Product Summary

Device	$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D T_A = +25°C
Q1	30V	60mΩ @ V_{GS}= 10V	3.4A
		100mΩ @ V_{GS}= 4.5V	2.7A
Q2	-30V	95mΩ @ V_{GS}= -10V	-2.8A
		140mΩ @ V_{GS}= -4.5V	-2.3A

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

- Backlighting
- DC-DC Converters
- Power management functions

Features and Benefits

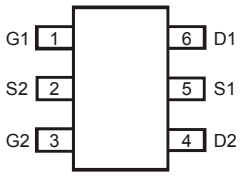
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

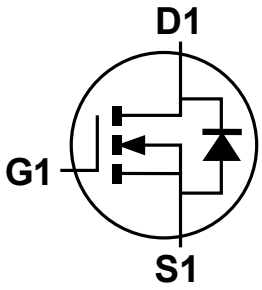
- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.013 grams (approximate)

TSOT26

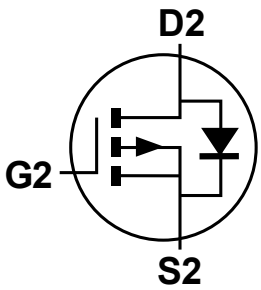
Top View



Top View



Q1 N-Channel MOSFET



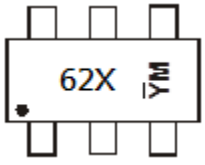
Q2 P-Channel MOSFET

Ordering Information (Note 4)

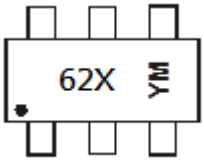
Part Number	Case	Packaging
DMG6602SVTX-7	TSOT26	3000 / Tape & Reel
DMG6602SVTX-13	TSOT26	10000 / Tape & Reel

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



Chengdu A/T Site



Shanghai A/T Site

62X = Product Type Marking Code
YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
$\overline{Y}$M = Date Code Marking for CAT (Chengdu Assembly/ Test site)
Y or $\overline{Y}$ = Year (ex: A = 2013)
M = Month (ex: 9 = September

Date Code Key

Year	2010	2011	2012	2013	2014	2015	2016
Code	X	Y	Z	A	B	C	D

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

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Maximum Ratings – Q1 (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
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	3.4 2.7	A
Continuous Drain Current (Note 5) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	2.7 2.2	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	1.5	A
Pulsed Drain Current (Note 6)			I_{DM}	13.0	A

Maximum Ratings – Q2 (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
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	-2.8 -2.4	A
Continuous Drain Current (Note 5) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	-2.3 -2.1	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	-1.5	A
Pulsed Drain Current (Note 6)			I_D	-11.2	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note5)	P_D	1.0	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 5)	$R_{\theta JA}$	124	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics – Q1 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0	µA	V_{DS} = 24V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	1.2	1.8	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	35 50 100	60 100 200	mΩ	V_{GS} = 10V, I_D = 3.1A V_{GS} = 4.5V, I_D = 2A V_{GS} = 3.3V, I_D = 1.5A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	4	—	S	V_{DS} = 5V, I_D = 3.1A
Diode Forward Voltage	V_{SD}	—	0.8	1	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	234	—	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	42	—		
Reverse Transfer Capacitance	C_{rss}	—	40	—		
Gate Resistance	R_g	—	1.45	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	3.6	—	nC	V_{DS} = 15V, V_{GS} = 4.5V, I_D = 3A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	7.3	—		V_{DS} = 15V, V_{GS} = 10V, I_D = 3A
Gate-Source Charge	Q_{gs}	—	0.9	—		
Gate-Drain Charge	Q_{gd}	—	1.6	—		
Turn-On Delay Time	$t_{D(on)}$	—	3.6	—	ns	V_{GS} = 10V, V_{DS} = 15V, R_G = 3Ω, R_L = 1.7Ω
Turn-On Rise Time	t_r	—	2.5	—		
Turn-Off Delay Time	$t_{D(off)}$	—	16	—		
Turn-Off Fall Time	t_f	—	6	—		

Notes:
5. Device mounted on FR-4 with minimum recommended pad layout, single sided.
6. Repetitive rating, pulse width limited by junction temperature.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

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Electrical Characteristics – Q2 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1.0	µA	V_{DS} = -24V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	-1.5	-2.2	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	75 105 140	95 140 200	mΩ	V_{GS} = -10V, I_D = -2.7A V_{GS} = -4.5V, I_D = -2A V_{GS} = -3.3V, I_D = -1.5A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	6	—	S	V_{DS} = -5V, I_D = -2.7A
Diode Forward Voltage	V_{SD}	—	-0.8	-1.0	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	410	—	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	50	—		
Reverse Transfer Capacitance	C_{rss}	—	45	—		
Gate Resistance	R_g	—	6.2	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	3.7	—	nC	V_{DS} = -15V, V_{GS} = -4.5V, I_D = -3A
Total Gate Charge (V_{GS} = -10V)	Q_g	—	7.8	—		V_{DS} = -15V, V_{GS} = -10V, I_D = -3A
Gate-Source Charge	Q_{gs}	—	1.1	—		
Gate-Drain Charge	Q_{gd}	—	1.3	—		
Turn-On Delay Time	$t_{D(on)}$	—	3.3	—	ns	V_{GS} = -10V, V_{DS} = -15V, R_G = 6Ω, R_L = 15Ω
Turn-On Rise Time	t_r	—	3.0	—		
Turn-Off Delay Time	$t_{D(off)}$	—	14	—		
Turn-Off Fall Time	t_f	—	6.8	—		

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

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Q1 N-CHANNEL

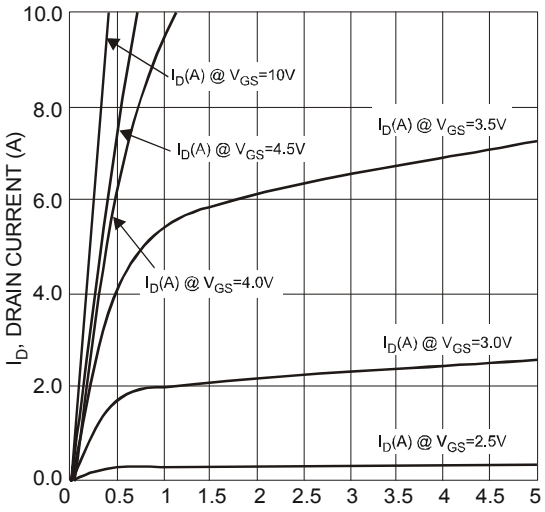

Fig. 1 Typical Output Characteristics

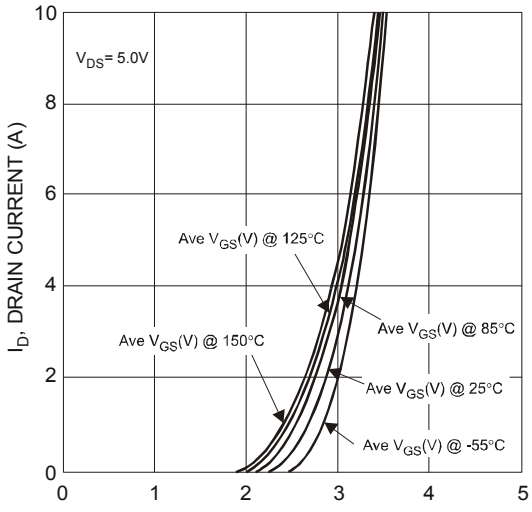

Fig. 2 Typical Transfer Characteristics

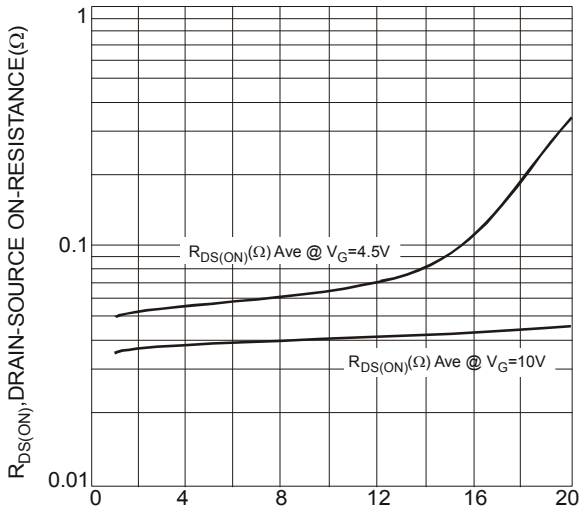

Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

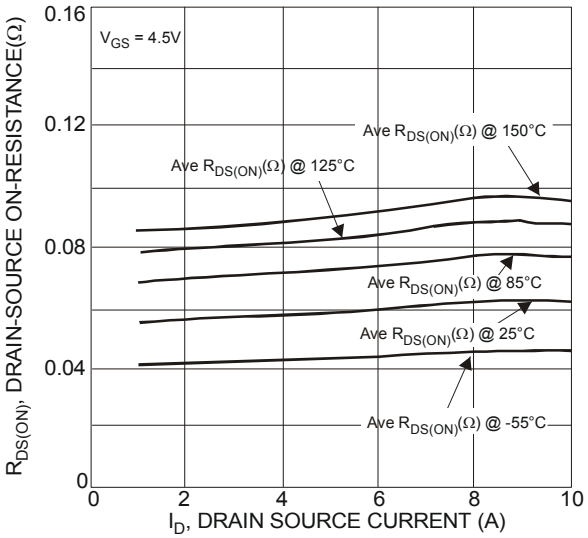

Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

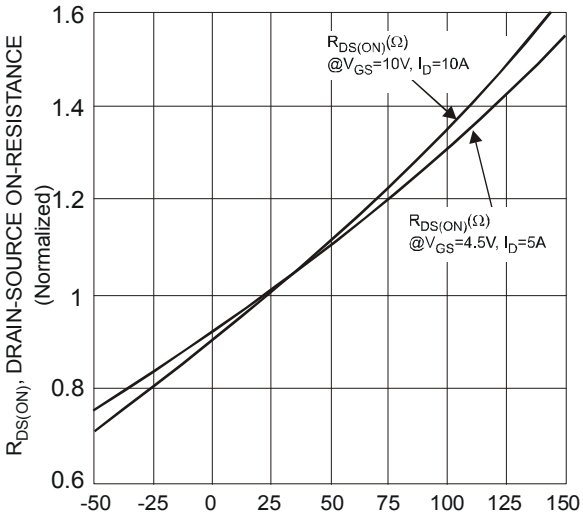

Fig. 5 On-Resistance Variation with Temperature

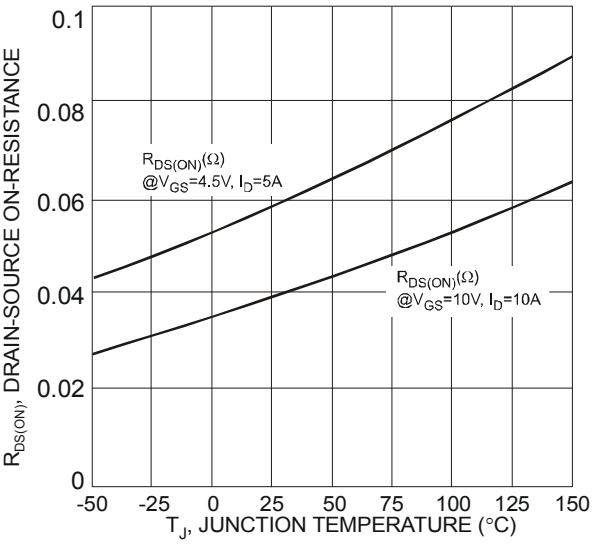

Fig. 6 On-Resistance Variation with Temperature

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Q1 N-CHANNEL

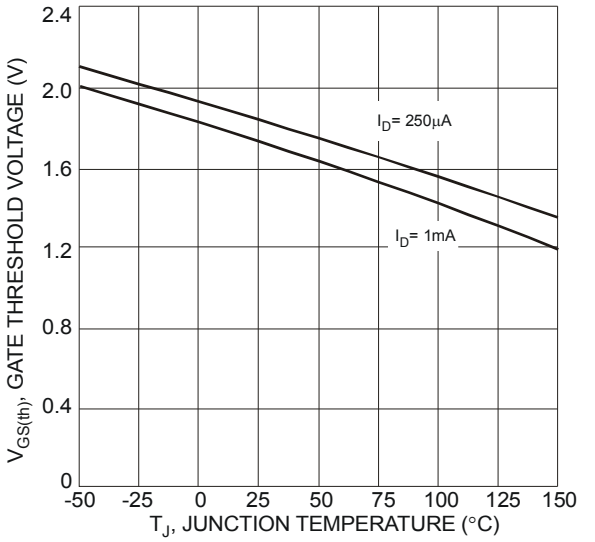

Fig. 7 Gate Threshold Variation vs. Ambient Temperature

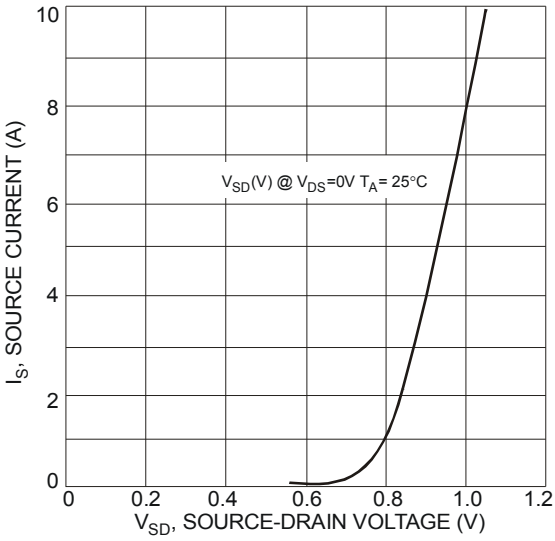

Fig. 8 Diode Forward Voltage vs. Current

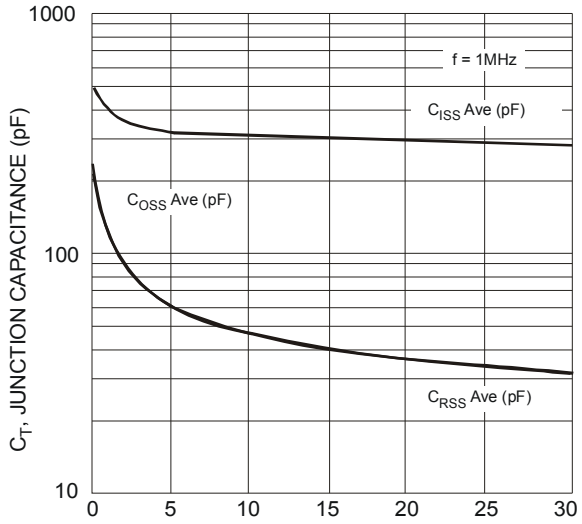

Fig. 9 Typical Junction Capacitance

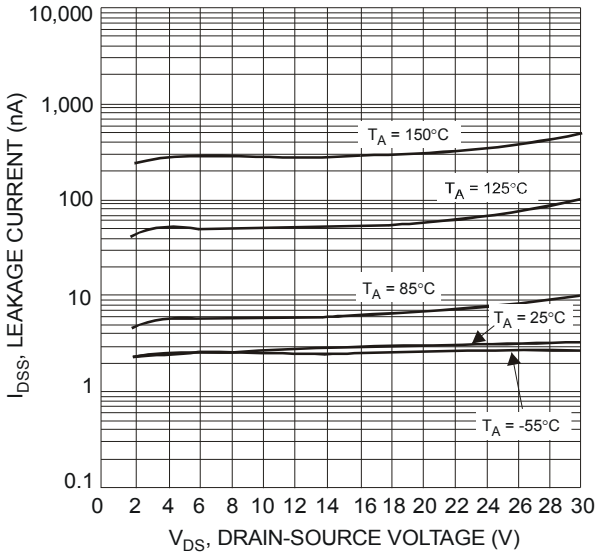

Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

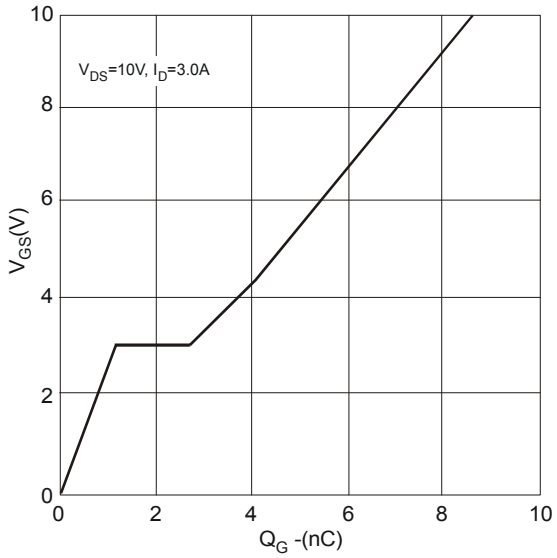

Fig. 11 Gate Charge Characteristics

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Q2 P-CHANNEL

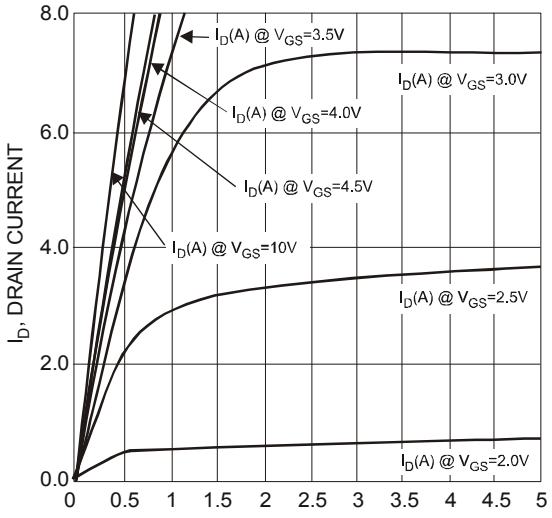

Fig. 12 Typical Output Characteristics

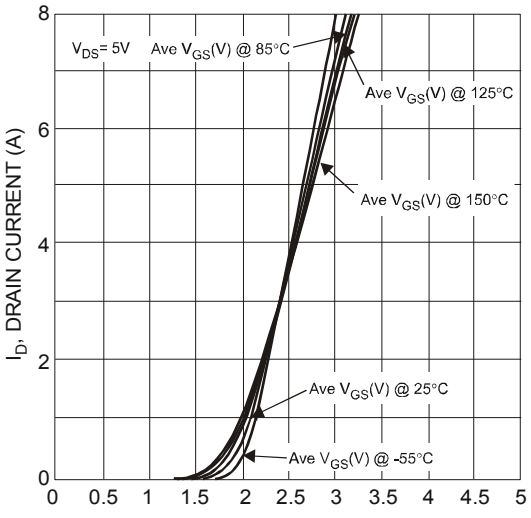

Fig. 13 Typical Transfer Characteristics

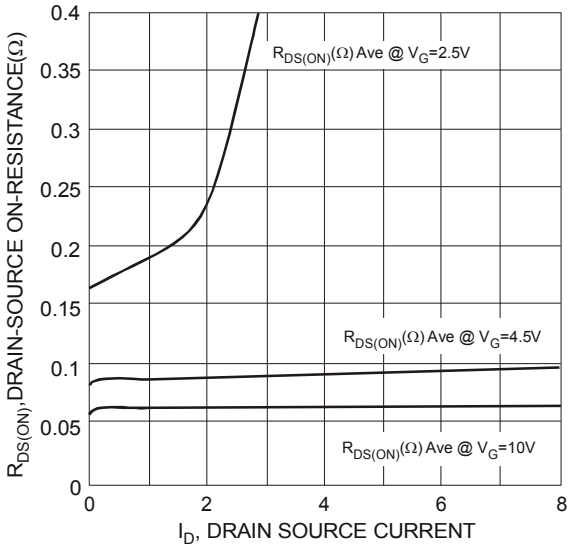

Fig. 14 Typical On-Resistance vs. Drain Current and Gate Voltage

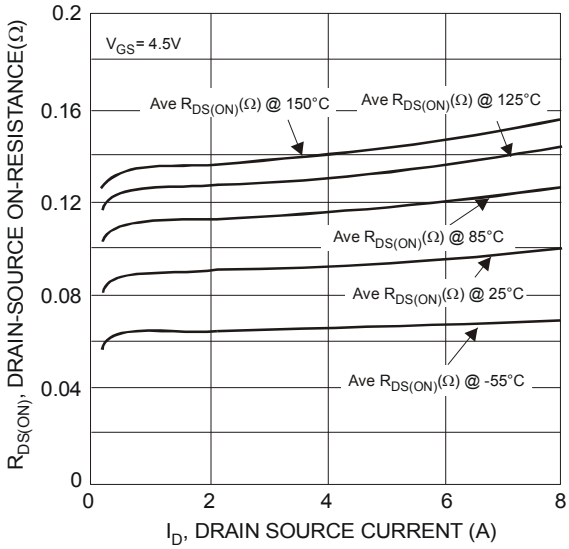

Fig. 15 Typical On-Resistance vs. Drain Current and Temperature

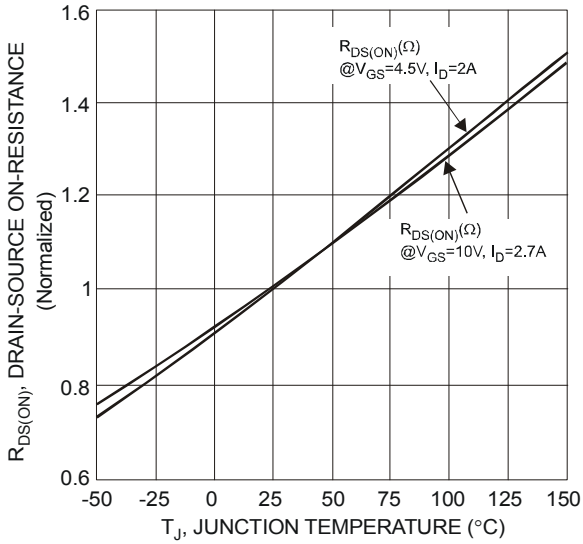

Fig. 16 On-Resistance Variation with Temperature

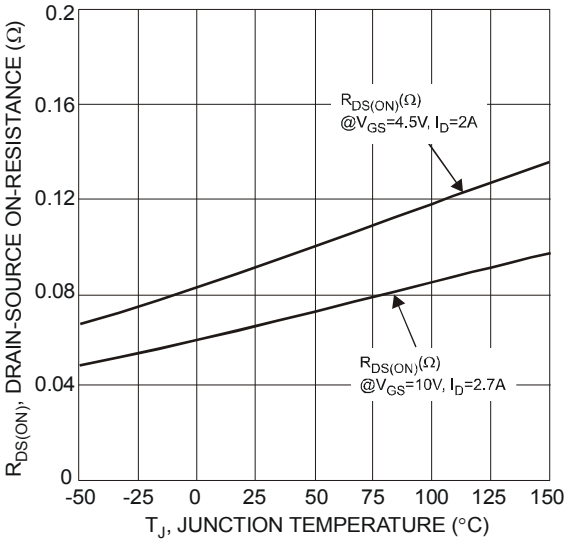

Fig. 17 On-Resistance Variation with Temperature

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Q2 P-CHANNEL

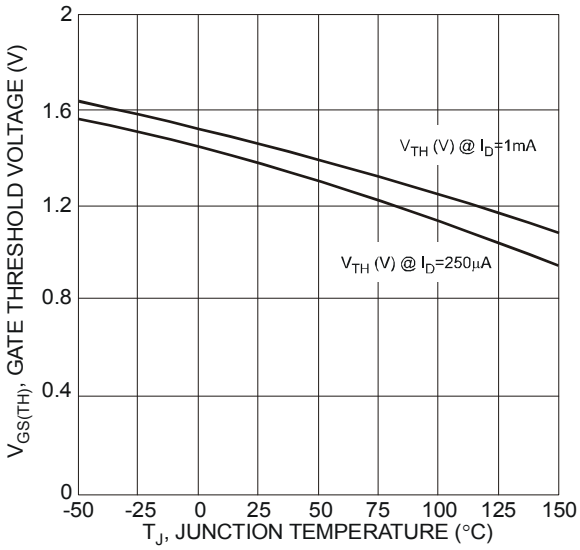

Fig. 18 Gate Threshold Variation vs. Ambient Temperature

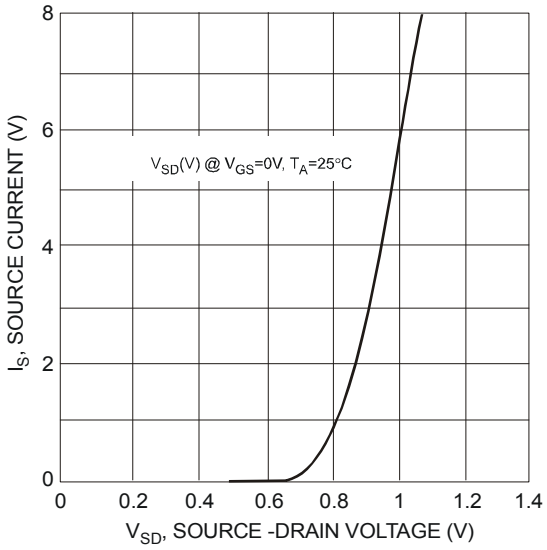

Fig. 19 Diode Forward Voltage vs. Current

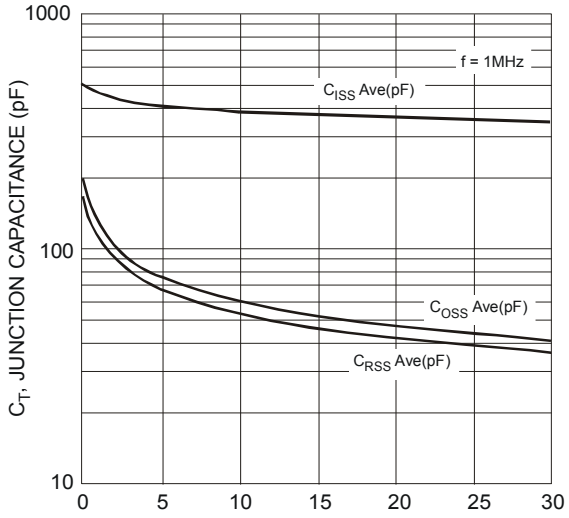

Fig. 20 Typical Junction Capacitance

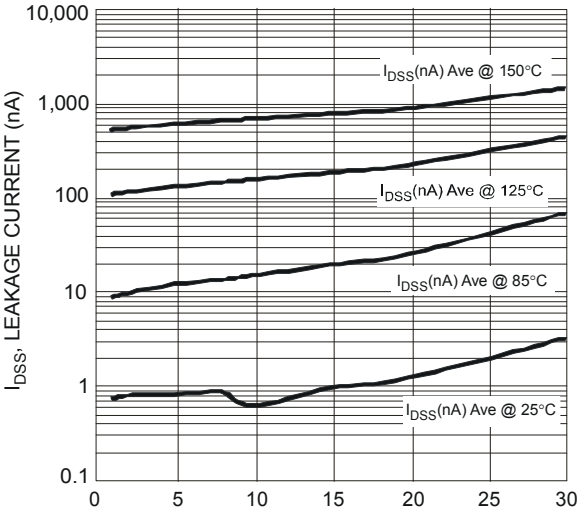

Fig. 21 Typical Drain-Source Leakage Current vs. Voltage

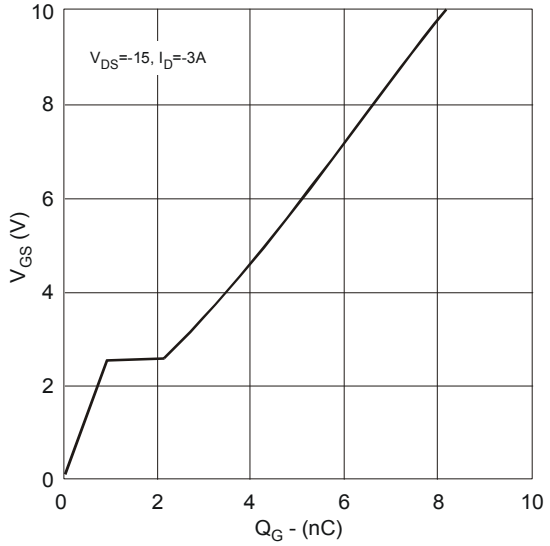

Fig. 22 Gate Charge Characteristics

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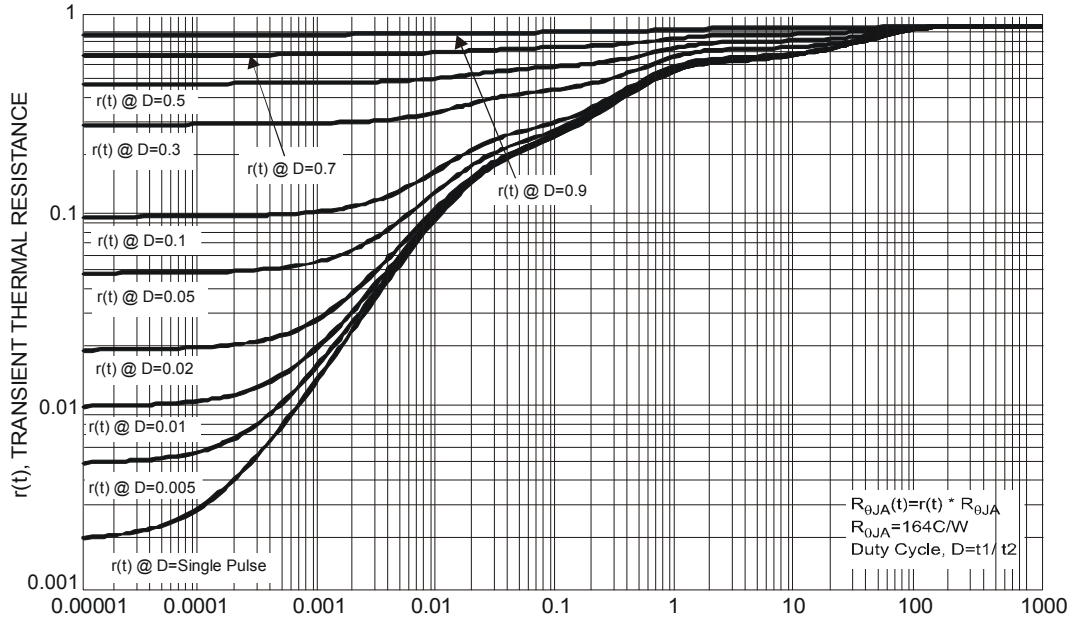
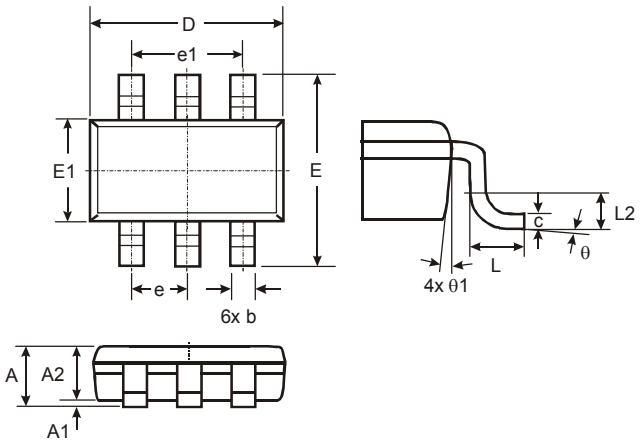


Fig. 23 Transient Thermal Resistance

Package Outline Dimensions

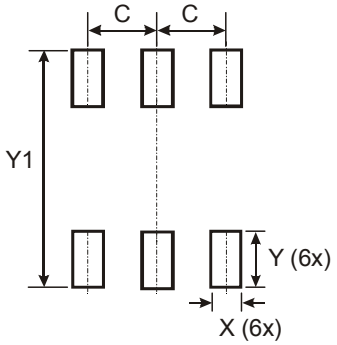
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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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LIFE SUPPORT

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A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

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