

**Maximum Ratings – Q1** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	25	V
Gate-Source Voltage	V <sub>GSS</sub>	-0.5 +8	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 4.5V	I <sub>D</sub>	0.5	A
Maximum Continuous Body Diode Forward Current (Note 6)	I <sub>S</sub>	1.2	A
Pulsed Drain Current (Note 6)	I <sub>DM</sub>	1.5	A

**Maximum Ratings – Q2** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V <sub>DSS</sub>	-12	V
Gate-Source Voltage		V <sub>GSS</sub>	±8	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V	Steady State	I <sub>D</sub>	-3.9	A
	Note 9		-17.4	A
Continuous Drain Current (Note 5) V <sub>GS</sub> = -2.5V			-2.82	A
Maximum Continuous Body Diode Forward Current (Note 6)		I <sub>S</sub>	-40	A
Pulsed Drain Current (Note 6)		I <sub>DM</sub>	-40	A

**Thermal Characteristics**

Characteristic		Symbol	Value	Unit
Power Dissipation (Note 5)		P <sub>D</sub>	1.3	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R <sub>θJA</sub>	100	°C/W
	Note 9		5	
Thermal Resistance, Junction to Case (Note 5)		R <sub>θJC</sub>	36	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics – Q1** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

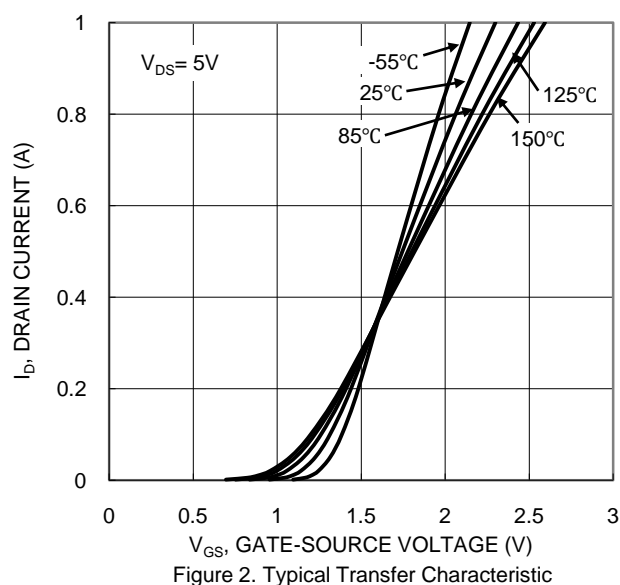
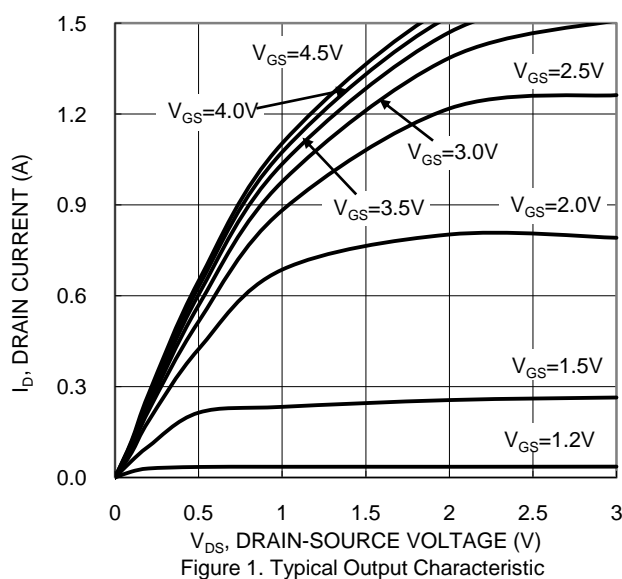
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	25	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	100	nA	V <sub>GS</sub> = 8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.65	0.85	1.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	3.8	4	Ω	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.4A
Diode Forward Voltage	V <sub>SD</sub>	—	0.76	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 0.29A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	27.6	—	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	8.5	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	3.3	—		
Gate Resistance	R <sub>g</sub>	—	25	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	0.4	—	nC	V <sub>DS</sub> = 5V, I <sub>D</sub> = 0.2A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	0.9	—		
Gate-Source Charge	Q <sub>gs</sub>	—	0.1	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	0.04	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	2.5	—	ns	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 6V, R <sub>G</sub> = 50Ω, I <sub>D</sub> = 0.5A
Turn-On Rise Time	t <sub>R</sub>	—	1.4	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	5.7	—		
Turn-Off Fall Time	t <sub>F</sub>	—	4.3	—		

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1in. square copper plate.
  - Repetitive rating, pulse width limited by junction temperature.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.
  - Pulse Test: Pulse Width < 300μs, Duty Cycle < 2.0%.

**Electrical Characteristics – Q2** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 10)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-12	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -6.4V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 10)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-0.35	—	-1.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	55	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2.8A
		—	—	70		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.5A
		—	—	100		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -2.0A
Diode Forward Voltage	V <sub>SD</sub>	—	—	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -0.6A
<b>DYNAMIC CHARACTERISTICS (Note 11)</b>						
Input Capacitance	C <sub>iss</sub>	—	9.7	—	pF	V <sub>DS</sub> = -6V, V <sub>GS</sub> = 0V, f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	393	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	1.9	—		
Gate Resistance	R <sub>g</sub>	—	1846	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = -4.5V)	Q <sub>g</sub>	—	24.5	—	nC	V <sub>DS</sub> = -6V, I <sub>D</sub> = -2.8A
Gate-Source Charge	Q <sub>gs</sub>	—	3.3	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	7.3	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	1.2	—	μs	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -6V, R <sub>G</sub> = 6Ω, I <sub>D</sub> = -2.8A
Turn-On Rise Time	t <sub>R</sub>	—	2.7	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	9.8	—		
Turn-Off Fall Time	t <sub>F</sub>	—	6.5	—		

Notes: 10. Short duration pulse test used to minimize self-heating effect.  
 11. Guaranteed by design. Not subject to production testing.

**Typical Characteristics - N-CHANNEL**


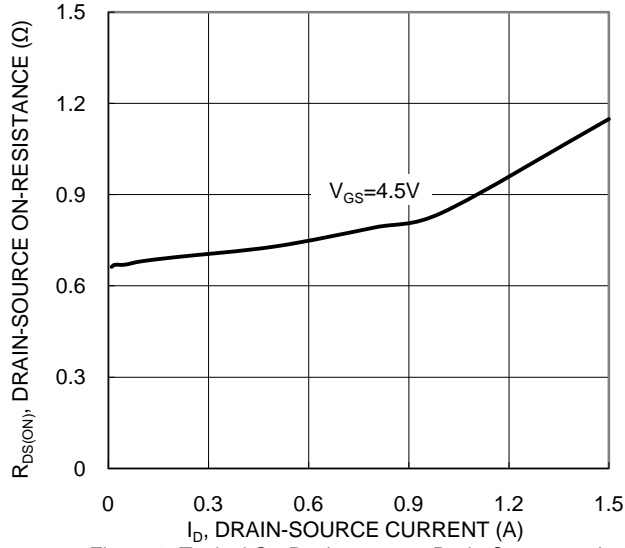


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

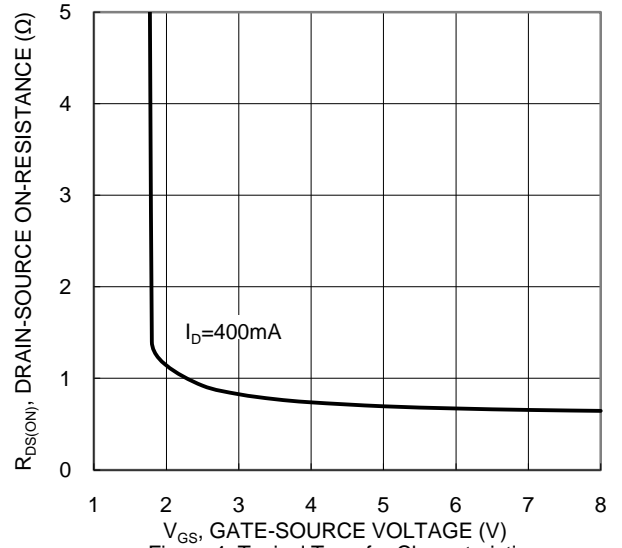


Figure 4. Typical Transfer Characteristic

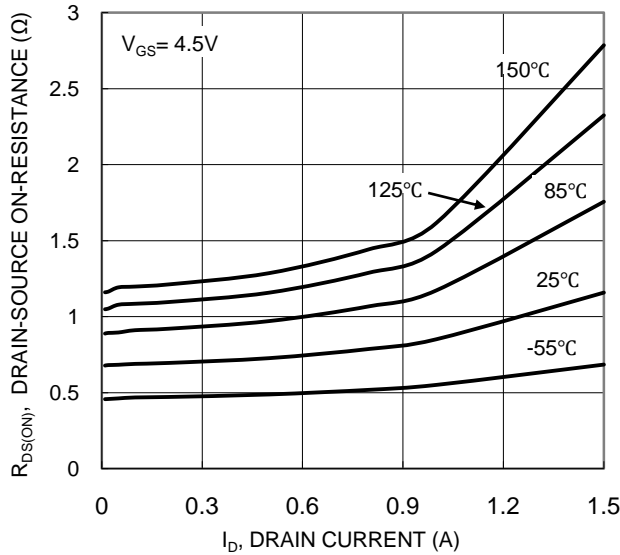


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

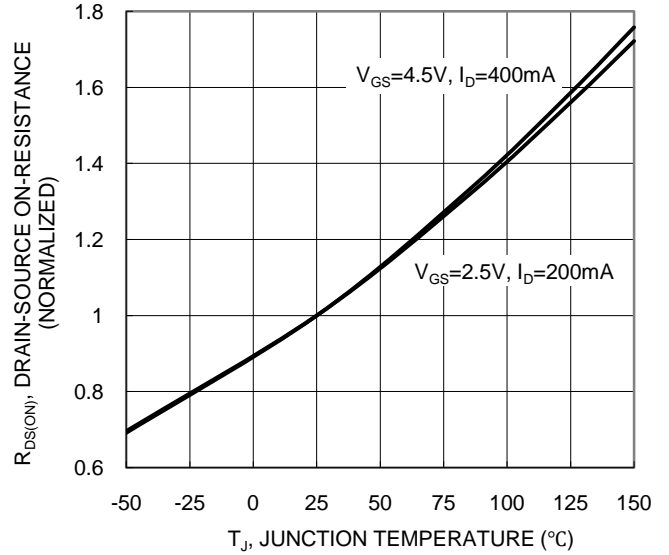


Figure 6. On-Resistance Variation with Temperature

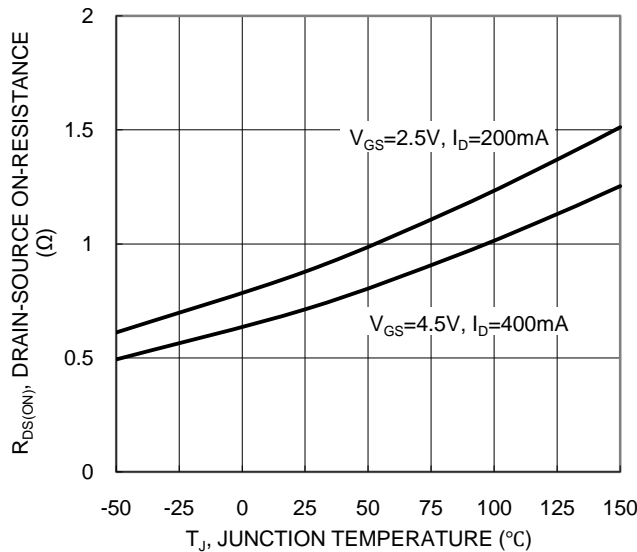


Figure 7. On-Resistance Variation with Temperature

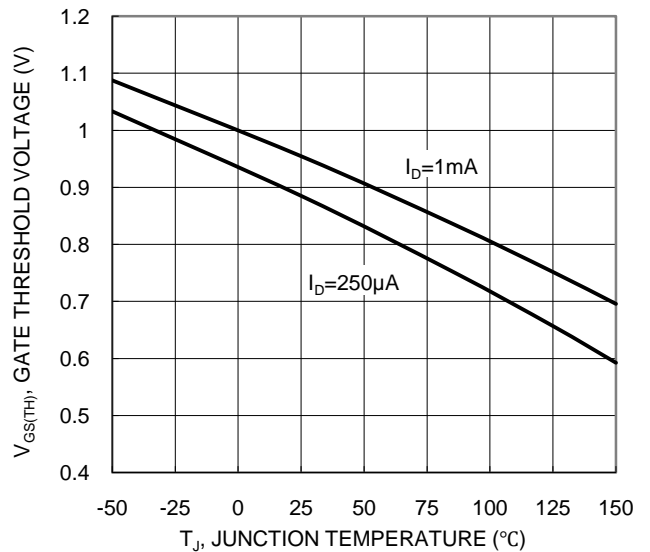


Figure 8. Gate Threshold Variation vs. Junction Temperature

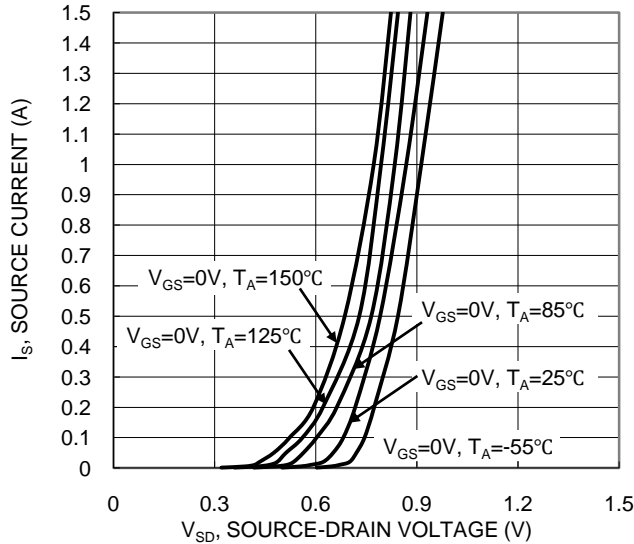


Figure 9. Diode Forward Voltage vs. Current

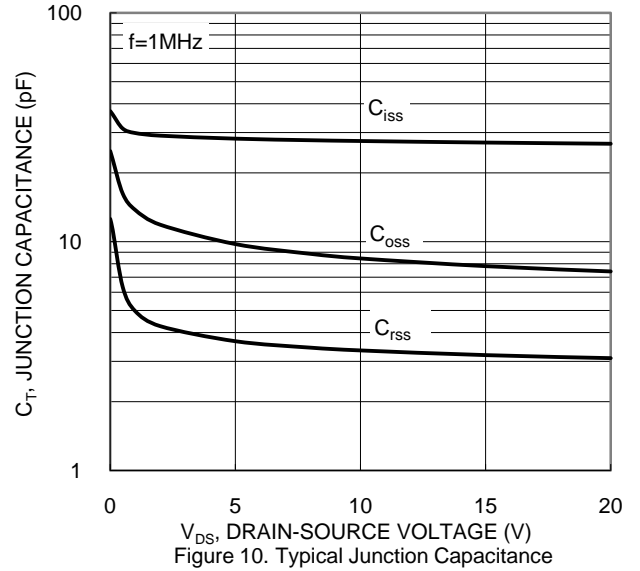


Figure 10. Typical Junction Capacitance

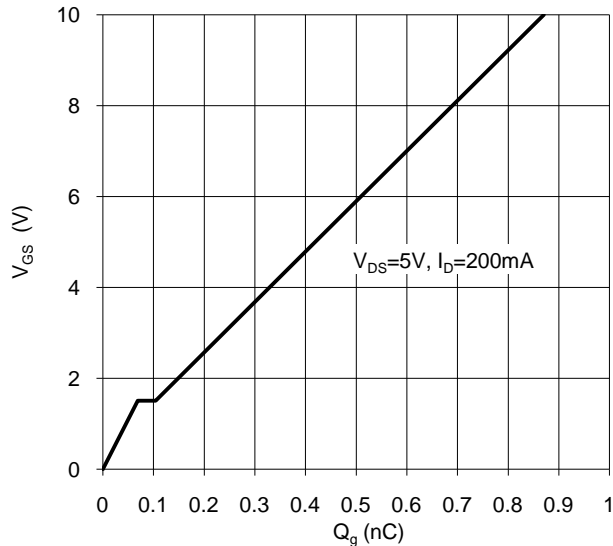


Figure 11. Gate Charge

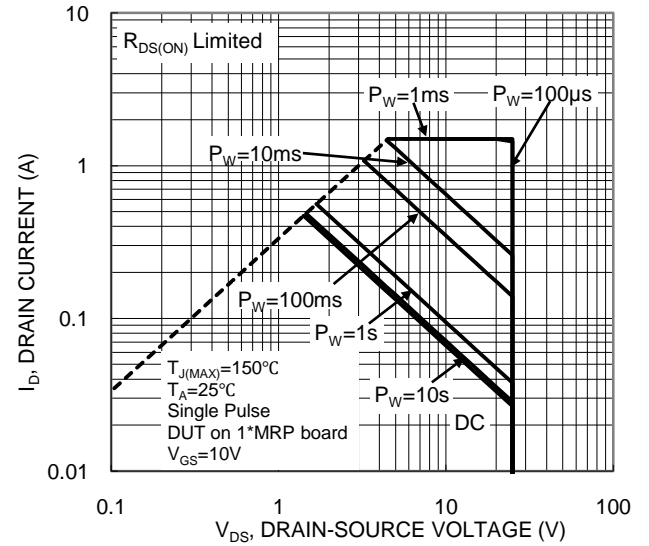


Figure 12. SOA, Safe Operation Area

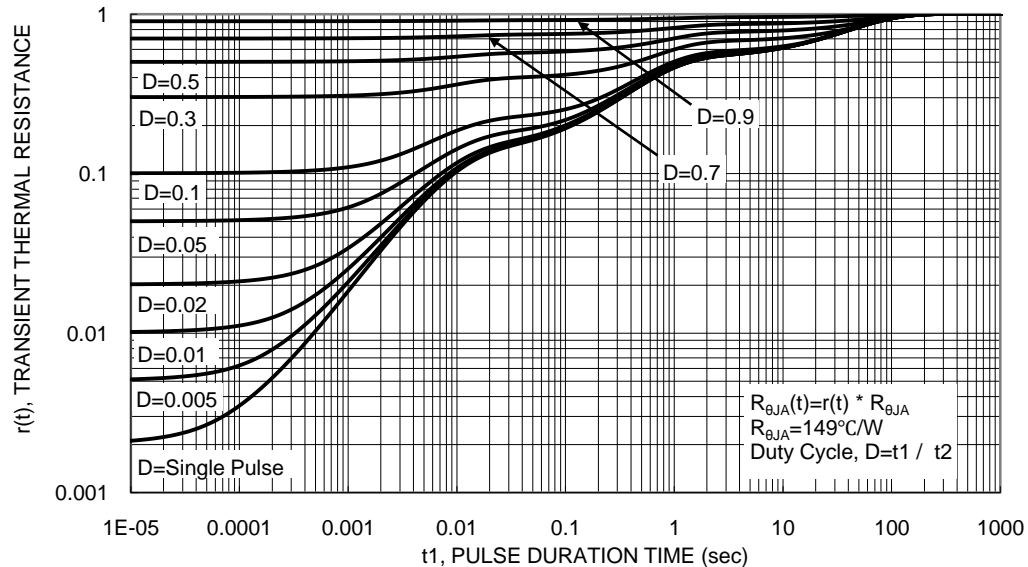


Figure 13. Transient Thermal Resistance

# Typical Characteristics - P-CHANNEL

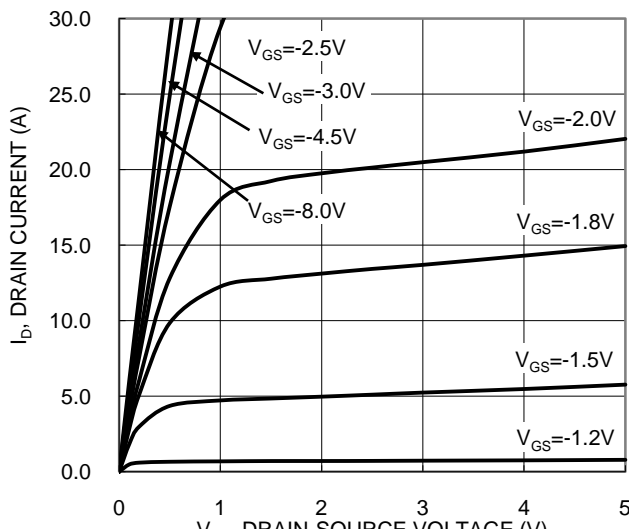


Figure 14. Typical Output Characteristic

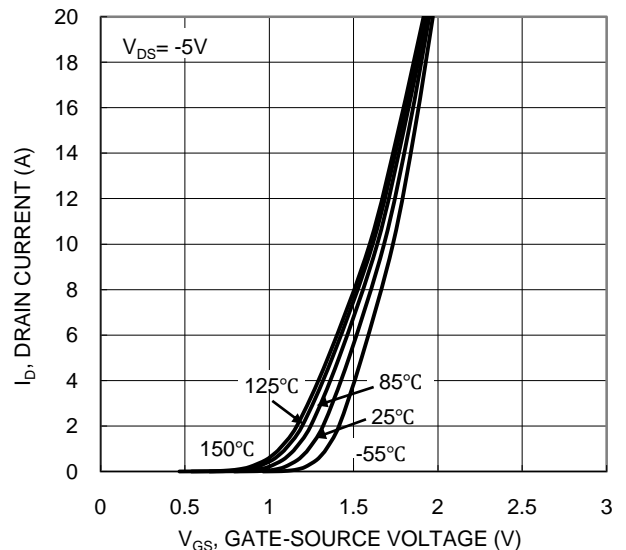


Figure 15. Typical Transfer Characteristic

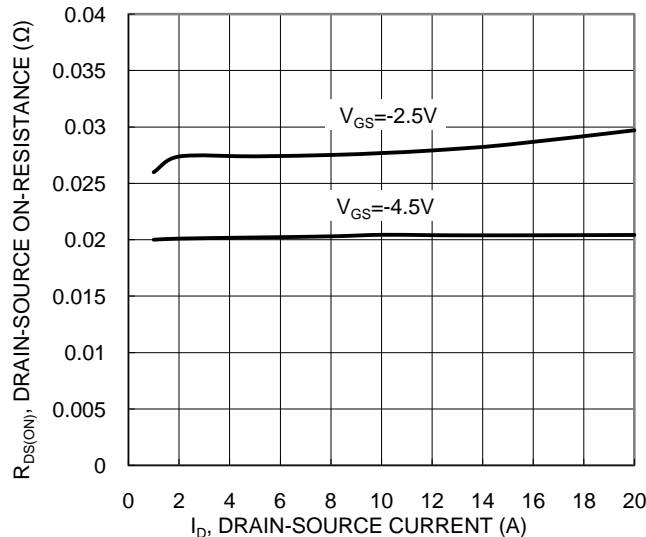


Figure 16. Typical On-Resistance vs. Drain Current and Gate Voltage

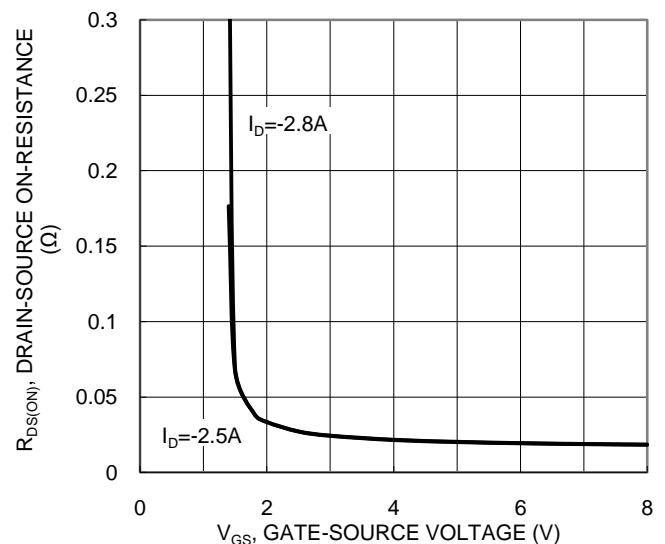


Figure 17. Typical Transfer Characteristic

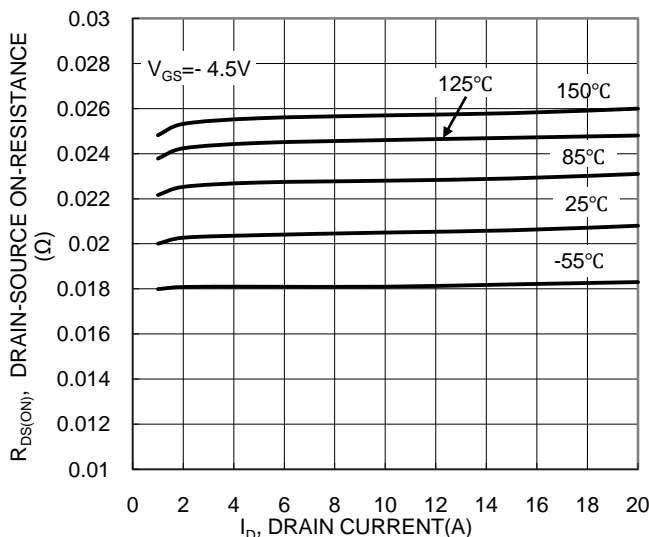


Figure 18. Typical On-Resistance vs. Drain Current and Temperature

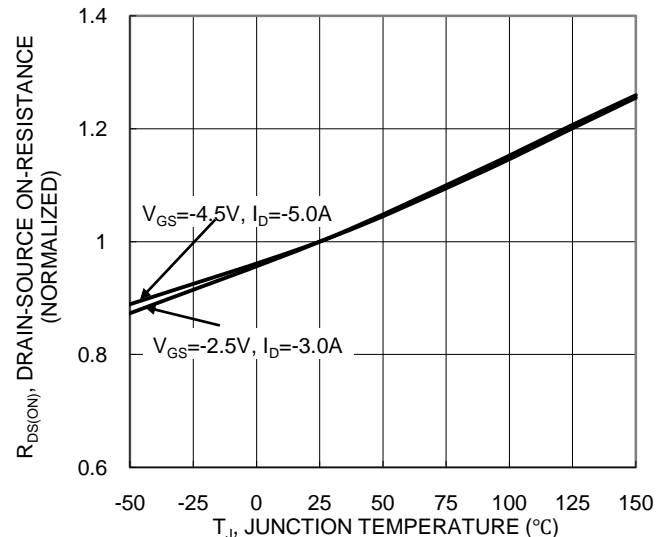
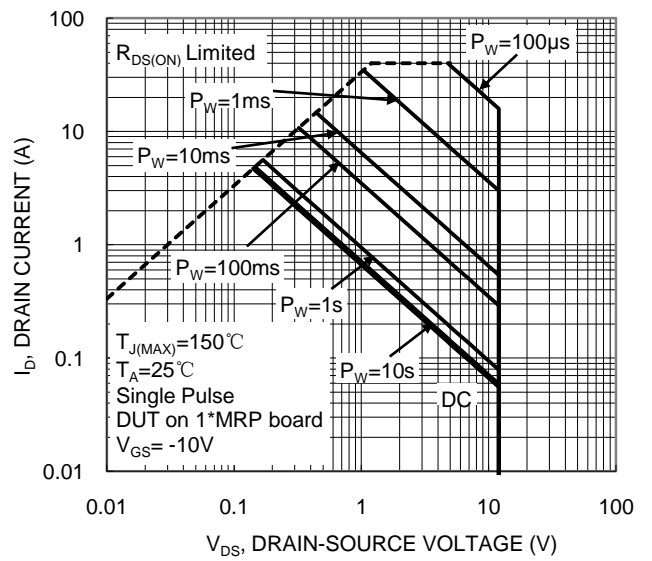
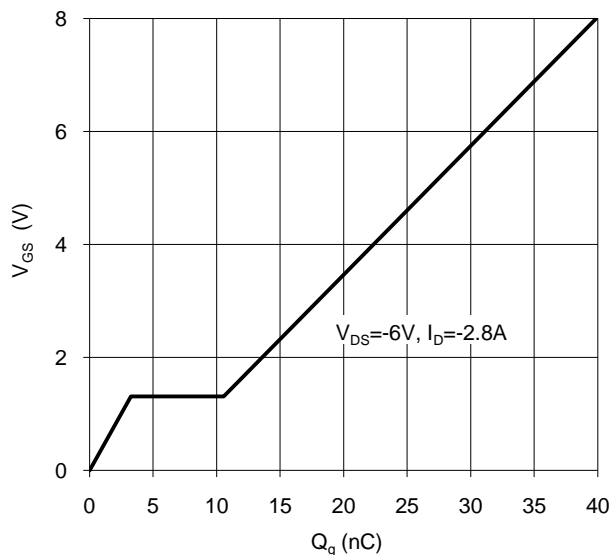
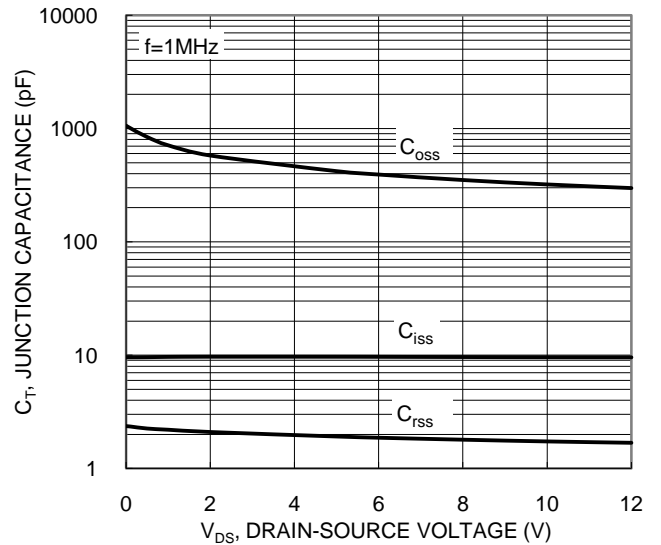
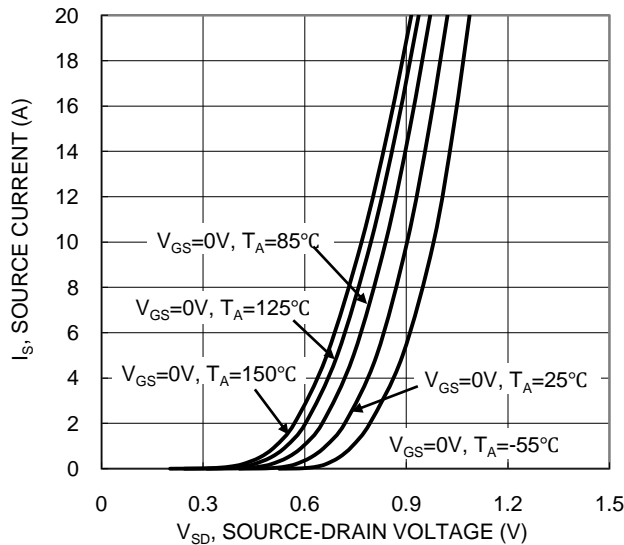
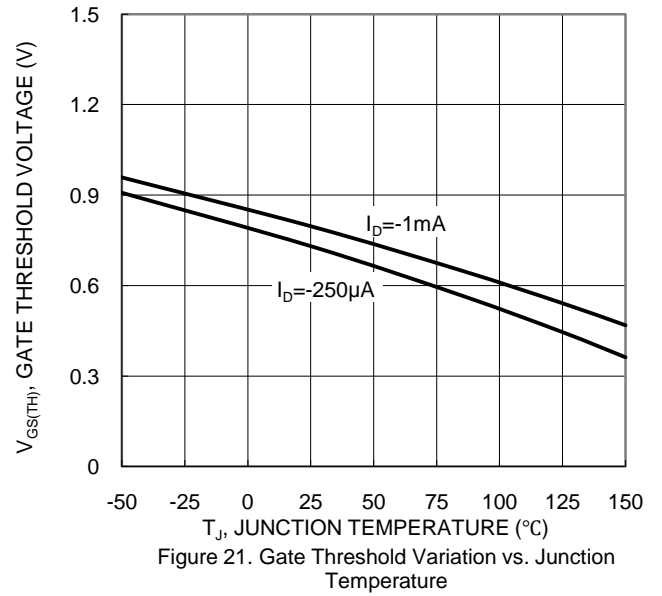
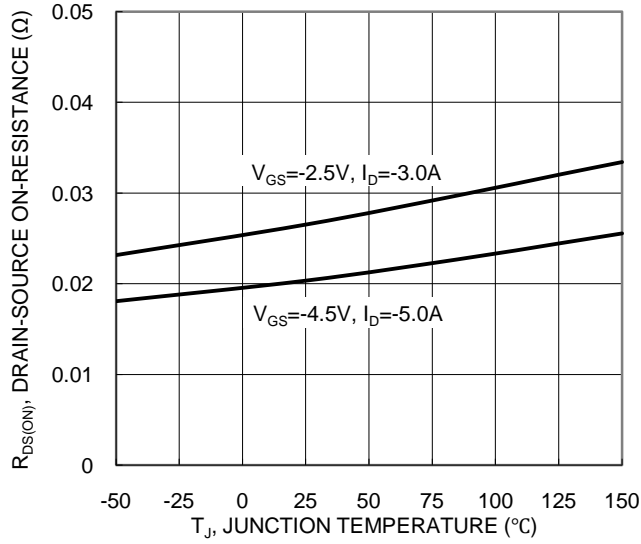
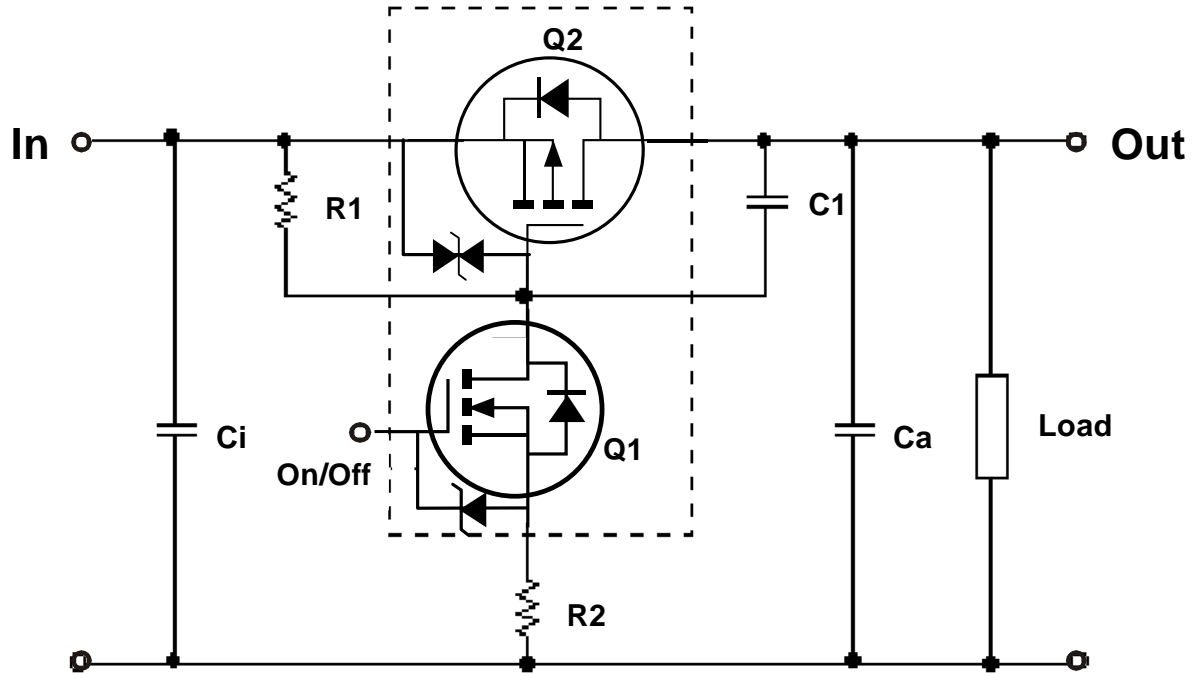


Figure 19. On-Resistance Variation with Temperature

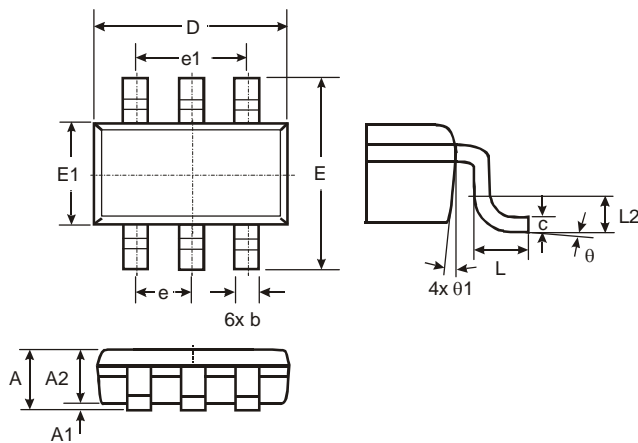


## Application Circuit



## Package Outline Dimensions

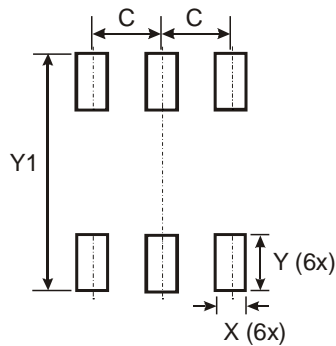
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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°	—
All Dimensions in mm			

## 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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