XYTB0130TA N-Channel Trench Power MOSFET

XYTB0130TA Description

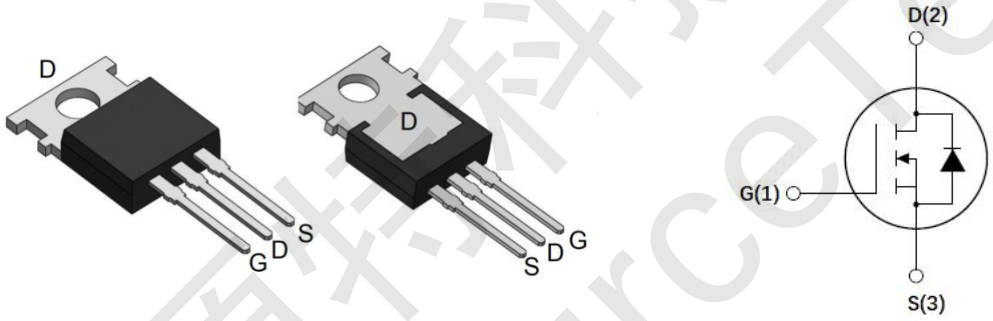
Features

- 100V,42A
- $R_{DS(ON)}$=30.8mΩ (Typ.) @ V_{GS} =10V
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS Tested

Application

- LCD TV
- Notebook
- Elevator
- Inductive heating
- Power tools

XYTB0130TA Package



TO-220

XYTB0130TAPackage Marking and Ordering Information

Product ID	PACK	Qty（pcs）
XYTB0130TA	TO-220	25

XYTB0130TA Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±25	V
I_D	Continuous Drain Current	T_C = 25℃	42	A
		T_C = 100℃	26	A
I_{DM}	Pulsed Drain Current note1		126	A
E_{AS}	Single Pulsed Avalanche Energy note2		110	mJ
P_D	Power Dissipation	T_C = 25℃	90	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.4	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

XYTB0130TA Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250μA	95	100	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =100V, V_{GS} = 0V,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V,V_{GS} = ±25V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	1	1.9	3	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS} =10V, I_D =20A	-	30.8	40	mΩ
g_{FS}	Forward Transconductance	V_{DS} =10V, I_D =20A	-	3.5	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =50V, V_{GS} =0V, f = 1.0MHz	-	3153	-	pF
C_{oss}	Output Capacitance		-	83	-	pF
C_{rss}	Reverse Transfer Capacitance		-	62	-	pF
R_g	Gate resistance	-	-	2.3	-	Ω
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS} =50V, I_D =10A, V_{GS} =10V	-	53	-	nC
Q_{gs}	Gate-Source Charge		-	8.5	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	8.7	-	nC
$V_{plateau}$	Gate plateau voltage		-	2.9	-	V
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=50V, V_{GS} =10V RL=5Ω,R_{GEN}=3Ω	-	7.5	-	ns
t_r	Turn-on Rise Time		-	3.5	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	23	-	ns
t_f	Turn-off Fall Time		-	5.5	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	42	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	126	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S=10A	-	-	1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25℃,VDD=20V,VG=10V, RG=25Ω， L=0.5mH

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

XYTB0130TA Typical Performance Characteristics

Figure1: On-Region Characteristics

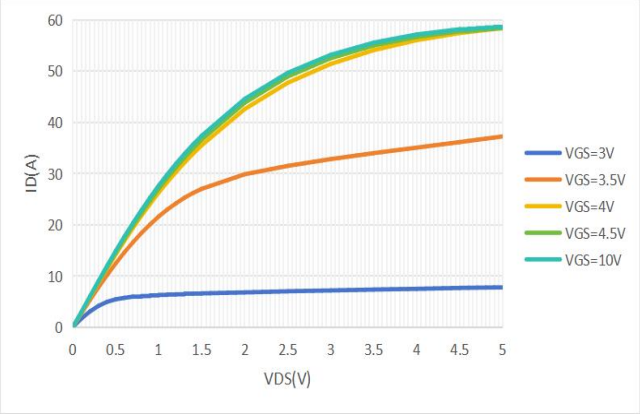


Figure 2: Transfer Characteristics

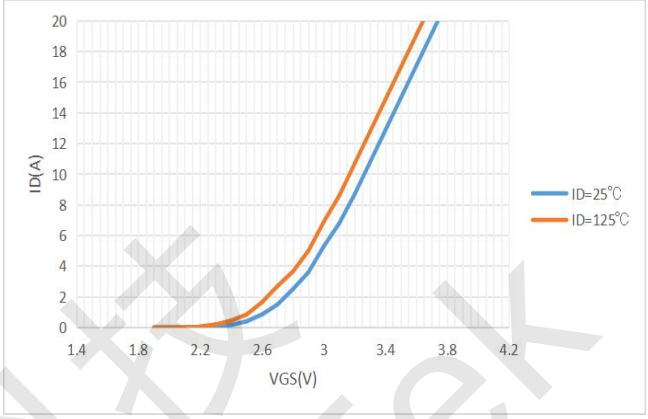


Figure 3: On-resistance vs. Drain Current and Gate Voltage

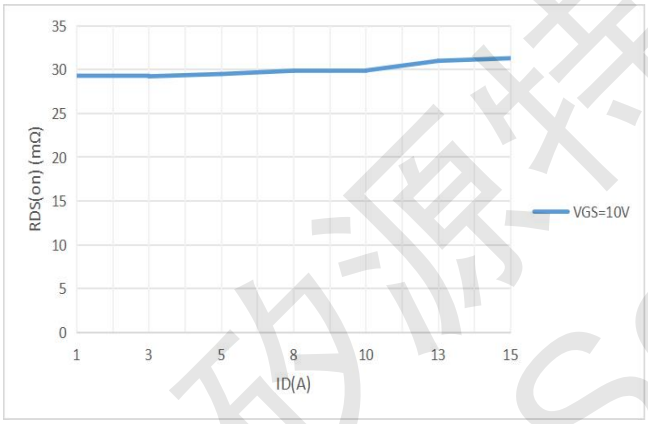


Figure 4: On-Resistance vs. Gate-Source Voltage

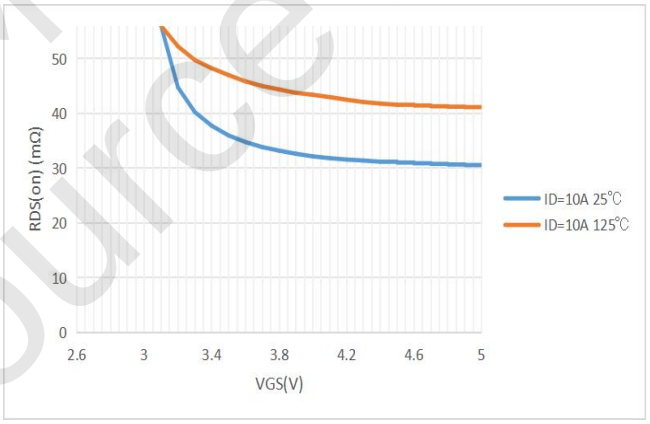


Figure 5: On-Resistance vs. Junction Temperature

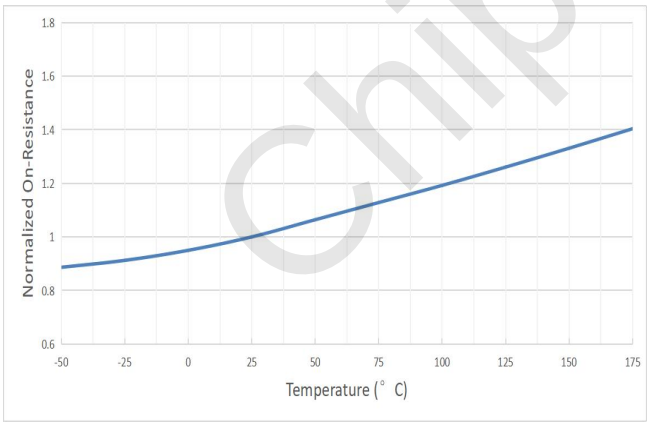
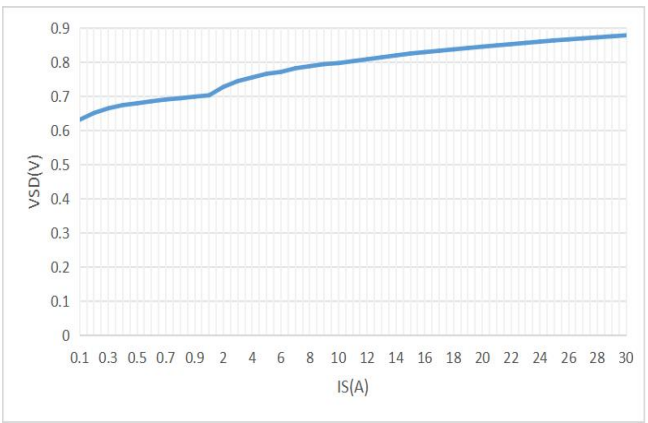


Figure 6: Body-Diode Characteristics



XYTB0130TA Typical Performance Characteristics

Figure7: Capacitance Characteristics C(pF)

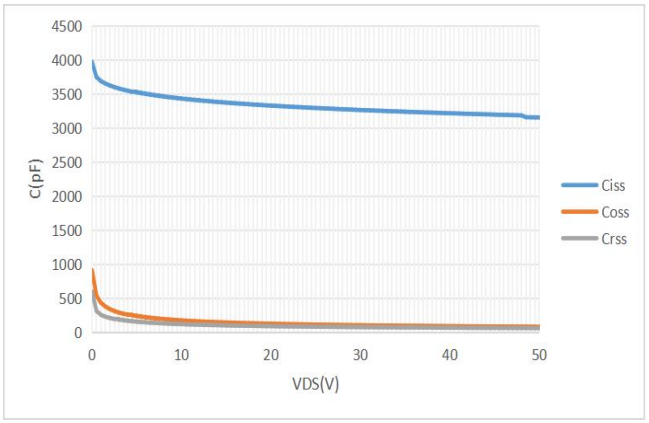


Figure 8: Gate-Charge Characteristics

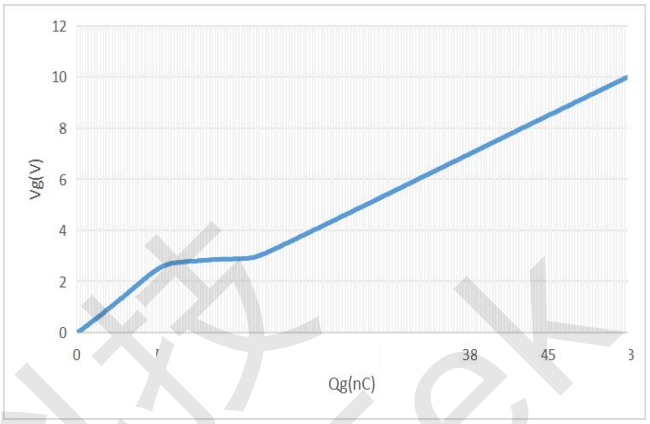


Figure9: Maximum Forward Biased Safe Operating Area

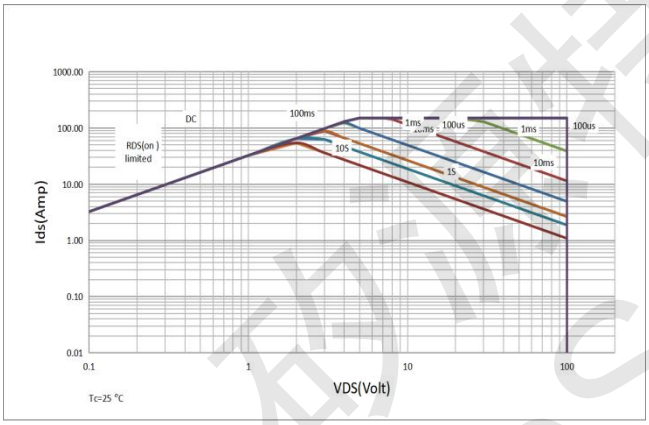
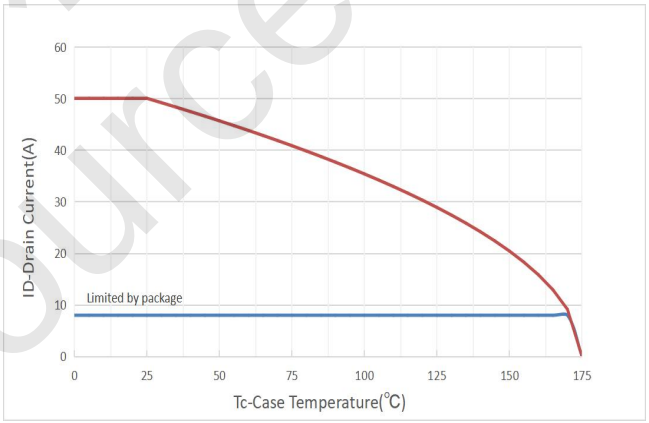


Figure 10: Current De-rating



XYTB0130TA Test Circuit

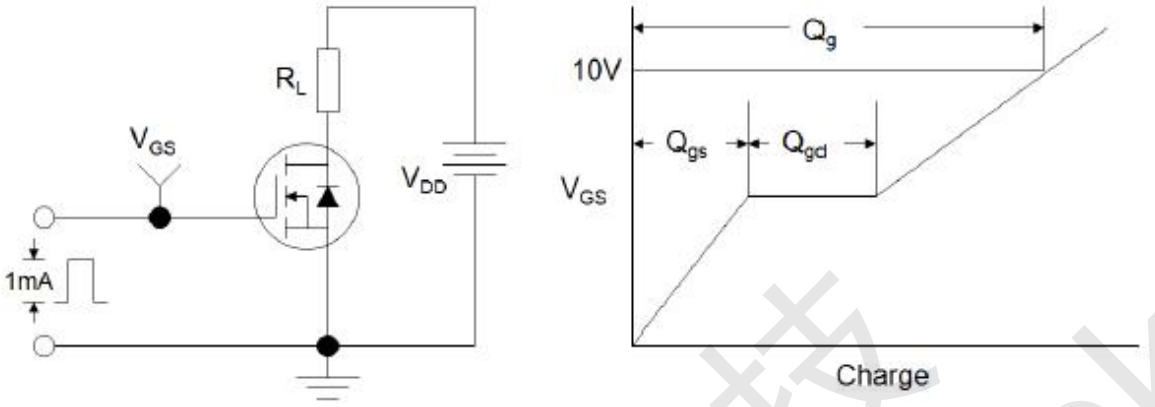


Figure1:Gate Charge Test Circuit & Waveform

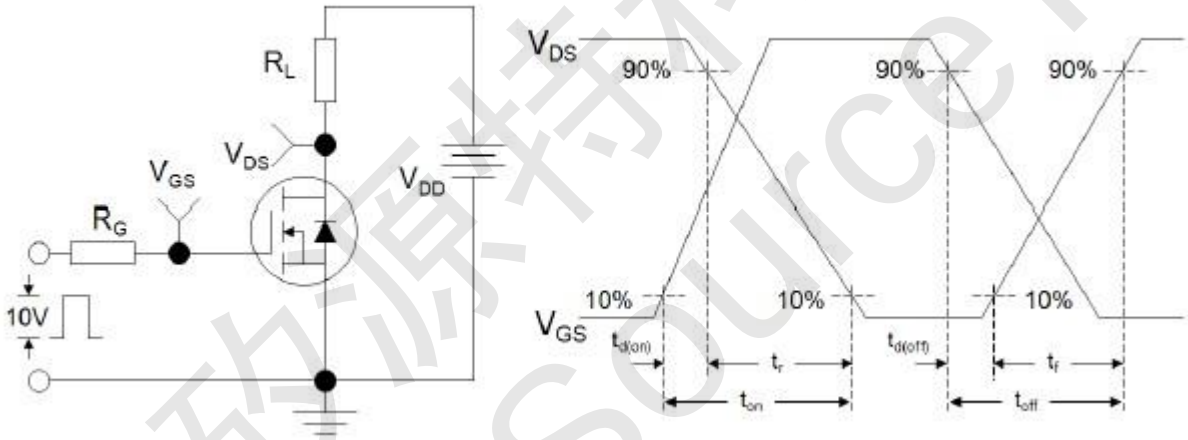


Figure 2: Resistive Switching Test Circuit & Waveforms

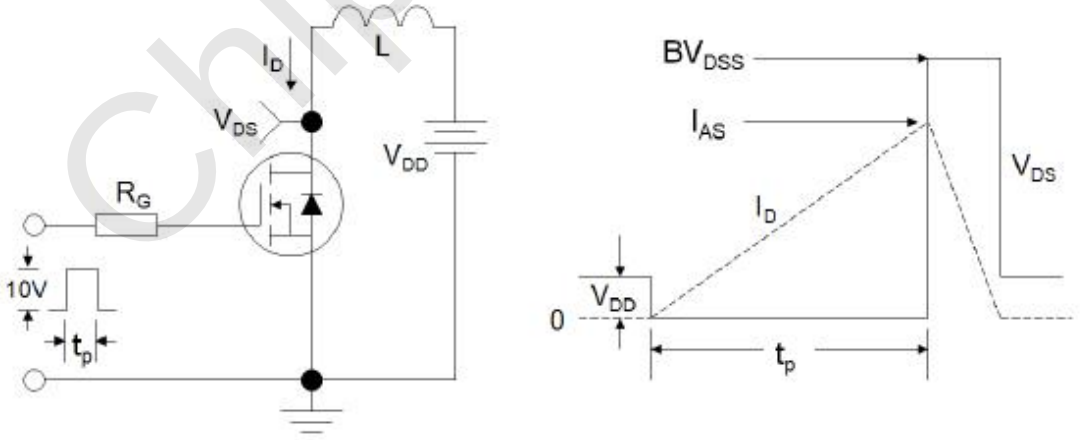


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

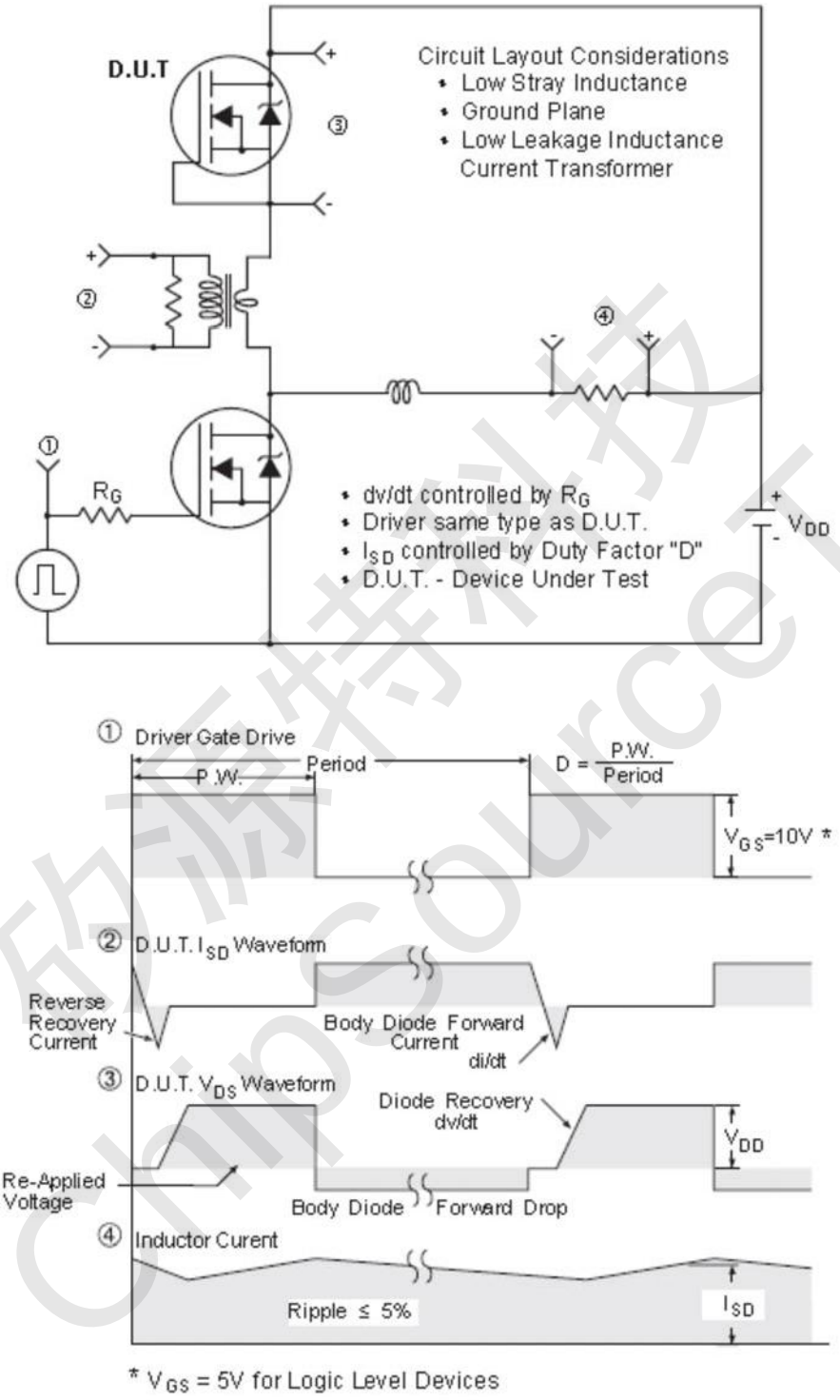
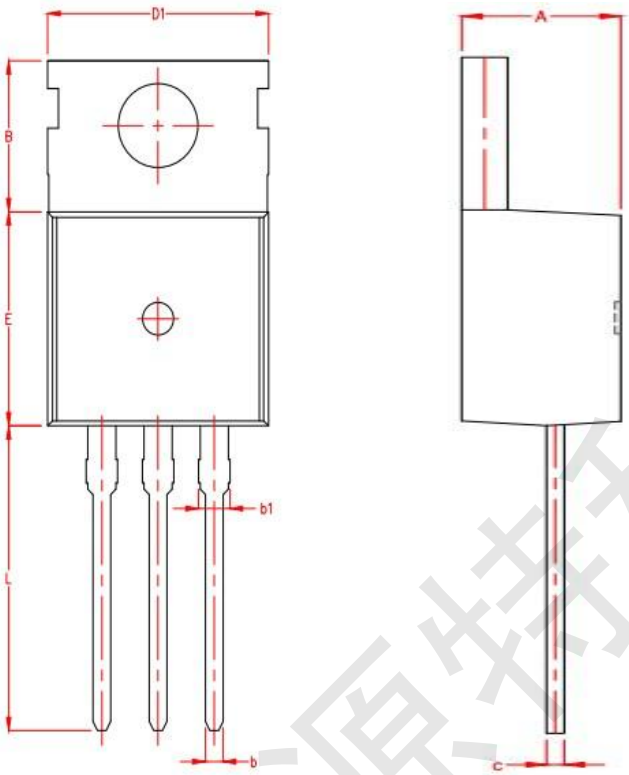


Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

XYTB0130TA TO-220 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.45	4.50	4.55
B	6.40	6.50	6.60
b		0.80TYP.	
b1	1.24	1.27	1.30
c	0.48	0.50	0.52
D	9.95	10.00	10.05
D1	9.80	10.00	10.20
E	9.15	9.20	9.25
e	2.51	2.54	2.57
e1	5.05	5.08	5.11
L	12.95	13.10	13.25