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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



**COMPLEMENTARY PAIR ENHANCEMENT MODE MOSFET**
**Product Summary**

Device	$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = +25^\circ C$
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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

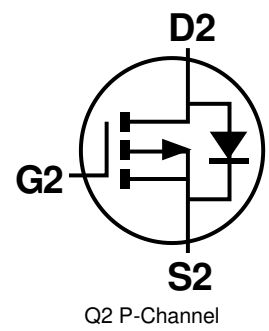
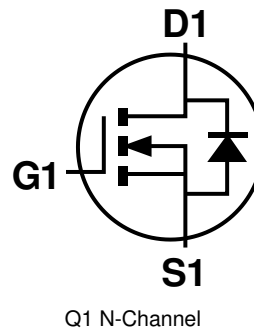
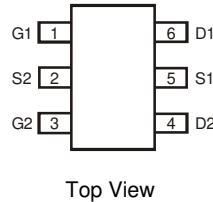
**Description and Applications**

This new generation MOSFET is 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.

- Backlighting
- DC-DC Converters
- Power Management Functions

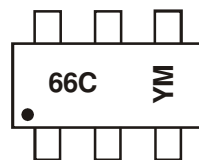
**Mechanical Data**

- 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
- Weight: 0.013 grams (Approximate)


**Ordering Information** (Note 3)

Part Number	Case	Packaging
DMG6602SVT-7	TSOT26	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](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**


66C = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: X = 2010)  
 M = Month (ex: 9 = September)

**Date Code Key**

Year	2010	2011	2012	2013	2014	2015	2016	2017				
Code	X	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 – Q1** (@TA = +25°C unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	3.4	A
		T <sub>A</sub> = +70°C		2.7	
Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	2.7	A
		T <sub>A</sub> = +70°C		2.2	
Maximum Continuous Body Diode Forward Current (Note 6)			I <sub>S</sub>	1.5	A
Pulsed Drain Current (Note 6)			I <sub>DM</sub>	25	A

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	-30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = -10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	-2.8	A
		T <sub>A</sub> = +70°C		-2.4	
Continuous Drain Current (Note 6) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	-2.3	A
		T <sub>A</sub> = +70°C		-2.1	
Maximum Continuous Body Diode Forward Current (Note 6)			I <sub>S</sub>	-1.5	A
Pulsed Drain Current (Note 6)			I <sub>D</sub>	-20	A

**Thermal Characteristics**

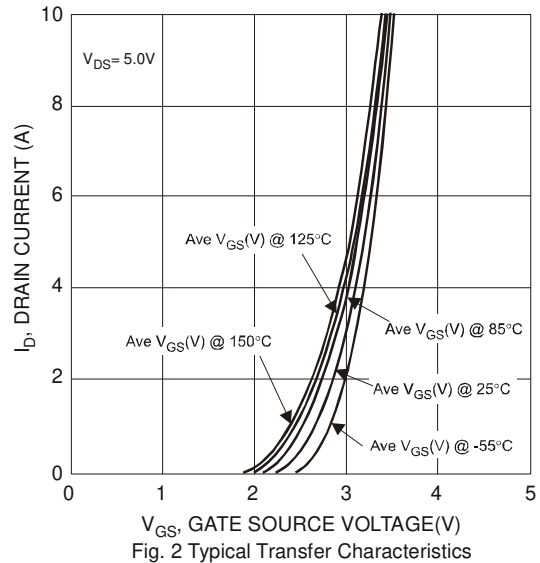
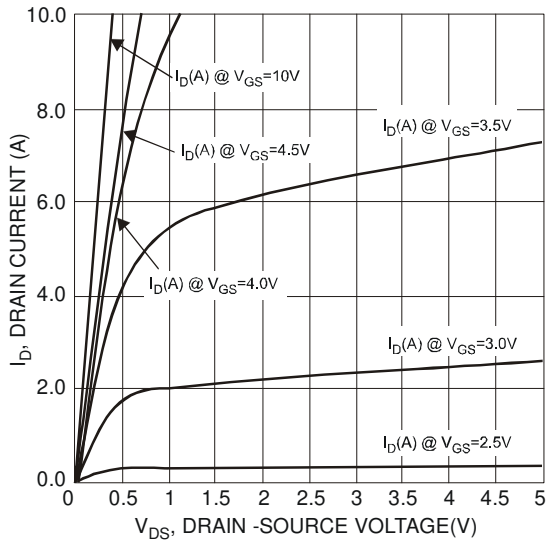
Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T <sub>A</sub> = +25°C	P <sub>D</sub>	0.84	W
	T <sub>A</sub> = +70°C		0.52	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R <sub>θJA</sub>	155	°C/W
	t < 10s		109	
Total Power Dissipation (Note 6)	T <sub>A</sub> = +25°C	P <sub>D</sub>	1.27	W
	T <sub>A</sub> = +70°C		0.8	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	R <sub>θJA</sub>	102	°C/W
	t < 10s		71	
Thermal Resistance, Junction to Case (Note 6)		R <sub>θJC</sub>	34	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-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 1 inch square copper plate.

**Electrical Characteristics – Q1 NMOS** (@TA = +25°C unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1.0	$\mu A$	$V_{DS} = 24V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	-	2.3	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	38 55	60 100	m $\Omega$	$V_{GS} = 10V, I_D = 3.1A$ $V_{GS} = 4.5V, I_D = 2A$
Forward Transfer Admittance	$ Y_{fs} $	-	4	-	S	$V_{DS} = 5V, I_D = 3.1A$
Diode Forward Voltage	$V_{SD}$	-	0.8	1	V	$V_{GS} = 0V, I_S = 1A$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	-	290	400	pF	$V_{DS} = 15V, V_{GS} = 0V,$ $f = 1.2MHz$
Output Capacitance	$C_{oss}$	-	40	80		
Reverse Transfer Capacitance	$C_{rss}$	-	40	80		
Gate Resistance	$R_g$	-	1.4	-	$\Omega$	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$
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	$V_{GS} = 10V, V_{DS} = 15V,$ $R_G = 3\Omega, R_L = 4.7\Omega$
Turn-On Rise Time	$t_r$	-	5	-		
Turn-Off Delay Time	$t_{D(off)}$	-	13	-		
Turn-Off Fall Time	$t_f$	-	3	-		

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



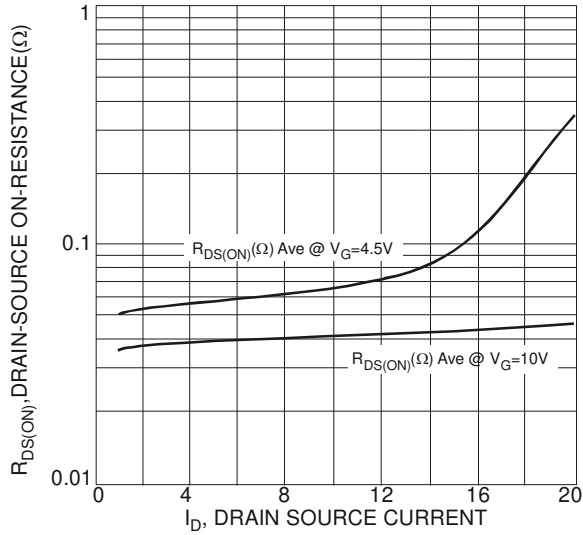


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

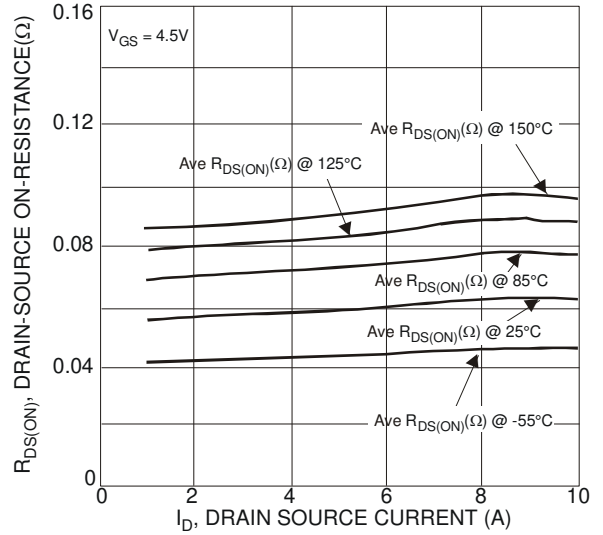


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

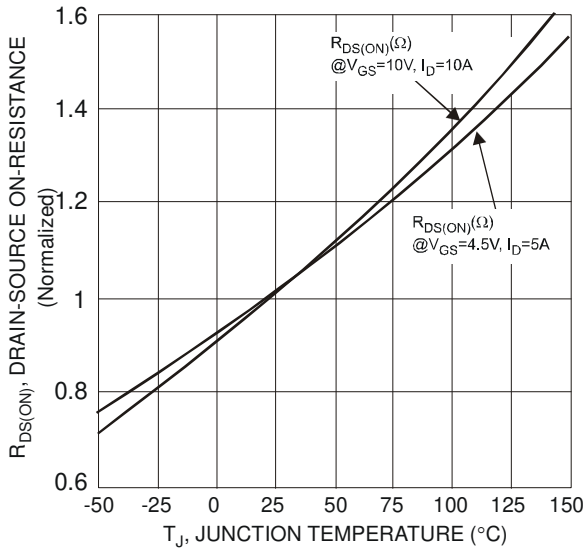


Fig. 5 On-Resistance Variation with Temperature

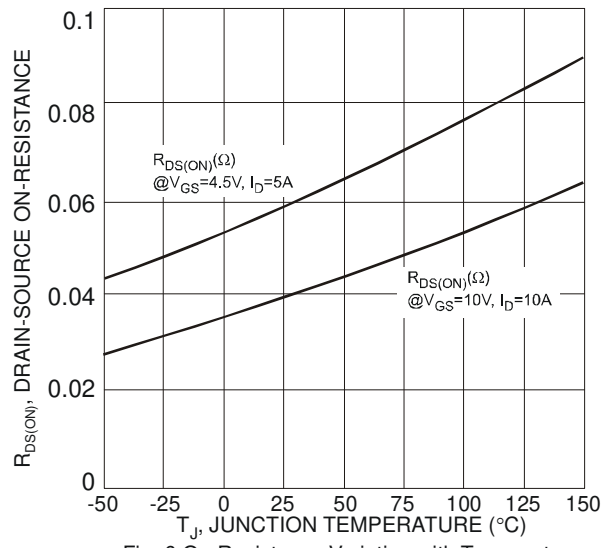


Fig. 6 On-Resistance Variation with Temperature

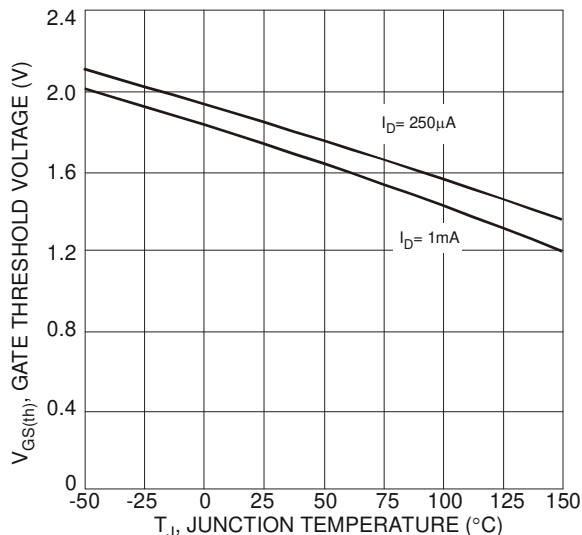


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

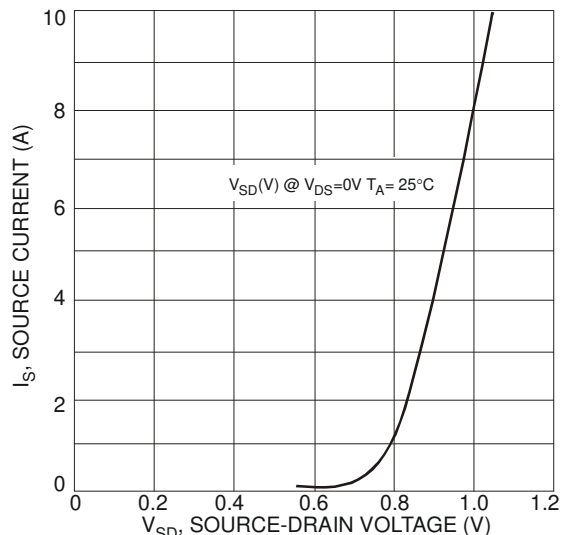
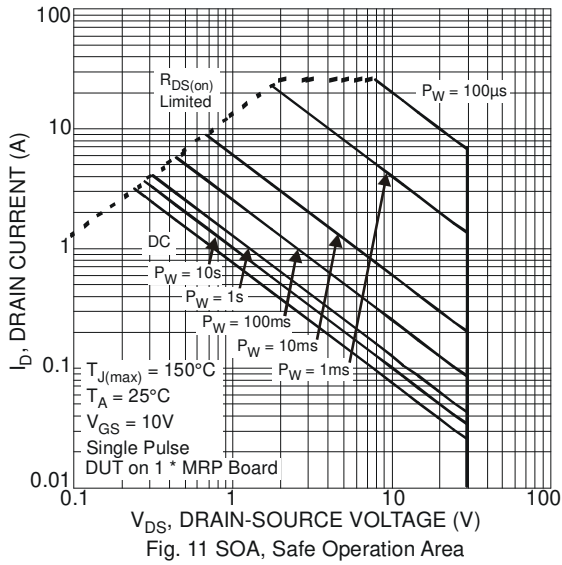
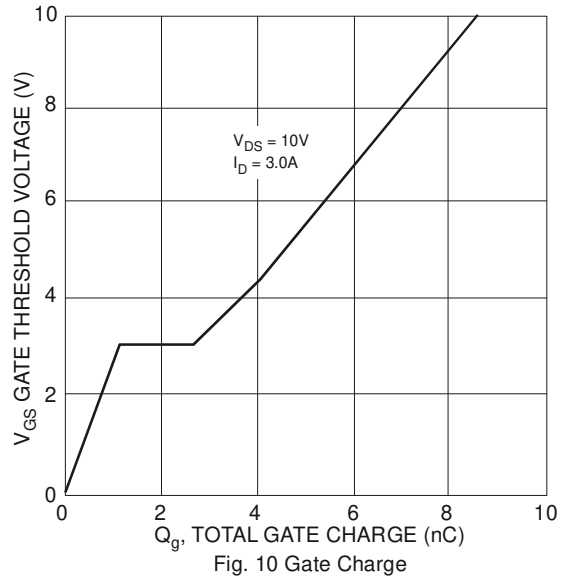
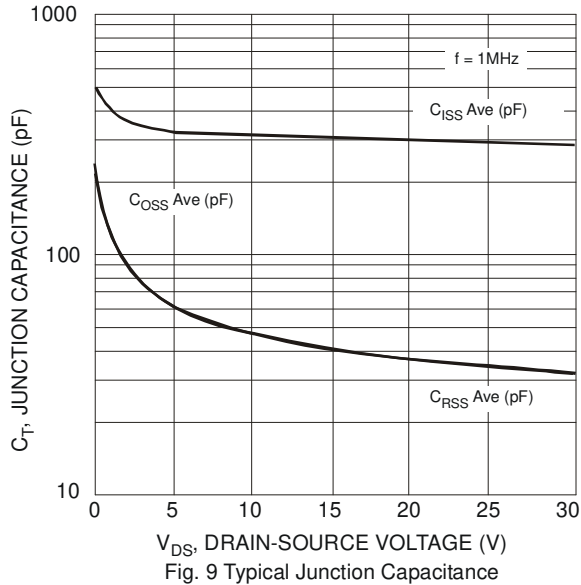


Fig. 8 Diode Forward Voltage vs. Current



**Electrical Characteristics – Q2 PMOS** (@TA = +25°C unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	-	-	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	-1.0	$\mu A$	$V_{DS} = -24V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	-	-2.3	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	73 99	95 140	m $\Omega$	$V_{GS} = -10V, I_D = -2.7A$ $V_{GS} = -4.5V, I_D = -2A$
Forward Transfer Admittance	$ Y_{fs} $	-	6	-	S	$V_{DS} = -5V, I_D = -2.7A$
Diode Forward Voltage	$V_{SD}$	-	-0.8	-1.0	V	$V_{GS} = 0V, I_S = -1A$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	-	350	420	pF	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.2MHz$
Output Capacitance	$C_{oss}$	-	50	100		
Reverse Transfer Capacitance	$C_{rss}$	-	45	80		
Gate Resistance	$R_g$	-	17.1	-	$\Omega$	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$
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	$V_{GS} = -10V, V_{DS} = -15V,$ $R_G = 6\Omega, R_L = 15\Omega$
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.

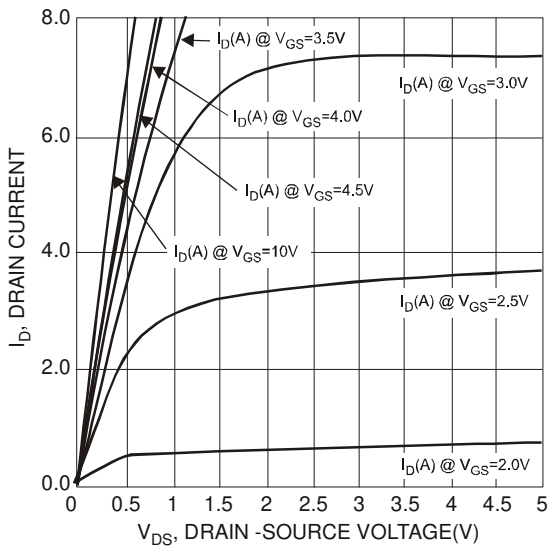


Fig. 12 Typical Output Characteristics

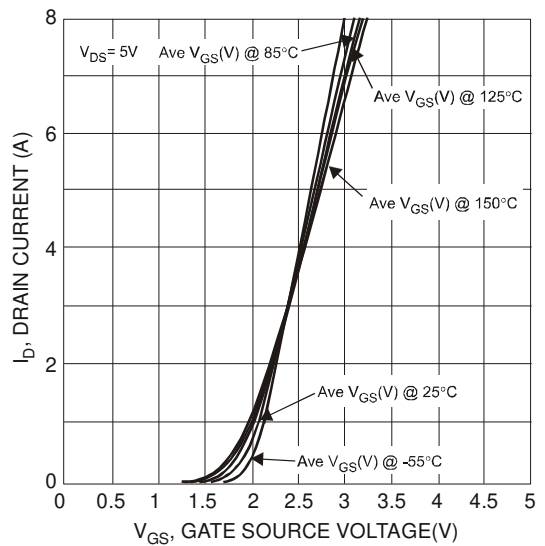


Fig. 13 Typical Transfer Characteristics

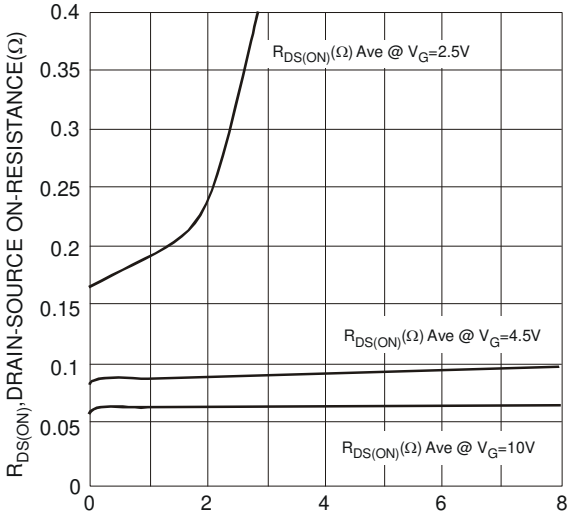


Fig. 14 Typical On-Resistance vs. Drain Current and Gate Voltage

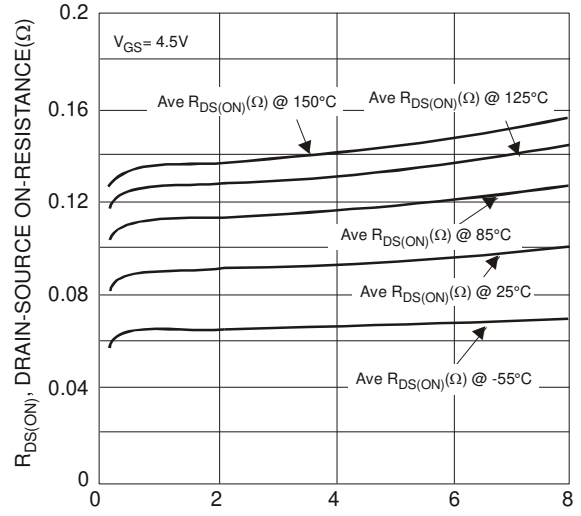


Fig. 15 Typical On-Resistance vs. Drain Current and Temperature

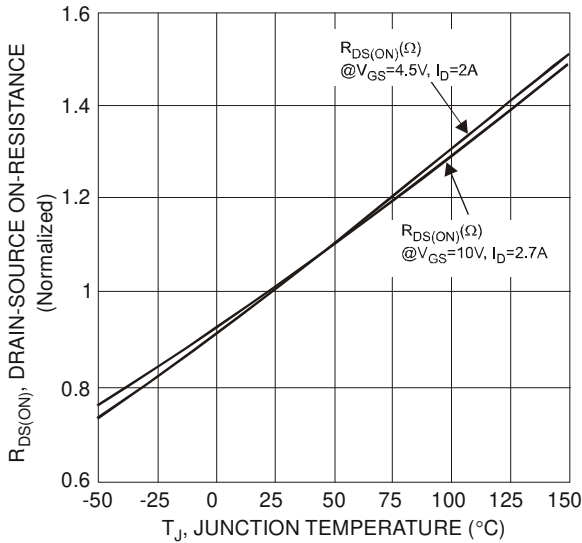


Fig. 16 On-Resistance Variation with Temperature

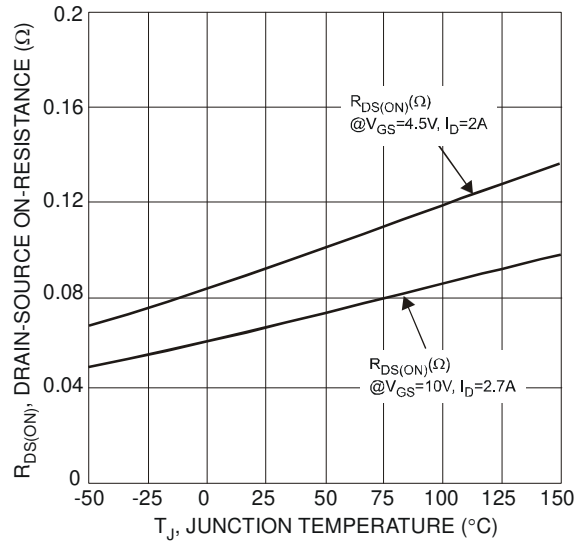


Fig. 17 On-Resistance Variation with Temperature

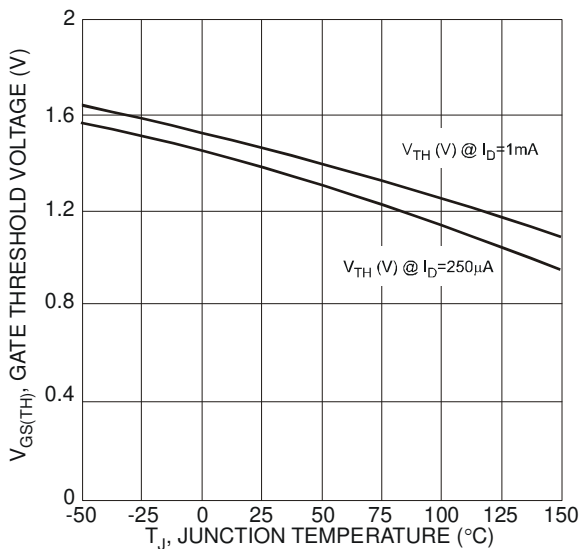


Fig. 18 Gate Threshold Variation vs. Ambient Temperature

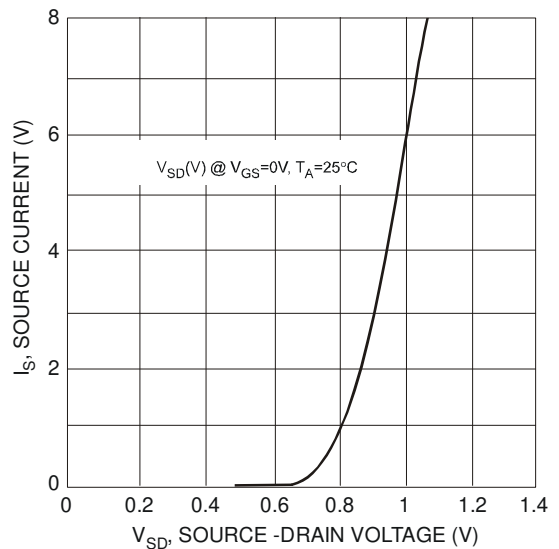
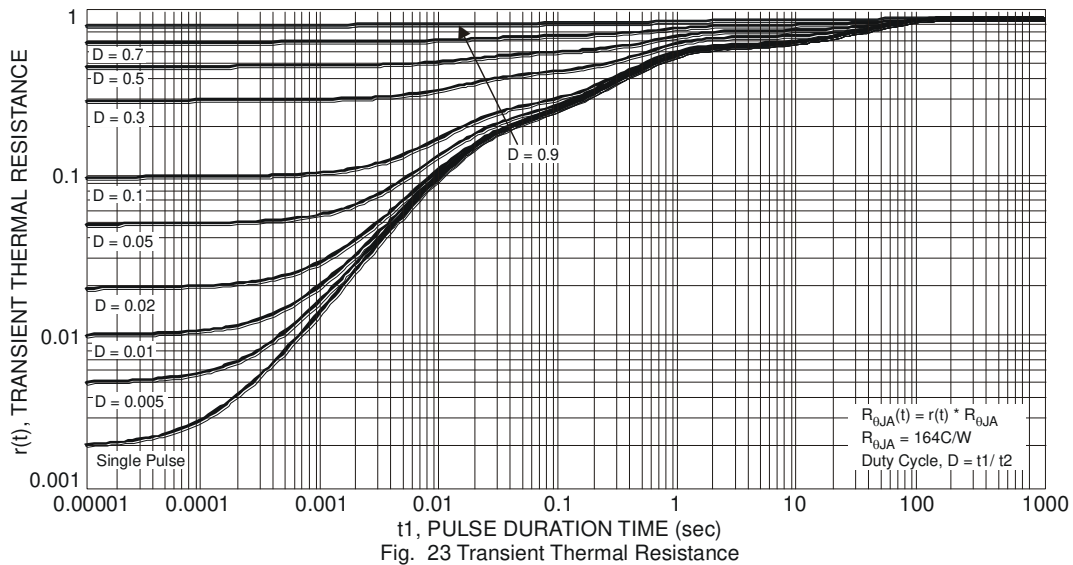
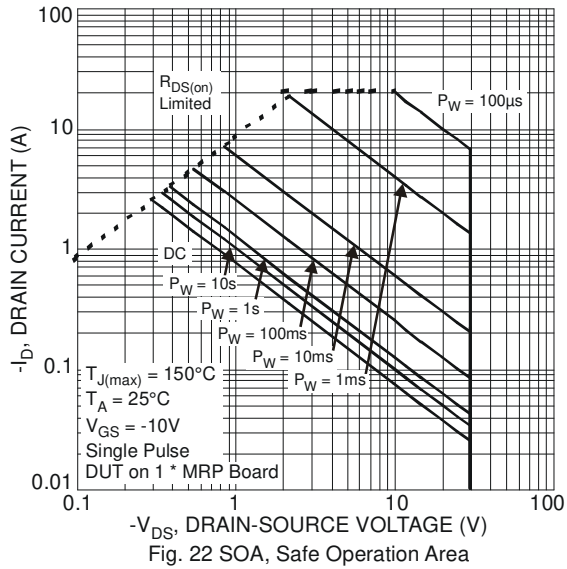
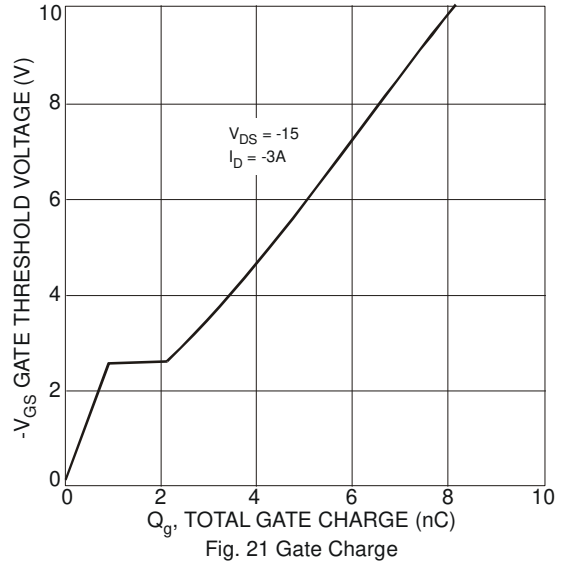
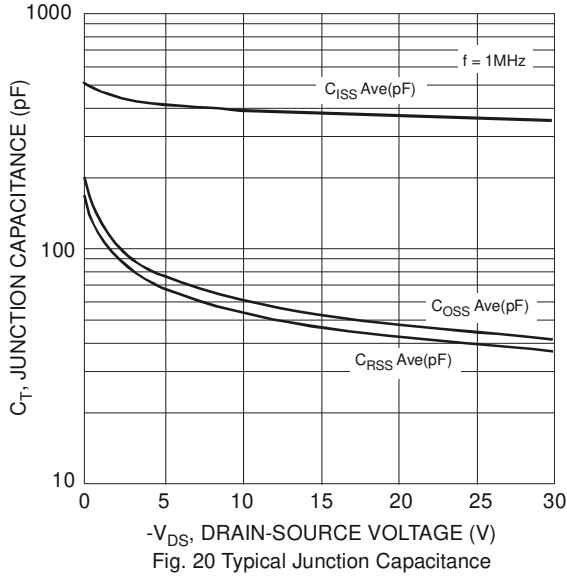


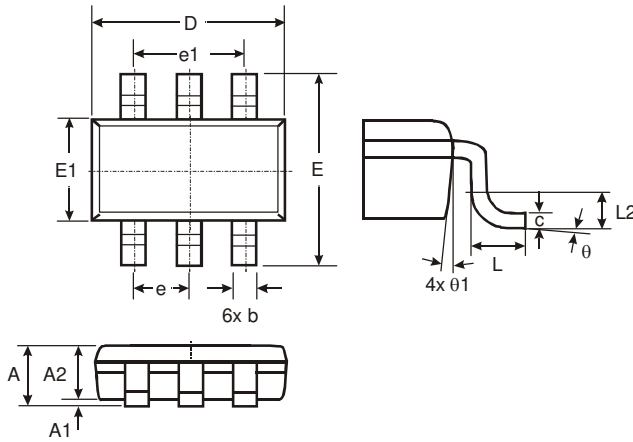
Fig. 19 Diode Forward Voltage vs. Current





**Package Outline Dimensions**

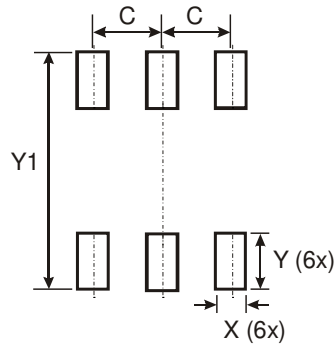
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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°	-
<b>All Dimensions in mm</b>			

**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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