

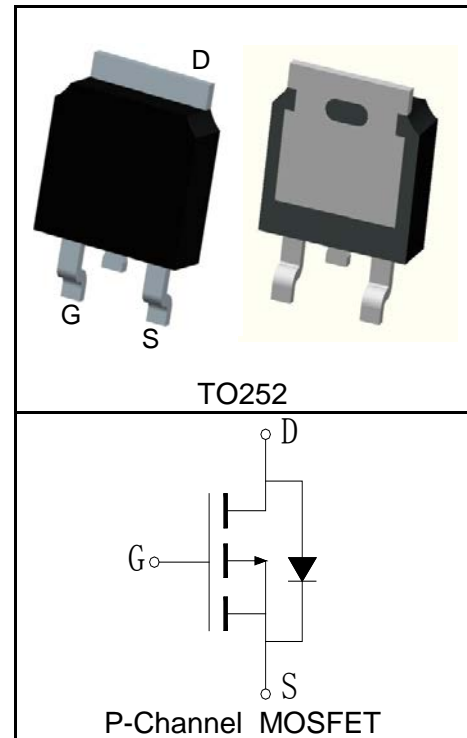
### Features

- -20V/-18A,  
 $R_{DS(ON)} = 30m\Omega(Typ.)@V_{GS}=-4.5V$   
 $R_{DS(ON)} = 45m\Omega(Typ.)@V_{GS}=-2.5V$
- Low On-Resistance
- Super High Dense Cell Design
- Fast Switching and Fully Avalanche Rated
- 100% avalanche tested
- 175°C Operating Temperature
- Lead Free and Green Devices Available (RoHS Compliant)

### Applications

- Load Switch
- Power Management

### 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	-20	V
$V_{GSS}$	Gate-Source Voltage	$\pm 12$	
$T_J$	Maximum Junction Temperature	175	$^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ C$ -18	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	300 $\mu s$ Pulse Drain Current Tested	$T_C=25^\circ C$ -72	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=-10V$ )	$T_C=25^\circ C$ -18	A
		$T_C=100^\circ C$ -13	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ C$ 30	W
		$T_C=100^\circ C$ 15	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	5	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	100	$^\circ C/W$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{③}$	Avalanche Energy, Single Pulsed	56	mJ

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

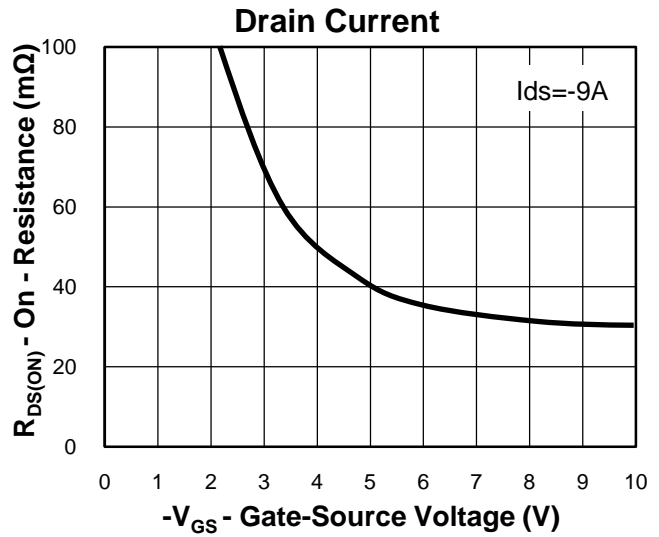
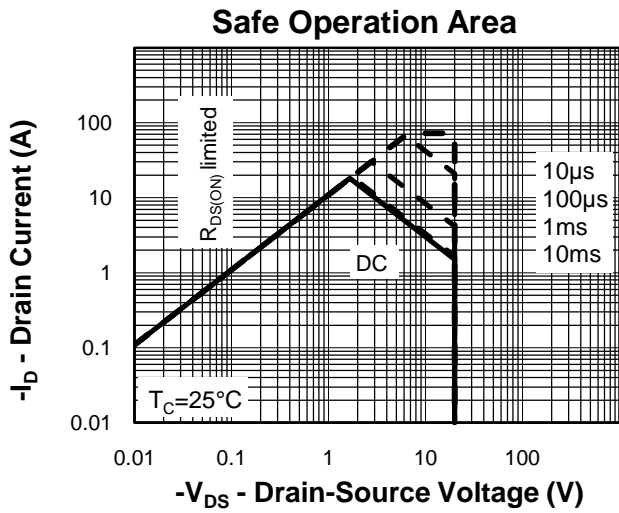
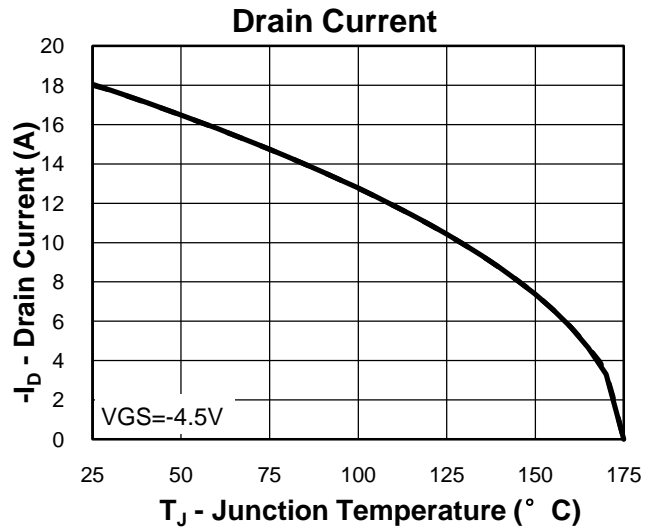
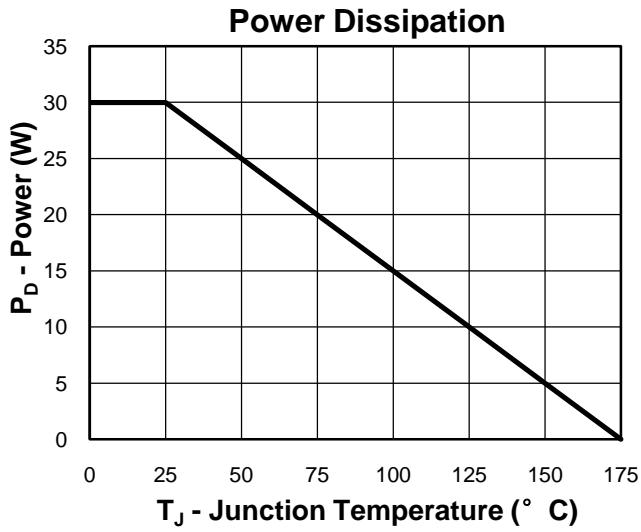
Symbol	Parameter	Test Condition	RU20P18L			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-20			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-16V, V_{GS}=0V$			-1	$\mu A$
		$T_J=125^\circ C$			-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-0.4		-1	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=-4.5V, I_{DS}=-9A$		30	40	$m\Omega$
		$V_{GS}=-2.5V, I_{DS}=-6A$		45	60	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=-18A, V_{GS}=0V$			-1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=-9A, di_{SD}/dt=100A/\mu s$		13		ns
$Q_{rr}$	Reverse Recovery Charge			8		nC
<b>Dynamic Characteristics</b> <sup>(5)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1.1		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=-10V, Frequency=1.0MHz$		545		pF
$C_{oss}$	Output Capacitance			90		
$C_{riss}$	Reverse Transfer Capacitance			45		
$t_{d(ON)}$	Turn-on Delay Time		$V_{DD}=-10V, I_{DS}=-9A, V_{GEN}=-4.5V, R_G=6\Omega$		7	
$t_r$	Turn-on Rise Time			11		
$t_{d(OFF)}$	Turn-off Delay Time			27		
$t_f$	Turn-off Fall Time			15		
<b>Gate Charge Characteristics</b> <sup>(5)</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=-16V, V_{GS}=-4.5V, I_{DS}=-9A$		7		nC
$Q_{gs}$	Gate-Source Charge			1.4		
$Q_{gd}$	Gate-Drain Charge			2.5		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature.
  - ③ Limited by  $T_{Jmax}$ ,  $I_{AS} = -15A$ ,  $V_{DD} = -16V$ ,  $R_G = 50\Omega$ , 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.

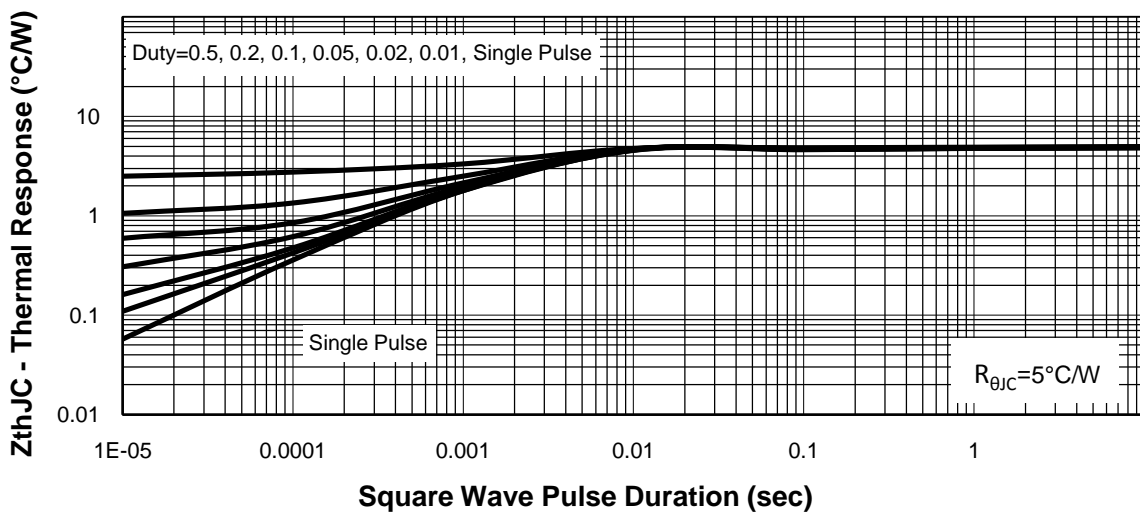
**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU20P18L	RU20P18L	TO252	Tape&Reel	2500	13"	16mm

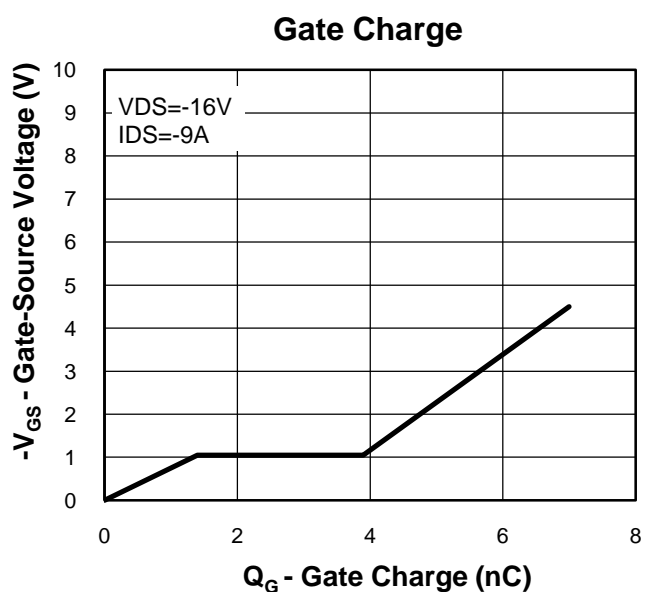
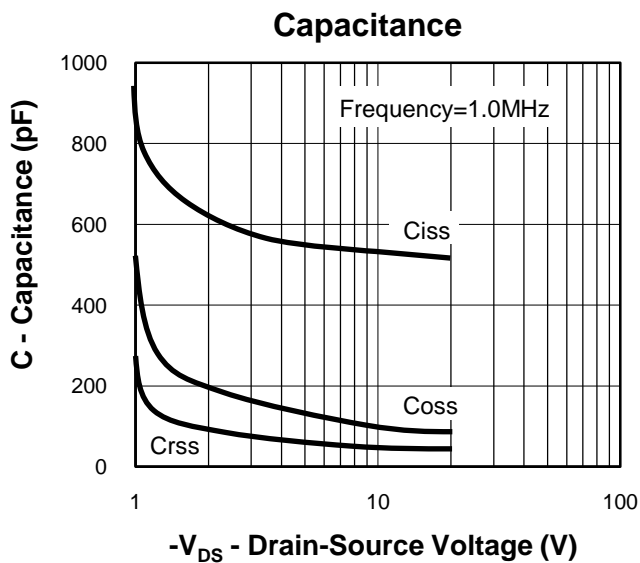
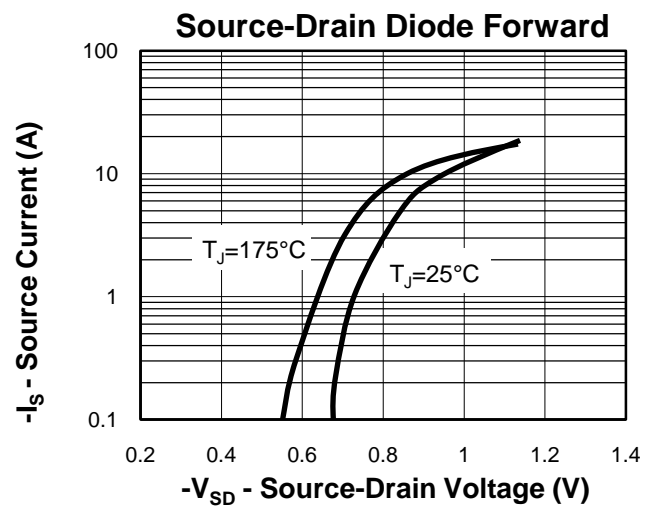
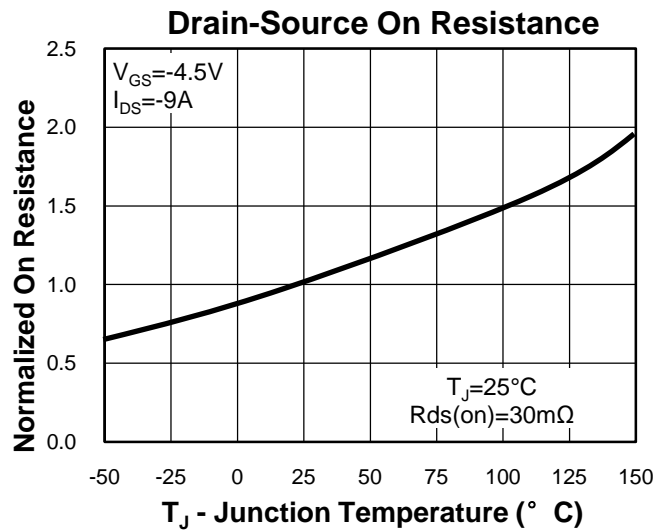
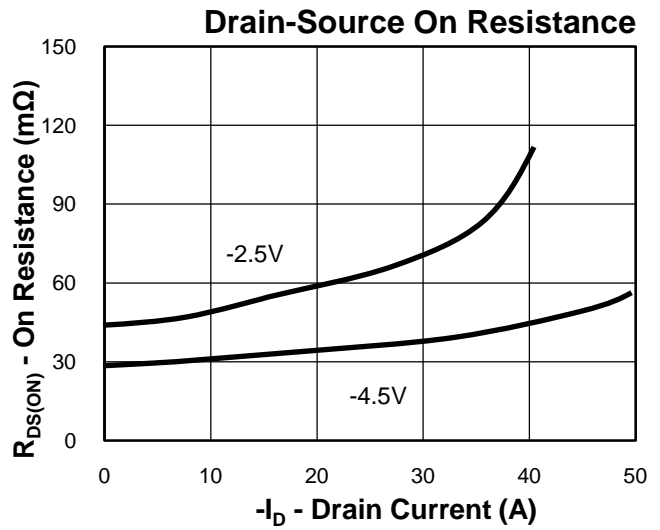
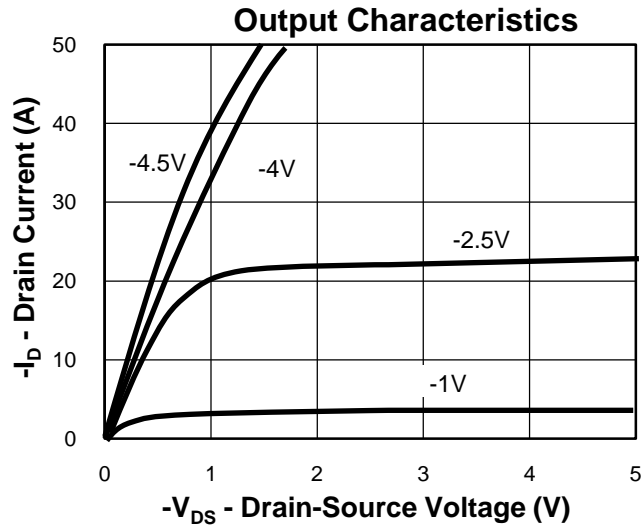
**Typical Characteristics**



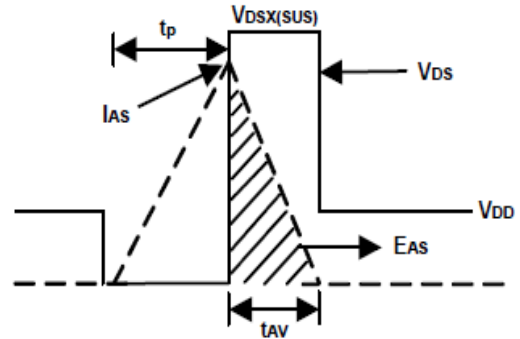
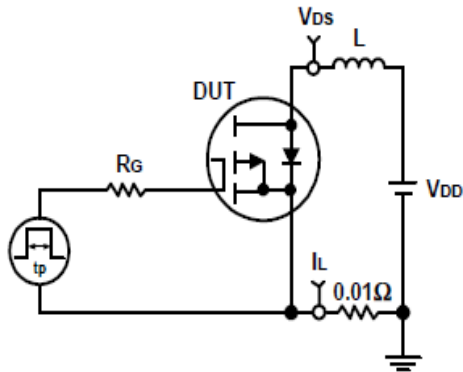
**Thermal Transient Impedance**



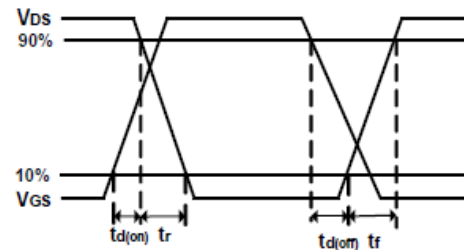
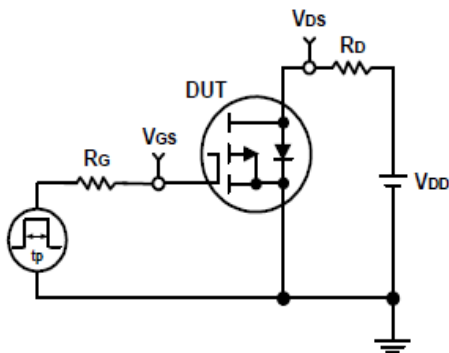
**Typical Characteristics**



**Avalanche Test Circuit and Waveforms**

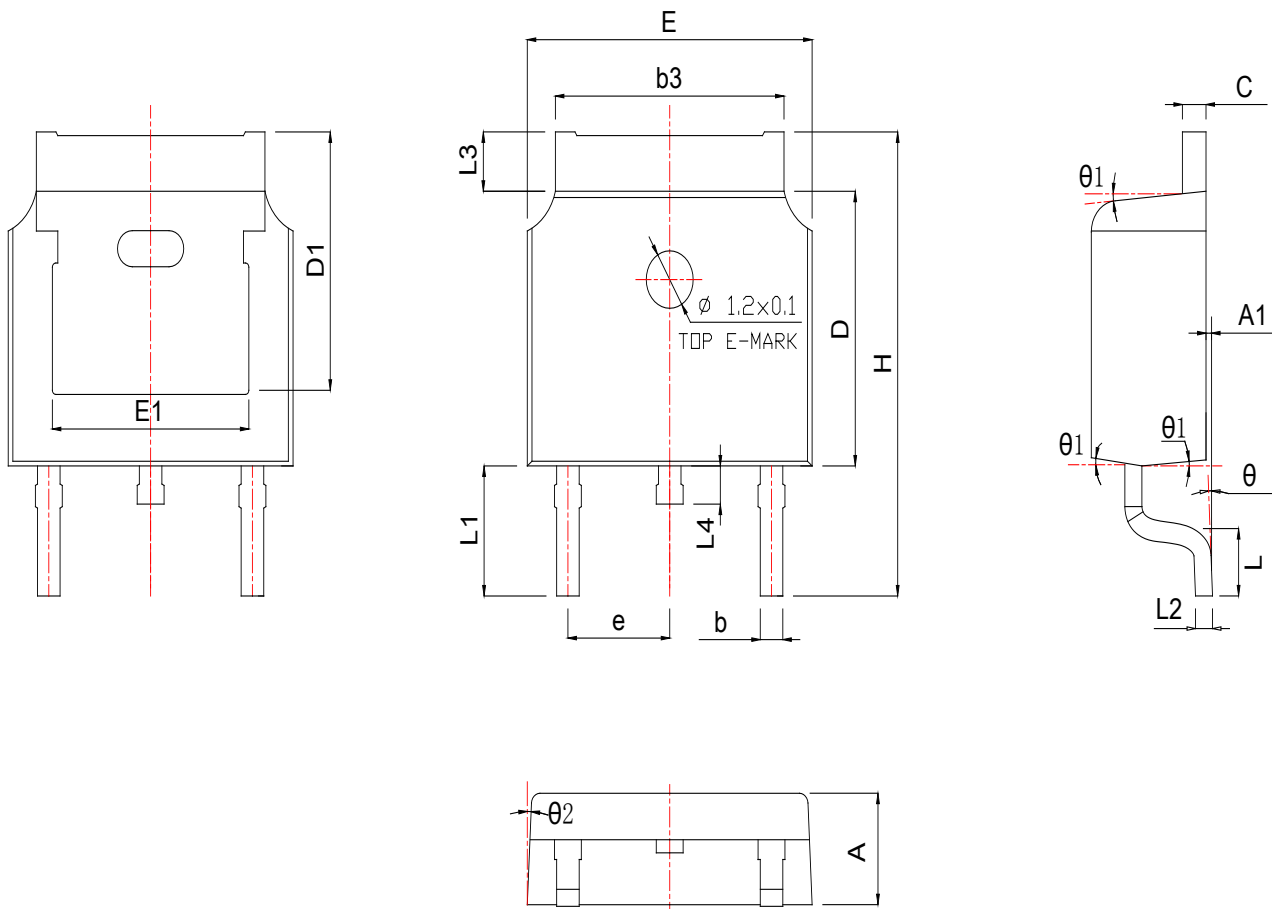


**Switching Time Test Circuit and Waveforms**



**Package Information**

**TO252**



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.200	2.290	2.380	0.087	0.090	0.094
A1	0.000		0.100	0.000		0.004
b	0.720	0.785	0.850	0.028	0.031	0.033
b3	5.230	5.345	5.460	0.206	0.210	0.215
c	0.470	0.525	0.580	0.019	0.021	0.023
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	9.900	10.100	10.300	0.390	0.398	0.406
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°

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