

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	I_D $T_A = +25^\circ C$
30V	30m Ω @ $V_{GS} = 10V$	6A
	42m Ω @ $V_{GS} = 4.5V$	5A

Description

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- DC-DC Converters
- Power Management Functions
- Backlighting

Features and Benefits

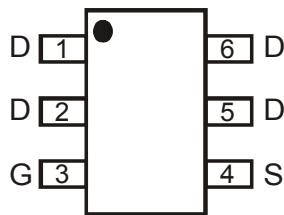
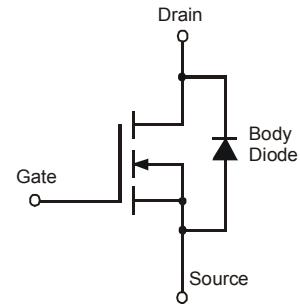
- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- Totally Lead-Free Finish; RoHS compliant (Note 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.013 grams (approximate)



Top View

Top View
Pin Configuration

Equivalent Circuit

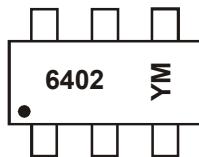
Ordering Information (Note 4)

Part Number	Case	Packaging
DMG6402LVT-7	TSOT26	3,000/Tape & Reel
DMG6402LVT-13	TSOT26	10,000/Tape & Reel

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



6402 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: Y = 2011)
 M = Month (ex: 9 = September)

Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017					
Code	Y	Z	A	B	C	D	E					
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	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	6.0 4.8	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	7.5 5.9	A
Continuous Drain Current (Note 5) $V_{GS} = 4.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	5.0 4.0	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	6 4.8	A
Maximum Body Diode Forward Current (Note 5)			I_S	2	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)			I_{DM}	31	A

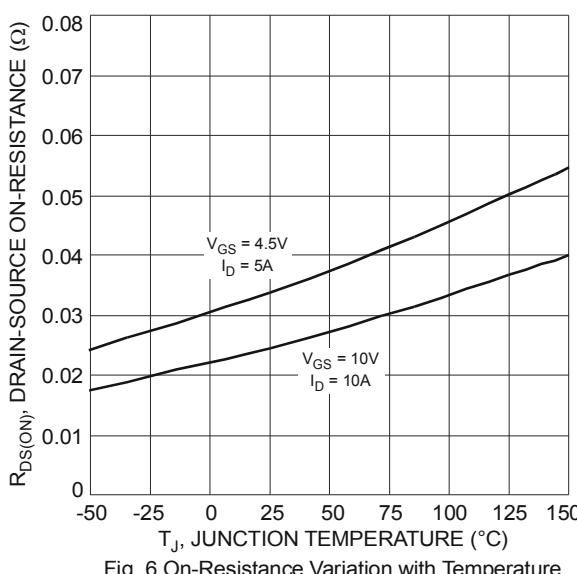
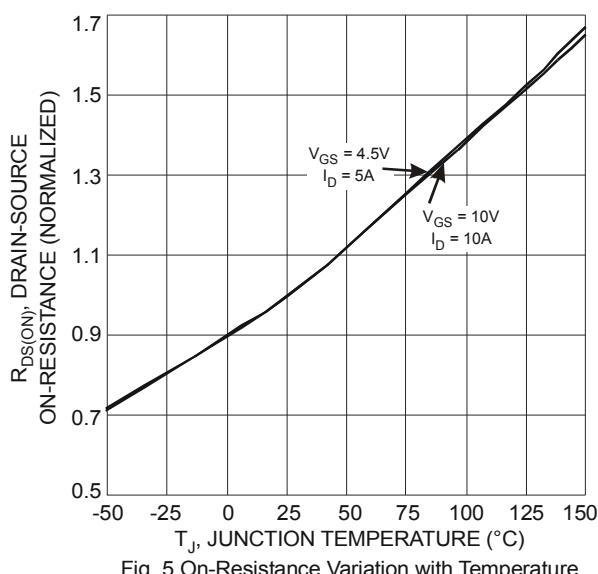
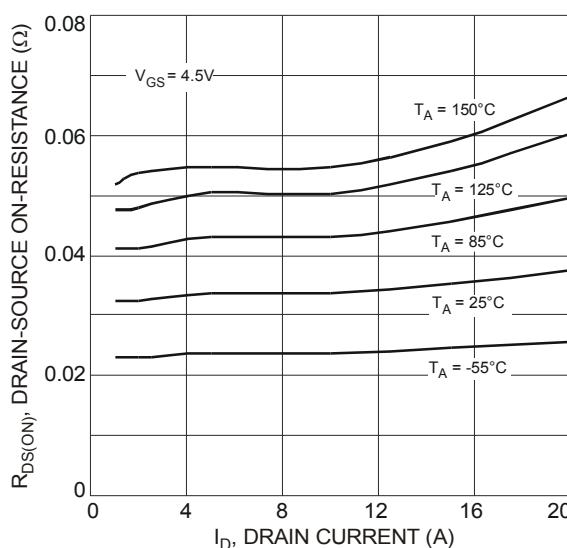
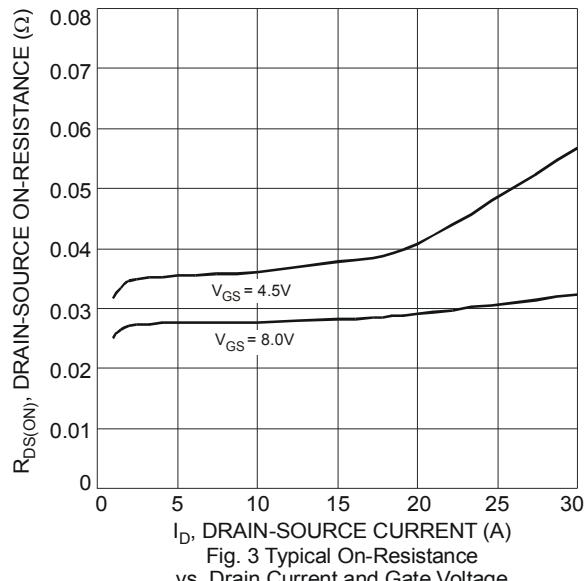
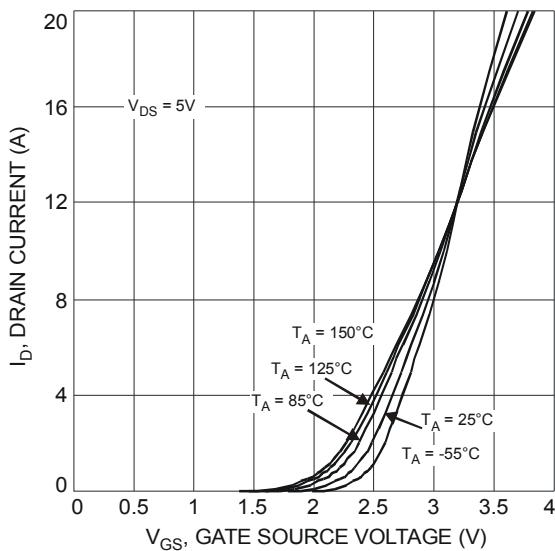
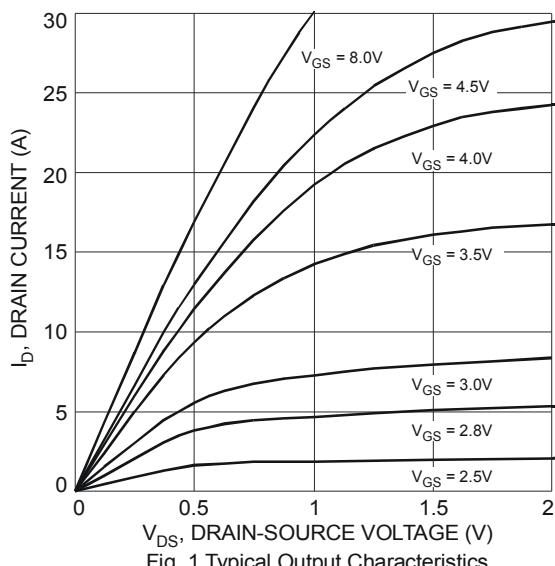
Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$		P_D	1.75	W
	$T_A = +70^\circ\text{C}$			1.1	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state		$R_{\theta JA}$	72	°C/W
	$t < 10\text{s}$			50	
Thermal Resistance, Junction to Case (Note 5)			$R_{\theta JC}$	23	
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 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(\text{th})}$	1	1.5	2	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	22	30	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 7\text{A}$
		—	32	42		$V_{GS} = 4.5\text{V}, I_D = 5.6\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	10	—	S	$V_{DS} = 5\text{V}, I_D = 7\text{A}$
Diode Forward Voltage	V_{SD}	—	0.75	1.0	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	498	—	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	52	—		
Reverse Transfer Capacitance	C_{rss}	—	45	—		
Gate Resistance	R_G	—	2.4	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge	Q_g	—	11.4	—		
Gate-Source Charge	Q_{gs}	—	1.4	—		
Gate-Drain Charge	Q_{gd}	—	2	—	nC	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, I_D = 5.8\text{A}$
Turn-On Delay Time	$t_{D(\text{on})}$	—	3.4	—		
Turn-On Rise Time	t_r	—	6.2	—		
Turn-Off Delay Time	$t_{D(\text{off})}$	—	13.9	—	nS	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_L = 2.6\Omega, R_G = 3\Omega$
Turn-Off Fall Time	t_f	—	2.8	—		

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
 6. Short duration pulse test used to minimize self-heating effect.
 7. Guaranteed by design. Not subject to production testing.



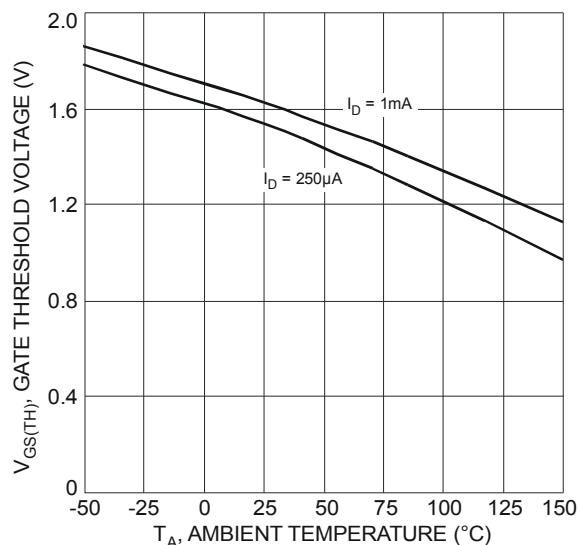


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

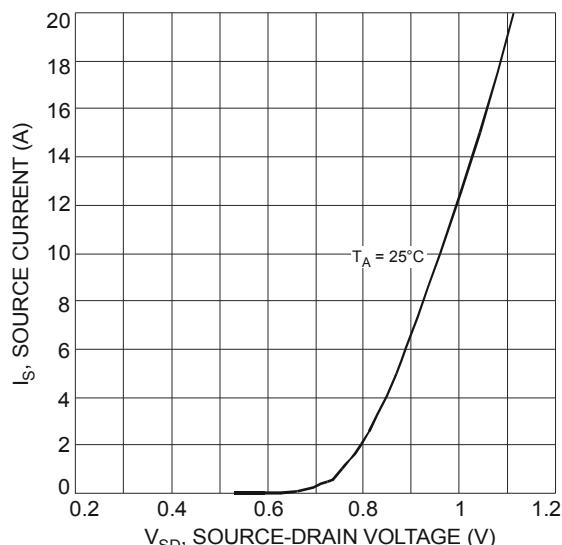


Fig. 8 Diode Forward Voltage vs. Current

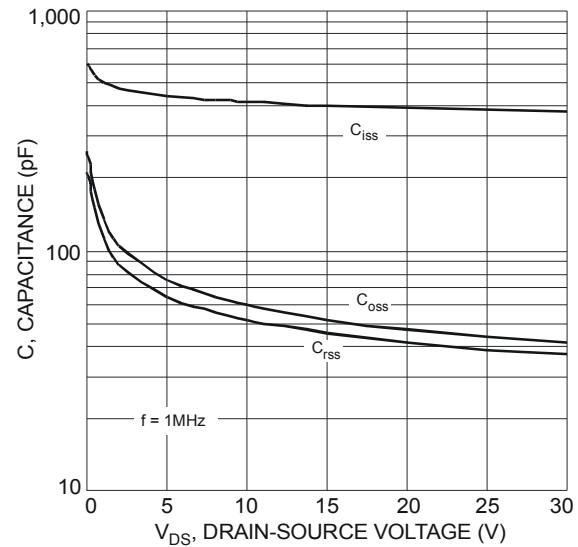


Fig. 9 Typical Capacitance

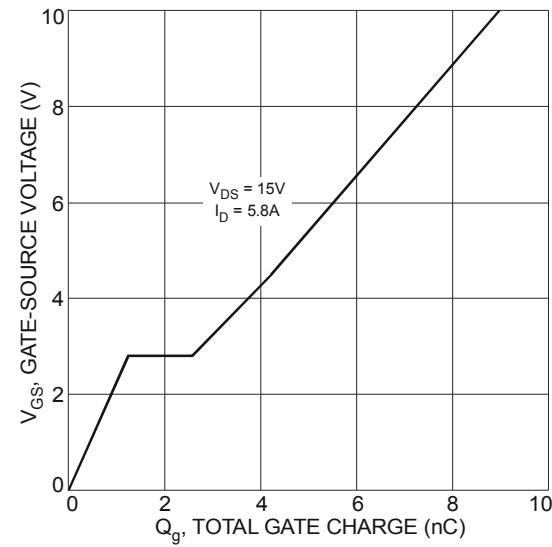


Fig. 10 Gate-Charge Characteristics

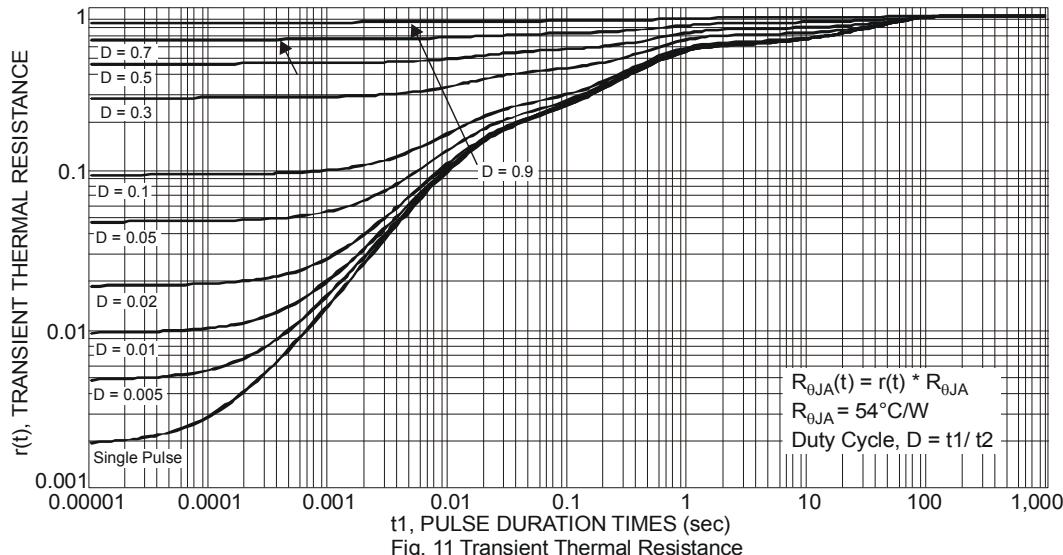
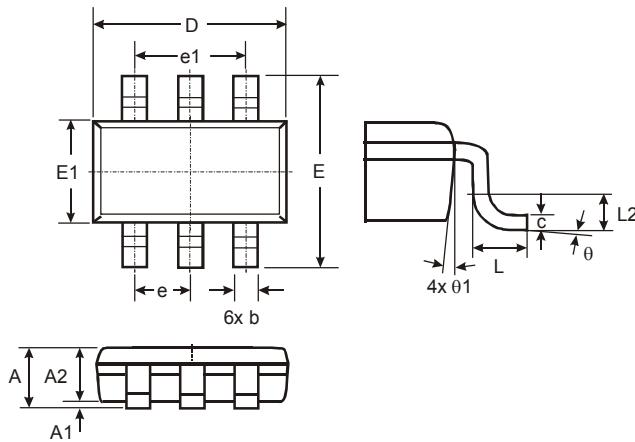


Fig. 11 Transient Thermal Resistance

Package Outline Dimensions

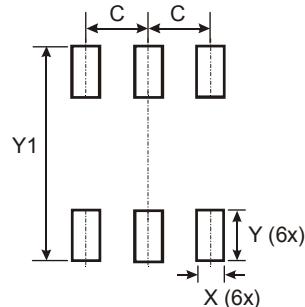
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



TSOT26			
Dim	Min	Max	Typ
A	—	1.00	—
A1	0.01	0.10	—
A2	0.84	0.90	—
D	—	—	2.90
E	—	—	2.80
E1	—	—	1.60
b	0.30	0.45	—
c	0.12	0.20	—
e	—	—	0.95
e1	—	—	1.90
L	0.30	0.50	—
L2	—	—	0.25
θ	0°	8°	4°
θ1	4°	12°	—
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)
C	0.950
X	0.700
Y	1.000
Y1	3.199

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