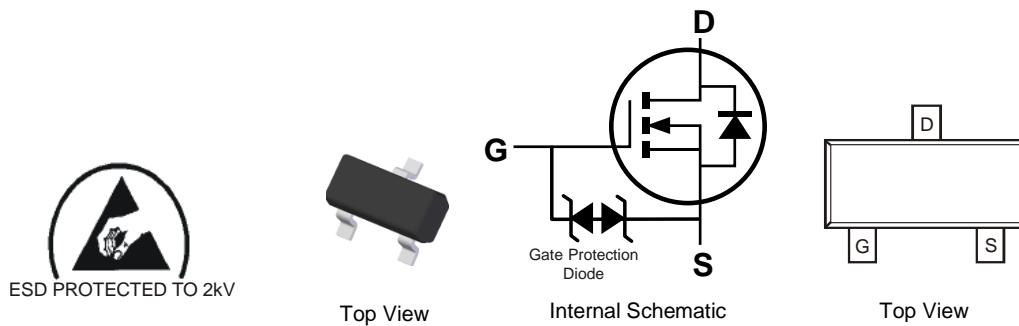


Features

- Low On-Resistance
 - 25mΩ @ $V_{GS} = 4.5V$
 - 29mΩ @ $V_{GS} = 2.5V$
 - 36mΩ @ $V_{GS} = 1.8V$
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected Up To 2kV**
- **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: SOT23
- 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)
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)



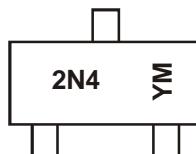
Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
DMG6968U-7	Standard	SOT23	3000/Tape & Reel
DMG6968UQ-7	Automotive	SOT23	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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to <https://www.diodes.com/quality/product-compliance-definitions/>.
5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



2N4 = Product Type Marking Code

YM = Date Code Marking

Y or YM = Year (ex: E = 2017)

M = Month (ex: 9 = September)

Date Code Key

Year	2009	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Code	W	E	F	G	H	I	J	K	L	M	N
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

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V_{GSS}	± 12	V
Continuous Drain Current (Note 6)	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	6.5 5.2	A
Pulsed Drain Current			I_{DM}	30	A

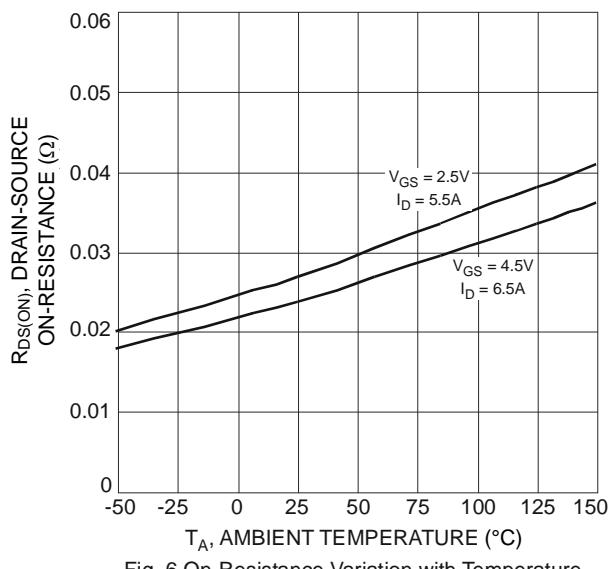
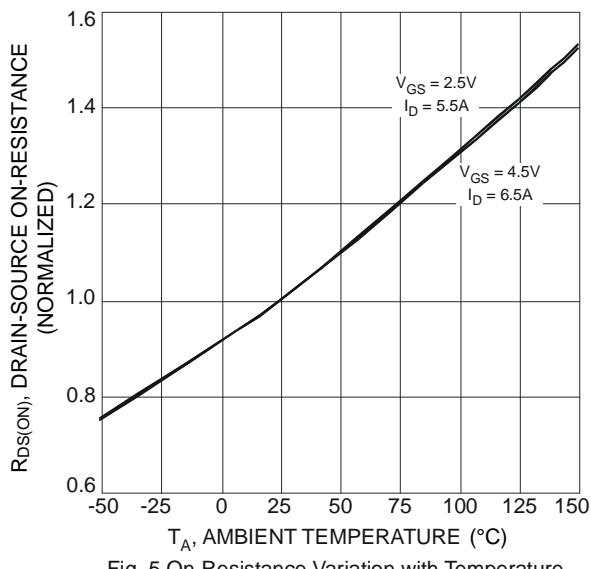
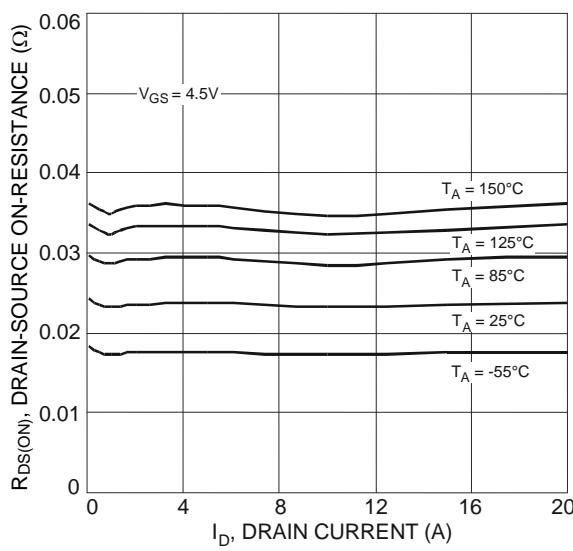
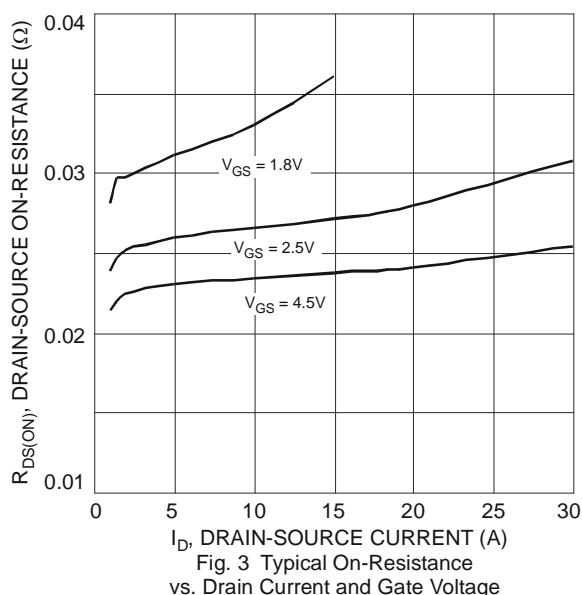
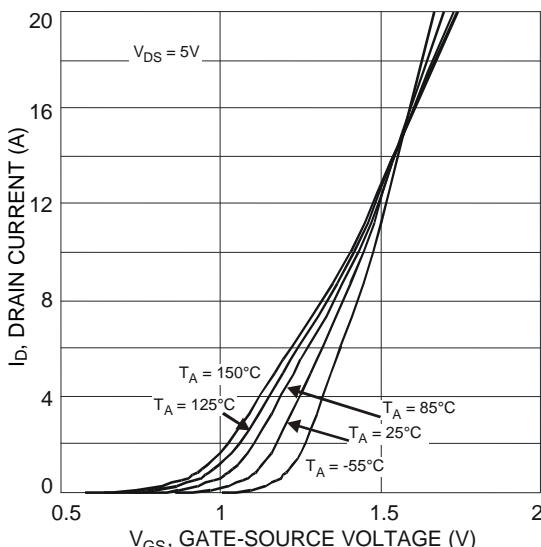
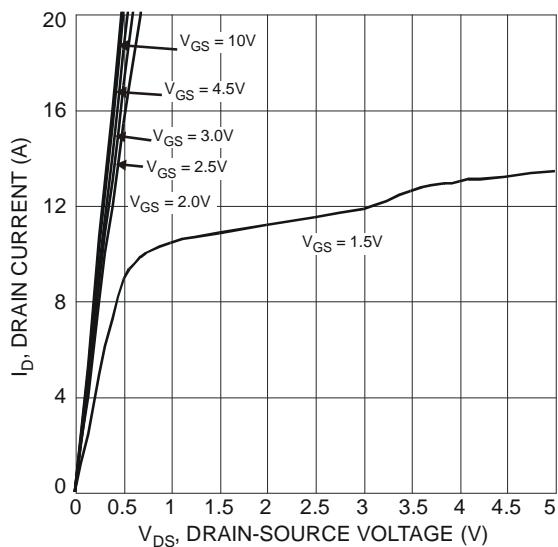
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	1.3	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	157	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	I_{DSS}	—	—	1.0	μA	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 10\text{V}, V_{DS} = 0\text{V}$
Gate-Source Breakdown Voltage	BV_{SGS}	± 12	—	—	V	$V_{DS} = 0\text{V}, I_G = \pm 250\mu\text{A}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.5	—	0.9	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	21	25	$\text{m}\Omega$	$V_{GS} = 4.5\text{V}, I_D = 6.5\text{A}$
			23	29		$V_{GS} = 2.5\text{V}, I_D = 5.5\text{A}$
			28	36		$V_{GS} = 1.8\text{V}, I_D = 3.5\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	8	—	S	$V_{DS} = 10\text{V}, I_D = 5\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	151	—	pF	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	91	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	32	—	pF	
Total Gate Charge	Q_g	—	8.5	—	nC	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 6.5\text{A}$
Gate-Source Charge	Q_{gs}	—	1.6	—	nC	
Gate-Drain Charge	Q_{gd}	—	2.8	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	54	—	ns	$V_{DD} = 10\text{V}, V_{GS} = 4.5\text{V},$ $R_L = 10\Omega, R_G = 6\Omega, I_D = 1\text{A}$
Turn-On Rise Time	t_R	—	66	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	613	—	ns	
Turn-Off Fall Time	t_F	—	205	—	ns	

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



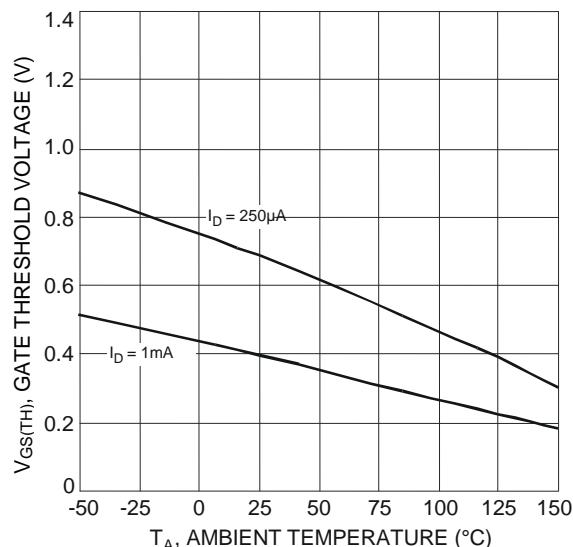


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

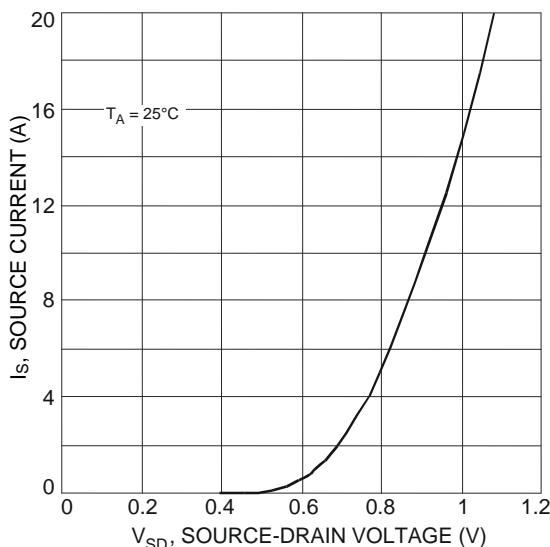


Fig. 8 Diode Forward Voltage vs. Current

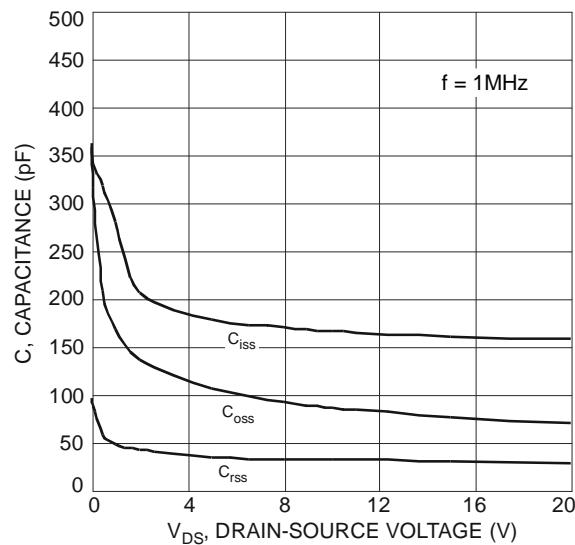


Fig. 9 Typical Total Capacitance

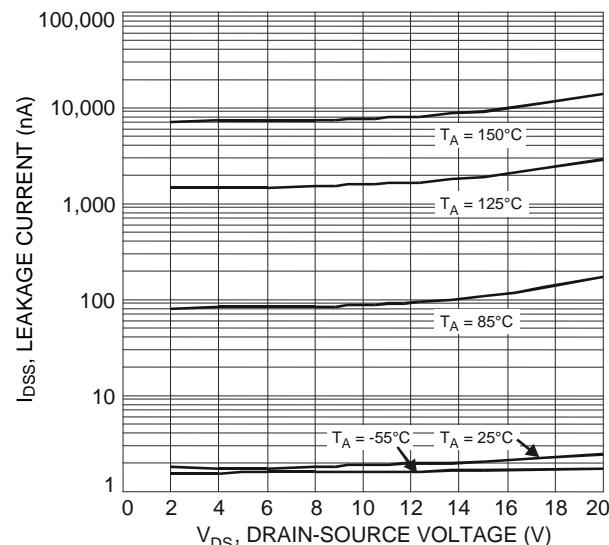


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

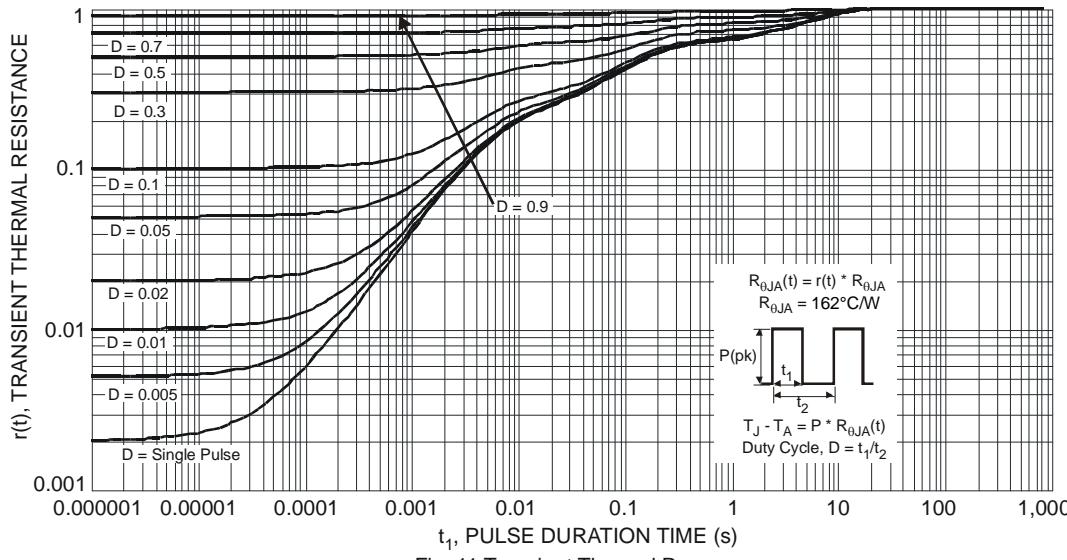
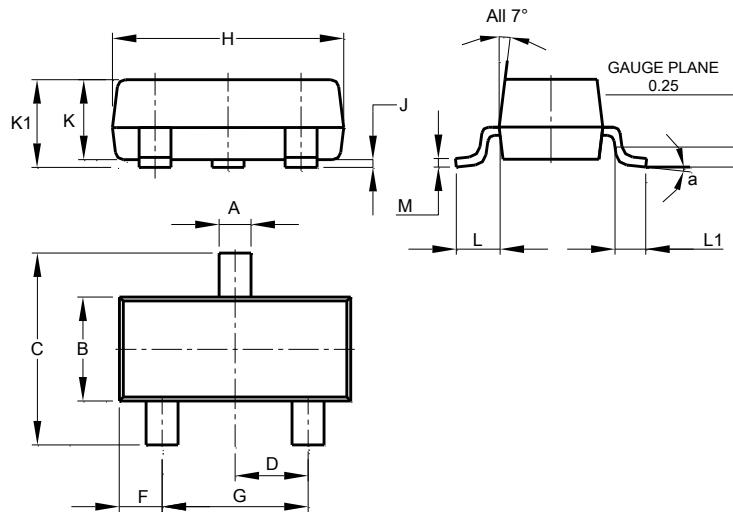


Fig. 11 Transient Thermal Response

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23



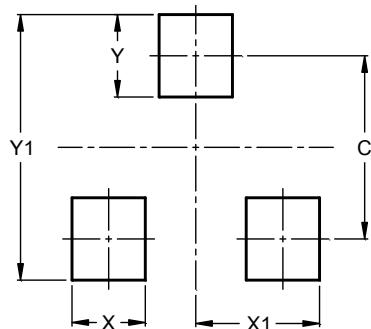
SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--

All Dimensions in mm

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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