

Product Summary

Device	V _{(BR)DSS}	R _{DS(ON)} max	Package	I _D max T _A = +25°C
Q1	30V	55mΩ @ V _{GS} = 10V	TSOT26	3.8A
		65mΩ @ V _{GS} = 4.5V	TSOT26	3.6A
Q2	-30V	110mΩ @ V _{GS} = -10V	TSOT26	-2.5A
		142mΩ @ V _{GS} = -4.5V	TSOT26	-2.1A

Features

- Complementary MOSFET
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **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

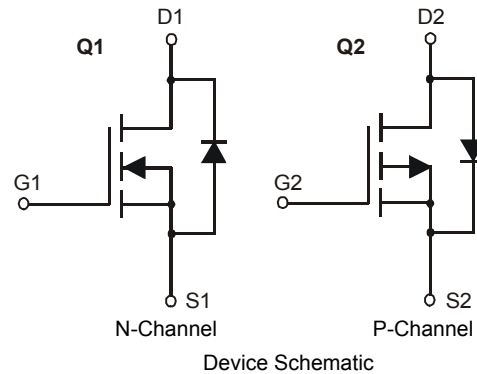
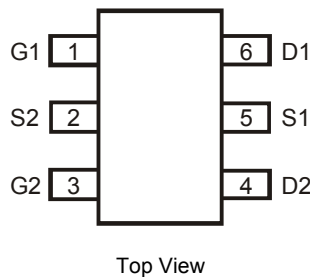
This MOSFET has been designed to minimize the on-state resistance (R_{DS(ON)}) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- Backlighting
- Power Management Functions
- DC-DC Converters

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 Indicator: See diagram
- Terminals: Finish — NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.008 grams (approximate)

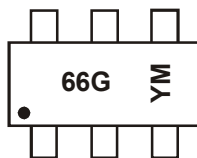


Ordering Information (Note 4)

Part Number	Case	Packaging
DMG6601LVT-7	TSOT26	3K/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



66G = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: X = 2010)
 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 - Q1 and Q2 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Q1	Q2	Units	
Drain-Source Voltage	V_{DSS}	30	-30	V	
Gate-Source Voltage	V_{GSS}	± 12	± 12	V	
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	3.8 3.0	-2.5 -2	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	4.5 3.4	-3 -2.3	A
Maximum Body Diode Forward Current (Note 6)	I_S	1.5	-1.5	A	
Pulsed Drain Current (Note 6)	I_{DM}	20	-15	A	

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

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)	P_D	$T_A = +25^\circ\text{C}$	0.85	W
		$T_A = +70^\circ\text{C}$	0.54	
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	Steady state	147	$^\circ\text{C/W}$
		$t < 10\text{s}$	103	
Total Power Dissipation (Note 6)	P_D	$T_A = +25^\circ\text{C}$	1.3	W
		$T_A = +70^\circ\text{C}$	0.83	
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	Steady state	96	$^\circ\text{C/W}$
		$t < 10\text{s}$	67	
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	36		
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$	

Electrical Characteristics - Q1 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current @ $T_J = +25^\circ\text{C}$	I_{DSS}	-	-	1	μA	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 12\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	1	1.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	34	55	m Ω	$V_{GS} = 10\text{V}, I_D = 3.4\text{A}$
		-	38	65		$V_{GS} = 4.5\text{V}, I_D = 3\text{A}$
		-	49	85		$V_{GS} = 2.5\text{V}, I_D = 2\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	-	6	-	S	$V_{DS} = 5\text{V}, I_D = 3.4\text{A}$
Diode Forward Voltage (Note 7)	V_{SD}	-	0.75	1.0	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	422	-	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	-	41	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	39	-	pF	
Gate resistance	R_g	-	1.26	-	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_g	-	5.4	-	nC	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, I_D = 3.1\text{A}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	-	12.3	-	nC	
Gate-Source Charge	Q_{gs}	-	0.8	-	nC	
Gate-Drain Charge	Q_{gd}	-	1.2	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	1.6	-	ns	$V_{DS} = 15\text{V}, V_{GS} = 10\text{V}, R_L = 4.7\Omega, R_G = 3\Omega,$
Turn-On Rise Time	t_r	-	7.4	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	31.2	-	ns	
Turn-Off Fall Time	t_f	-	15.6	-	ns	

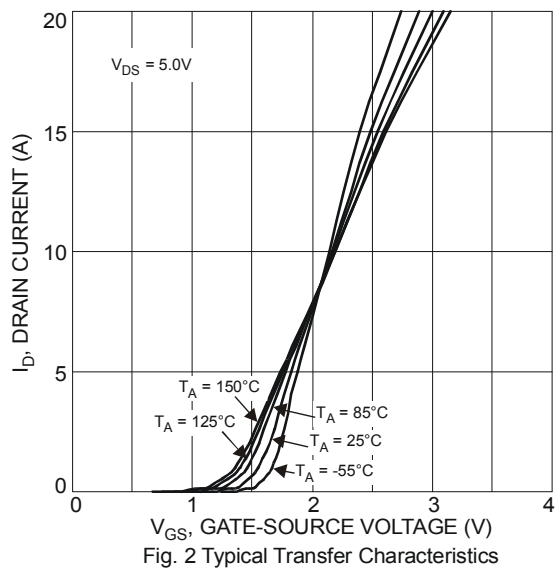
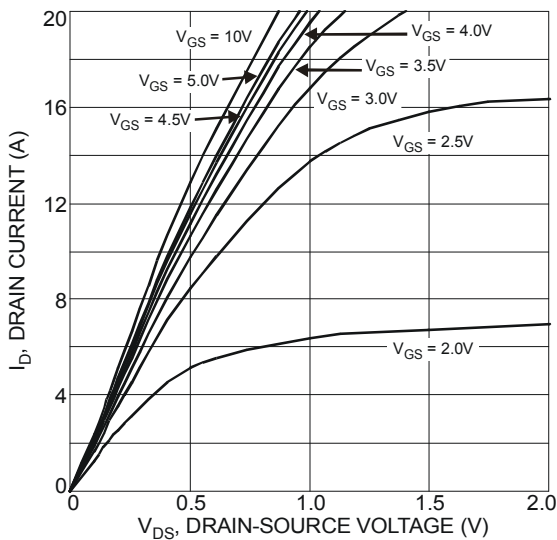
- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed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

Electrical Characteristics - Q2 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	-	-	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current @ $T_J = +25^\circ\text{C}$	I_{DSS}	-	-	-1	μA	$V_{DS} = -30V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	-0.4	-0.8	-1.2	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	70	110	m Ω	$V_{GS} = -10V, I_D = -2.3A$
		-	81	142		$V_{GS} = -4.5V, I_D = -2A$
		-	105	190		$V_{GS} = -2.5V, I_D = -1A$
		-	-	-		$V_{GS} = -10V, I_D = -2.3A$
Forward Transfer Admittance	$ Y_{fs} $	-	5.3	-	S	$V_{DS} = -5V, I_D = -2.3A$
Diode Forward Voltage (Note 7)	V_{SD}	-	-0.8	-1.0	V	$V_{GS} = 0V, I_S = -1A$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	541	-	pF	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	-	46	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	43	-	pF	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0\text{MHz}$
Gate resistance	R_g	-	16.9	-	Ω	
Total Gate Charge ($V_{GS} = -4.5V$)	Q_g	-	6.5	-	nC	$V_{GS} = -10V, V_{DS} = -15V,$ $I_D = -2.3A$
Total Gate Charge ($V_{GS} = -10V$)	Q_g	-	13.8	-	nC	
Gate-Source Charge	Q_{gs}	-	1.0	-	nC	
Gate-Drain Charge	Q_{gd}	-	1.6	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	1.7	-	ns	$V_{DS} = -15V, V_{GS} = -10V,$ $R_L = 6\Omega, R_G = 3\Omega,$
Turn-On Rise Time	t_r	-	4.6	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	18.3	-	ns	
Turn-Off Fall Time	t_f	-	2.2	-	ns	

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

N Channel - Q1



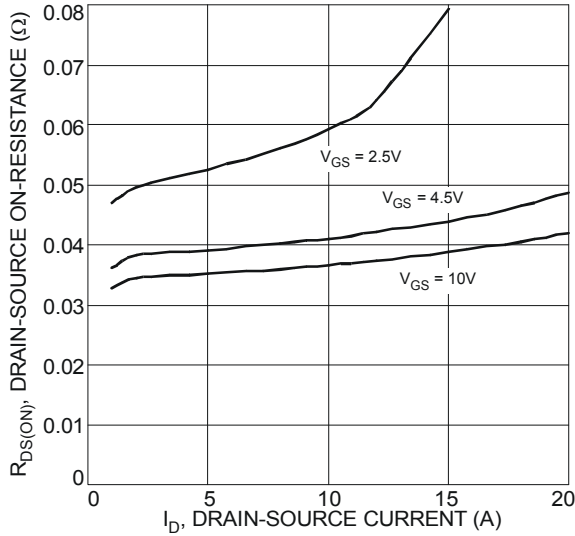


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

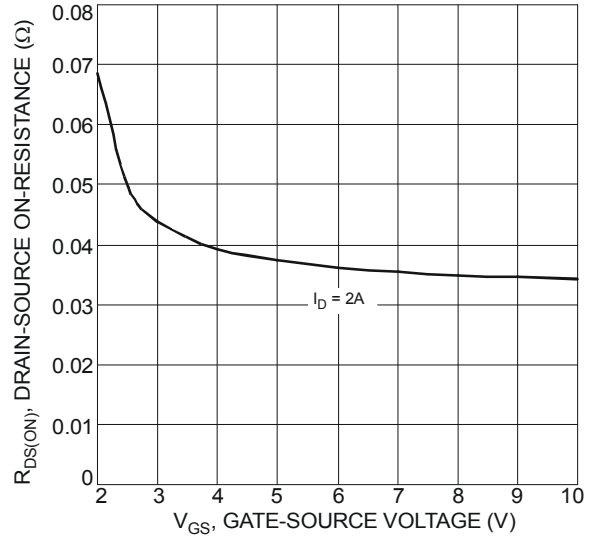


Fig. 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

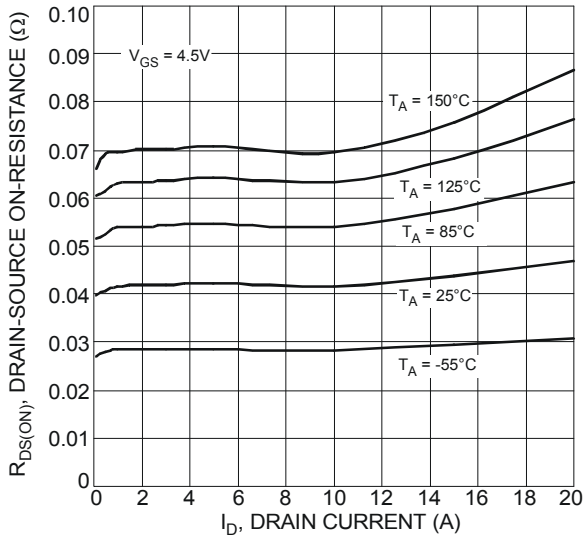


Fig. 5 Typical On-Resistance vs. Drain Current and Temperature

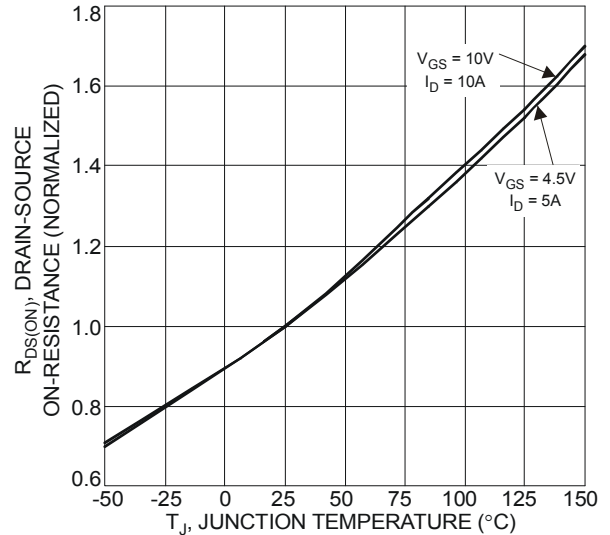


Fig. 6 On-Resistance Variation with Temperature

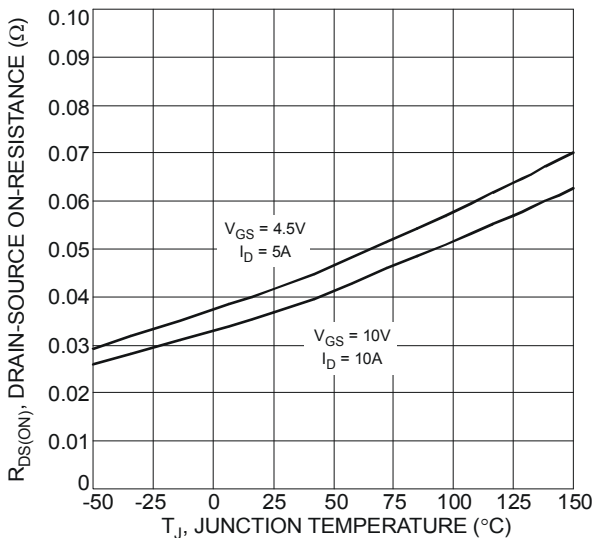


Fig. 7 On-Resistance Variation with Temperature

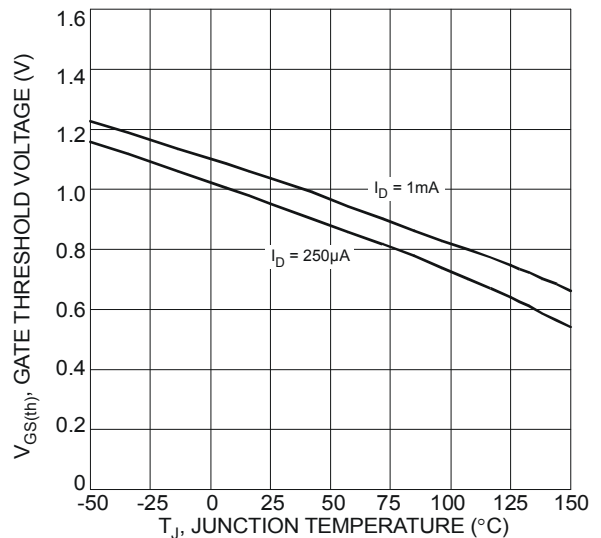


Fig. 8 Gate Threshold Variation vs. Ambient Temperature

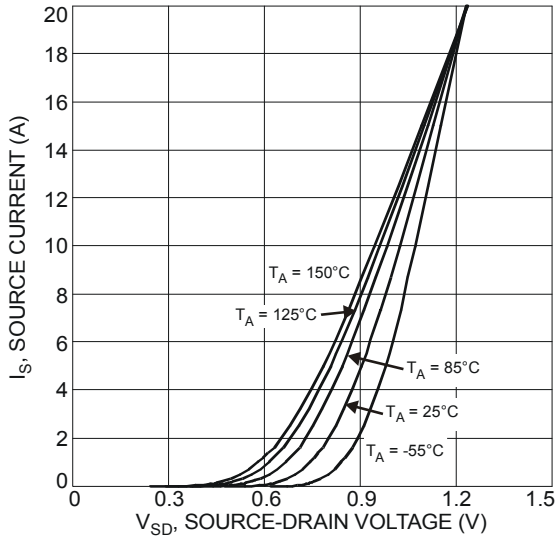


Fig. 9 Diode Forward Voltage vs. Current

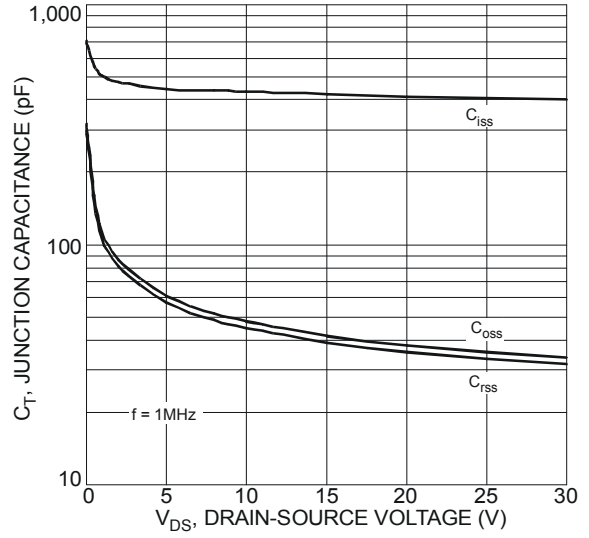


Fig. 10 Typical Junction Capacitance

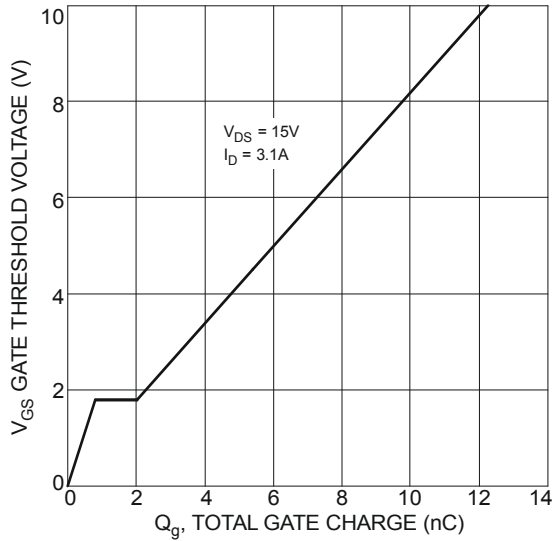


Fig. 11 Gate Charge

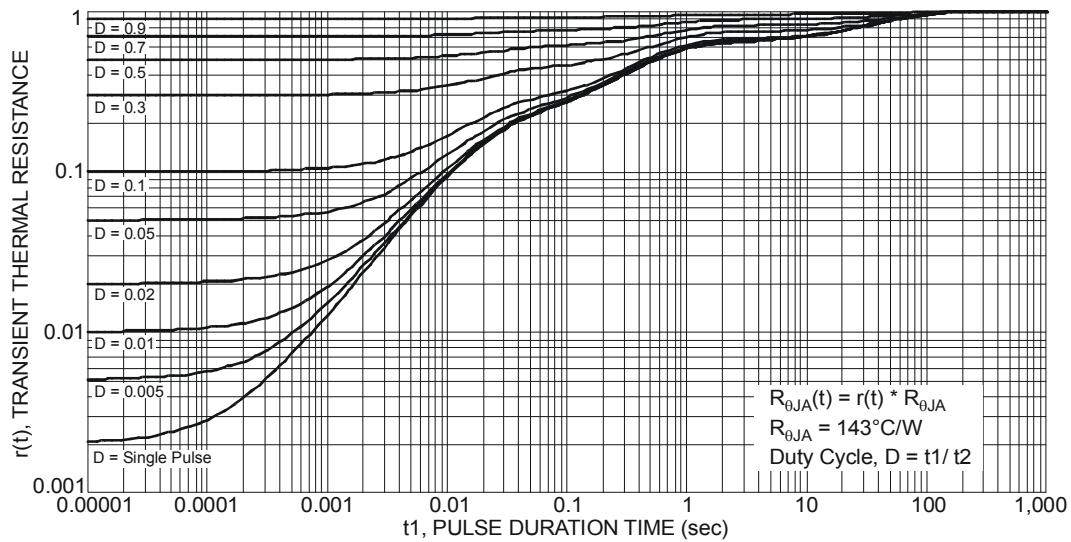


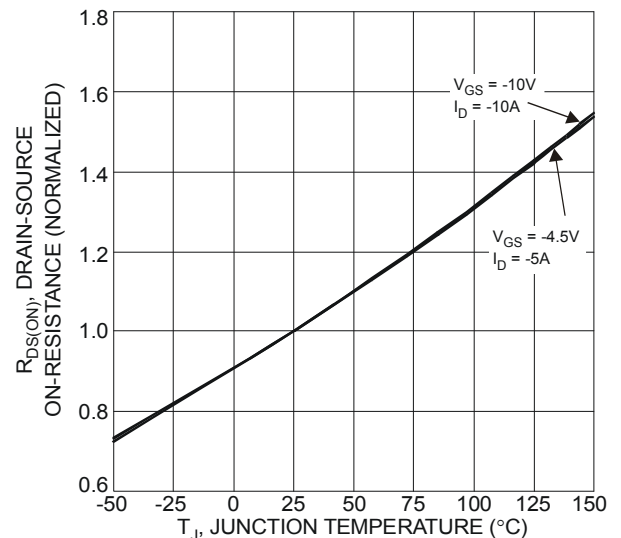
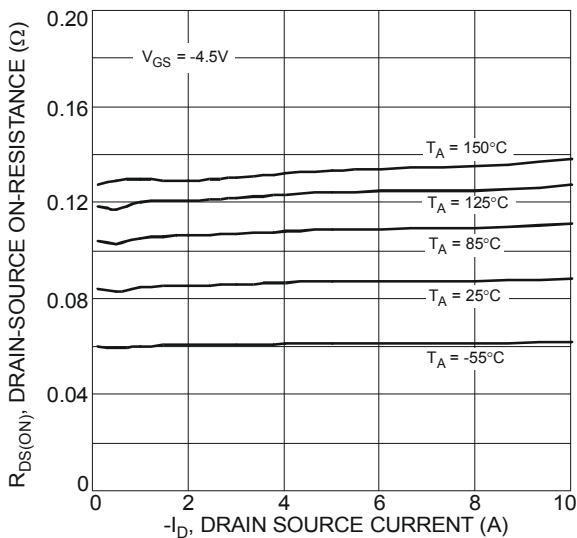
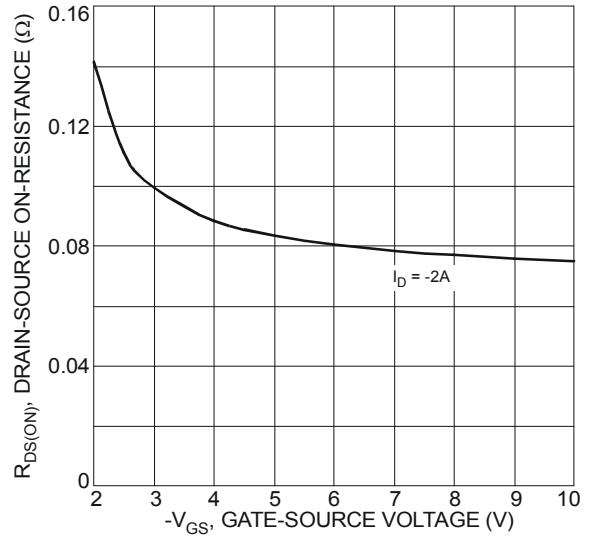
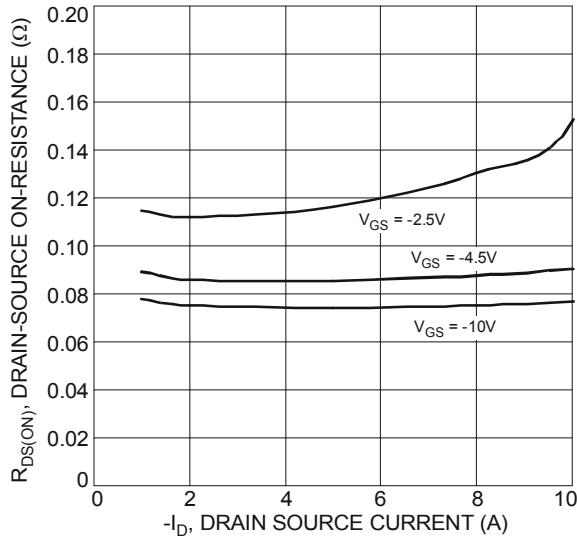
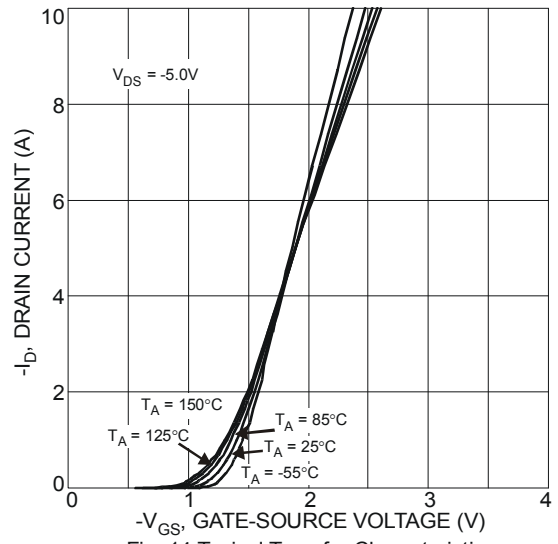
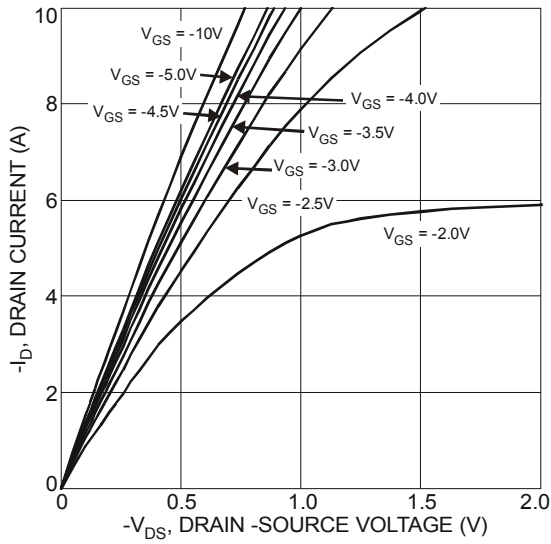
Fig. 12 Transient Thermal Resistance

$$R_{\theta JA}(t) = r(t) * R_{\theta JA}$$

$$R_{\theta JA} = 143^{\circ}\text{C/W}$$

$$\text{Duty Cycle, } D = t_1 / t_2$$

P Channel - Q2



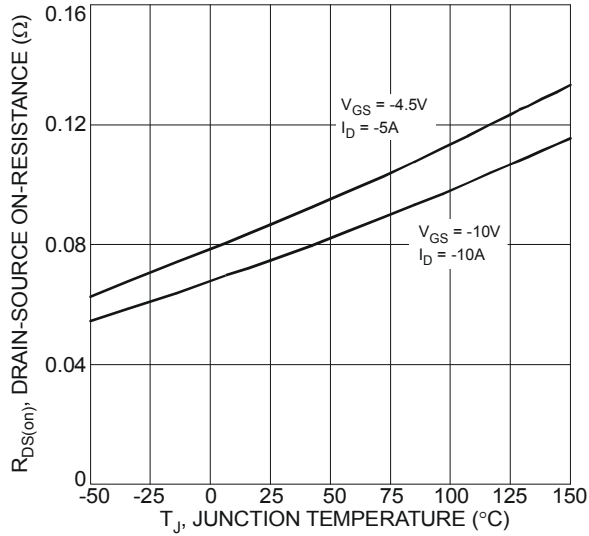


Fig. 19 On-Resistance Variation with Temperature

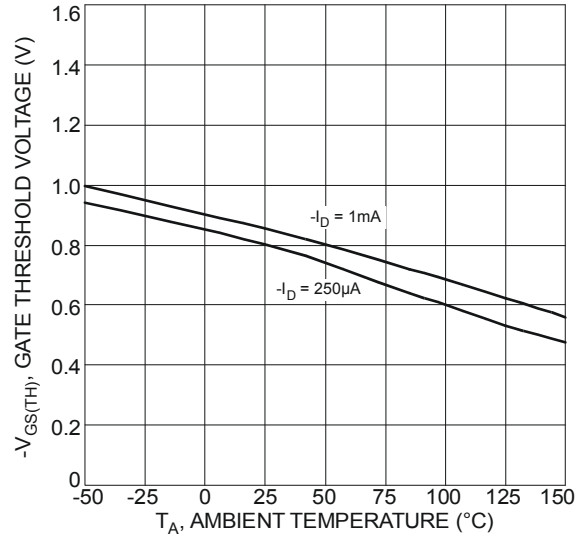


Fig. 20 Gate Threshold Variation vs. Ambient Temperature

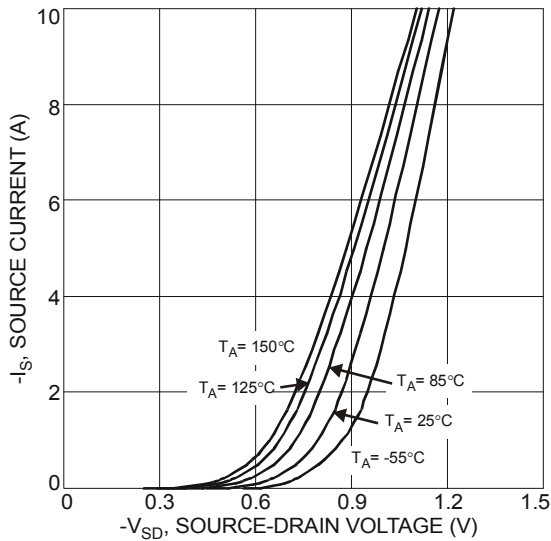


Fig. 21 Diode Forward Voltage vs. Current

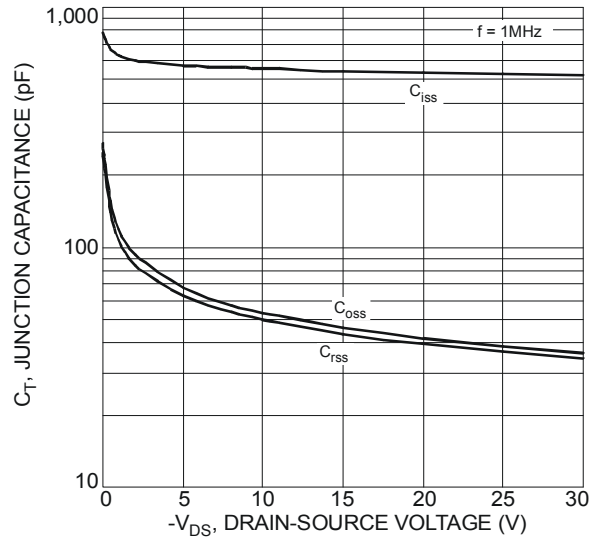


Fig. 22 Typical Junction Capacitance

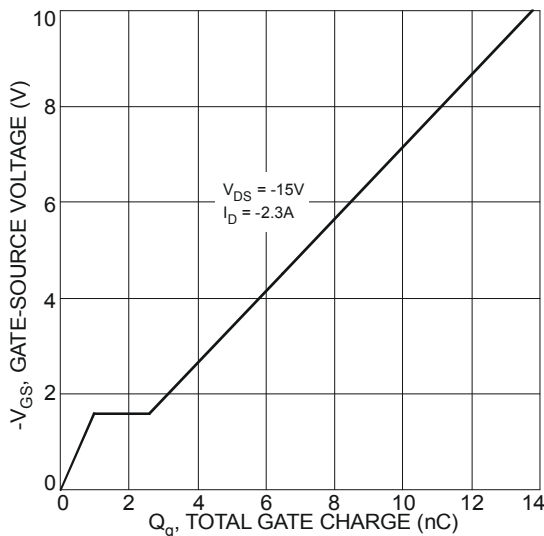
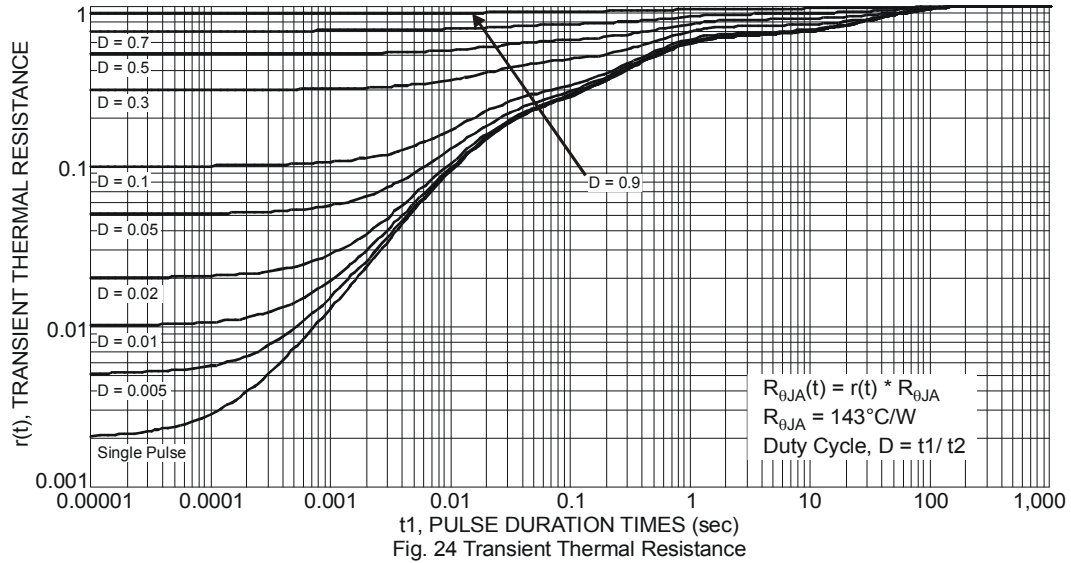
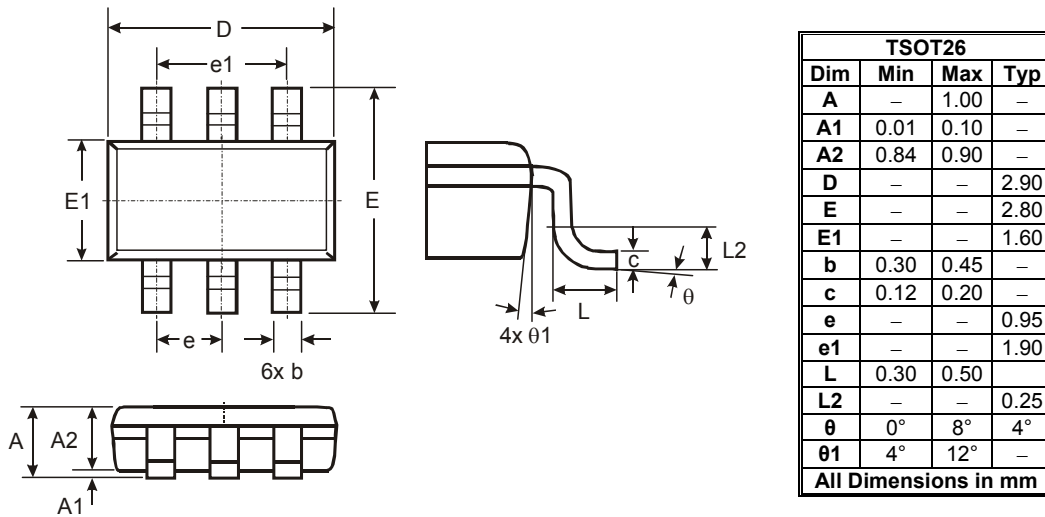


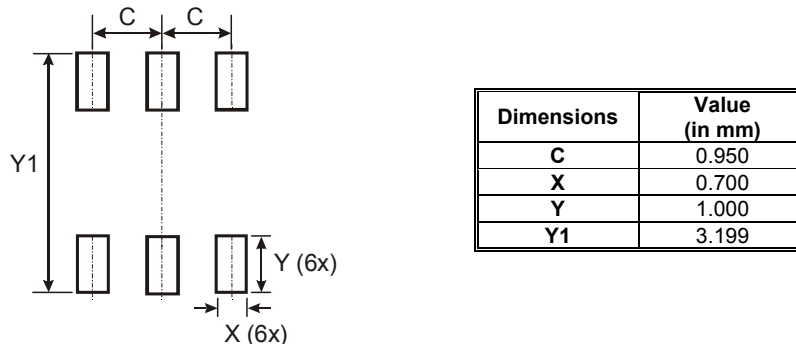
Fig. 23 Gate-Charge Characteristics



Package Outline Dimensions



Suggested Pad Layout



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