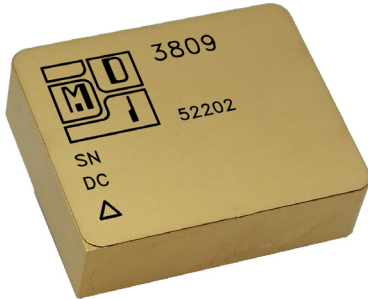


2 WATT HYBRID

DC-DC CONVERTERS PROTON RAD HARD 100K+® TECHNOLOGY



28 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 $> 82 \text{ MeV} \cdot \text{cm}^2/\text{mg}$
- 100K Rad Hard TID 100 kRads (R, S, RE and SE Grades)
- TID 45 Krads (L and LE grades)
- Magnetically coupled regulation
- "Inhibit-not"
- Internal soft start

Specifications

INPUT: 28 VDC nominal
Range: 16 to 50 VDC

ISOLATION:

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

ENVIRONMENT:

Case Temperature Range:
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, 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:
TID up to 45kRad(Si)
No SEE up to 60MeV*cm²/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



Modular Devices, Inc.
Power Conversion for Space and Military/Aerospace

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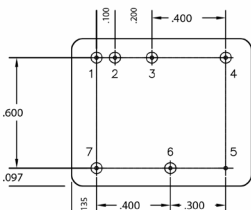
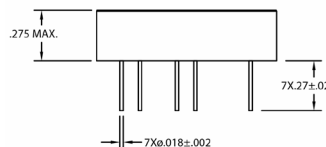
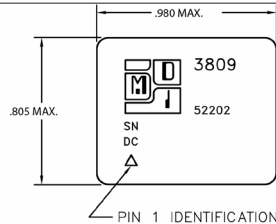
Released 2018-10-01

MODEL 3809

SINGLE OUTPUT DEVICES		3809-S3.3 (2W)			3809-S05 (2W)			3809-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	$V_{\text{in min}} - V_{\text{in max}}$	0.06	—	0.6A	0.04	—	0.4A	0.0167	—	0.167A
Efficiency	$P_{\text{out}} = \text{max rated load}$	66%	69%	—	71%	74%	—	75%	78%	—
Line regulation	$V_{\text{in min}} - V_{\text{in max}}$ $P_{\text{out}} = \text{max rated load}$	—	100mV	200mV	—	110mV	200mV	—	200mV	350mV
Load regulation	$P_{\text{out}} = 10\%$ 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		3809-S15 (2W)			3809-S28(2W)					
Output set voltage	—	+14.8	+15	+15.2	+27.7	+28	+28.3			
Output current	$V_{\text{in min}} - V_{\text{in max}}$	0.0133	—	0.133A	0.0071	—	0.071A			
Efficiency	$P_{\text{out}} = \text{max rated load}$	75%	78%	—	75%	78%	—			
Line regulation	$V_{\text{in min}} - V_{\text{in max}}$ $P_{\text{out}} = \text{max rated load}$	—	200mV	400mV	—	400mV	700mV			
Load regulation	$P_{\text{out}} = 10\%$ to F.L.	—	200mV	400mV	—	400mV	700mV			
Output ripple	F.L. BW 2 MHz mV _{pp}	—	70	150mV	—	180mV	300mV			
DUAL OUTPUT DEVICES		3809-D05 (2W)			3809-D12 (2W)			3809-D15 (2W)		
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*	$V_{\text{in min}} - V_{\text{in max}}$	0.02A	—	0.2A	±0.0083A	—	±0.083A	±0.0067A	—	±0.067A
Efficiency	$P_{\text{out}} = \text{max rated load}$	71%	74%	—	75%	78%	—	75%	78%	—
Line regulation	$V_{\text{in min}} - V_{\text{in max}}$ $P_{\text{out}} = \text{max rated load}$	— ±110mV±200mV			— ±200mV±350mV			— ±200mV±400mV		
Load regulation†	$P_{\text{out}} = 10\%$ to F.L.	— ±100mV±200mV			— ±150mV±300mV			— ±200mV±400mV		
Output ripple	F.L. BW 2 MHz mV _{ppmV}	—	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
3809	16	7	Seam Weld Flangeless PCB Mount



Pin Outs

3809-SXX	3809-DXX
Pin 1 + Input	Pin 1 + Input
Pin 2 Input Rtn	Pin 2 Input Rtn
Pin 3 + Output	Pin 3 + Output
Pin 4 Output Rtn	Pin 4 Output Rtn
Pin 5 Case	Pin 5 Case
Pin 6 N/C	Pin 6 - Output
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
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