

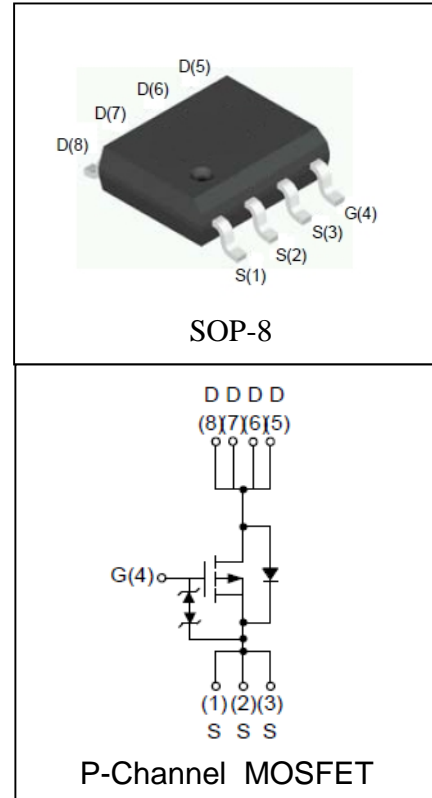
### Features

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

### Applications

- DC-DC Converter.

### Pin Description



### Absolute Maximum Ratings

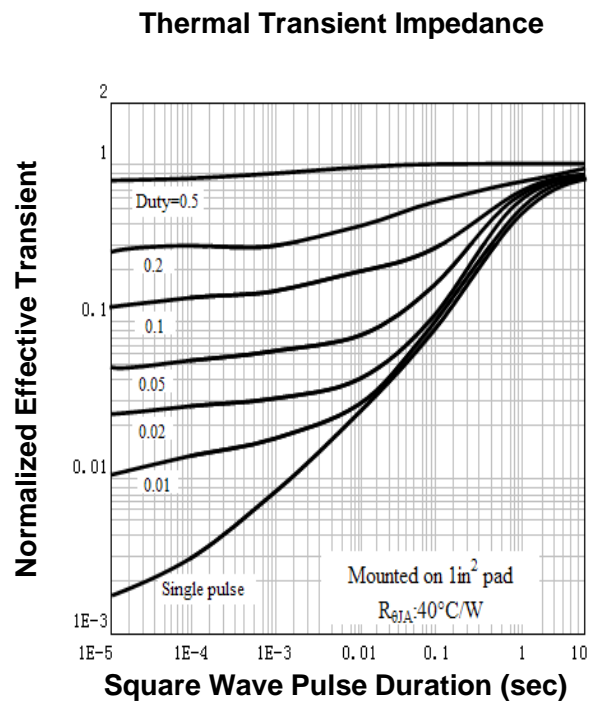
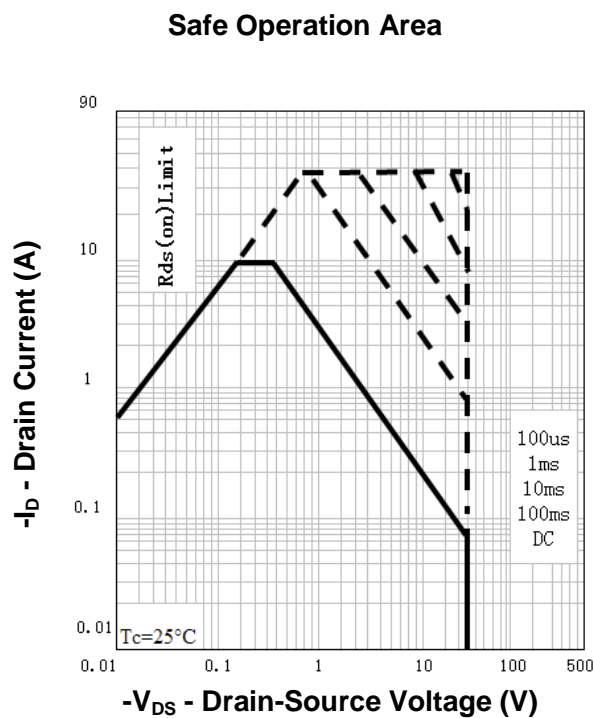
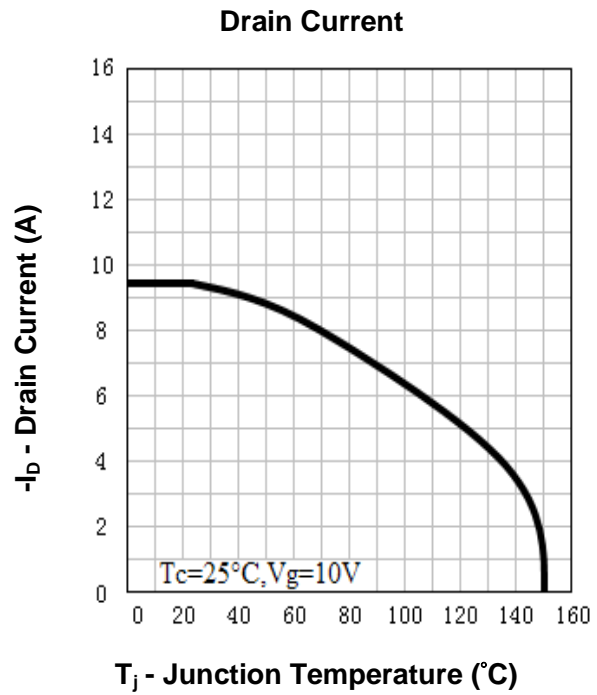
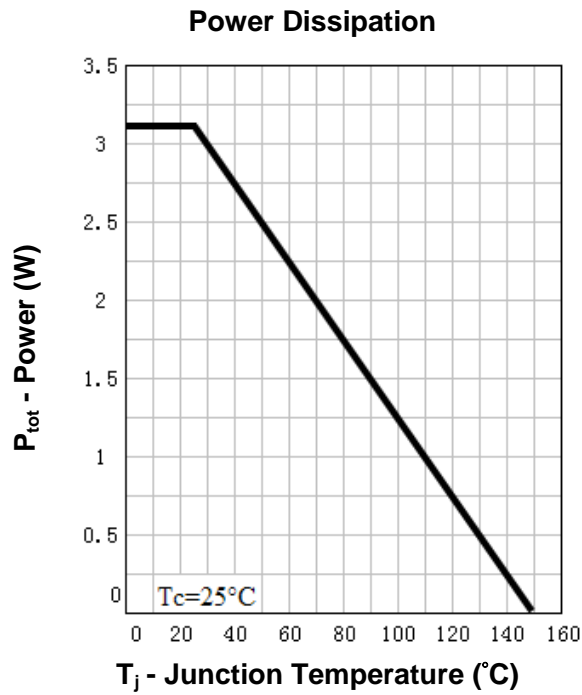
Symbol	Parameter	Rating	Unit	
<b>Common Ratings</b> ( $T_A = 25^\circ C$ Unless Otherwise Noted)				
$V_{DSS}$	Drain-Source Voltage	-40	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$		
$T_J$	Maximum Junction Temperature	150	$^\circ C$	
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$	
$I_S$	Diode Continuous Forward Current	$T_C = 25^\circ C$ -9.5	A	
<b>Mounted on Large Heat Sink</b>				
$I_{DP}$	300 $\mu s$ Pulse Drain Current Tested	$T_C = 25^\circ C$ -38 <sup>①</sup>	A	
$I_D$	Continuous Drain Current ( $V_{GS} = -10V$ )	$T_C = 25^\circ C$	-9.5	A
		$T_C = 70^\circ C$	-8	
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	3.1	W
		$T_C = 70^\circ C$	2.0	
$R_{\theta JA}$ <sup>②</sup>	Thermal Resistance-Junction to Ambient	40	$^\circ C/W$	

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

Symbol	Parameter	Test Condition	RU40L10H			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-40			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-40V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			-1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-1	-1.8	-2.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 10$	$\mu A$
$R_{DS(on)}^{(3)}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_{DS}=-9A$		19	22	$m\Omega$
		$V_{GS}=-4.5V, I_{DS}=-8A$		30	34	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(3)}$	Diode Forward Voltage	$I_{SD}=-1A, V_{GS}=0V$			-1	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=-9A, di_{SD}/dt=100A/\mu s$		36		ns
$Q_{rr}$	Reverse Recovery Charge			28		nC
<b>Dynamic Characteristics</b> <sup>(4)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.5		$\Omega$
$C_{iss}$	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	$V_{DD}=-20V, R_L=30\Omega,$ $I_{DS}=-9A, V_{GEN}=-10V,$ $R_G=6\Omega$		13		ns
$t_r$	Turn-on Rise Time			20		
$t_{d(OFF)}$	Turn-off Delay Time			39		
$t_f$	Turn-off Fall Time			19		
<b>Gate Charge Characteristics</b> <sup>(4)</sup>						
$Q_g$	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		

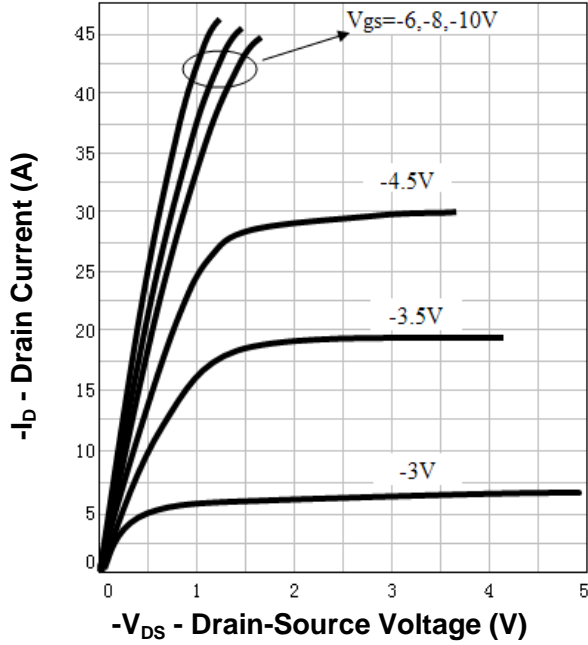
- Notes: ① Pulse width limited by safe operating area.  
 ② When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ . The value in any given application depends on the user's specific board design.  
 ③ Pulse test ; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .  
 ④ Guaranteed by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

**Typical Characteristics**

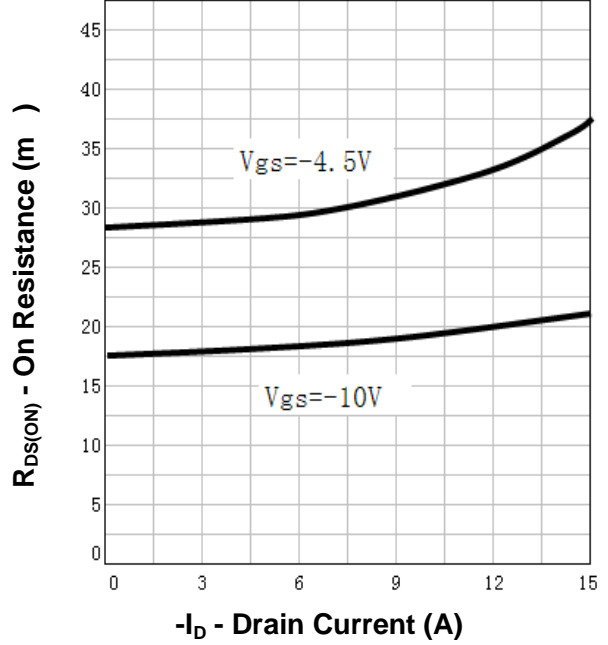


**Typical Characteristics**

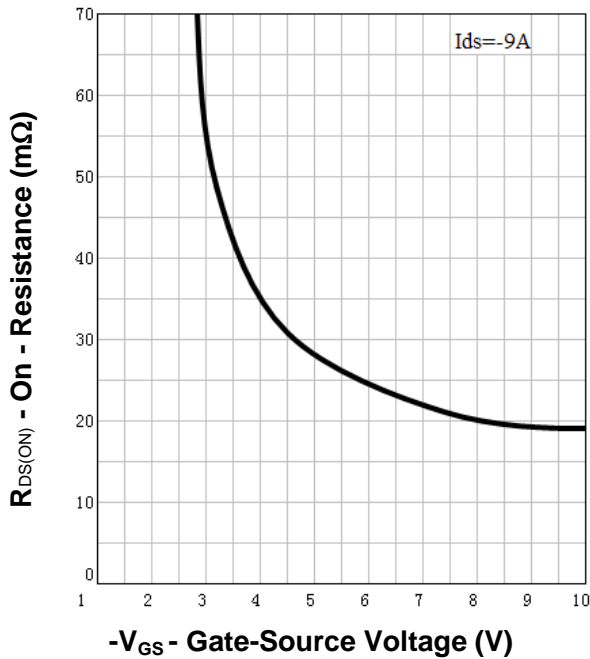
**Output Characteristics**



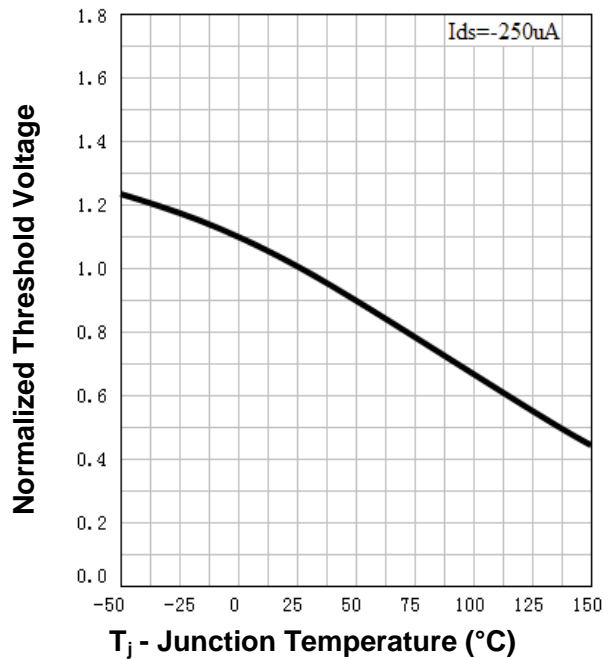
**Drain-Source On Resistance**



**Drain-Source On Resistance**

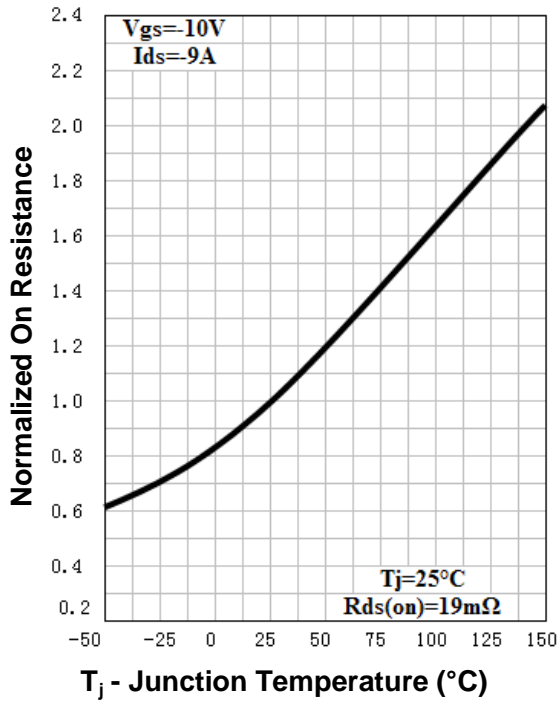


**Gate Threshold Voltage**

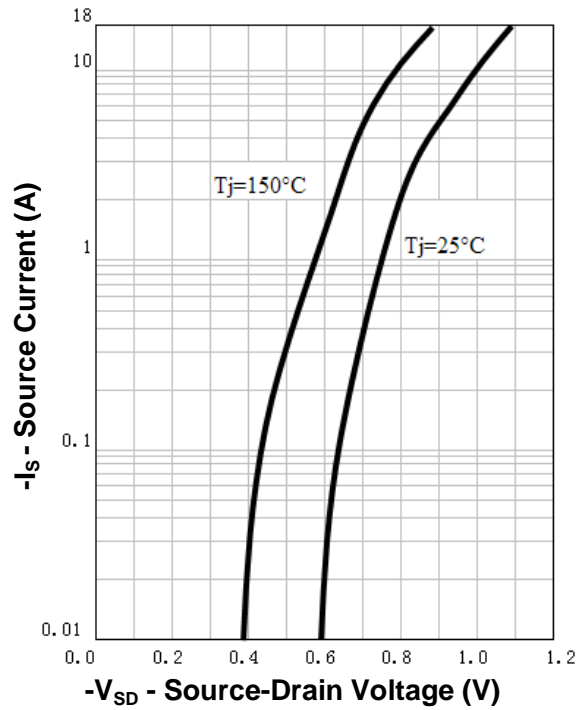


**Typical Characteristics**

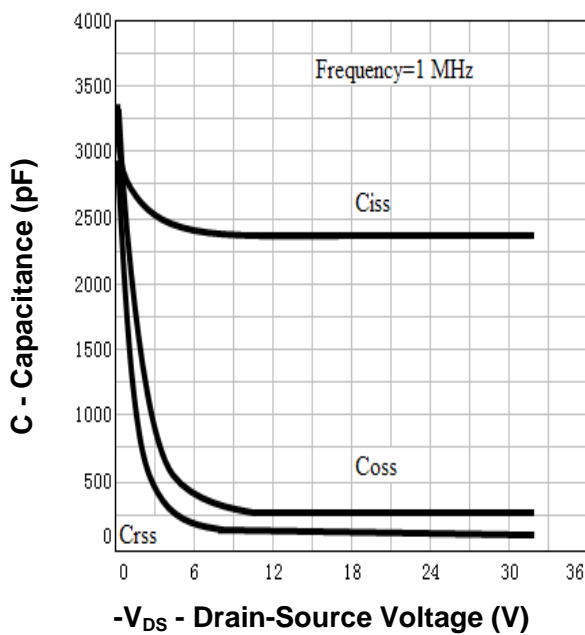
**Drain-Source On Resistance**



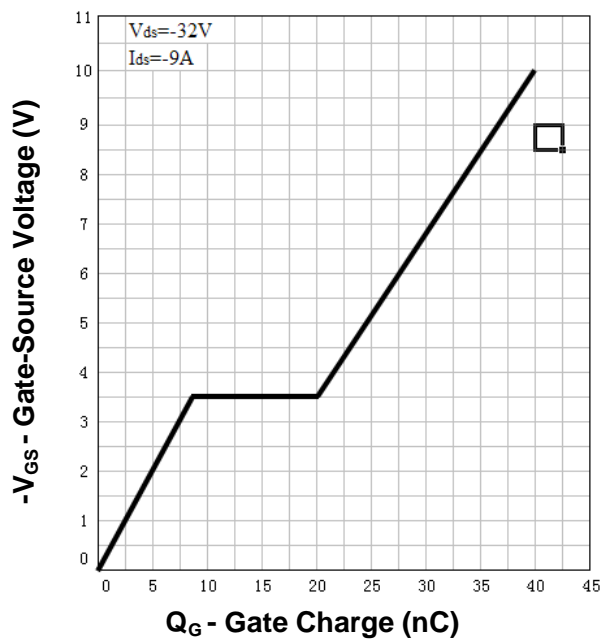
**Source-Drain Diode Forward**



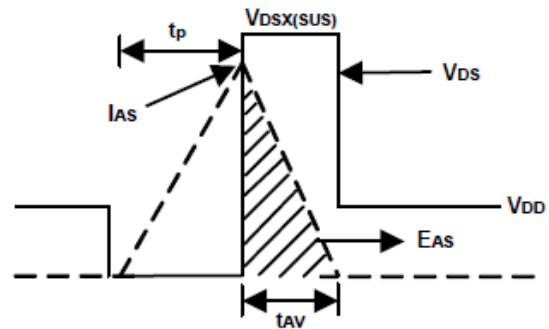
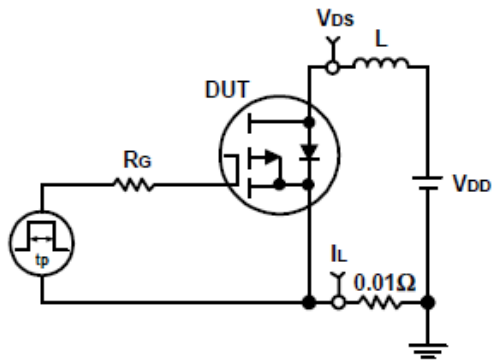
**Capacitance**



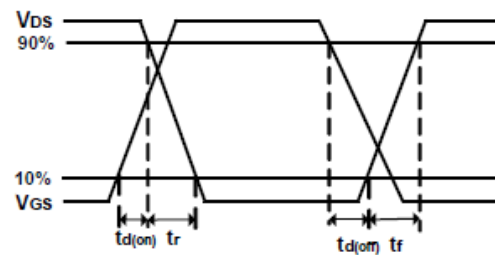
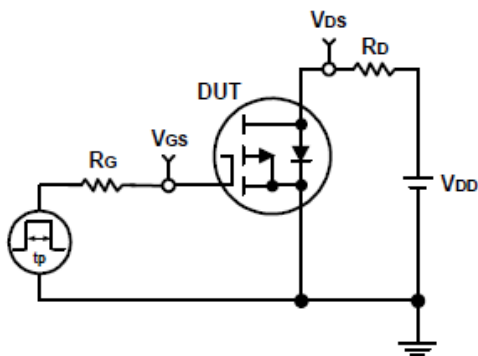
**Gate Charge**



### Avalanche Test Circuit and Waveforms



### Switching Time Test Circuit and Waveforms

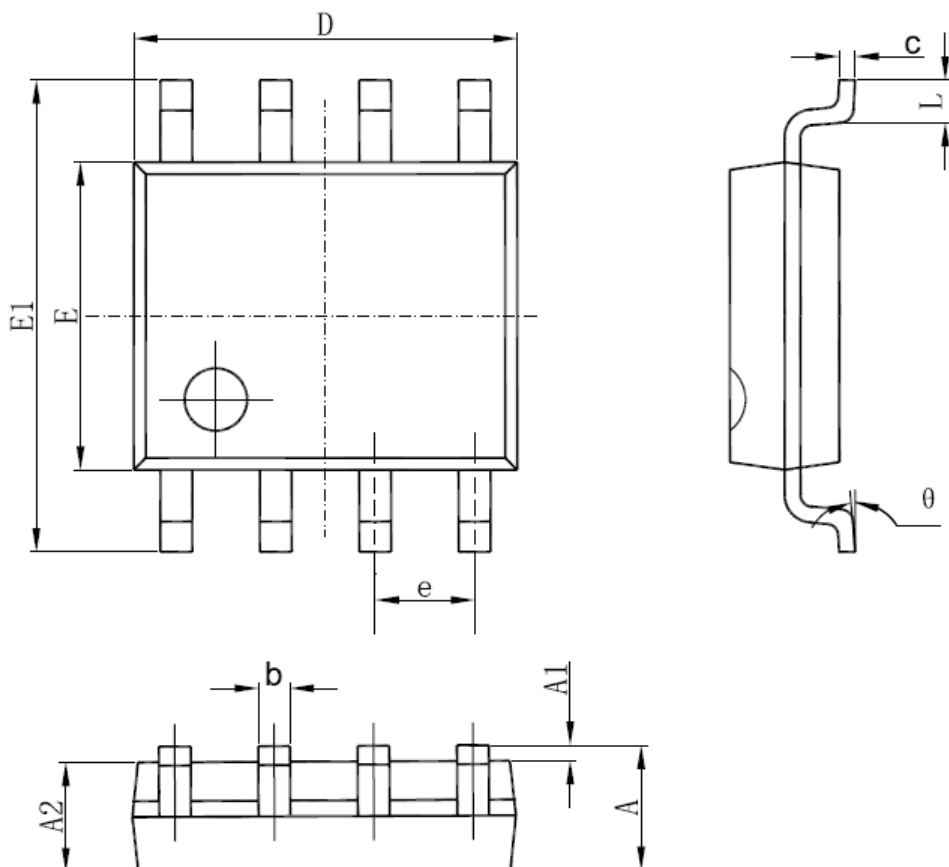


**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU40L10H	RU40L10H	SOP-8	Tape&Reel	2500	13''	12mm

**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