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

Characteristic			Symbol	Value_Q2	Value_Q1	Units
Drain-Source Voltage			V_{DSS}	40	-40	V
Gate-Source Voltage			V_{GSS}	±20	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	7.0 5.6	-5.1 -4.1	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	9.0 7.2	-6.5 -5.2	A
Maximum Body Diode Forward Current (Note 6)			I_S	2.5	-2.5	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	70	-40	A
Avalanche Current (Notes 7) L = 0.1mH			I_{AR}	20	20	A
Repetitive Avalanche Energy (Notes 7) L = 0.1mH			E_{AR}	20	20	mJ

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	1.3	W
	T_A = +70°C		0.8	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	98	°C/W
	t<10s		59	
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.8	W
	T_A = +70°C		1.1	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	71	°C/W
	t<10s		43	
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	11.8	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics N-Channel Q2 (@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}	40	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 40V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	1.4	—	2.4	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	15	24	mΩ	V_{GS} = 10V, I_D = 6A
		—	20	32		V_{GS} = 4.5V, I_D = 5A
Diode Forward Voltage	V_{SD}	—	0.7	1.0	V	V_{GS} = 0V, I_S = 1.0A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1060	—	pF	V_{DS} = 20V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	84	—		
Reverse Transfer Capacitance	C_{rss}	—	58	—		
Gate Resistance	R_G	—	1.6	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	8.8	—	nC	V_{DS} = 20V, I_D = 8A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	19.1	—		
Gate-Source Charge	Q_{gs}	—	3.0	—		
Gate-Drain Charge	Q_{gd}	—	2.5	—		
Turn-On Delay Time	$t_{D(on)}$	—	5.3	—	nS	V_{DD} = 25V, R_L = 2.5Ω V_{GS} = 10V, R_G = 3Ω
Turn-On Rise Time	t_r	—	7.1	—		
Turn-Off Delay Time	$t_{D(off)}$	—	15.1	—		
Turn-Off Fall Time	t_f	—	4.8	—		
Body Diode Reverse Recovery Time	t_{rr}	—	10.5	—	nS	I_F = 8A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{rr}	—	4.15	—	nC	I_F = 8A, di/dt = 100A/µs

Electrical Characteristics P-Channel Q1 (@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}	-40	—	—	V	V_{GS} = 0V, I_D = -250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	V_{DS} = -40V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	—	-2.2	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	33	45	mΩ	V_{GS} = -10V, I_D = -5A
		—	40	55		V_{GS} = -4.5V, I_D = -4A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.0	V	V_{GS} = 0V, I_S = -1.0A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1154	—	pF	V_{DS} = -20V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	84	—		
Reverse Transfer Capacitance	C_{rss}	—	66	—		
Gate Resistance	R_G	—	12.6	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	10.6	—	nC	V_{DS} = -20V, I_D = -4.9A
Total Gate Charge (V_{GS} = -10V)	Q_g	—	21.5	—		
Gate-Source Charge	Q_{gs}	—	2.2	—		
Gate-Drain Charge	Q_{gd}	—	3.3	—		
Turn-On Delay Time	$t_{D(on)}$	—	8.7	—	nS	V_{DS} = -20V, I_D = -3.9A V_{GS} = -4.5V, R_G = 1Ω
Turn-On Rise Time	t_r	—	19.6	—		
Turn-Off Delay Time	$t_{D(off)}$	—	34.9	—		
Turn-Off Fall Time	t_f	—	25.5	—		
Body Diode Reverse Recovery Time	t_{rr}	—	9.61	—	nS	I_S = -3.9A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	—	3.30	—	nC	I_S = -3.9A, dI/dt = 100A/μs

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 1inch square copper plate.
7. IAR and EAR rating are based on low frequency and duty cycles to keep TJ = +25°C
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

N-Channel Q2

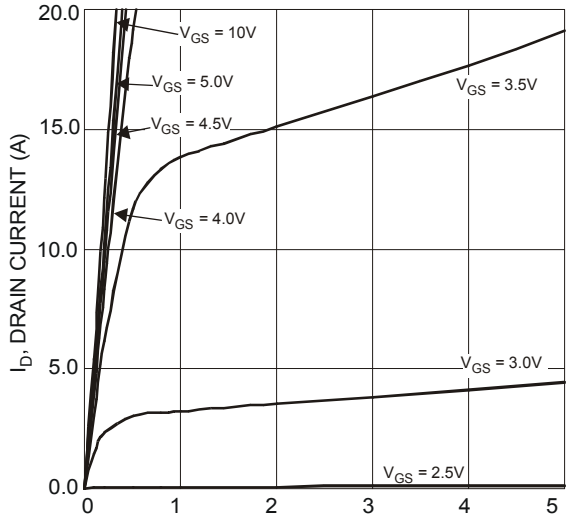


Figure 1 Typical Output Characteristics

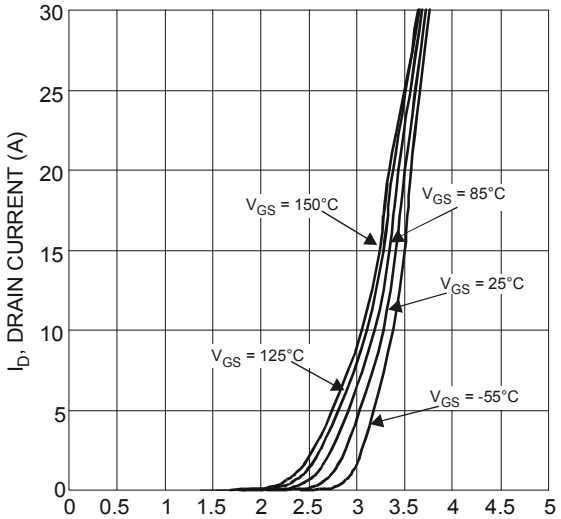


Figure 2 Typical Transfer Characteristics

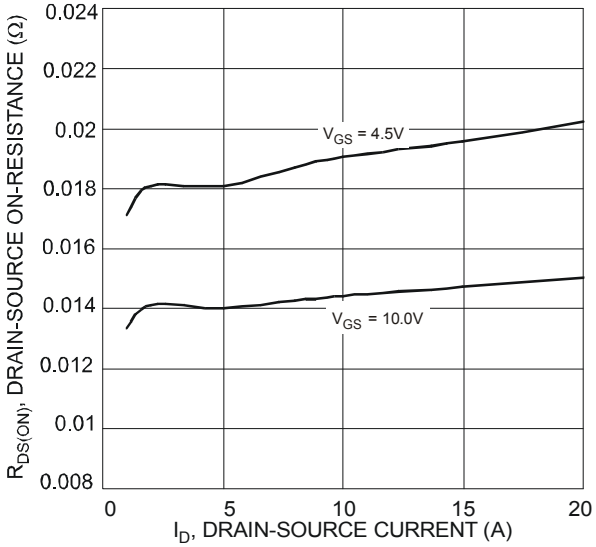


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

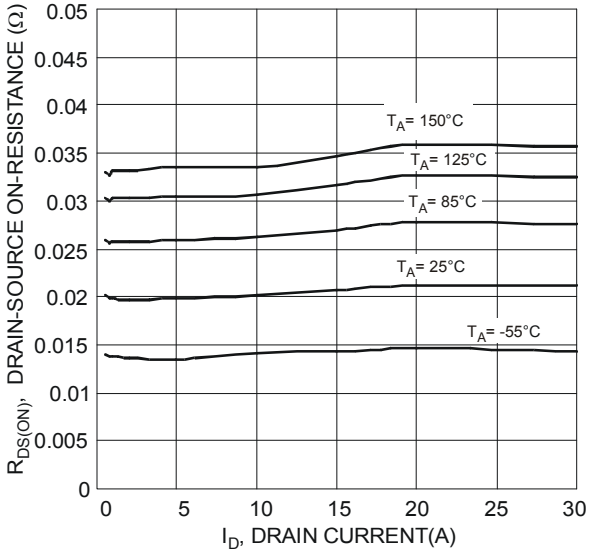


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

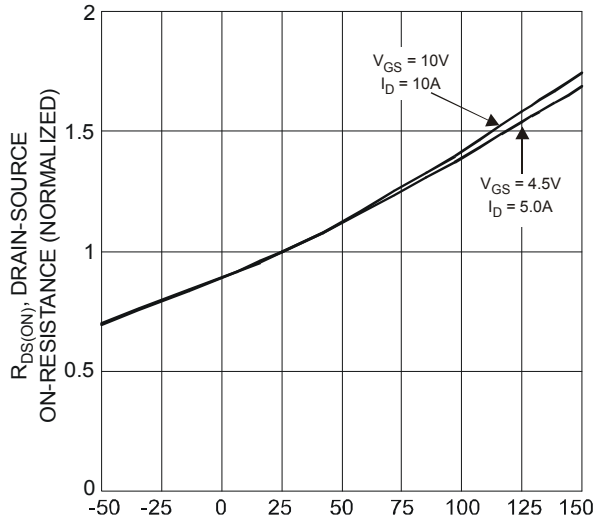


Figure 5 On-Resistance Variation with Temperature

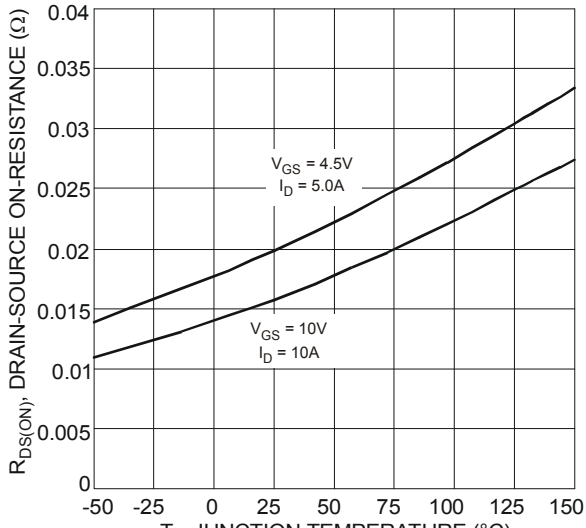


Figure 6 On-Resistance Variation with Temperature

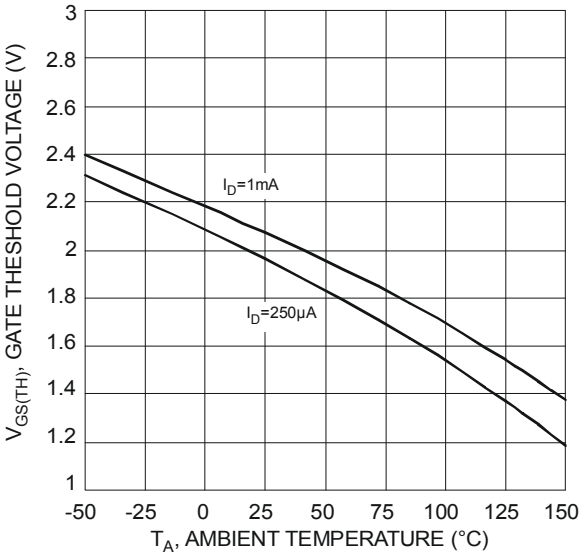


Figure 7 Gate Theshold Variation vs Ambient Temperature

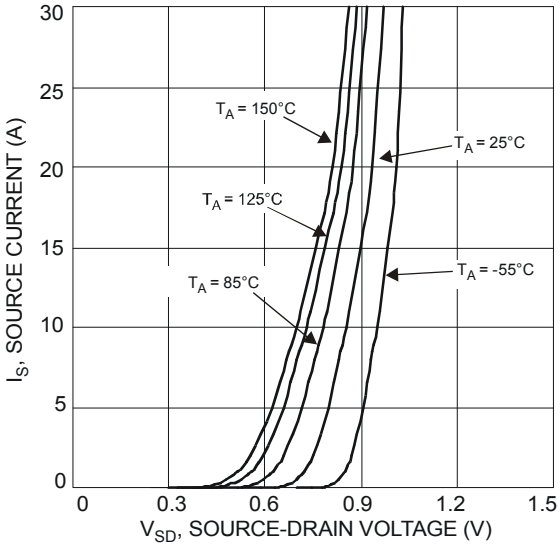


Figure 8 Diode Forward Voltage vs. Current

P-Channel Q1

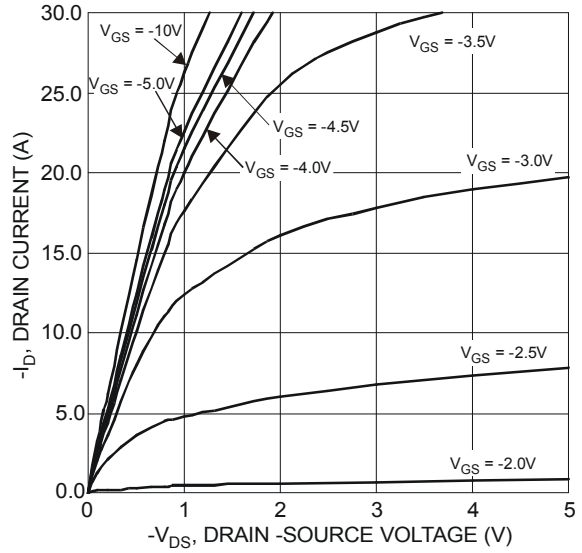


Figure 9 Typical Output Characteristics

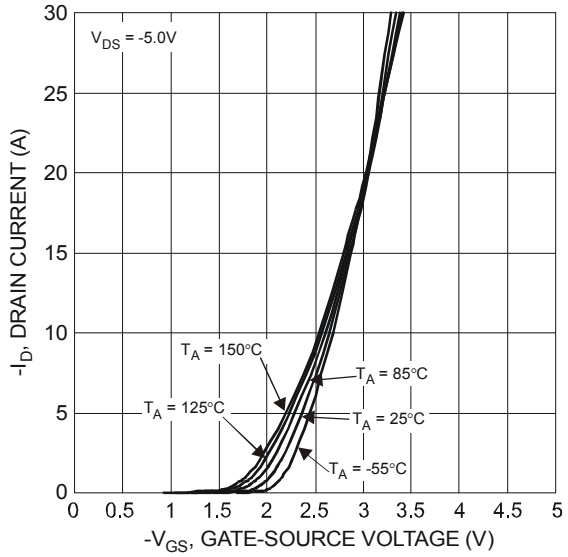


Figure 10 Typical Transfer Characteristics

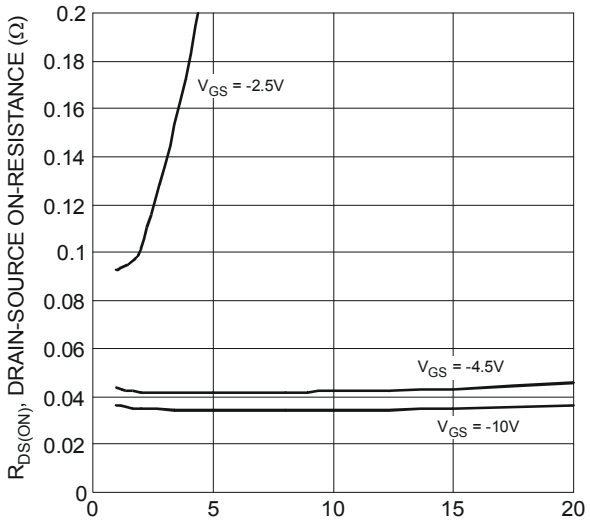


Figure 11 Typical On-Resistance vs. Drain Current and Gate Voltage

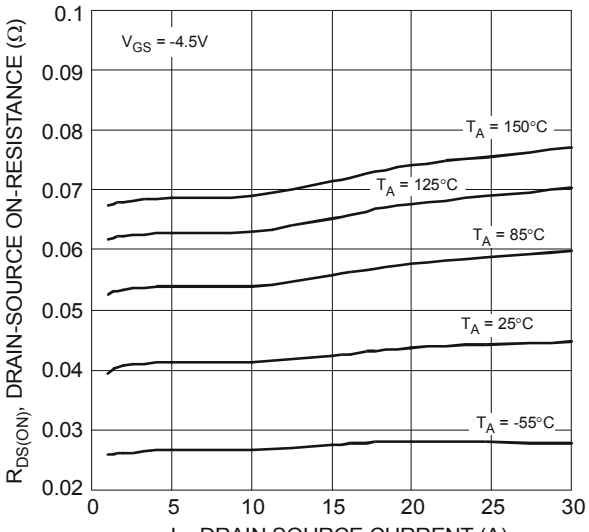


Figure 12 Typical On-Resistance vs. Drain Current and Temperature

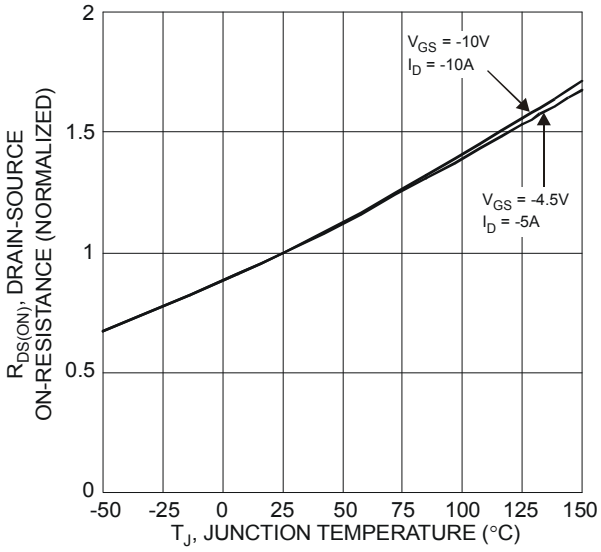


Figure 13 On-Resistance Variation with Temperature

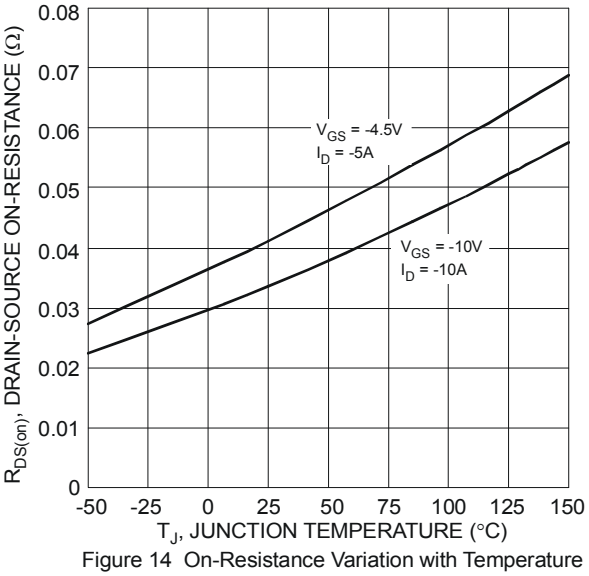


Figure 14 On-Resistance Variation with Temperature

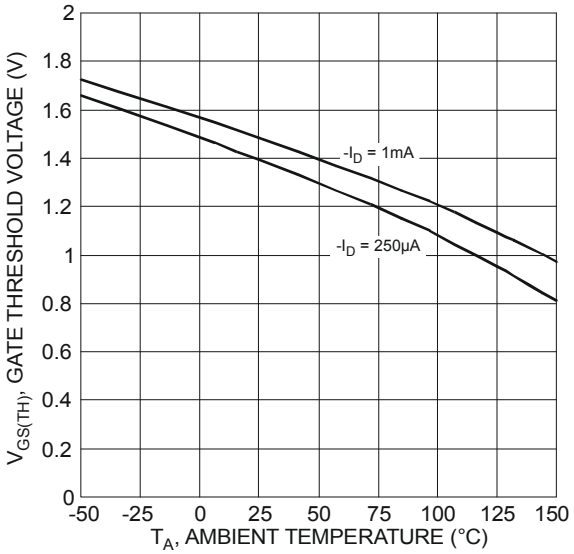


Figure 15 Gate Threshold Variation vs. Ambient Temperature

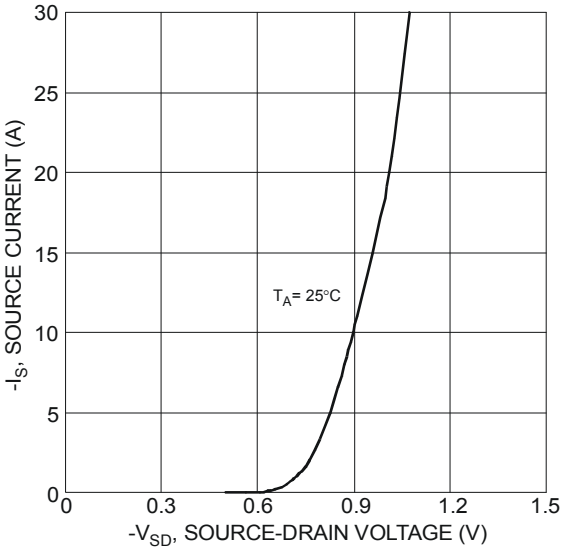


Figure 16 Diode Forward Voltage vs. Current

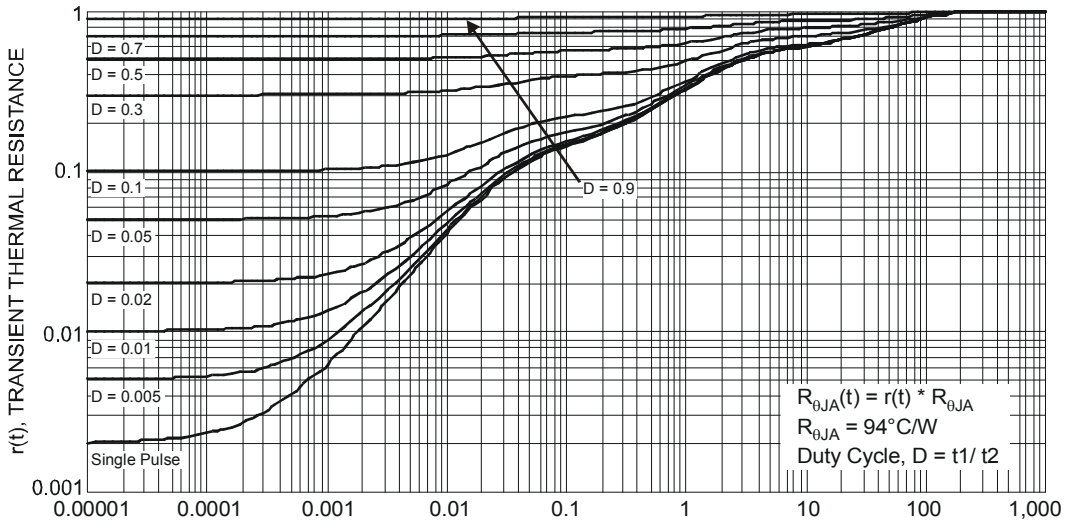
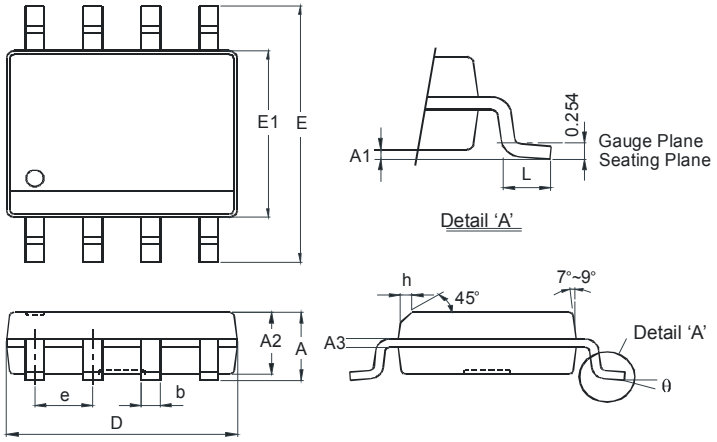


Figure 17 Transient Thermal Resistance

Package Outline Dimensions

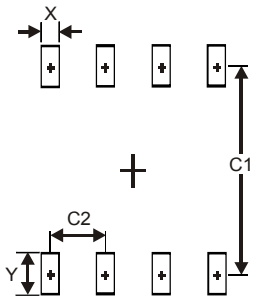
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SO-8		
Dim	**Min**	**Max**
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
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)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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