

# 12.5-30 Watt Hybrid

## Features

- Specifically designed for aircraft 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 sync for switching frequencies
- Built-in test capability

## Specifications

**INPUT:** 270 VDC nominal  
Range: 185 to 335 VDC continuous  
Survives 440 V transients

### 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

### Grade M:

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

### Grade E:

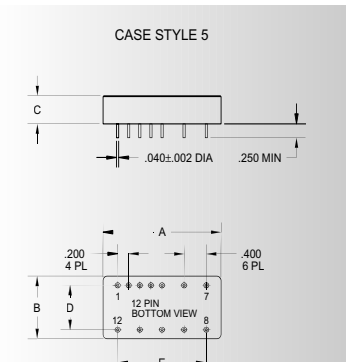
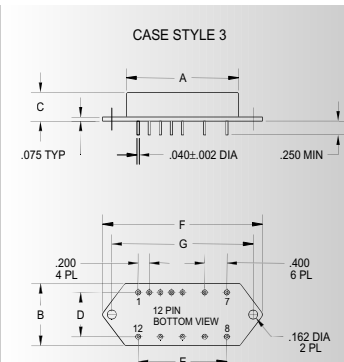
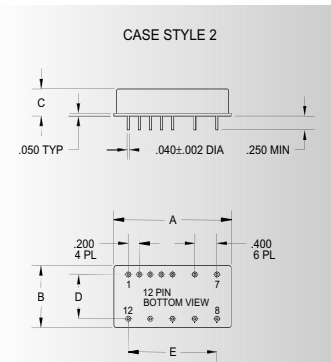
Full Power Output at  $T_{case} = +125^{\circ}C$   
Linearly derates to zero at  $T_{case} = +135^{\circ}C$

**WEIGHT:** 75 grams typical

SINGLE OUTPUT DEVICES		3000-S03.3 (20W)			3000-S05 (30W)			3000-S05.2 (30W)			3000-S12 (30W)		
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	$V_{in\ min} - V_{in\ max}$	—	—	6.06A	—	—	6A	—	—	5.76A	—	—	2.5A
Efficiency	$P_{out} = \text{max rated load}$	66%	69%	—	71%	74%	—	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	$P_{out} = 10\% \text{ to F.L.}$	—	10mV	30mV	—	10mV	50mV	—	10mV	50mV	—	20mV	100mV
Output ripple	F.L. BW 2 MHz mV <sub>pp</sub>	—	30	65	—	40	85	—	40	85	—	60	150

SINGLE OUTPUT DEVICES		3000-S15 (30W)			3000-S28 (30W)				
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX		
Output voltage	—	+14.9	+15.0	+15.1	+27.8	+28.0	+28.2		
Output current	$V_{in\ min} - V_{in\ max}$	—	—	2A	—	—	1.07A		
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	$P_{out} = 10\% \text{ to F.L.}$	—	25mV	125mV	—	50mV	250mV		
Output ripple	F.L. BW 2 MHz mV <sub>pp</sub>	—	75	180	—	150	350		

Model No.	Case Style	Pin Count	Mounting
3000	2	12	Solder Sealed Flangeless PCB Mount
3000	F	12	Solder Sealed PCB Mount with Flange
3000	I	12	Seam Weld Flangeless PCB Mount
3000	IF	12	Seam Weld PCB Mount with Flange
3000	WF	8	Seam Weld Chassis Mount with Flange
3000	PB	10	Solder Sealed Flangeless PCB Stud Mount
3000	PE	12	Seam Weld Flangeless PCB Stud Mount



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

## Case Dimensions

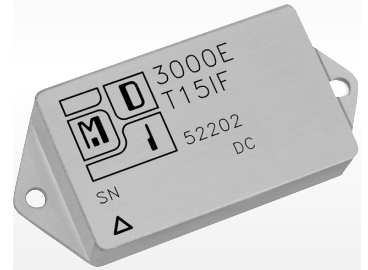
Units: inches | millimeters

Case Style	A	B	C	D	E	F	G
2	2.200   55.880	1.350   34.290	0.495   12.573	1.000   25.400	1.600   40.640	—   —	—   —
3 F	2.200   55.880	1.350   34.290	0.495   12.573	1.000   25.400	1.600   40.640	2.960   75.184	2.610   66.294
5 I	2.225   56.515	1.350   34.290	0.495   12.573	1.000   25.400	1.600   40.640	—   —	—   —
6 IF	2.225   56.515	1.350   34.290	0.495   12.573	1.000   25.400	1.600   40.640	2.960   75.184	2.610   66.294
8 WF	2.225   56.515	1.710   43.434	0.495   12.573	—   —	1.600   40.640	2.960   75.184	2.610   66.294
10 PB	2.225   56.515	1.350   34.290	0.495   12.573	1.000   25.400	1.600   40.640	—   —	—   —
12 PE	2.225   56.515	1.350   34.290	0.495   12.573	1.000   25.400	1.600   40.640	—   —	—   —

# DC-DC CONVERTERS

## FULL FEATURE SERIES

# 3000



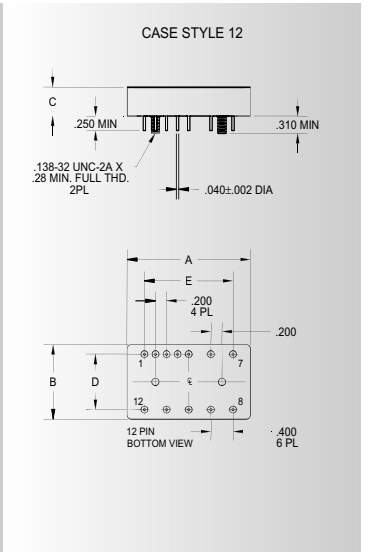
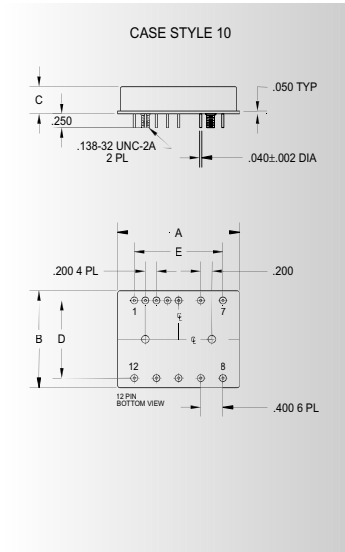
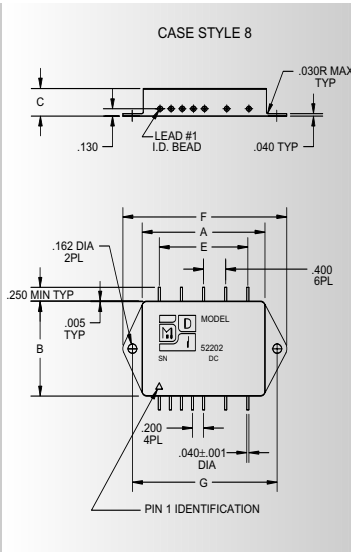
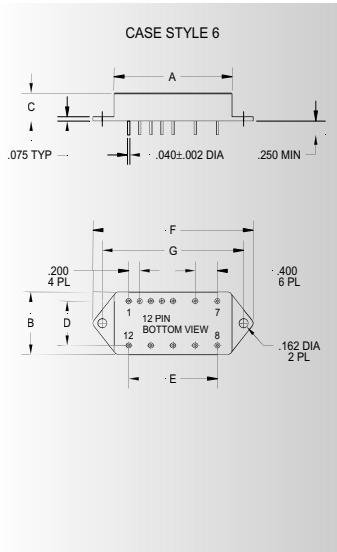
## 270 VDC

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DUAL OUTPUT DEVICES		3000-D3.3/5 (14.9W)			3000-D05 (30W)			3000-D12 (30W)			3000-D15 (30W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	$+I_{out} = -I_{out}$	+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*	$V_{in\ min} - V_{in\ max}$	300mA 100mA	—	3A 1A	±150mA	—	±3A	±95mA	—	±1.25A	±76mA	—	±1A
Efficiency	$P_{out} = \text{max rated load}$	63%	66%	—	72%	76%	—	78%	82%	—	79%	83%	—
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†	$P_{out} = 10\%$ to F.L.	—	10mV 10mV	30mV 50mV	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
Output ripple	F.L. BW 2 MHz mV <sub>pp</sub>	—	30 25	65 50	—	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		3000-T3.3/5 (12.5W)			3000-T3.3/12 (17.5W)			3000-T3.3/15 (17.5W)			3000-T05 (12.5W)			3000-T12 (17.5W)			3000-T15 (17.5W)		
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	$V_{in\ min} - V_{in\ max}$	300mA ±40mA	—	3A ±250mA	300mA ±40mA	—	3A ±312mA	300mA ±32mA	—	3A ±250mA	200mA ±40mA	—	2A ±250mA	200mA ±40mA	—	2A ±312mA	200mA ±32mA	—	2A ±250mA
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	$P_{out} = 10\%$ 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 <sub>pp</sub>	—	30 —	65 50	—	30 —	65 50	—	30 —	65 50	—	40 —	85 50	—	40 —	85 50	—	40 —	85 50



### 3000-SXX output <24 VDC

Pin 1	bit	Pin 7	+ input
Pin 2	inhibit not	Pin 8	main output
Pin 3	soft start	Pin 9	main output ret
Pin 4	sync	Pin 10	+ remote sense
Pin 5	N/C	Pin 11	adjust
Pin 6	input ret	Pin 12	- remote sense

### 3000-SXX output ≥24 VDC

Pin 1	bit	Pin 7	+ input
Pin 2	inhibit not	Pin 8	N/C
Pin 3	soft start	Pin 9	N/C
Pin 4	sync	Pin 10	main output
Pin 5	N/C	Pin 11	N/C
Pin 6	input ret	Pin 12	main output ret

### 3000-DXX

Pin 1	bit	Pin 7	+ input
Pin 2	inhibit not	Pin 8	N/C
Pin 3	soft start	Pin 9	N/C
Pin 4	sync	Pin 10	+ dual output
Pin 5	N/C	Pin 11	dual output ret
Pin 6	input ret	Pin 12	- dual output

### 3000-TXX

Pin 1	bit	Pin 7	+ input
Pin 2	inhibit not	Pin 8	main output
Pin 3	soft start	Pin 9	main output ret
Pin 4	sync	Pin 10	+ dual output
Pin 5	N/C	Pin 11	dual output ret
Pin 6	input ret	Pin 12	- dual output

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

- M** +85°C military
- E** +125°C military