Lead-free Green

P-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

NEW PRODUCT

Features

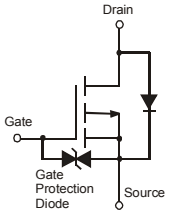
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **ESD Protected Gate**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

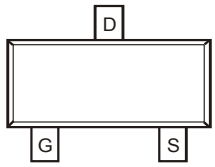
- Case: SC-59
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)

SC-59

TOP VIEW



Equivalent Circuit



TOP VIEW

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	±12	V
Drain Current (Note 1) Steady State	I_D	-0.7	A
Pulsed Drain Current (Note 3)	I_{DM}	-2.8	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_d	500	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	250	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-65 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	V_{GS} = 0V, I_D = 250mA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-10	μA	V_{DS} = -20V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±10	μA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	—	-1.2	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	0.23 0.37	0.30 0.50	Ω	V_{GS} = -4.5V, I_D = -0.4A V_{GS} = -2.5V, I_D = -0.4A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	1.5	—	S	V_{DS} = -10V, I_D = 0.4A
Diode Forward Voltage (Note 5)	V_{SD}	—	-0.8	-1.1	V	V_{GS} = 0V, I_S = -0.7A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	180	—	pF	V_{DS} = -10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	120	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	50	—	pF	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	—	5	—	ns	V_{DD} = -10V, I_D = -0.4A, V_{GS} = -5.0V, R_{GEN} = 50Ω
Turn-Off Delay Time	$t_{D(OFF)}$	—	55	—	ns	
Turn-On Rise Time	t_r	—	20	—	ns	
Turn-Off Fall Time	t_f	—	70	—	ns	

Notes:
1. Device mounted on FR-4 PCB.
2. No purposefully added lead.
3. Pulse width ≤10μS, Duty Cycle ≤1%.
4. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
5. Short duration pulse test used to minimize self-heating effect.

NEW PRODUCT

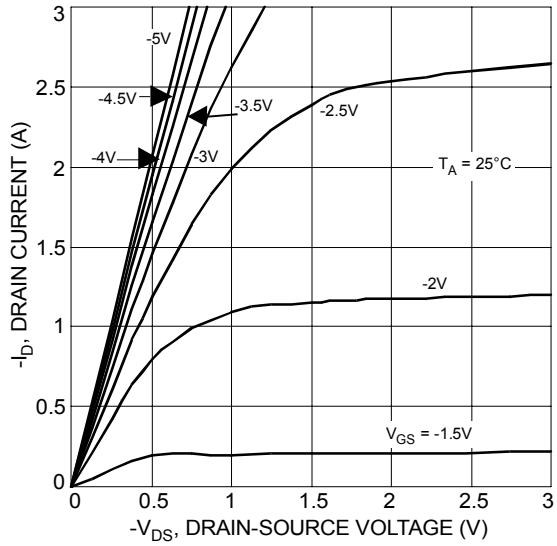


Fig. 1 Typical Output Characteristics

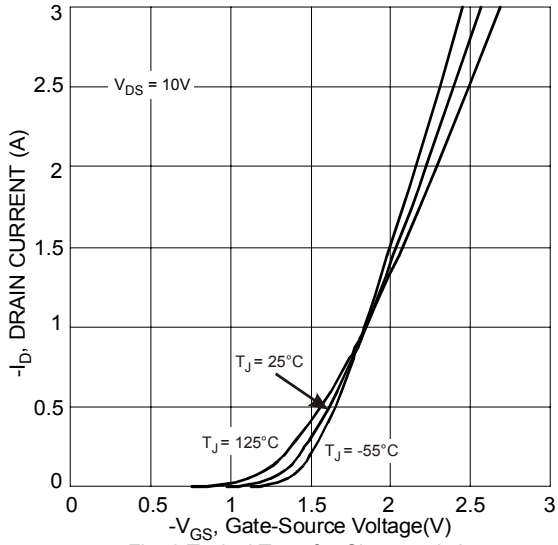


Fig. 2 Typical Transfer Characteristics

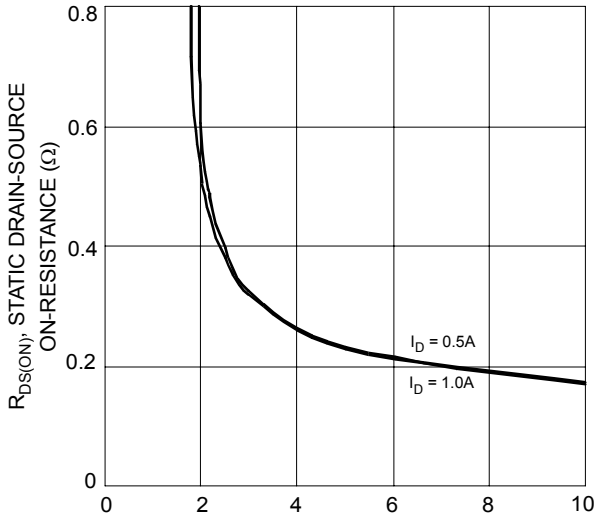


Fig. 3 On-Resistance vs. Gate Voltage

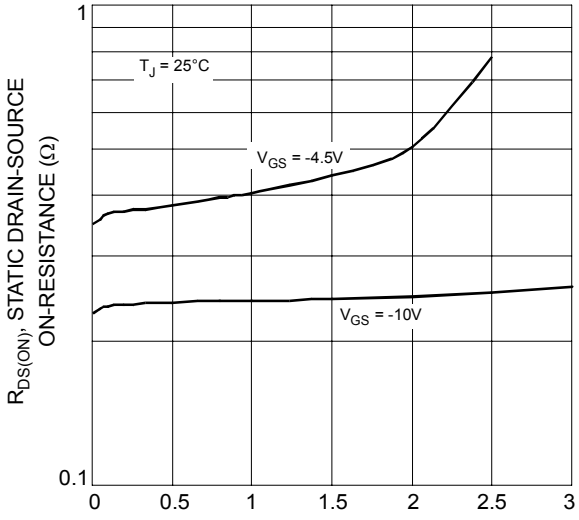


Fig. 4 On-Resistance vs. Drain Current

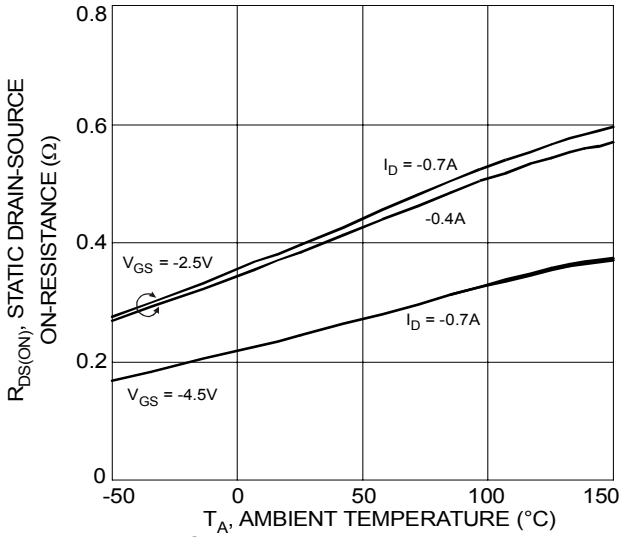


Fig. 5 On-Resistance Variation with Temperature

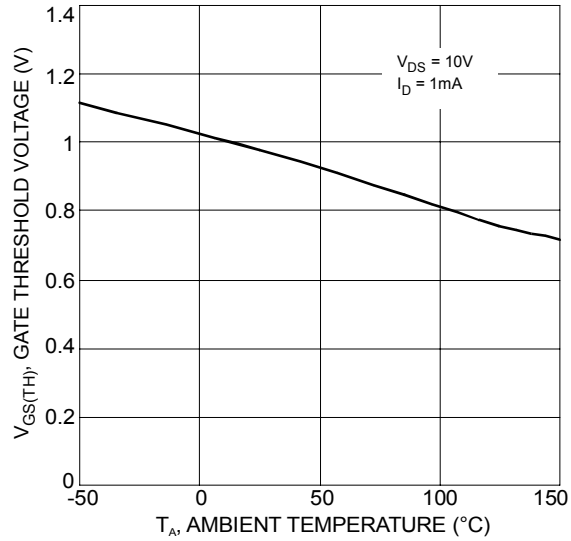


Fig. 6 Gate Threshold Voltage vs. Temperature

NEW PRODUCT

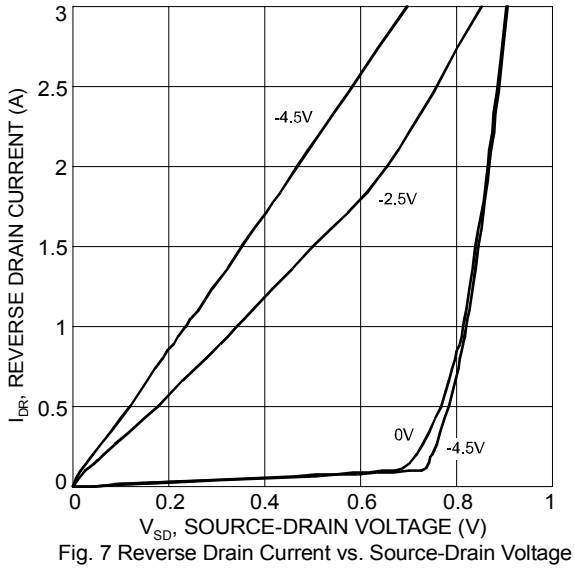


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

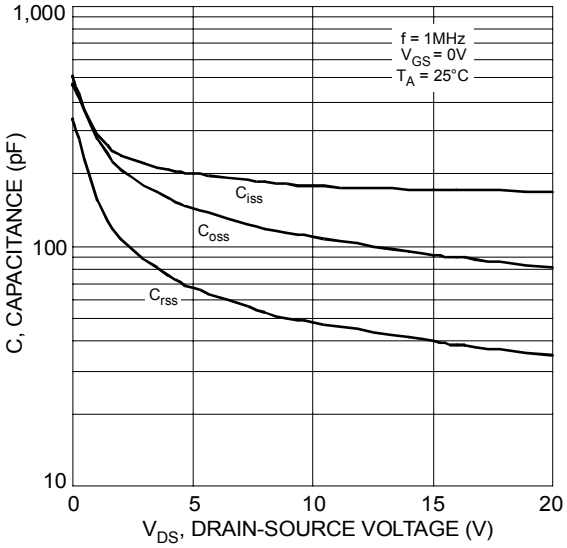


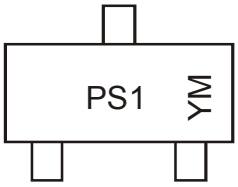
Fig. 8 Typical Total Capacitance

Ordering Information (Note 6)

Part Number	Case	Packaging
DMP2012SN-7	SC-59	3000/Tape & Reel

Notes: 6. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



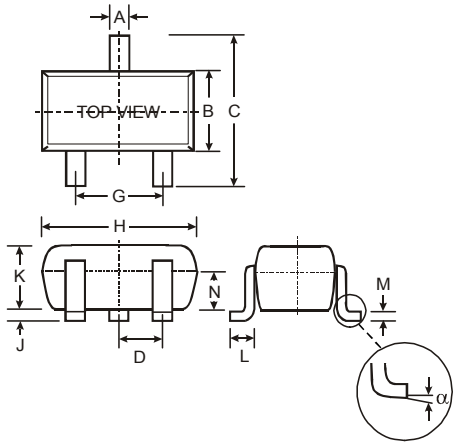
PS1 = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: T = 2006
M = Month ex: 9 = September

Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012
Code	T	U	V	W	X	Y	Z

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

Package Outline Dimensions



SC-59		
Dim	Min	Max
A	0.35	0.50
B	1.50	1.70
C	2.70	3.00
D	0.95	
G	1.90	
H	2.90	3.10
J	0.013	0.10
K	1.00	1.30
L	0.35	0.55
M	0.10	0.20
N	0.70	0.80
α	0°	8°
All Dimensions in mm		

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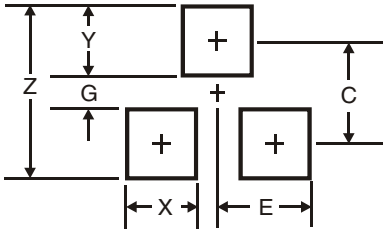
Suggested Pad Layout



Dimensions	Value (in mm)
Z	4.0
G	1.2
X	0.9
Y	1.4
C	2.6
E	0.95