

## Features

- Extremely Low On-Resistance: 170mΩ @ V<sub>GS</sub> = 4.5V
- High Drain Current: 1.1A
- Ideal for Notebook Computer, Portable Phone, PCMCIA Cards, and Battery Powered Circuits
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **ESD Protected Gate**
- **"Green" Device (Note 3)**

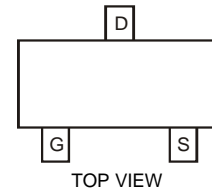
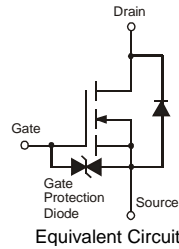
## Mechanical Data

- 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)



TOP VIEW

SC-59



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

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V <sub>DSS</sub>	30	V
Gate-Source Voltage	Continuous	V <sub>GSS</sub>	±20	V
Drain Current	Continuous	I <sub>D</sub>	1.1	A
	Pulsed		4.0	

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

Characteristic	Symbol	Value	Units
Total Power Dissipation	P <sub>d</sub>	500	mW
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	250	K/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
1. Pulse width ≤ 300μs, duty cycle ≤ 2%.
  2. No purposefully added lead.
  3. Diodes Inc.'s "Green" Policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 4)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1.0 10	μA	@ T <sub>j</sub> = 25°C @ T <sub>j</sub> = 125°C V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GSS</sub>	—	—	± 100	nA	V <sub>GS</sub> = ± 12V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 4)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.0	—	3.0	V	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1.0mA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	—	0.170 0.240	Ω	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.5A V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.0A
Forward Transconductance	g <sub>FS</sub>	1.3	2.4	—	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.5A
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	—	150	—	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	90	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	30	—	pF	
Total Gate Charge	Q <sub>g</sub>	—	5.5	—	nC	V <sub>DS</sub> = 24V, I <sub>D</sub> = 1.0A, V <sub>GS</sub> = 10V
Gate-to-Source Charge	Q <sub>gs</sub>	—	0.8	—	nC	
Gate-to-Drain Charge	Q <sub>gd</sub>	—	1.3	—	nC	
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	t <sub>D(ON)</sub>	—	10	—	ns	V <sub>DD</sub> = 10V, I <sub>D</sub> = 0.5A, V <sub>GS</sub> = 5.0V, R <sub>GEN</sub> = 50Ω
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	25	—	ns	
Turn-On Rise Time	t <sub>r</sub>	—	15	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	45	—	ns	
<b>SOURCE-DRAIN RATINGS (BODY DIODE)</b>						
Continuous Source Current	I <sub>S</sub>	—	—	0.54	A	—
Pulse Source Current	I <sub>SM</sub>	—	—	4.0	A	—
Forward Voltage	V <sub>SD</sub>	—	—	1.2	V	I <sub>F</sub> = 1.0A, V <sub>GS</sub> = 0V
Reverse Recovery Time	t <sub>rr</sub>	—	35	—	ns	I <sub>F</sub> = 1.0A, di/dt = 50A/μs

Notes: 4. Pulse width ≤ 300μs, duty cycle ≤ 2%.

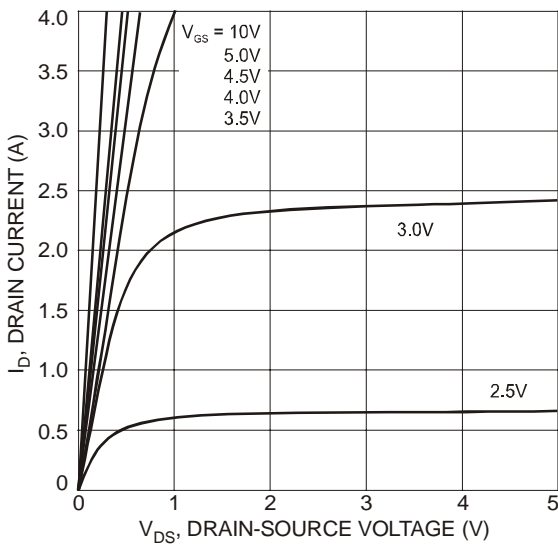


Fig. 1 On-Region Characteristics

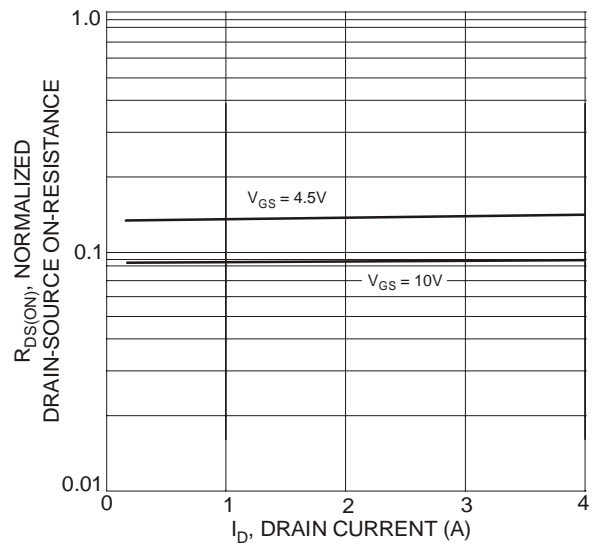


Fig. 2 On-Resistance vs. Drain Current

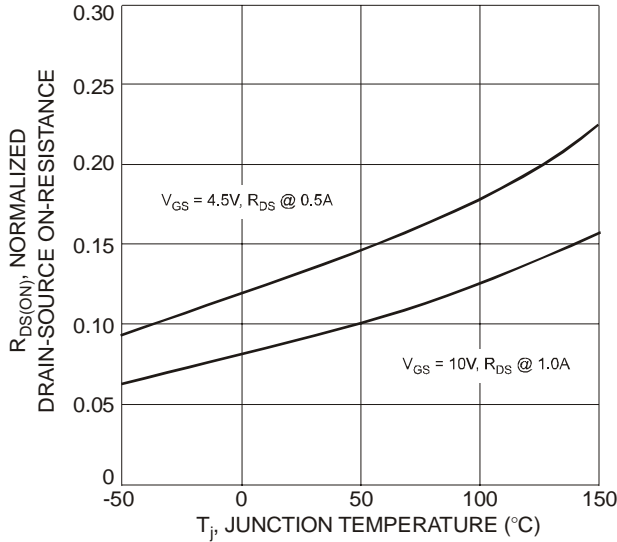


Fig. 3 On-Resistance vs. Junction Temperature

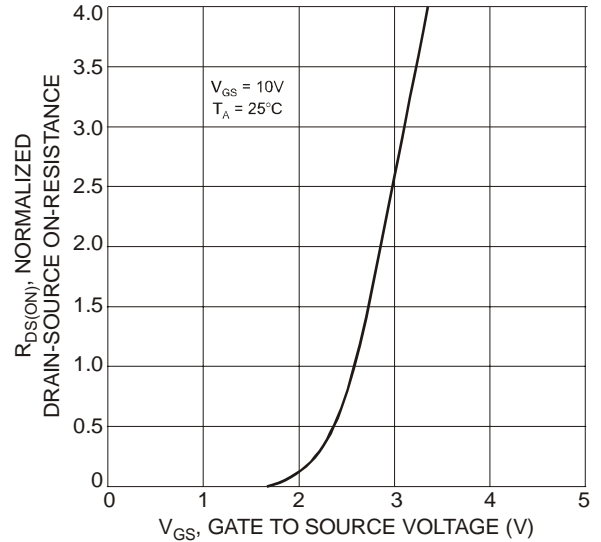


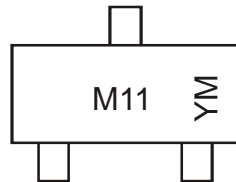
Fig. 4 On-Resistance vs. Gate-Source Voltage

**Ordering Information** (Note 5)

Part Number	Case	Packaging
DMN100-7-F	SC-59	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



M11 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: T = 2006  
 M = Month ex: 9 = September

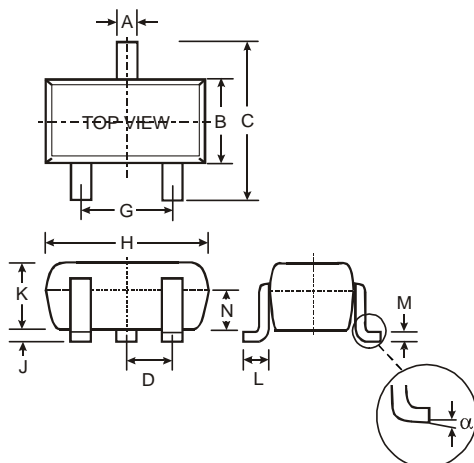
Date Code Key

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

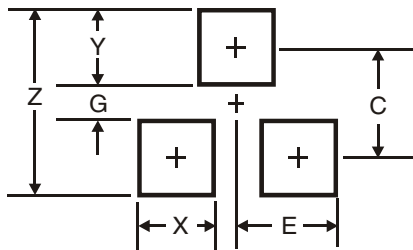
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**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		

**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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