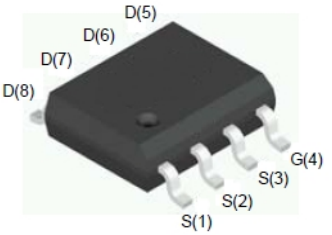
RU40P4H

P-Channel Advanced Power MOSFET

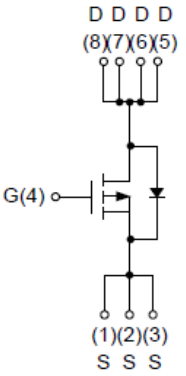
Features

- -40V/-4.5A,
  $R_{DS(ON)}$ =60mΩ (Typ.) @ V_{GS}=-10V
  $R_{DS(ON)}$ =80mΩ (Typ.) @ V_{GS}=-4.5V
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Available

Pin Description



SOP-8



P-Channel MOSFET

Applications

- Load Switches.

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		-40	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_A=25°C	-3	A
Mounted on Large Heat Sink				
I_{DP}	300μs Pulse Drain Current Tested	T_A=25°C	-18①	A
I_D	Continuous Drain Current	T_A=25°C	-4.5	A
		T_A=70°C	-3.6	
P_D	Maximum Power Dissipation	T_A=25°C	2.5	W
		T_A=70°C	1.6	
$R_{\theta JA}$②	Thermal Resistance-Junction to Ambient		50	°C/W

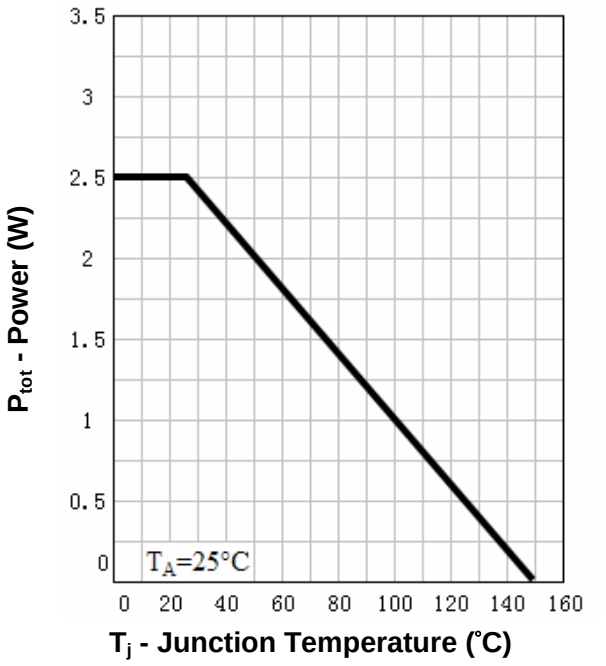
Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU40P4H			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250μA	-40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-40V, V_{GS}=0V			-1	μA
		T_J=85°C			-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=-250μA	-1	-1.8	-2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ③	Drain-Source On-state Resistance	V_{GS}=-10V, I_{DS}=-4.2A		60	70	mΩ
		V_{GS}=-4.5V, I_{DS}=-2A		80	105	mΩ
Diode Characteristics						
V_{SD} ③	Diode Forward Voltage	I_{SD}=-2A, V_{GS}=0V			-1	V
t_{rr}	Reverse Recovery Time	I_{SD}=-4.5A, dI_{SD}/dt=100A/μs		13		ns
Q_{rr}	Reverse Recovery Charge			8		nC
Dynamic Characteristics ④						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.2		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-20V, Frequency=1.0MHz		560		pF
C_{oss}	Output Capacitance			95		
C_{rss}	Reverse Transfer Capacitance			55		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-20V, R_L=4.4Ω, I_{DS}=-4.5A, V_{GEN}=-10V, R_G=6Ω		8		ns
t_r	Turn-on Rise Time			11		
$t_{d(OFF)}$	Turn-off Delay Time			27		
t_f	Turn-off Fall Time			12		
Gate Charge Characteristics ④						
Q_g	Total Gate Charge	V_{DS}=-32V, V_{GS}=-10V, I_{DS}=-4.5A		14	18	nC
Q_{gs}	Gate-Source Charge			3		
Q_{gd}	Gate-Drain Charge			4		

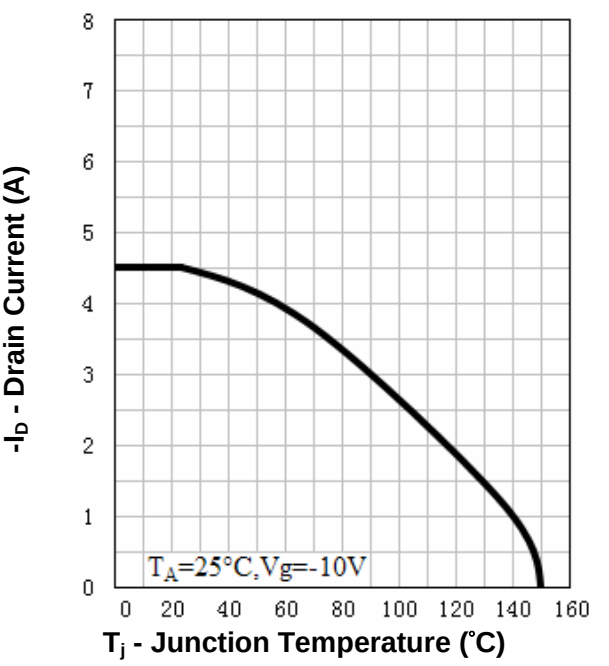
Notes: ①Pulse width limited by safe operating area.
②When mounted on 1 inch square copper board, t ≤10sec. The value in any given application depends on the user's specific board design.
③Pulse test ; Pulse width≤300μs, duty cycle≤2%.
④Guaranteed by design, not subject to production testing.

Typical Characteristics

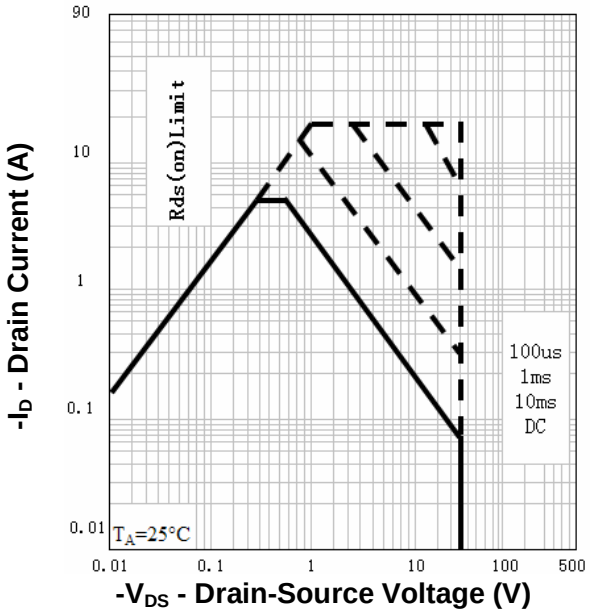
Power Dissipation



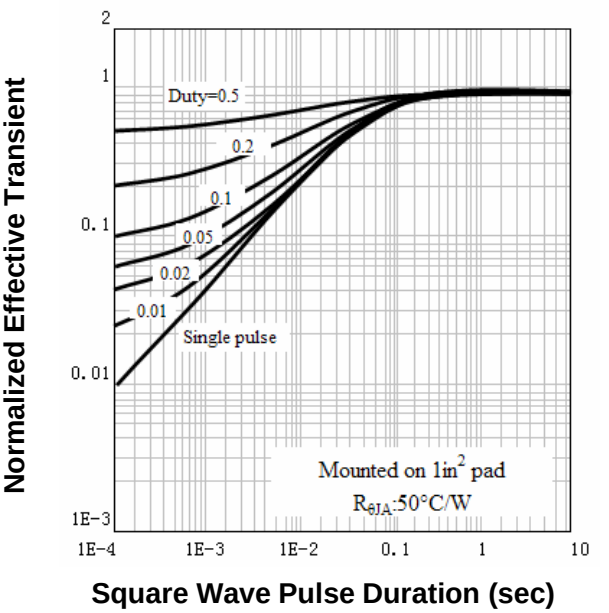
Drain Current



Safe Operation Area

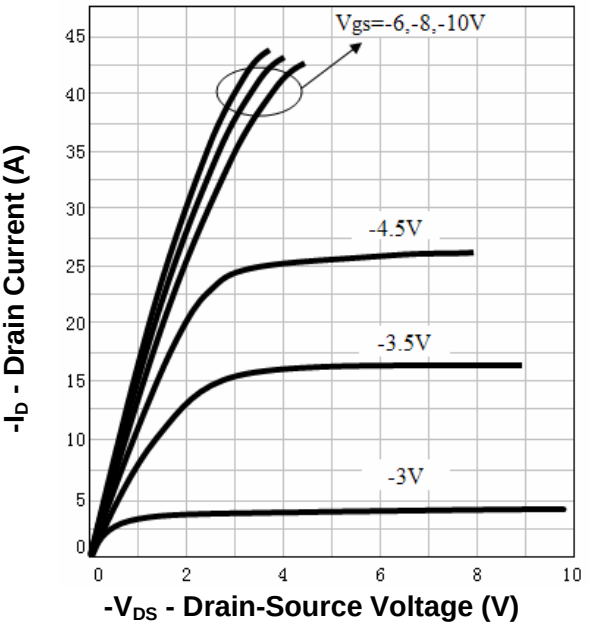


Thermal Transient Impedance

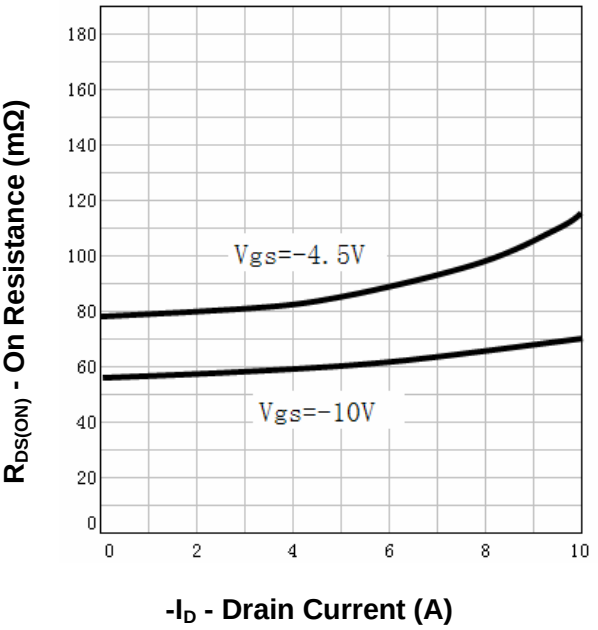


Typical Characteristics

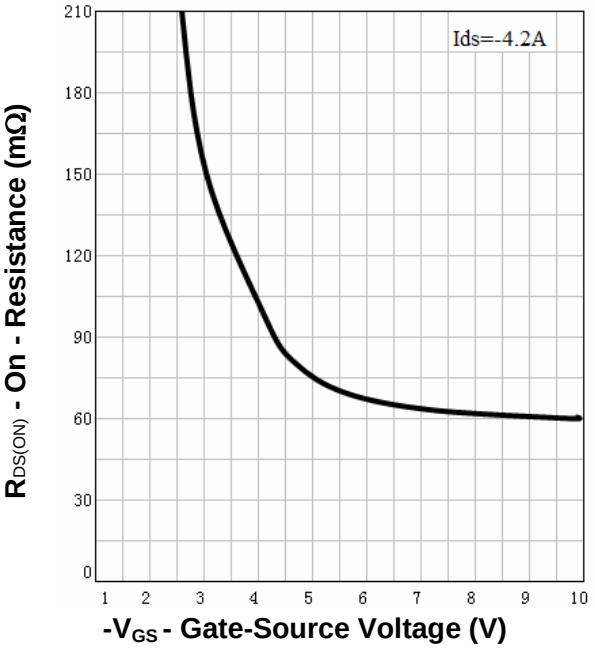
Output Characteristics



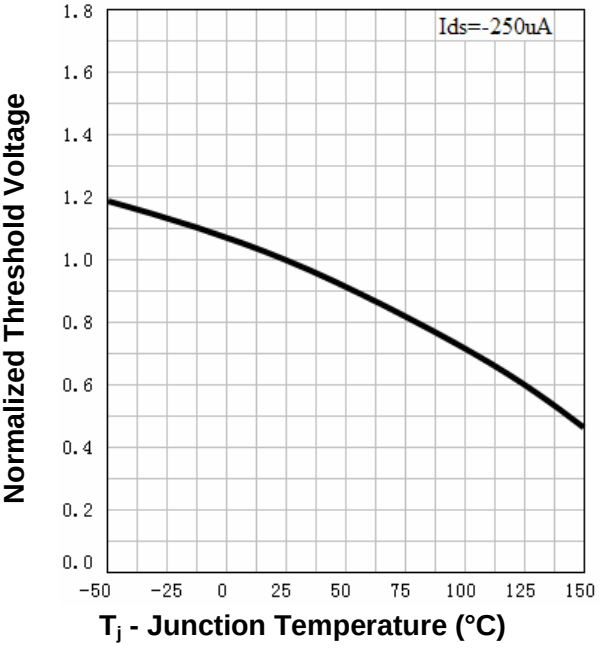
Drain-Source On Resistance



Drain-Source On Resistance

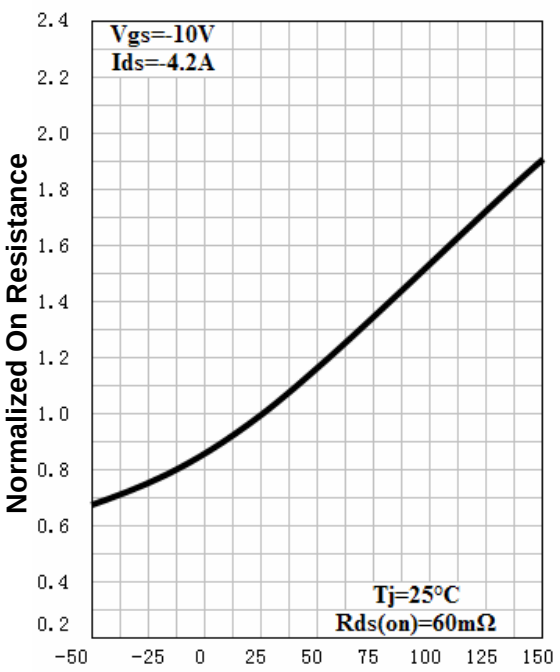


Gate Threshold Voltage



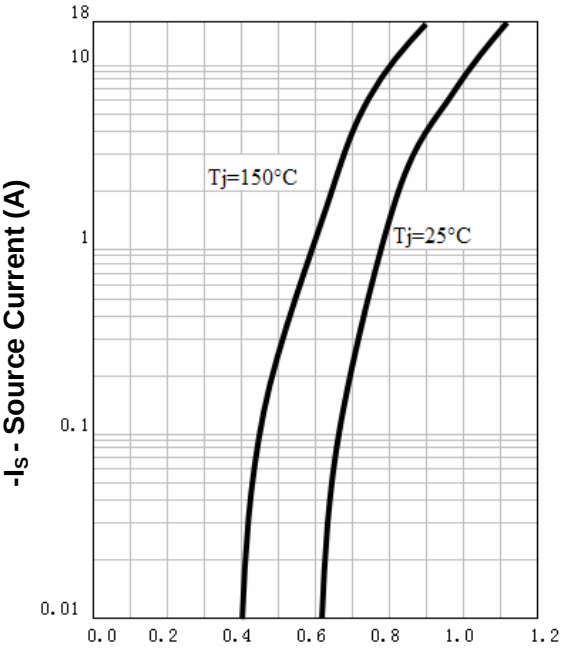
Typical Characteristics

Drain-Source On Resistance



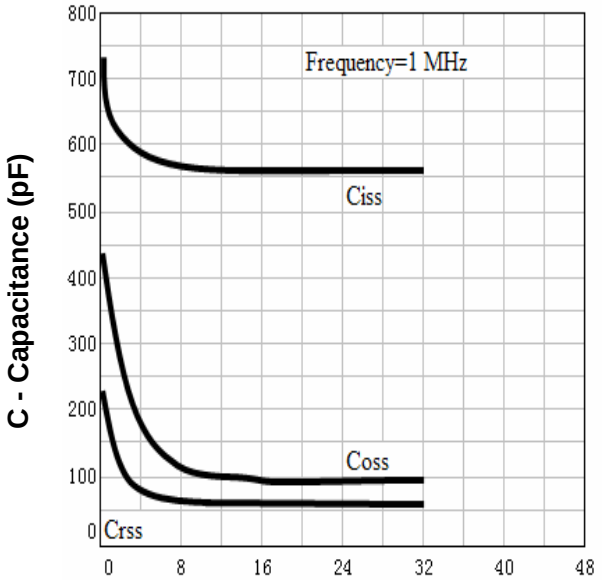
T_j - Junction Temperature (°C)

Source-Drain Diode Forward



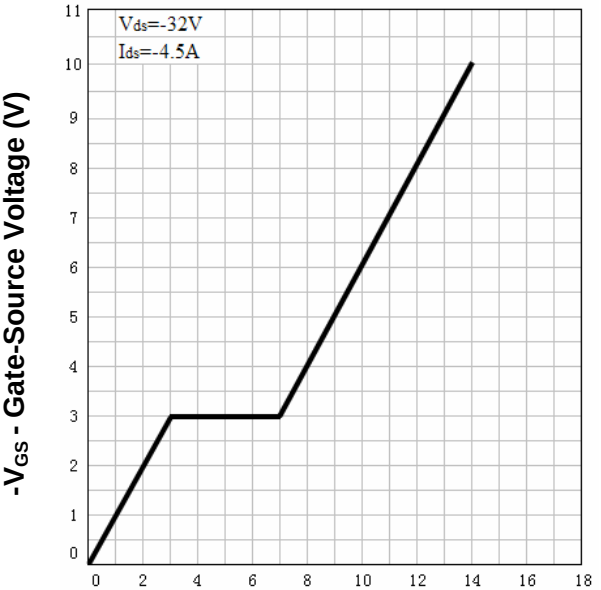
$-V_{SD}$ - Source-Drain Voltage (V)

Capacitance



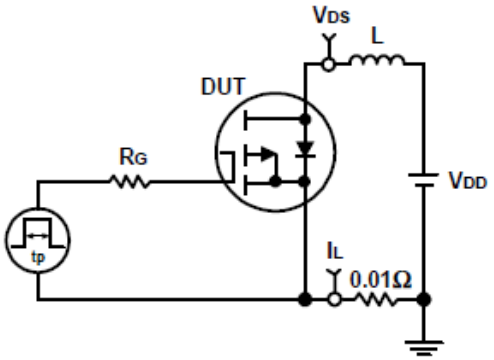
$-V_{DS}$ - Drain-Source Voltage (V)

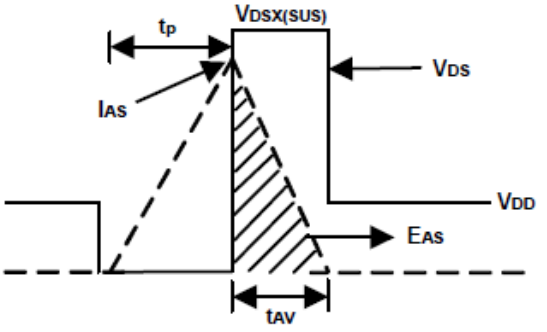
Gate Charge



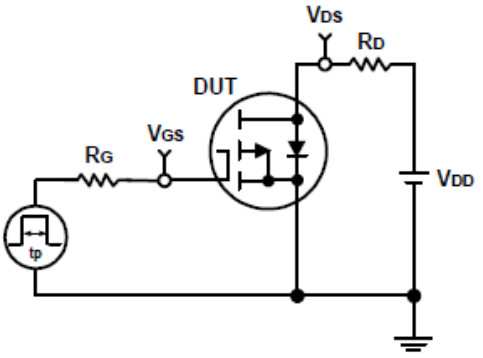
Q_G - Gate Charge (nC)

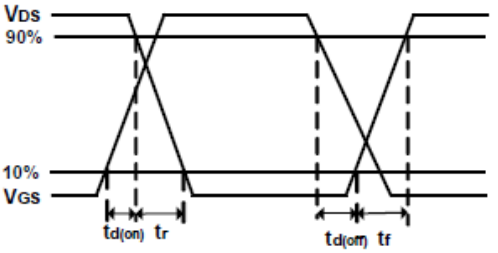
Avalanche Test Circuit and Waveforms





Switching Time Test Circuit and Waveforms





Ordering and Marking Information

RU40P4

Package (Available)

H : SOP-8

Operating Temperature Range

C : -55 to 150 ºC

Assembly Material

G : Green & Lead Free

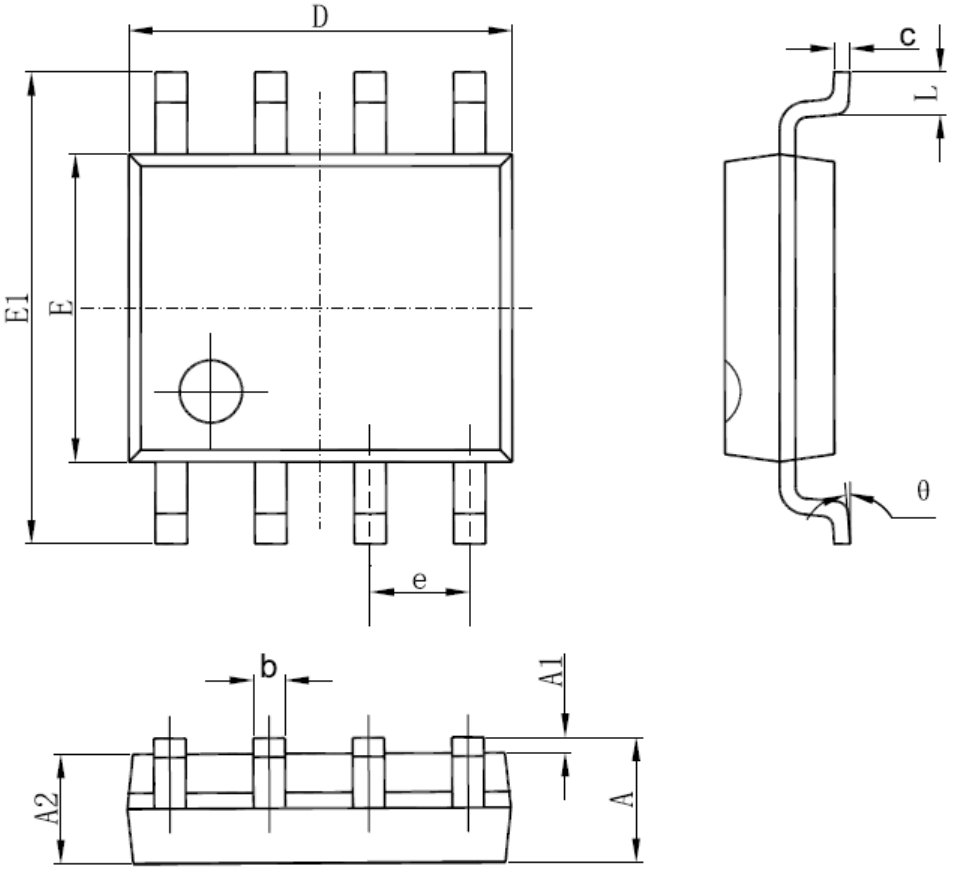
Packaging

T : TUBE

TR : Tape & Reel

Package Information

SOP-8



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

ALL DIMENSIONS REFER TO JEDEC STANDARD
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

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