

Dual N-Channel 100 V (D-S) Super Junction MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (mΩ)(Typ.)	I _D (A) ^a	Q _g (Typ.)
100	30 at V _{GS} = 10 V	15	6.9 nC
	40 at V _{GS} = 4.5 V		

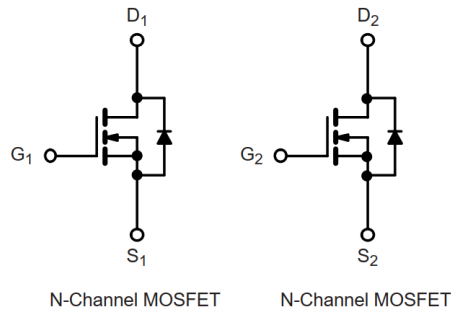
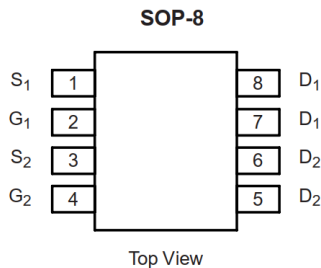
FEATURES

- DT-SJ Power MOSFET
- 100 % R_g and UIS tested
- Extremely Low Q_g for Switching Losses
- Compliant to RoHS Directive 2002/95/EC



APPLICATIONS

- Primary Side Switch



ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	100	V	
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C)	T _C = 25 °C	15	A	
	T _C = 70 °C	13		
	T _A = 25 °C	6.2 ^{b, c}		
	T _A = 70 °C	5.3 ^{b, c}		
Pulsed Drain Current	I _{DM}	60		
Continuous Source-Drain Diode Current	T _C = 25 °C	15		
	T _A = 25 °C	3.3 ^{b, c}		
Single Pulse Avalanche Current	I _{AS}	13.5		
Single Pulse Avalanche Energy	E _{AS}	14.8	mJ	
Maximum Power Dissipation	T _C = 25 °C	14	W	
	T _C = 70 °C	8.96		
	T _A = 25 °C	3.2 ^{b, c}		
	T _A = 70 °C	2.05 ^{b, c}		
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 ^{b, d}	R _{thJA}	40	60	°C/W	
Maximum Junction-to-Foot (Drain)	R _{thJF}	20	40		

Notes:

- Based on T_C = 25 °C.
- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under steady state conditions is 80 °C/W.

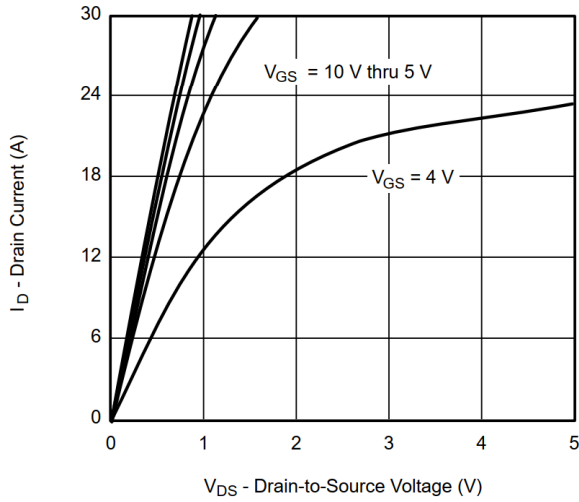
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$		172		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 10		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		3	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}	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$	15			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$		30	40	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 8\text{ A}$		35	50	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 10\text{ A}$		25		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		368		pF
Output Capacitance	C_{oss}			80		
Reverse Transfer Capacitance	C_{rss}			3		
Total Gate Charge	Q_g	$V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, I_D = 10\text{ A}$		6.9		nC
Gate-Source Charge	Q_{gs}			3.8		
Gate-Drain Charge	Q_{gd}			1.5		
Gate Resistance	R_g	$f = 1\text{ MHz}$		2.5		Ω
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 10\text{ }\Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$		6		ns
Rise Time	t_r			18		
Turn-Off Delay Time	$t_{d(off)}$			12		
Fall Time	t_f			9		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 10\text{ }\Omega$ $I_D \cong 8\text{ A}, V_{GEN} = 8\text{ V}, R_g = 1\text{ }\Omega$		13		
Rise Time	t_r			10		
Turn-Off Delay Time	$t_{d(off)}$			20		
Fall Time	t_f			6		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			15	A
Pulse Diode Forward Current ^a	I_{SM}				60	
Body Diode Voltage	V_{SD}	$I_S = 1\text{ A}$		0.7	1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		30		ns
Body Diode Reverse Recovery Charge	Q_{rr}			40		nC
Reverse Recovery Fall Time	t_a			20		ns
Reverse Recovery Rise Time	t_b			18		

Notes:

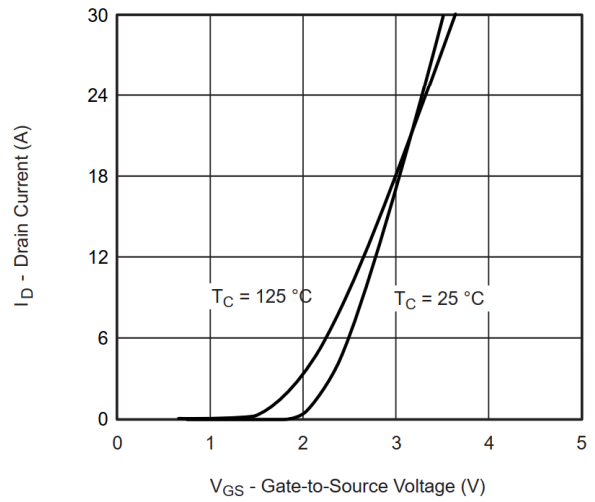
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- a. Guaranteed by design, not subject to production testing.

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.

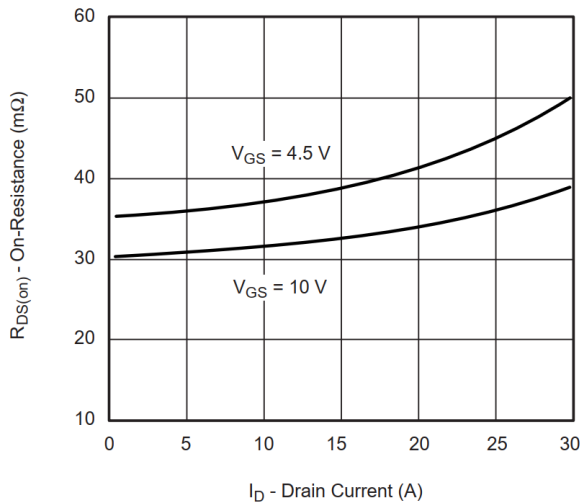
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



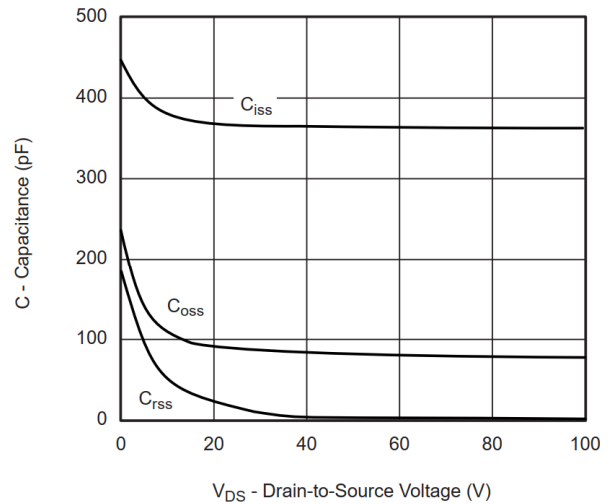
Output Characteristics



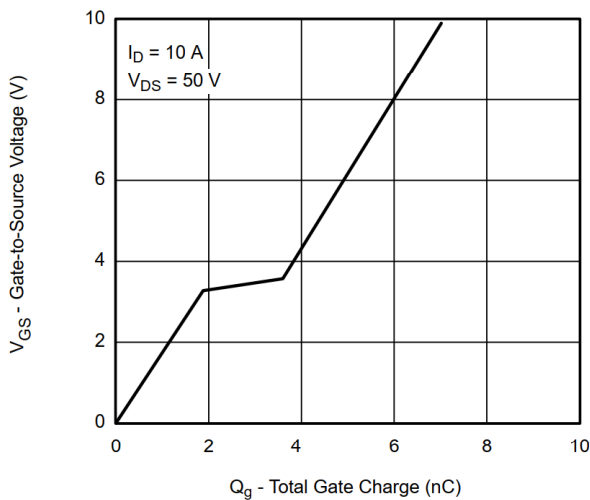
Transfer Characteristics



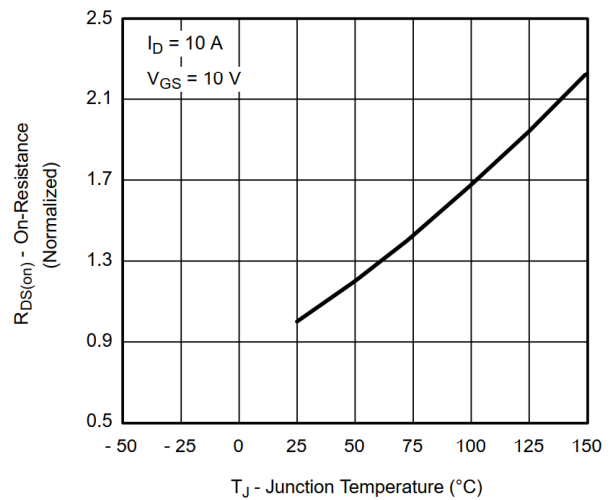
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

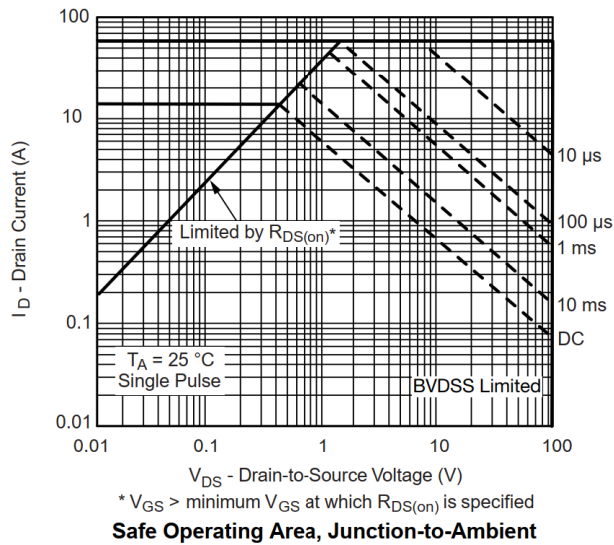
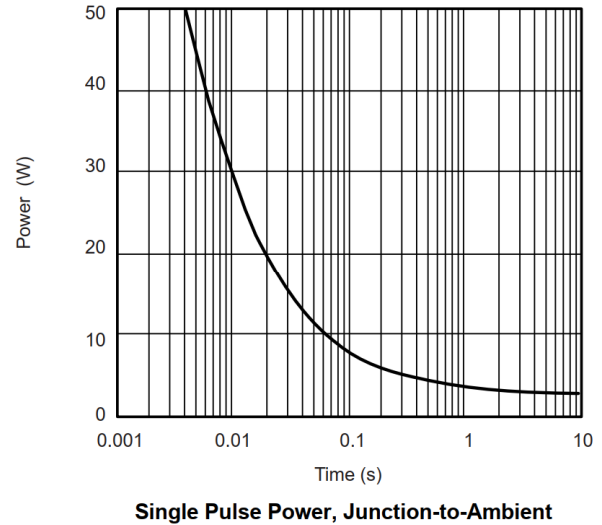
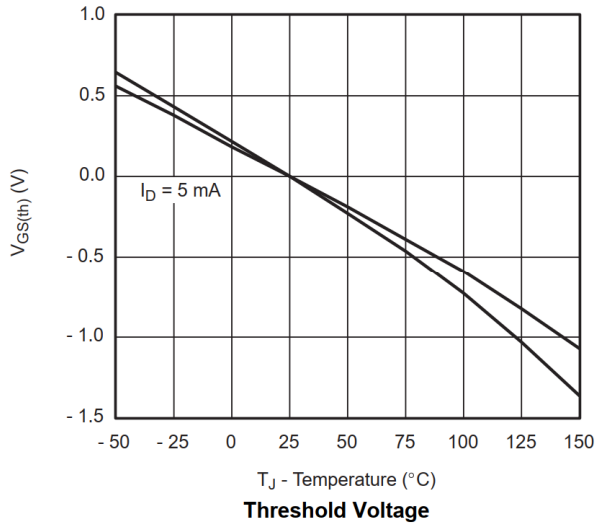
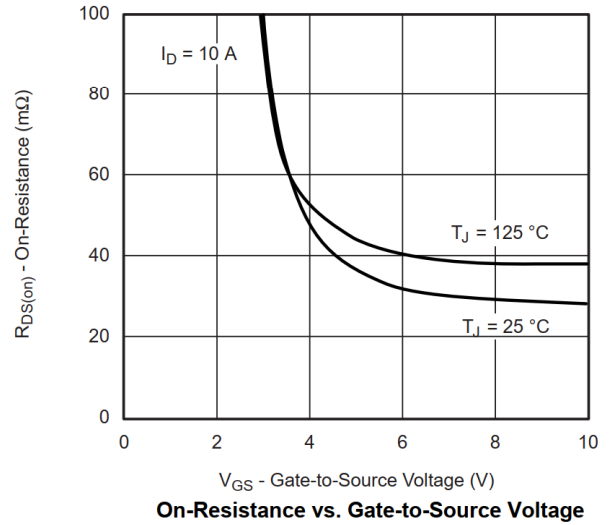
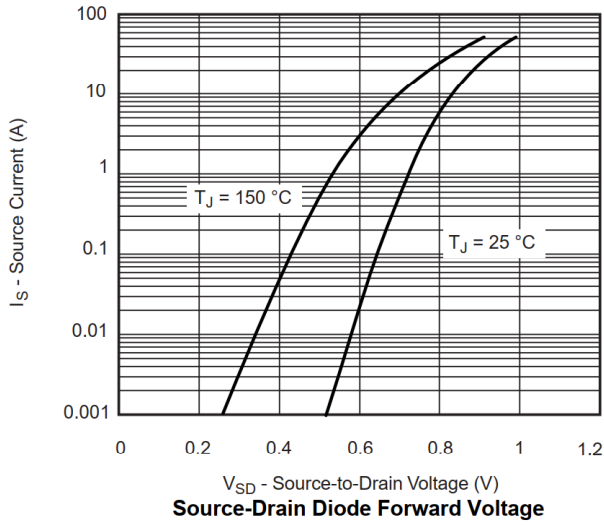


Gate Charge

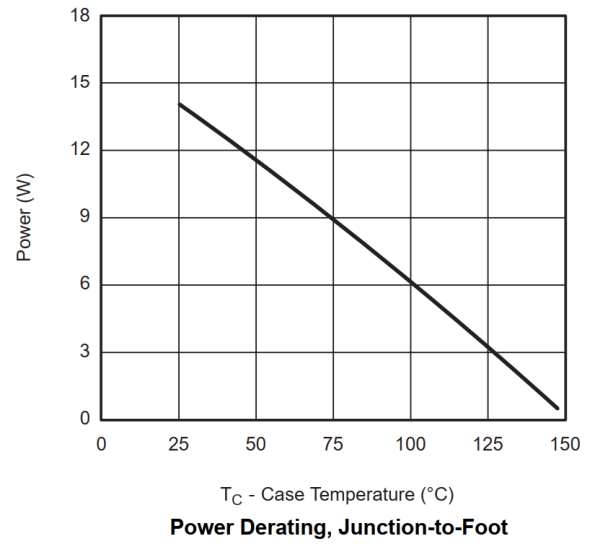
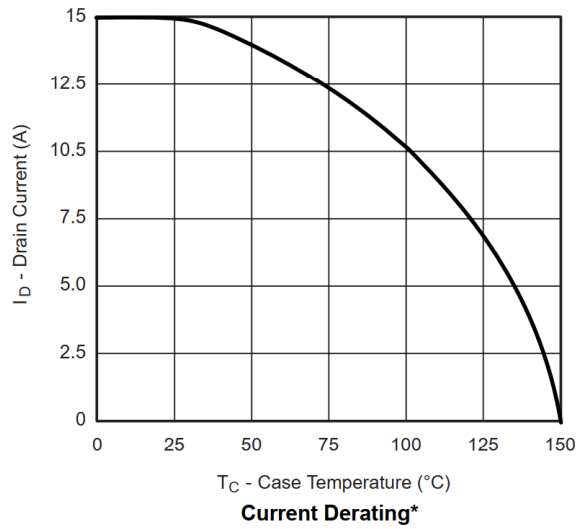


On-Resistance vs. Junction Temperature

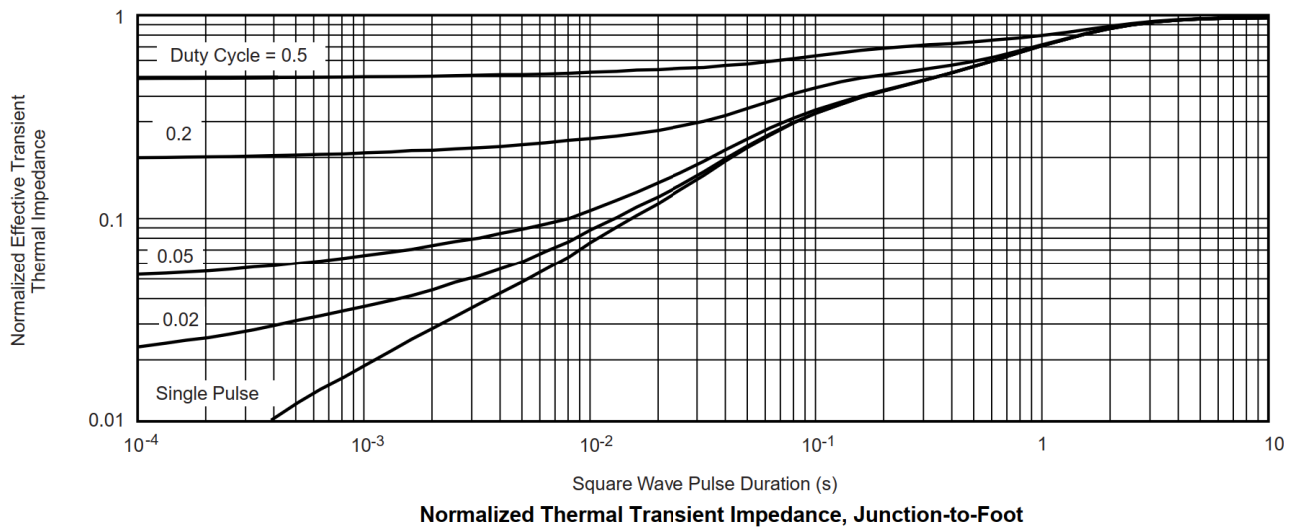
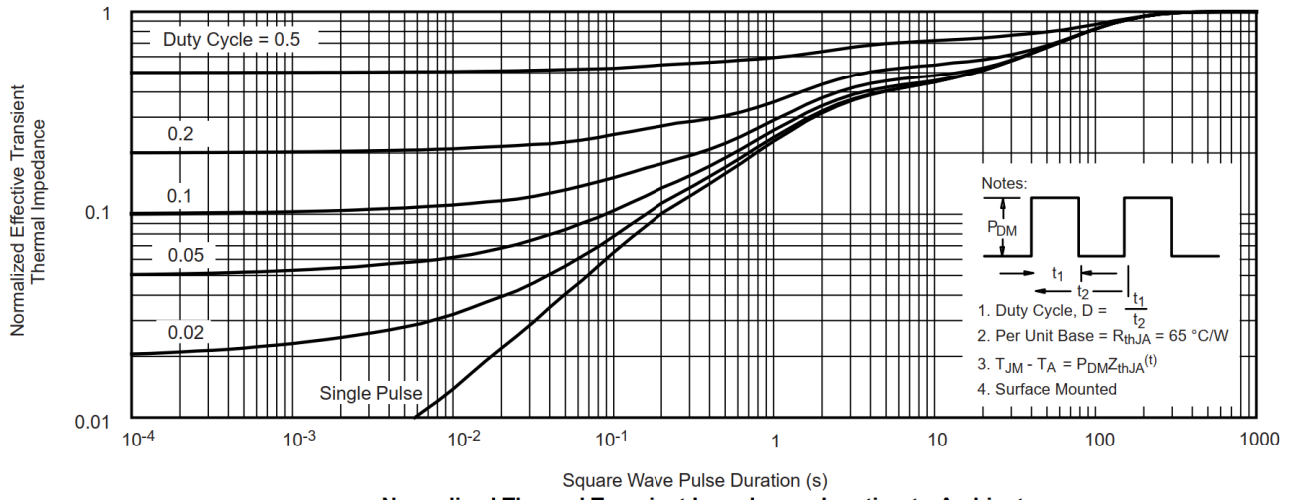
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



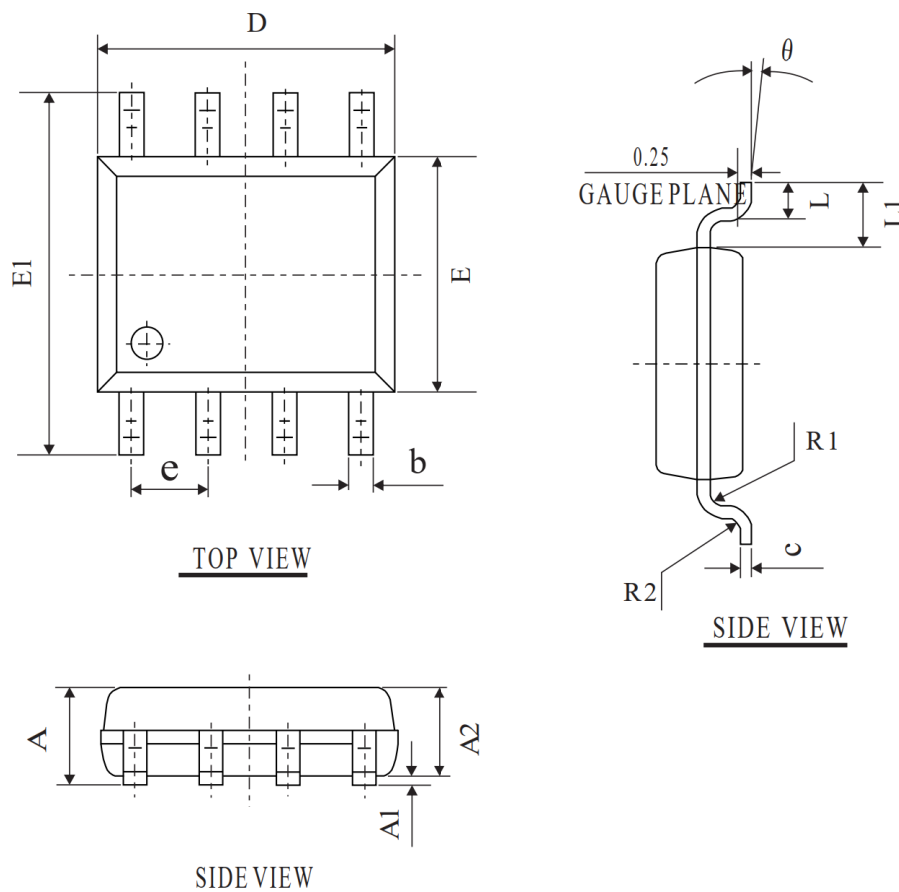
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SOP-8 PACKAGE OUTLINE



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		
c	1.27BSC		
R1	0.07TYP		
R2	0.07TYP		

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