

Series 1707

7.5 – 20 Watt Hybrid

For demanding Industrial and Railroad (EN50155) applications

Features

- Hermetic packaging protects against harsh environments
- Built-in EMI filter limits conducted emissions and reduces transient susceptibility
- Short circuit proof – inherent dual mode overcurrent protection
- Fixed frequency operation offers low ripple and fast load transient response
- User programmable soft start for Vout ramp
- Sync input
- Power on/off – ground INH to shut output: low quiescent current
- Precision RF feedback – no optical devices used
- Parallelable – for higher output prime or redundant power applications

Specifications

INPUT: 110 VDC nominal
Range: 77 to 135 VDC
Operates through input transients of up to 160 V

ISOLATION:

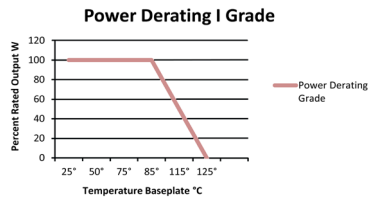
Input to case: 100 MOhms at 500 VDC
Input to output: 100 MOhms at 500 VDC
Output to case: 10 MOhms at 100 VDC

ENVIRONMENT:

Storage temperature: -55°C to +150°C
Mechanical Shock: 50 G's, 11 mSec 1/2 sine pulse, 3X each axis
Random Vibration: 30 G's 50 – 2000Hz, 6dB/octave ramp, .6 PSD, 32g RMS overall

DERATING:

Full Power Output at $T_{case} = +85^{\circ}C$
Linearly derates to 50% at $T_{case} = +115^{\circ}C$



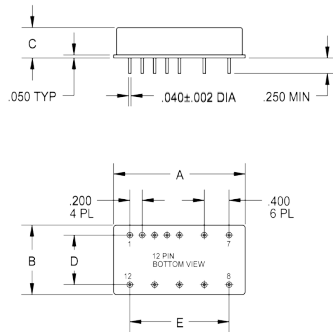
WEIGHT: 60 grams typical

SINGLE OUTPUT DEVICES		1707-S02 (8W)			1707-S02.5 (10W)			1707-S03.3 (13.2W)			1707-S05 (20W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	—	+1.9	+2.0	+2.1	+2.4	+2.5	+2.6	+3.2	+3.3	+3.4	+4.9	+5.0	+5.1
Output current	$V_{in min} - V_{in max}$	—	—	4A	—	—	4A	—	—	4A	—	—	4A
Efficiency	$P_{out} = \text{max rated load}$	55%	58%	—	60%	63%	—	65%	68%	—	70%	73%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in min} - V_{in max}$	—	10mV	30mV	—	10mV	30mV	—	10mV	30mV	—	10mV	50mV
Load regulation	$P_{out} = 10\% \text{ to F.L.}$	—	10mV	30mV	—	10mV	30mV	—	10mV	30mV	—	10mV	50mV
Output ripple	F.L. BW 2 MHz mV _{pp}	—	25	50	—	30	60	—	30	65	—	40	85

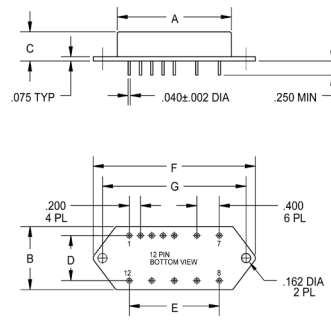
SINGLE OUTPUT DEVICES		1707-S05.2 (20W)			1707-S12 (20W)			1707-S15 (20W)			1707-S28 (20W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	—	+5.1	+5.2	+5.3	+11.9	+12.0	+12.1	+14.9	+15.0	+15.1	+27.8	+28.0	+28.2
Output current	$V_{in min} - V_{in max}$	—	—	3.85A	—	—	1.67A	—	—	1.33A	—	—	714mA
Efficiency	$P_{out} = \text{max rated load}$	70%	73%	—	76%	80%	—	77%	81%	—	76%	80%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in min} - V_{in max}$	—	10mV	50mV	—	20mV	100mV	—	25mV	125mV	—	50mV	250mV
Load regulation	$P_{out} = 10\% \text{ to F.L.}$	—	10mV	50mV	—	20mV	100mV	—	25mV	125mV	—	50mV	250mV
Output ripple	F.L. BW 2 MHz mV _{pp}	—	40	85	—	60	150	—	75	180	—	150	350

Model No.	Case Style	Pin Count	Mounting
1707	2	12	Solder Sealed Flangeless PCB Mount
1707	F	12	Solder Sealed PCB Mount with Flange
1707	VF	12	Seam Weld Chassis Mount with Flange

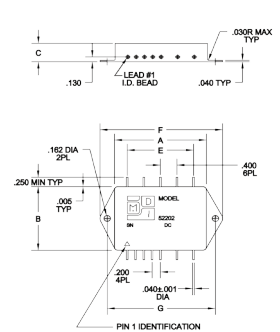
CASE STYLE 2
Solder Sealed
Flangeless PCB Mount



CASE STYLE 3
Solder Sealed
PCB Mount with Flange



CASE STYLE 8
Seam Welded
Chassis Mount with Flange



Case Dimensions

Units: inches | millimeters

TOLERANCES: ALL DIMENSIONS ±0.01 EXCEPT F= MAX. C = +0.01/-0.02; **DRAWINGS IN INCHES.**

Case Style	A	B	C	D	E	F	G
2	2.130 54.102	1.120 28.448	0.495 12.573	0.800 20.320	1.600 40.640	— —	— —
3 F	2.130 54.102	1.120 28.448	0.495 12.573	0.800 20.320	1.600 40.640	2.890 73.406	2.550 64.770
8 VF	2.160 54.864	1.510 38.354	0.495 12.573	— —	1.600 40.640	2.890 73.406	2.550 64.770



Modular Devices, Inc.
Power Conversion for Industrial/Railroad

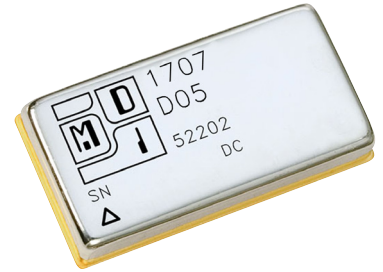
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Series 1707

DC – DC Converters INDUSTRIAL/RAILROAD GRADE

DUAL OUTPUT DEVICES		1707-D3.3/5 (11.6W)			1707-D05 (20W)			1707-D12 (20W)			1707-D15 (20W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	—	+3.2 +4.9	+3.3 +5.0	+3.4 +5.1	+4.9 -4.9	+5.0 -5.0	+5.1 -5.1	+11.9 -11.9	+12.0 -12.0	+12.1 -12.1	+14.9 -14.9	+15.0 -15.0	+15.1 -15.1
Output current*	$V_{in\ min} - V_{in\ max}$	200mA 100mA	—	2A 1A	±150mA	—	±2A	±125mA	—	±833mA	±100mA	—	±667mA
Efficiency	$P_{out} = \text{max rated load}$	62%	65%	—	70%	74%	—	76%	80%	—	77%	81%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in\ min} - V_{in\ max}$	— —	10mV 10mV	30mV 50mV	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
Load regulation ¹	$P_{out} = 10\% \text{ to F.L.}$	—	10mV 10mV	30mV 50mV	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
Output ripple	F.L. BW 2 MHz mV_{pp}	— —	30 25	65 50	—	40	85	—	60	150	—	75	180

110 Volts DC Input



Notes: *Up to 90% full power available from either output if rated output power is not exceeded; ¹balanced load conditions.

TRIPLE OUTPUT DEVICES		1707-T3.3/5 (7.5W)			1707-T3.3/12 (10W)			1707-T3.3/15 (10W)			1707-T05 (7.5W)			1707-T12 (10W)			1707-T15 (10W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	$+I_{out} = -I_{out}$	+3.2 +4.9 -4.9	+3.3 +5.0 -5.0	+3.4 +5.1 -5.1	+3.2 +11.9 -11.9	+3.3 +12.0 -12.0	+3.4 +12.1 -12.1	+3.2 +14.9 -14.9	+3.3 +15.0 -15.0	+3.4 +15.1 -15.1	+4.9 +4.9 -4.9	+5.0 +5.0 -5.0	+5.1 +5.1 -5.1	+4.9 +11.9 -11.9	+5.0 +12.0 -12.0	+5.1 +12.1 -12.1	+4.9 +14.9 -14.9	+5.0 +15.0 -15.0	+5.1 +15.1 -15.1
Output current	$V_{in\ min} - V_{in\ max}$	150mA ±15mA	— —	1.5A ±250mA	150mA ±15mA	— —	1.5A ±208mA	150mA ±15mA	— —	1.5A ±167mA	60mA ±15mA	— —	1A ±250mA	30mA ±15mA	— —	1A ±208mA	30mA ±15mA	— —	1A ±167mA
Efficiency	$P_{out} = \text{max rated load}$	65%	68%	—	65%	68%	—	65%	68%	—	64%	67%	—	69%	72%	—	69%	72%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in\ min} - V_{in\ max}$	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV
Load regulation	$P_{out} = 10\% \text{ to F.L.}$	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV	—	10mV 25mV	50mV 50mV
Output ripple	F.L. BW 2 MHz mV_{pp}	— —	30 —	65 50	— —	30 —	65 50	— —	30 —	65 50	— —	40 —	85 50	— —	40 —	85 50	— —	40 —	85 50

1707-SXX output < 24 VDC			1707-SXX output ≥ 24 VDC			1707-DXX			1707-TXX						
Pin 1	N/C	Pin 7	+ Input	Pin 1	N/C	Pin 7	+ Input	Pin 1	N/C	Pin 7	+ Input	Pin 1	N/C	Pin 7	+ Input
Pin 2	Inhibit Not	Pin 8	Main Output	Pin 2	Inhibit Not	Pin 8	N/C	Pin 2	Inhibit Not	Pin 8	N/C	Pin 2	Inhibit Not	Pin 8	Main Output
Pin 3	Soft Start	Pin 9	Main Output Ret	Pin 3	Soft Start	Pin 9	N/C	Pin 3	Soft Start	Pin 9	N/C	Pin 3	Soft Start	Pin 9	Main Output Ret
Pin 4	Sync	Pin 10	N/C	Pin 4	Sync	Pin 10	Main Output	Pin 4	Sync	Pin 10	+ Dual Output	Pin 4	Sync	Pin 10	+ Dual Output
Pin 5	N/C	Pin 11	Adjust	Pin 5	N/C	Pin 11	N/C	Pin 5	N/C	Pin 11	Dual Output Ret	Pin 5	N/C	Pin 11	Dual Output Ret
Pin 6	Input Ret	Pin 12	N/C	Pin 6	Input Ret	Pin 12	Main Output Ret	Pin 6	Input Ret	Pin 12	- Dual Output	Pin 6	Input Ret	Pin 12	- Dual Output



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