

# 32.5-80 Watt Hybrid

## Features

- Rad Hard: TID > 25kRad(Si)
- No SEE: LET > 37MeV\*cm<sup>2</sup>/mg
- 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 sync for switching frequencies
- Built-in test capability

## Specifications

**INPUT:** 120 VDC nominal

Range: 86 to 158 VDC continuous

### 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, R & S:

Full Power Output at T<sub>case</sub> = +85°C

Linearly derates to zero at T<sub>case</sub> = +115°C

Grades RE & SE:

Full Power Output at T<sub>case</sub> = +125°C

Linearly derates to zero at T<sub>case</sub> = +135°C

**WEIGHT:** 160 grams typical

SINGLE OUTPUT DEVICES		3051-S02 (30W)			3051-S02.5 (37.5W)			3051-S03.3 (49.5W)			3051-S05 (75W)		
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 <sub>in min</sub> — V <sub>in max</sub>	—	—	15A	—	—	15A	—	—	15A	—	—	15A
Efficiency	P <sub>out</sub> = max rated load	57%	60%	—	62%	65%	—	67%	70%	—	72%	75%	—
Line regulation	P <sub>out</sub> = max rated load V <sub>in min</sub> — V <sub>in max</sub>	—	10mV	30mV	—	10mV	30mV	—	10mV	30mV	—	10mV	50mV
Load regulation	P <sub>out</sub> = 10% 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		3051-S05.2 (75W)			3051-S12 (75W)			3051-S15 (75W)			3051-S28 (70W)		
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 <sub>in min</sub> — V <sub>in max</sub>	—	—	15A	—	—	6.25A	—	—	5A	—	—	2.5A
Efficiency	P <sub>out</sub> = max rated load	72%	75%	—	79%	83%	—	80%	84%	—	79%	83%	—
Line regulation	P <sub>out</sub> = max rated load V <sub>in min</sub> — V <sub>in max</sub>	—	10mV	50mV	—	20mV	100mV	—	25mV	125mV	—	50mV	250mV
Load regulation	P <sub>out</sub> = 10% 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

Model No.	Case Style	Pin Count	Mounting
3051	4	12	Solder Sealed PCB Mount with Flange
3051 LF	7	12	Seam Weld PCB Mount with Flange
3051 ZF	9	12	Seam Weld Chassis Mount with Flange
3051 PD	11	12	Solder Sealed Flangeless PCB Stud Mount

3051-SXX output <24 VDC				3051-SXX output ≥24 VDC				3051-DXX				3051-TXX			
Pin 1	bit	Pin 7	+ input	Pin 1	bit	Pin 7	+ input	Pin 1	bit	Pin 7	+ input	Pin 1	bit	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	+ 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	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	- 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

3051-SXX ZF output <24 VDC				3051-SXX ZF output ≥24 VDC				3051-DXX ZF				3051-TXX ZF			
Pin 1	bit	Pin 7	N/C	Pin 1	bit	Pin 7	N/C	Pin 1	bit	Pin 7	N/C	Pin 1	bit	Pin 7	N/C
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	+ 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	+ input	Pin 11	adjust	Pin 5	+ input	Pin 11	N/C	Pin 5	+ input	Pin 11	dual output ret	Pin 5	+ input	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

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

**EU** Engineering Units

**R** 25 KRAD, +85°C military/aerospace  
**RE** 25 KRAD, +125°C military/aerospace

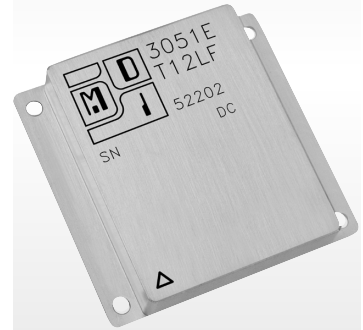
**S** 25 KRAD, +85°C space  
**SE** 25 KRAD, +125°C space

# RAD HARD DC-DC CONVERTERS

## FULL FEATURE SERIES

# 3051

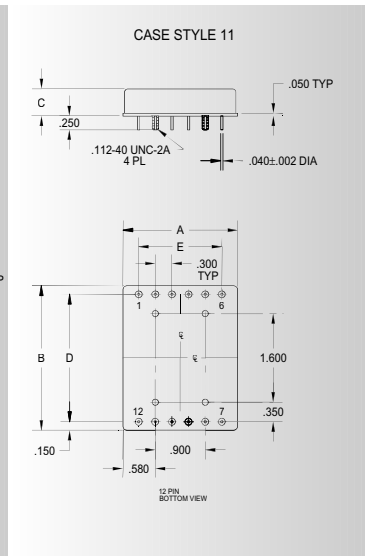
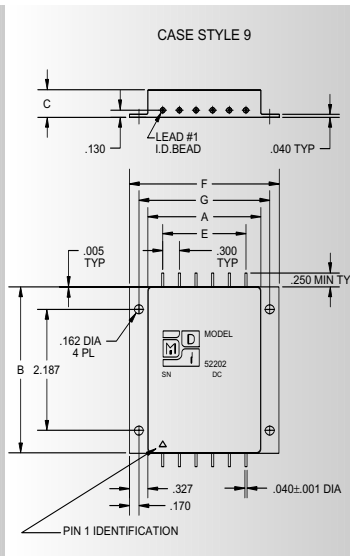
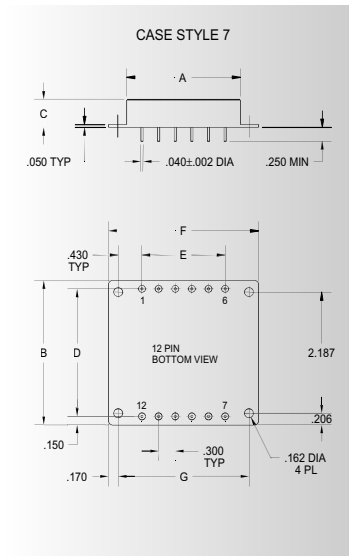
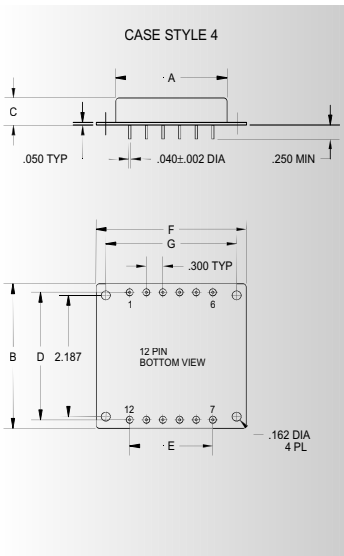
DUAL OUTPUT DEVICES		3051-D3.3/5 (31.78W)			3051-D05 (75W)			3051-D12 (74.4W)			3051-D15 (75W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	$+I_{out} = -I_{out}$	+3.2	+3.3	+3.4	+4.9	+5.0	+5.1	+11.9	+12.0	+12.1	+14.9	+15.0	+15.1
		+4.9	+5.0	+5.1	-4.9	-5.0	-5.1	-11.9	-12.0	-12.1	-14.9	-15.0	-15.1
Output current*	$V_{in\ min} - V_{in\ max}$	660mA	—	6.6A	±266mA	—	±7.5A	±158mA	—	±3.1A	±127mA	—	±2.5A
		200mA	—	2A	—	—	—	—	—	—	—	—	—
Efficiency	$P_{out} = \text{max rated load}$	64%	67%	—	73%	77%	—	79%	83%	—	80%	84%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in\ min} - V_{in\ max}$	—	10mV	30mV	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
		—	10mV	50mV	—	—	—	—	—	—	—	—	—
Load regulation†	$P_{out} = 10\% \text{ to F.L.}$	—	10mV	30mV	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
		—	10mV	50mV	—	—	—	—	—	—	—	—	—
Output ripple	F.L. BW 2 MHz mV <sub>pp</sub>	—	30	65	—	40	85	—	60	150	—	75	180
		—	25	50	—	—	—	—	—	—	—	—	—



## 120 VDC

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

TRIPLE OUTPUT DEVICES		3051-T3.3/5 (32.25W)			3051-T3.3/12 (42.75W)			3051-T3.3/15 (47.25W)			3051-T05 (32.5W)			3051-T12 (43W)			3051-T15 (47.5W)		
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	+3.3	+3.4	+3.2	+3.3	+3.4	+3.2	+3.3	+3.4	+4.9	+5.0	+5.1	+4.9	+5.0	+5.1	+4.9	+5.0	+5.1
		+4.9	+5.0	+5.1	+11.9	+12.0	+12.1	+14.9	+15.0	+15.1	+4.9	+5.0	+5.1	+11.9	+12.0	+12.1	+14.9	+15.0	+15.1
Output current	$V_{in\ min} - V_{in\ max}$	750mA	—	7.5A	750mA	—	7.5A	750mA	—	7.5A	50mA	—	5A	50mA	—	5A	50mA	—	5A
		±40mA	—	±750mA	±40mA	—	±750mA	±32mA	—	±750mA	±40mA	—	±750mA	±40mA	—	±750mA	±32mA	—	±750mA
Efficiency	$P_{out} = \text{max rated load}$	67%	70%	—	67%	70%	—	67%	70%	—	67%	70%	—	72%	75%	—	72%	75%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in\ min} - V_{in\ max}$	—	10mV	50mV	—	10mV	50mV	—	10mV	50mV	—	10mV	50mV	—	10mV	50mV	—	10mV	50mV
		—	25mV	50mV	—	25mV	50mV	—	25mV	50mV	—	25mV	50mV	—	25mV	50mV	—	25mV	50mV
Load regulation	$P_{out} = 10\% \text{ to F.L.}$	—	10mV	50mV	—	10mV	50mV	—	10mV	50mV	—	10mV	50mV	—	10mV	50mV	—	10mV	50mV
		—	25mV	50mV	—	25mV	50mV	—	25mV	50mV	—	25mV	50mV	—	25mV	50mV	—	25mV	50mV
Output ripple	F.L. BW 2 MHz mV <sub>pp</sub>	—	30	65	—	30	65	—	30	65	—	40	85	—	40	85	—	40	85
		—	—	50	—	—	50	—	—	50	—	—	50	—	—	50	—	—	50



### 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
4	2.040   51.816	2.610   66.294	0.495   12.573	2.300   58.420	1.500   38.100	2.710   68.834	2.360   59.944
7 LF	2.040   51.816	2.610   66.294	0.495   12.573	2.300   58.420	1.500   38.100	2.710   68.834	2.360   59.944
9 ZF	2.040   51.816	3.010   76.454	0.495   12.573	—   —	1.500   38.100	2.710   68.834	2.360   59.944
11 PD	2.040   51.816	2.610   66.294	0.495   12.573	2.300   58.420	1.500   38.100	—   —	—   —