

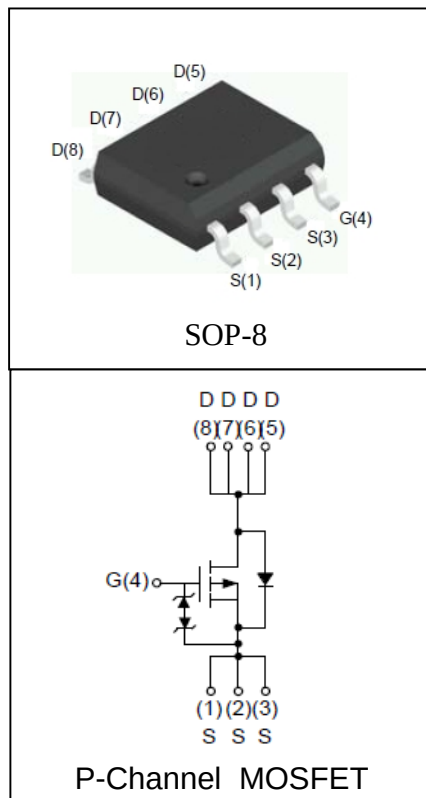
Features

- -40V/-9.5A,
 $R_{DS(ON)} = 19m\Omega$ (Type) @ $V_{GS} = -10V$
 $R_{DS(ON)} = 30m\Omega$ (Type) @ $V_{GS} = -4.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- ESD Protected
- Lead Free and Green Available

Applications

- DC-DC Converter.

Pin Description



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 _C =25°C	-9.5	A
Mounted on Large Heat Sink				
I _{DP}	300μs Pulse Drain Current Tested	T _C =25°C	-38 ^①	A
I _D	Continuous Drain Current	T _C =25°C	-9.5	A
		T _C =70°C	-8	
P _D	Maximum Power Dissipation	T _C =25°C	3.1	W
		T _C =70°C	2.0	
R _{θJA} ^②	Thermal Resistance-Junction to Ambient		40	°C/W

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU40L10H			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			±10	μA
R _{DS(ON)} ③	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-9A		19	22	mΩ
		V _{GS} =-4.5V, I _{DS} =-8A		30	34	mΩ
Diode Characteristics						
V _{SD} ③	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V			-1	V
t _{rr}	Reverse Recovery Time	I _{SD} =-9A, dI _{SD} /dt=100A/μs		36		ns
Q _{rr}	Reverse Recovery Charge			28		nC
Dynamic Characteristics ④						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.5		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-20V, Frequency=1.0MHz		2310		pF
C _{oss}	Output Capacitance			250		
C _{rss}	Reverse Transfer Capacitance			165		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-20V, R _L =30Ω, I _{DS} =-9A, V _{GEN} =-10V, R _G =6Ω		13		ns
t _r	Turn-on Rise Time			20		
t _{d(OFF)}	Turn-off Delay Time			39		
t _f	Turn-off Fall Time			19		
Gate Charge Characteristics ④						
Q _g	Total Gate Charge	V _{DS} =-32V, V _{GS} =-10V, I _{DS} =-9A		40	52	nC
Q _{gs}	Gate-Source Charge			8		
Q _{gd}	Gate-Drain Charge			12		

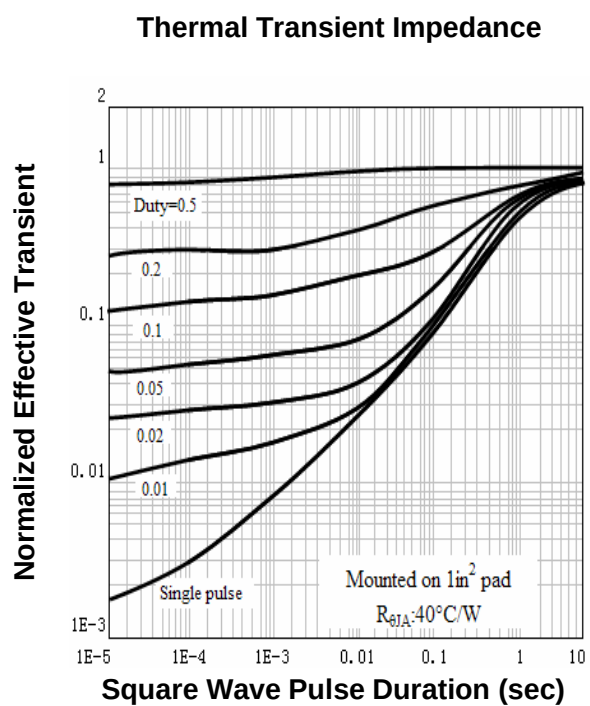
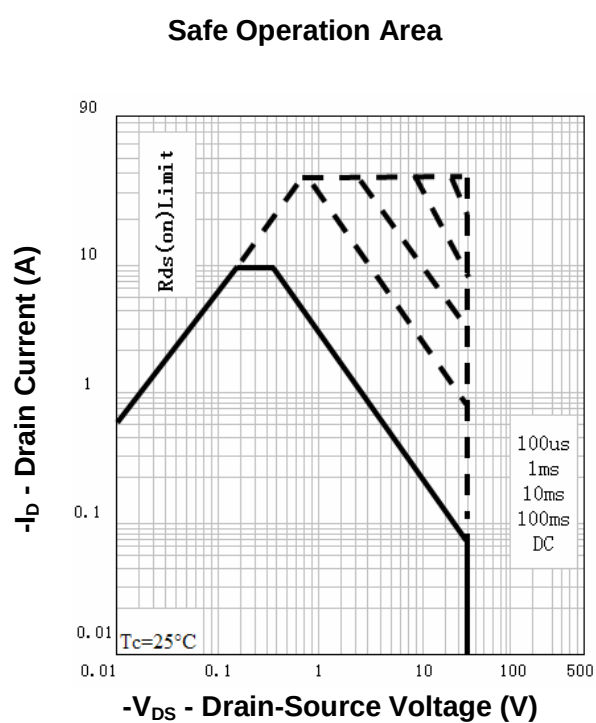
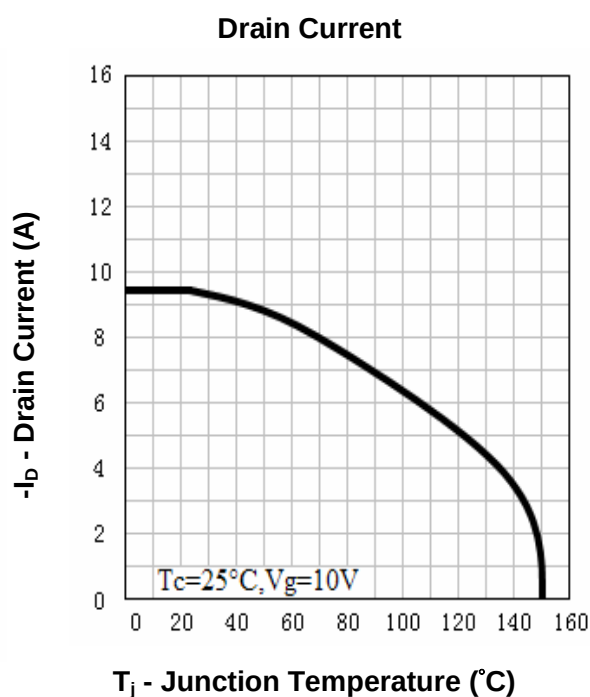
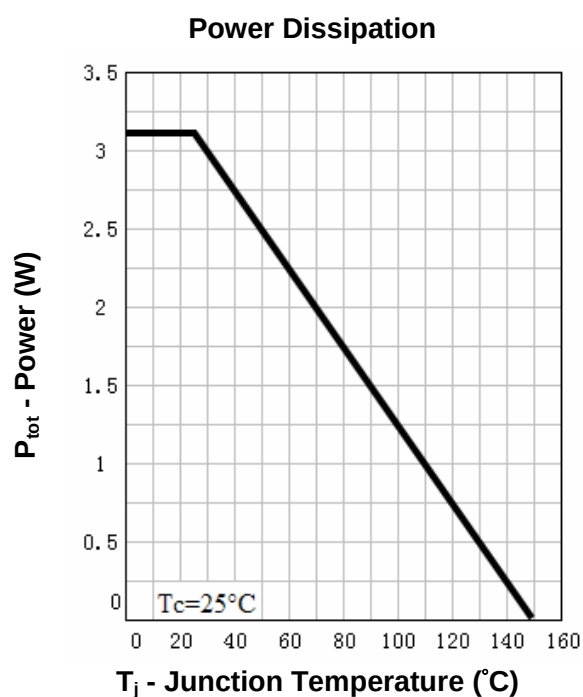
Notes: ① Pulse width limited by safe operating area.

② When mounted on 1 inch square copper board, $t \leq 10\text{sec}$. The value in any given application depends on the user's specific board design.

③ Pulse test ; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

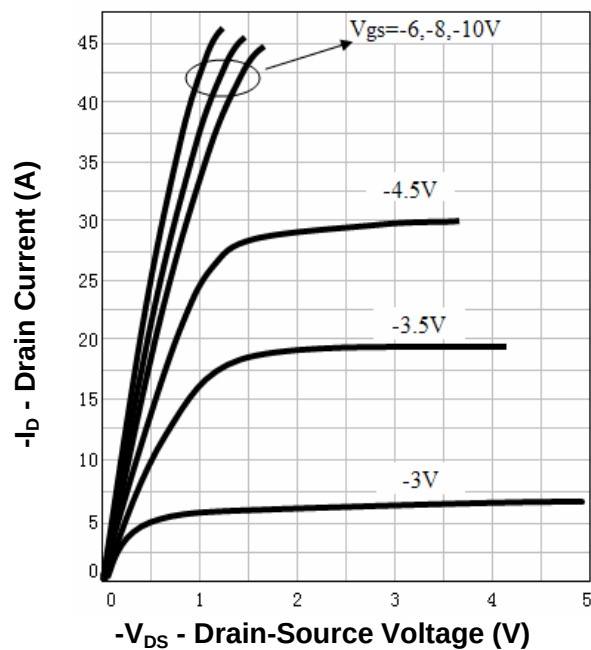
④ Guaranteed by design, not subject to production testing.

Typical Characteristics

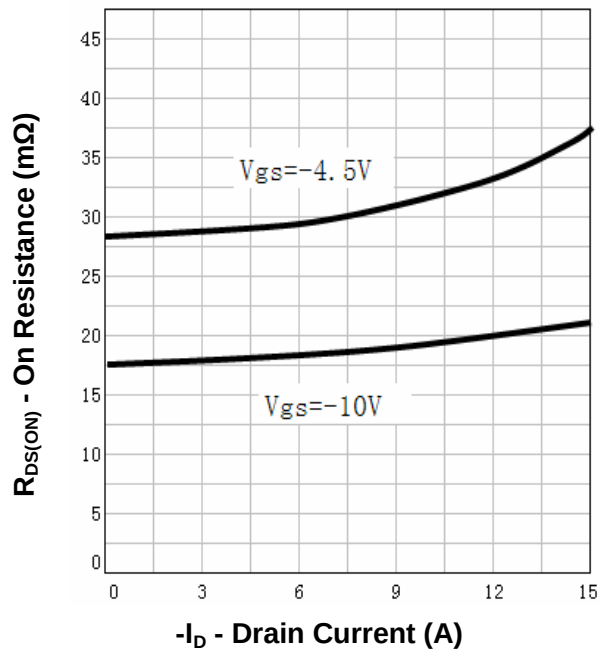


Typical Characteristics

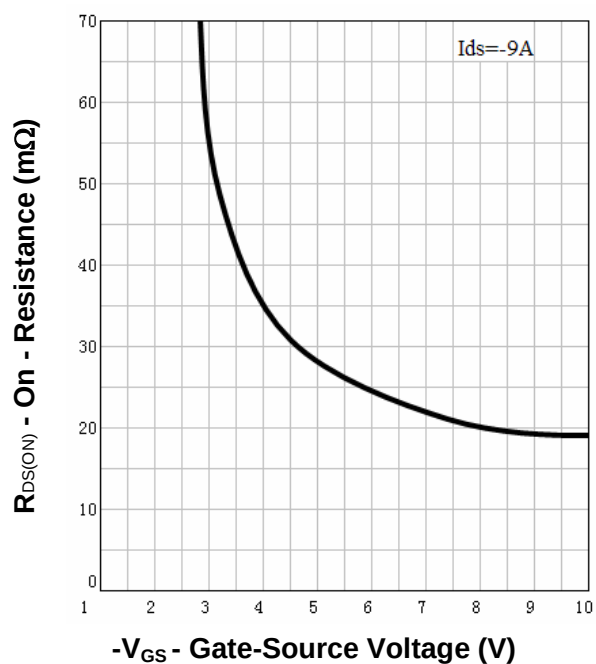
Output Characteristics



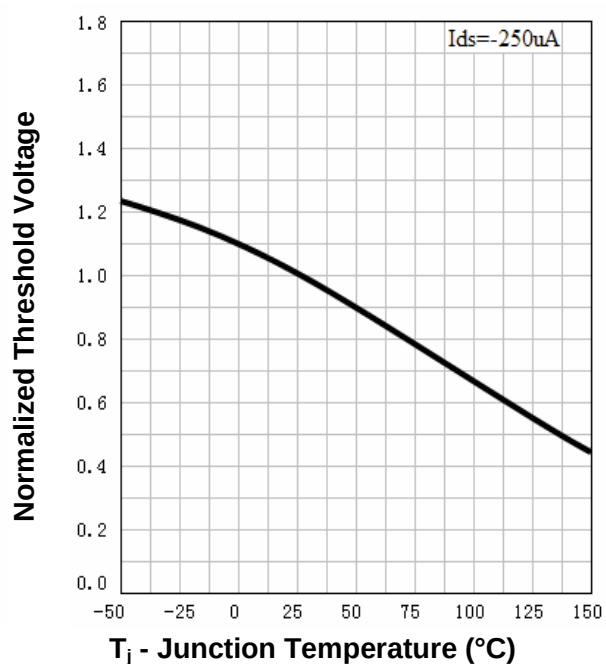
Drain-Source On Resistance



Drain-Source On Resistance

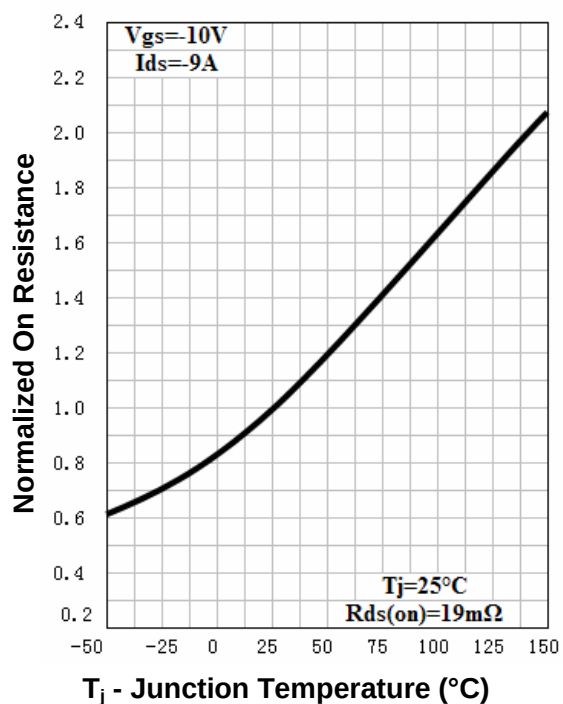


Gate Threshold Voltage

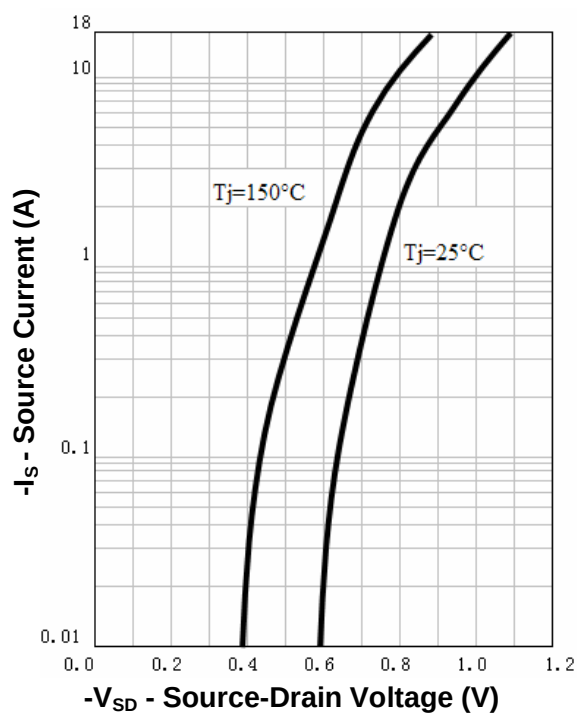


Typical Characteristics

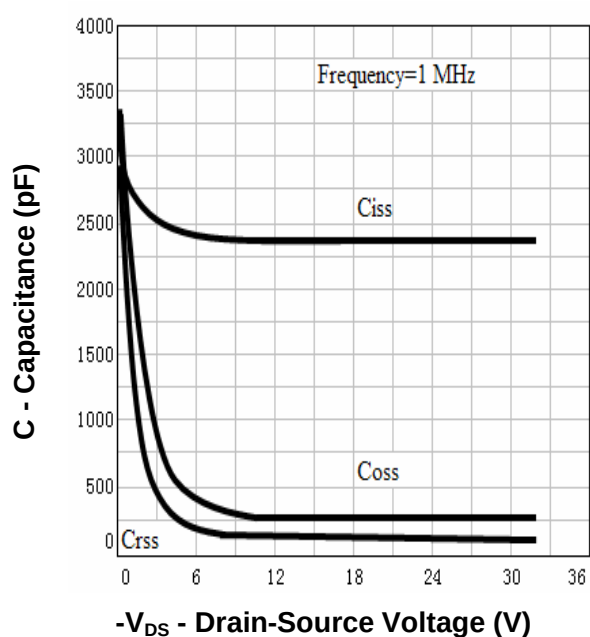
Drain-Source On Resistance



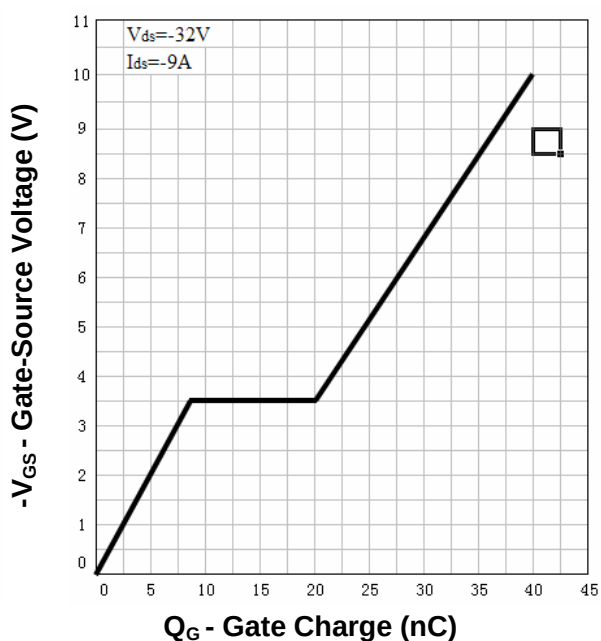
Source-Drain Diode Forward



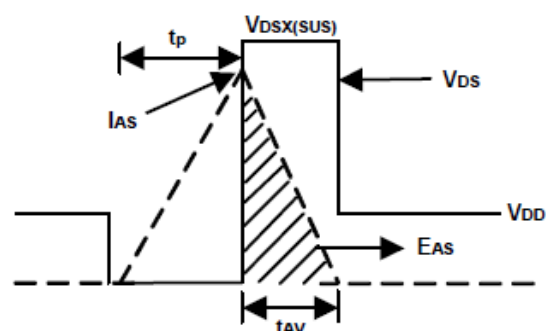
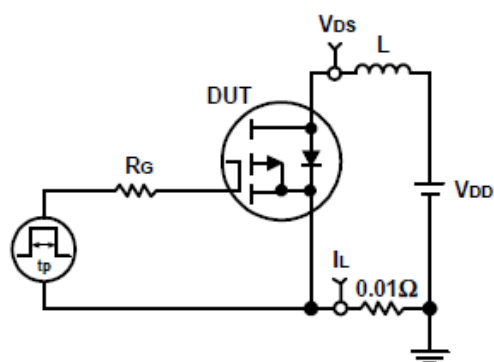
Capacitance



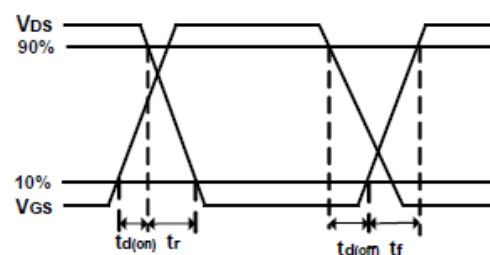
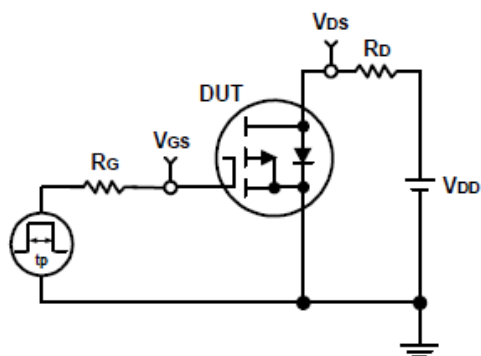
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Ordering and Marking Information**RU40L10****Package (Available)**

H : SOP-8

Operating Temperature Range

C : -55 to 150 °C

Assembly Material

G : Green & Lead Free

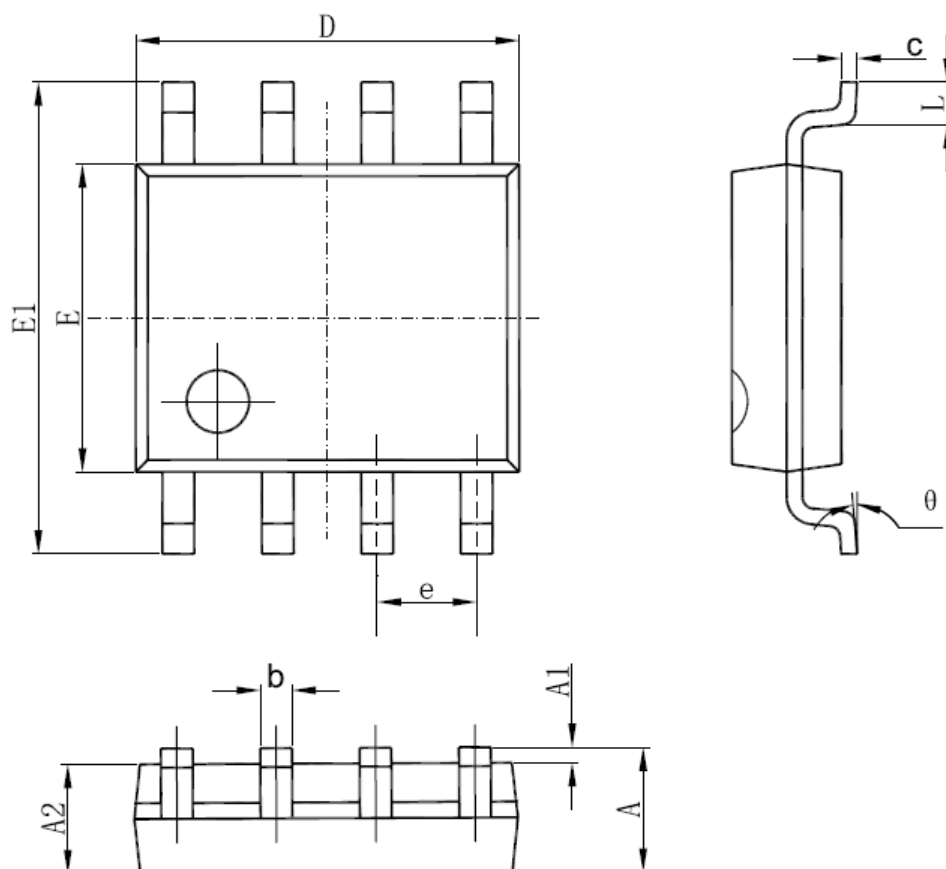
Packaging

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

Customer Service

Worldwide Sales and Service:

Sales@ruichips.com

Technical Support:

Technical@ruichips.com

Investor Relations Contacts:

Investor@ruichips.com

Marcom Contact:

Marcom@ruichips.com

Editorial Contact:

Editorial@ruichips.com

HR Contact:

HR@ruichips.com

Legal Contact:

Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD

Room 501, the 5floor An Tong Industrial Building,
NO.207 Mei Hua Road Fu Tian Area Shen Zhen City, CHINA

TEL: (86-755) 8311-5334

FAX: (86-755) 8311-4278

E-mail: Sales-SZ@ruichips.com