

Product Summary

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

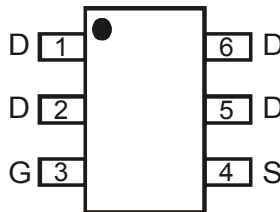
Mechanical Data

- 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 **e3**
- Weight: 0.013 grams (approximate)

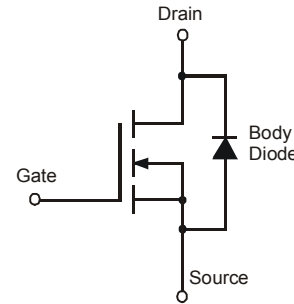
NEW PRODUCT



Top View



Top View
Pin Configuration



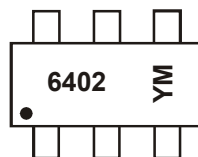
Equivalent Circuit

Ordering Information (Note 4)

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

- Notes:
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



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°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} = 10V	Steady State	T _A = +25°C T _A = +70°C	I _D	6.0 4.8	A
	t < 10s	T _A = +25°C T _A = +70°C	I _D	7.5 5.9	A
Continuous Drain Current (Note 5) V _{GS} = 4.5V	Steady State	T _A = +25°C T _A = +70°C	I _D	5.0 4.0	A
	t < 10s	T _A = +25°C T _A = +70°C	I _D	6 4.8	A
Maximum Body Diode Forward Current (Note 5)			I _S	2	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I _{DM}	31	A

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	1.75	W
	T _A = +70°C		1.1	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R _{θJA}	72	°C/W
	t < 10s		50	
Thermal Resistance, Junction to Case (Note 5)		R _{θJC}	23	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°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} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(th)}	1	1.5	2	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(on)}	—	22	30	mΩ	V _{GS} = 10V, I _D = 7A
		—	32	42		V _{GS} = 4.5V, I _D = 5.6A
Forward Transfer Admittance	Y _{fs}	—	10	—	S	V _{DS} = 5V, I _D = 7A
Diode Forward Voltage	V _{SD}	—	0.75	1.0	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	—	498	—	pF	V _{DS} = 15V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	52	—		
Reverse Transfer Capacitance	C _{rss}	—	45	—		
Gate Resistance	R _G	—	2.4	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge	Q _g	—	11.4	—	nC	V _{GS} = 10V, V _{DS} = 15V, I _D = 5.8A
Gate-Source Charge	Q _{gs}	—	1.4	—		
Gate-Drain Charge	Q _{gd}	—	2	—		
Turn-On Delay Time	t _{D(on)}	—	3.4	—	nS	V _{DD} = 15V, V _{GS} = 10V, R _L = 2.6Ω, R _G = 3Ω
Turn-On Rise Time	t _r	—	6.2	—		
Turn-Off Delay Time	t _{D(off)}	—	13.9	—		
Turn-Off Fall Time	t _f	—	2.8	—		

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

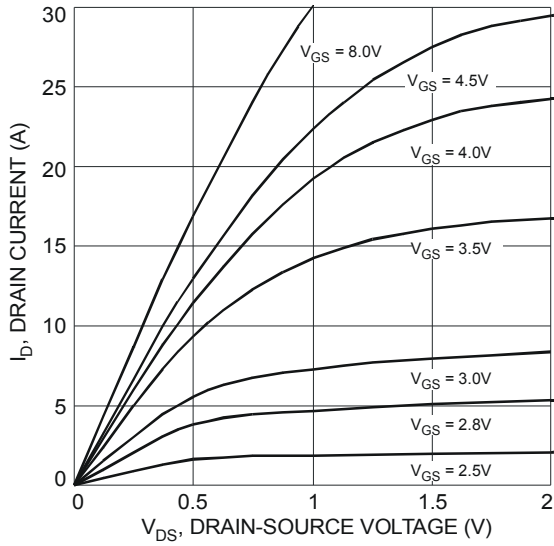


Fig. 1 Typical Output Characteristics

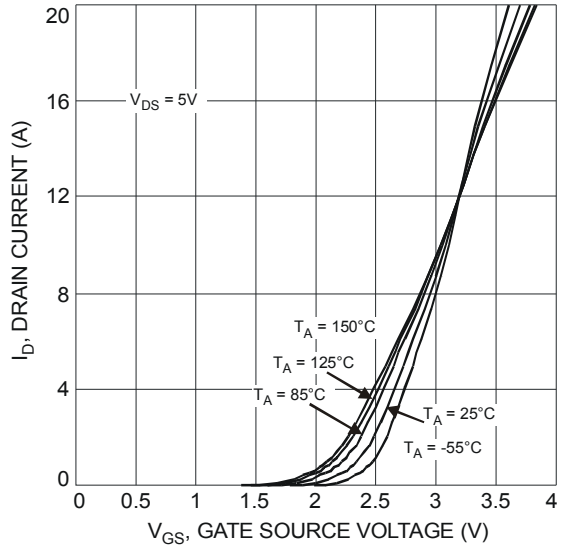


Fig. 2 Typical Transfer Characteristics

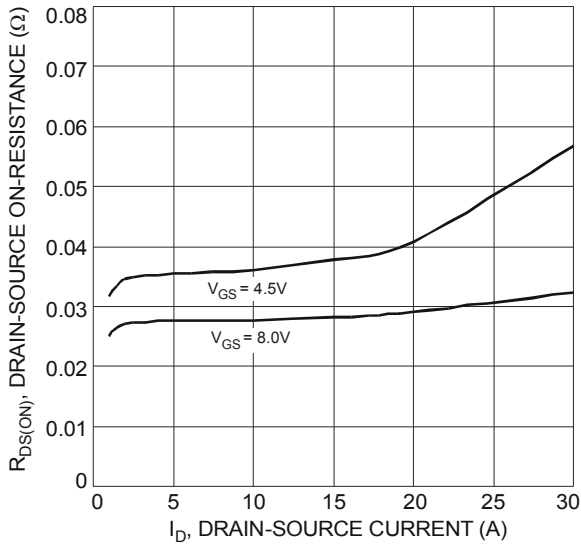


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

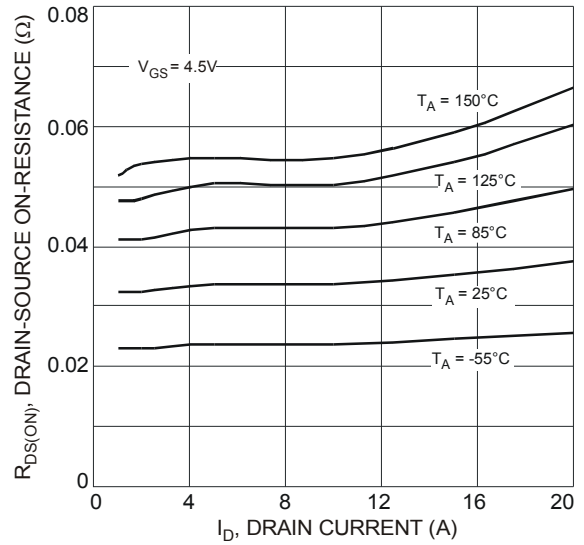


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

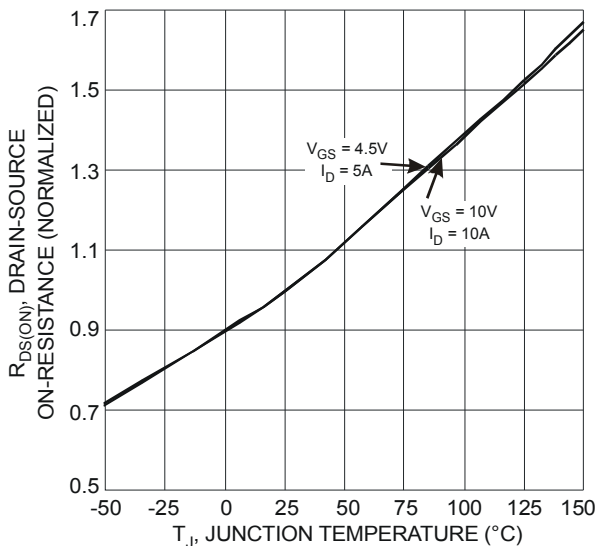


Fig. 5 On-Resistance Variation with Temperature

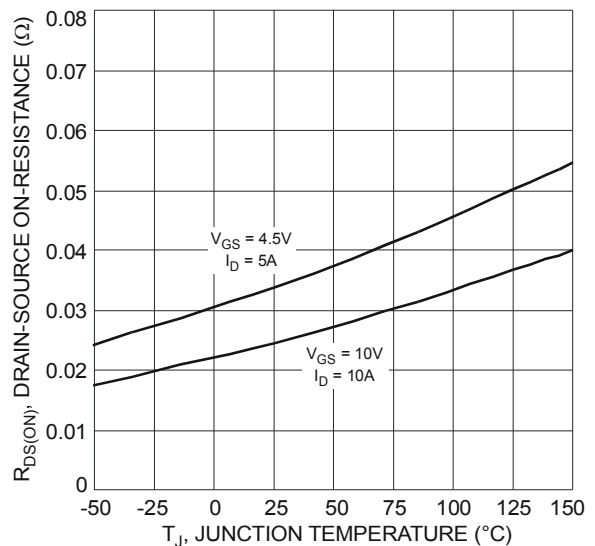


Fig. 6 On-Resistance Variation with Temperature

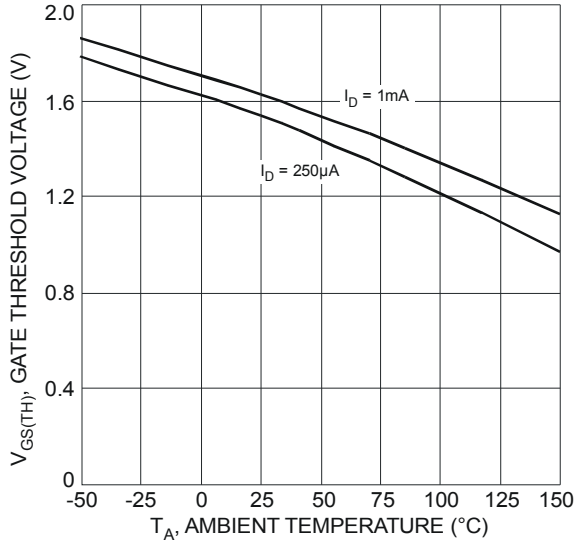


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

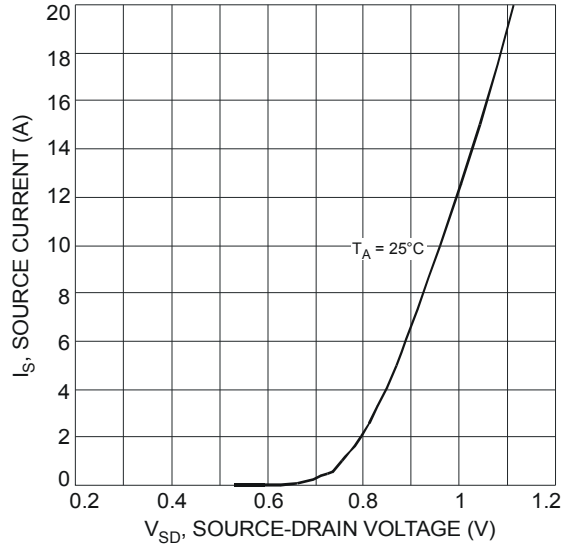


Fig. 8 Diode Forward Voltage vs. Current

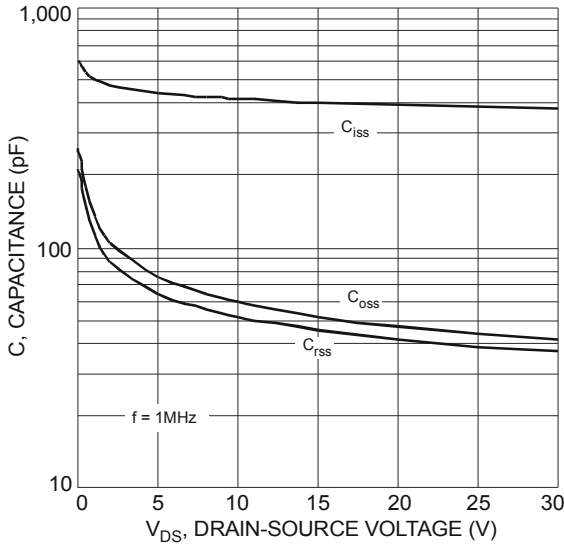


Fig. 9 Typical Capacitance

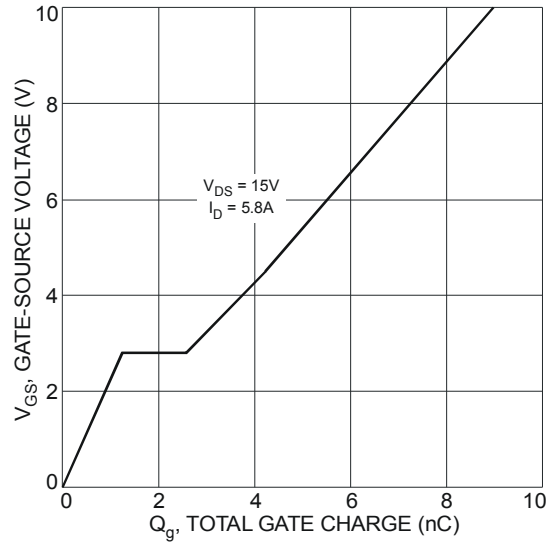


Fig. 10 Gate-Charge Characteristics

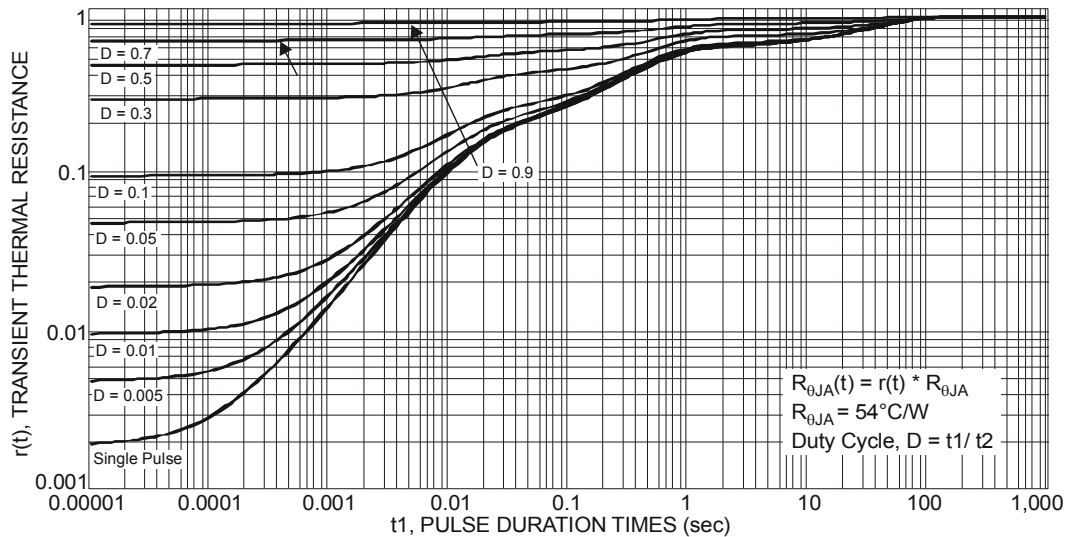
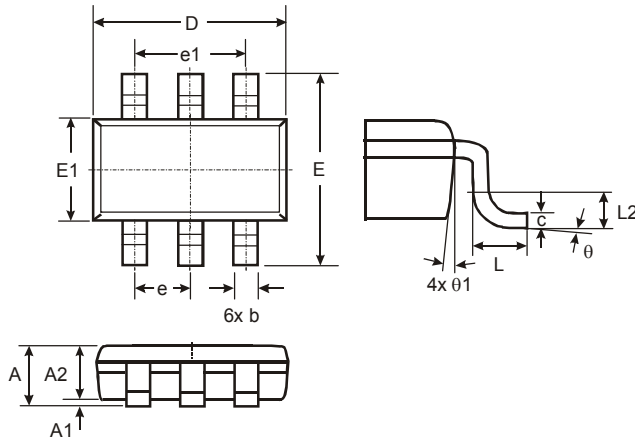


Fig. 11 Transient Thermal Resistance

Package Outline Dimensions

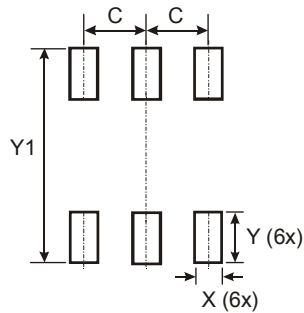
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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
theta	0°	8°	4°
theta1	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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