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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V_{GSS}	±12	V
Continuous Drain Current (Note 7) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	1030 800	mA
	t<10s	T_A = +25°C T_A = +70°C	I_D	1150 900	mA
Continuous Drain Current (Note 7) V_{GS} = 1.8V	Steady State	T_A = +25°C T_A = +70°C	I_D	740 570	mA
	t<10s	T_A = +25°C T_A = +70°C	I_D	870 700	mA
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	3	A
Maximum Body Diode Continuous Current			I_S	800	mA

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	±8	V
Continuous Drain Current (Note 7) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	-700 -550	mA
	t<10s	T_A = +25°C T_A = +70°C	I_D	-820 -640	mA
Continuous Drain Current (Note 7) V_{GS} = -1.8V	Steady State	T_A = +25°C T_A = +70°C	I_D	-460 -350	mA
	t<10s	T_A = +25°C T_A = +70°C	I_D	-550 -420	mA
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	-2	A
Maximum Body Diode Continuous Current			I_S	-800	mA

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6)		P_D	0.45	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	281	°C/W
	t<10s		210	°C/W
Total Power Dissipation (Note 7)		P_D	1	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	$R_{\theta JA}$	129	°C/W
	t<10s		97	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	V_{GS} = 0V, I_D = 1mA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	100	nA	V_{DS} = 20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±1	μA	V_{GS} = ±5V, V_{DS} = 0V
		—	—	±4.0		V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.5	—	0.9	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	0.3	0.48	Ω	V_{GS} = 5.0V, I_D = 200mA
		—	0.35	0.5		V_{GS} = 4.5V, I_D = 200mA
		—	0.45	0.7		V_{GS} = 2.5V, I_D = 200mA
		—	0.55	0.9		V_{GS} = 1.8V, I_D = 100mA
		—	0.65	1.5		V_{GS} = 1.5V, I_D = 50mA
		—	2	—		V_{GS} = 1.2V, I_D = 1mA
Forward Transfer Admittance	$\|Y_{fs}\|$	—	1.4	—	S	V_{DS} = 3V, I_D = 200mA
Diode Forward Voltage	V_{SD}	—	0.7	1.2	V	V_{GS} = 0V, I_S = 500mA
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	37.1	—	pF	V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	6.5	—		
Reverse Transfer Capacitance	C_{rss}	—	4.8	—		
Gate Resistance	R_g	—	68	—	Ω	V_{DS} = 0V, V_{GS} = 0V
Total Gate Charge	Q_g	—	0.5	—	nC	V_{GS} = 4.5V, V_{DS} = 10V, I_D = 250mA
Gate-Source Charge	Q_{gs}	—	0.07	—		
Gate-Drain Charge	Q_{gd}	—	0.1	—		
Turn-On Delay Time	$t_{D(ON)}$	—	4.06	—	ns	V_{DD} = 10V, V_{GS} = 4.5V, R_L = 47Ω, R_G = 10Ω, I_D = 200mA
Turn-On Rise Time	t_R	—	7.28	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	13.74	—		
Turn-Off Fall Time	t_F	—	10.54	—		

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

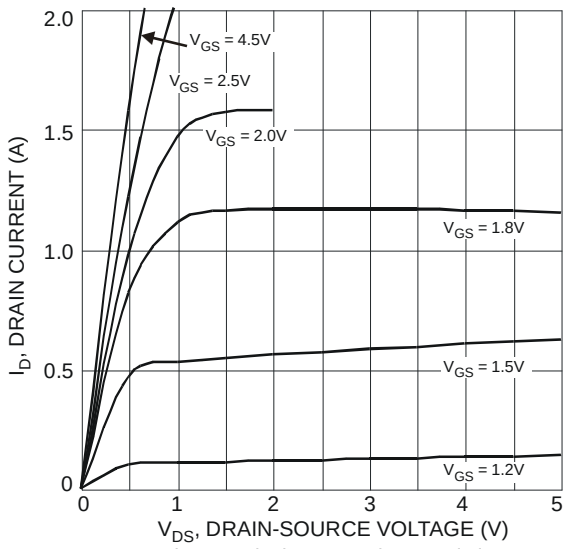


Fig. 1 Typical Output Characteristics

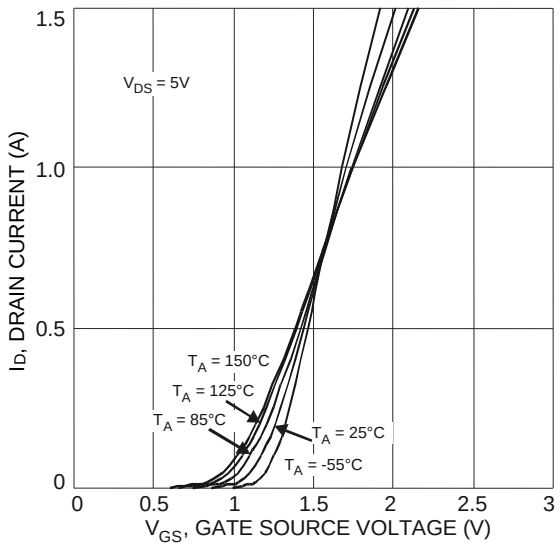


Fig. 2 Typical Transfer Characteristics

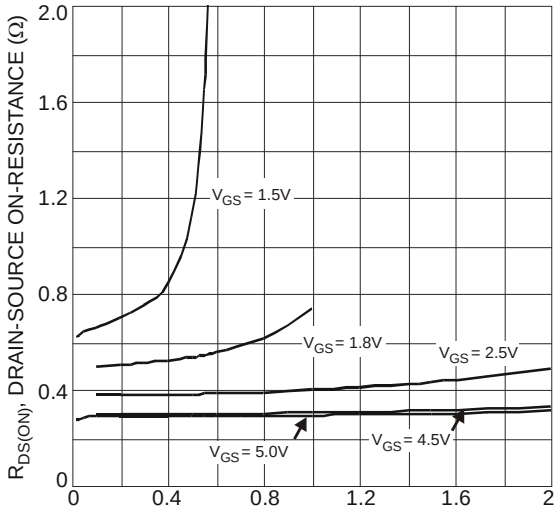


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

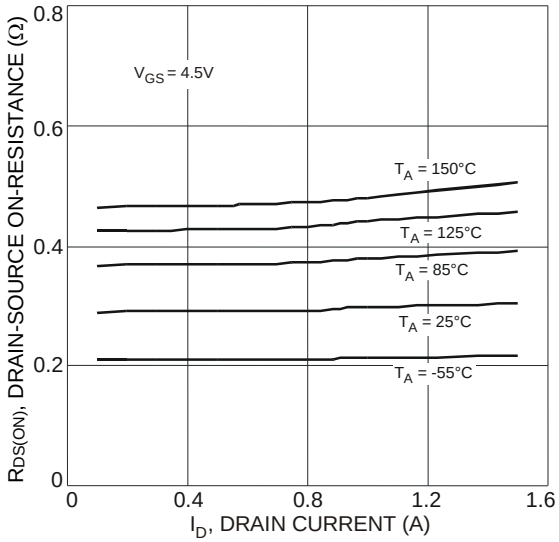


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

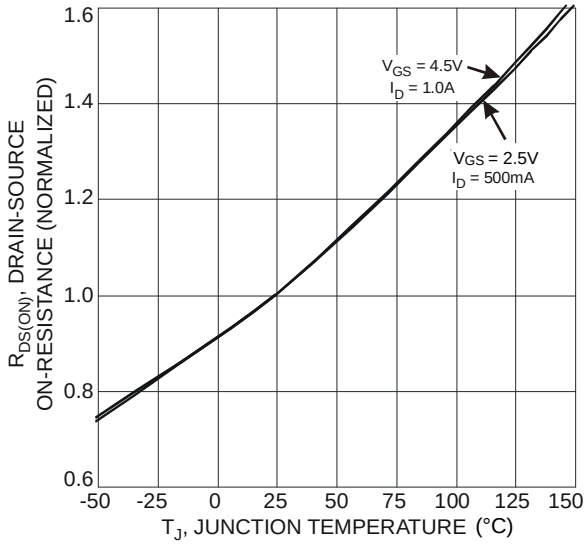


Fig. 5 On-Resistance Variation with Temperature

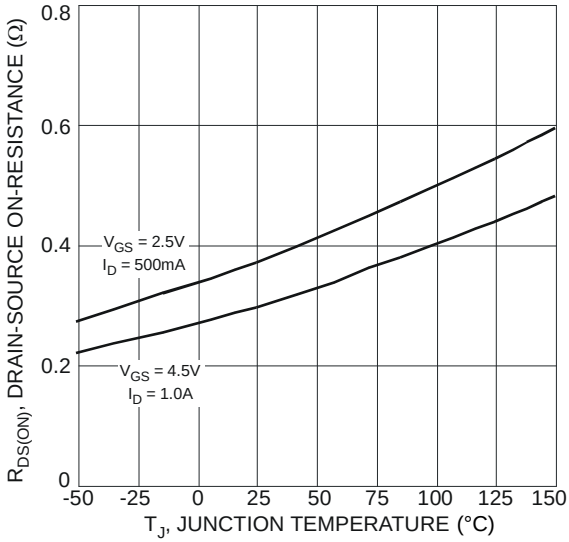


Fig. 6 On-Resistance Variation with Temperature

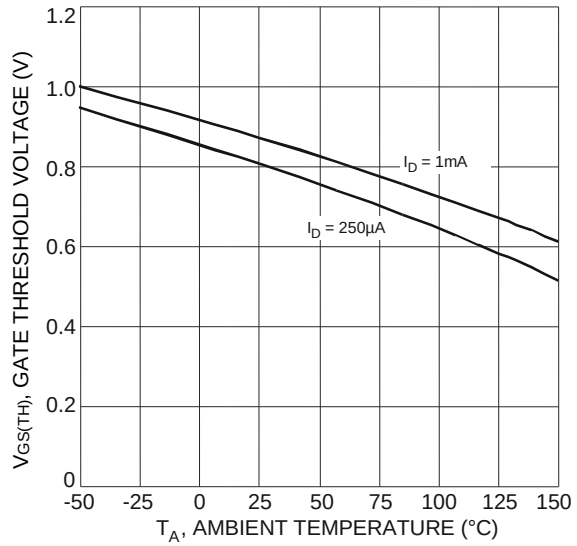


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

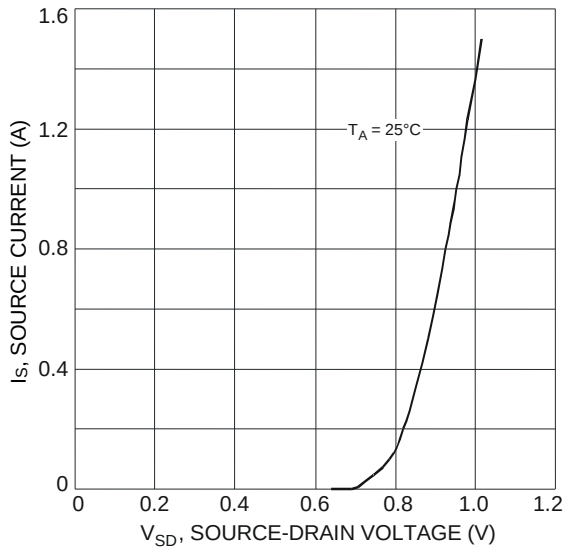


Fig. 8 Diode Forward Voltage vs. Current

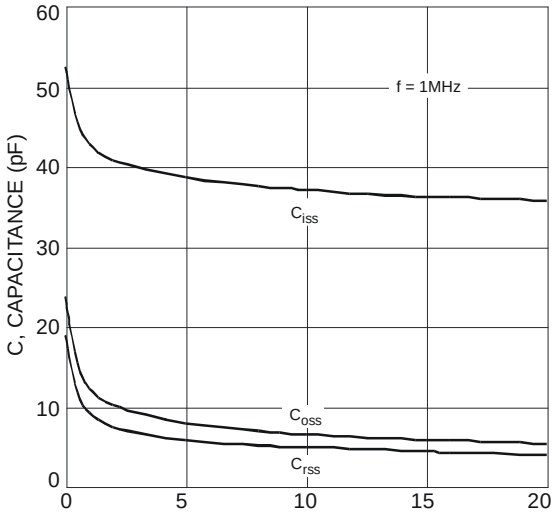


Fig. 9 Typical Capacitance

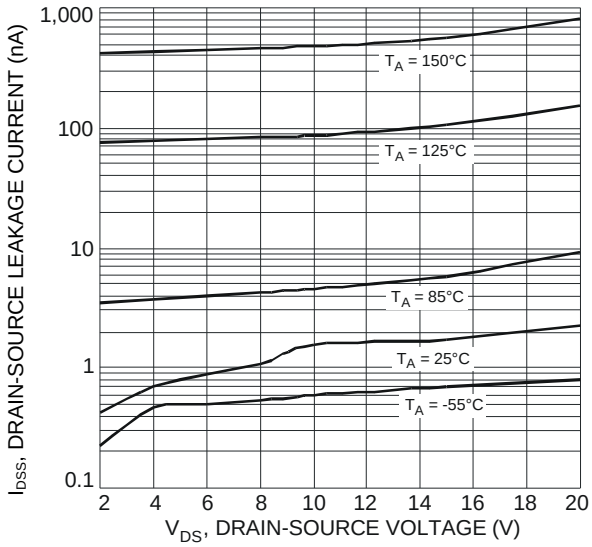


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

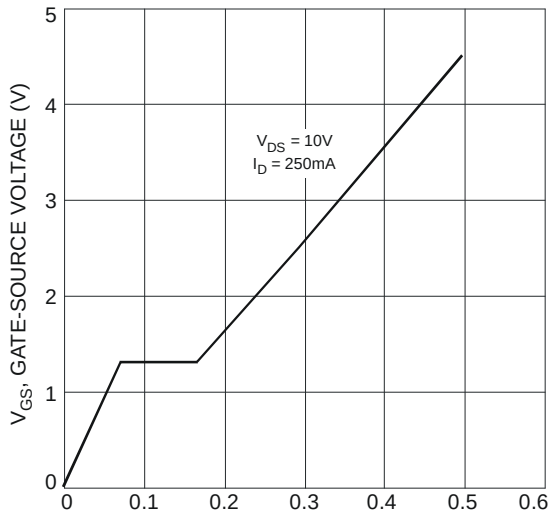


Fig. 11 Gate-Charge Characteristics

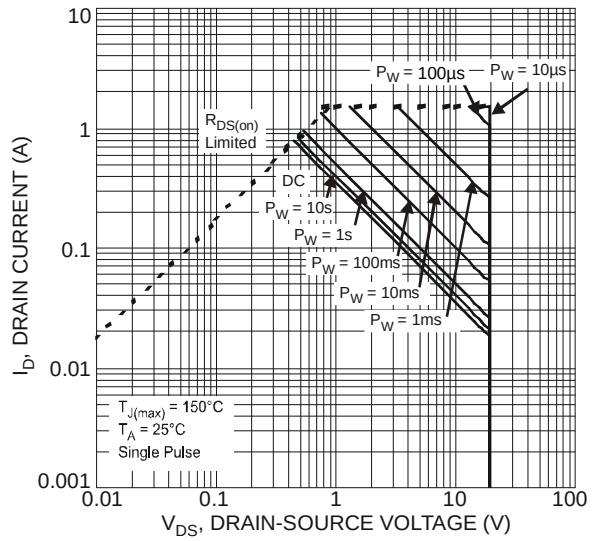


Fig. 12 SOA, Safe Operation Area

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	V_{GS} = 0V, I_D = -1mA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	-100	nA	V_{DS} = -20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±1.0	μA	V_{GS} = ±5V, V_{DS} = 0V
		—	—	±5.0		V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.5	—	-1.0	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	0.67	0.97	Ω	V_{GS} = -5V, I_D = -100mA
		—	0.7	1.0		V_{GS} = -4.5V, I_D = -100mA
		—	0.9	1.5		V_{GS} = -2.5V, I_D = -80mA
		—	1.2	2.0		V_{GS} = -1.8V, I_D = -40mA
		—	1.5	3.0		V_{GS} = -1.5V, I_D = -30mA
		—	5	—		V_{GS} = -1.2V, I_D = -1mA
Forward Transfer Admittance	$\|Y_{fs}\|$	—	0.7	—	S	V_{DS} = -3V, I_D = -100mA
Diode Forward Voltage	V_{SD}	—	-0.75	-1.2	V	V_{GS} = 0V, I_S = -330mA
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	46.1	—	pF	V_{DS} = -10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	7.2	—		
Reverse Transfer Capacitance	C_{rss}	—	4.9	—		
Gate Resistance	R_g	—	14.3	—	Ω	V_{DS} = 0V, V_{GS} = 0V
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	0.5	—	nC	V_{DS} = -10V, I_D = -250mA
Total Gate Charge (V_{GS} = -10V)	Q_g	—	0.85	—		
Gate-Source Charge	Q_{gs}	—	0.09	—		
Gate-Drain Charge	Q_{gd}	—	0.09	—		
Turn-On Delay Time	$t_{D(ON)}$	—	8.5	—	ns	V_{DD} = -3V, V_{GS} = -2.5V, R_L = 300Ω, R_G = 25Ω, I_D = -100mA
Turn-On Rise Time	t_R	—	4.3	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	20.2	—		
Turn-Off Fall Time	t_F	—	19.2	—		

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

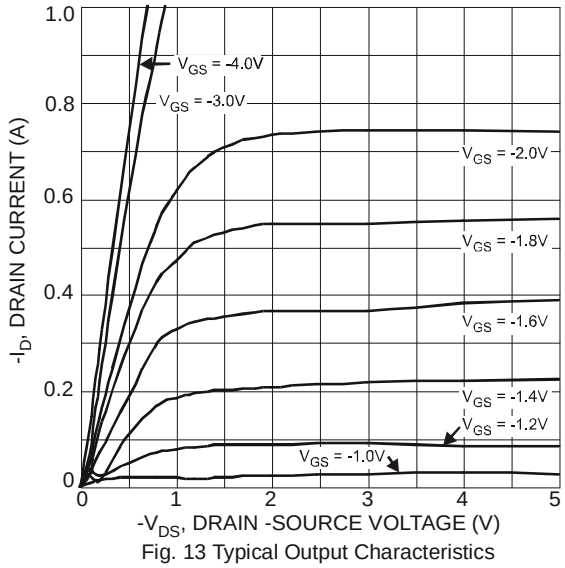


Fig. 13 Typical Output Characteristics

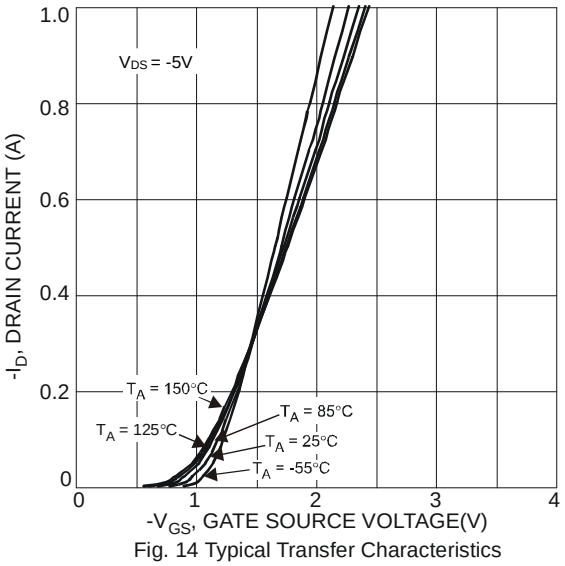


Fig. 14 Typical Transfer Characteristics

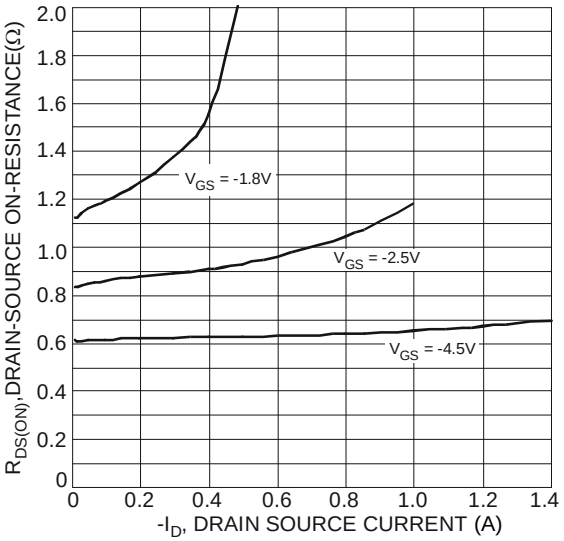


Fig. 15 Typical On-Resistance vs. Drain Current and Gate Voltage

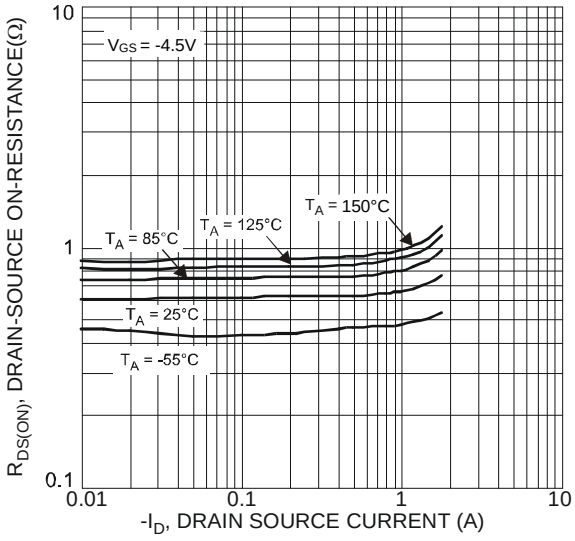


Fig. 16 Typical On-Resistance vs. Drain Current and Temperature

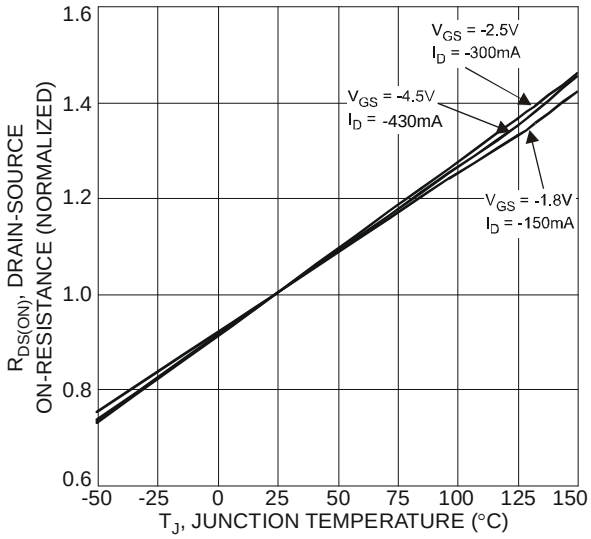


Fig. 17 On-Resistance Variation with Temperature

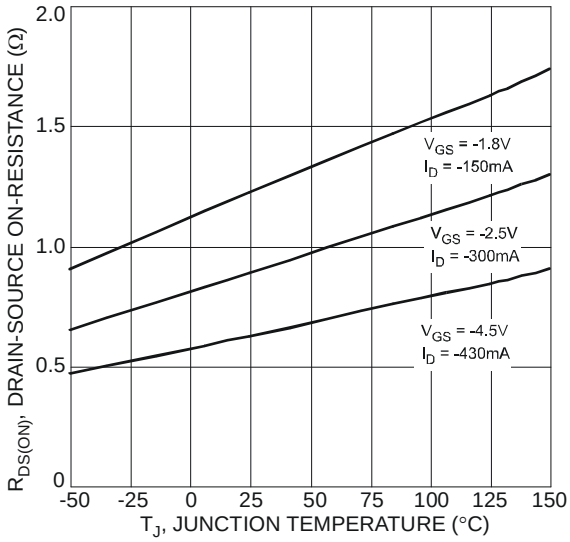


Fig. 18 On-Resistance vs.Temperature

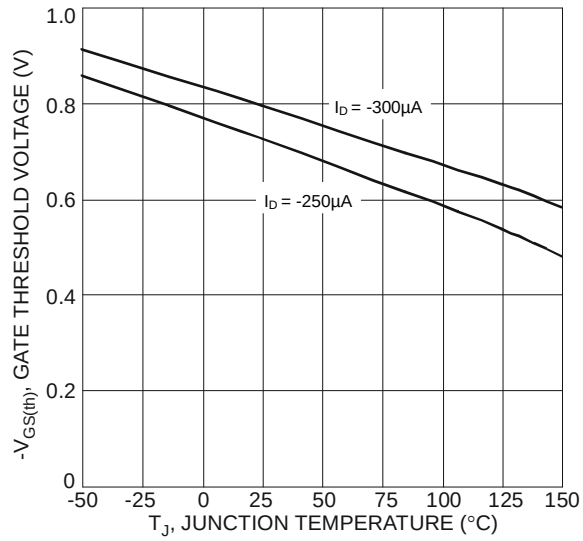


Fig. 19 Gate Threshold Voltage vs. Junction Temperature

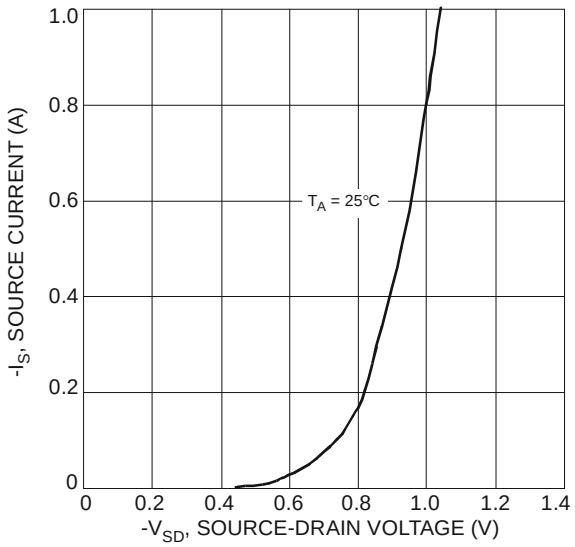


Fig. 20 Diode Forward Voltage vs. Current

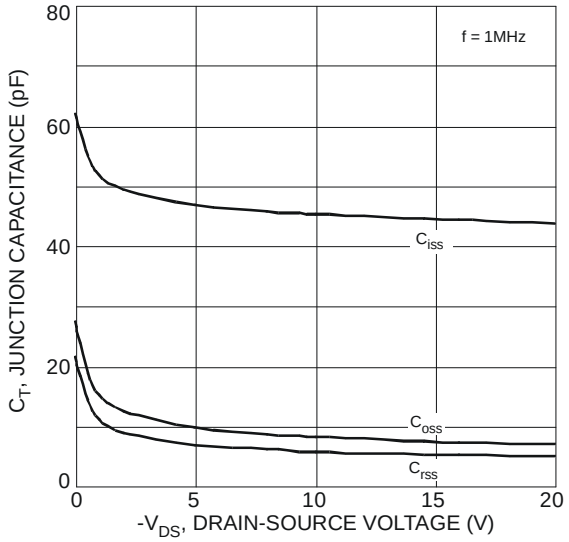


Fig. 21 Typical Junction Capacitance

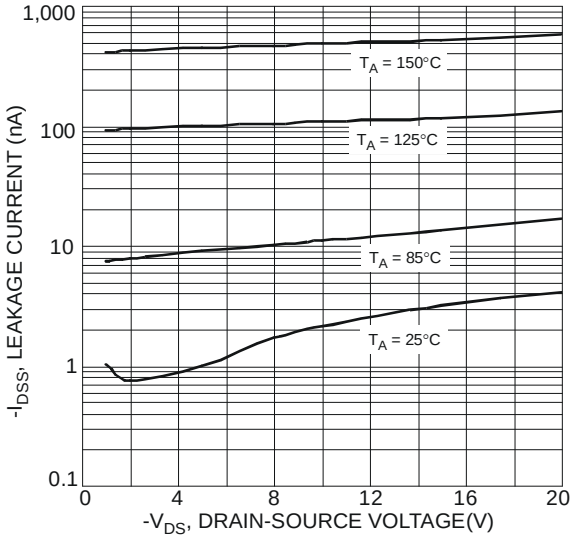


Fig. 22 Typical Drain-Source Leakage Current vs. Voltage

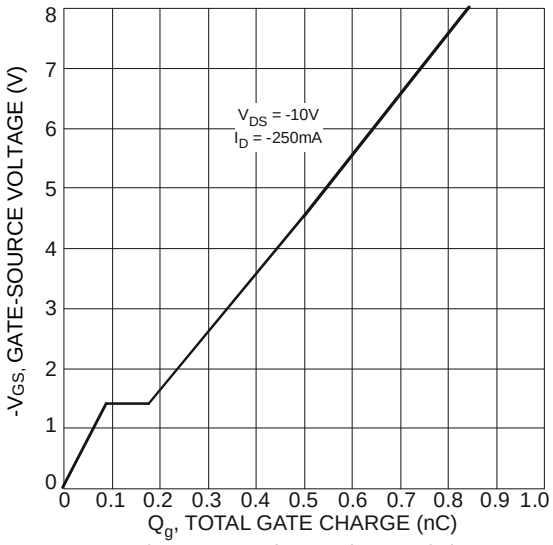


Fig. 23 Gate-Charge Characteristics

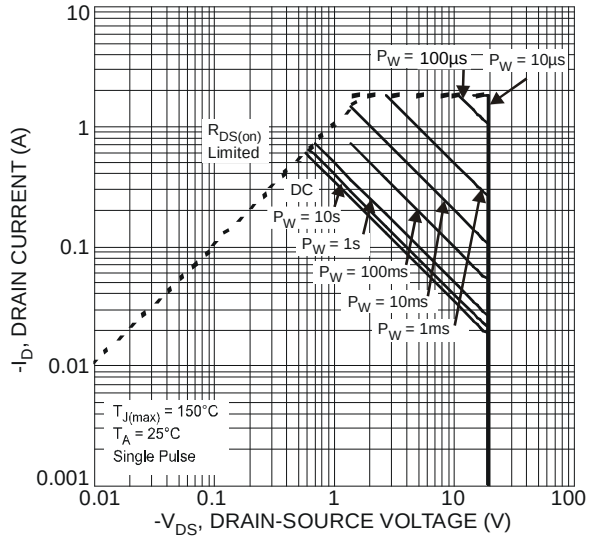


Fig. 24 SOA, Safe Operation Area

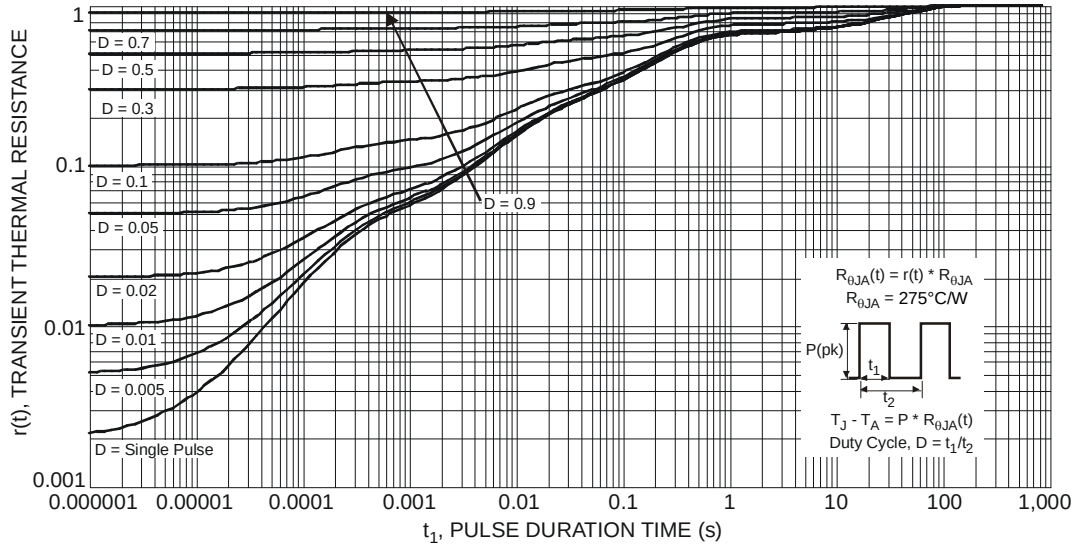
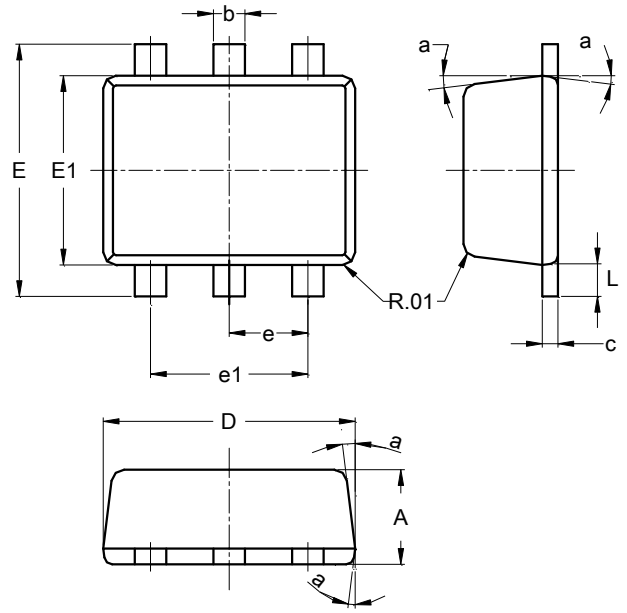


Fig. 25 Transient Thermal Response

Package Outline Dimensions

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

SOT563

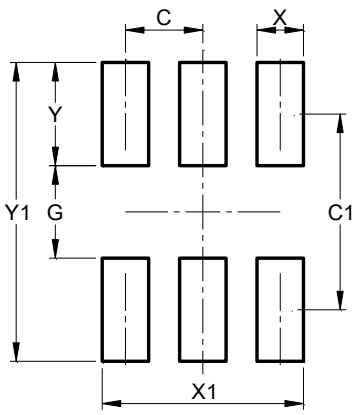


SOT563			
Dim	**Min**	**Max**	**Typ**
A	0.55	0.60	0.60
b	0.15	0.30	0.20
c	0.10	0.18	0.11
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
e	--	--	0.50
e1	0.90	1.10	1.00
L	0.10	0.30	0.20
a	8°	9°	7°
All Dimensions in mm			

Suggested Pad Layout

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

SOT563



Dimensions	Value (in mm)
C	0.500
C1	1.270
G	0.600
X	0.300
X1	1.300
Y	0.670
Y1	1.940

IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

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.

www.diodes.com