

### Features

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

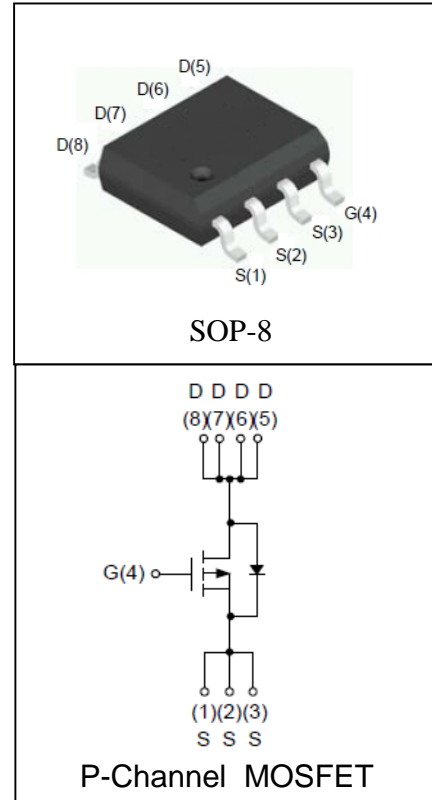
### Applications

- Load Switches.

### 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	$T_A = 25^\circ C$ -3	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}$	300 $\mu s$ Pulse Drain Current Tested	$T_A = 25^\circ C$ -18 <sup>①</sup>	A
$I_D$	Continuous Drain Current ( $V_{GS} = -10V$ )	$T_A = 25^\circ C$	A
		$T_A = 70^\circ C$	
$P_D$	Maximum Power Dissipation	$T_A = 25^\circ C$	W
		$T_A = 70^\circ C$	
$R_{\theta JA}$ <sup>②</sup>	Thermal Resistance-Junction to Ambient	50	$^\circ C/W$

### Pin Description

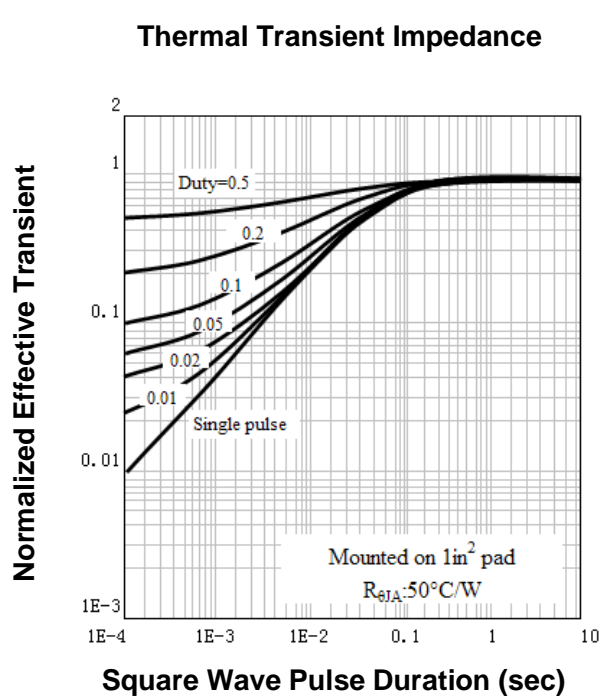
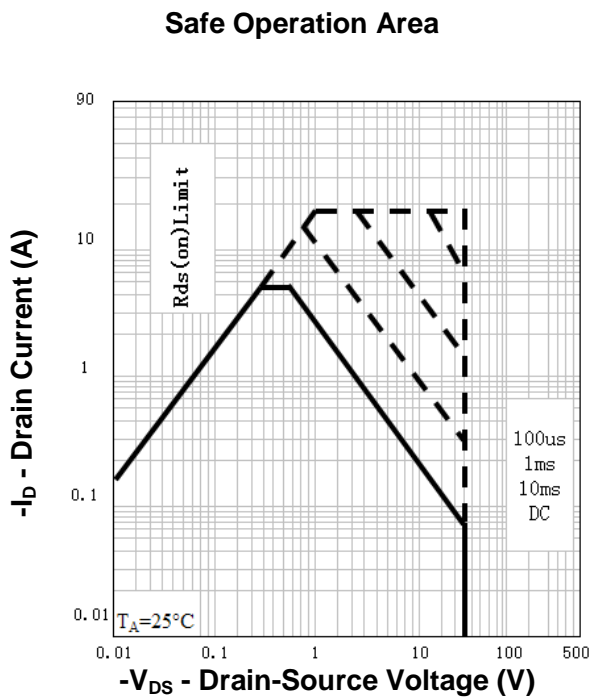
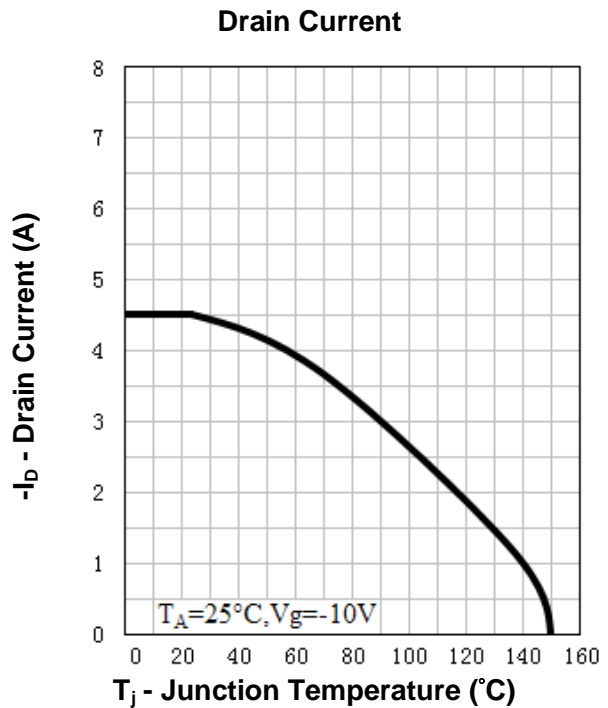
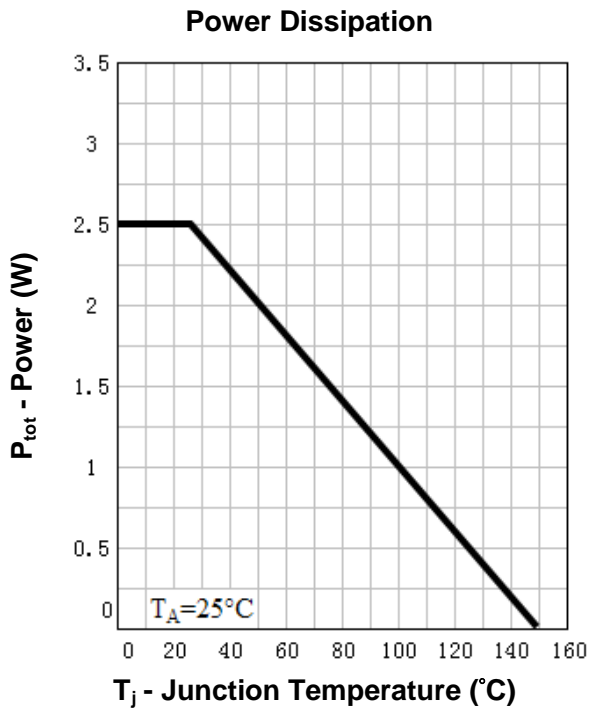


**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU40P4H			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	$V_{DS}=-40V, V_{GS}=0V$			-1	$\mu A$
		$T_J=85^\circ C$			-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-1	-1.8	-2.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(3)}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_{DS}=-4.2A$		60	70	$m\Omega$
		$V_{GS}=-4.5V, I_{DS}=-2A$		80	105	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(3)}$	Diode Forward Voltage	$I_{SD}=-2A, V_{GS}=0V$			-1	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=-4.5A, dI_{SD}/dt=100A/\mu s$		13		ns
$Q_{rr}$	Reverse Recovery Charge			8		nC
<b>Dynamic Characteristics</b> <sup>(4)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1.2		$\Omega$
$C_{iss}$	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	$V_{DD}=-20V, R_L=4.4\Omega,$ $I_{DS}=-4.5A, V_{GEN}=-10V,$ $R_G=6\Omega$		8		ns
$t_r$	Turn-on Rise Time			11		
$t_{d(OFF)}$	Turn-off Delay Time			27		
$t_f$	Turn-off Fall Time			12		
<b>Gate Charge Characteristics</b> <sup>(4)</sup>						
$Q_g$	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		

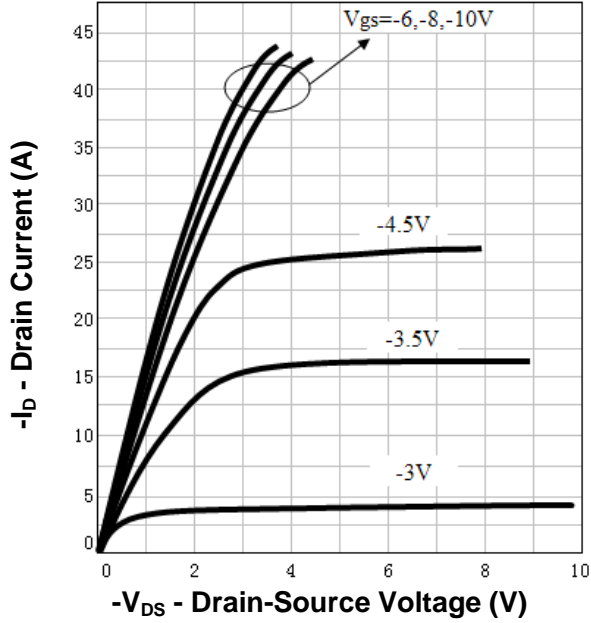
- Notes: ① Pulse width limited by safe operating area.  
 ② When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ . The value in any given application depends on the user's specific board design.  
 ③ Pulse test ; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .  
 ④ Guaranteed by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

**Typical Characteristics**

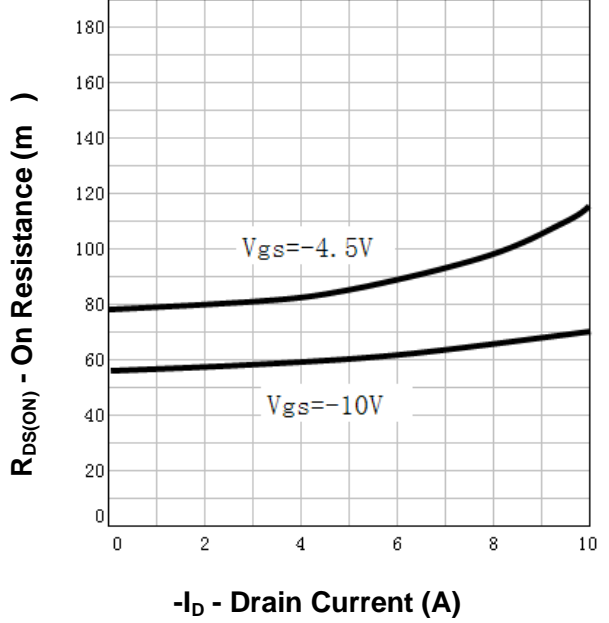


**Typical Characteristics**

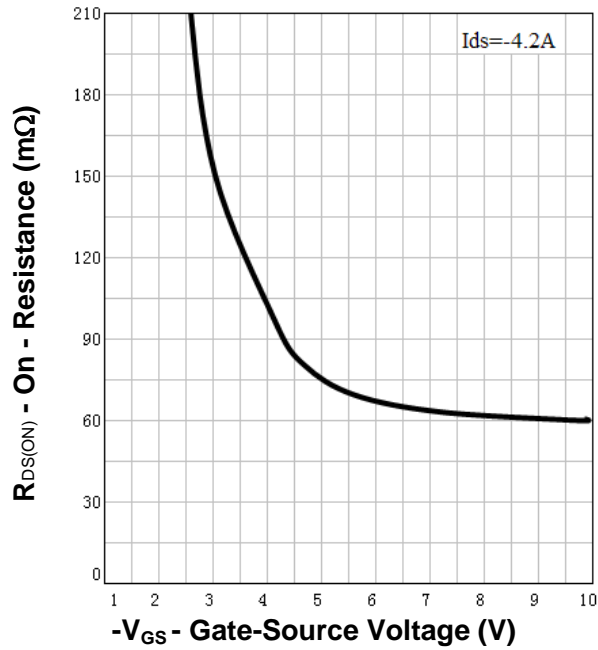
**Output Characteristics**



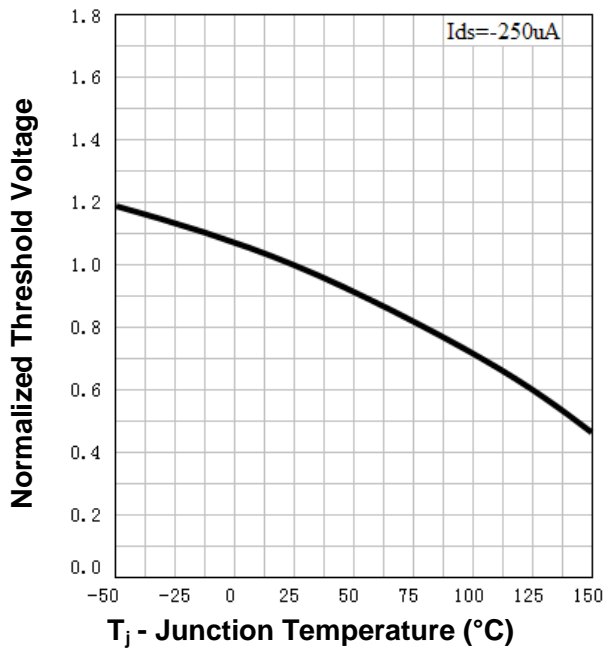
**Drain-Source On Resistance**



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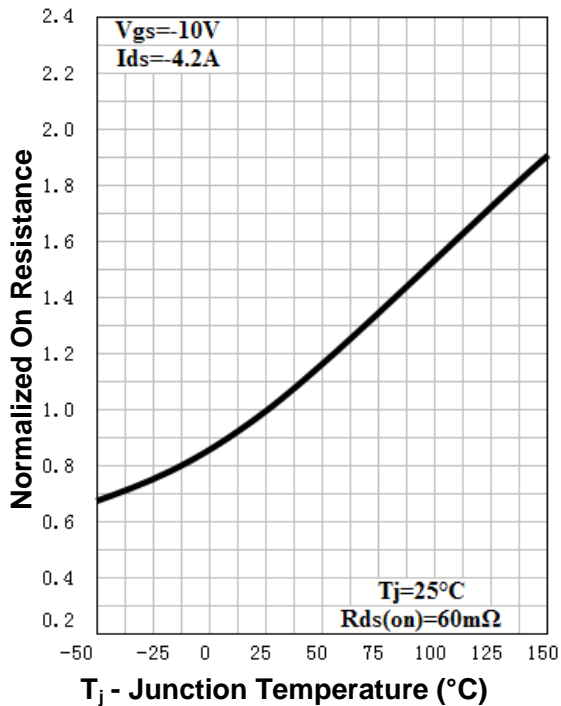


**Gate Threshold Voltage**

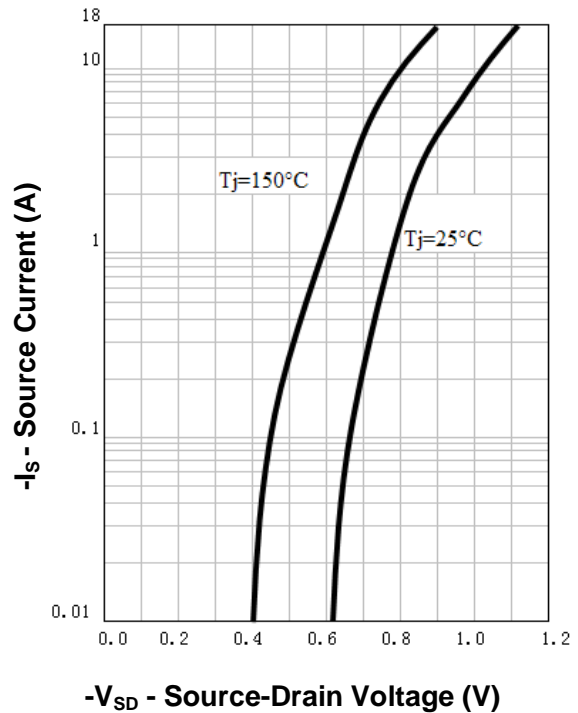


**Typical Characteristics**

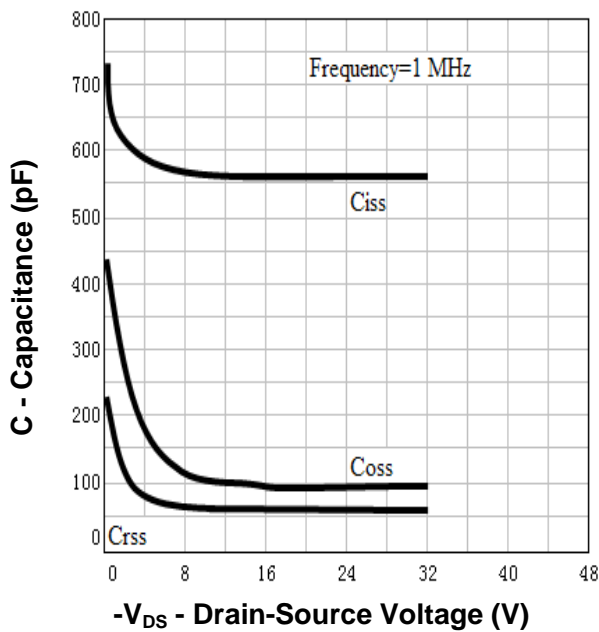
**Drain-Source On Resistance**



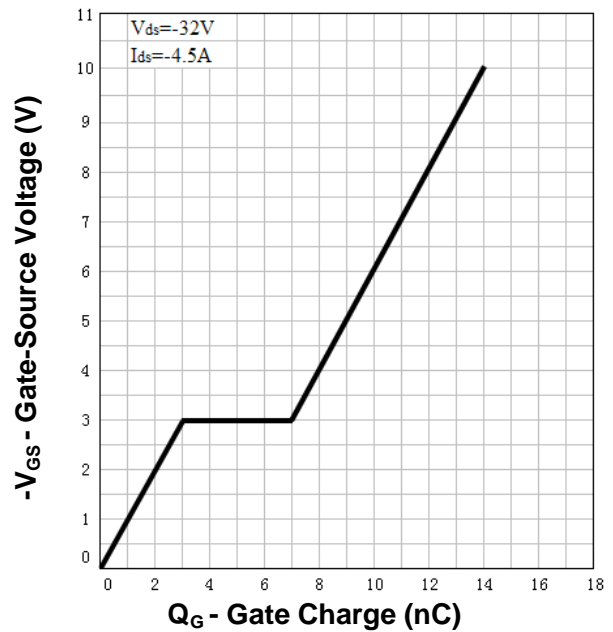
**Source-Drain Diode Forward**



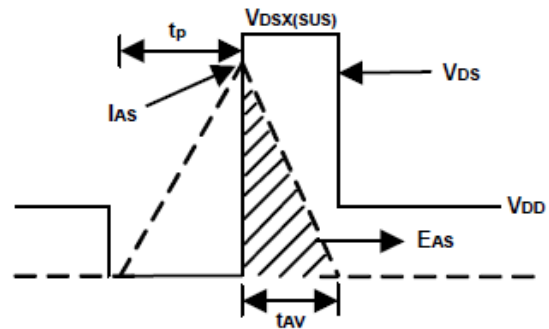
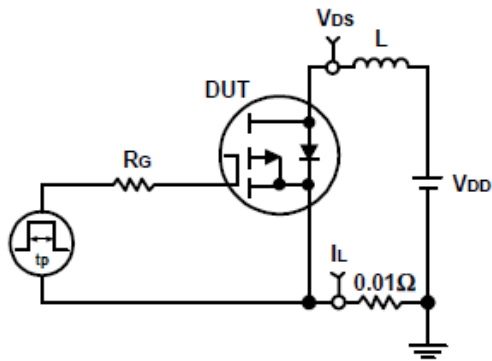
**Capacitance**



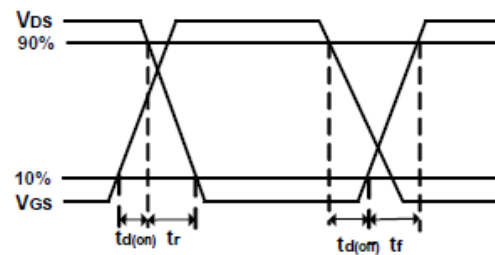
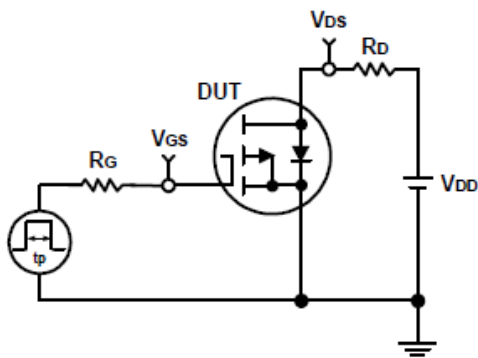
**Gate Charge**



### Avalanche Test Circuit and Waveforms



### Switching Time Test Circuit and Waveforms

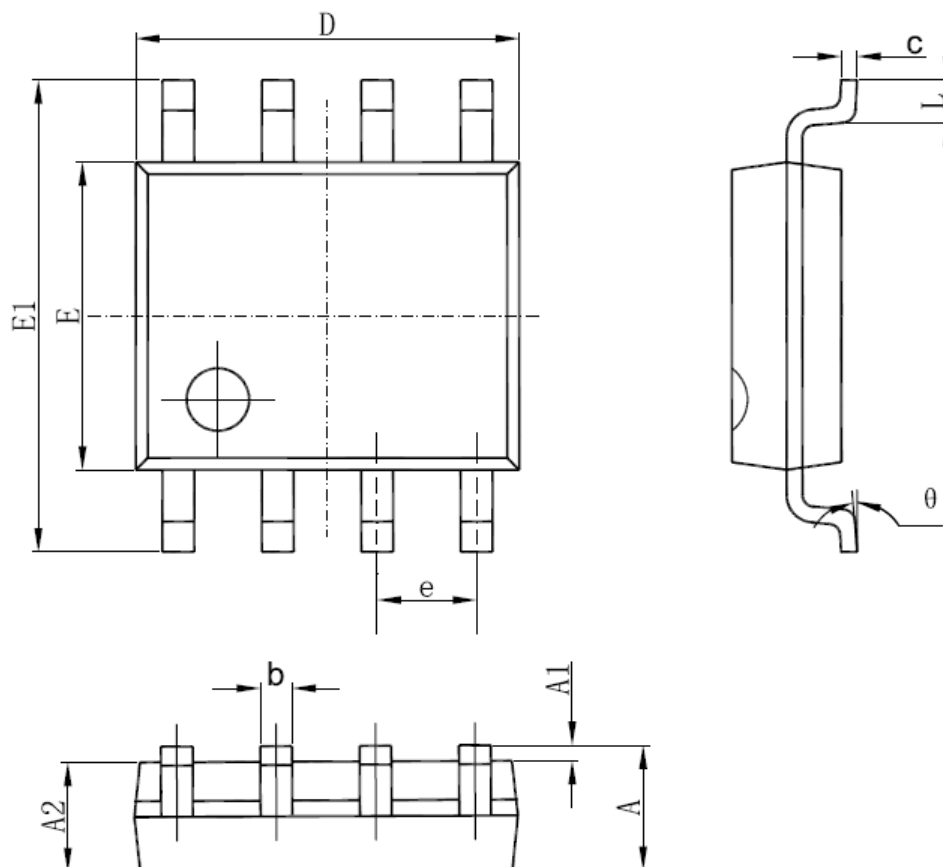


**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU40P4H	RU40P4H	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



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