



DMP10H400SE

#### 100V P-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> T <sub>A</sub> = +25°C
-100V	250mΩ @ $V_{GS} = -10V$	-2.3A
-1007	300mΩ @ V <sub>GS</sub> = -4.5V	-2.1A

## **Description**

This MOSFET is designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

### **Applications**

- Motor Control
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply

### **Features and Benefits**

- Low Gate Drive
- Low Input Capacitance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- An Automotive-Compliant Part is Available Under Separate Datasheet (DMP10H400SEQ)

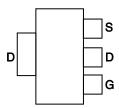
#### **Mechanical Data**

- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound.
  UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish Matte Tin Annealed over Copper Lead Frame.
  Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.112 grams (Approximate)

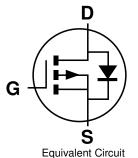
SOT223



Top View



Pin Out - Top View



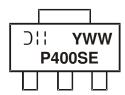
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP10H400SE-13	SOT223	2.500 / Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com/quality/lead\_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- ${\it 4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.}\\$

# **Marking Information**



O!! = Manufacturer's Marking P400SE = Marking Code YWW = Date Code Marking Y or Y = Year (ex: 5 = 2015) WW = Week (01 to 53)



# **Maximum Ratings** (@ $T_A = +25$ °C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage			$V_{DSS}$	-100	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V		
Continuous Drain Current, V <sub>GS</sub> = -10V (Note 5)	Steady State	$T_{C} = +25^{\circ}C$ $T_{A} = +25^{\circ}C$	I <sub>D</sub>	-6.0 -2.3	А
Maximum Body Diode Forward Current (Note 5)	I <sub>S</sub>	-1.9	Α		
Pulsed Drain Current (380μs Pulse, Duty Cycle = 1%)			I <sub>DM</sub>	-10	Α

# Thermal Characteristics (@TA = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Total Power Dissipation (Note 5)	$T_A = +25^{\circ}C$	0	2.0	W
Total Power Dissipation (Note 5)	$T_A = +70^{\circ}C$	P <sub>D</sub>	1.3	
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	62	°C/W
Total Power Dissipation (Note 5) $T_C = +25^{\circ}C$		$P_{D}$	13.7	W
Thermal Resistance, Junction to Case (Note 5)		$R_{ heta JC}$	9.1	°C/W
Operating and Storage Temperature Range		$T_{J}$ , $T_{STG}$	-55 to +150	°C

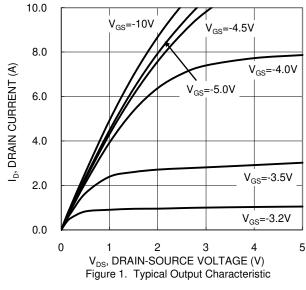
# **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

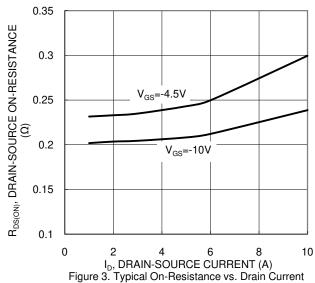
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 6)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-100	—		V	$V_{GS} = 0V, I_D = -250\mu A$	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	1	μΑ	$V_{DS} = -80V, V_{GS} = 0V$	
Gate-Source Leakage	I <sub>GSS</sub>	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 6)							
Gate Threshold Voltage	$V_{GS(TH)}$	-1.0	-2.2	-3.0	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
Static Drain-Source On-Resistance		_	203	250	mΩ	$V_{GS} = -10V, I_D = -5A$	
Static Diani-Source On-nesistance	R <sub>DS(ON)</sub>	_	241	300	1115.2	$V_{GS} = -4.5V, I_D = -5A$	
Diode Forward Voltage	$V_{SD}$	_	-0.9	-1.2	V	$V_{GS} = 0V, I_{S} = -5A$	
DYNAMIC CHARACTERISTICS (Note 7)							
Input Capacitance	C <sub>iss</sub>	_	1239				
Output Capacitance	Coss	_	42		pF	$V_{DS} = -25V$ , $V_{GS} = 0V$ , $f = 1.0MHz$	
Reverse Transfer Capacitance	C <sub>rss</sub>	_	28	_			
Gate Resistance	$R_g$	_	13		Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	
Total Gate Charge (V <sub>GS</sub> = -4.5V)	$Q_g$	_	8.4	_			
Total Gate Charge (V <sub>GS</sub> = -10V)	$Q_g$	_	17.5	_	nC	$V_{DS} = -60V, I_{D} = -5A$	
Gate-Source Charge	$Q_{gs}$	_	2.8	_	IIC		
Gate-Drain Charge	$Q_{gd}$	_	3.2	_			
Turn-On Delay Time	t <sub>D(ON)</sub>	_	9.1	_		$V_{DD} = -50V, R_G = 9.1\Omega, I_D = -5A$	
Turn-On Rise Time	t <sub>R</sub>	_	14.9	_	20		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	_	57.4	_	ns		
Turn-Off Fall Time	t <sub>F</sub>	_	34.4	_			
Body Diode Reverse Recovery Time	t <sub>RR</sub>	_	25.2		ns	$V_{GS} = 0V$ , $I_S = -5A$ , $di/dt = 100A/\mu s$	
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	_	24.5	_	nC	$V_{GS} = 0V$ , $I_S = -5A$ , $di/dt = 100A/\mu s$	

Notes:

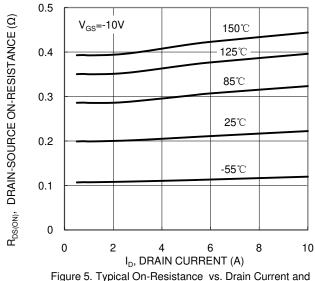
- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.6. Short duration pulse test used to minimize self-heating effect.7. Guaranteed by design. Not subject to production testing.



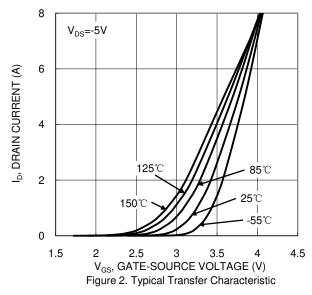


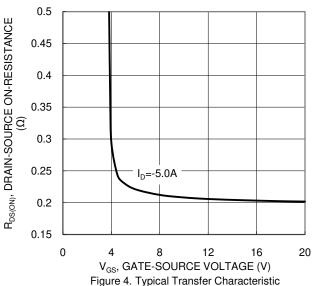


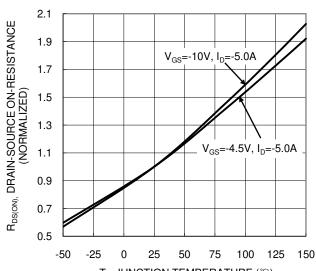
and Gate Voltage



Junction Temperature







T<sub>J</sub>, JUNCTION TEMPERATURE (°C) Figure 6. On-Resistance Variation with Junction Temperature

### DMP10H400SE

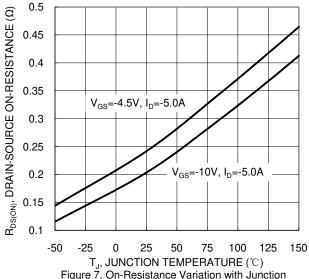
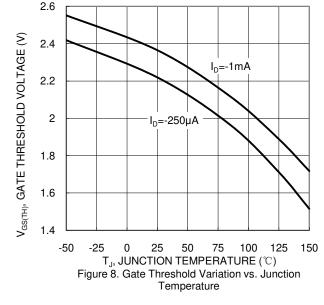
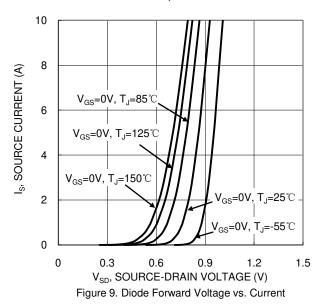
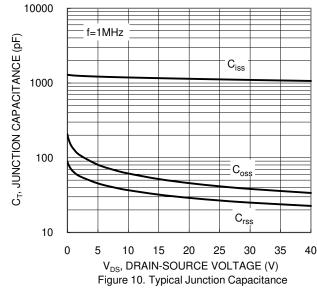
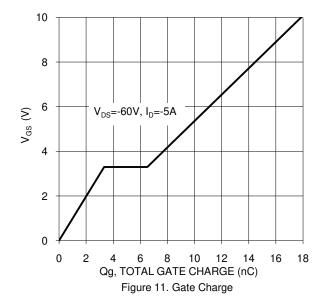


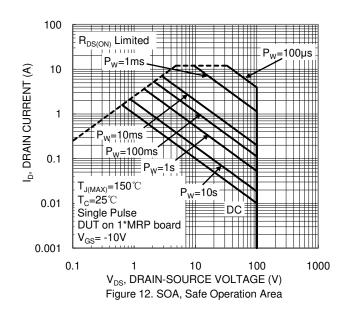
Figure 7. On-Resistance Variation with Junction Temperature













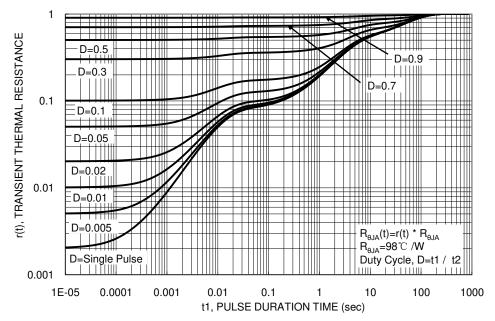


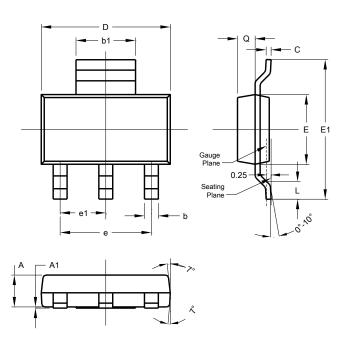
Figure 13. Transient Thermal Resistance



# **Package Outline Dimensions**

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.

#### **SOT223**

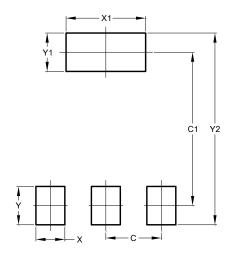


SOT223					
Dim	Min	Max	Тур		
Α	1.55	1.65	1.60		
<b>A</b> 1	0.010	0.15	0.05		
b	0.60	0.80	0.70		
b1	2.90	3.10	3.00		
С	0.20	0.30	0.25		
D	6.45	6.55	6.50		
Е	3.45	3.55	3.50		
E1	6.90	7.10	7.00		
е	-	-	4.60		
e1	-	-	2.30		
L	0.85	1.05	0.95		
Q	0.84	0.94	0.89		
All Dimensions in mm					

# **Suggested Pad Layout**

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

### **SOT223**



Dimensions	Value (in mm)
С	2.30
C1	6.40
Х	1.20
X1	3.30
Υ	1.60
Y1	1.60
V2	8.00



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