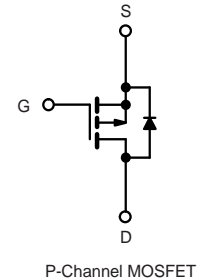
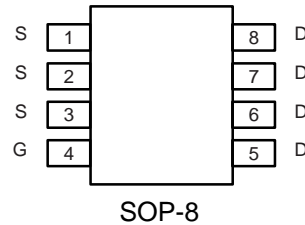


PRODUCT SUMMARY

- $V_{DS} (V) = -40V$
- $R_{DS(ON)} < 18m\Omega$ ($V_{GS} = -10V$)
- $R_{DS(ON)} < 29m\Omega$ ($V_{GS} = -4.5V$)

APPLICATIONS

- Load Switch
- POL



ABSOLUTE MAXIMUM RATINGS $T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150\text{ }^\circ\text{C}$)	$T_C = 25\text{ }^\circ\text{C}$	- 16.1	A
	$T_C = 70\text{ }^\circ\text{C}$	- 12.9	
	$T_A = 25\text{ }^\circ\text{C}$	- 10.2 ^{b, c}	
	$T_A = 70\text{ }^\circ\text{C}$	- 8.2 ^{b, c}	
Pulsed Drain Current	I_{DM}	- 50	
Continuous Source-Drain Diode Current	$T_C = 25\text{ }^\circ\text{C}$	- 5.3	
	$T_A = 25\text{ }^\circ\text{C}$	- 2.1 ^{b, c}	
Single Pulse Avalanche Current	I_{AS}	- 28	
Single Pulse Avalanche Energy	E_{AS}	39	mJ
Maximum Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	6.3	W
	$T_C = 70\text{ }^\circ\text{C}$	4	
	$T_A = 25\text{ }^\circ\text{C}$	2.5 ^{b, c}	
	$T_A = 70\text{ }^\circ\text{C}$	1.6 ^{b, c}	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, d}	R_{thJA}	37	50	$^\circ\text{C/W}$
Maximum Junction-to-Foot (Drain)	R_{thJF}	16	20	

Notes:

- Based on $T_C = 25\text{ }^\circ\text{C}$.
- Surface mounted on 1" x 1" FR4 board.
- $t = 10\text{ s}$.
- Maximum under steady state conditions is $85\text{ }^\circ\text{C/W}$.

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted

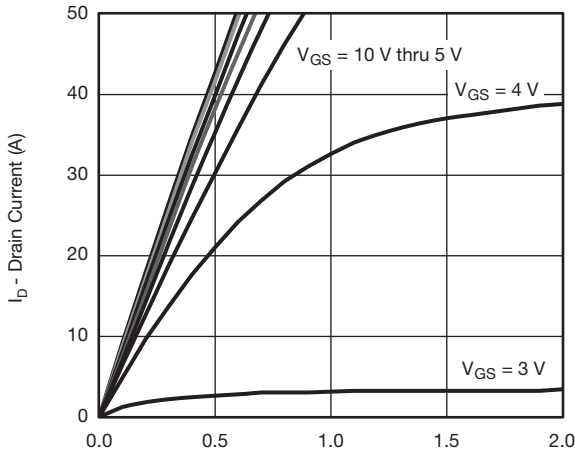
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-40			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	μA		-36		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			5		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1.2		-2.5	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -10\text{ V}$	-25			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -10.2\text{ A}$			18	m Ω
		$V_{GS} = -4.5\text{ V}, I_D = -8.4\text{ A}$			29	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -10.2\text{ A}$		37		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		3007		pF
Output Capacitance	C_{oss}			335		
Reverse Transfer Capacitance	C_{rss}			291		
Total Gate Charge	Q_g	$V_{DS} = -20\text{ V}, V_{GS} = -10\text{ V}, I_D = -10.2\text{ A}$		64	95	nC
		$V_{DS} = -20\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -10.2\text{ A}$		33	50	
Gate-Source Charge	Q_{gs}	$V_{DS} = -20\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -10.2\text{ A}$		9.8		
Gate-Drain Charge	Q_{gd}			15.7		
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.4	2	4	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -20\text{ V}, R_L = 2.4\text{ }\Omega$ $I_D \cong -8.2\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 1\text{ }\Omega$		57	86	ns
Rise Time	t_r			50	75	
Turn-Off Delay Time	$t_{d(off)}$			40	60	
Fall Time	t_f			17	26	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -20\text{ V}, R_L = 2.4\text{ }\Omega$ $I_D \cong -8.2\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		13	20	ns
Rise Time	t_r			11	20	
Turn-Off Delay Time	$t_{d(off)}$			45	68	
Fall Time	t_f			9	18	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			-5.3	A
Pulse Diode Forward Current	I_{SM}				-50	
Body Diode Voltage	V_{SD}	$I_S = -8.2\text{ A}, V_{GS} = 0\text{ V}$		-0.8	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -8.2\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		36	54	ns
Body Diode Reverse Recovery Charge	Q_{rr}			41	62	nC
Reverse Recovery Fall Time	t_a			20		ns
Reverse Recovery Rise Time	t_b			16		

Notes:

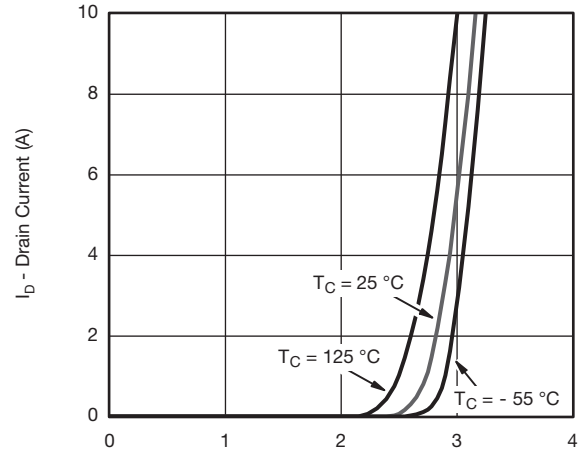
 a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

b. Guaranteed by design, not subject to production testing.

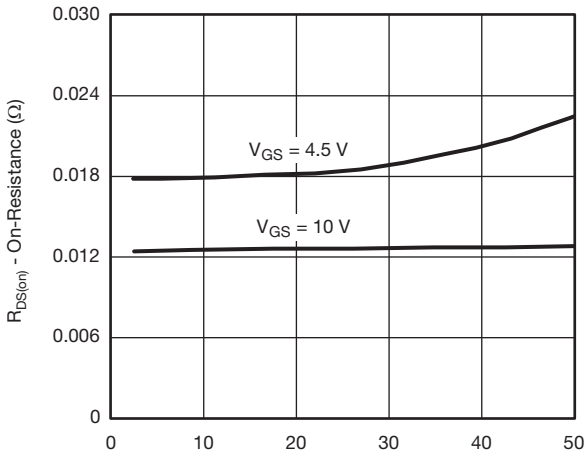
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



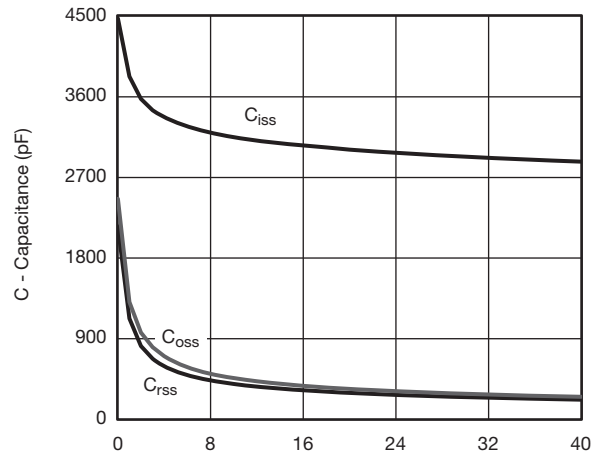
V_{DS} - Drain-to-Source Voltage (V)
Output Characteristics



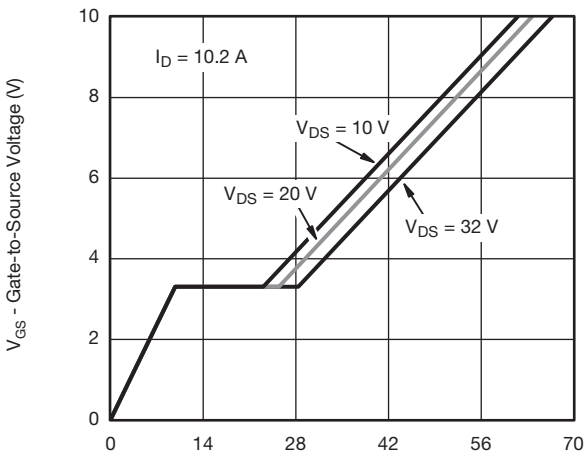
V_{GS} - Gate-to-Source Voltage (V)
Transfer Characteristics



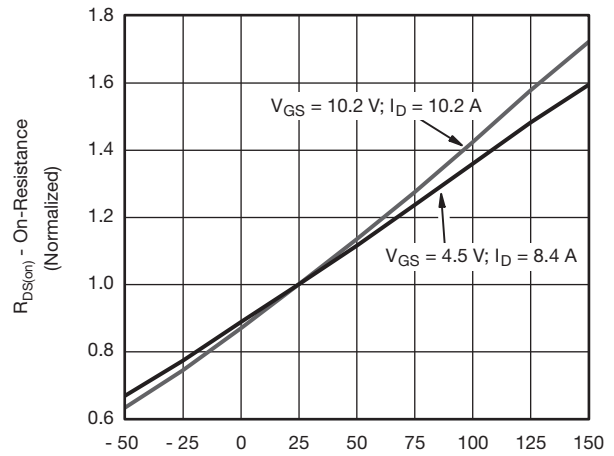
I_D - Drain Current (A)
On-Resistance vs. Drain Current



V_{DS} - Drain-to-Source Voltage (V)
Capacitance

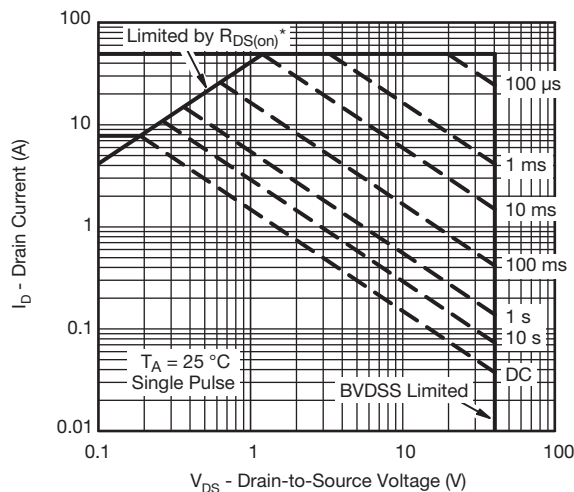
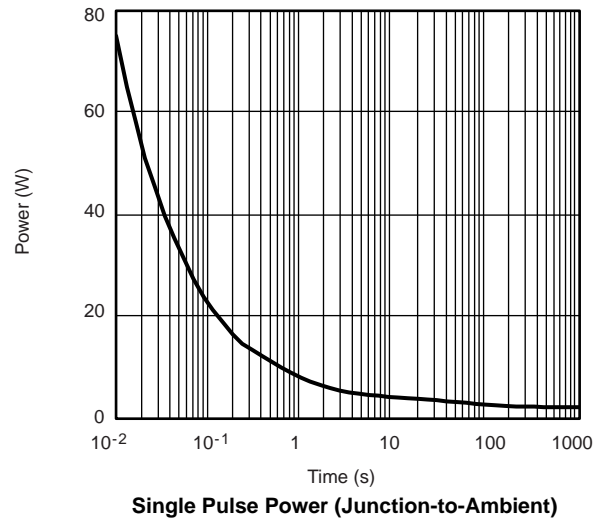
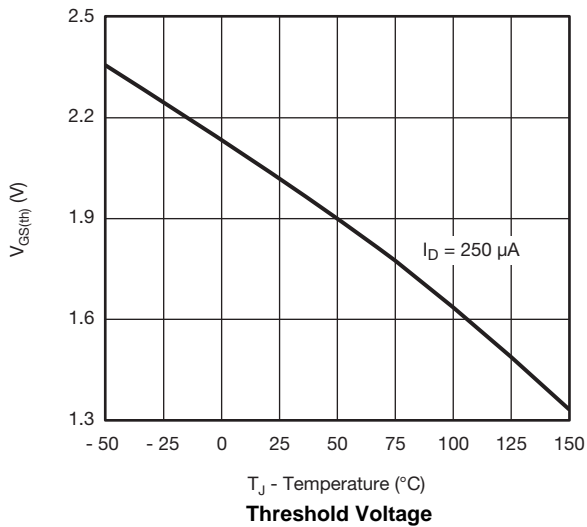
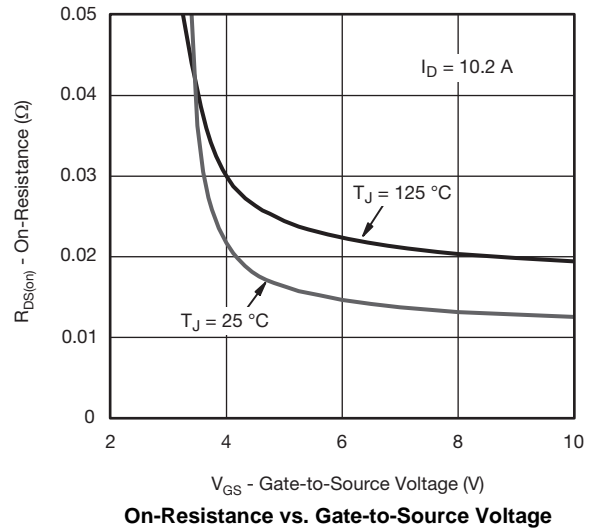
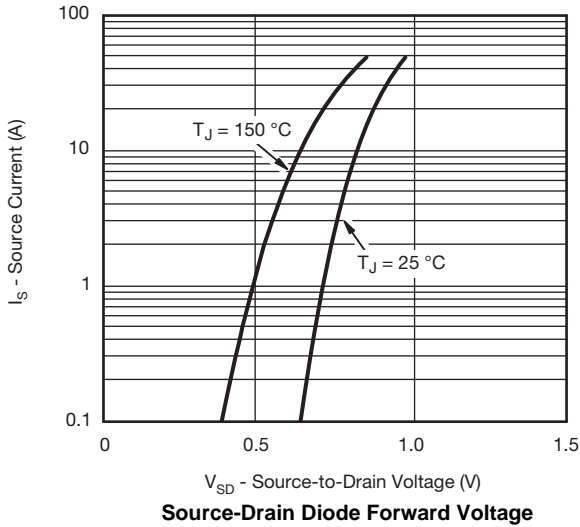


Q_g - Total Gate Charge (nC)
Gate Charge



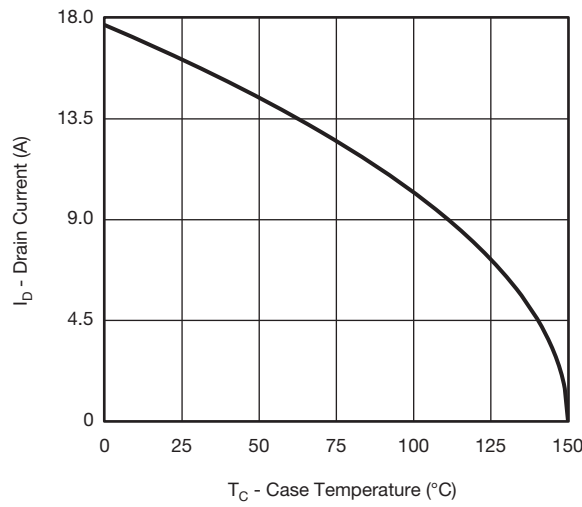
T_J - Junction Temperature (°C)
On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

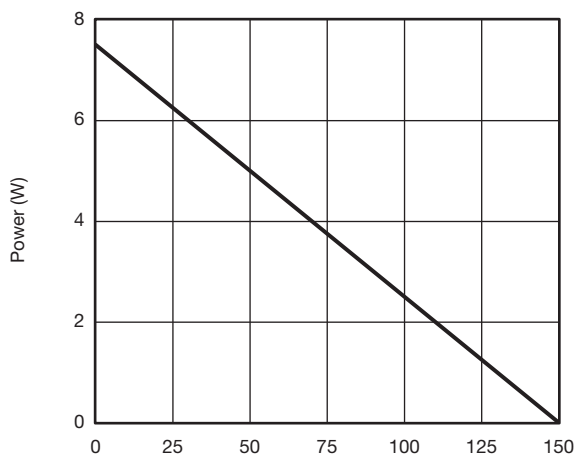


* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

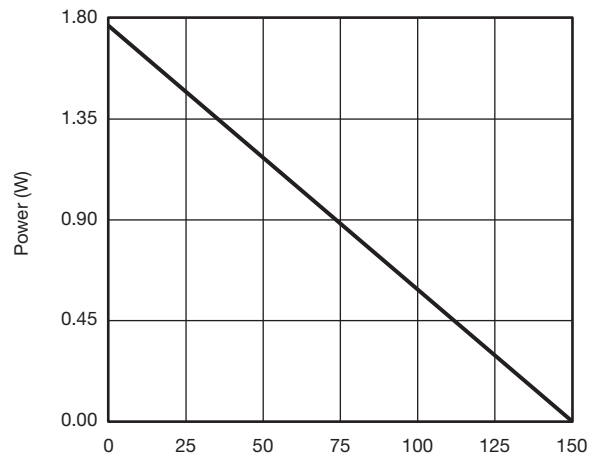
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Current Derating*



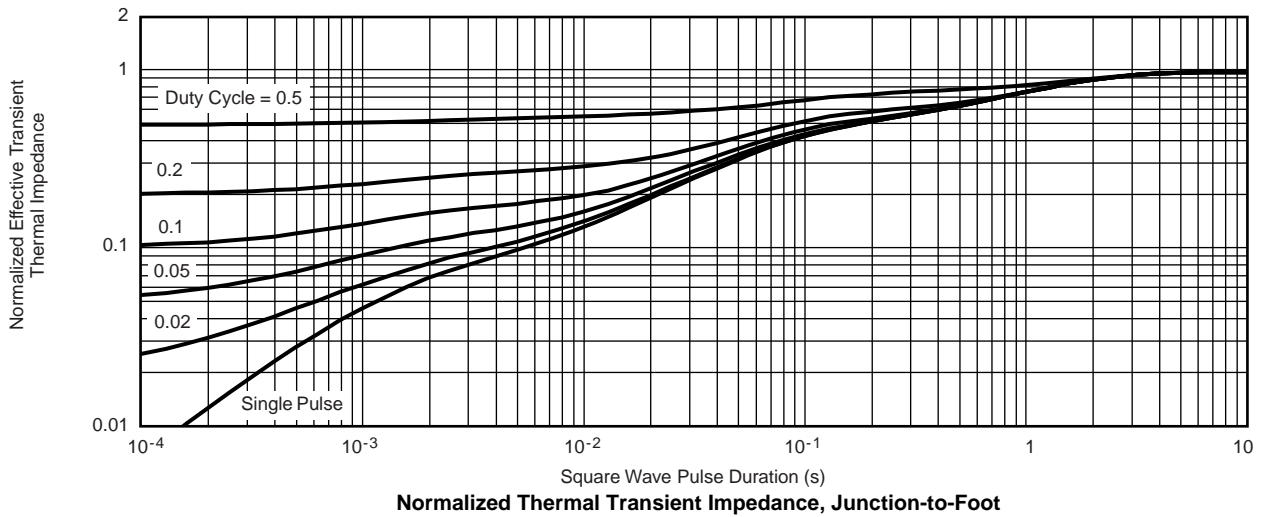
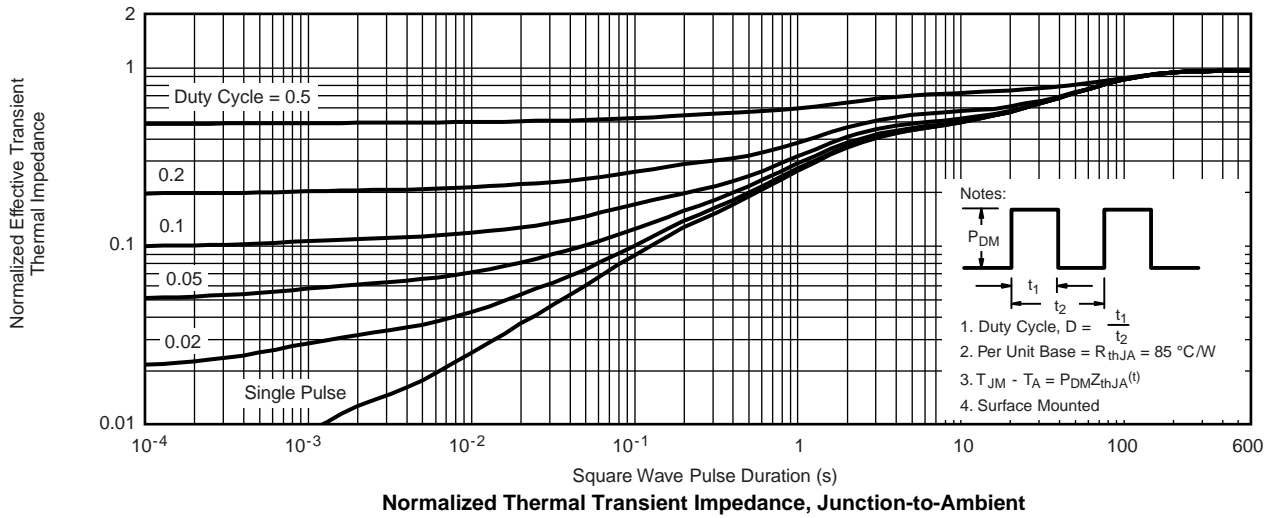
Power, Junction-to-Foot



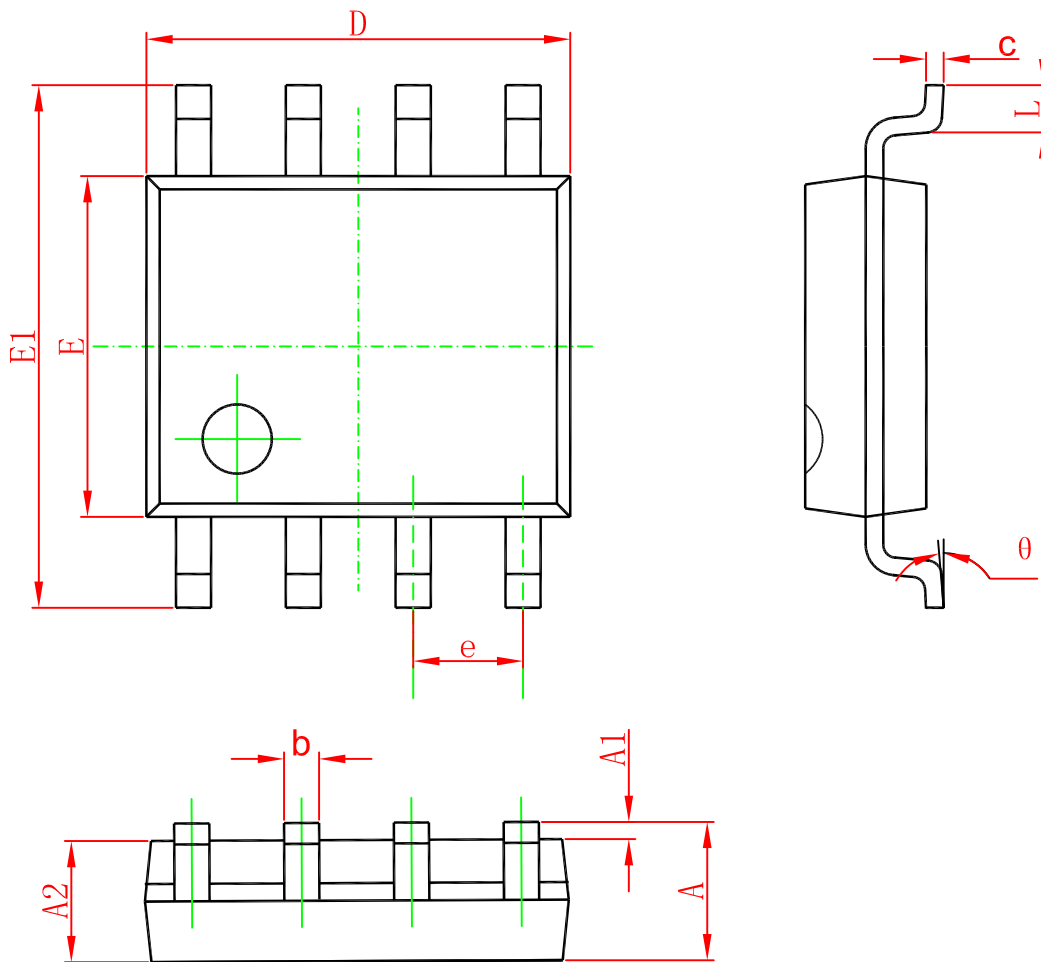
Power, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

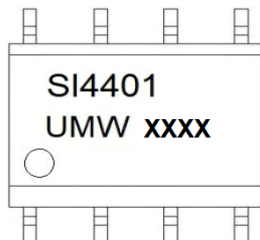


SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW SI4401BDY	SOP-8	3000	Tape and reel