

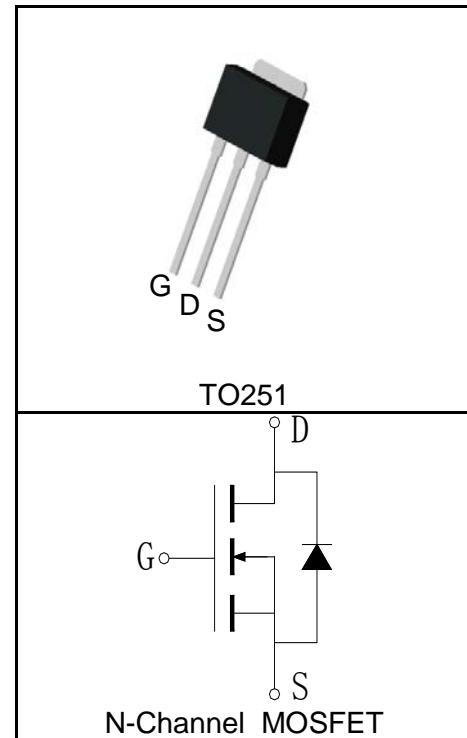
### Features

- 100V/40A,  
RDS (ON) =21mΩ(Typ.)@VGS=10V
- Super High Dense Cell Design
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

### Applications

- High Speed Power Switching

### Pin Description



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	100	V
$V_{GSS}$	Gate-Source Voltage	$\pm 25$	
$T_J$	Maximum Junction Temperature	175	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 40	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 160	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10\text{V}$ )	$T_C=25^\circ\text{C}$ 40	A
		$T_C=100^\circ\text{C}$ 30	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 97	W
		$T_C=100^\circ\text{C}$ 48	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.55	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	100	$^\circ\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{③}$	Avalanche Energy, Single Pulsed	90	mJ

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

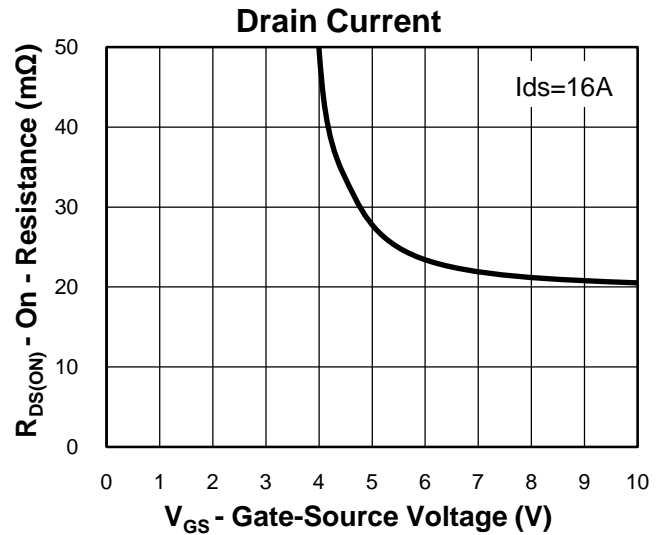
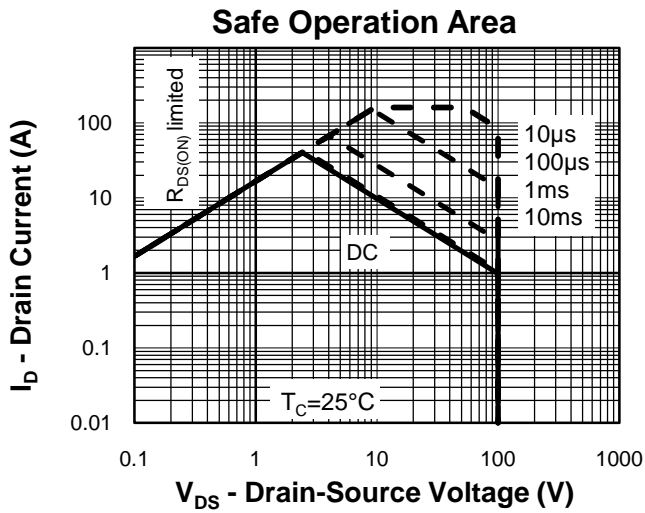
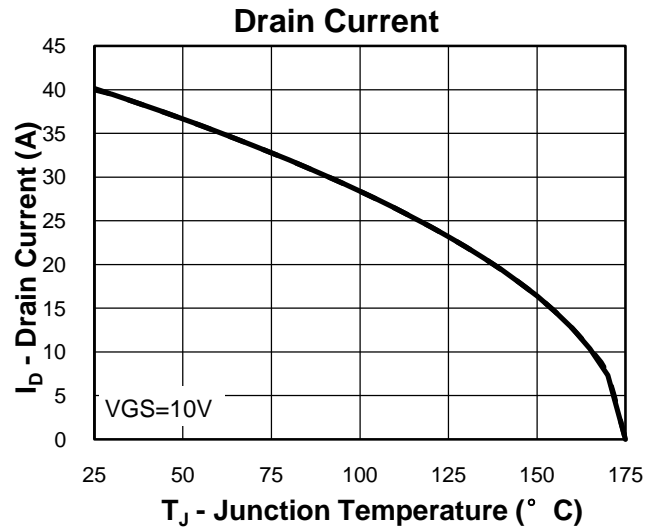
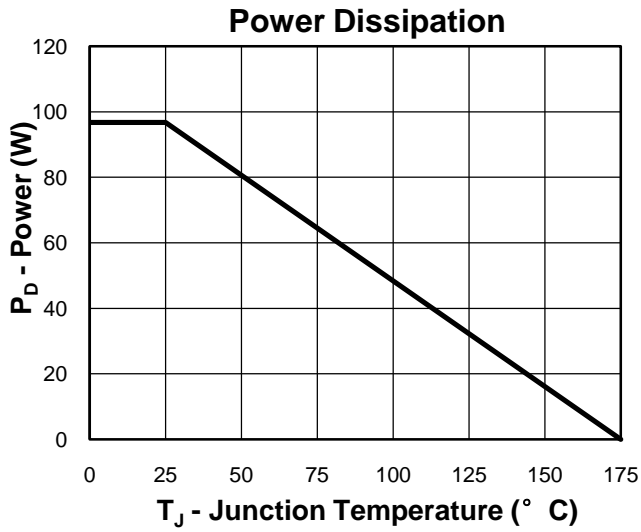
Symbol	Parameter	Test Condition	RU1H35K			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$			1	$\mu A$
		$T_J=85^\circ C$			10	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	3	4	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=16A$		21	25	m $\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=16A, V_{GS}=0V$		0.8	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=16A, di_{SD}/dt=100A/\mu s$		100		ns
$Q_{rr}$	Reverse Recovery Charge			430		nC
<b>Dynamic Characteristics<sup>(5)</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		2.8		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=50V,$ Frequency=1.0MHz		2100		pF
$C_{oss}$	Output Capacitance			250		
$C_{riss}$	Reverse Transfer Capacitance			115		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=50V, R_L=3\Omega,$ $I_{DS}=16A, V_{GEN}=10V,$ $R_G=4.7\Omega$		22		ns
$t_r$	Turn-on Rise Time			76		
$t_{d(OFF)}$	Turn-off Delay Time			60		
$t_f$	Turn-off Fall Time			23		
<b>Gate Charge Characteristics<sup>(5)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=80V, V_{GS}=10V,$ $I_{DS}=16A$		44		nC
$Q_{gs}$	Gate-Source Charge			10		
$Q_{gd}$	Gate-Drain Charge			20		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature.
  - ③ Limited by  $T_{Jmax}$ ,  $I_{AS}=19A$ ,  $V_{DD}=48V$ ,  $R_G=47\Omega$ , Starting  $T_J=25^\circ C$ .
  - ④ Pulse test ; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑤ Guaranteed by design, not subject to production testing.

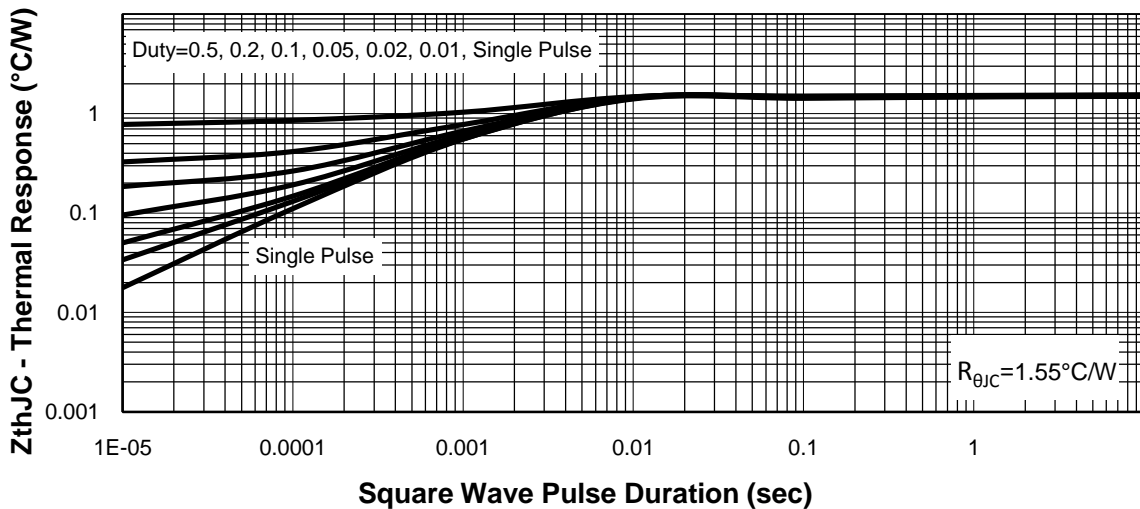
**Ordering and Marking Information**

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU1H35K	RU1H35K	TO251	Tube	75	-	-

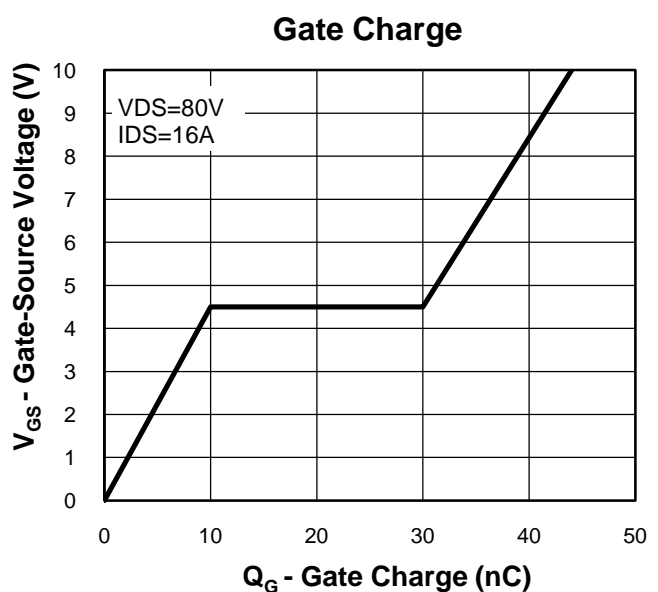
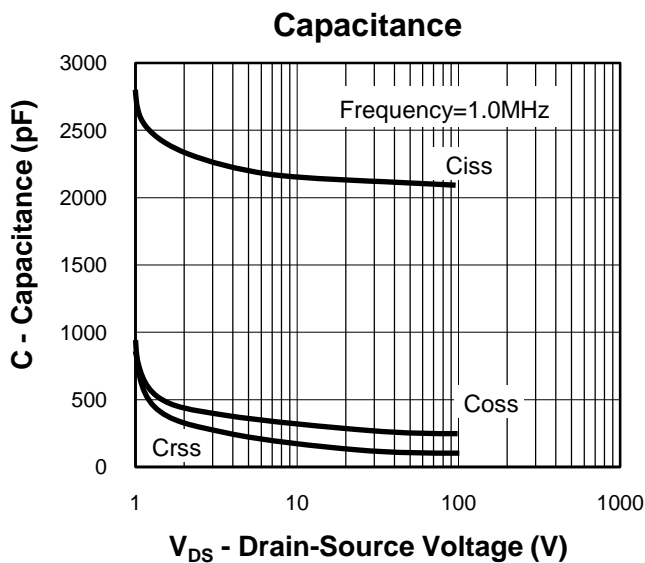
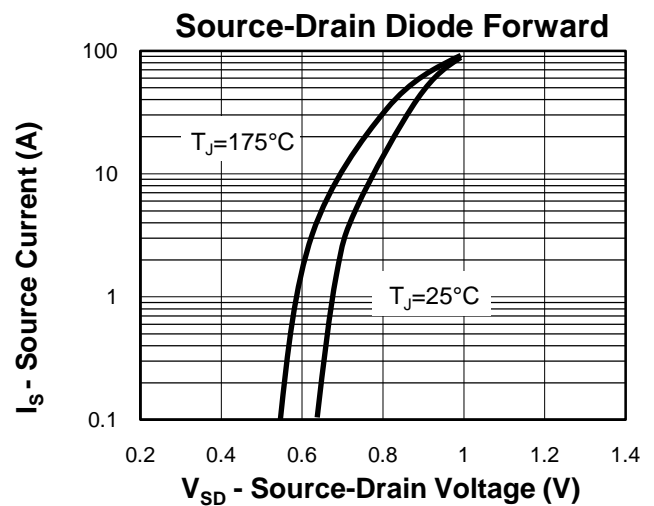
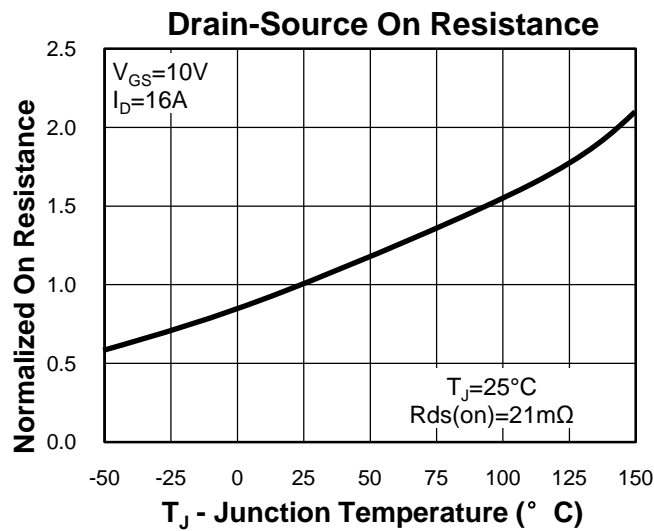
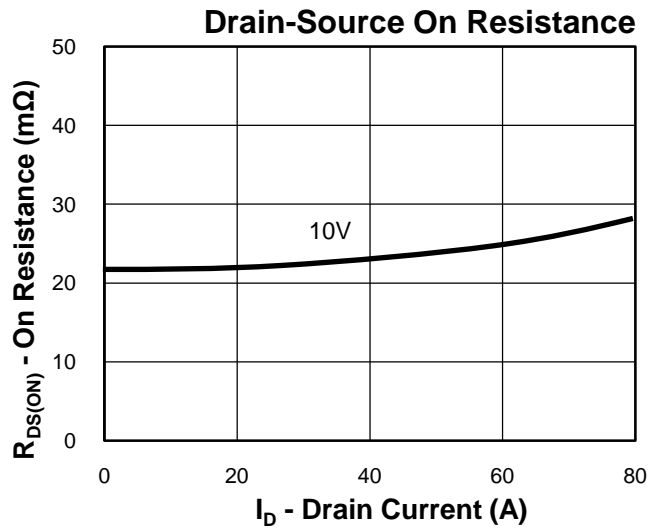
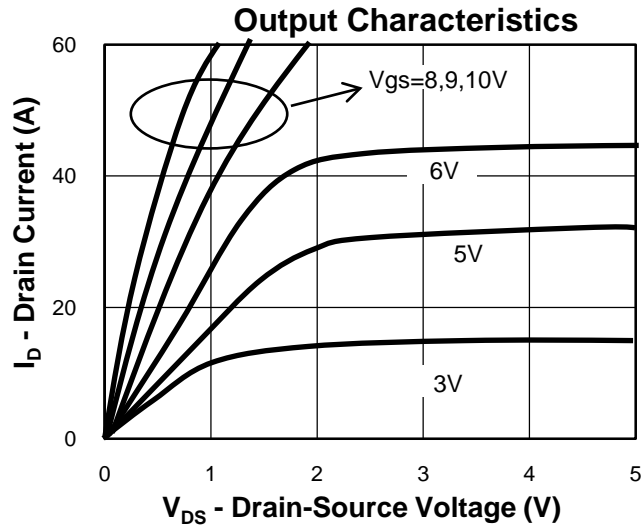
**Typical Characteristics**



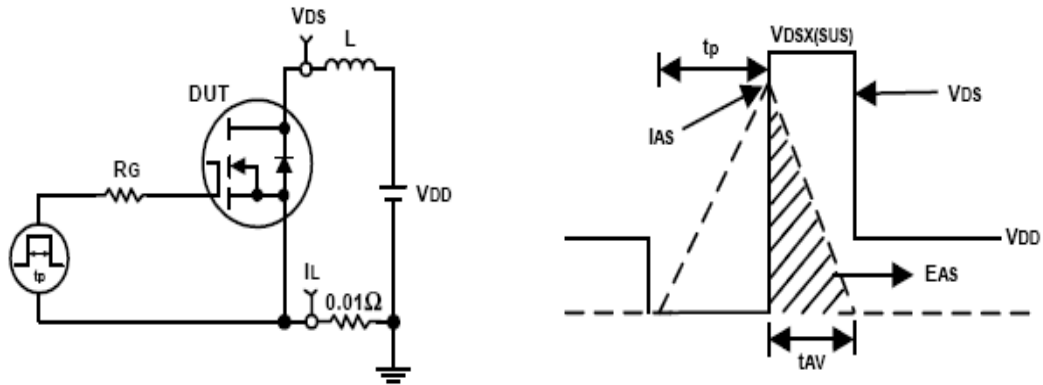
**Thermal Transient Impedance**



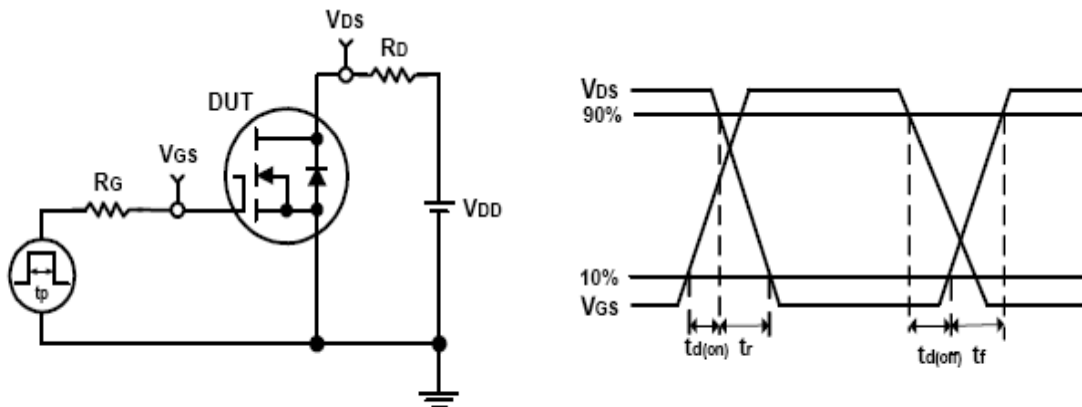
**Typical Characteristics**



**Avalanche Test Circuit and Waveforms**

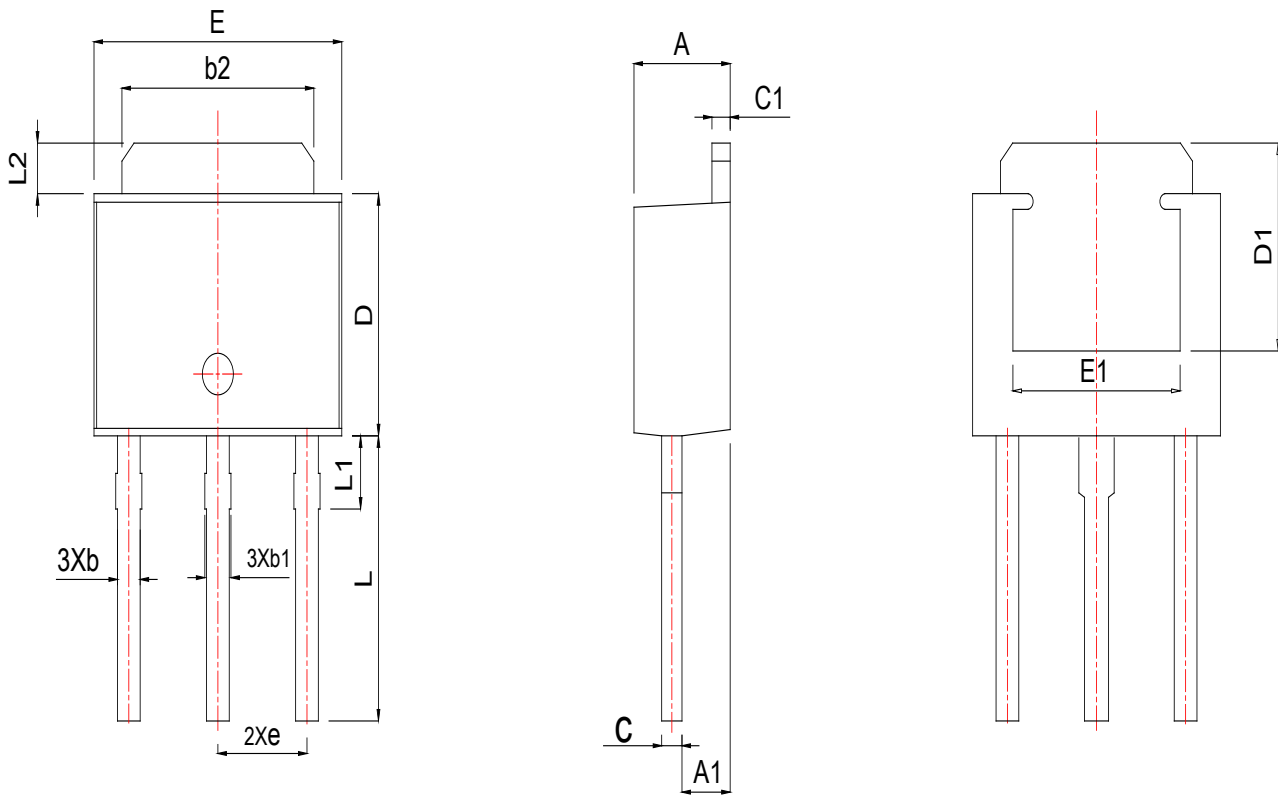


**Switching Time Test Circuit and Waveforms**



**Package Information**

**TO251**



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.220	2.320	2.420	0.087	0.091	0.095
A1	0.890	1.015	1.140	0.035	0.040	0.045
b	0.550	0.610	0.670	0.022	0.024	0.026
b1	0.760	0.860	0.960	0.030	0.034	0.038
b2	5.200	5.300	5.400	0.205	0.209	0.213
c	0.460	0.515	0.570	0.018	0.020	0.022
c1	0.450	0.500	0.550	0.018	0.020	0.022
D	5.950	6.100	6.250	0.234	0.240	0.246
D1	4.200	4.350	4.500	0.165	0.171	0.177
E	6.400	6.550	6.700	0.252	0.258	0.264
E1	4.750	4.800	4.850	0.187	0.189	0.191
e	2.280 REF			0.090 REF		
L	8.900	9.200	9.500	0.350	0.362	0.374
L1	1.900	2.095	2.290	0.075	0.082	0.090
L2	0.900	0.950	1.000	0.035	0.037	0.039

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