

Series 1693

17 – 40 Watt Hybrid

For demanding industrial applications not requiring military specifications

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: 24 VDC nominal
Range: 18 to 50 VDC
Operates through input transients of up to 80 V

ISOLATION:

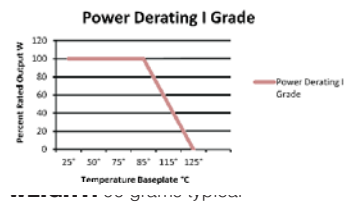
Input to case: 100 MOhms at 500 VDC
Input to output: 100 MOhms at 500 VDC
Output to case: 10 MOhms at 100 VDC

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 $T_{case} = +115^{\circ}C$

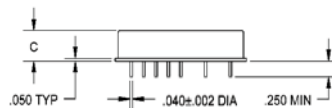


SINGLE OUTPUT DEVICES		1693-S03.3 (26.4W)			1693-S05 (40W)			1693-S05.2 (40W)			1693-S12 (40W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	—	+3.2	+3.3	+3.4	+4.9	+5.0	+5.1	+5.1	+5.2	+5.3	+11.9	+12.0	+12.1
Output current	$V_{in min} - V_{in max}$	—	—	8A	—	—	8A	—	—	7.69A	—	—	3.33A
Efficiency	$P_{out} = \text{max rated load}$	66%	69%	—	69%	73%	—	71%	74%	—	78%	82%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in min} - V_{in max}$	—	10mV	30mV	—	10mV	50mV	—	10mV	50mV	—	20mV	100mV
Load regulation	$P_{out} = 10\%$ to F.L.	—	10mV	30mV	—	10mV	50mV	—	10mV	50mV	—	20mV	100mV
Output ripple	F.L. BW 2 MHz	—	30	65	—	40	85	—	40	85	—	60	150

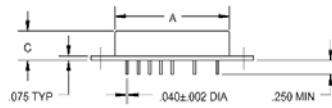
SINGLE OUTPUT DEVICES		1693-S15 (40W)			1693-S28 (40W)								
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	—	+14.9	+15.0	+15.1	+27.8	+28.0	+28.2						
Output current	$V_{in min} - V_{in max}$	—	—	2.67A	—	—	1.43A						
Efficiency	$P_{out} = \text{max rated load}$	79%	83%	—	78%	82%	—						
Line regulation	$P_{out} = \text{max rated load}$ $V_{in min} - V_{in max}$	—	25mV	125mV	—	50mV	250mV						
Load regulation	$P_{out} = 10\%$ to F.L.	—	25mV	125mV	—	50mV	250mV						
Output ripple	F.L. BW 2 MHz mV _{pp}	—	75	180	—	150	350						

Model No.	Case Style	Pin Count	Mounting
1693	2	12	Solder Sealed Flangeless PCB Mount
1693	F	12	Solder Sealed PCB Mount with Flange
1693	XF	12	Seam Weld Chassis Mount with Flange
1693	PC	10	Solder Sealed Flangeless PCB Stud Mount

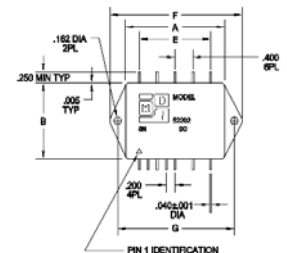
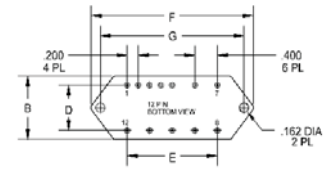
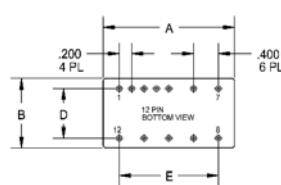
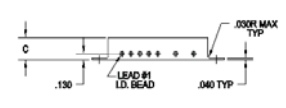
CASE STYLE 2
Solder Sealed
Flangeless PCB Mount



CASE STYLE 3
Solder Sealed
PCB Mount with Flange



CASE STYLE 8
Seam Weld
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		2.205 56.007	1.755 44.577	0.495 12.573	1.400 35.560	1.600 40.640	— —	— —
3	F	2.205 56.007	1.755 44.577	0.495 12.573	1.400 35.560	1.600 40.640	2.960 75.184	2.610 66.294
8	XF	2.220 56.388	2.110 53.594	0.495 12.573	— —	1.600 40.640	2.960 75.184	2.610 66.294
10	PC	2.220 56.388	1.760 44.704	0.495 12.573	1.400 35.560	1.600 40.640	— —	— —



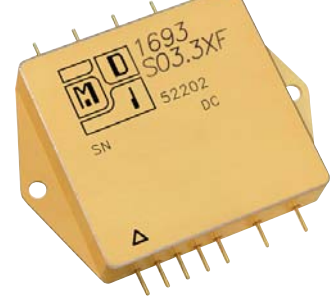
Series 1693

INDUSTRIAL GRADE

DC – DC Converters

DUAL OUTPUT DEVICES		1693-D05 (40W)			1693-D12 (40W)			1693-D15 (40W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	—	+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*	$V_{in\ min} - V_{in\ max}$	±150mA	—	±4A	±95mA	—	±1.67A	±76mA	—	±1.33A
Efficiency	$P_{out} = \text{max rated load}$	73%	76%	—	78%	82%	—	79%	83%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in\ min} - V_{in\ max}$	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
Load regulation ¹	$P_{out} = 10\% \text{ to F.L.}$	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
Output ripple	F.L. BW 2 MHz mV _{pp}	—	40	85	—	60	150	—	75	180

24 Volts DC Input



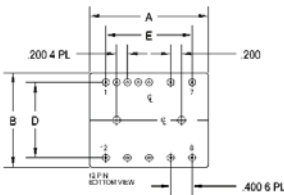
Notes: *Up to 90% full power available from either output if rated output power is not exceeded; ¹balanced load conditions.

TRIPLE OUTPUT DEVICES		1693-T3.3/5 (17.7W)			1693-T3.3/12 (24W)			1693-T3.3/15 (25.2W)			1693-T05 (19.5W)			1693-T12 (25.8W)			1693-T15 (27W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	+ _{out} = - _{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	$V_{in\ min} - V_{in\ max}$	400mA ±40mA	— —	4A ±450mA	400mA ±40mA	— —	4A ±450mA	400mA ±32mA	— —	4A ±400mA	90mA ±40mA	— —	3A ±450mA	90mA ±40mA	— —	3A ±450mA	90mA ±32mA	— —	3A ±400mA
Efficiency	$P_{out} = \text{max rated load}$	66%	69%	—	66%	69%	—	66%	69%	—	66%	69%	—	71%	74%	—	71%	74%	—
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

CASE STYLE 10

Solder Sealed

Flangeless PCB Stud Mount



1693-SXX output < 24 VDC		1693-SXX output ≥ 24 VDC		1693-DXX		1693-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 + Remote Sense	Pin 2 Inhibit Not	Pin 8 + Remote Sense	Pin 2 Inhibit Not	Pin 8 Main Output
Pin 3 Soft Start	Pin 9 Main Output Ret	Pin 3 Soft Start	Pin 9 - Remote Sense	Pin 3 Soft Start	Pin 9 - Remote Sense	Pin 3 Soft Start	Pin 9 Main Output Ret
Pin 4 Sync	Pin 10 + Remote Sense	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 Adjust	Pin 11 N/C	Pin 5 Adjust	Pin 11 Dual Output Ret	Pin 5 N/C	Pin 11 Dual Output Ret
Pin 6 Input Ret	Pin 12 - Remote Sense	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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