

HiTRON

ON-BOARD UNIVERSAL INPUT AC-DC ENCAPSULATED MODULAR POWER SUPPLIES 10 WATTS SINGLE & DUAL OUTPUT HAM10S & HAM10D SERIES



FEATURES:

- ON-BOARD AC/DC MODULAR POWER SUPPLIES
- UNIVERSAL AC INPUT RANGE
- COMPACT IN SIZE
- MEET UNIVERSAL SAFETY STANDARDS
- EMI MEET CISPR PUB.22 / FCC CLASS B
- CE MARKING COMPLIANCE

SPECIFICATION

INPUT SPECIFICATION

Input Voltage: Typical 90-264Vac. (or 110-340Vdc).
Input Frequency: 47-63 Hz. (50/60Hz.Nom.) or DC.
Input Current: 0.3A at 115Vac./ 0.13A at 230Vac.
Inrush Current: 32.5A peak at 230Vac.
Input Fuse: Use external fuse. 1.0A/250Vac for primary fuse is suggested.
Dielectric Withstand: Meet IEC950.
3,000Vac-Output/Input.
1,500Vac-Input/GND.
500Vac-Output/GND.
EMI: Meet CISPR PUB.22/ FCC Class B.
Hold-up time: 20mS at 115Vac, 80mS at 230Vac.
Earth Leakage Current: Less than 3.5mA at 230Vac.

OUTPUT SPECIFICATION

Output Voltage: See Ratings Chart.
Output Current: See Ratings Chart.
Output Wattage: Typical 10 Watts.
Output Indicator: LED.
Line Regulation: Various with output voltage.
HAM10S typical $\pm 0.1\%$.
HAM10D typical $\pm 0.2\%$.
Load Regulation: Various with output voltage.
HAM10S typical $\pm 1.0\%$.
HAM10D typical $\pm 2.0\%$.
Noise & Ripple: Typical 1.0% peak to peak.
OVP: Built-in on main output.
Adjustability: From -10% of main output till OVP.
Overload Protection (OLP):
Fully protected against output overload and short circuit.
OLP set at about 125-150% rating output wattage.
Consult the factory for OLP setting.

GENERAL SPECIFICATION

Efficiency: Typical 67-79%. (Various with output voltage)
Switching Frequency: 75K Hz.
Circuit Topology: Fixed Frequency Flyback circuit.
Transient Response: Typical peak deviation 250mV,
Recovery time $< 3\text{mS}$ for a 25% load change.
Case: Impact resistant thermo-plastic enclosure.
Weight: 120g (4.23 Oz).
Power Density: 2.51 Watts. / Cubic inch.
Safety Standard: EN60950/ UL1950 Class I.
MTBF: 100,000 hours. Mil Std 217, 25°C.
Operating Temperature: -10 to +70°C range.
-10°C to +50°C full load without derating.
From +50°C, derating linearly to half load at +70°C.
(Refer to Derating Chart.)
Storage Temperature: -20°C to +85°C.
Temperature Coefficient: $\pm 0.02\% / ^\circ\text{C}$.
Humidity: Up to 95%RH, Non-condensing.
Cooling: Convection cooling for +50°C at full load.
At least 100LFM moving air is recommended
for full load $> +50^\circ\text{C}$ in a confined area.
Commercial Grade only.

NOTE: (1) All measurements are at nominal input, full load, and +25°C unless otherwise specified.

(2) Load Regulation measured from Full-Load (F-L) to Half-Load (H-L) at nominal input and others loaded at half load.

(3) Due to requests in market and advances in technology, specifications subject to change without notice.



For the details of safety approval, please consult the factory.

OUTPUT VOLTAGE/ CURRENT RATINGS CHART

SINGLE OUTPUT

MODEL NO.	VO1 @ ★		
	TYP.	VOLT.	PEAK
HAM10S-033243	2.43A	3.3V	2.91A
HAM10S-050200	2.00A	5.0V	2.44A
HAM10S-090112	1.12A	9.0V	1.34A
HAM10S-120090	0.90A	12.0V	1.08A
HAM10S-150072	0.72A	15.0V	0.86A
HAM10S-240045	0.45A	24.0V	0.54A
HAM10S-480025	0.25A	48.0V	0.30A

DUAL OUTPUT

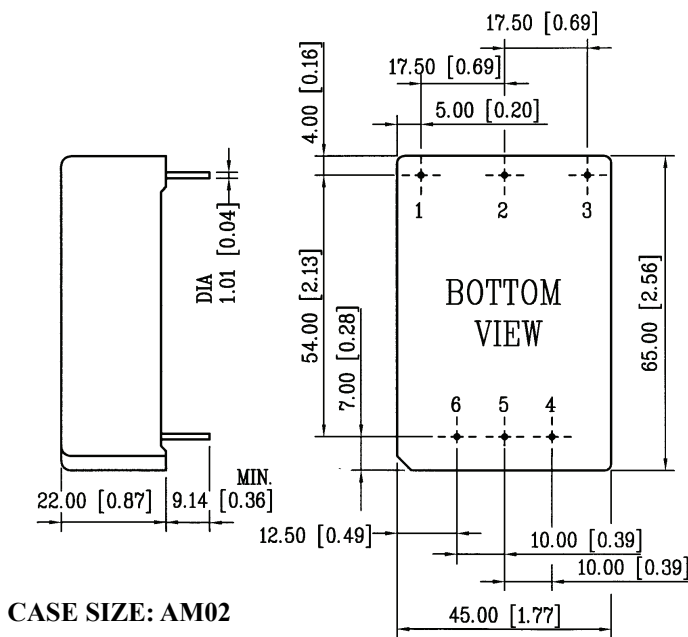
MODEL NO.	+VO1 @ ★			-VO2		
	TYP.	VOLT.	MAX.	TYP.	VOLT.	MAX.
HAM10D-033120	1.20A	+3.3V	1.38A	1.20A	-3.3V	1.38A
HAM10D-050100	1.00A	+5.0V	1.15A	1.00A	-5.0V	1.15A
HAM10D-120045	0.45A	+12.0V	0.51A	0.45A	-12.0V	0.51A
HAM10D-150035	0.35A	+15.0V	0.40A	0.35A	-15.0V	0.40A

Symbols: "★" OVP built-in. "@" Adjustable. "||" Double Feedback.

Note: (1) Max. (maximum load) is the continuous operating load of each rail, but the max. load of each rail can not be drawn from all outputs at the same time.
 (2) Peak output, less than 60 Sec. with duty cycle <10%.

MECHANICAL DIMENSIONS: MM [INCHES]

WEIGHT: 120.0g (4.23 Oz.)

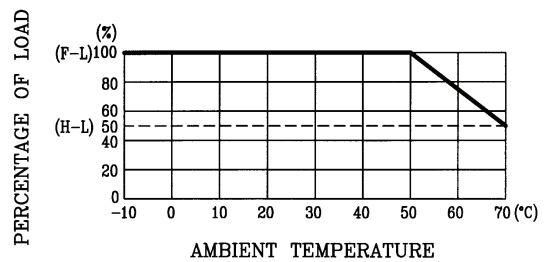


CASE SIZE: AM02

PIN ASSIGNMENT

PIN NO.	SINGLE	DUAL
PIN #1.	AC-GROUND	AC-GROUND
PIN #2.	AC-NEUTRAL	AC-NEUTRAL
PIN #3.	AC-LINE	AC-LINE
PIN #4.	+ VO1	+ VO1
PIN #5.	NO PIN	DC-COM
PIN #6.	DC-COM	-VO2

DERATING CHART





ON-BOARD UNIVERSAL INPUT AC-DC ENCAPSULATED MODULAR POWER SUPPLIES 10 WATTS TRIPLE OUTPUT HAM10-T SERIES



FEATURES:

- ON-BOARD AC/DC MODULAR POWER SUPPLIES
- UNIVERSAL INPUT RANGE
- COMPACT IN SIZE
- MEET UNIVERSAL SAFETY STANDARDS
- EMI MEET CISPR PUB.22 / FCC CLASS B
- CE MARKING COMPLIANCE

SPECIFICATION

INPUT SPECIFICATION

Input Voltage: 90-264Vac.
Input Frequency: 47-63 Hz. (50/60 Hz. Nom.)
Input Current: Typical 0.3A at 115Vac./0.13A at 230Vac.
Inrush Current: Typical 32.5A peak at 230Vac.
Input Fuse: Use external fuse. 1.0A/250Vac for the primary fuse is suggested.
Dielectric Withstand: Meet IEC950.
3,000Vac-Output/Input.
1,500Vac-Input/GND.
500Vac-Output/GND.
EMI: Meet CISPR PUB.22 / FCC class B.
Hold-up time: Typical 20mS at 115Vac, 80mS at 230Vac.
Earth Leakage Current: Less than 3.5mA at 230Vac.

OUTPUT SPECIFICATION

Output Voltage: See Ratings Chart.
Output Current: See Ratings Chart.
Output Wattage: Typical 10 Watts.
Output Indicator: LED.
Line Regulation: Various with output voltage, typ. $\pm 0.5\%$.
Load Regulation: Various with output voltage.
VO1 typ. $\pm 5.0\%$, VO2 typ. $\pm 3.0\%$, VO3 typ. $\pm 4.0\%$.
Noise & Ripple: Typical 1.0% peak to peak.
OVP: Built-in on main output.
Adjustability: From -10% of main output till OVP.
Overload Protection (OLP):
Fully protected against output overload and short circuit.
OLP set at about 125-150% rating output wattage.
Consult the factory for OLP setting.

GENERAL SPECIFICATION

Efficiency: Typical 70-75%. (Various with output voltage).
Switching Frequency: 83KHz.
Circuit Topology: Fixed Frequency Flyback circuit.
Transient Response: Typical peak deviation 250mV,
Recovery time $< 3\text{mS}$ for a 25% load change.
Case: Impact resistant thermo-plastic enclosure.
Power Density: 2.51 Watts. / Cubic inch.
Safety Standard: EN60950/ UL1950 Class I.
MTBF: 110,000 hours. Mil Std 217, 25 °C.

Operating Temperature: -10 to +70°C range.
-10°C to +50°C full load without derating.
From +50°C, derating linearly to half load at +70°C.
(Refer to Derating Chart.)
Storage Temperature: -20°C to +85°C.
Temperature Coefficient: $\pm 0.03\%$ /°C.
Humidity: Up to 95%RH, Non-condensing.
Cooling: Convection cooling for +50°C at full load.
At least 100LFM moving air is recommended
for full load $> +50^\circ\text{C}$ in a confined area.
Commercial Grade only.

NOTE: (1) All measurements are at nominal input, full load, and +25°C unless otherwise specified.
(2) Load Regulation measured from Full-Load (F-L) to Half-Load (H-L) at nominal input and others loaded at half load.
(3) Due to requests in market and advances in technology, specifications subject to change without notice.



For the details of safety approval, please consult the factory.

OUTPUT VOLTAGE/ CURRENT RATINGS CHART

TRIPLE OUTPUT

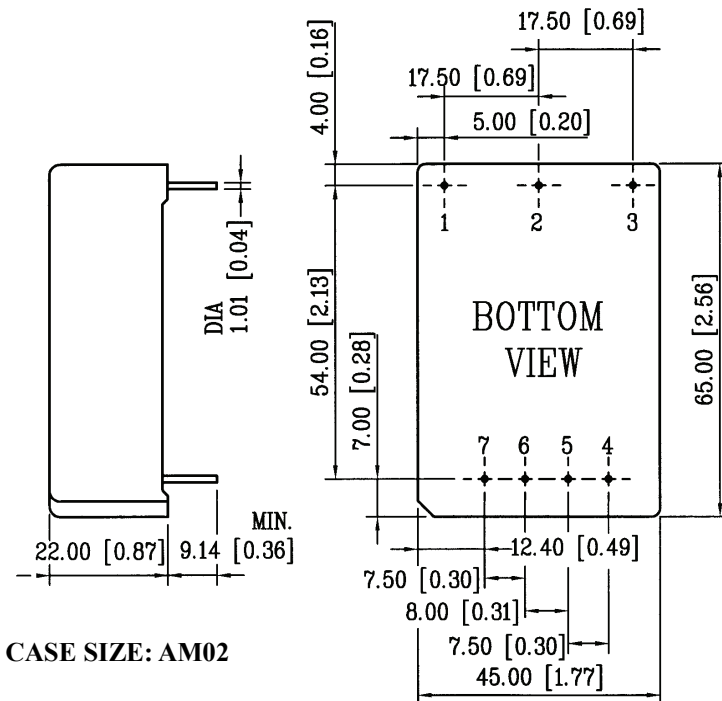
MODEL NO.	+VO1 @★			+VO2 †			-VO3		
	TYP.	VOLT.	MAX.	TYP.	VOLT.	MAX.	TYP.	VOLT.	MAX.
HAM10T-5/09	1.0A	+5.0V	1.15A	0.27A	+9.0V	0.31A	0.27A	-9.0V	0.31A
HAM10T-5/12	1.0A	+5.0V	1.15A	0.25A	+12.0V	0.28A	0.25A	-12.0V	0.28A
HAM10T-5/15	1.0A	+5.0V	1.15A	0.20A	+15.0V	0.23A	0.20A	-15.0V	0.23A
HAM10T-5/24	1.0A	+5.0V	1.15A	0.12A	+24.0V	0.14A	0.12A	-24.0V	0.14A
HAM10T-3/05	1.0A	+3.3V	1.15A	0.40A	+5.0V	0.46A	0.40A	-5.0V	0.46A
HAM10T-3/12	1.0A	+3.3V	1.15A	0.25A	+12.0V	0.29A	0.25A	-12.0V	0.29A
HAM10T-3/15	1.0A	+3.3V	1.15A	0.20A	+15.0V	0.23A	0.20A	-15.0V	0.23A
HAM10T-3/5,12	1.0A	+3.3V	1.15A	0.40A	+5.0V	0.46A	0.25A	-12.0V	0.28A
HAM10T-3/24	1.0A	+3.3V	1.15A	0.12A	+24.0V	0.14A	0.12A	-24.0V	0.14A

Symbols: "★" OVP built-in. "@" Adjustable. "||" Double Feedback. "†" Stacked on main O/P.

Note: (1) Max. (maximum load) is the continuous operating load of each rail, but the max. load of each rail can not be drawn from all outputs at the same time.
 (2) Peak output, less than 60 Sec. with duty cycle <10%.

MECHANICAL DIMENSIONS: MM [INCHES]

WEIGHT: 120.0g (4.23 Oz.)



PIN ASSIGNMENT

PIN NO.	TRIPLE
PIN #1	AC-GROUND
PIN #2	AC-NEUTRAL
PIN #3	AC-LINE
PIN #4	+ VO2
PIN #5	+ VO1
PIN #6	DC-COM
PIN #7	- VO3

DERATING CHART

