (76.20 x 45.20 x 22.10 mm)
Weight	140 g (0.31 Pounds)

NOTE

1. Voltage accuracy is set of 60% rated load.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
3. Line regulation is measured from high line to low line with full load.
4. Load regulation is measured from 60% to full load and from 60% to 20% load (60% +/- 40% load).

TR30M SERIES
30 WATT, MEDICAL SWITCHING ADAPTER

Features

- Universal Input: 90-264VAC
- EN60601-1 and EN55011 Class B
- Continuous Short Circuit Protection
- Over Voltage Protection
- CEC Level Ⅳ Compliant Except TR30M050
  Meets CEC Level Ⅲ
  (Output Cable Length ≦ 1800mm)
  (TR30M050: Output Cable Length ≦ 720mm)
- Efficiency & Standby Power Meet Level V (Option)
  (Output Cable Length ≦ 1800mm)
  (TR30M050: Output Cable Length ≦ 720mm)
  (TR30M090: Output Cable Length ≦ 1220mm)
- 2 MOPP

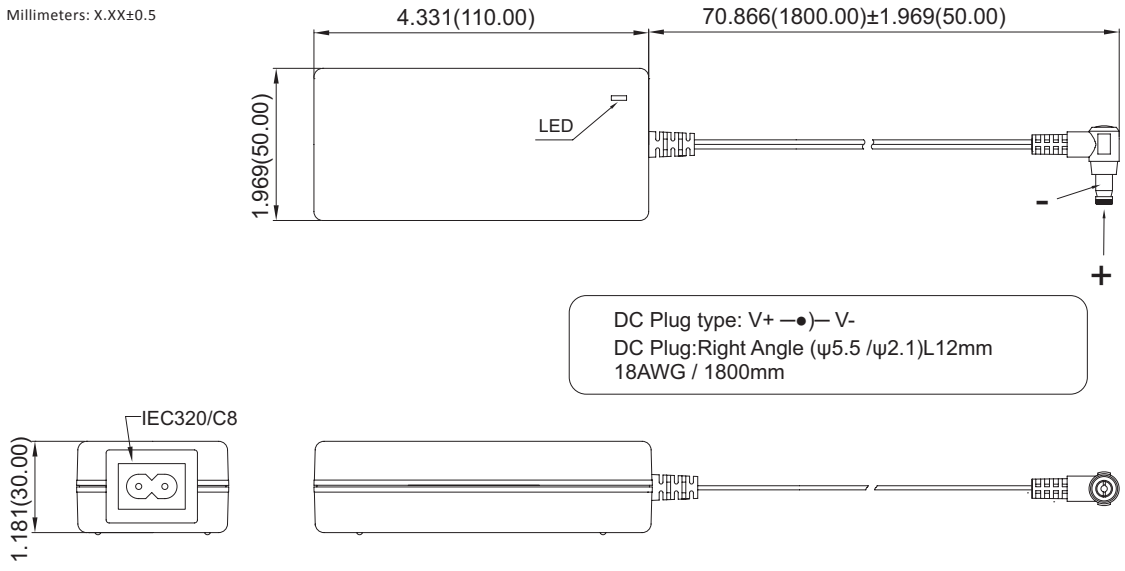
Ordering information

TR30MXXX	-	XX	E	XX
Model No.		DC Plug Type		DC Cable Length and Type 01: 720mm 02: 1220mm 03: 1800mm 11: 720mm with Ferrite Core 12: 1220mm with Ferrite Core 13: 1800mm with Ferrite Core * 18AWG / SPT1

IEC 60601-1 EN 60601-1 E252331 III IV V

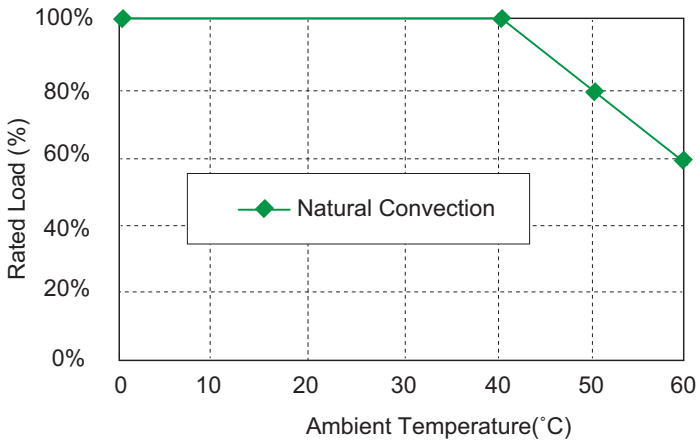
Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE (NOTE 2)	VOLTAGE ACCURACY (NOTE 1)	LINE REGULATION (NOTE 3)	LOAD REGULATION (NOTE 4)	% EFF. (Typ.) (NOTE 5)
TR30M050	5 V	4 A	50 mVp-p	±2%	±1%	±6%	76%
TR30M090	9 V	3 A	90 mVp-p	±2%	±1%	±4%	82%
TR30M120	12 V	2.5 A	120 mVp-p	±2%	±1%	±3%	82%
TR30M150	15 V	2 A	150 mVp-p	±2%	±1%	±3%	85%
TR30M180	18 V	1.65 A	180 mVp-p	±2%	±1%	±2%	85%
TR30M240	24 V	1.25 A	240 mVp-p	±2%	±1%	±2%	84%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, Full Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	50A max. @240Vac
Input Current	0.6A max.

OUTPUT SPECIFICATIONS

Hold-up Time	16ms typ. @115Vac
Short Circuit Protection	Continuous (Auto Recovery)
Over Voltage Protection	TVS Component to Clamp
Temperature Coefficient	±0.05%/˚C

GENERAL SPECIFICATIONS

Isolation	Input to output = 5,656VDC
Operating Temperature	0-60˚C (See Derating Curve)
Storage Temperature	-20-85˚C
Humidity	93% RH max. Non condensing
Cooling	Natural Convection
Switching Frequency	65KHz Typical
MTBF ..... MIL-HDBK-217F, GB, 25˚C/115VAC	300Khrs min.
Altitude	3000m
Dimensions	4.331 x 1.969 x 1.181 inches (110.00 x 50.00 x 30.00 mm)
Weight	220 g (0.49 Pounds)

SAFETY AND EMISSION

Emission and Immunity	EN55011, EN60601-1-2, EN61000-3-2, EN61000-3-3
Safety	Class II, IEC60601-1:2005, EN60601-1:2006, UL ANSI/AAMI ES60601-1:2005

NOTE

1. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
2. Voltage setpoint at 60% full load.
3. Line regulation is measured from 100VAC to 240VAC with full load.
4. Load regulation is measured from 60% to full load and from 60% to 20% load (60% +/- 40% load).
5. Typical efficiency at 230VAC and full load at 25˚C.

TR60M SERIES
60 WATT, MEDICAL SWITCHING ADAPTER

Features

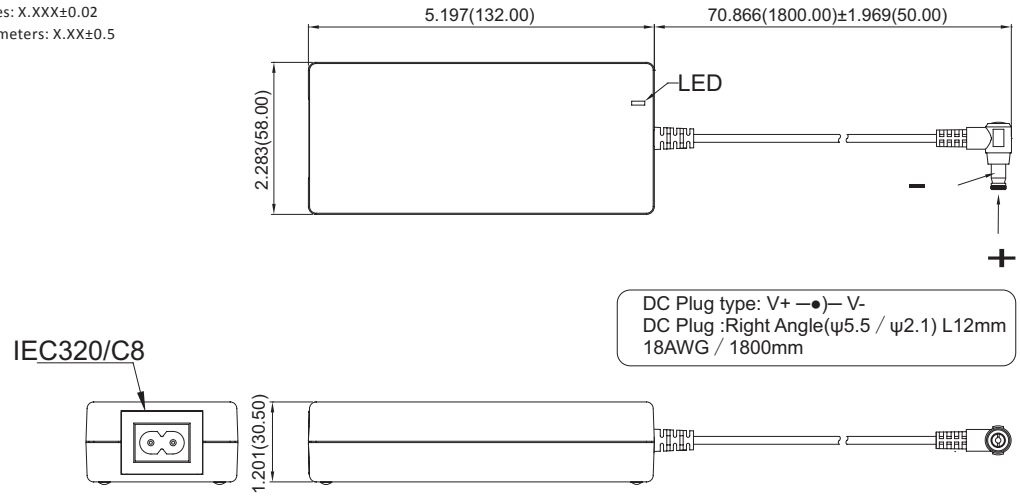
- Universal Input Range 90-264VAC
- EN60601-1 and EN55011 Class B
- Continuous Short Circuit Protection
- Over Voltage Protection
- Meets CEC Level Ⅳ
  (Output Cable Length ≦ 1800mm)
  (TR60M Series Meets CEC IV Except TR60M05 is Non-CEC Compliant)
  (TR60M12: Output Cable Length ≦ 1220mm 16AWG)
- Efficiency & Standby Power Meet Level V (Option)
  (Output Cable Length ≦ 1800mm)
  (TR60M12: Output Cable Length ≦ 720mm 16AWG)
  (TR60M15: Output Cable Length ≦ 1220mm 16AWG)
  (TR60M18, TR60M19: Output Cable Length ≦ 1500mm
- 2 MOPP

Ordering information

TR60MXX-	XX	X	XX
Model No.	DC Plug Type	OVP E: With OVP	DC Cable Length and Type 01: 720mm 02: 1220mm 03: 1800mm 11: 720mm with Ferrite Core 12:1220mm with Ferrite Core 13:1800mm with Ferrite Core *18AWG/UL1185

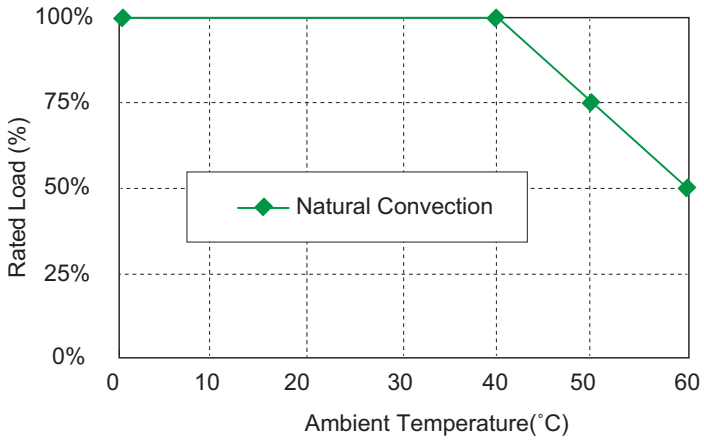
Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE (NOTE 2)	VOLTAGE ACCURACY (NOTE 1)	LINE REGULATION (NOTE 3)	LOAD REGULATION (NOTE 4)	% EFF. (Typ.) (NOTE 5)
TR60M05	5 V	6 A	50 mV	±4%	±1%	±6%	75%
TR60M12	12 V	5 A	120 mV	±2%	±1%	±5%	85%
TR60M15	15 V	4 A	150 mV	±2%	±1%	±3%	85%
TR60M18	18 V	3.33 A	180 mV	±2%	±1%	±2%	86%
TR60M19	19 V	3.15 A	190 mV	±2%	±1%	±2%	86%
TR60M24	24 V	2.5 A	240 mV	±2%	±1%	±2%	87%
TR60M36	36 V	1.66 A	360 mV	±2%	±1%	±2%	87%
TR60M48	48 V	1.25 A	480 mV	±2%	±1%	±2%	87%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, Full Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	Cold Start @25˚C 80A max. @240Vac
Conducted EMI	CISPR/FCC Class B
Leakage Current	0.1mA max.

OUTPUT SPECIFICATIONS

Hold-up Time	8ms typ. @115Vac
Short Circuit Protection	Continuous
Over Voltage Protection	Yes
Temperature Coefficient	±0.05%/˚C

GENERAL SPECIFICATIONS

Isolation	Input to output = 5,656VDC
Operating Temperature	0-60˚C (See Derating Curve)
Storage Temperature	-20-85˚C
Humidity	93% RH max. Non condensing
Cooling	Natural Convection
Switching Frequency	100KHz Typical
MTBF .....MIL-HDBK-217F, GB, at 25˚C/115VAC	200Khrs min.
Altitude	3000m
Dimensions	5.197 x 2.283 x 1.201 inches (132.00 x 58.00 x 30.50 mm)
Weight	345 g (0.76 Pounds)

SAFETY AND EMC

Emission and Immunity	EN55011, EN60601-1-2, EN61000-3-2, EN61000-3-3
Safety	Class II, IEC60601-1, EN60601-1, UL ANSI/AAMI ES60601-1:2005

NOTE

1. Voltage accuracy at 60% full load.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation is measured from 100VAC to 240VAC full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60% +/- 40% full load).
5. Typical efficiency at 230VAC and full load at 25˚C.

TR100M SERIES
100 WATT, MEDICAL SWITCHING ADAPTER

Features

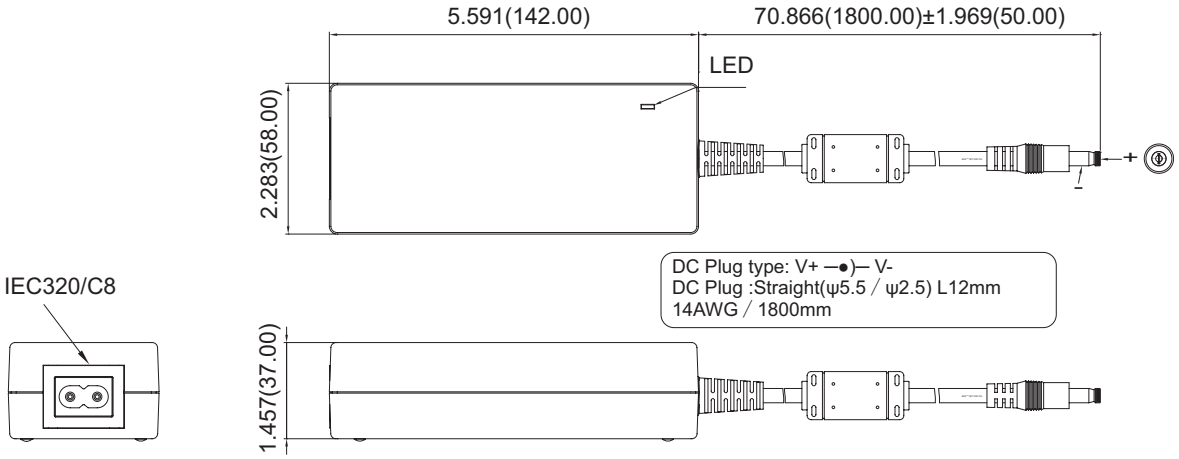
- Universal Input Range 90-264VAC
- Meets EN60601-1 and EN55011 Class B
- Continuous Short Circuit Protection
- Over Voltage Protection
- Efficiency & Standby Power Meet Level V
  (TR100M120-150: Output Cable
  Length ≦ 1500mm 14AWG /UL1185)
  (TR100M180-480: Output Cable
  Length ≦ 1800mm 16AWG /UL1185)
- 2 MOPP

Ordering information

TR100MXXX- Model No.	XX DC Plug Type	X OVP E: with OVP	XX or XXX DC Cable Length and Type 11: 720mm with Ferrite Core 12: 1220mm with Ferrite Core 36: 1500mm with Ferrite Core 13: 1800mm with Ferrite Core

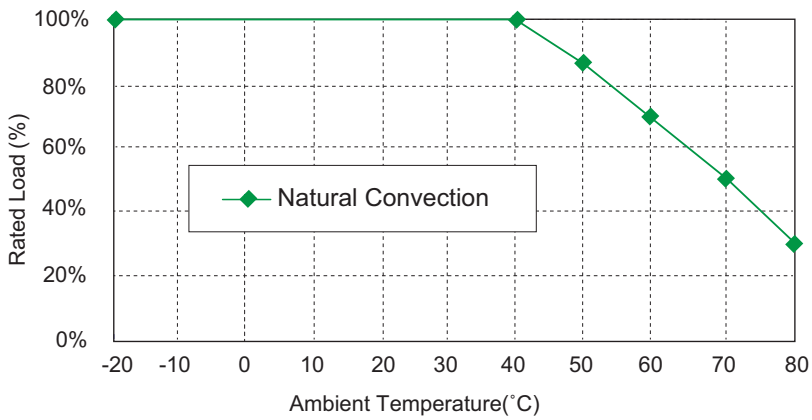
Mechanical Dimensions

All Dimensions are in Inches (mm)
Tolerance Inches: X.XXX±0.02
Millimeters: X.XX±0.5
UNIT: inches(mm)



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE (NOTE 2)	VOLTAGE ACCURACY (NOTE 1)	LINE REGULATION (NOTE 3)	LOAD REGULATION (NOTE 4)	% EFF. (Typ.) (NOTE 5)
TR100M120	12 V	8.34 A	1%	±2%	±1%	±4%	88%
TR100M150	15 V	6.67 A	1%	±2%	±1%	±3%	88%
TR100M180	18 V	5.56 A	1%	±2%	±1%	±2%	88%
TR100M190	19 V	5.27 A	1%	±2%	±1%	±2%	88%
TR100M200	20 V	5.0 A	1%	±2%	±1%	±2%	88%
TR100M240	24 V	4.17 A	1%	±2%	±1%	±2%	89%
TR100M480	48 V	2.1 A	1%	±2%	±1%	±2%	89%

Derating Curve



Specifications

All Specifications Typical At Nominal Line, Full Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Voltage	90-264Vac
Frequency	47 to 63Hz
Inrush Current	Cold Start @25˚C 100A max. @240Vac
Conducted EMI	CISPR/FCC Class B
Isolation	Input to output = 4k Vac
Leakage Current	0.1mA max.

OUTPUT SPECIFICATIONS

Hold-up Time	16ms typ. @115Vac
Short Circuit Protection	Hiccup Mode (Auto Recover)
Over Voltage Protection	TVS Component to Clamp
Temperature Coefficient	±0.05%/˚C

GENERAL SPECIFICATIONS

Operating Temperature	-20-80˚C (See Derating Curve)
Storage Temperature	-20-85˚C
Humidity	93% RH max. Non condensing
Cooling	Natural Convection
Switching Frequency	70KHz Typical
MTBF ... MIL-HDBK-217F, GB, at 25˚C/115VAC	150Khrs min.
Altitude	3000m
Dimensions	5.591 x 2.283 x 1.457 inches (142.00 x 58.00 x 37.00 mm)
Weight	500 g
AC Inlet	IEC320/C8

SAFETY AND EMC

Emission and Immunity	EN55011, EN60601-1-2, EN61000-3-2, EN61000-3-3
Safety (Medical 3rd)	Class II, IEC60601-1, EN60601-1 UL ANSI/AAMI ES60601-1

NOTE

1. Voltage accuracy at 60% full load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for ripple & noise measurement @20MHz BW.
3. Line regulation is measured from 100Vac to 240Vac, full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60% +/- 40% full load).
5. Typical efficiency with 230 VAC and full load at 25°C.

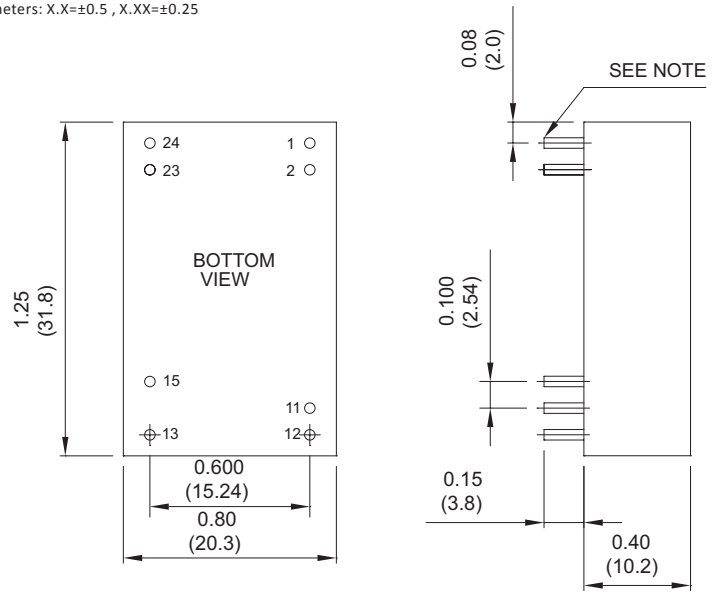
EC4AW-H6 SERIES
5-6 WATT, ISOLATION 6000 VDC

Features

- 5-6W Isolated Output
- DIP-24 Package
- Regulated Outputs
- Efficiency to 85%
- Continuous Short Circuit Protection
- I/O Isolation Voltage 6000VDC
- Reinforced Insulation Rated For Working Voltage 300VAC
- 5μA Leakage Current
- EMI Meets EN55022 Class A
- Safety Meets UL60950-1 and UL60601-1
- CE Mark 2004/108/EC

Mechanical Dimensions

NOTE: Pin Size is 0.02" Inch (0.5mm) DIA±0.05
All Dimensions in Inches (mm)
Tolerance Inches: X.XX=±0.02 , X.XXX=±0.010
Millimeters: X.X=±0.5 , X.XX=±0.25

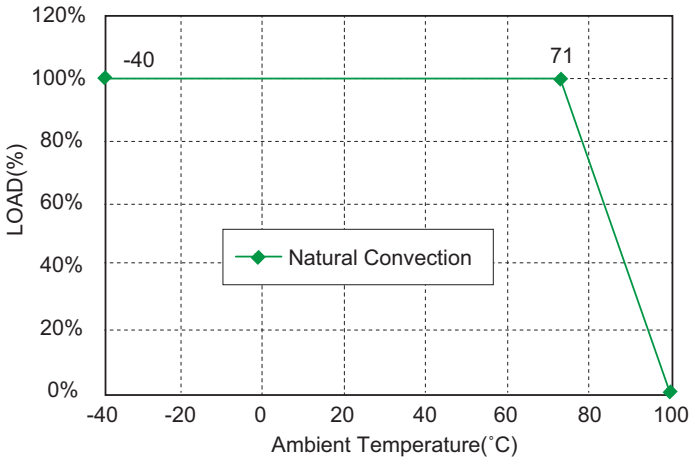


PIN CONNECTION		
PIN	Single Output	Dual Output
1	-V Input	-V Input
2	+V Input	+V Input
11	NP	Common
12	-V Output	NP
13	+V Output	-V Output
15	NP	+V Output
23	-V Input	-V Input
24	-V Input	-V Input

* NP-NO PIN
* NC-NO CONNECTION WITH PIN

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT MIN.	OUTPUT CURRENT MAX.	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	% EFF.	CAPACITOR LOAD MAX.
EC4AW-24S05H6	9-36 VDC	5 VDC	100 mA	1000 mA	10 mA	260 mA	80	1000μF
EC4AW-24S12H6	9-36 VDC	12 VDC	50 mA	500 mA	10 mA	295 mA	85	500μF
EC4AW-24D12H6	9-36 VDC	±12 VDC	25 mA	±250 mA	15 mA	298 mA	84	250μF
EC4AW-24D15H6	9-36 VDC	±15 VDC	20 mA	±200 mA	15 mA	298 mA	84	200μF
EC4AW-48S05H6	18-72 VDC	5 VDC	100 mA	1000 mA	5 mA	130 mA	80	1000μF
EC4AW-48S12H6	18-72 VDC	12 VDC	50 mA	500 mA	5 mA	149 mA	84	500μF
EC4AW-48D12H6	18-72 VDC	±12 VDC	25 mA	±250 mA	8 mA	150 mA	83	250μF
EC4AW-48D15H6	18-72 VDC	±15 VDC	20 mA	±200 mA	8 mA	149 mA	84	200μF

Derating Curve



Specifications

All Specifications Typical At Nominal Line, Full Load, and 25˚C Unless Otherwise Noted

INPUT SPECIFICATIONS

Input Voltage Range		24Vin 9-36V
		48Vin 18-72V
Under Voltage Protection		24Vin power up ..... 8.8V typ.
		24Vin power down .... 8V typ.
		48Vin power up..... 17V typ.
		48Vin power down .. 16V typ.
Leakage Current		5uA max.
Input Filter		Pi Type
Input Surge (100ms max.)		24Vin ..... 50V max.
		48Vin ..... 100V max.

OUTPUT SPECIFICATIONS

Voltage Accuracy		±1.5% max.
Voltage Balance (Dual)		±2.0% max.
Transient Response: 75%-100% Step Load Change		
	Error Band	±6% Vout nominal
	Recovery Time	< 500µs
Ripple & Noise, 20MHz BW (with 0.1µF MLCC)		5V ..... 100mV pk-pk max.
		12V/15V ..... 1% pk-pk max.
Temperature Coefficient		±0.05%/°C
Line Regulation (note 1)		±0.5% max.
Load Regulation	Single (note 2)	±0.5% max.
	Dual (note 3)	±1.0% max.
Cross Regulation (Dual output)		
Load Cross Variation 25%/100%		±5% max.
Output Short Circuit Protection		Continuous
Start up Time		1.5ms typ.

GENERAL SPECIFICATIONS

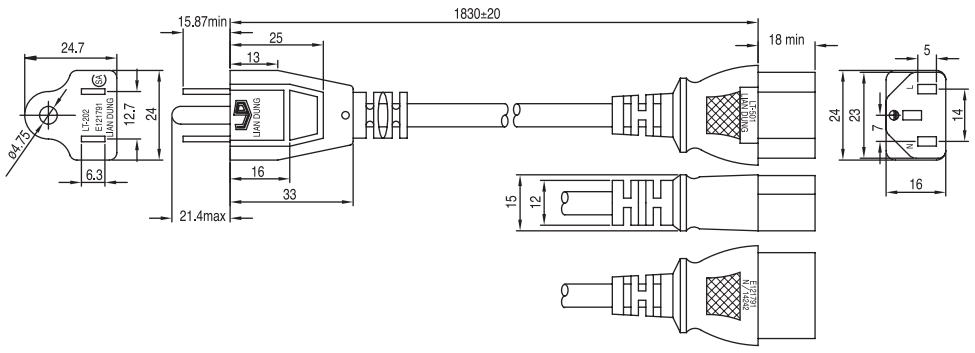
Efficiency	See Table
Isolation Voltage	6000VDC min.
Isolation Resistance	10^9 ohm min.
Isolation Capacitance	40pF typ.
Reinforced Insulation	Creepage Distances .....8mm min.
	Air Clearances ..... 8mm min.
Switching Frequency	100KHz min.
Operating Ambient Temperature	-40˚C to +71˚C
De-rating, Above 71˚C	Linearly to Zero power at 100˚C
Case Temperature (note 4)	100˚C max.
Storage Temperature	-40˚C to +100˚C
EMI	Conductive EMI Meet EN55022 Class A
Humidity	95% RH max. Non condensing
Dimensions	1.25 x 0.80 x 0.40 inches (31.8 x 20.3 x 10.2 mm)
Case Material	Non-Conductive Black Plastic

NOTE

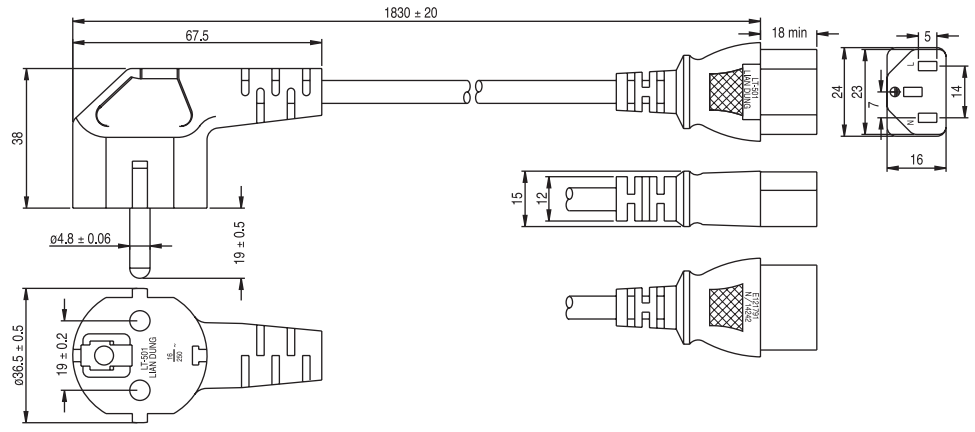
1. Measured from high line to low line.
2. Measured from full load to 10% load.
3. Measured from full load to 25% load.
4. Maximum case temperature under any operating condition should not be exceeded 100˚C.

AC POWER CORD

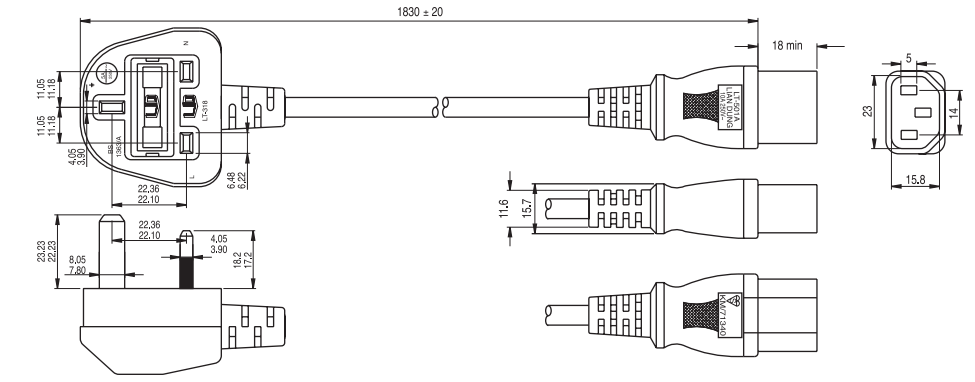
C13+US Plug
P/N: G7472205014
LT-202+501



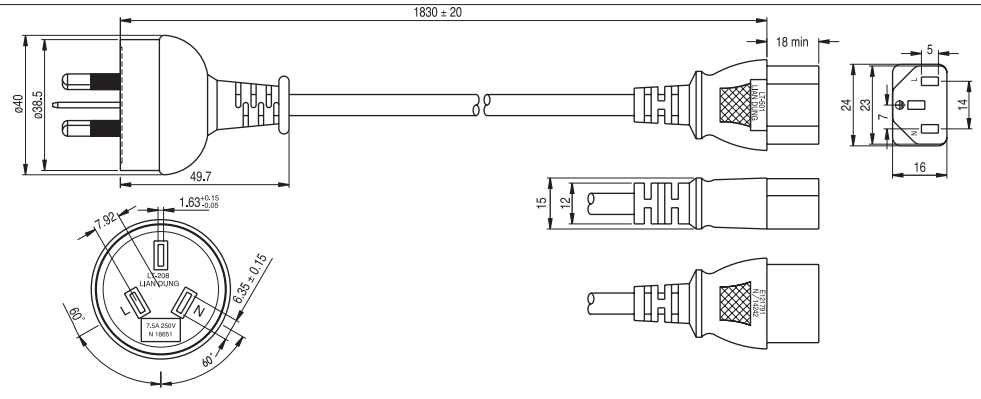
C13+European Plug
P/N: G7472205414
LT-322+501



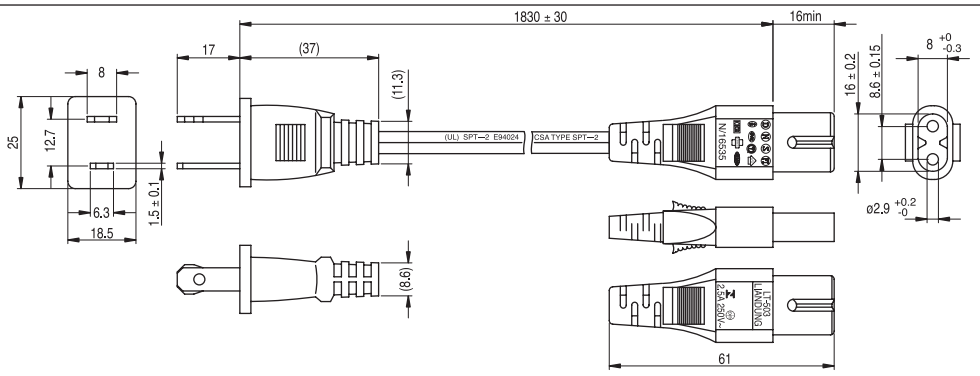
C13+UK Plug
P/N: G7472206214
LT-318+501A



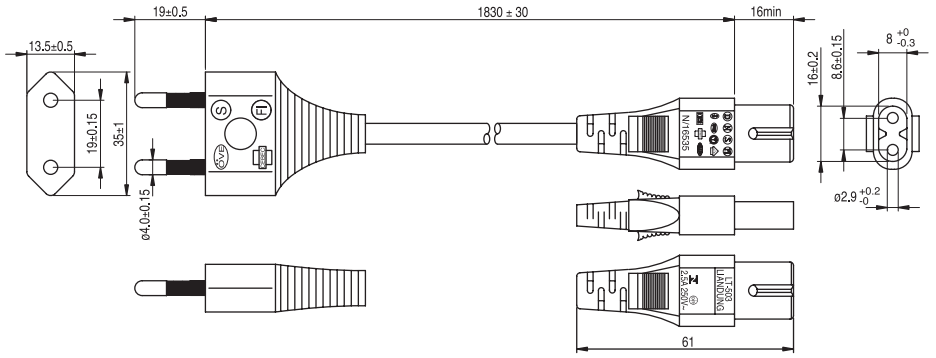
C13+Australian Plug
P/N: G7472205514
LT-208+501



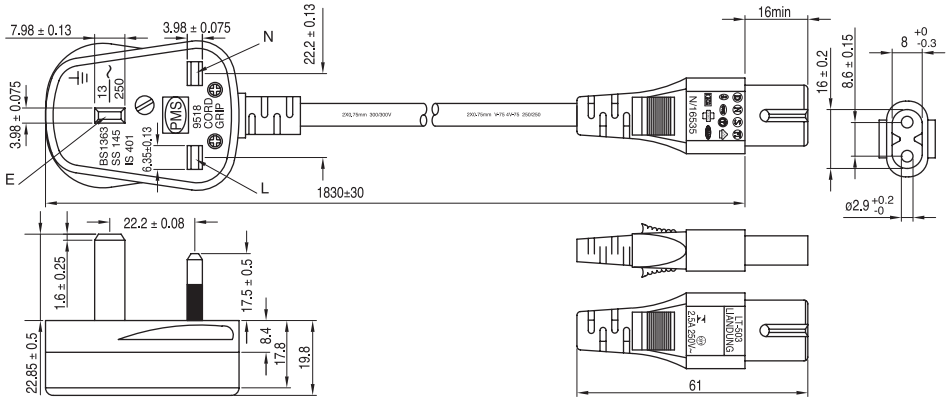
C7+US Plug
P/N: G7476205014
LT-301+503



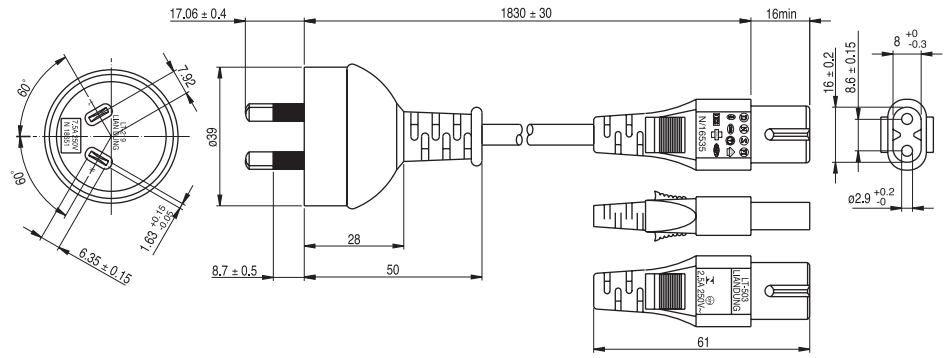
C7+European Plug
P/N: G7472205314
LT-207+503



C7+UK Plug
P/N: G7472205214
LT-317+503



C7+Australian Plug
P/N: G7472207014
LT-219+503



SWITCHING ADAPTER PART NUMBER CONFIGURATION

WALL-MOUNT AC-DC SWITCHING ADAPTER

TRXXXX - **XX** **X** **XX**

Model No.	AC Plug Type	DC Plug Type	OVP Option	DC Cable Length and Type

AC Plug Type

A : USA 2 Pin
E : Europe 2 Pin
U : British 3 Pin
S : Australia 2 Pin

DC Plug Type

Straight/Inner+Outer-

+ —●)— –

11 : 5.5 x 2.1 x 12mm
12 : 5.5 x 2.5 x 12mm
18 : 5.5 x 2.5 x 11mm
23 : 5.5 x 2.1 x 9.5mm
26 : 5.5 x 2.5 x 9.5mm
32 : 5.5 x 2.1 x 7.5mm
33 : 5.5 x 2.1 x 11.5mm
35 : 4.0 x 1.7 x 9.5mm
37 : 5.5 x 2.5 x 7.5mm
39 : 3.5 x 1.35 x 9mm
41 : 3.5 x 1.35 x 7.5mm
45 : 4.75 x 1.7 x 9.5mm
50 : 4.0 x 1.7 x 11mm

Right Angle/Inner+Outer-

+ —●)— –

01 : 5.5 x 2.1 x 12mm
02 : 5.5 x 2.5 x 12mm
17 : 5.5 x 2.1 x 11mm
19 : 5.5 x 2.5 x 10.5mm
20 : 5.5 x 2.5 x 9mm
21 : 5.5 x 2.5 x 9.5mm
24 : 5.5 x 2.1 x 9.5mm
31 : 3.5 x 1.35 x 7.5mm
34 : 5.5 x 2.1 x 11.5mm
36 : 3.5 x 1.35 x 9mm
40 : 4.0 x 1.7 x 9.5mm
42 : 3.5 x 1.35 x 9.5mm
46 : 4.0 x 1.7 x 12mm
48 : 5 x 1.5 x 9.5mm
49 : 2.35 x 0.7 x 9.5mm

Straight/Inner-Outer+

– —●)— +

05 : 5.5 x 2.1 x 12mm
13 : 5.5 x 2.1 x 12mm
14 : 5.5 x 2.5 x 12mm
27 : 5.5 x 2.5 x 9.5mm

Right Angle / Inner-Outer+

– —●)— +

03 : 5.5 x 2.1 x 12mm
04 : 5.5 x 2.5 x 12mm
16 : 5.5 x 2.1 x 11mm
22 : 5.5 x 2.5 x 9.5mm
43 : 5.5 x 2.1 x 9.5mm
44 : 3.5 x 1.35 x 7.5mm
105 : 3.5 x 1.05 x 9.5mm
111 : 3.5 x 1.35 x 9.5mm
122 : 3.5 x 1.35 x 12mm
141 : 5.5 x 2.1 x 11mm
150 : 3.5 x 1.35 x 9mm
317 : 5.5 x 2.5 x 9mm

OVP Option

A: Without OVP Option
E : With OVP Option

DC Cable Length and Type

01: 720mm
02: 1220mm
03: 1800mm
11: 720mm with Ferrite Core
12: 1220mm with Ferrite Core
13: 1800mm with Ferrite Core

DESK-TOP AC-DC SWITCHING ADAPTER

TRXXXXX -	XX	X	XX
Model No.	**DC Plug Type**	**OVP Option**	**DC Cable Length and Type**

Straight/Inner+Outer-

+——●)——–

11 : 5.5 x 2.1 x 12mm
12 : 5.5 x 2.5 x 12mm
18 : 5.5 x 2.5 x 11mm
23 : 5.5 x 2.1 x 9.5mm
26 : 5.5 x 2.5 x 9.5mm
32 : 5.5 x 2.1 x 7.5mm
33 : 5.5 x 2.1 x 11.5mm
35 : 4.0 x 1.7 x 9.5mm
37 : 5.5 x 2.5 x 7.5mm
39 : 3.5 x 1.35 x 9mm
41 : 3.5 x 1.35 x 7.5mm
45 : 4.75 x 1.7 x 9.5mm
50 : 4.0 x 1.7 x 11mm

Right Angle/Inner+Outer-

+——●)——–

01 : 5.5 x 2.1 x 12mm
02 : 5.5 x 2.5 x 12mm
17 : 5.5 x 2.1 x 11mm
19 : 5.5 x 2.5 x 10.5mm
20 : 5.5 x 2.5 x 9mm
21 : 5.5 x 2.5 x 9.5mm
24 : 5.5 x 2.1 x 9.5mm
31 : 3.5 x 1.35 x 7.5mm
34 : 5.5 x 2.1 x 11.5mm
36 : 3.5 x 1.35 x 9mm
40 : 4.0 x 1.7 x 9.5mm
42 : 3.5 x 1.35 x 9.5mm
46 : 4.0 x 1.7 x 12mm
48 : 5 x 1.5 x 9.5mm
49 : 2.35 x 0.7 x 9.5mm

Straight/Inner-Outer+

–——●)——– +

05 : 5.5 x 2.1 x 12mm
13 : 5.5 x 2.1 x 12mm
14 : 5.5 x 2.5 x 12mm
27 : 5.5 x 2.5 x 9.5mm

Right Angle/Inner-Outer+

–——●)——– +

03 : 5.5 x 2.1 x 12mm
04 : 5.5 x 2.5 x 12mm
16 : 5.5 x 2.1 x 11mm
22 : 5.5 x 2.5 x 9.5mm
43 : 5.5 x 2.1 x 9.5mm
44 : 3.5 x 1.35 x 7.5mm

A: Without OVP Option
E : With OVP Option

01: 720mm
02: 1220mm
03: 1800mm
11: 720mm with Ferrite Core
12: 1220mm with Ferrite Core
13: 1800mm with Ferrite Core

Cincon offers a wide variety of DC plugs for every customers.

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Cincon provides a broad range of standard products that address the needs of many applications, there are occasions when a standard product doesn't address all your application requirements.

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Company _____ Date _____

First Name _____ Last Name _____

Country _____ City _____

Address _____

Telephone _____ Fax _____

E-mail _____

Product Type	Application
Output Voltages	Output Currents
Input Voltages	Efficiency
Isolation	Protection

Storage / Operating Temperature Range

Safety Standard	EMC Standard

Mechanical Description

Remarks

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