3.75-6.5 Watt HYBRID

PROTON RAD HARD DC-DC CONVERTERS

28 VOLTS DC INPUT

Features

- Proton Rad Hard
- SEU resistant
- Specifically designed for redundant or individual space applications
- Completely self contained Thick Film Hybrid DC-DC Converter
- No external filter caps required
- Fully isolated design
- "Inhibit-not" function
- Power on soft start
- 200 kHz operation for low ripple and fast response time
- Built-in EMI input filter meets MIL-STD-461C requirements CE01, CE03, CS01, CS02 and CS06
- Short circuit and overvoltage protection
- Capability of external synch for switching frequencies
- Built-in test capability

Specifications

INPUT: 28 VDC nominal
Range: 16 to 50 VDC continuous
18 to 50 VDC full power
Survives 80 V transients/MIL-STD-704A

ISOLATION:
Input to case: 500 VDC
Input to output: 500 VDC
Output to case: 100 VDC

ENVIRONMENT:
Storage temperature: -55°C to +150°C
Shock: 50 G's
Acceleration: 500 G's
Vibration: 30 G's
Grades EU, RE & SE
Full Power Output at T_{case} = +125°C
Linearly derates to zero at T_{case} = +135°C

WEIGHT: 50 grams typical

PACKAGE and DIMENSIONS: Many case styles are available. See package option chart below.

Magnetically Isolated Series 5690

SINGLE OUTPUT DEVICES		5690-S03.3 (6.5W)			5690-S05 (6.5W)			5690-S05.2 (6.5W)		
PARAMETER	CONDITION	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
Output current	$V_{in\ min}$ — $V_{in\ max}$	—	—	1.97A	—	—	1.3A	—	—	1.25A
Efficiency	P_{out} = max rated load	65%	68%	—	70%	73%	—	70%	73%	—
Line regulation	P_{out} = max rated load, $V_{in\ min}$ — $V_{in\ max}$	—	10mV	30mV	—	10mV	50mV	—	10mV	50mV
Load regulation	P_{out} = 10% to F.L.	—	10mV	30mV	—	10mV	50mV	—	10mV	50mV
Output ripple	F.L. BW 2 MHz mV_{pp}	—	30	65	—	40	85	—	40	85

SINGLE OUTPUT DEVICES		5690-S12 (6.5W)			5690-S15 (6.5W)			5690-S28 (6.5W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	—	+11.9	+12.0	+12.1	+14.9	+15.0	+15.1	+27.8	+28.0	+28.2
Output current	$V_{in\ min}$ — $V_{in\ max}$	—	—	541mA	—	—	433mA	—	—	232mA
Efficiency	P_{out} = max rated load	77%	81%	—	78%	82%	—	77%	81%	—
Line regulation	P_{out} = max rated load, $V_{in\ min}$ — $V_{in\ max}$	—	20mV	100mV	—	25mV	125mV	—	50mV	250mV
Load regulation	P_{out} = 10% to F.L.	—	20mV	100mV	—	25mV	125mV	—	50mV	250mV
Output ripple	F.L. BW 2 MHz mV_{pp}	—	60	150	—	75	180	—	150	350

DUAL OUTPUT DEVICES		5690-D05 (6.5W)			5690-D12 (6.5W)			5690-D15 (6.5W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	$+I_{out} = -I_{out}$	+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*	$V_{in\ min}$ — $V_{in\ max}$	±35mA	—	±625mA	±35mA	—	±270mA	±32mA	—	±217mA
Efficiency	P_{out} = max rated load	72%	75%	—	77%	81%	—	78%	82%	—
Line regulation	P_{out} = max rated load, $V_{in\ min}$ — $V_{in\ max}$	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
Load regulation†	P_{out} = 10% to F.L.	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
Output ripple	F.L. BW 2 MHz mV_{pp}	—	40	85	—	60	150	—	75	180

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

TRIPLE OUTPUT DEVICES		5690-T05 (3.75W)			5690-T12 (5W)			5690-T15 (5W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	$+I_{out} = -I_{out}$	+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	$V_{in\ min}$ — $V_{in\ max}$	60mA ±20mA	— —	500mA ±150mA	60mA ±20mA	— —	500mA ±105mA	60mA ±20mA	— —	500mA ±83mA
Efficiency	P_{out} = max rated load	65%	68%	—	70%	73%	—	70%	73%	—
Line regulation	P_{out} = max rated load $V_{in\ min}$ — $V_{in\ max}$	— —	10mV 25mV	50mV 50mV	— —	10mV 25mV	50mV 50mV	— —	10mV 25mV	50mV 50mV
Load regulation	P_{out} =10% to F.L.	— —	10mV 25mV	50mV 50mV	— —	10mV 25mV	50mV 50mV	— —	10mV 25mV	50mV 50mV
Output ripple	F.L. BW 2 MHz mV_{pp}	— —	40 —	85 50	— —	40 —	85 50	— —	40 —	85 50

0005

GRADE LEVELS:
Please specify grade level for your application. Industrial grade units will be shipped if no option is specified.

EU Engineering Units
R 100 KRAD, +85°C military/aerospace
RE 100 KRAD, +125°C military/aerospace
S 100 KRAD, +85°C space
SE 100 KRAD, +125°C space

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Pin Out Chart

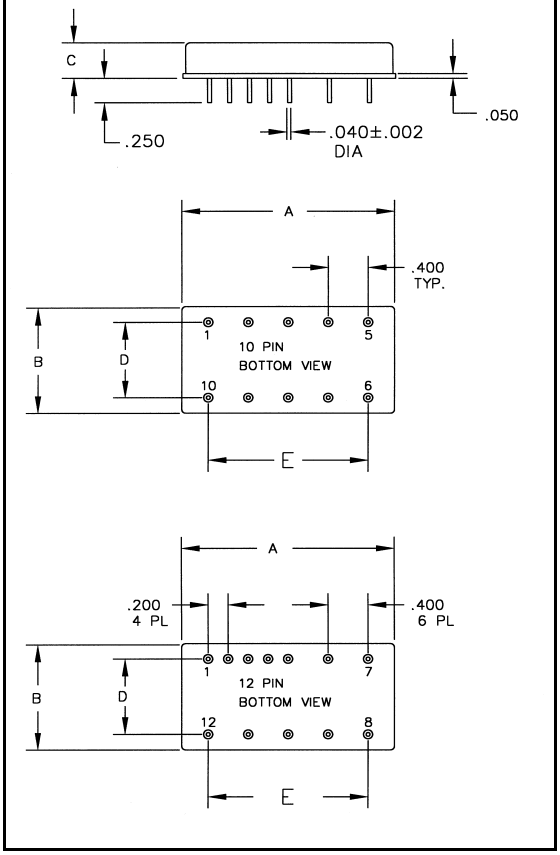
Model Number / Pin Number	1	2	3	4	5	6	7	8	9
	10	11	12	13	14	15	16	17	18
5690-SXX output <24 VDC	bit	inhibit not	soft start	sync	N/C	input ret	+ input	main output	main output ret
	N/C	adjust	N/C						
5690-SXX output >=24 VDC	bit	inhibit not	soft start	sync	N/C	input ret	+ input	N/C	N/C
	main output	N/C	main output ret						
5690-DXX	bit	inhibit not	soft start	sync	N/C	input ret	+ input	N/C	N/C
	+ dual output	dual output ret	- dual output						
5690-TXX	bit	inhibit not	soft start	sync	N/C	input ret	+ input	main output	main output ret
	+ dual output	dual output ret	- dual output						

Case Dimensions

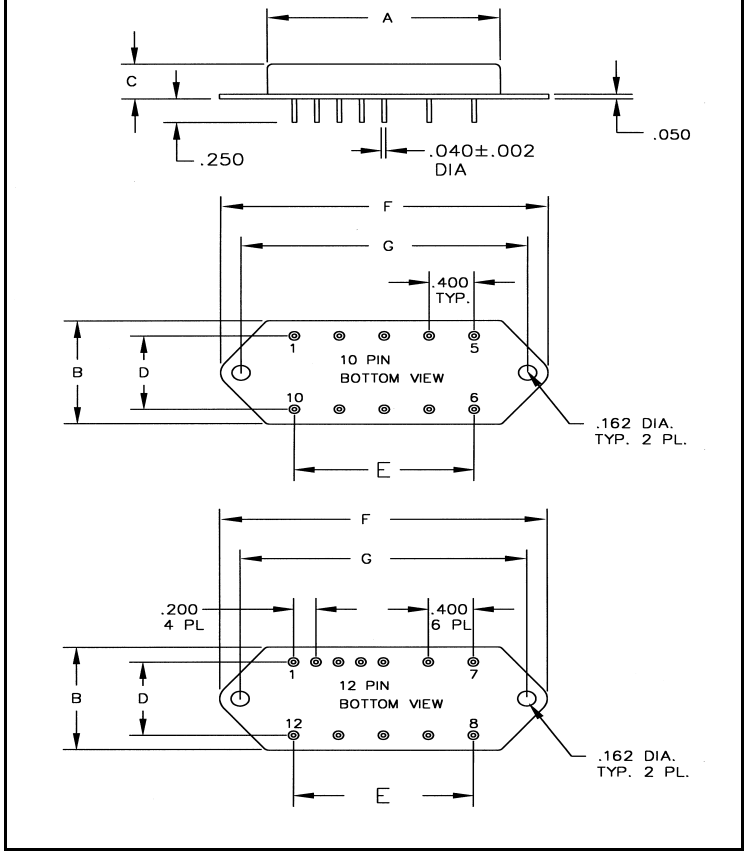
Model Number	Case Style	Pin Count	A	B	C	D	E	F	G
5690	2	12	2.130	1.120	0.375	0.800	1.600	--	--
5690 F	3	12	2.130	1.120	0.375	0.800	1.600	2.890	2.550
5690 G	5	12	2.130	1.120	0.375	0.800	1.600	--	--
5690 GF	6	12	2.130	1.120	0.375	0.800	1.600	2.890	2.550
5690 UF	8	12	2.160	1.510	0.495	--	1.600	2.890	2.550

All dimensions ±0.01 except F=max, C= +0.01/-0.020

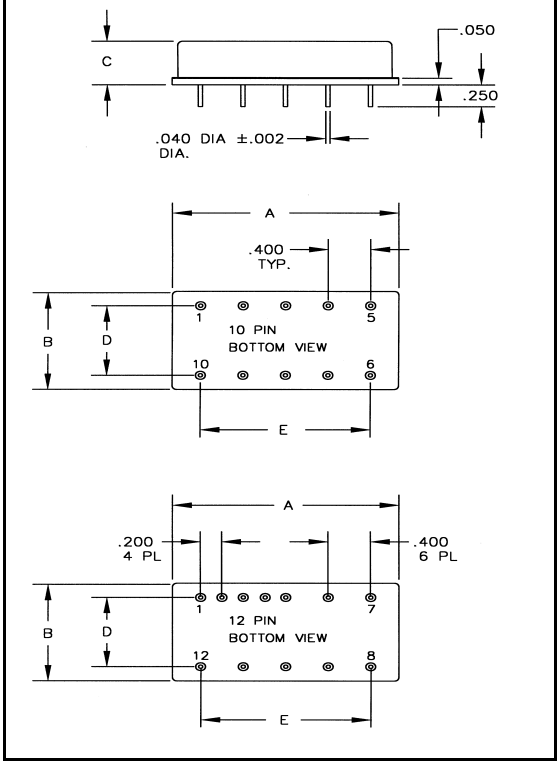
Case Style 2



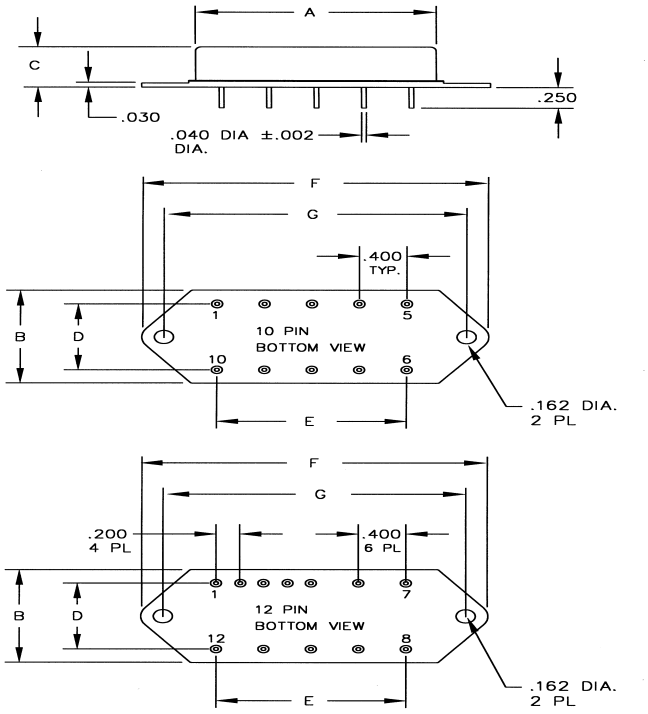
Case Style 3



Case Style 5



Case Style 6



Case Style 8