

COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET

Product Summary

Device	BV _{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

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)**
- **The DMG6602SVTQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
<https://www.diodes.com/quality/product-definitions/>

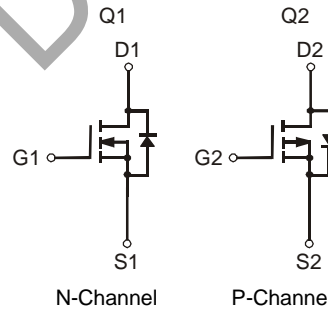
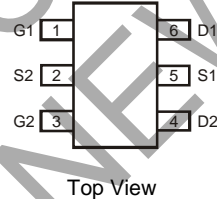
Description and Applications

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

- Backlighting
- DC-DC converters
- Power-management functions

Mechanical Data

- Package: TSOT26
- Package 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 (3)
- Weight: 0.013 grams (Approximate)

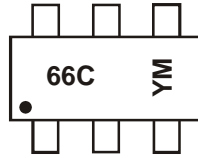


Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMG6602SVTQ-7	TSOT26	3000	Tape & Reel
DMG6602SVTQ-13	TSOT26	10,000	Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>

Marking Information



66C = Product Type Marking Code
 YM or YM= Date Code Marking
 Y or Y= Year (ex: L = 2024)
 M = Month (ex: 9 = September)

Date Code Key

Year	2014	...	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	B	...	L	M	N	P	R	S	T	U	V	W

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 – 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 6) V _{GS} = 10V	Steady State	T _A = +25°C	I _D	3.4	A
		T _A = +70°C		2.7	
Continuous Drain Current (Note 6) V _{GS} = 4.5V	Steady State	T _A = +25°C	I _D	2.7	A
		T _A = +70°C		2.2	
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	1.5	A
Pulsed Drain Current (Note 6)			I _{DM}	25	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 6) V _{GS} = -10V	Steady State	T _A = +25°C	I _D	-2.8	A
		T _A = +70°C		-2.4	
Continuous Drain Current (Note 6) V _{GS} = -4.5V	Steady State	T _A = +25°C	I _D	-2.3	A
		T _A = +70°C		-2.1	
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	-1.5	A
Pulsed Drain Current (Note 6)			I _D	-20	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	0.84	W
	T _A = +70°C		0.52	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	155	°C/W
	t < 10s		109	
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	1.27	W
	T _A = +70°C		0.8	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	102	°C/W
	t < 10s		71	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	34	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1.0	μA	V _{DS} = 24V, V _{GS} = 0
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1.0	—	2.3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	38	60	mΩ	V _{GS} = 10V, I _D = 3.1A
			55	100		V _{GS} = 4.5V, I _D = 2A
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} = 0, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	290	400	pF	V _{DS} = 15V, V _{GS} = 0, f = 1.2MHz
Output Capacitance	C _{oss}	—	40	80		
Reverse Transfer Capacitance	C _{rss}	—	40	80		
Gate Resistance	R _g	—	1.4	—	Ω	V _{DS} = 0, V _{GS} = 0, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	4	6	nC	V _{DS} = 15V, V _{GS} = 4.5V, I _D = 3.1A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	9	13		
Gate-Source Charge	Q _{gs}	—	1.2	—		
Gate-Drain Charge	Q _{gd}	—	1.5	—		
Turn-On Delay Time	t _{D(on)}	—	3	—	ns	V _{GS} = 10V, V _{DS} = 15V, R _G = 3Ω, R _L = 4.7Ω
Turn-On Rise Time	t _r	—	5	—		
Turn-Off Delay Time	t _{D(off)}	—	13	—		
Turn-Off Fall Time	t _f	—	3	—		

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	—	—	V	V _{GS} = 0, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1.0	μA	V _{DS} = -24V, V _{GS} = 0
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-1.0	—	-2.3	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	73	95	mΩ	V _{GS} = -10V, I _D = -2.7A
			99	140		V _{GS} = -4.5V, I _D = -2A
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} = 0, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	350	420	pF	V _{DS} = -15V, V _{GS} = 0, f = 1.2MHz
Output Capacitance	C _{oss}	—	50	100		
Reverse Transfer Capacitance	C _{rss}	—	45	80		
Gate Resistance	R _g	—	17.1	—	Ω	V _{DS} = 0, V _{GS} = 0, f = 1MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	4	6	nC	V _{DS} = -15V, V _{GS} = -4.5V, I _D = -3A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	7	9		
Gate-Source Charge	Q _{gs}	—	0.9	—		
Gate-Drain Charge	Q _{gd}	—	1.2	—		
Turn-On Delay Time	t _{D(on)}	—	4.8	—	ns	V _{GS} = -10V, V _{DS} = -15V, R _G = 6Ω, R _L = 15Ω
Turn-On Rise Time	t _r	—	7.3	—		
Turn-Off Delay Time	t _{D(off)}	—	20	—		
Turn-Off Fall Time	t _f	—	13	—		

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

Q1 NMOS

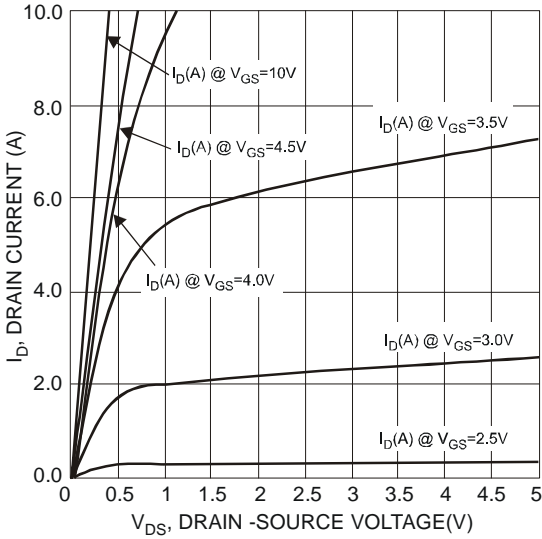


Fig. 1 Typical Output Characteristics

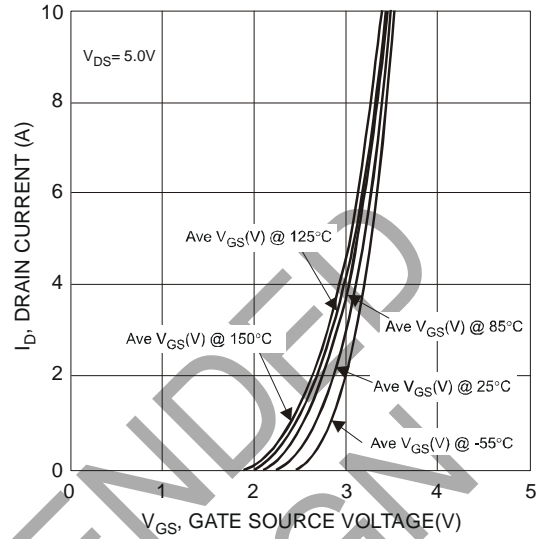


Fig. 2 Typical Transfer Characteristics

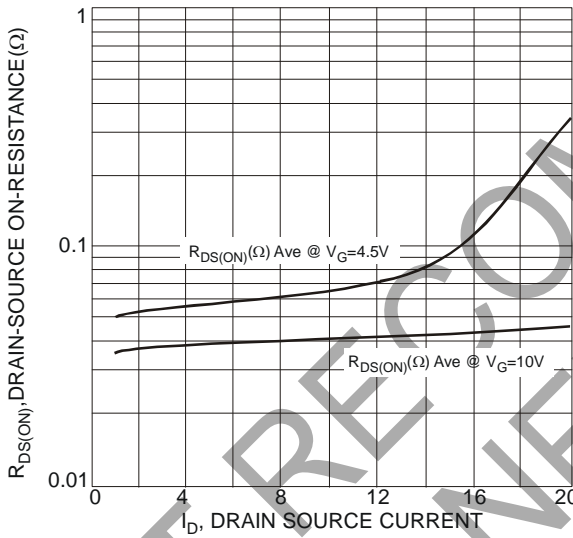


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

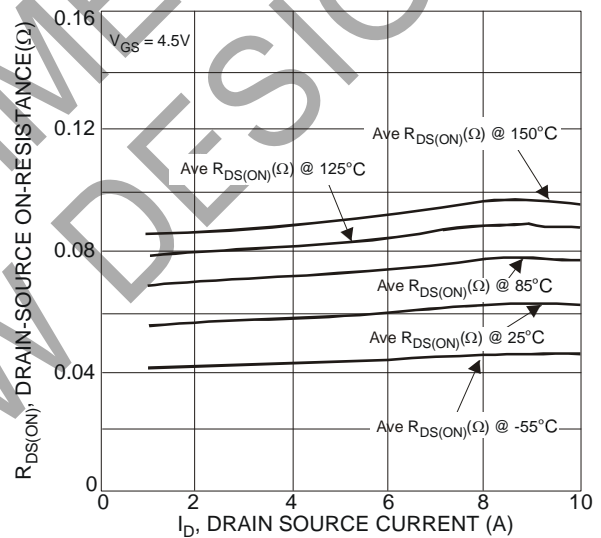


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

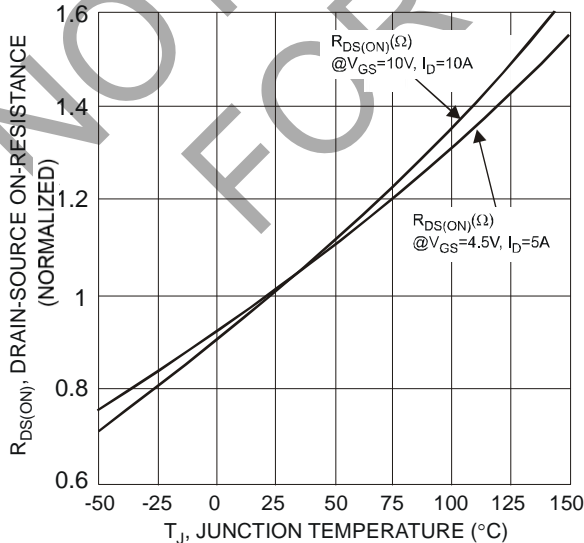


Fig. 5 On-Resistance Variation with Temperature

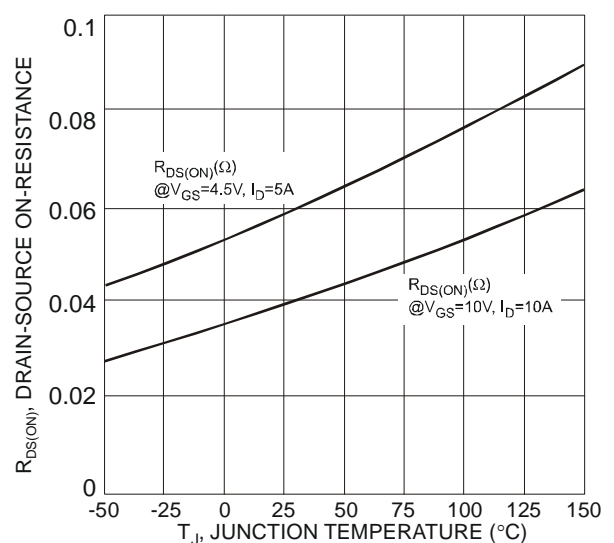


Fig. 6 On-Resistance Variation with Temperature

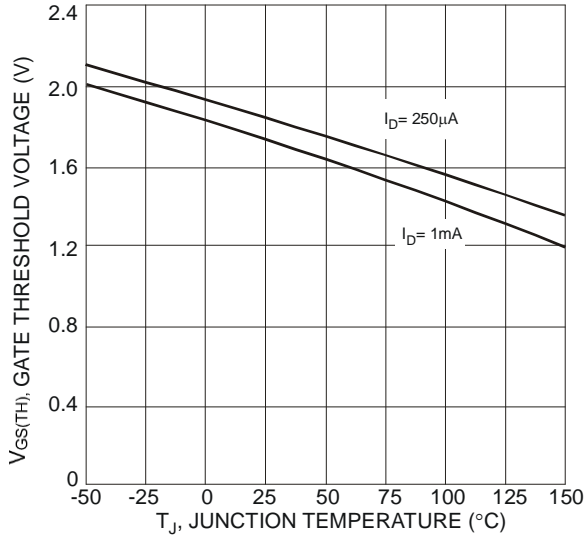


Fig. 7 Gate Threshold Variation vs. Junction Temperature

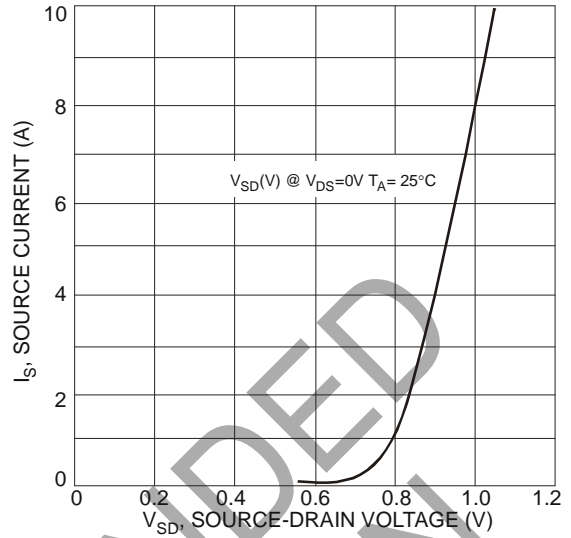


Fig. 8 Diode Forward Voltage vs. Current

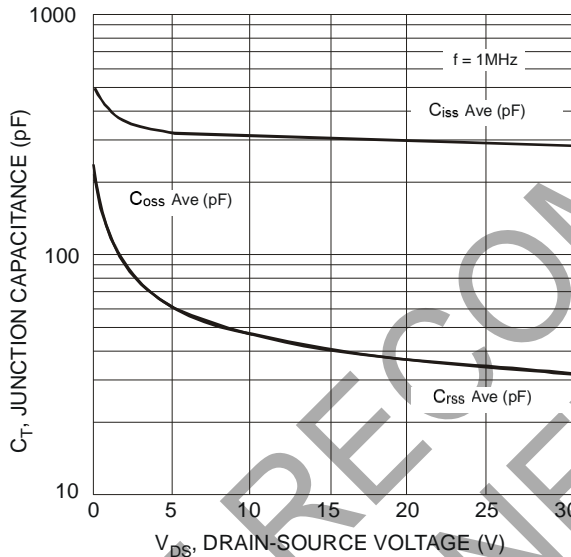


Fig. 9 Typical Junction Capacitance

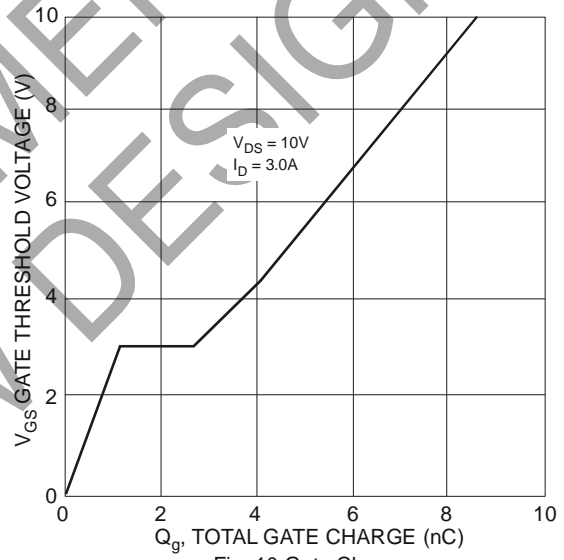


Fig. 10 Gate Charge

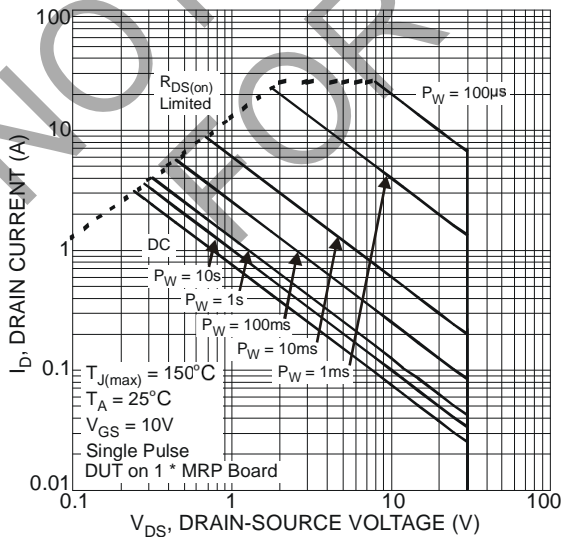


Fig. 11 SOA, Safe Operation Area

Q2 PMOS

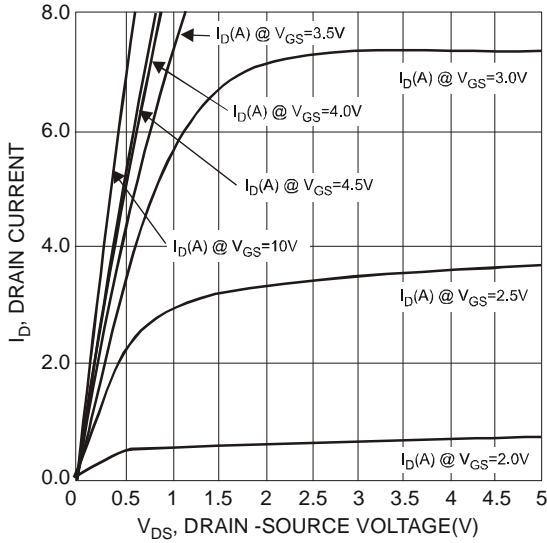


Fig. 12 Typical Output Characteristics

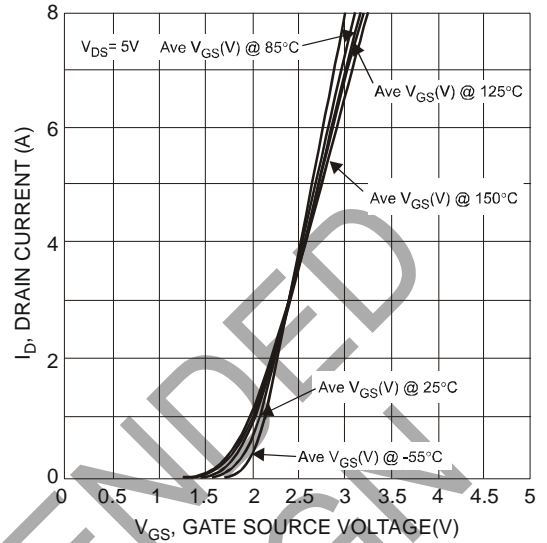


Fig. 13 Typical Transfer Characteristics

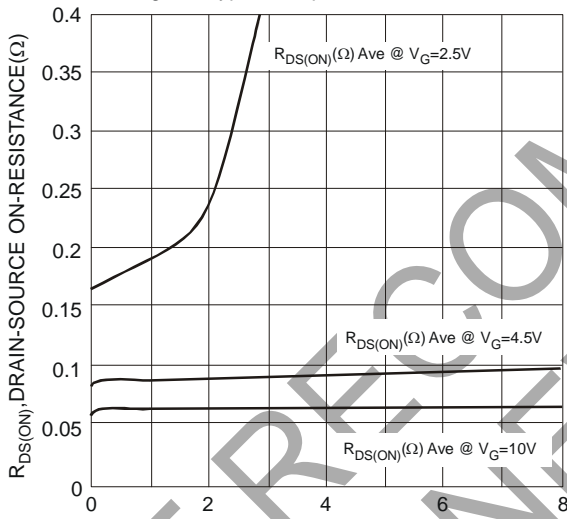


Fig. 14 Typical On-Resistance vs. Drain Current and Gate Voltage

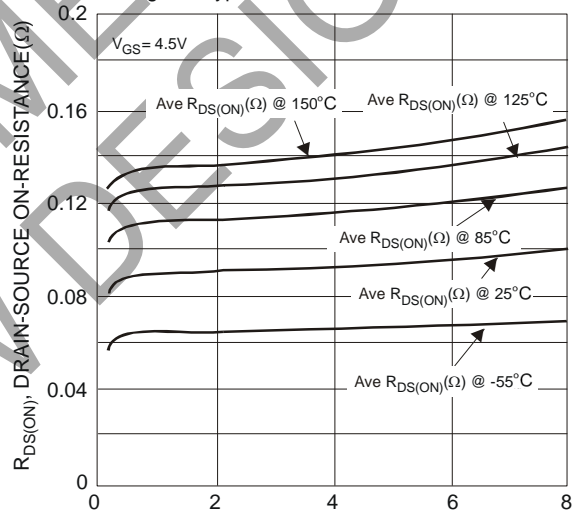


Fig. 15 Typical On-Resistance vs. Drain Current and Temperature

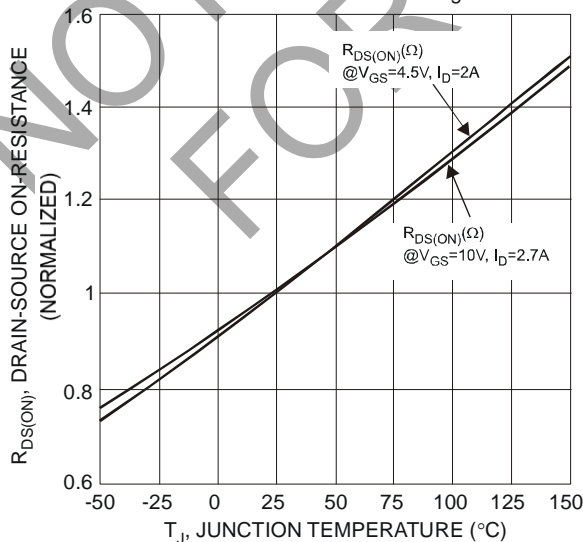


Fig. 16 On-Resistance Variation with Temperature

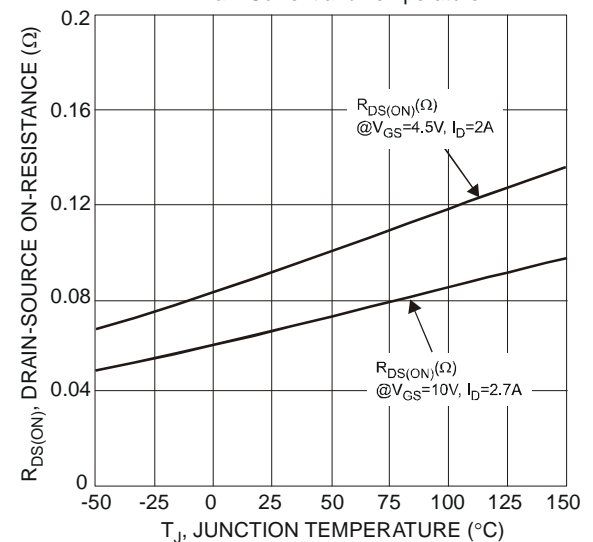


Fig. 17 On-Resistance Variation with Temperature

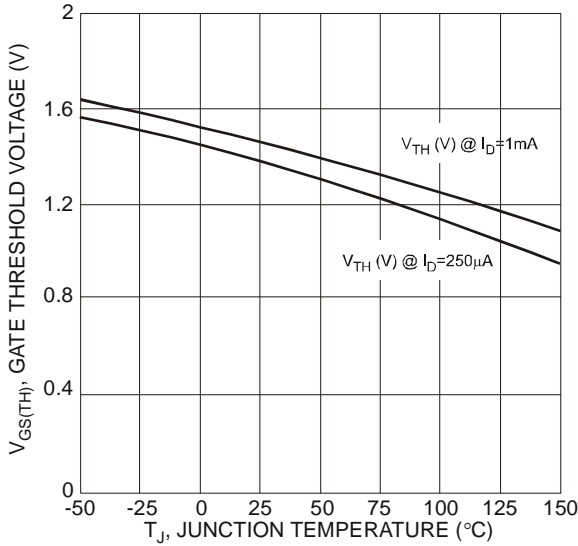


Fig. 18 Gate Threshold Variation vs. Junction Temperature

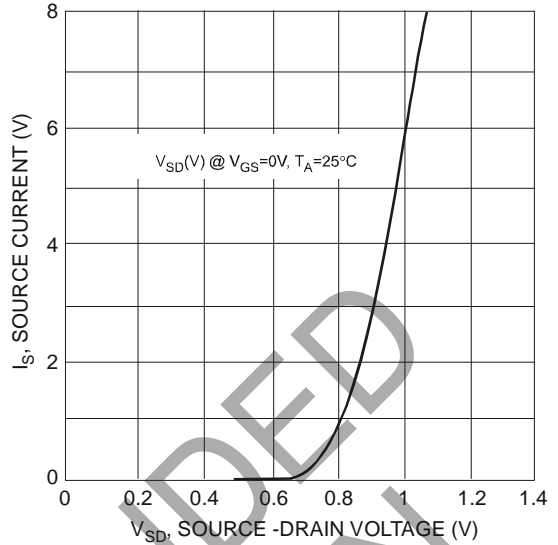


Fig. 19 Diode Forward Voltage vs. Current

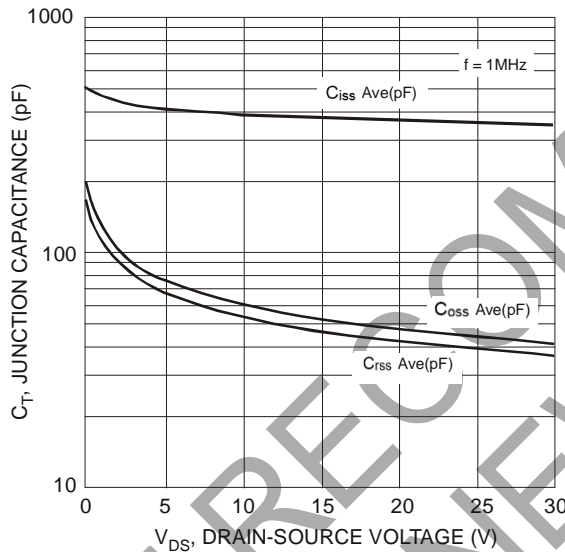


Fig. 20 Typical Junction Capacitance

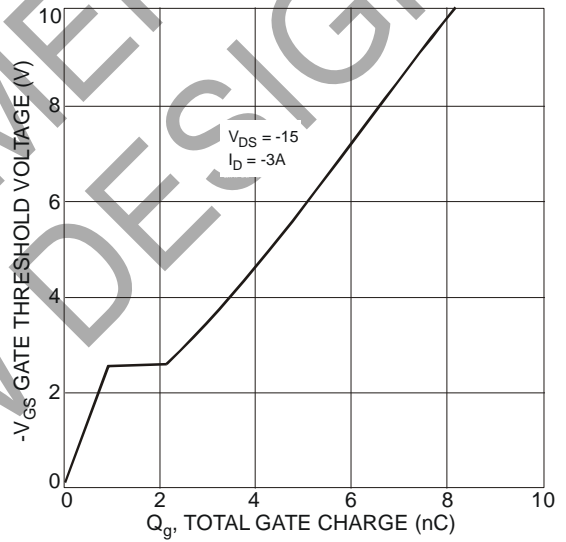


Fig. 21 Gate Charge

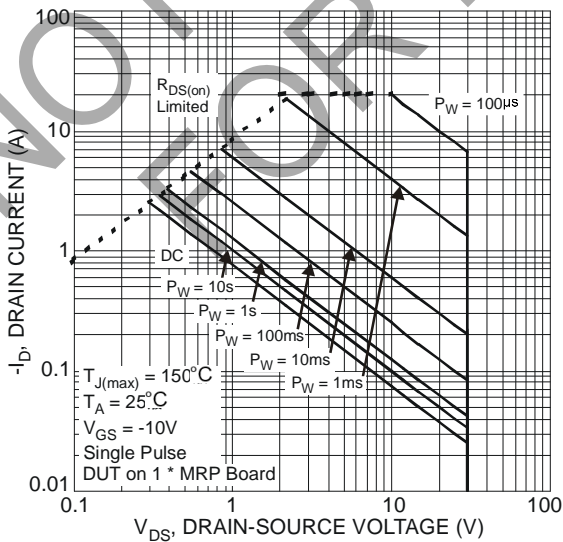


Fig. 22 SOA, Safe Operation Area

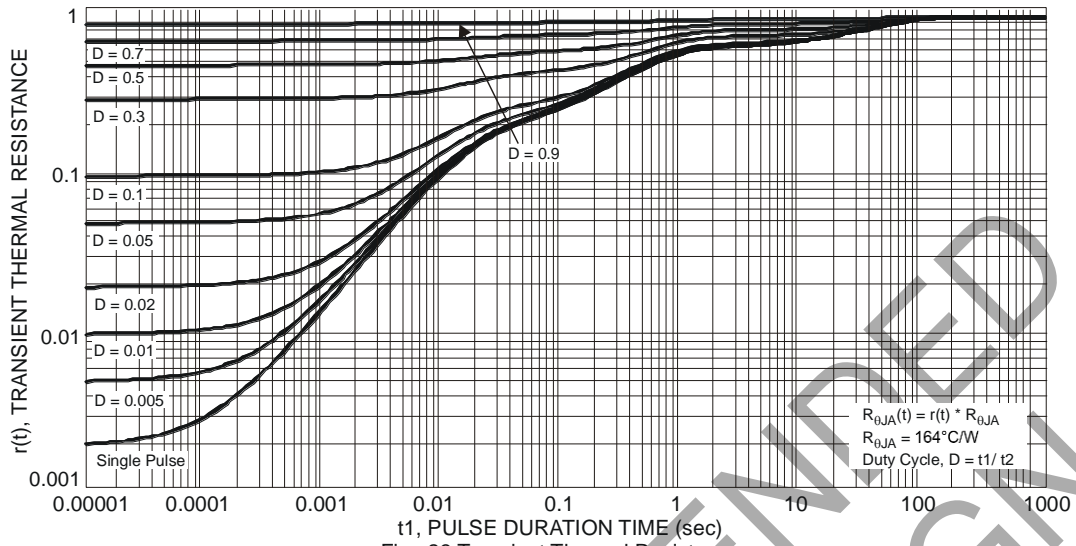


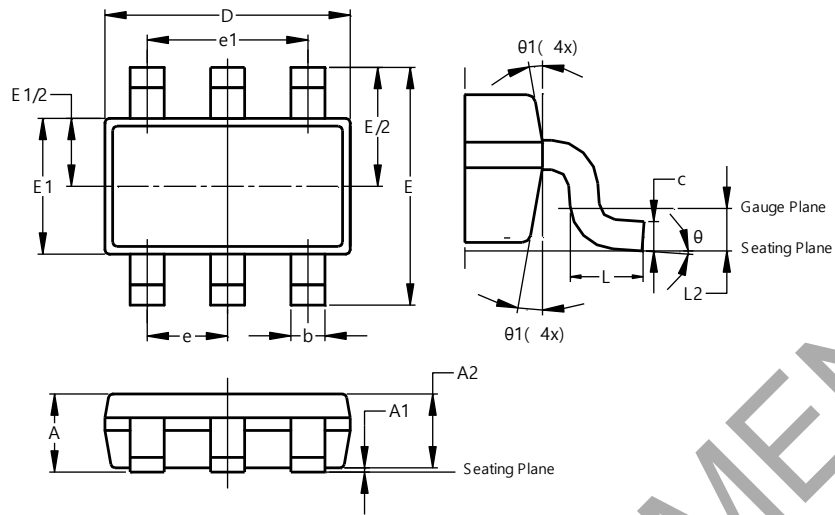
Fig. 23 Transient Thermal Resistance

NOT RECOMMENDED FOR NEW DESIGN

Package Outline Dimensions

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

TSOT26

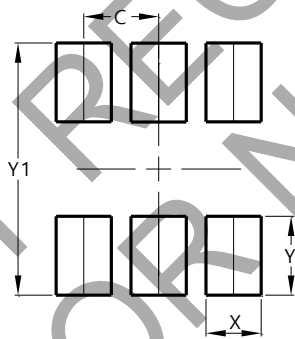


TSOT26			
Dim	Min	Max	Typ
A	–	1.00	–
A1	0.010	0.100	–
A2	0.840	0.900	–
D	2.800	3.000	2.900
E	2.800 BSC		
E1	1.500	1.700	1.600
b	0.300	0.450	–
c	0.120	0.200	–
e	0.950 BSC		
e1	1.900 BSC		
L	0.30	0.50	–
L2	0.250 BSC		
θ	0°	8°	4°
$\theta 1$	4°	12°	–
All Dimensions in mm			

Suggested Pad Layout

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

TSOT26



Dimensions	Value (in mm)
C	0.950
X	0.700
Y	1.000
Y1	3.200

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