

# 3.25-5 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
- Built-in EMI input filter meets MIL-STD-461C requirements CE01, CE03, CS01, CS02 and CS06
- "Inhibit-not" function
- Fully isolated, input to output
- Single, double or triple outputs
- Short circuit protection
- 200 kHz operation for low ripple and fast response time
- No external filter caps required
- Hermetically sealed package

## 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

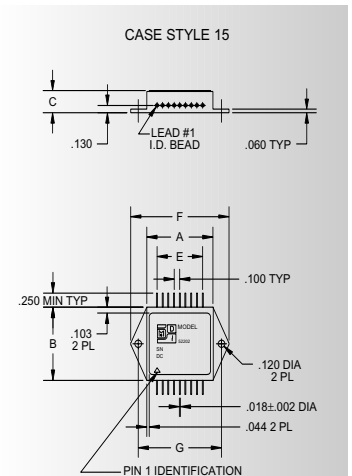
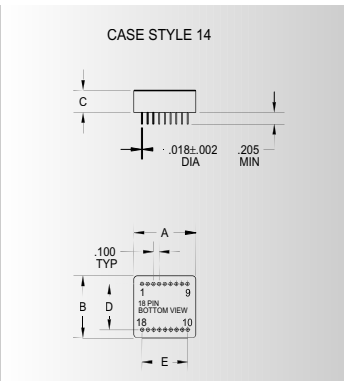
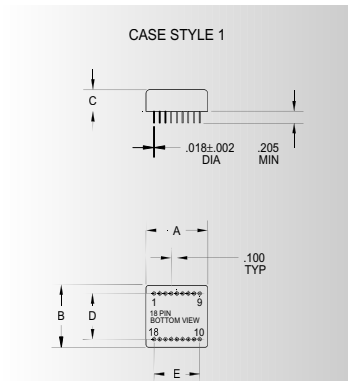
Linearly derates to zero at T<sub>case</sub> = +135°C

**WEIGHT:** 20 grams typical

SINGLE OUTPUT DEVICES		3325-S02 (2W)			3325-S02.5 (2.5W)			3325-S03.3 (3.3W)			3325-S05 (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 <sub>in min</sub> — V <sub>in max</sub>	—	—	1A	—	—	1A	—	—	1A	—	—	1A
Efficiency	P <sub>out</sub> = max rated load	53%	56%	—	58%	61%	—	63%	66%	—	69%	72%	—
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		3325-S05.2 (5W)			3325-S12 (5W)			3325-S15 (5W)			3325-S28 (5W)		
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>	—	—	961mA	—	—	416mA	—	—	333mA	—	—	178mA
Efficiency	P <sub>out</sub> = max rated load	69%	72%	—	76%	80%	—	77%	81%	—	76%	80%	—
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
3325	1	18	Solder Sealed Flangeless PCB Mount
3325	D	14	Seam Weld Flangeless PCB Mount
3325	TF	15	Seam Weld Chassis Mount with Flange



**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
1	1.080   27.432	1.080   27.432	0.380   9.652	0.800   20.320	0.800   20.320	—   —	—   —
14 D	1.090   27.686	1.090   27.686	0.380   9.652	0.800   20.320	0.800   20.320	—   —	—   —
15 TF	1.160   29.464	1.283   32.588	0.380   9.652	—   —	0.800   20.320	1.754   44.552	1.460   37.084

# DC-DC CONVERTERS

## FULL FEATURE SERIES

# 3325

DUAL OUTPUT DEVICES		3325-D05 (5W)			3325-D12 (5W)			3325-D15 (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	—	±500mA	±15mA	—	±208mA	±12mA	—	±166mA
Efficiency	$P_{out} = \text{max rated load}$	70%	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†	$P_{out} = 10\%$ 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



## 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		3325-T05 (3.25W)			3325-T12 (3.7W)			3325-T15 (3.7W)		
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	+4.9 -11.5	+5.0 -12.0	+5.1 -12.5	+4.9 -14.5	+5.0 -15.0	+5.1 -15.5
Output current	$V_{in\ min} - V_{in\ max}$	100mA ±10mA	—	500mA ±75mA	100mA ±5mA	—	500mA ±50mA	100mA ±5mA	—	500mA ±40mA
Efficiency	$P_{out} = \text{max rated load}$	64%	67%	—	69%	72%	—	69%	72%	—
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
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 <sub>pp</sub>	—	40	85	—	40	85	—	40	85

3325-SXX output <24 VDC		3325-SXX output ≥24 VDC		3325-DXX		3325-TXX	
Pin 1	+ input	Pin 10	N/C	Pin 1	+ input	Pin 10	N/C
Pin 2	+ input	Pin 11	N/C	Pin 2	+ input	Pin 11	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 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	output com	Pin 15	inhibit not
Pin 7	main out ret	Pin 16	N/C	Pin 7	output com	Pin 16	N/C
Pin 8	N/C	Pin 17	input ret	Pin 8	+ dual output	Pin 17	input ret
Pin 9	main output	Pin 18	input ret	Pin 9	N/C	Pin 18	input ret

Please specify **GRADE LEVEL** for your application. **8H** grade units will be shipped if no option is specified.

**8H** 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