

## N-Channel 100V(D-S) MOSFET

Product summary		
$V_{DS}$	100	V
$R_{DS(ON)}$ (at $V_{GS}=10V$ ) Typ.	95	m $\Omega$
$I_D$ ( $T_C=25^{\circ}C$ )	15	A

### Features

- Low  $C_{rss}$
- Fast switching

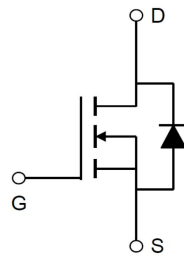
### Applications

- PWM Application
- Load switching

### Pin Configuration



TO-252



### Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECFA15N10	TO-252	13"	2500pcs

### Absolute Maximum Ratings (at $T_A=25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
$V_{DS}$	Drain-Source Voltage		100	V
$V_{GS}$	Gate-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C=25^{\circ}C$	15	A
		$T_C=100^{\circ}C$	9.5	A
$I_{DM}$	Pulse Drain Current Tested <sup>A</sup>		62	A
$E_{AS}$	Single Pulse Avalanche Energy <sup>B</sup>		25	mJ
$P_D$	Power Dissipation	$T_C=25^{\circ}C$	55	W
$T_J, T_{STG}$	Junction and Storage Temperature Range		-55 to +150	$^{\circ}C$

### Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JC}$	Thermal Resistance-Junction to case	2.3	$^{\circ}C/W$

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

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
<b>Static Parameters</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	--	--	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	--	--	1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	$\pm 1$	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.7	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance <sup>C</sup>	$V_{GS}=10V, I_D=10A$	--	95	110	m $\Omega$
		$V_{GS}=4.5V, I_D=8A$	--	100	130	m $\Omega$
$V_{SD}$	Forward Voltage	$I_S=15A, V_{GS}=0V$	--	--	1.2	V
$I_S$	Maximum Body-Diode Continuous Current		--	--	15	A
<b>Dynamic Parameters <sup>D</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=25V$ $f=1\text{MHz}$	--	637	--	pF
$C_{oss}$	Output Capacitance		--	41	--	pF
$C_{rss}$	Reverse Transfer Capacitance		--	20	--	pF
$Q_g$	Total Gate Charge	$V_{DS}=30V, I_D=15A$ $V_{GS}=10V$	--	19	--	nC
$Q_{gs}$	Gate-Source Charge		--	3.2	--	nC
$Q_{gd}$	Gate-Drain Charge		--	7.0	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DS}=30V, I_D=10A,$ $R_G=1.8\Omega,$ $V_{GS}=10V$	--	13.3	--	ns
$t_r$	Turn-on Rise Time		--	5.8	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	33.2	--	ns
$t_f$	Turn-off Fall Time		--	4.7	--	ns

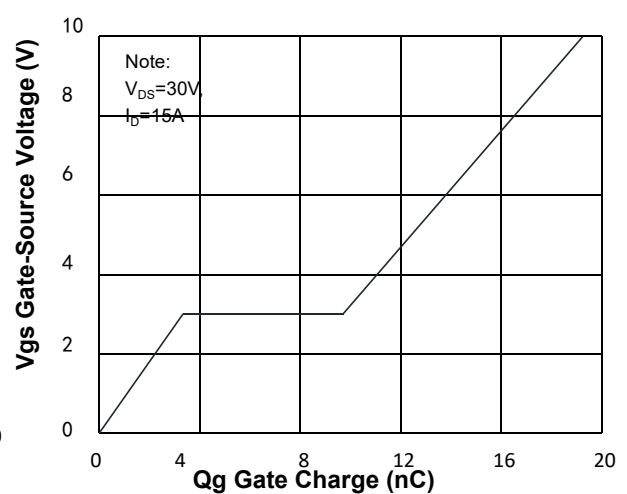
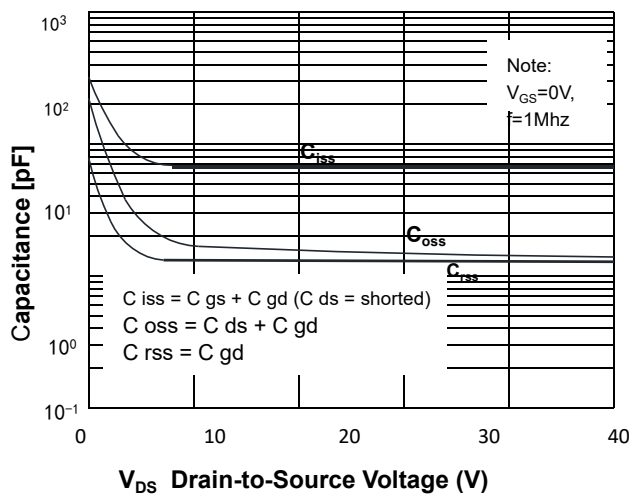
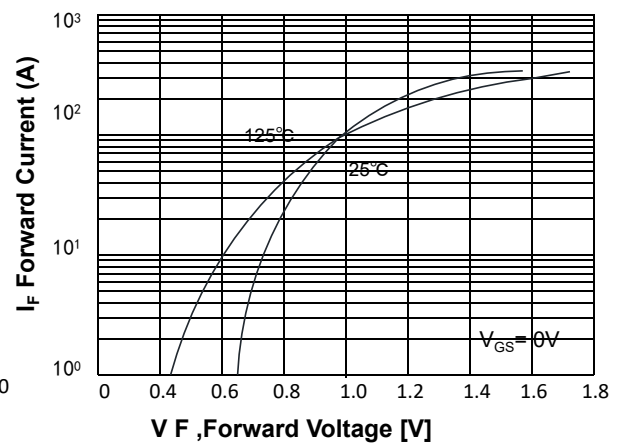
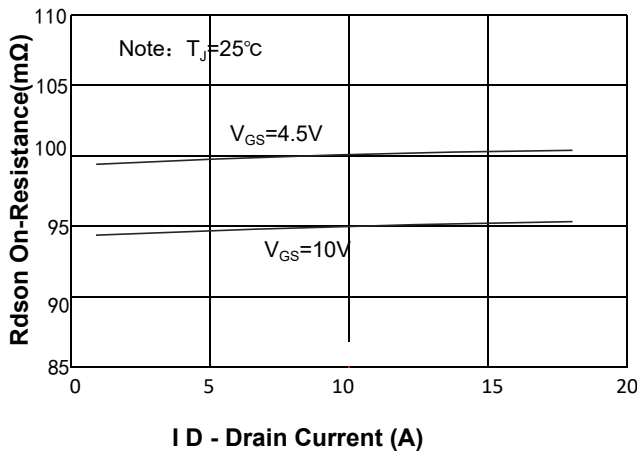
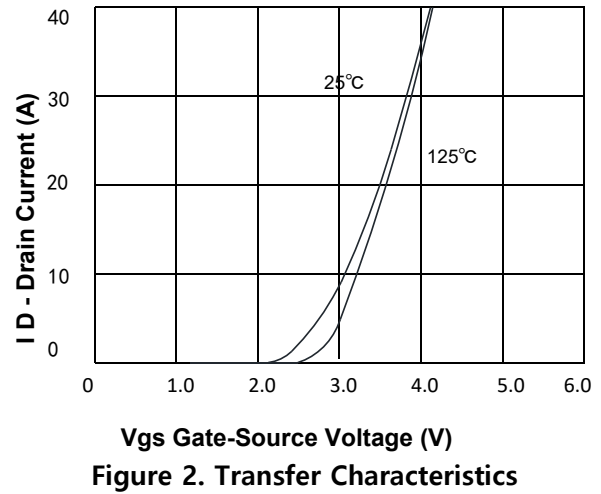
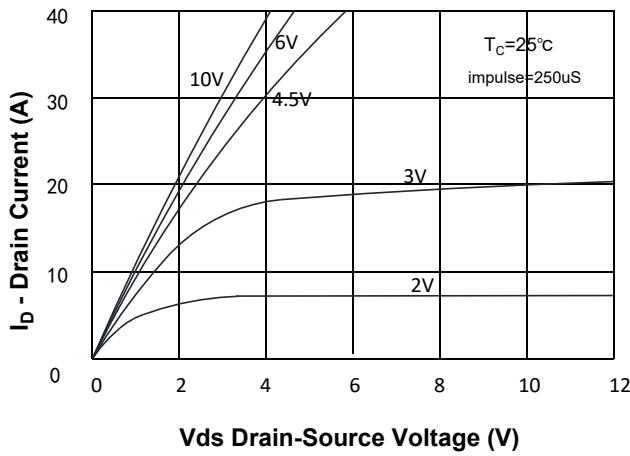
A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. EAS condition:  $T_J=25^\circ\text{C}$ ,  $V_{DD}=30V$ ,  $V_G=10V$ ,  $L=0.5\text{mH}$ .

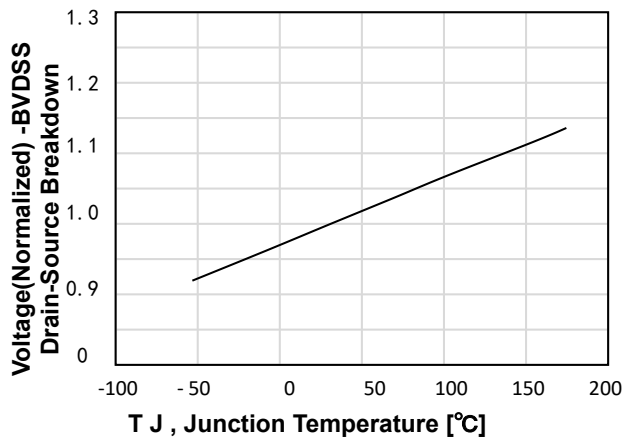
C. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

D. Guaranteed by design, not subject to production testing.

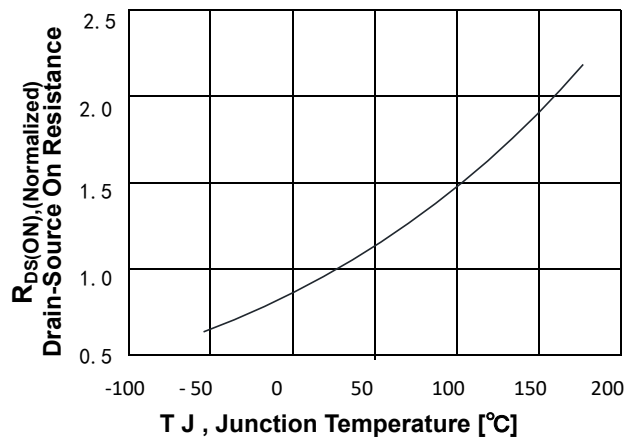
## Typical Characteristics



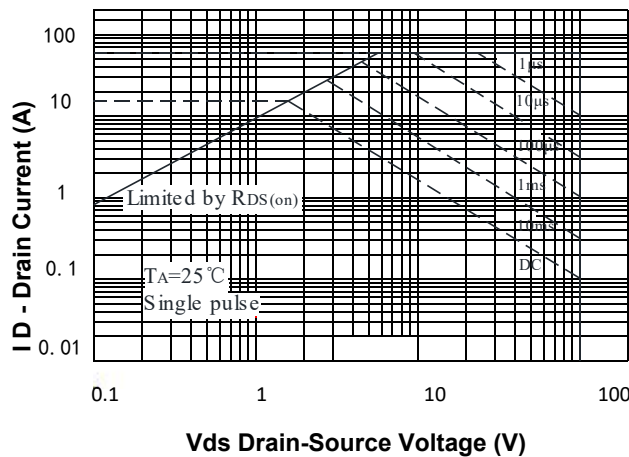
## Typical Characteristics



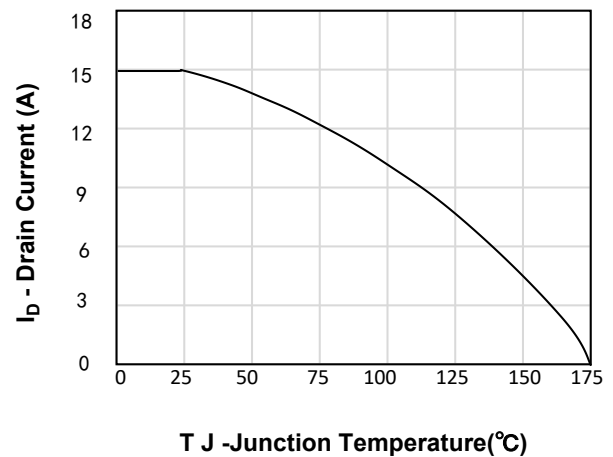
**Figure 7. Breakdown Voltage Variation vs Temperature**



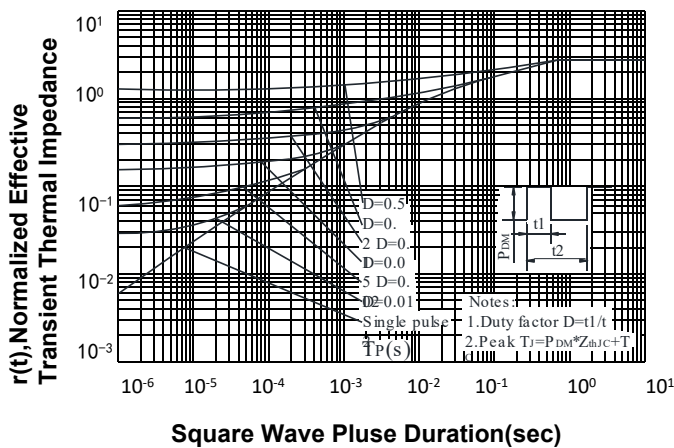
**Figure 8. On-Resistance Variation vs Temperature**



**Figure 9. Maximum Safe Operating Area**



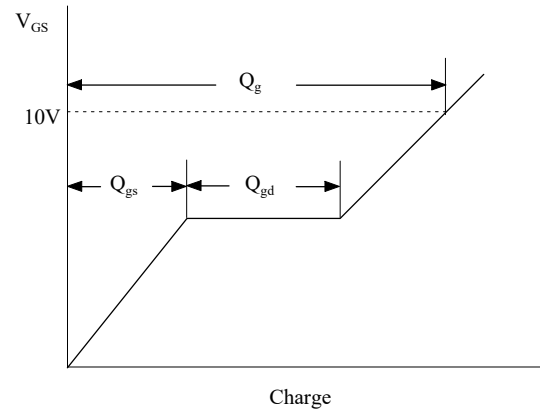
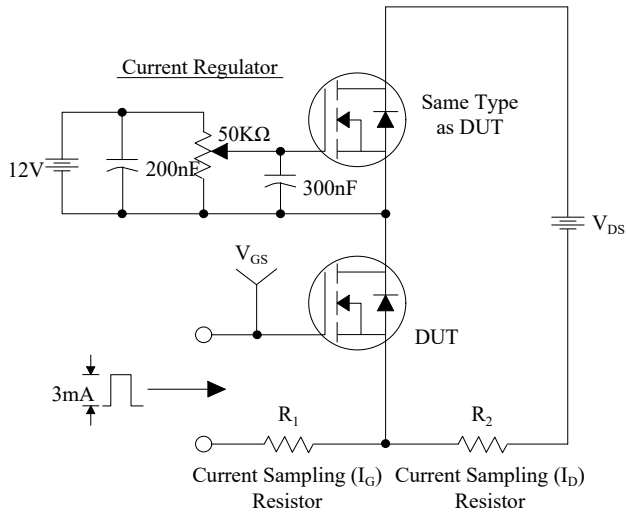
**Figure 10. Maximum Continuous Drain Current vs Temperature**



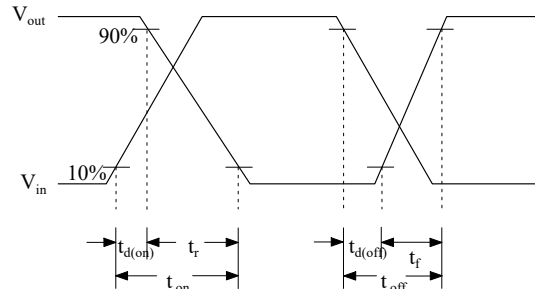
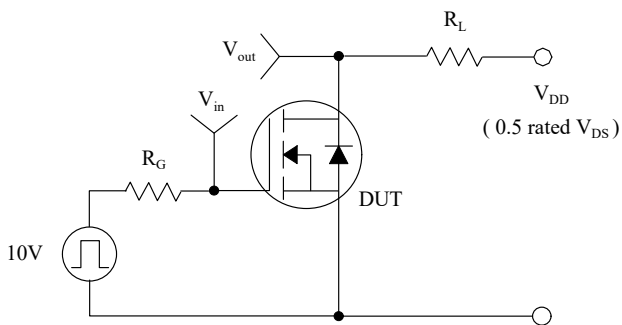
**Figure 11. Transient Thermal Response Curve**

## Test Circuit

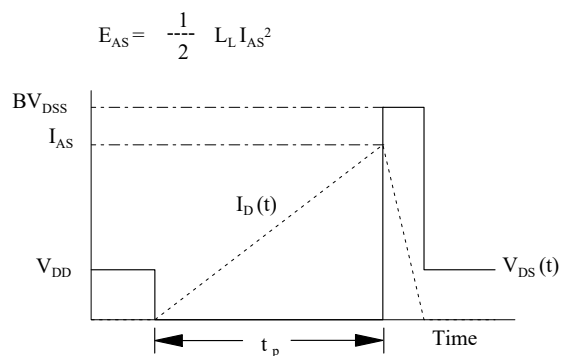
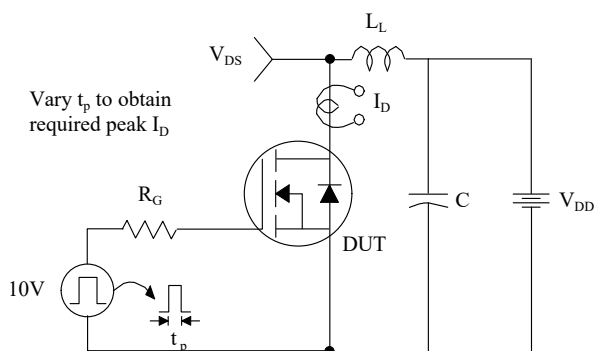
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

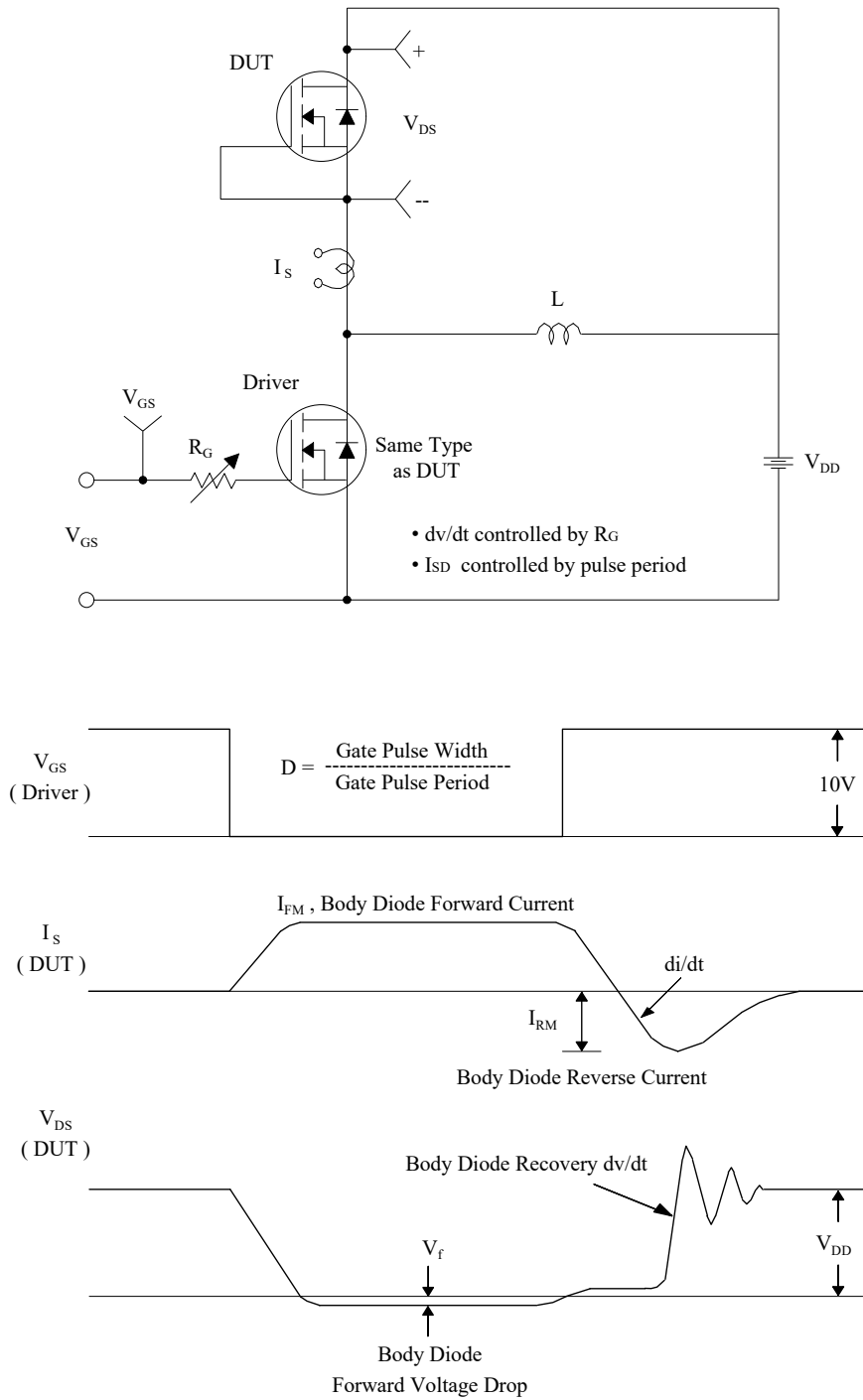


### Unclamped Inductive Switching Test Circuit & Waveforms

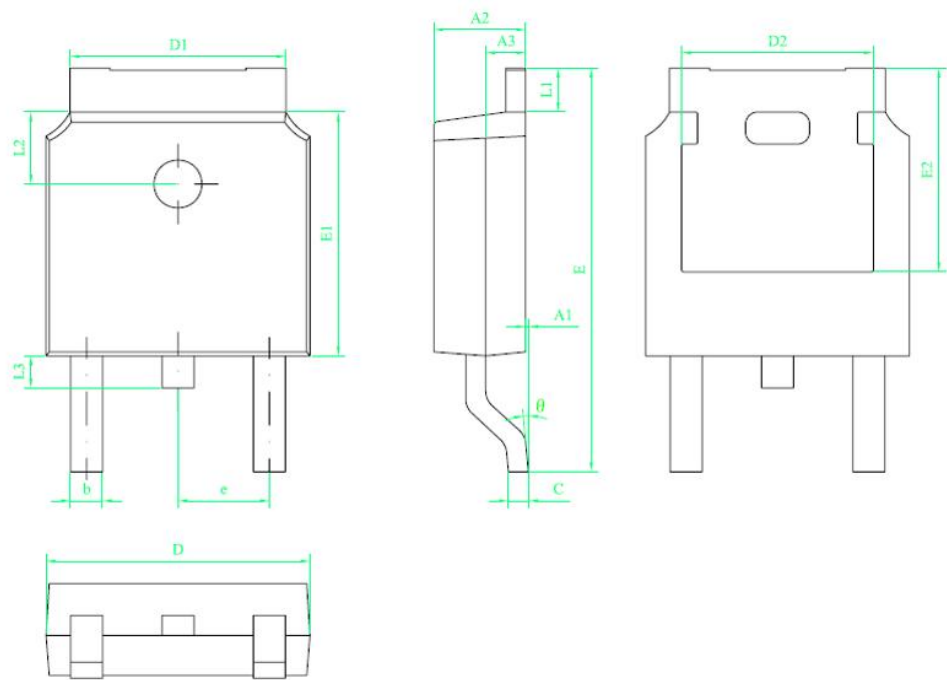


## Test Circuit

### Peak Diode Recovery dv/dt Test Circuit & Waveforms



TO-252 Package Information



符号	尺寸		
	min	nom	max
A1	0	—	0.10
A2	2.20	2.30	2.40
A3	0.90	1.00	1.10
b	0.75	—	0.85
c	0.50	—	0.60
D	6.50	6.60	6.70
D1	5.30	5.40	5.50
D2	4.70	4.80	4.90
E	9.90	10.10	10.30
E1	6.00	6.10	6.20
E2	5.20	5.30	5.40
e	2.20	2.286	2.40
L1	0.90	—	1.25
L2	1.70	1.80	1.90
L3	0.60	0.80	1.00
θ	0°	—	8°

- 技术要求:
1. 树脂体不应有崩裂、缺损等缺陷;
  2. 树脂上下部X、Y方向偏差不超过0.20;
  3. 胶体两端留废胶总和宽度不超过0.50;
  4. 所有单位为mm;