

Dual P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A) ^{d, e}	Q _g (Typ.)
- 20	0.048 at V _{GS} = - 4.5 V	- 5	7 nC
	0.065 at V _{GS} = - 2.5 V	- 3	

FEATURES

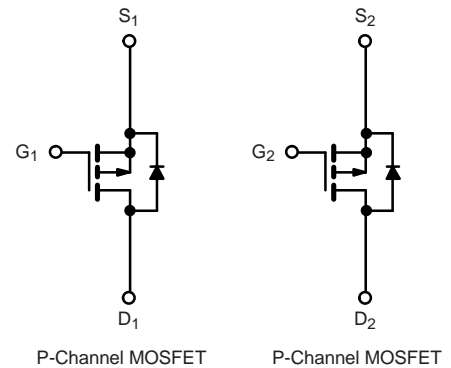
- DT-Trench Power MOSFET
- 100 % UIS Tested

APPLICATIONS

- Load Switches
 - Notebook PCs
 - Desktop PCs
 - Game Stations



RoHS
COMPLIANT



ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	- 20	V	
Gate-Source Voltage	V _{GS}	± 12		
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	- 5.0 ^e	A
		T _C = 70 °C	- 4.0 ^e	
		T _A = 25 °C	- 3.3 ^{a, b}	
		T _A = 70 °C	- 2.5 ^{a, b}	
Pulsed Drain Current	I _{DM}	- 20 ^e	A	
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C		
		T _A = 25 °C	- 2.9 ^{a, b}	
Avalanche Current	I _{AS}	- 10	mJ	
Single-Pulse Avalanche Energy	E _{AS}	15		
Maximum Power Dissipation	P _D	T _C = 25 °C	5.0	W
		T _C = 70 °C	2.2	
		T _A = 25 °C	1.5 ^{a, b}	
		T _A = 70 °C	0.8 ^{a, b}	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^{a, c}	R _{thJA}	30	40	°C/W	
Maximum Junction-to-Foot	R _{thJF}	15	20		

Notes:

- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under Steady State conditions is 85 °C/W.
- Based on T_C = 25 °C.
- Limited by package.

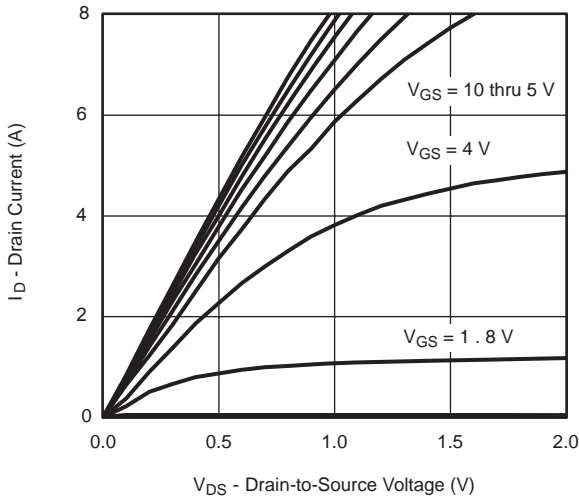
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-20			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		-25		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		4.0			
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-0.5		-1.5	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq -10\text{ V}, V_{GS} = -10\text{ V}$	-20			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -4\text{ A}$		0.048	0.055	Ω
		$V_{GS} = -2.5\text{ V}, I_D = -2.4\text{ A}$		0.065	0.073	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10\text{ V}, I_D = -4\text{ A}$		23		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1296		pF
Output Capacitance	C_{oss}		205			
Reverse Transfer Capacitance	C_{rss}		118			
Total Gate Charge	Q_g	$V_{DS} = -15\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -4\text{ A}$		7		nC
				5.5		
Gate-Source Charge	Q_{gs}	$V_{DS} = -15\text{ V}, V_{GS} = -2.5\text{ V}, I_D = -2.4\text{ A}$		2		nC
Gate-Drain Charge	Q_{gd}			1.5		
Gate Resistance	R_g		$f = 1\text{ MHz}$		6.8	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 15\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 1\text{ }\Omega$		7		ns
Rise Time	t_r			6.3		
Turn-Off Delay Time	$t_{d(off)}$			45		
Fall Time	t_f			10		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 15\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -2.5\text{ V}, R_g = 1\text{ }\Omega$		6		ns
Rise Time	t_r			3.5		
Turn-Off Delay Time	$t_{d(off)}$			40		
Fall Time	t_f			6		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			-4	A
Pulse Diode Forward Current	I_{SM}				-20	
Body Diode Voltage	V_{SD}	$I_S = -2\text{ A}, V_{GS} = 0\text{ V}$		-0.7	-1.0	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -2\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		14		ns
Body Diode Reverse Recovery Charge	Q_{rr}				3.5	

Notes:

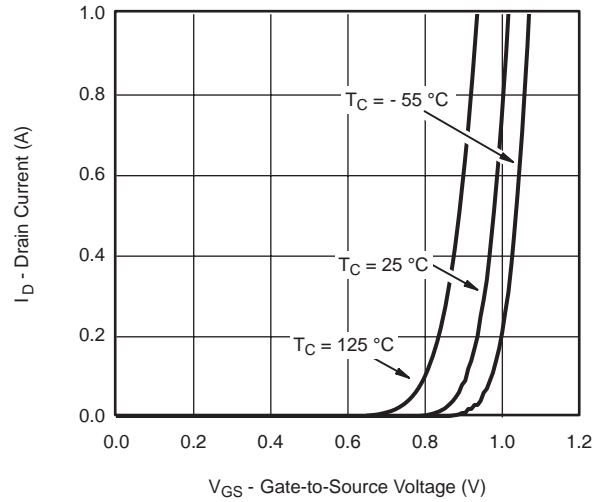
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

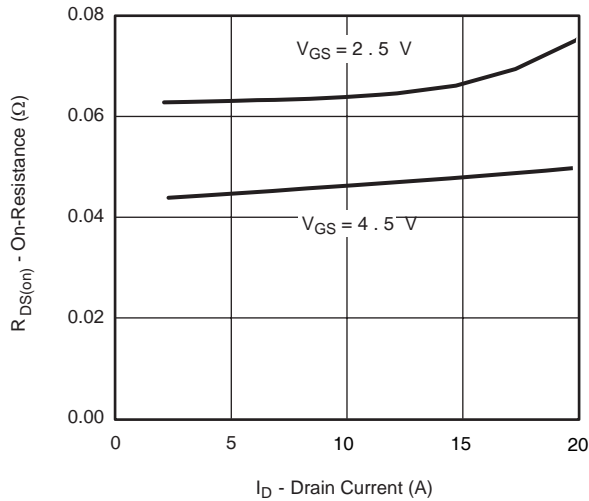
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



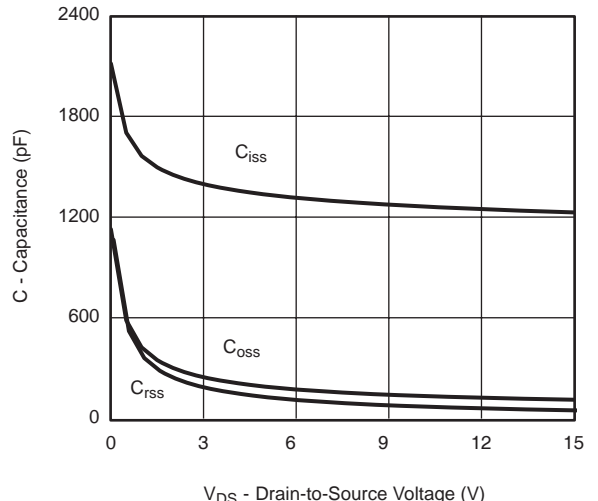
V_{DS} - Drain-to-Source Voltage (V)
Output Characteristics



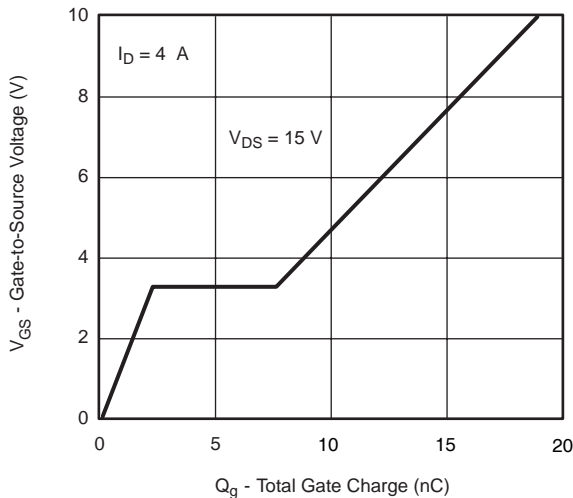
V_{GS} - Gate-to-Source Voltage (V)
Transfer Characteristics



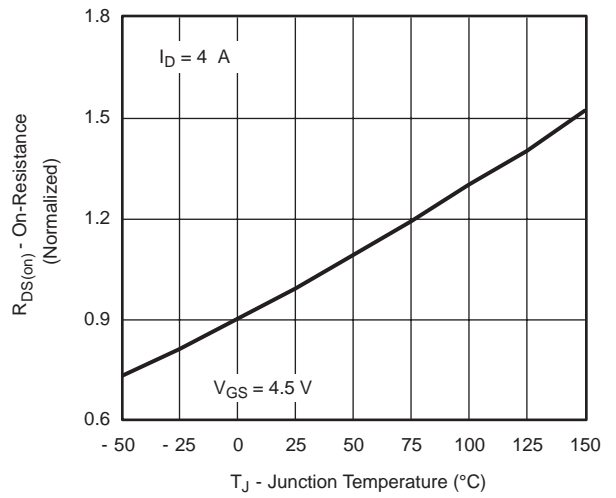
I_D - Drain Current (A)
On-Resistance vs. Drain Current



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

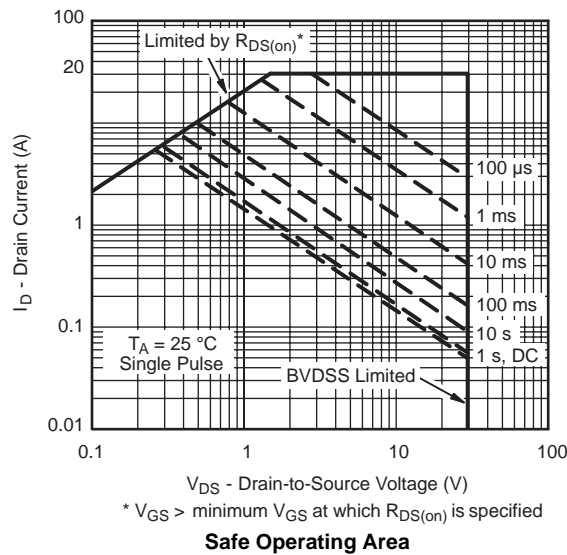
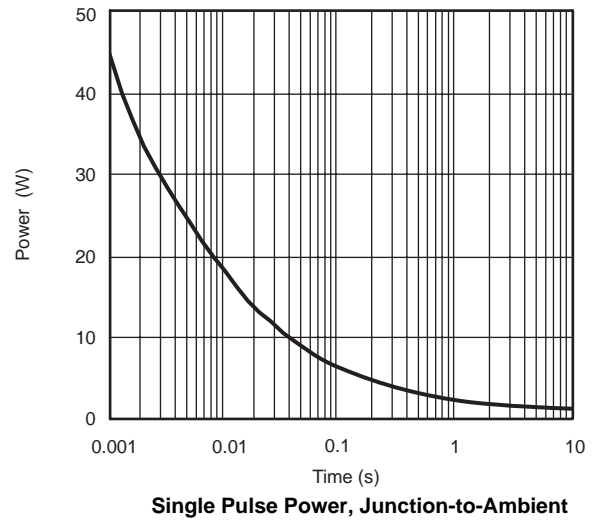
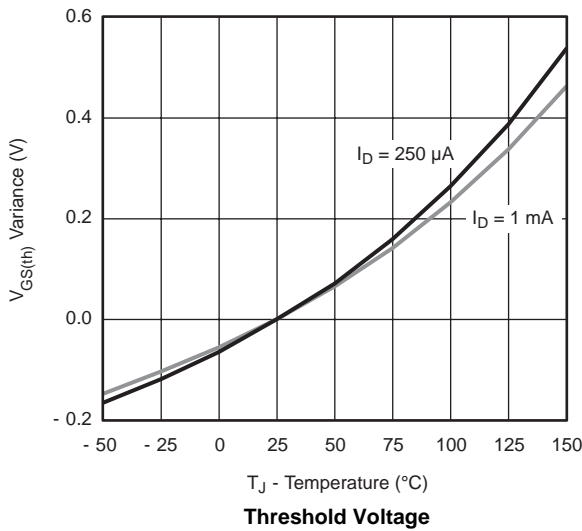
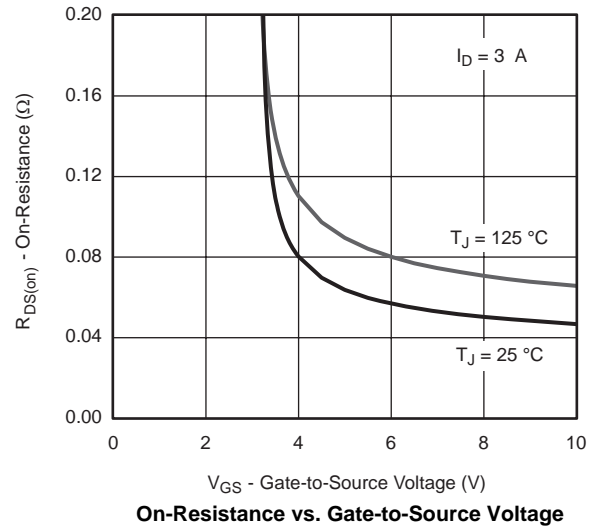
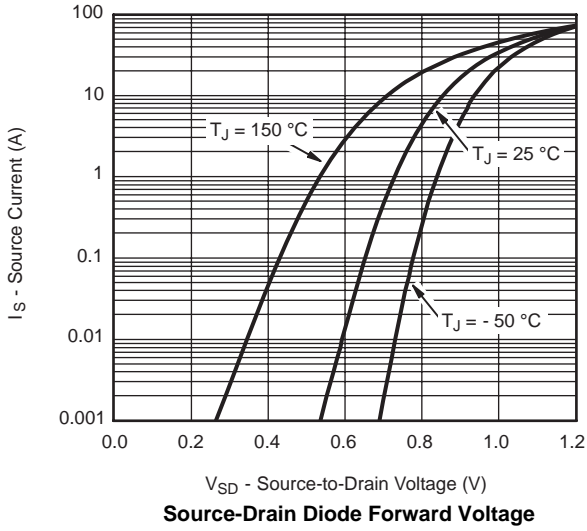


Q_g - Total Gate Charge (nC)
Gate Charge

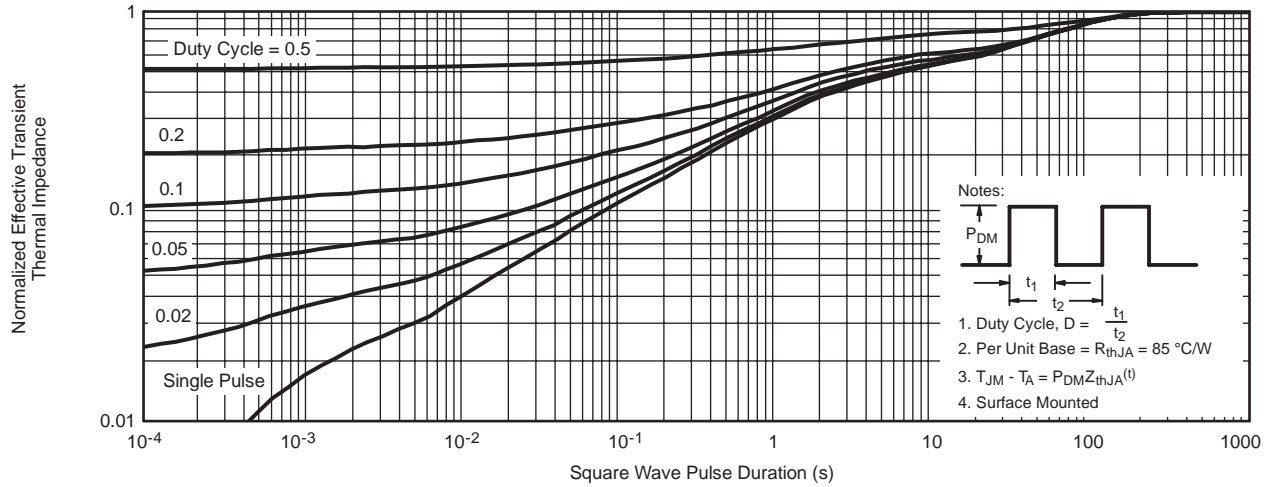


T_J - Junction Temperature ($^\circ\text{C}$)
On-Resistance vs. Junction Temperature

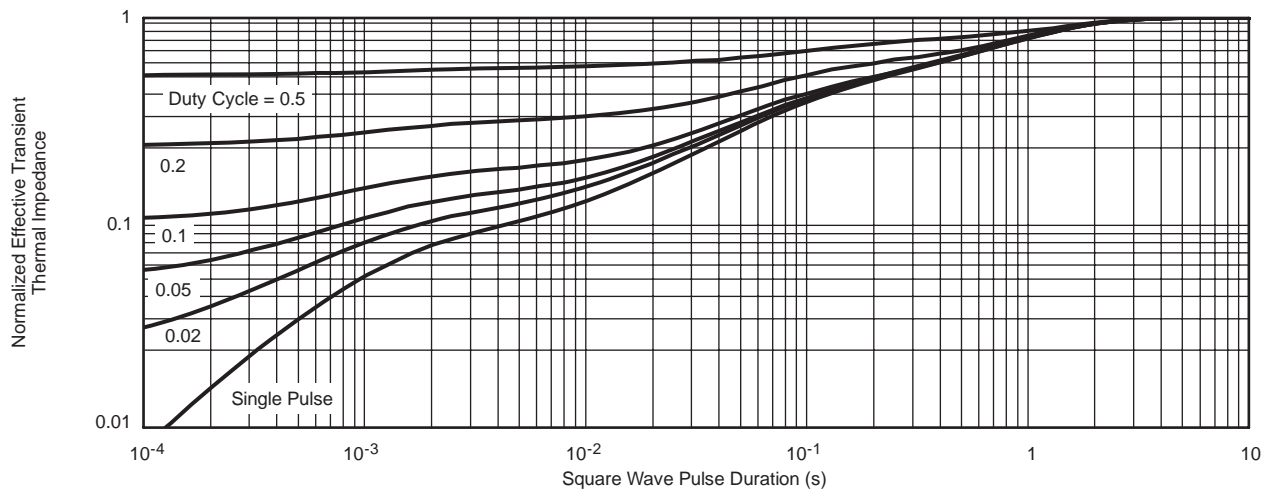
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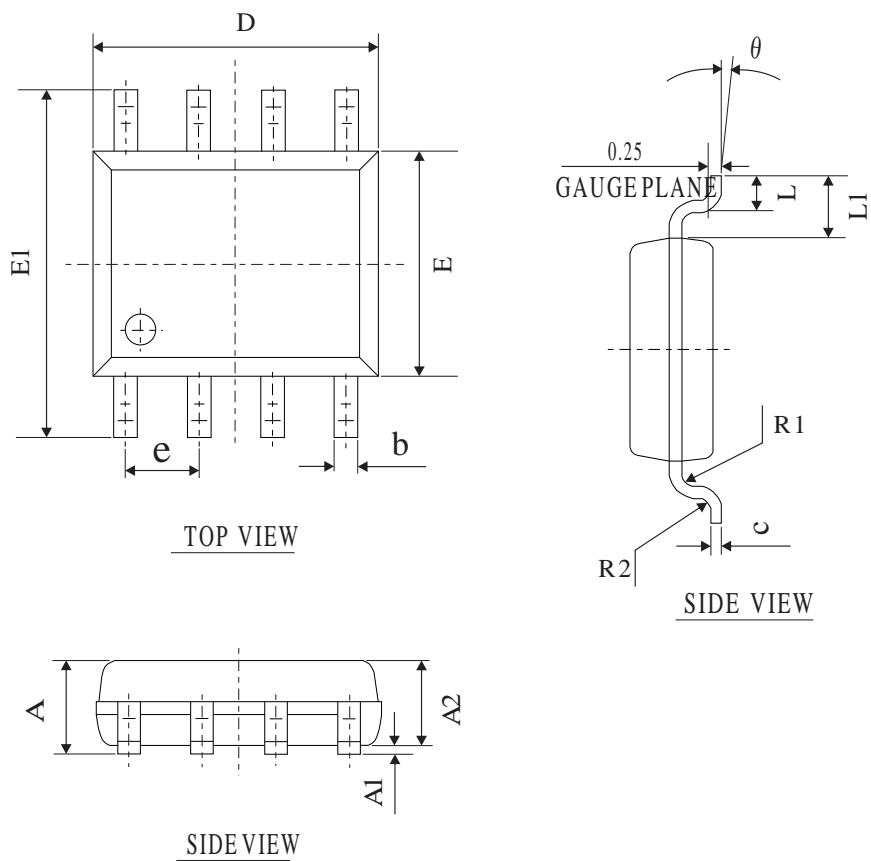


Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

SOP-8 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	1.30	1.60	1.85
A1	0.03	0.15	0.28
A2	1.20	1.45	1.70
b	0.26	0.40	0.54
C	0.132	0.203	0.273
D	4.50	4.90	5.30
E	3.50	3.00	4.30
E1	5.50	6.00	6.50
L	0.30	0.70	1.10
θ	2°	4°	6°
L1	1.04REF		
e	1.27BSC		
R1	0.07TYP		
R2	0.07TYP		

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