N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

NEW PRODUCT

Features

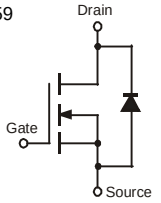
- Low Gate Charge
- Low $R_{DS(ON)}$:
  - 30 mΩ @V_{GS} = 10V
  - 40 mΩ @V_{GS} = 4.5V
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **"Green" Device (Note 4)**

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 4
- Ordering & Date Code Information: See Page 4
- Weight: 0.008 grams (approximate)

TOP VIEW

SC-59



Equivalent Circuit

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Note 1) Continuous	T_A = 25°C T_A = 70°C	I_D	6 5	A
Pulsed Drain Current (Note 2)		I_{DM}	24	A
Body-Diode Continuous Current (Note 1)		I_S	2.25	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_d	1.4	W
Thermal Resistance, Junction to Ambient (Note 1) t ≤10s	$R_{\theta JA}$	90	°C /W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	°C

Notes:
1. Device mounted on 1"x1", FR-4 PC board with 2 oz. Copper and test pulse width t ≤10s.
2. Repetitive Rating, pulse width limited by junction temperature.
3. No purposefully added lead.
4. Diodes Inc's "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.

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Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	I_D = 250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current T_J = 25°C T_J = 55°C	I_{DSS}	—	—	1 5	μA	V_{DS} = 30V, V_{GS} = 0V
Gate-Body Leakage Current	I_{GSS}	—	—	±100	nA	V_{DS} = 0V, V_{GS} = ±20V
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	2.1	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance (Note 5)	$R_{DS\ (ON)}$	—	25 36	30 40	mΩ	V_{GS} = 10V, I_D = 6A V_{GS} = 4.5V, I_D = 5A
Forward Transconductance (Note 5)	g_{FS}	—	5	—	S	V_{DS} = 15V, I_D = 8A
Diode Forward Voltage (Note 5)	V_{SD}	—	0.7	1.1	V	I_S = 2.25A, V_{GS} = 0V
DYNAMIC PARAMETERS (Note 6)						
Total Gate Charge	Q_g	—	10.5	—	nC	V_{GS} = 5V, V_{DS} = 15V, I_D = 6A
Gate-Source Charge	Q_{gs}	—	3.8	—	nC	V_{GS} = 10V, V_{DS} = 15V, I_D = 6A
Gate-Drain Charge	Q_{gd}	—	2.9	—	nC	V_{GS} = 10V, V_{DS} = 15V, I_D = 6A
Turn-On Delay Time	$t_{D(on)}$	—	11	—	ns	V_{DD} = 15V, V_{GS} = 10V, R_D = 1.8Ω, R_G = 6Ω
Turn-On Rise Time	t_r	—	7	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	63	—	ns	
Turn-Off Fall Time	t_f	—	30	—	ns	
Input Capacitance	C_{iss}	—	755	—	pF	V_{DS} = 10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	136	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	108	—	pF	

Notes: 5. Test pulse width t = 300ms.
6. Guaranteed by design. Not subject to production testing.

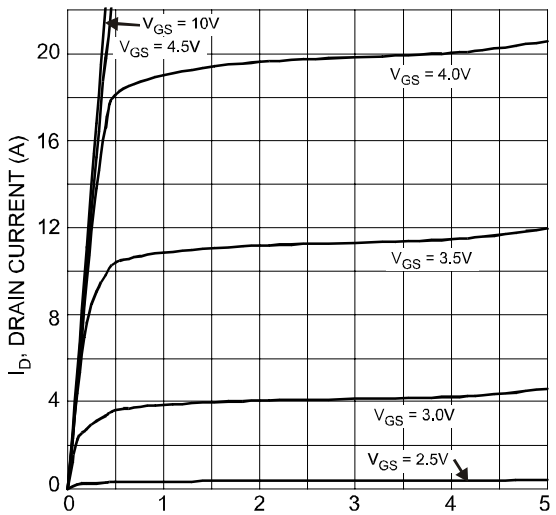

Fig. 1 Typical Output Characteristics

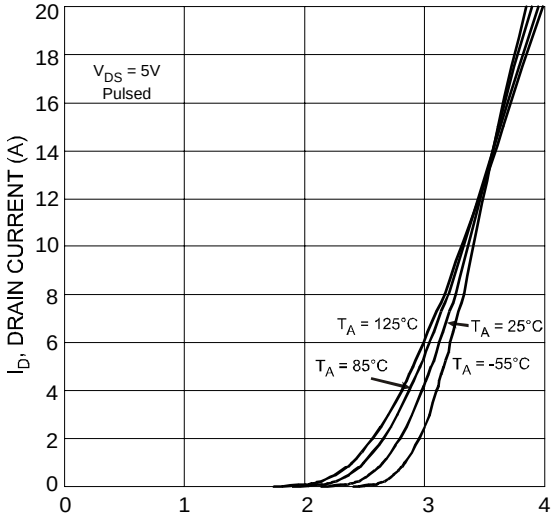

Fig. 2 Typical Transfer Characteristics

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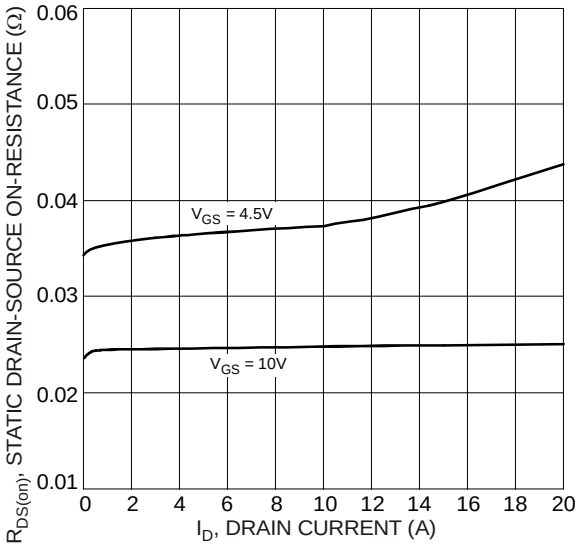

Fig. 3 On-Resistance vs. Drain Current and Gate Voltage

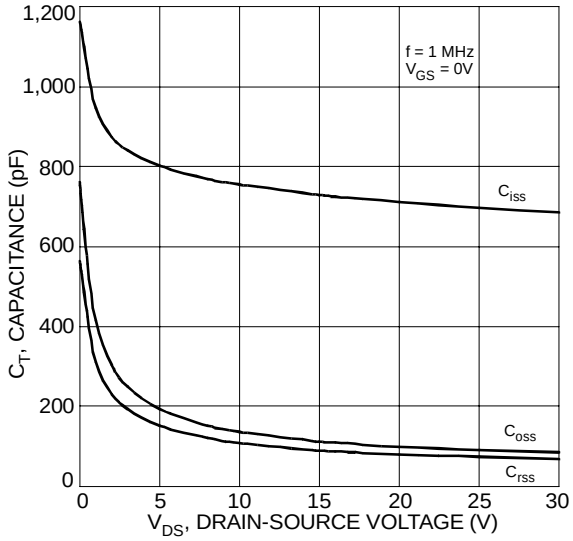

Fig. 4 Typical Total Capacitance

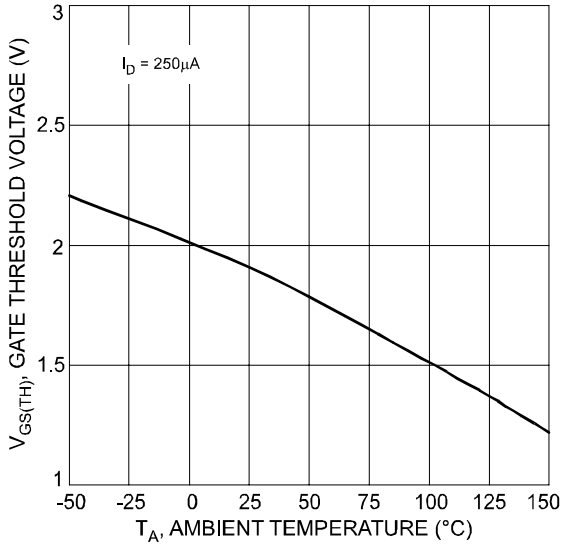

Fig. 5 Gate Threshold Voltage vs. Ambient Temperature

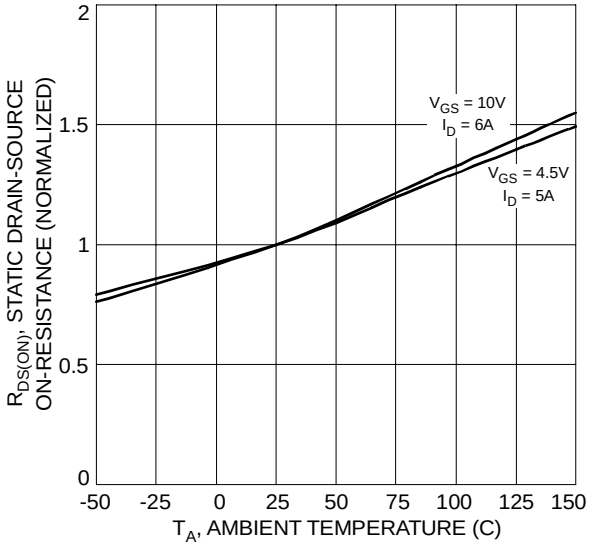

Fig. 6 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

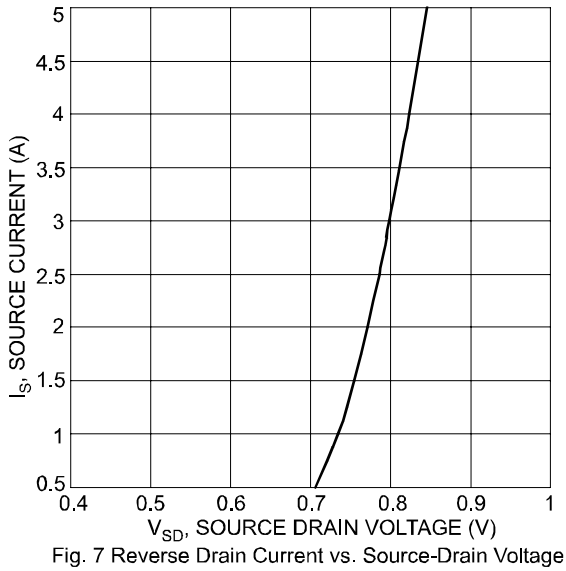

Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

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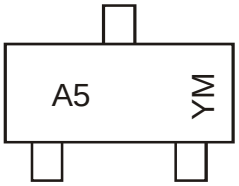
Ordering Information (Note 7)

Part Number	Case	Packaging
DMN3033LSN-7	SC-59	3000/Tape & Reel

Notes: 7. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



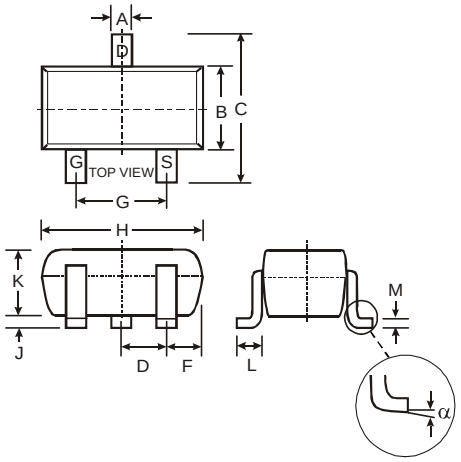
A5 = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: U = 2007
M = Month ex: 9 = September

Date Code Key

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

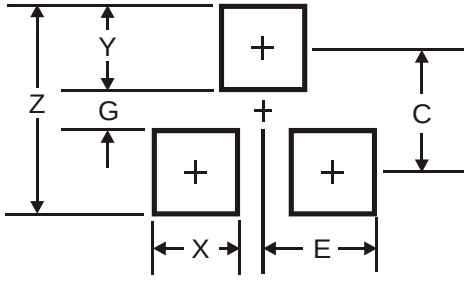
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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 nominal	
G	1.90 nominal	
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
α	0°	8°
All Dimensions in mm		

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

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