

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 _{θJA}	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 _{θJA}	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.

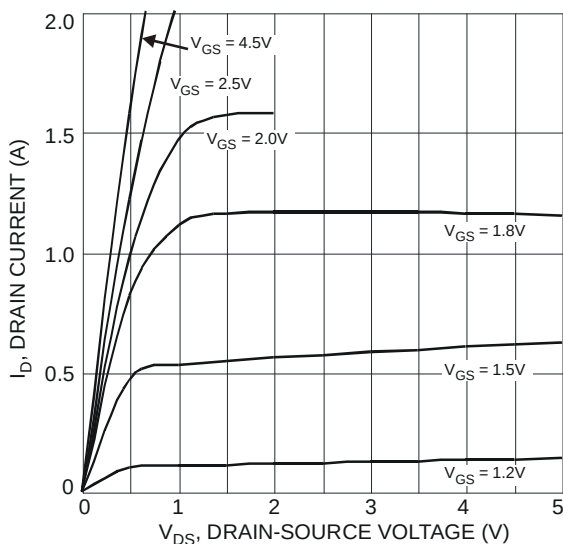


Fig. 1 Typical Output Characteristics

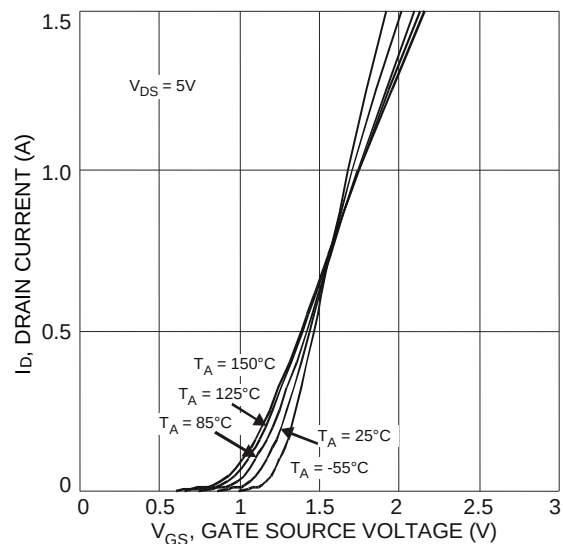


Fig. 2 Typical Transfer Characteristics

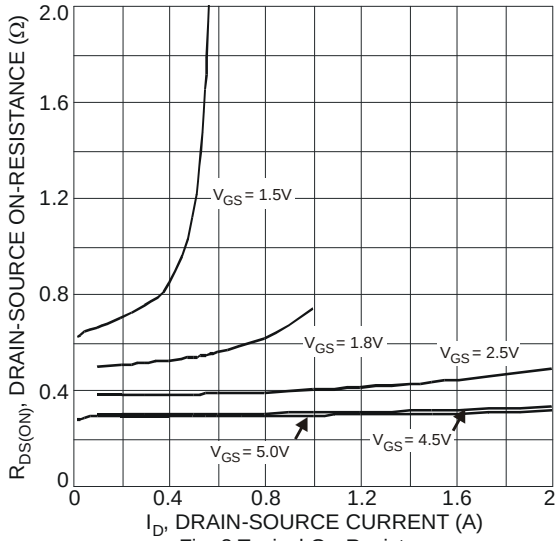


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

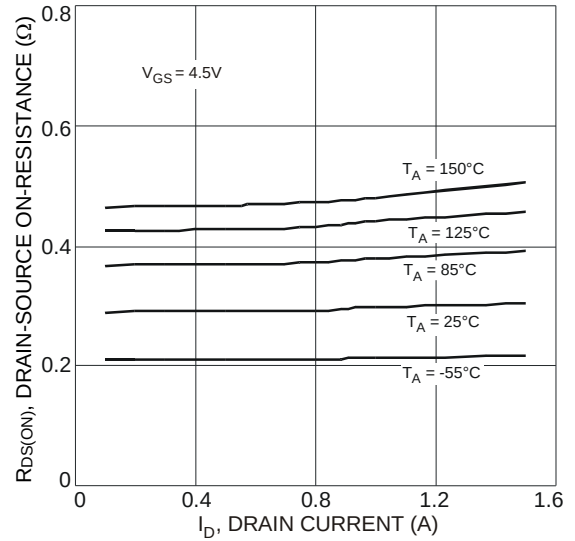


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

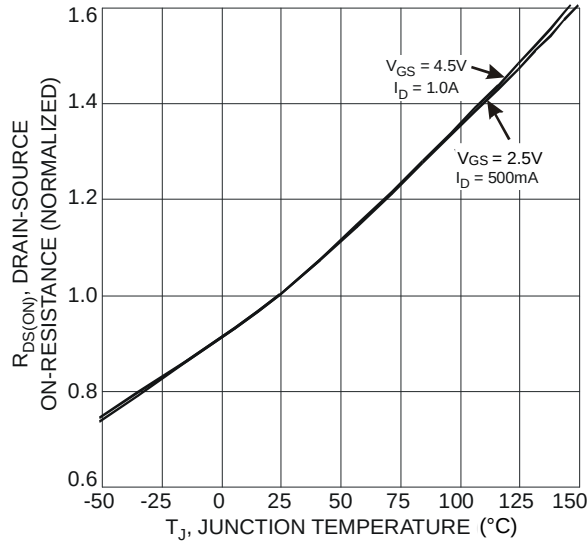


Fig. 5 On-Resistance Variation with Temperature

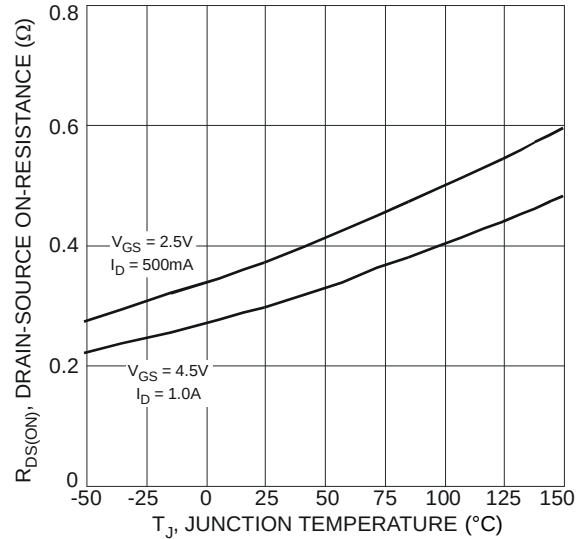


Fig. 6 On-Resistance Variation with Temperature

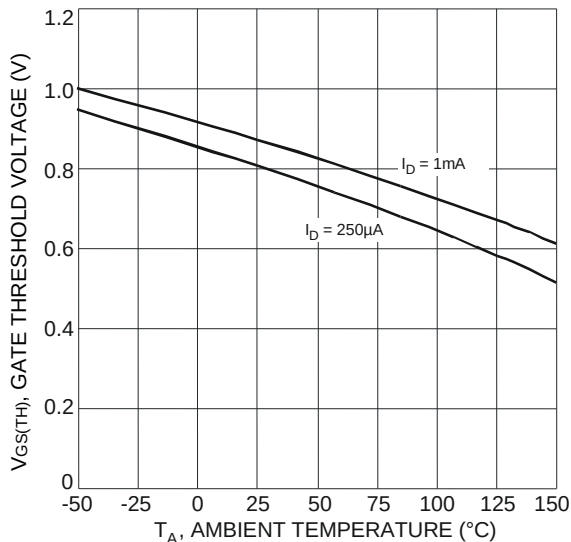


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

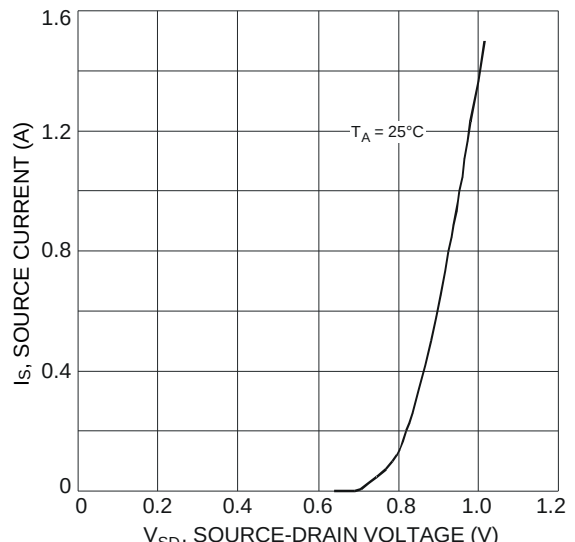
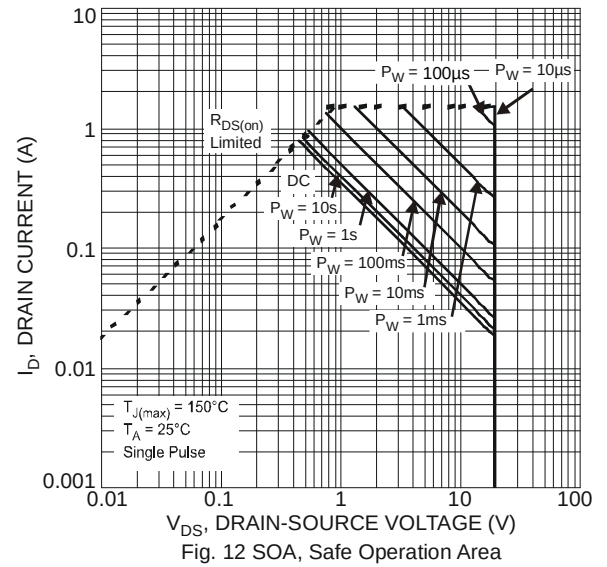
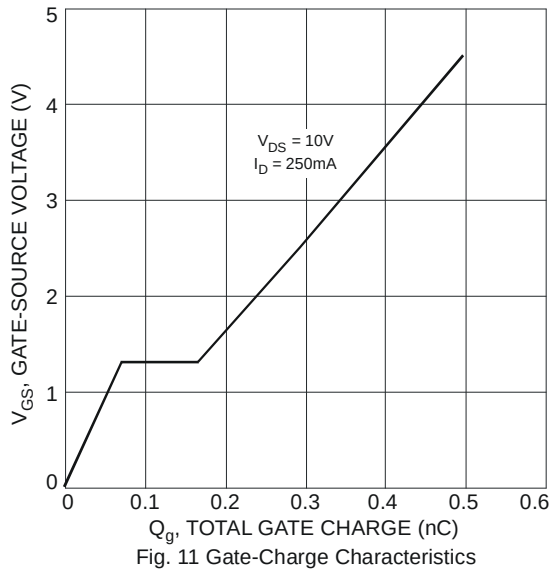
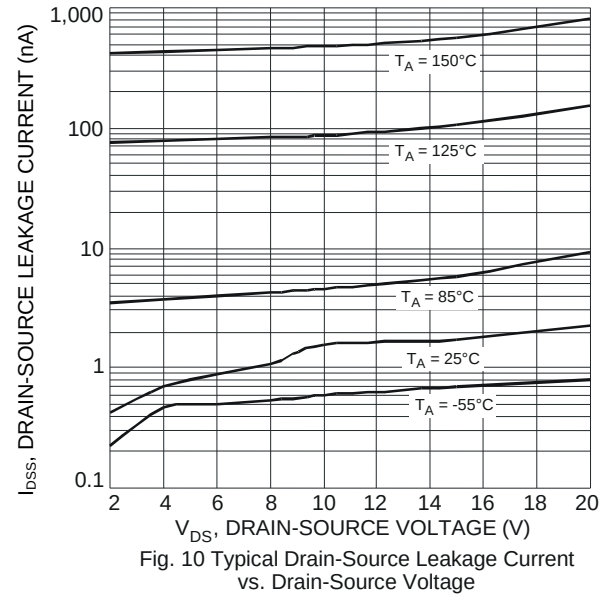
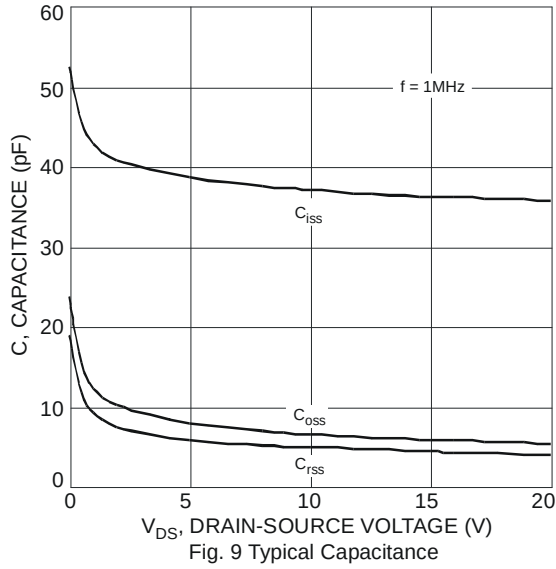


Fig. 8 Diode Forward Voltage vs. Current



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.

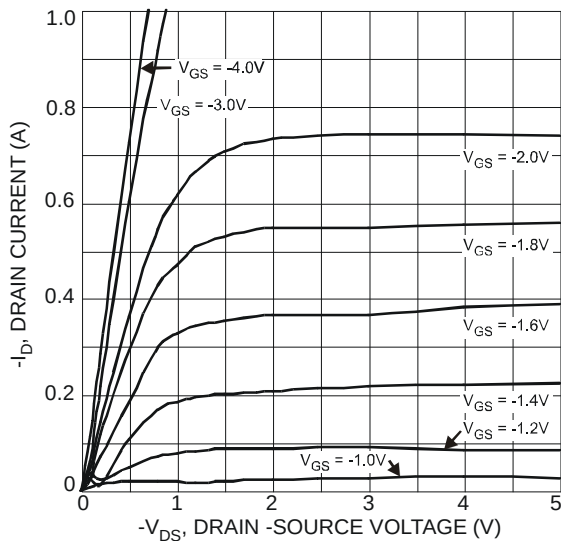


Fig. 13 Typical Output Characteristics

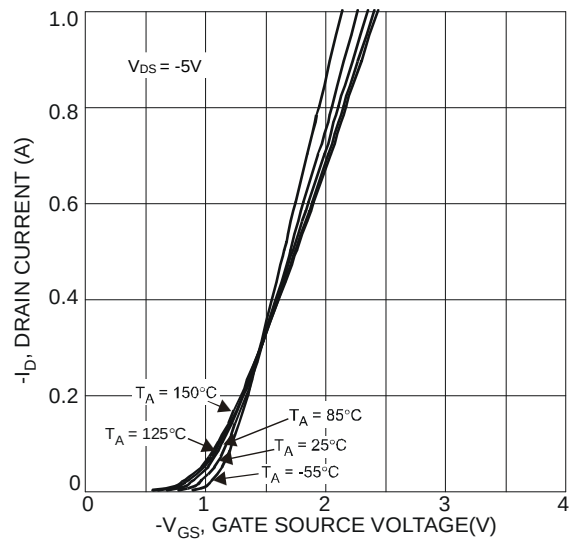


Fig. 14 Typical Transfer Characteristics

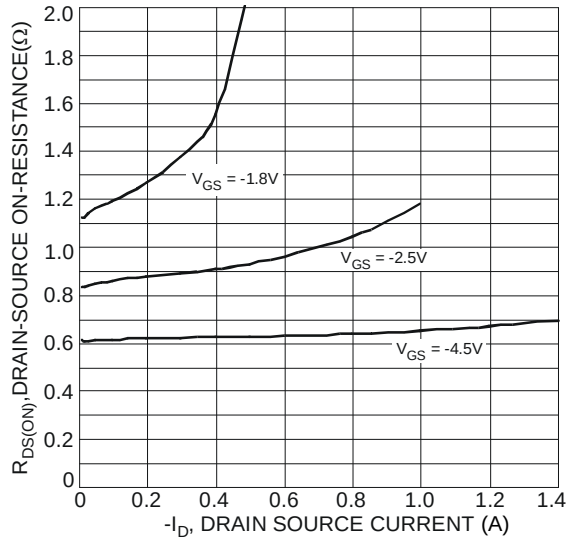


Fig. 15 Typical On-Resistance vs. Drain Current and Gate Voltage

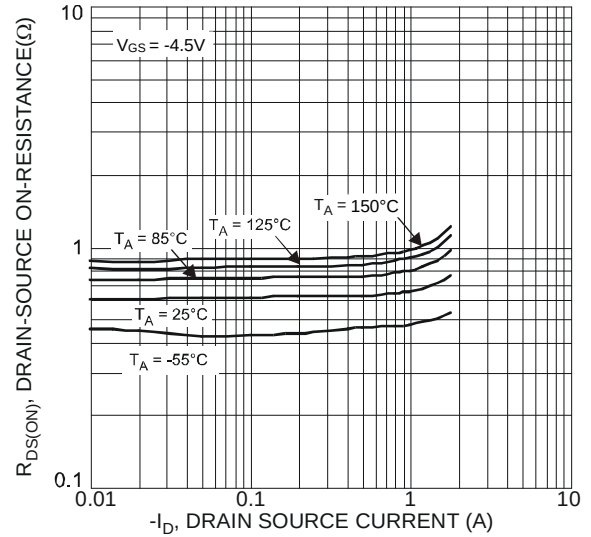


Fig. 16 Typical On-Resistance vs. Drain Current and Temperature

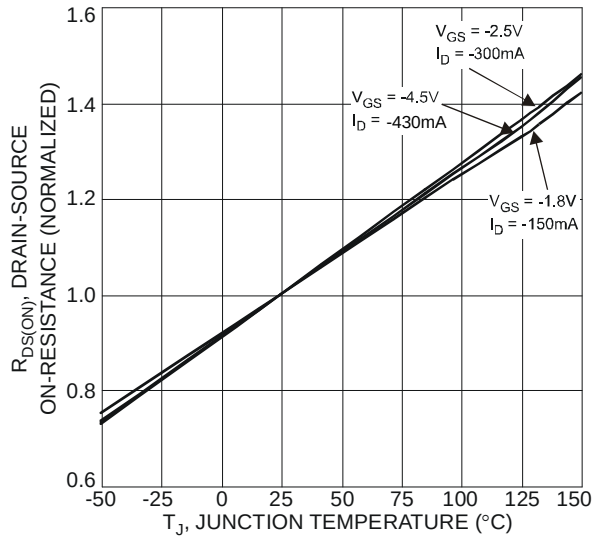


Fig. 17 On-Resistance Variation with Temperature

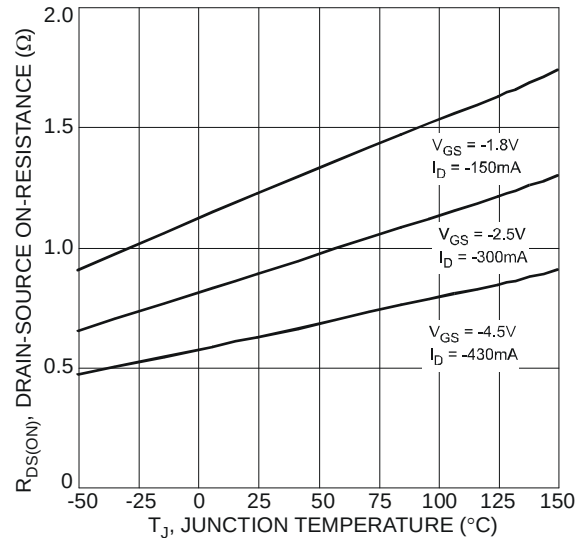


Fig. 18 On-Resistance vs. Temperature

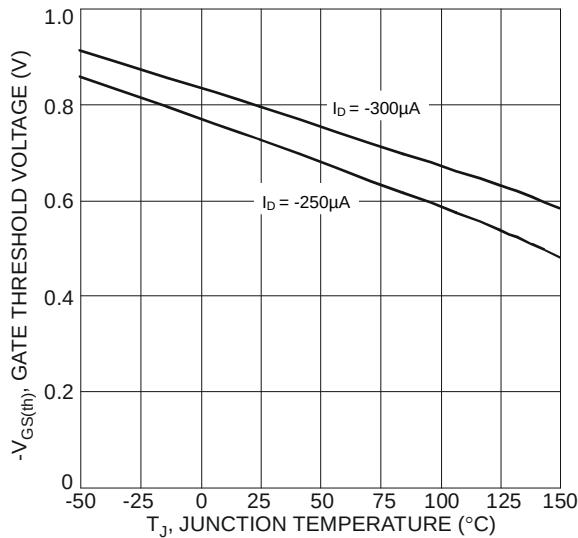


Fig. 19 Gate Threshold Voltage vs. Junction Temperature

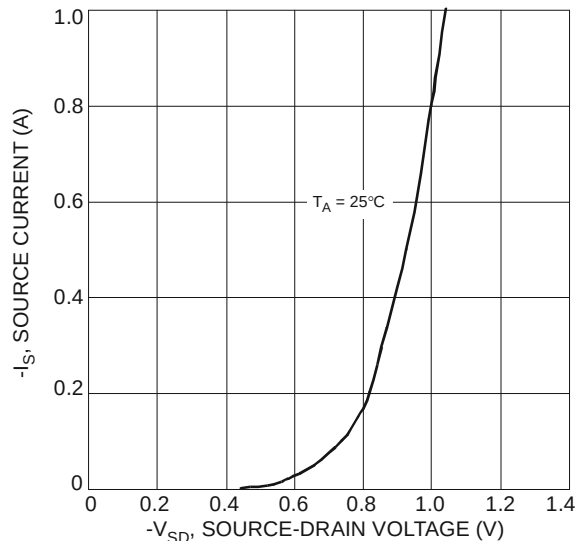


Fig. 20 Diode Forward Voltage vs. Current

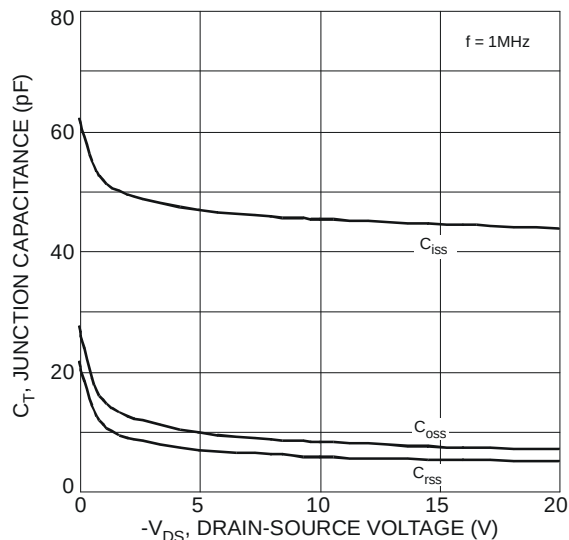


Fig. 21 Typical Junction Capacitance

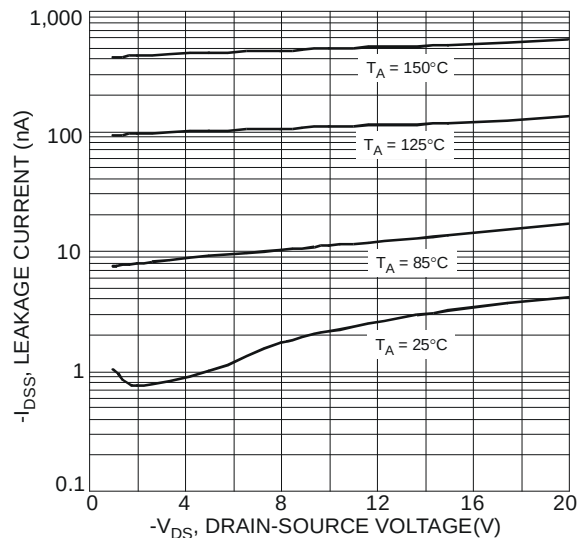


Fig. 22 Typical Drain-Source Leakage Current vs. Voltage

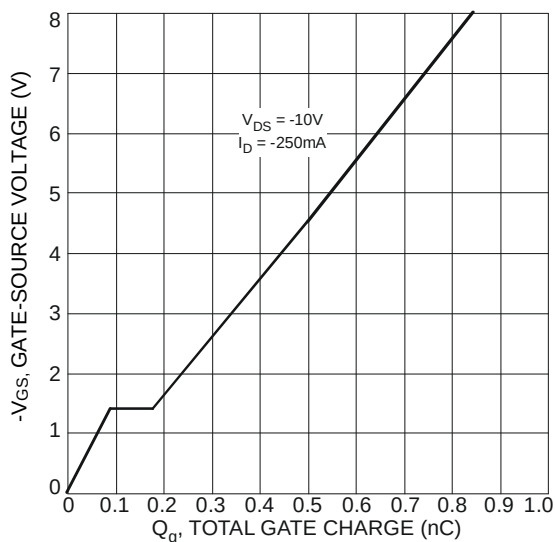


Fig. 23 Gate-Charge Characteristics

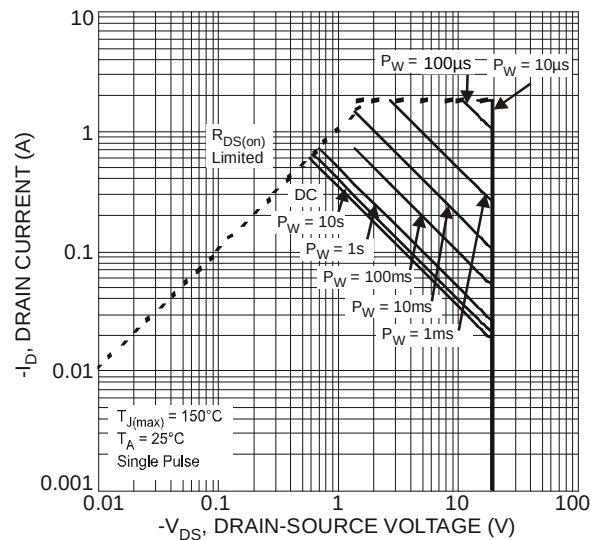


Fig. 24 SOA, Safe Operation Area

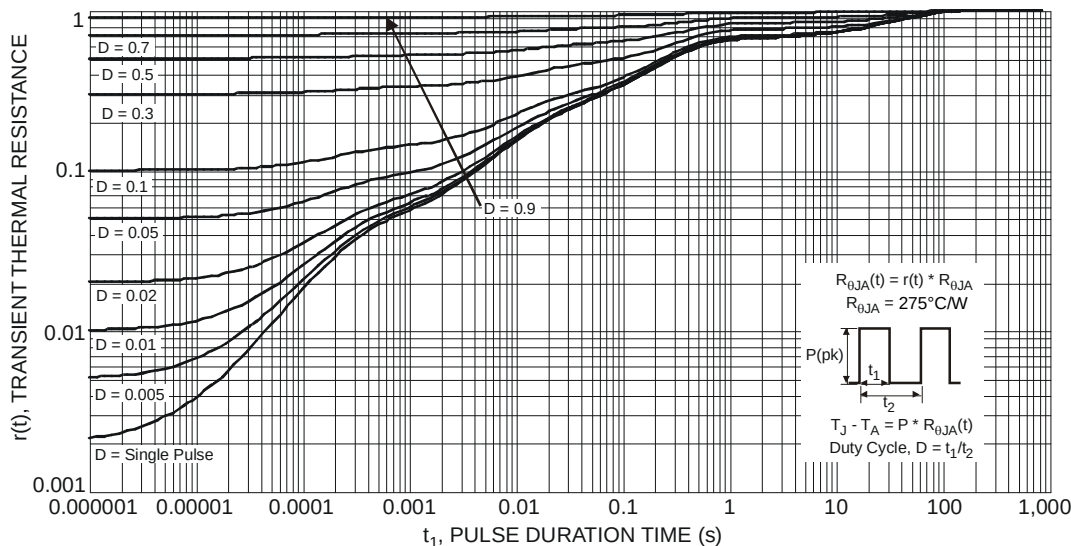
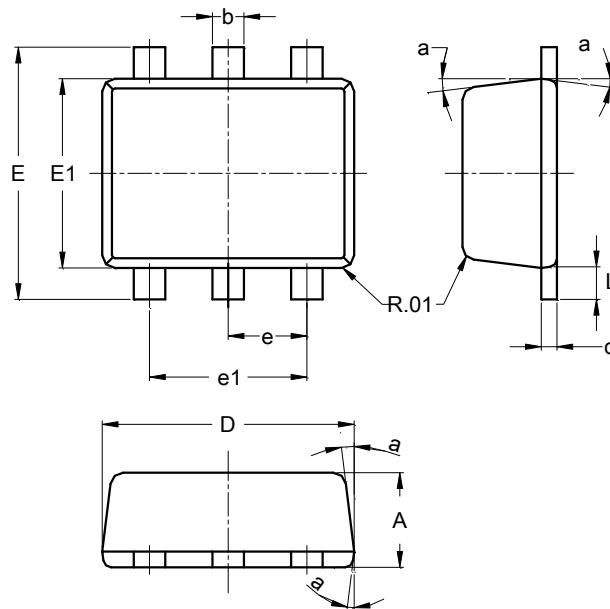


Fig. 25 Transient Thermal Response

Package Outline Dimensions

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

SOT563

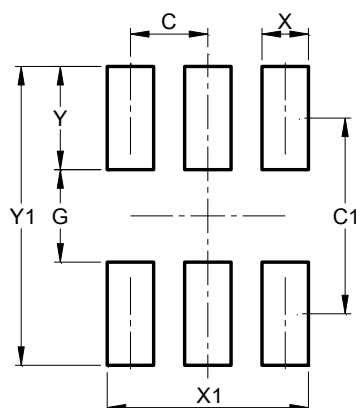


SOT563			
Dim	Min	Max	Typ
A	0.55	0.60	0.60
b	0.15	0.30	0.20
c	0.10	0.18	0.11
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
e	--	--	0.50
e1	0.90	1.10	1.00
L	0.10	0.30	0.20
a	8°	9°	7°
All Dimensions in mm			

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

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