

# 2 WATT DC – DC CONVERTERS

## PROTON RAD HARD 100K+® TECHNOLOGY



### 9 – 20 VOLTS DC INPUT

This DC-DC Converter is recommended for space applications requiring good efficiency at low power as well as a small package size.

#### Features

- Efficiency Optimized for low power applications
- GaN switching transistor at fixed 250 kHz. for low ripple
- No SEE  $\text{Let} > 82 \text{ MeV} \cdot \text{cm}^2/\text{mg}$
- 100K Rad Hard TID 100 kRads (S, and SE Grades)
- TID 45 Krads (L, L and LE grades)
- Magnetically coupled regulation
- "Inhibit-not"
- Internal soft start

#### Specifications

**INPUT:** 12 VDC nominal  
**Range:** 9 to 20 VDC (Start)  
 10 to 20 VDC (Run)

#### ISOLATION:

10 Megohms Minimum  
 Input to case: 500 VDC  
 Input to output: 500 VDC  
 Output to case: 500 VDC

#### ENVIRONMENT:

Case Temperature Range:  
 Operating -40°C to +85°C (I grade)  
 Operating -55°C to 85°C (L or S grades)  
 Operating -55°C to 125°C (LE or SE grades)  
 Storage: -65°C to +150°C  
 Shock: MIL-STD-810 Method 516.5 Procedure III  
 Random Vibration: MIL-STD-883 Method 2026, test condition 2H  
 Acceleration: MIL-STD 883 Method 2001, test condition A1, Y1 direction, 500G's

#### Grades I:

Full Output Power at  $T_{\text{case}} = +85^\circ\text{C}$   
 Linearly derates to zero at  $T_{\text{case}} = +105^\circ\text{C}$

#### Grades, L & S:

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

#### Grades LE & SE:

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

#### Grades L, LE & I:

TID up to 45kRad(Si)  
 No SEE up to 60MeV $\cdot$ cm $^2$ /mg

To operate converter, open inhibit-not pin

To inhibit converter, connect inhibit-not pin to input return

If needed use EMI Filter MDI Model 3747 available separately

**WEIGHT:** 18 grams typical



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## MODEL 3834

SINGLE OUTPUT DEVICES		3834-S3.3 (2W)			3834-S05 (2W)			3834-S12 (2W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output set voltage	—	+3.15	+3.3	+3.45	+4.8	+5	+5.2	+11.8	+12	+12.2
Output current	$V_{in \text{ min}} - V_{in \text{ max}}$	0.06	—	0.6A	0.04	—	0.4A	0.017	—	0.017A
Efficiency	$P_{out} = \text{max rated load}$	66%	69%	—	71%	74%	—	75%	78%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in \text{ min}} - V_{in \text{ max}}$	—	100mV	200mV	—	110mV	200mV	—	200mV	350mV
Load regulation	$P_{out} = 10\%$ to F.L.	—	100mV	200mV	—	100mV	200mV	—	150mV	300mV
Output ripple	F.L. BW 2 MHz mV $_{pp}$	—	30	50	—	30	50	—	60	120

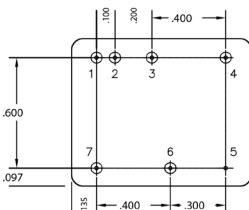
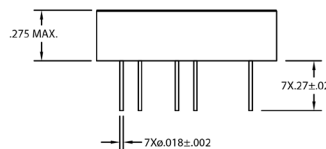
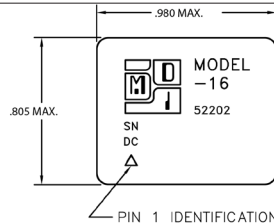
SINGLE OUTPUT DEVICES		3834-S15 (2W)			3834-S28 (2W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX
Output set voltage	—	+14.8	+15	+15.2	+27.7	+28	+28.3
Output current	$V_{in \text{ min}} - V_{in \text{ max}}$	0.013	—	0.133A	0.007	—	0.071A
Efficiency	$P_{out} = \text{max rated load}$	75%	78%	—	75%	78%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in \text{ min}} - V_{in \text{ max}}$	—	200mV	400mV	—	400mV	700mV
Load regulation	$P_{out} = 10\%$ to F.L.	—	200mV	400mV	—	400mV	700mV
Output ripple	F.L. BW 2 MHz mV $_{pp}$	—	70	150mV	—	180mV	300mV

DUAL OUTPUT DEVICES		3834-D05 (2W)			3834-D12 (2W)			3834-D15 (2W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output set voltage	+ $I_{out} = -I_{out}$	+4.8	+5.0	+5.2	+11.8	+12.0	+12.2	+14.8	+15.0	+15.2
Output current*	$V_{in \text{ min}} - V_{in \text{ max}}$	0.02A	—	0.2A	$\pm 0.008A$	—	$\pm 0.083A$	$\pm 0.007A$	—	$\pm 0.067A$
Efficiency	$P_{out} = \text{max rated load}$	71%	74%	—	75%	78%	—	75%	78%	—
Line regulation	$P_{out} = \text{max rated load}$ $V_{in \text{ min}} - V_{in \text{ max}}$	—	$\pm 110mV$	$\pm 200mV$	—	$\pm 200mV$	$\pm 350mV$	—	$\pm 200mV$	$\pm 400mV$
Load regulation†	$P_{out} = 10\%$ to F.L.	—	$\pm 100mV$	$\pm 200mV$	—	$\pm 150mV$	$\pm 300mV$	—	$\pm 200mV$	$\pm 400mV$
Output ripple	F.L. BW 2 MHz mV $_{pp}$	—	30mV	50mV	—	60mV	120mV	—	70mV	150mV

Notes: \*Up to 70% full power available from either output if rated output power is not exceeded; †balanced load conditions.

Model No.	Case Style	Pin Count	Mounting
3834	16	7	Seam Weld Flangeless PCB Mount



#### Pin Outs

3834-SXX	3834-DXX
Pin 1 +12VDC Input	Pin 1 +12VDC Input
Pin 2 +12VDC Input Rtn	Pin 2 +12VDC Input Rtn
Pin 3 Output Pos	Pin 3 Output Pos
Pin 4 Output Rtn	Pin 4 Output Rtn
Pin 5 Case	Pin 5 Case
Pin 6 N/C	Pin 6 Output Neg
Pin 7 Inhibit-not	Pin 7 Inhibit-not

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

- EU Engineering Units  
 I 45K, +85°C commercial/space  
 L 45 K, +85°C military/aerospace  
 LE 45 K, +125°C military/aerospace  
 S 100 K+, +85°C space  
 SE 100 K+, +125°C space

For Heat Removal and Mounting Recommendations See MDI application notes on mounting considerations for DC-DC Converters