DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

NEW PRODUCT

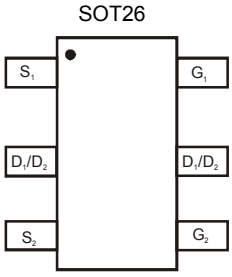
Features

- Low Gate Charge
- Low $R_{DS(ON)}$:
  - 24mΩ @ V_{GS} = 4.5V
  - 28mΩ @ V_{GS} = 2.5V
  - 34mΩ @ V_{GS} = 1.8V
- Low Input/Output Leakage
- **ESD Protected up to 2kV HBM**
- **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**

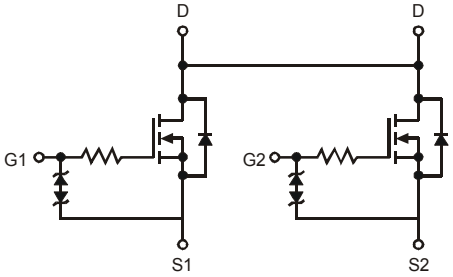
Mechanical Data

- Case: SOT26
- Case Material - Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.0008 grams (approximate)

Top View



Top View
Pin Configuration



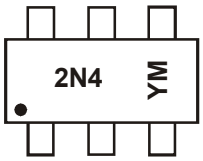
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMG6968UDM-7	SOT26	3000/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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



2N4 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: W = 2009)
M = Month (ex: 9 = September)

Date Code Key

Year	2008	2009	2010	2011	2012	2013	2014	2015
Code	V	W	X	Y	Z	A	B	C

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

NEW PRODUCT

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

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage (Note 5)		V_{GSS}	±12	V
Drain Current (Note 6) Continuous	T_A = +25°C T_A = +70°C	I_D	6.5 5.2	A
Pulsed Drain Current (Note 7)		I_{DM}	30	A

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P_D	0.85	W
Thermal Resistance, Junction to Ambient (Note 6) t ≤10s	$R_{\theta JA}$	147	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 5. AEC-Q101 VGS maximum is ±9.6V.
6. Device mounted on 1"x1", FR-4 PC board with 2 oz. Copper and test pulse width t ≤10s.
7. Repetitive Rating, pulse width limited by junction temperature.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
STATIC CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	I_D = 250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	V_{DS} = 20V, V_{GS} = 0V
Gate-Body Leakage Current	I_{GSS}	—	—	±10	μA	V_{DS} = 0V, V_{GS} = ±10V
Gate-Source Breakdown Voltage	BV_{SGS}	±12	—	—	V	V_{DS} = 0V, I_G = ±250μA
Gate Threshold Voltage	$V_{GS(th)}$	0.5	—	0.9	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance (Note 8)	$R_{DS\ (ON)}$	—	17 20 26	24 28 34	mΩ	V_{GS} = 4.5V, I_D = 6.5A V_{GS} = 2.5V, I_D = 5.5A V_{GS} = 1.8V, I_D = 3.5A
Forward Transfer Admittance	$\|Y_{FS}\|$	—	8	—	S	V_{DS} = 10V, I_D = 5A
Diode Forward Voltage (Note 8)	V_{SD}	—	0.7	1.0	V	I_S = 2.25A, V_{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	143	—	pF	V_{DS} = 10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	74	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	29	—	pF	
Gate Resisitance	R_G	—	202	—	Ω	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz
SWITCHING CHARACTERISTICS (Note 9)						
Total Gate Charge	Q_g	—	8.8	—	nC	V_{GS} = 4.5V, V_{DS} = 10V, I_D = 6.5A
Gate-Source Charge	Q_{gs}	—	1.4	—	nC	
Gate-Drain Charge	Q_{gd}	—	3.0	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	53	—	ns	V_{DD} = 10V, V_{GS} = 4.5V, R_L = 10Ω, R_G = 6Ω
Turn-On Rise Time	t_r	—	78	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	562	—	ns	
Turn-Off Fall Time	t_f	—	234	—	ns	

Notes: 8. Test pulse width t = 300ms.
9. Guaranteed by design. Not subject to production testing.

NEW PRODUCT

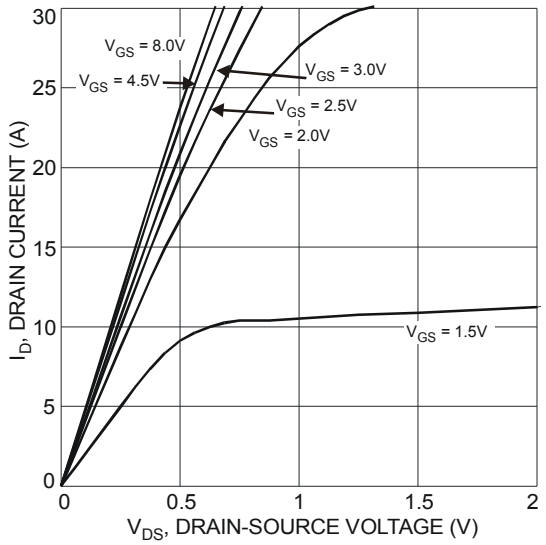


Fig. 1 Typical Output Characteristics

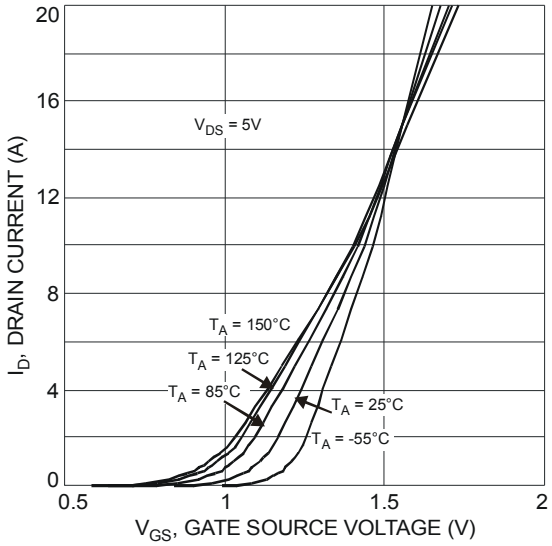


Fig. 2 Typical Transfer Characteristics

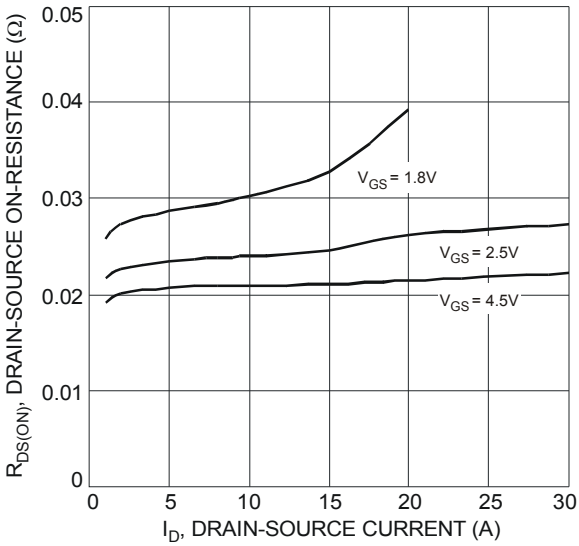


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

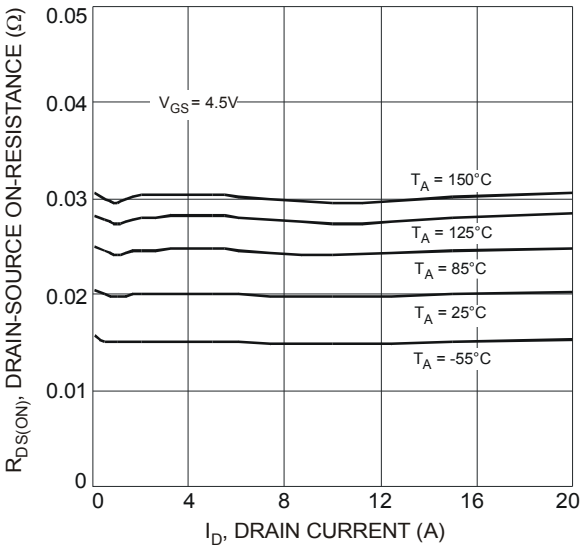


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

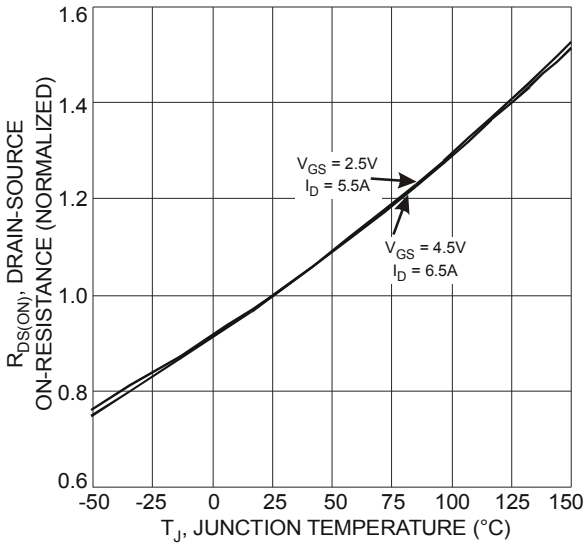


Fig. 5 On-Resistance Variation with Temperature

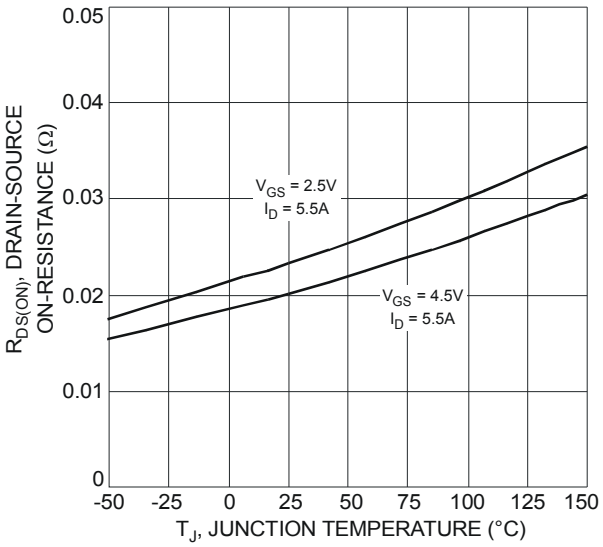


Fig. 6 On-Resistance Variation with Temperature

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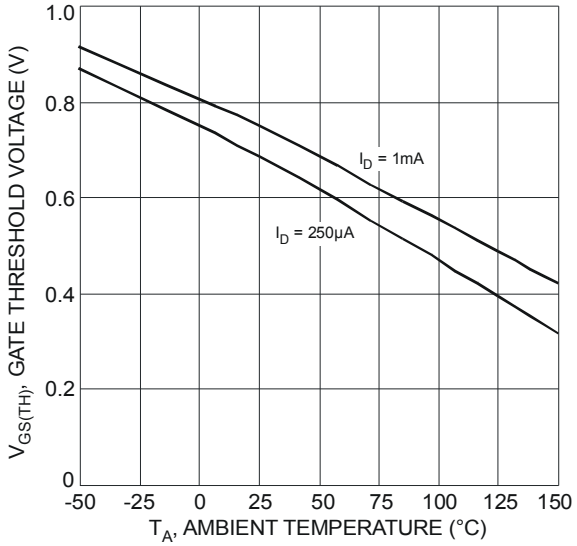

Fig. 7 Gate Threshold Variation vs. Ambient Temperature

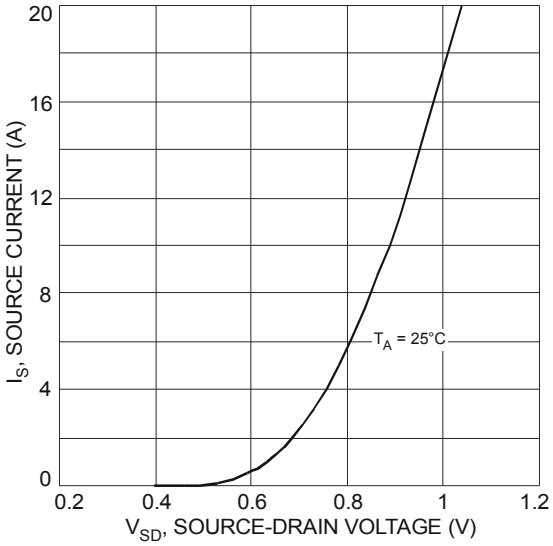

Fig. 8 Diode Forward Voltage vs. Current

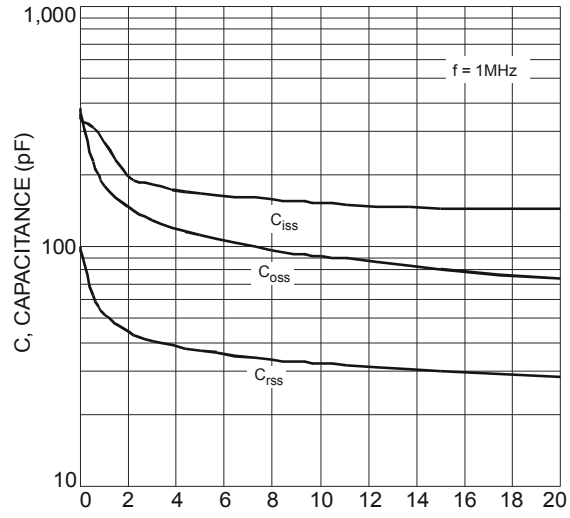

Fig. 9 Typical Capacitance

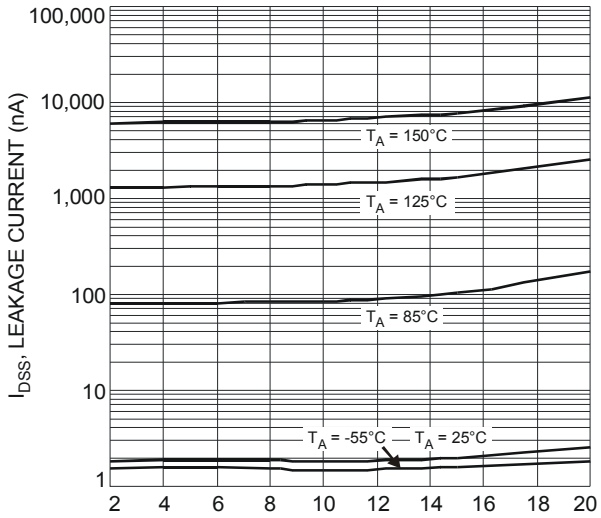

Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

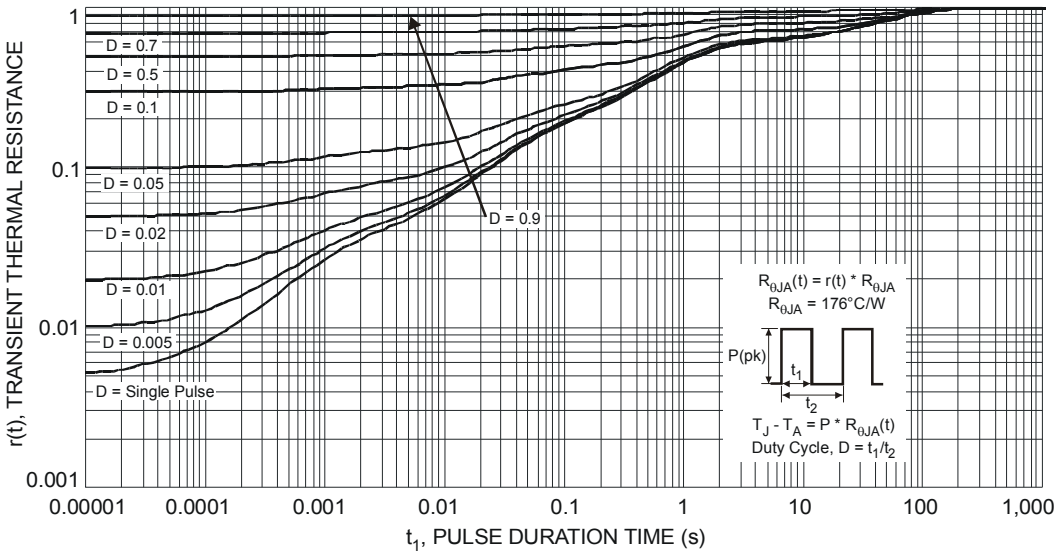

Fig. 11 Transient Thermal Response

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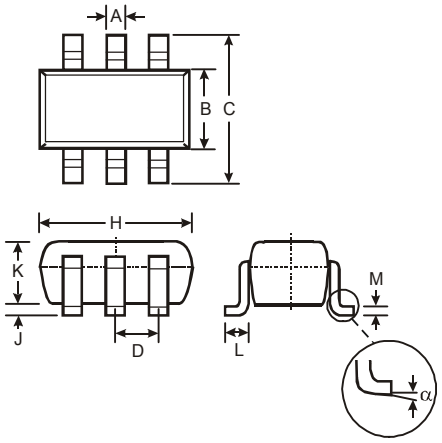
Package Outline Dimensions

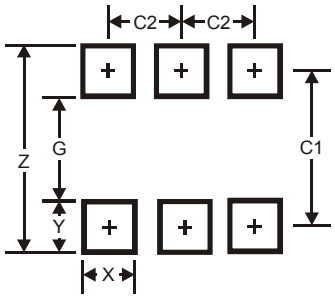
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

NEW PRODUCT

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