



#### 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 and Applications**

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Engine Management Systems
- Body Control Electronics
- DC-DC Converters

## **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
- PPAP Capable (Note 4)

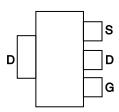
#### **Mechanical Data**

- 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)

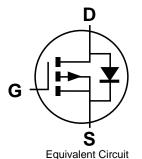




Top View



Pin Out - Top View



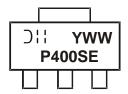
## Ordering Information (Note 5)

Part Number	Case	Packaging
DMP10H400SEQ-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.
- 4. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product\_compliance\_definitions.html.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

## **Marking Information**



Dil = Manufacturer's Marking P400SE = Marking Code YWW = Date Code Marking Y or Y= Year (ex: 15 = 2015) WW = Week (01 to 53)



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

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	$V_{DSS}$	-100	V		
Gate-Source Voltage	$V_{GSS}$	±20	V		
Continuous Drain Current, V <sub>GS</sub> = -10V (Note 6)	Steady State	$T_C = +25$ °C $T_A = +25$ °C	I <sub>D</sub>	-6.0 -2.3	А
Maximum Body Diode Forward Current (Note 6)	I <sub>S</sub>	-1.9	Α		
Pulsed Drain Current (380μs Pulse, Duty Cycle = 1%	I <sub>DM</sub>	-10	Α		

# Thermal Characteristics ( $@T_A = +25^{\circ}C$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Total Power Dissipation (Note 6)	$T_A = +25^{\circ}C$	P <sub>D</sub>	2.0	W
Total Power Dissipation (Note 6)	$T_A = +70^{\circ}C$		1.3	] vv
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	62	°C/W	
Total Power Dissipation (Note 6) $T_C = +25^{\circ}C$		P <sub>D</sub>	13.7	W
Thermal Resistance, Junction to Case (Note 6)	R <sub>0JC</sub>	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	Tym	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)	Syllibol	IVIIII	Тур	IVIAX	Ullit	rest condition
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	μA	$V_{DS} = -80V, V_{GS} = 0V$
Gate-Source Leakage	I <sub>GSS</sub>			±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)	.000					163 ==01, 183 01
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-1.0	-2.2	-3.0	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$
Olatia Busia Osama Os Basiatana		_	203	250		V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	_	241	300	mΩ	$V_{GS} = -4.5V, I_D = -5A$
Diode Forward Voltage	$V_{SD}$		-0.9	-1.2	V	$V_{GS} = 0V, I_{S} = -5A$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	Ciss		1239			V <sub>DS</sub> = -25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	Coss		42	_	pF	
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)	Qg		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	_		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	_	57.4	_	ns	
Turn-Off Fall Time	t <sub>F</sub>	1	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:

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



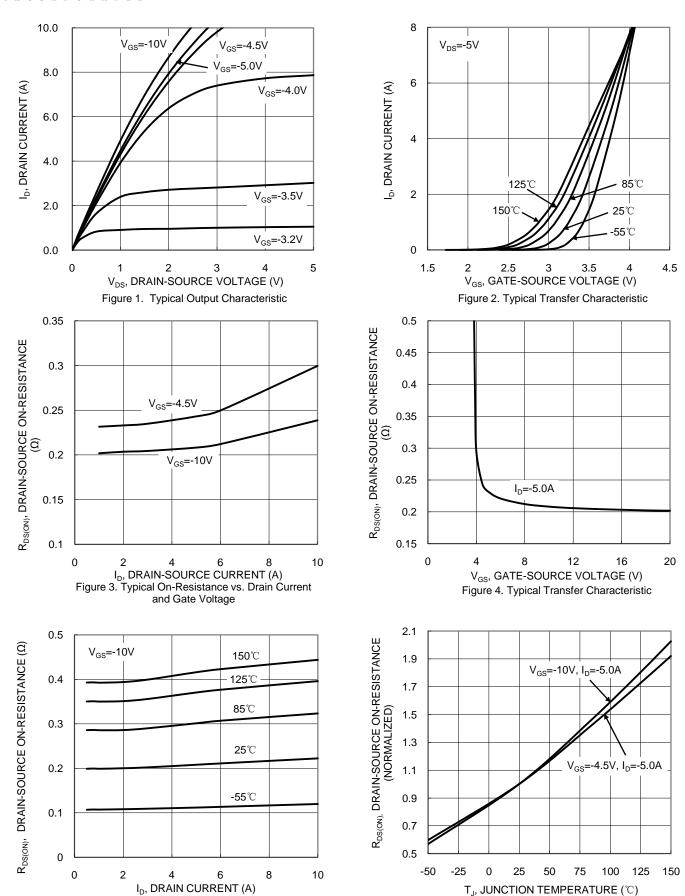


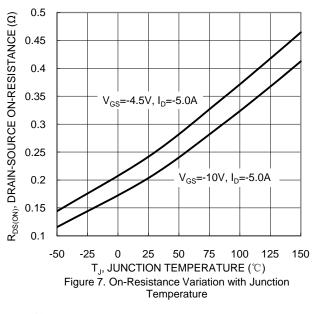
Figure 5. Typical On-Resistance vs. Drain Current and

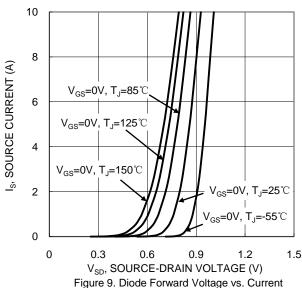
Junction Temperature

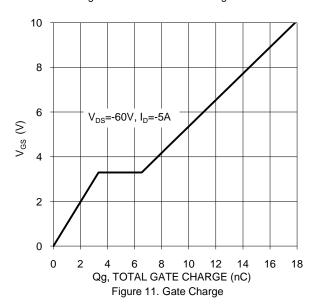
Figure 6. On-Resistance Variation with Junction

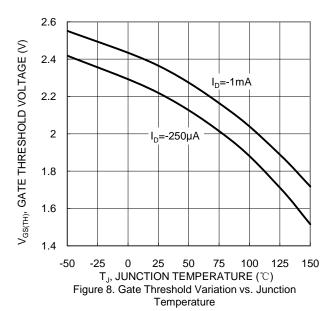
Temperature

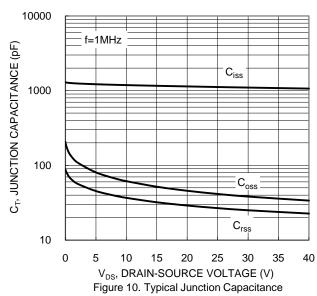


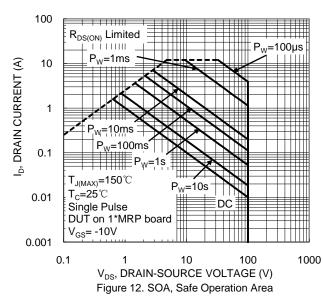




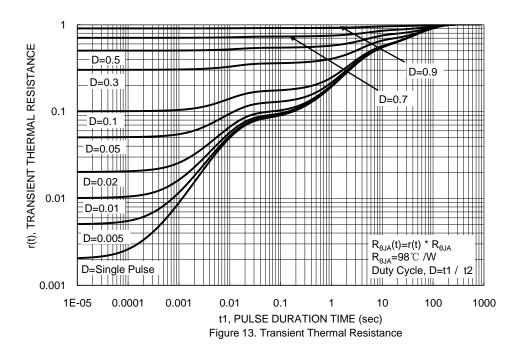










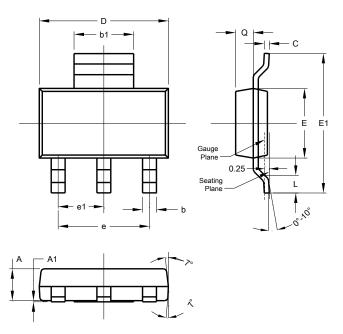




# **Package Outline Dimensions**

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

#### **SOT223**

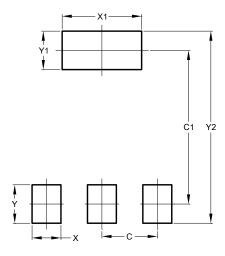


SOT223					
Dim	Min	Max	Тур		
Α	1.55	1.65	1.60		
A1	0.010	0.15	0.05		
b	0.60	0.80	0.70		
b1	2.90	3.10	3.00		
С	0.20	0.30	0.25		
D	6.45	6.55	6.50		
Е	3.45	3.55	3.50		
E1	6.90	7.10	7.00		
е	-	-	4.60		
e1	-	-	2.30		
L	0.85	1.05	0.95		
Q	0.84	0.94	0.89		
All Dimensions in mm					

# **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				
Y	1.60				
Y1	1.60				
V2	8 00				



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многоканальный

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