

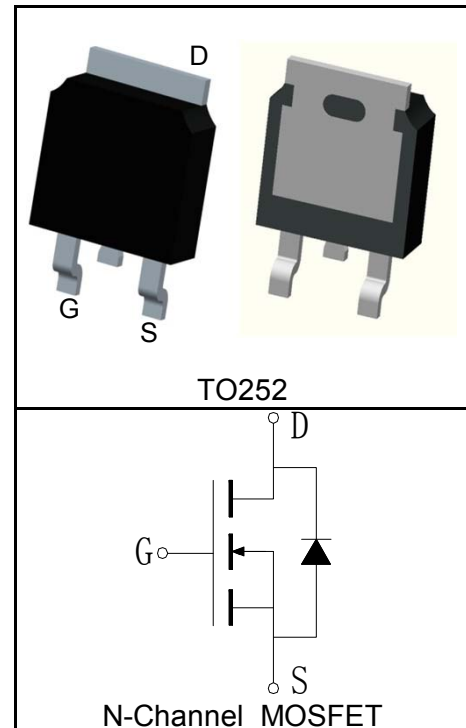
### Features

- 60V/50A,  
 $R_{DS(ON)} = 10m\Omega(Typ.)@V_{GS}=10V$   
 $R_{DS(ON)} = 12m\Omega(Typ.)@V_{GS}=4.5V$
- Super High Dense Cell Design
- Ultra Low On-Resistance
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

### Applications

- Power Management.
- Switch Applications.
- Load switch

### Pin Description



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
<b>Common Ratings</b> ( $T_C=25^\circ C$ Unless Otherwise Noted)				
$V_{DSS}$	Drain-Source Voltage	60	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$		
$T_J$	Maximum Junction Temperature	175	$^\circ C$	
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$	
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ C$	50	A
<b>Mounted on Large Heat Sink</b>				
$I_{DP}^{①}$	300 $\mu s$ Pulse Drain Current Tested	$T_C=25^\circ C$	200	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_C=25^\circ C$	50	A
		$T_C=100^\circ C$	36	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ C$	71	W
		$T_C=100^\circ C$	36	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.1	$^\circ C/W$	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	100	$^\circ C/W$	
<b>Drain-Source Avalanche Ratings</b>				
$E_{AS}^{③}$	Avalanche Energy, Single Pulsed	100	mJ	

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

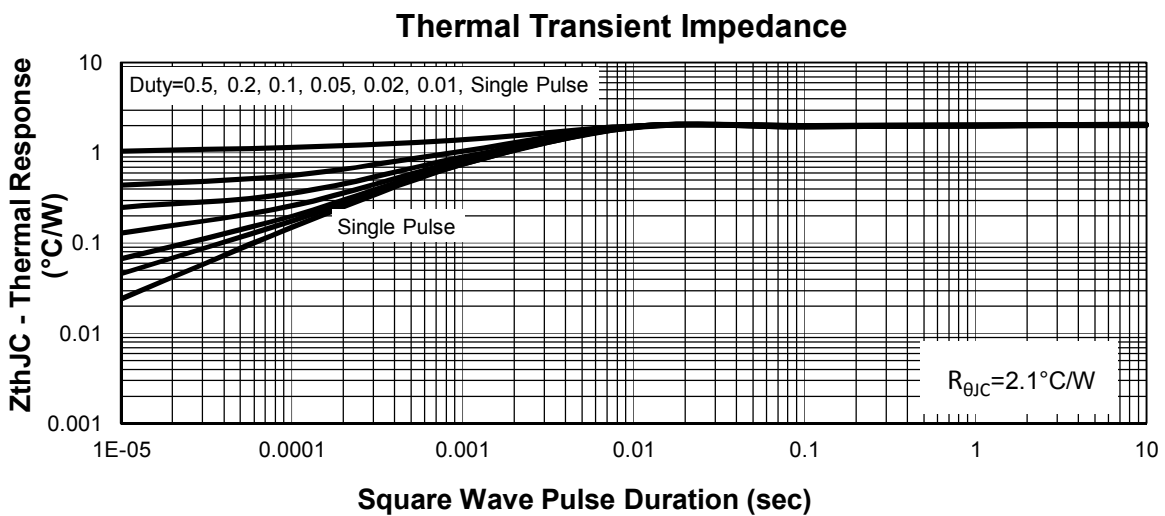
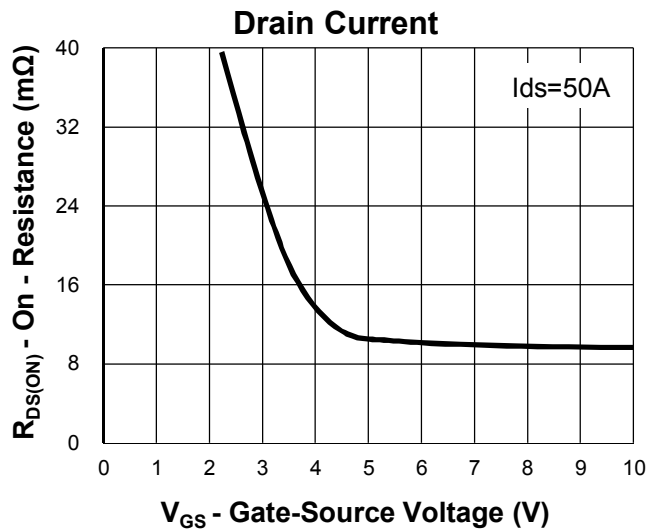
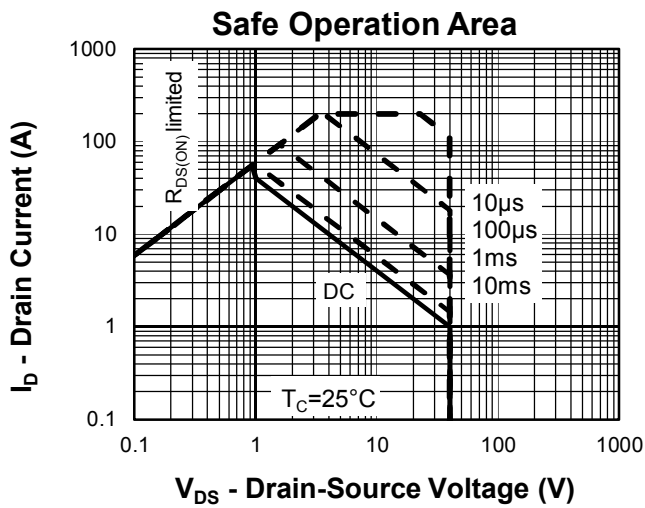
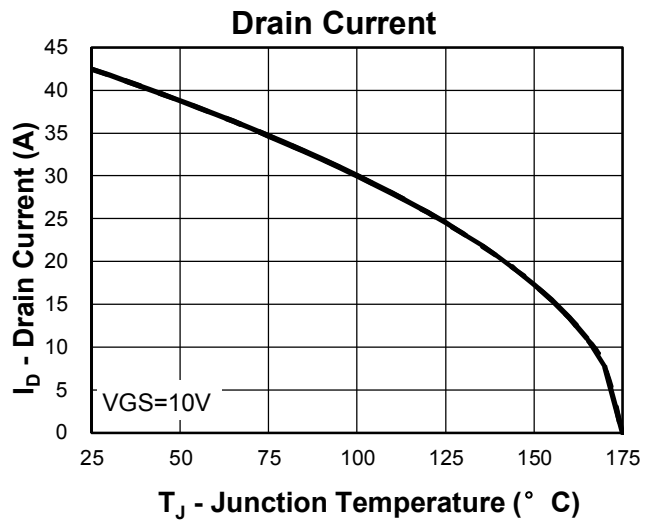
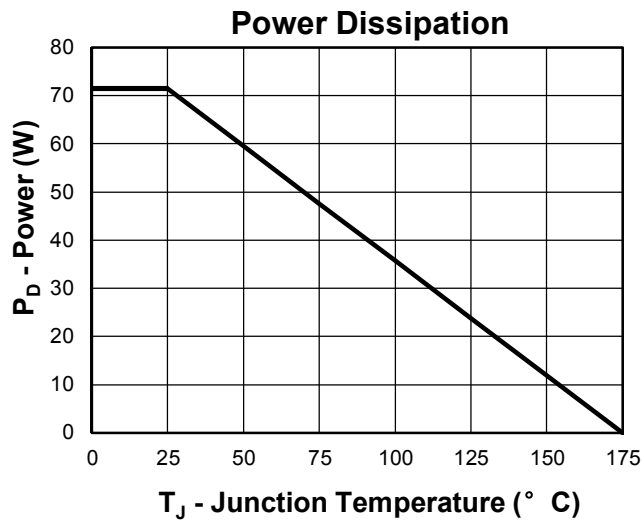
Symbol	Parameter	Test Condition	RU6051L			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	60			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
		$T_J=125^\circ C$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1		3	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=50A$		10	14	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=35A$		12	18	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=50A, V_{GS}=0V$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=50A, di_{SD}/dt=100A/\mu s$		32		ns
$Q_{rr}$	Reverse Recovery Charge			39		nC
<b>Dynamic Characteristics</b> <sup>(5)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1.6		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ Frequency=1.0MHz		1670		pF
$C_{oss}$	Output Capacitance			340		
$C_{rss}$	Reverse Transfer Capacitance			145		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=30V, I_{DS}=50A,$ $V_{GEN}=10V, R_G=0.5\Omega$		10		ns
$t_r$	Turn-on Rise Time			86		
$t_{d(OFF)}$	Turn-off Delay Time			34		
$t_f$	Turn-off Fall Time			26		
<b>Gate Charge Characteristics</b> <sup>(5)</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=48V, V_{GS}=10V,$ $I_{DS}=50A$		25		nC
$Q_{gs}$	Gate-Source Charge			9		
$Q_{gd}$	Gate-Drain Charge			8		

- Notes:**
- ①Pulse width limited by safe operating area.
  - ②Calculated continuous current based on maximum allowable junction temperature.
  - ③Limited by  $T_{Jmax}$ ,  $I_{AS}=20A$ ,  $V_{DD}=32V$ ,  $R_G=50\Omega$ , Starting  $T_J=25^\circ C$ .
  - ④Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑤Guaranteed by design, not subject to production testing.

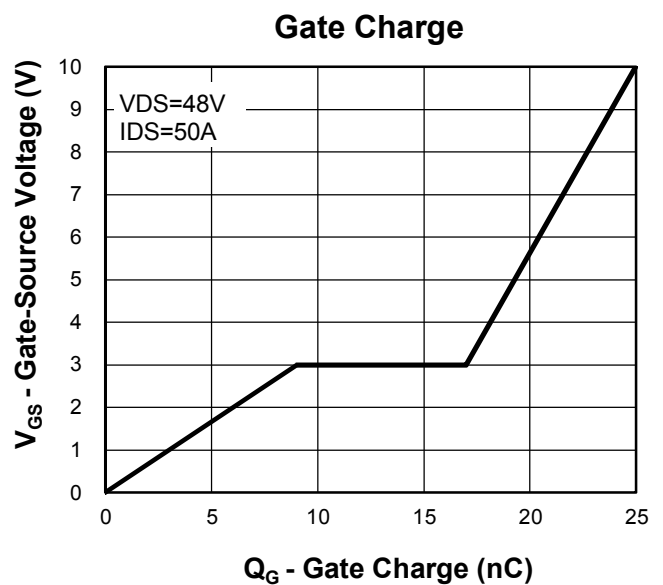
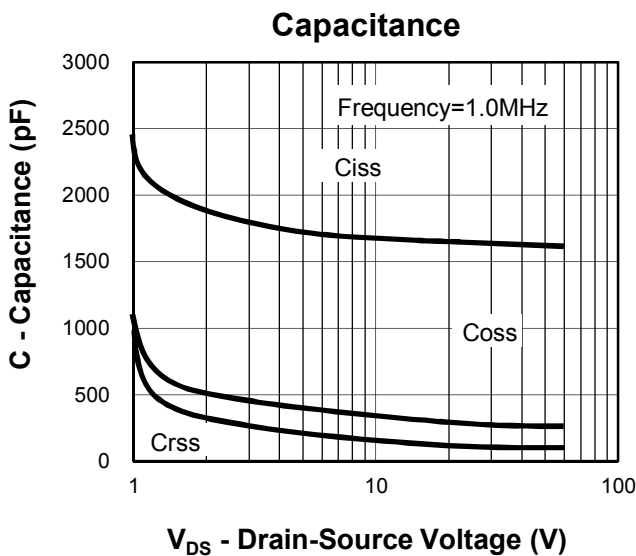
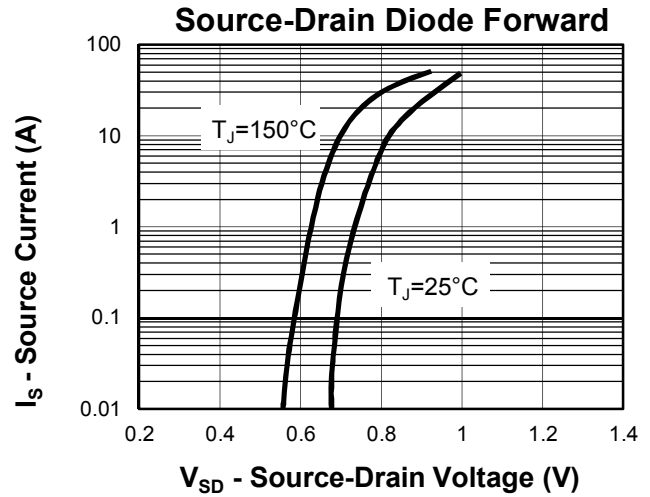
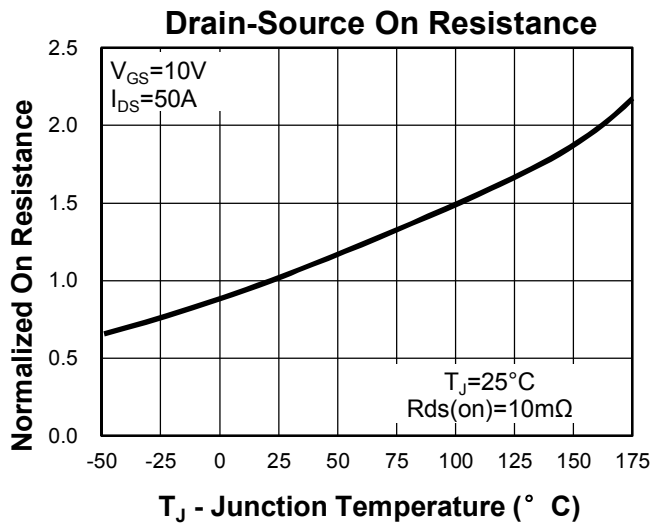
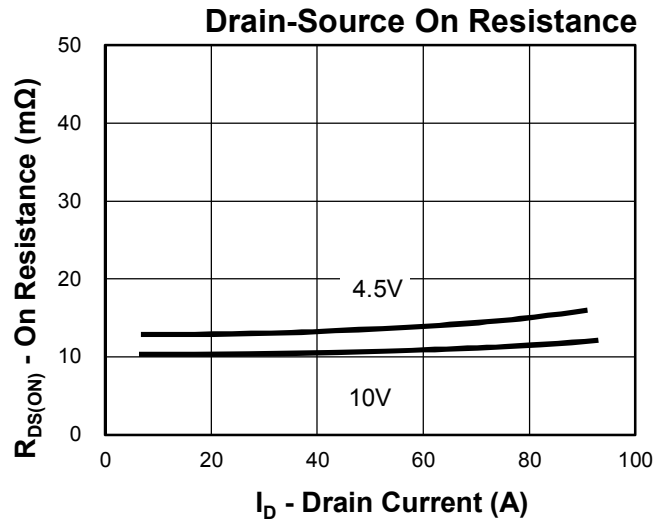
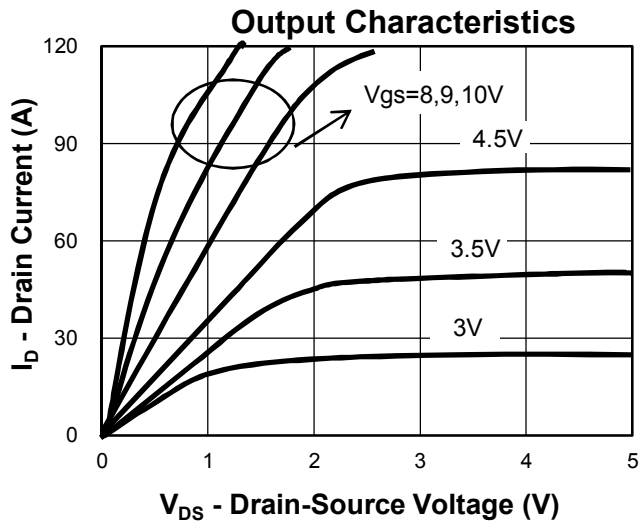
**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU6051L	RU6051L	TO252	Tape&Reel	2500	13"	16mm

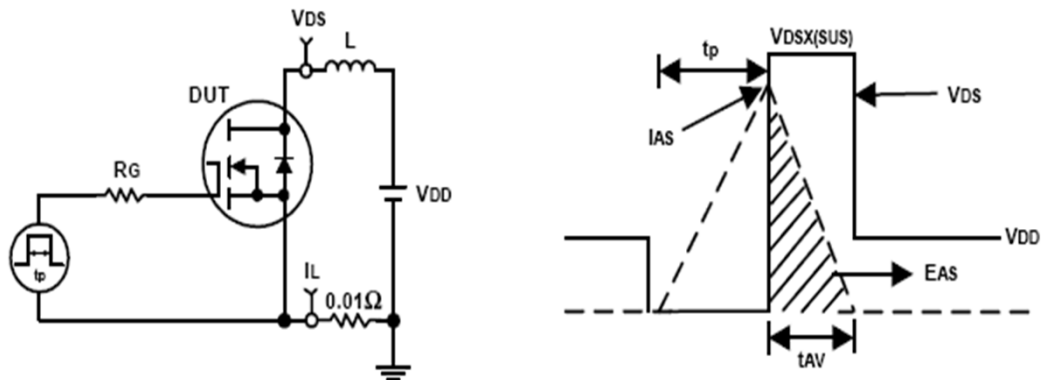
**Typical Characteristics**



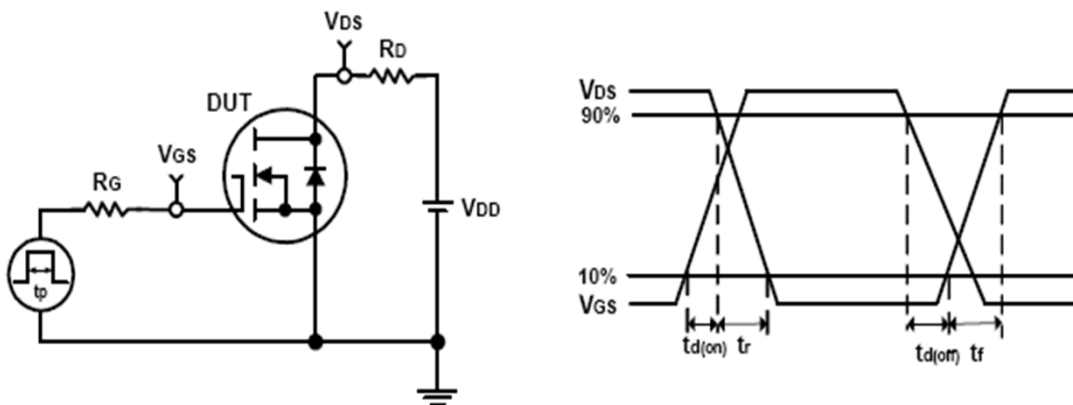
**Typical Characteristics**



**Avalanche Test Circuit and Waveforms**

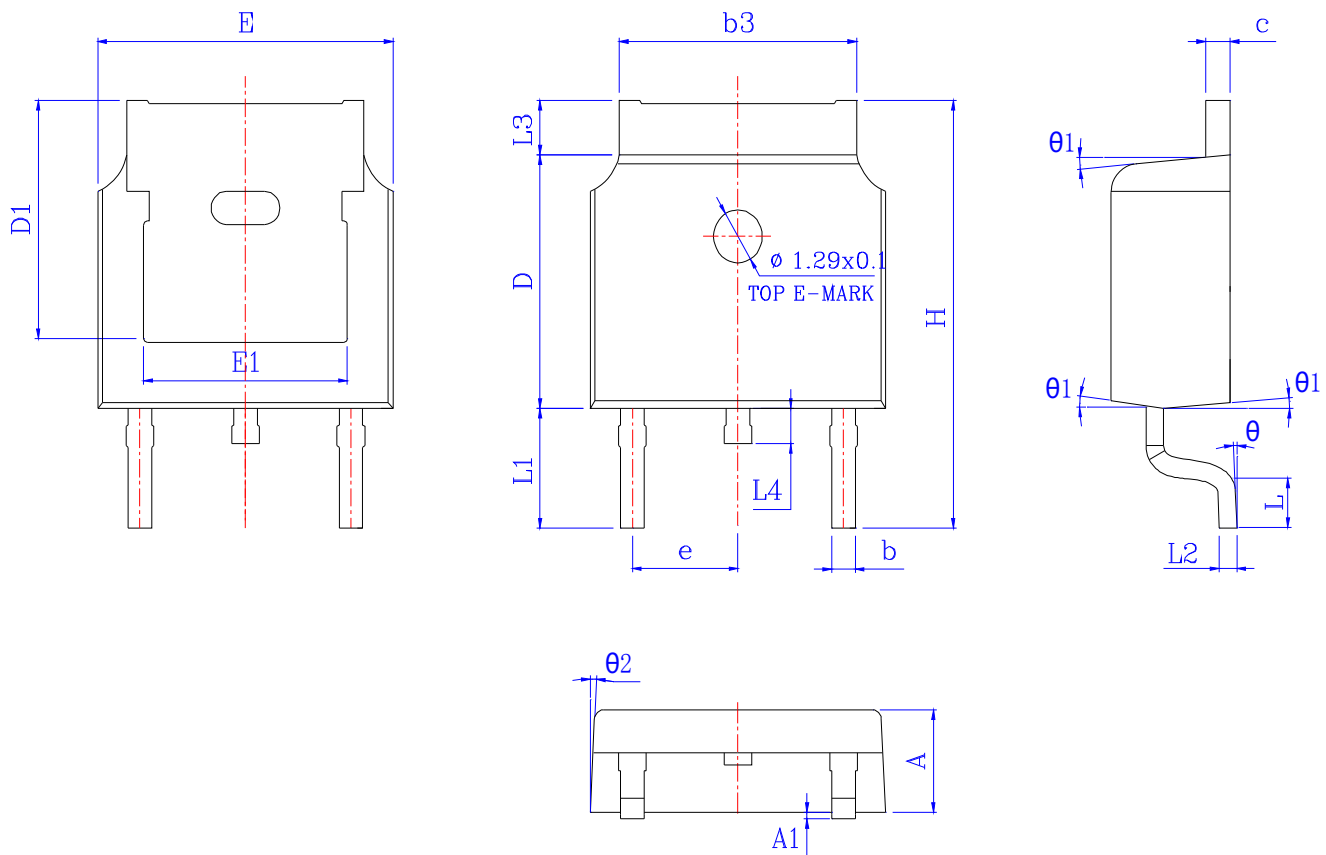


**Switching Time Test Circuit and Waveforms**



**Package Information**

**TO252**



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.200	2.300	2.400	0.087	0.091	0.094
A1	*	*	0.100	*	*	0.004
b	0.660	0.760	0.860	0.026	0.030	0.034
b3	5.130	5.295	5.460	0.202	0.208	0.215
c	0.470	0.535	0.600	0.019	0.021	0.024
D	6.000	6.100	6.200	0.236	0.240	0.244
D1	5.30 REF			0.20 REF		
E	6.500	6.600	6.700	0.256	0.260	0.264
E1	4.700	4.810	4.920	0.185	0.189	0.194
e	2.28 REF			0.09 REF		
H	9.800	10.100	10.400	0.386	0.398	0.409
L	1.400	1.550	1.700	0.055	0.061	0.067
L1	2.743 REF			0.108 REF		
L2	0.510 BSC			0.020 BSC		
L3	0.900	1.075	1.250	0.035	0.042	0.049
L4	0.600	0.800	1.000	0.024	0.031	0.039
$\theta$	0°	*	8°	0°	*	8°
$\theta_1$	5°	7°	9°	5°	7°	9°
$\theta_2$	5°	7°	9°	5°	7°	9°

**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**

4th Floor, Block 8, Changyuan New Material Port, Keyuan Middle Road, Science & Industry Park,  
Nanshan District, Shenzhen, CHINA

**TEL:** (86-755) 8311-5334

**FAX:** (86-755) 8311-4278

**E-mail:** Sales-SZ@ruichips.com