

# Series 3835

## 15 Watt Proton Rad Hard 100K+<sup>®</sup> DC – DC Converters



### 9 - 20 VDC Input

#### Features

- Efficiency optimized for medium power applications
- GaN switching transistor at fixed 200 kHz. for low ripple
- No SEE LET>82 MeV\*cm<sup>2</sup>/mg
- 100K+ Rad Hard TID 100 kRads (S and SE grades)
- TID 45 Krads (L, LE and I grades)
- Magnetically coupled regulation, no optocoupler
- Inhibit-not and external sync
- Internal soft start
- Rugged Seam Welded Hermetic Package 1.12" by 1.45"

#### Specifications

**INPUT:** 12 VDC nominal  
 Range: 9 to 20 VDC Start  
 8 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:  
 Storage temperature: -55°C to +150°C  
 Operating -55°C to +85°C (L or S grades)  
 Operating -55°C to +125°C (LE or SE grades)  
 Operating -40°C to +85°C (I grade)  
 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

**Grade: EU:**  
 Full Output Power at T<sub>case</sub> = +85°C  
 Linearly derated to zero at T<sub>case</sub> = +115°C  
**Grade: I:**  
 Full Output Power at T<sub>case</sub> = +85°C  
 Linearly derated to zero at T<sub>case</sub> = +105°C  
**Grades: L & S:**  
 Full Output Power at T<sub>case</sub> = +85°C  
 Linearly derated to zero at T<sub>case</sub> = +115°C  
**Grades LE & SE:**  
 Full Output Power at T<sub>case</sub> = +125°C  
 Linearly derated to zero at T<sub>case</sub> = +135°C

**WEIGHT:** 35 grams typical

To operate converter, open inhibit-not pin  
 To inhibit converter, connect inhibit-not pin to input return  
 If not used, leave sync pin open do not connect

Suggested EMI Filter MDI Model 3723

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

SINGLE OUTPUT DEVICES		3835-S3.3 (15W)			3835-S05 (15W)			3835-S12 (15W)			3835-S15 (15W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	F.L.	+3.1	+3.3	+3.4	+4.8	+5.0	+5.2	+11.8	+12.0	+12.2	+14.8	+15.0	+15.2
Output current	V <sub>in min</sub> - V <sub>in max</sub>	0.45A	—	4.5A	0.3A	—	3A	0.125A	—	1.25A	0.10A	—	1A
Efficiency	P <sub>out</sub> = max rated load	67%	70%	—	72%	75%	—	80%	83%	—	80%	84%	—
Line regulation	P <sub>out</sub> = max rated load V <sub>in min</sub> - V <sub>in max</sub>	—	100mV	200mV	—	110mV	200mV	—	20mV	100mV	—	25mV	125mV
Load regulation	P <sub>out</sub> = 10% to F.L.	—	100mV	200mV	—	100mV	200mV	—	150mV	500mV	—	200mV	600mV
Output ripple	F.L. BW 2 MHz mV <sub>pp</sub>	—	30	100	—	40	125	—	60	150	—	70	180

SINGLE OUTPUT DEVICES		3835-S28 (15W)		
PARAMETER	CONDITION	MIN	TYP	MAX
Output voltage	F.L.	+27.7	+28.0	+28.3
Output current	V <sub>in min</sub> - V <sub>in max</sub>	0.054A	—	0.54A
Efficiency	P <sub>out</sub> = max rated load	80%	84%	—
Line regulation	P <sub>out</sub> = max rated load V <sub>in min</sub> - V <sub>in max</sub>	—	50mV	250mV
Load regulation	P <sub>out</sub> = 10% to F.L.	—	400mV	700mV
Output ripple	F.L. BW 2 MHz mV <sub>pp</sub>	—	180	300

DUAL OUTPUT DEVICES		3835-D05 (15W)			3835-D12 (15W)			3835-D15 (15W)		
PARAMETER	CONDITION	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
Output voltage	F.L.	+4.8	+5.0	+5.2	+11.8	+12.0	+12.2	+14.8	+15.0	+15.2
Output current*	V <sub>in min</sub> - V <sub>in max</sub>	±0.15A	—	±1.5A	±0.063	—	±0.63A	±0.05A	—	±0.5A
Efficiency	P <sub>out</sub> = max rated load	72%	75%	—	80%	83%	—	80%	84%	—
Line regulation	P <sub>out</sub> = max rated load V <sub>in min</sub> - V <sub>in max</sub>	—	±110mV	±200mV	—	±200mV	±350mV	—	±200mV	±400mV
Load regulation†	P <sub>out</sub> = 10% to F.L.	—	±100mV	±200mV	—	±150mV	±500mV	—	±200mV	±600mV
Output ripple	F.L. BW 2 MHz mV <sub>pp</sub>	—	40	125	—	60	150	—	70	18

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

#### Pin Outs

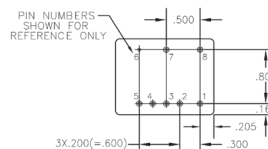
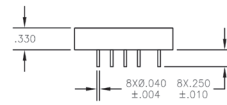
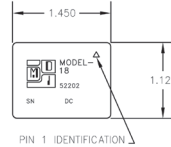
##### 3835-SXX

- Pin 1 Inhibit-Not
- Pin 2 N/C
- Pin 3 Output Return
- Pin 4 Output Pos
- Pin 5 Sync
- Pin 6 Case
- Pin 7 +12VDC Input Return
- Pin 8 +12VDC Input

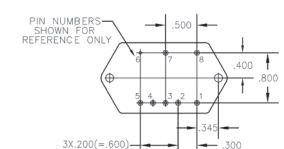
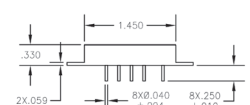
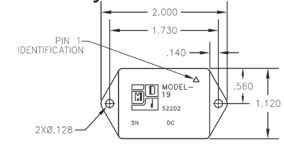
##### 3835-DXX

- Pin 1 Inhibit-Not
- Pin 2 Output Pos
- Pin 3 Output Return
- Pin 4 Output Neg
- Pin 5 Sync
- Pin 6 Case
- Pin 7 +12VDC Input Return
- Pin 8 +12VDC Input

#### Case Style 18 Seam Weld



#### Case Style 19 Seam Weld



Note: Baseplate is recommended heat removal surface.

For heat removal and mounting recommendations. See MDI application notes on mounting considerations for DC-DC converters.

#### GRADE LEVELS:

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

<b>EU</b>	Engineering Units	<b>I</b>	45K, 85°C Commercial/Space
<b>L</b>	45K, +85°C Military/Aerospace	<b>S</b>	100K+ <sup>TM</sup> , +85°C Space
<b>LE</b>	45K, +125°C Military/Aerospace	<b>SE</b>	100K+ <sup>TM</sup> , +125°C Space



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