

# POINT-OF -LOAD DC/DC CONVERTER

4.5V TO 12V INPUT, 1V TO 5V SINGLE OUTPUT  
RADIATION HARDENED DESIGN

## 3DPM0289-1

### KEY FEATURES

- Output current up to 2A
- Efficiency > 90% (3.3V/0.3A)
- Supports Current Sharing
- Excellent Dynamic Performances
- Fixed switching frequency (340kHz)
- Integrated EMC filters
- Input Under-voltage Protection
- Output Overload Protection
- Internal Temperature Protection
- Soft Start, Enable Command
- Space Qualified Technology
- Radiation Hardened design  
TID > 40 krad(Si)  
SEL LET > 60 MeV.cm<sup>2</sup>/mg  
Critical SET LET threshold > 60 MeV.cm<sup>2</sup>/mg
- Junction Temperature Range -40°C / +125°C
- 16-pin gull wing SMD
- ITAR Free Product - Worldwide delivery guarantee
- Size: 12.5 x 11 x 9.4 mm
- Mass: 4 g

### PRODUCT OVERVIEW

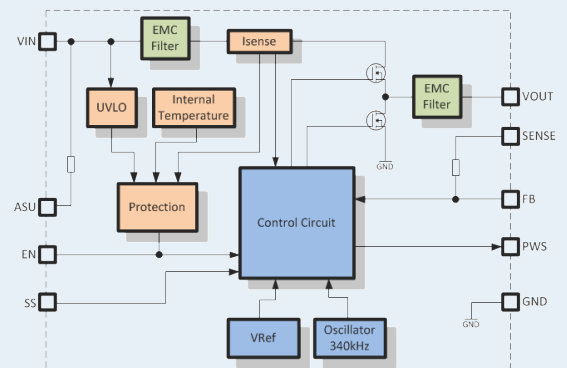
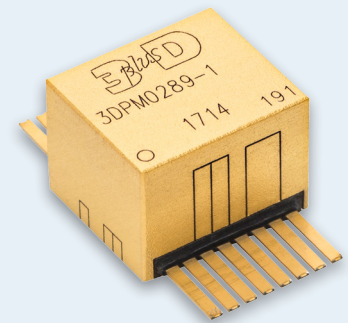
The 3D PLUS 3DPM0289 PoL DC/DC Converter module operates over a wide input voltage range (4.5V to 12.0V) and provides up to 2A of output current with an output voltage range of 1.0V to 5.0V. The module has a small form factor, which makes it possible to bring the PoL close to the load in order to limit the voltage drop.

Based on a Buck topology, the PoL module uses synchronous rectification to provide efficiencies higher than 90% (3.3V/from 0.3A to 1.5A). The switching frequency is fixed at 340 kHz. EMC filters are integrated to simplify module implementation and output voltage is adjustable through an external resistor. The module is fully protected against output overload, input under-voltage and internal over-temperature.

For increased output current, two PoL modules can operate in a parallel configuration to achieve up to 4A. No other external components need to be added. PWS pins must be connected together to enable an equitable sharing of the current between the two PoLs.

The 3DPM0289-1 PoL Converter is an ITAR Free product that features a SEL/SET of 60 MeV.cm<sup>2</sup>/mg and a TID of 40krad (Si).

The PoL Converter is an excellent solution for low voltage power distribution systems designed around high-speed digital electronics such as ASICs, FPGAs (Microsemi, XILINX,...) and memories (SDRAM, DDR, DDR2, DDR3,...). Also, it can be used for any other high efficiency Point of Load regulation / distributed power system for other space applications: science and deep space missions, Earth observation, navigation, launch and manned space vehicles.



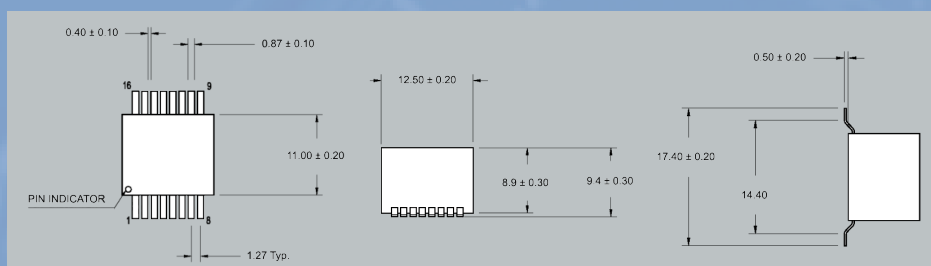
## ELECTRICAL SPECIFICATIONS

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
<b>OPERATING CONDITIONS</b>					
Input Voltage	Continuous	4.5		12	V
Output Current	$P_{out} \leq 7.5W$	0		2	A
Enable Command	EN(OFF state)	0		1.1	V
	EN(ON state)	2.7		5.5	V
Storage Temperature	-	-55		+150	°C
Junction Temperature	-	-40		+125	°C
Thermal Resistance ( $\Theta_{ja}$ )	-			25	°C/W
<b>INTERNAL TEMPERATURE PROTECTION</b>					
Internal Thermal Shutdown Temperature	-	115	125	135	°C
<b>OVERLOAD PROTECTION</b>					
Maximum Output Current	Before PoL switch OFF	2			A
<b>UNDER-VOLTAGE PROTECTION</b>					
UVD Protection threshold	$V_{in} = 5V, V_{out} = 3.3V, I_{out} = 1A$	3.5		4.1	V
UVD Recovery threshold	$V_{in} = 5V, V_{out} = 3.3V, I_{out} = 1A$	3.8		4.48	V
UVD hysteresis	-		220		mV

## PRODUCT PERFORMANCES

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
<b>OUTPUT CHARACTERISTICS</b>					
Output Voltage Range	-	1		5	V
Line Regulation	$V_{in} = 4.5V \text{ to } 12V$			-0.2	%/V
Load Regulation	$I_{out} = 0A \text{ to } 500mA$			-3	%/A
	$I_{out} = 500mA \text{ to } 2A$			-1.25	%/A
Load Transient	$I_{out} = \pm 1A, di/dt = 10A/\mu s$ (min DC load = 500mA)		75	100	mV
Switching Frequency	-		340		kHz
Output Ripple	Measurement BW limited to 20MHz; $I_{out} = 1.5A$			12	mVrms
				80	mVpp
	Measurement BW limited to 20MHz; $I_{out} = 2A$			12	mVrms
				80	mVpp
Efficiency	$V_{in} = 5V, V_{out} = 3.3V$ $I_{out} = 500mA$	90	94		%
	$V_{in} = 5V, V_{out} = 3.3V$ $I_{out} = 2A$	82	87		%
	$V_{in} = 12V, V_{out} = 5V$ $I_{out} = 1.5A$	84	89		%

## PACKAGE



### TEMPERATURE RANGES

C : Commercial (0°C to +70°C)

I : Industrial (-40°C to +85°C)

### QUALITY GRADE

N : Commercial

B : Industrial

S : Space

### ORDERING INFORMATION

Quality Grade ——— Options

Part Number – X X – XXX

Temperature Range ———



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