

**DMP1045U**

**P-CHANNEL ENHANCEMENT MODE MOSFET**

**Product Summary**

$V_{(BR)DSS}$	$R_{DS(on) max}$	$I_D$ $T_A = 25^\circ C$
-12V	31mΩ @ $V_{GS} = -4.5V$	5.2A
	45mΩ @ $V_{GS} = -2.5V$	4.3A

**Features and Benefits**

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **ESD Protected Up To 3kV**
- **"Green" Device, Halogen and Antimony Free (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

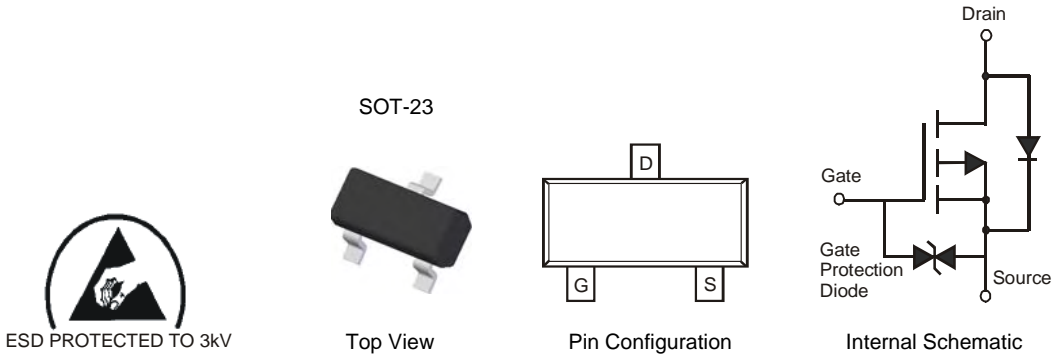
**Description and Applications**

This new generation MOSFET has been designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- DC-DC Converters
- Power management functions
- Analog Switch

**Mechanical Data**

- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.0072 grams (approximate)

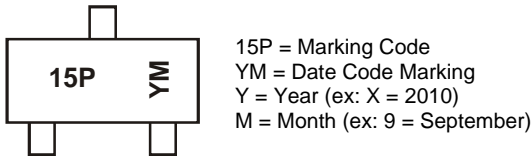


**Ordering Information** (Note 3)

Part Number	Case	Packaging
DMP1045U-7	SOT-23	3,000/Tape & Reel

Notes: 1. No purposefully added lead. Halogen and Antimony Free.

**Marking Information**



Date Code Key

Year	2010	2011	2012	2013	2014	2015
Code	X	Y	Z	A	B	C

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D



**DMP1045U**

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	-12	V
Gate-Source Voltage			V <sub>GSS</sub>	±8	V
Continuous Drain Current (Note 4) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = 25°C	I <sub>D</sub>	4.0	A
		T <sub>A</sub> = 70°C		3.1	
Continuous Drain Current (Note 4) V <sub>GS</sub> = -2.5V	Steady State	T <sub>A</sub> = 25°C	I <sub>D</sub>	3.3	A
		T <sub>A</sub> = 70°C		2.6	
Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = 25°C	I <sub>D</sub>	5.2	A
		T <sub>A</sub> = 70°C		4.2	
Continuous Drain Current (Note 5) V <sub>GS</sub> = -2.5V	Steady State	T <sub>A</sub> = 25°C	I <sub>D</sub>	4.3	A
		T <sub>A</sub> = 70°C		3.4	
Maximum Continuous Body Diode Forward Current (Note 5)			I <sub>S</sub>	2	A
Pulsed Drain Current (10us pulse, duty cycle=1%) (Note 4)			I <sub>DM</sub>	40	A

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 4)	P <sub>D</sub>	0.8	W
Thermal Resistance, Junction to Ambient (Note 4)	R <sub>θJA</sub>	168	°C/W
Total Power Dissipation (Note 5)	P <sub>D</sub>	1.3	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	99	°C/W
Thermal Resistance, Junction to Case (Note 5)	R <sub>θJc</sub>	14.8	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-12	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	-	-	-1.0	μA	V <sub>DS</sub> = -12V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±10	μA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-0.3	-0.55	-1.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	-	26	31	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4.0A
			31	45		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -3.5A
			45	75		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -2.7A
Forward Transfer Admittance	Y <sub>fs</sub>	-	12	-	S	V <sub>DS</sub> = -5V, I <sub>D</sub> = -4A
Diode Forward Voltage	V <sub>SD</sub>	-	-0.6	-	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iss</sub>	-	1357	-	pF	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	504	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	235	-	pF	
Gate Resistnace	R <sub>g</sub>	-	14.1	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
<b>SWITCHING CHARACTERISTICS (Note 7)</b>						
Total Gate Charge	Q <sub>g</sub>	-	15.8	-	nC	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, I <sub>D</sub> = -4A
Gate-Source Charge	Q <sub>gs</sub>	-	2.0	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	3.9	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	15.7	-	ns	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V, R <sub>L</sub> = 2.5Ω, R <sub>G</sub> = 3.0Ω
Turn-On Rise Time	t <sub>r</sub>	-	23.3	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	91.2	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	106.9	-	ns	

Notes: 2. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.  
3. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate