

# 3.25-5 WATT HYBRID

## DC-DC CONVERTERS



Meets MIL-STD-461D/E/F  
CE/CS Input Power Leads

### Features

- Built-In EMI filter meets MIL-STD-461D/E/F CE101, CE102, CS101, CS114, CS115 and CS116. Also meets DO-160C/D/E/F/G CE Section 21 and CS Sections 20, 22
- 28 VDC input for MIL-STD-704A applications
- Completely self contained Thick Film Hybrid DC-DC Converter
- No external filter elements required
- "Inhibit-not" function
- Short circuit protection
- Fully isolated, input to output
- Single or dual outputs
- 250 kHz operation for low ripple and fast response time
- Full hermetic package

### Specifications

**INPUT:** 28 VDC nominal

Range: 16 to 50 VDC continuous  
18 to 50 VDC full power

Operates through 80 V transients/MIL-STD-704A

#### ISOLATION:

Input to case: 500 VDC

Input to output: 500 VDC

#### ENVIRONMENT:

Storage temperature: -55°C to +150°C

Shock: 50 G's

Acceleration: 500 G's

Vibration: 30 G's

#### Grades M:

Full Output Power at  $T_{case} = +85^{\circ}C$

Linearly derates to zero at  
 $T_{case} = +115^{\circ}C$

#### Grades E:

Full Power Output at  $T_{case} = +125^{\circ}C$

Linearly derates to zero at  
 $T_{case} = +135^{\circ}C$

**WEIGHT:** 20 grams typical



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## SERIES 3090

SINGLE OUTPUT DEVICES		3090-S02 (2W)			3090-S02.5 (2.5W)			3090-S03.3 (3.3W)			3090S05 (5W)		
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	$V_{in\ min} - V_{in\ max}$	—	—	1A	—	—	1A	—	—	1A	—	—	1A
Efficiency	$P_{out} = \text{max rated load}$	54%	57%	—	59%	62%	—	64%	67%	—	69%	72%	—
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 <sub>pp</sub>	—	25	50	—	30	60	—	30	65	—	40	85
SINGLE OUTPUT DEVICES		3090-S5.2 (5W)			3090-S12 (5W)			3090-S15 (5W)			3090-S28 (5W)		
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	$V_{in\ min} - V_{in\ max}$	—	—	961mA	—	—	416mA	—	—	333mA	—	—	178mA
Efficiency	$P_{out} = \text{max rated load}$	69	72%	—	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 <sub>pp</sub>	—	40	85	—	60	150	—	75	180	—	150	350
DUAL OUTPUT DEVICES		3090-D05 (5W)			3090-D12 (5W)			3090-D15 (5W)					
Output voltage	$+I_{out} = -I_{out}$	+4.9	+5.0	+5.1	+11.9	+12.0	+12.1	+14.9	+15.0	+15.1	—	—	—
Output current*	$V_{in\ min} - V_{in\ max}$	±35mA	—	±500mA	±15mA	—	±208mA	±12mA	—	±166mA	—	—	—
Efficiency	$P_{out} = \text{max rated load}$	71%	74%	—	76%	80%	—	77%	81%	—	—	—	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in\ min} - V_{in\ max}$	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV	—	—	—
Load regulation	$P_{out} = 10\% \text{ to F.L.}$	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV	—	—	—
Output ripple	F.L. BW 2 MHz mV <sub>pp</sub>	—	40	85	—	60	150	—	75	180	—	—	—

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

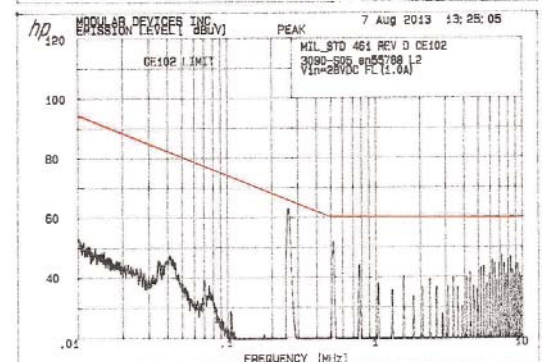
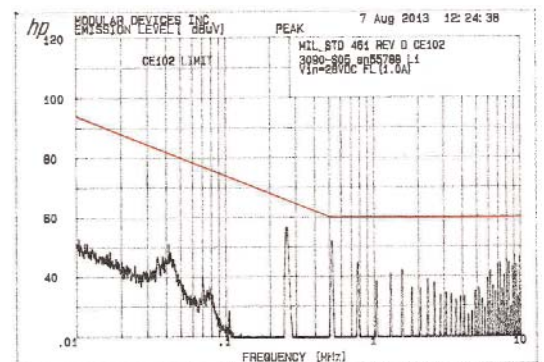
The 3090 series comprise state-of-the-art DC-DC converters that fulfill the latest Electromagnetic Interference Compatibility (EMC) requirements for Aerospace, Defense and Civil Aviation airborne electronics applications.

Very compact and highly efficient, each 3090 model incorporates a completely self-contained input EMI filter that enables compliance with:

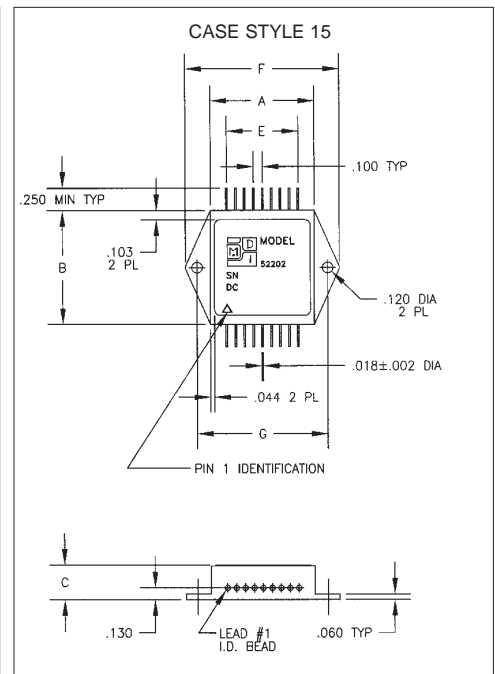
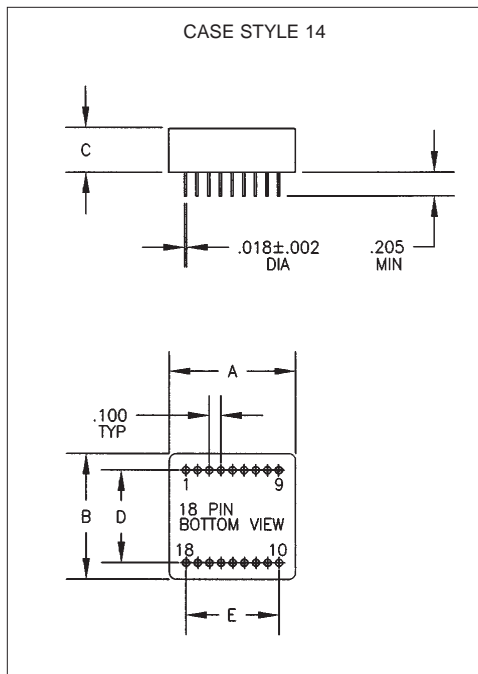
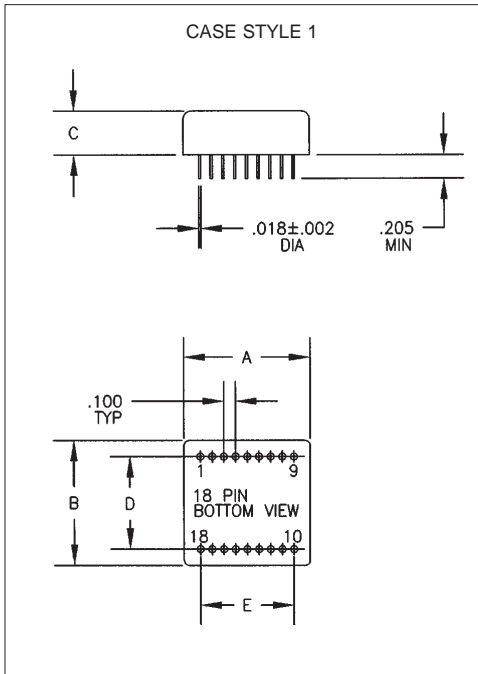
- MIL-STD-461D/E/F:
  - Conducted Emissions (CE)
    - CE101, power leads, 30Hz - 10kHz
    - CE102, power leads, 10kHz - 10MHz
  - Conducted Susceptibility (CS)
    - CS101, power leads, 30Hz - 150kHz
    - CS114, bulk cable injection, 10kHz - 200MHz
    - CS115, bulk cable injection, impulse excitation
    - CS116, cables and power leads, damped sinusoid transients, 10kHz - 100MHz
- DO-160 C/D/E/F/G:
  - Conducted Emissions (CE)
    - Section 21: power lines, emissions 15kHz - 30MHz, categories B, LMH, AZ
  - Conducted Susceptibility (CS)
    - Section 20: power lines, 10kHz - 400MHz
    - Section 22: lightning induced transients

Moreover, the 3090 design is robust enough to operate through MIL-STD-704A 80V/100mS power line transients.

Available in all-hermetic standard solder-sealed or optional seam-welded packages, flanged and non-flanged.



## MIL-STD-461D/E/F AND DO-160 APPLICATIONS



Model No.	Case Style	Pin Count	Mounting
3090	1	18	Solder Sealed Flangeless PCB Mount
3090 D	14	18	Seam Weld Flangeless PCB Mount
3090 TF	15	18	Seam Weld Chassis Mount with Flange

### Case Dimensions

Units: inches | millimeters

TOLERANCES: Drawings in Inches All dimensions ±0.01 except F = max, C = +0.01/-0.020 For Custom Packages, Contact Factory

Case Style	A	B	C	D	E	F	G
1	1.080   27.432	1.080   27.432	0.380   9.625	0.800   20.320	0.800   20.320	—   —	—   —
14 D	1.090   27.686	1.090   27.686	0.380   9.625	0.800   20.320	0.800   20.320	—   —	—   —
15 TF	1.160   29.464	1.283   32.588	0.380   9.625	—   —	0.800   20.320	1.754   44.552	1.460   37.084

### Pin Outs

3090-SXX output <24 VDC

3090-SXX output ≥ 24VDC

3090-DXX

Pin 1 N/C	Pin 10 N/C	Pin 1 N/C	Pin 10 N/C	Pin 1 N/C	Pin 10 N/C
Pin 2 N/C	Pin 11 N/C	Pin 2 N/C	Pin 11 N/C	Pin 2 N/C	Pin 11 N/C
Pin 3 N/C	Pin 12 N/C	Pin 3 N/C	Pin 12 N/C	Pin 3 N/C	Pin 12 N/C
Pin 4 Case	Pin 13 N/C	Pin 4 Case	Pin 13 N/C	Pin 4 Case	Pin 13 N/C
Pin 5 N/C	Pin 14 N/C	Pin 5 N/C	Pin 14 N/C	Pin 5 - Dual Output	Pin 14 N/C
Pin 6 Main Out Ret	Pin 15 Inhibit Not	Pin 6 Main Out Ret	Pin 15 Inhibit Not	Pin 6 Output Com Ret	Pin 15 Inhibit Not
Pin 7 Main Out Ret	Pin 16 N/C	Pin 7 Main Out Ret	Pin 16 N/C	Pin 7 Output Com Ret	Pin 16 N/C
Pin 8 N/C	Pin 17 Input Ret	Pin 8 N/C	Pin 17 Input Ret	Pin 8 N/C	Pin 17 Input Ret
Pin 9 Main Output	Pin 18 + Input	Pin 9 Main Output	Pin 18 + Input	Pin 9 + Dual Output	Pin 18 + Input

Specifications subject to change.

### GRADE LEVELS:

Please specify **GRADE LEVEL** for your application. Industrial grade units will be shipped if no option is specified.

Industrial Grade	-55°C to +85°C Test data 25°C with 24 hours 25°C burn-in
M Grade	-55°C to +85°C Test data -55°C, +25°C, +85°C with 160 hours 85°C burn-in
E Grade	-55°C to +125°C Test data -55°C, +25°C, +125°C with 160 hours 125°C burn-in

