

# 30-50 Watt Hybrid

## Features

- Completely self contained Thick Film Hybrid DC-DC Converter
- Built-in EMI input filter meets MIL-STD-461C requirements CE01, CE03, CS01, CS02 and CS06
- "Inhibit-not" function
- Power on soft start
- Fully isolated, input to output
- Single, double and triple outputs
- Short circuit protection
- 200 kHz operation for low ripple and fast response
- No external filter caps required
- Hermetically sealed package

## Specifications

**INPUT:** 16 to 24 VDC nominal

Range: 8 to 40 VDC continuous

Unit will start up at  $V_{in} > 9.5$  VDC

**OUTPUT:** for  $V_{in} < 16$  VDC, the output power linearly derates to 1/2 full output power at  $V_{in} = 8$  VDC

### 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  $T_{case} = +85^{\circ}\text{C}$

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

Grade E:

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

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

**WEIGHT:** 160 grams typical

SINGLE OUTPUT DEVICES		3114-S03.3 (33W)			3114-S05 (50W)			3114-S05.2 (50W)			3114-S12 (50W)		
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	$V_{in} = 16$ to 40 VDC	—	—	10A	—	—	10A	—	—	9.61A	—	—	4.17A
Efficiency	$P_{out} = \text{max rated load}$	65%	68%	—	70%	73%	—	70%	73%	—	75%	79%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in} = 16$ to 40 VDC	—	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 mV <sub>pp</sub>	—	30	65	—	40	85	—	40	85	—	60	150

SINGLE OUTPUT DEVICES		3114-S15 (50W)			3114-S28 (50W)				
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX		
Output voltage	—	+14.9	+15.0	+15.1	+27.8	+28.0	+28.2		
Output current	$V_{in} = 16$ to 40 VDC	—	—	3.3A	—	—	1.79A		
Efficiency	$P_{out} = \text{max rated load}$	76%	80%	—	75%	79%	—		
Line regulation	$P_{out} = \text{max rated load}$ $V_{in} = 16$ to 40 VDC	—	25mV	125mV	—	50mV	250mV		
Load regulation	$P_{out} = 10\%$ 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
3114	4	12	Solder Sealed PCB Mount with Flange
3114 LF	7	12	Seam Weld PCB Mount with Flange
3114 ZF	9	12	Seam Weld Chassis Mount with Flange
3114 PD	11	12	Solder Sealed Flangeless PCB Stud Mount

3114-SXX output <24 VDC				3114-SXX output ≥24 VDC				3114-DXX				3114-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

3114-SXX ZF output <24 VDC				3114-SXX ZF output ≥24 VDC				3114-DXX ZF				3114-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	N/C	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	N/C	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	N/C	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

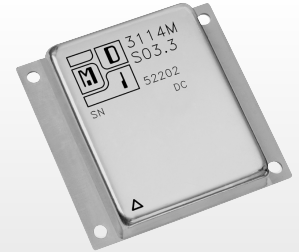
Please specify **GRADE LEVEL** for your application. Industrial grade units will be shipped if no option is specified.

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

# DC-DC CONVERTERS

# FULL FEATURE SERIES 3114

**LOW INPUT VOLTAGE**



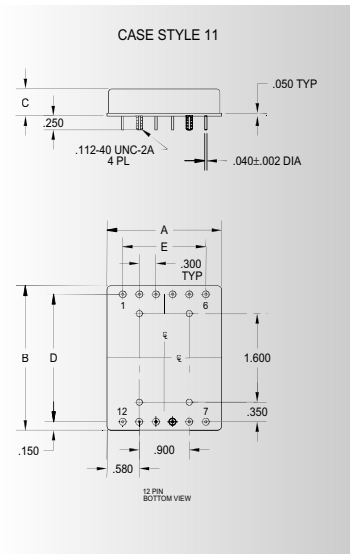
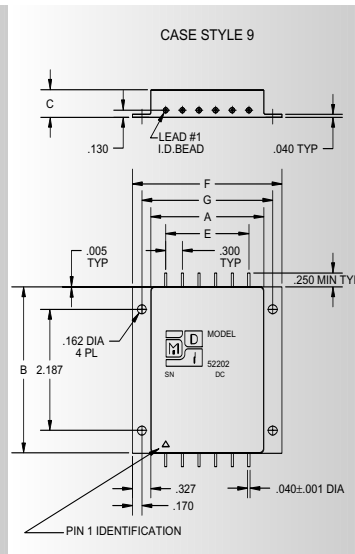
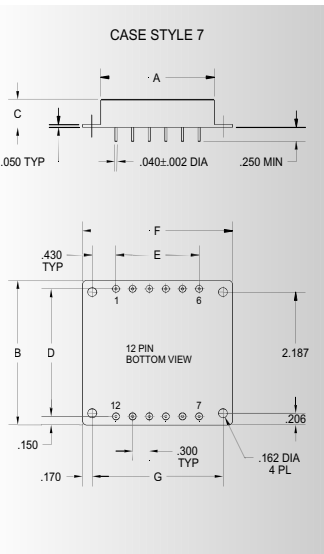
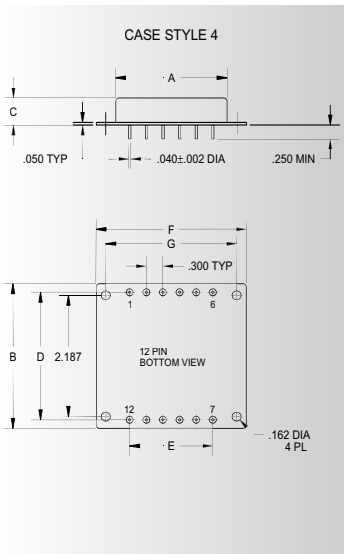
**8-40 VDC**

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DUAL OUTPUT DEVICES		3114-D05 (50W)			3114-D12 (50W)			3114-D15 (50W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	$+I_{out} = -I_{out}$	+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*	$V_{in} = 16$ to 40 VDC	±266mA	—	±5A	±158mA	—	±2.08A	±127mA	—	±1.67A
Efficiency	$P_{out} = \text{max rated load}$	72%	75%	—	77%	81%	—	78%	82%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in} = 16$ to 40 VDC	—	±10mV	±50mV	—	±20mV	±100mV	—	±25mV	±125mV
		—	±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 <sub>pp</sub>	—	40	85	—	60	150	—	75	180
		—	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		3114-T3.3/5 (29.75W)			3114-T3.3/12 (34.73W)			3114-T3.3/15 (34.75W)			3114-T05 (30W)			3114-T12 (35W)			3114-T15 (35W)		
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	$V_{in} = 16$ to 40 VDC	750mA	—	7.5A	750mA	—	7.5A	750mA	—	7.5A	90mA	—	5A	90mA	—	5A	90mA	—	5A
		±40mA	—	±500mA	±40mA	—	±416mA	±32mA	—	±333mA	±40mA	—	±500mA	±40mA	—	±416mA	±32mA	—	±333mA
Efficiency	$P_{out} = \text{max rated load}$	64%	67%	—	64%	67%	—	64%	67%	—	72%	75%	—	70%	73%	—	70%	73%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in} = 16$ to 40 VDC	—	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	$P_{out} = 10\%$ 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
		—	30	65	—	30	65	—	30	65	—	40	85	—	40	85	—	40	85



## 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	—   —	—   —