

●General Description

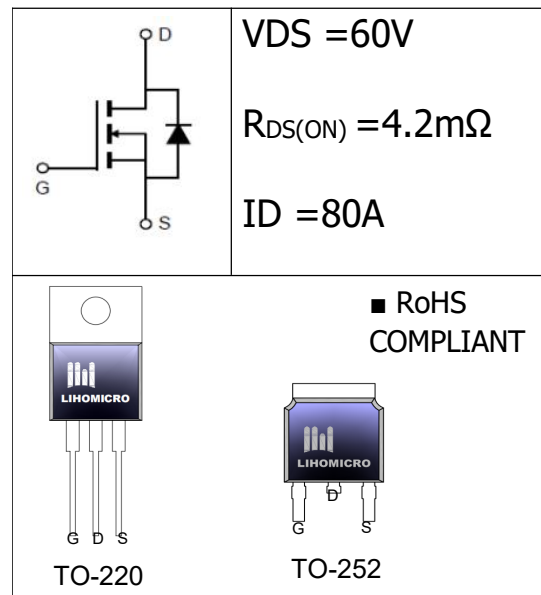
The N-Channel MOSFET LH80N06C has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

●Features

- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

●Application

- Motor Drives
- UPS
- DC-DC Converter



●Ordering Information:

Part Number	LH80N06C	LH80N06C
Package	TO-220	TO-252
Basic Ordering Unit (pcs)	1000	2500
Normal Package Material Ordering Code	LH80N06CT-TO220-TU	LH80N06CT5-TO252-TAP
Halogen Free Ordering Code	LH80N06CT-TO220-TU-HF	LH80N06CT5-TO252-TAP-HF

●Absolute Maximum Ratings (TC =25℃)

PARAMETER	SYMBOL	Value		UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	60		V
Gate-Source Voltage	V_{GS}	± 20		V
Continuous Drain Current , $T_C = 25^{\circ}C$	I_D	80		A
	$I_{D(TC=100^{\circ}C)}$	50		
Pulsed drain current ¹	I_{DM}	360		A
Avalanche Energy ²	E_{AS}	144		mJ
Power Dissipation($TC=25^{\circ}C$)	P_D	TO-220:125	TO-252:38	W
Operating Temperature	T_J	$-55\sim+150$		$^{\circ}C$
Storage Temperature	T_{STG}	$-55\sim+150$		$^{\circ}C$

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	--	3.0	V
Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$	--	4.2	6.0	mΩ
		$V_{GS}=4.5V, I_D=20A$	--	7.0	9.0	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V, T_J=25^\circ C$	--	--	1	uA
		$V_{DS}=48V, V_{GS}=0V, T_J=125^\circ C$	--	--	30	
Gate leakage current, Forward	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_{DS}=30A$	--	92	--	S
Gate resistance	R_G	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	--	2.95	--	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1MHz$	--	3752	--	pF
Output Capacitance	C_{oss}		--	269	--	
Reverse Transfer Capacitance	C_{rss}		--	206	--	
Turn -Off Delay Time	$T_d(off)$	$V_{GS}=10V, V_{DD}=30V, I_D=25A$	--	464	--	ns
Fall time	t_f		--	140	--	
Turn-on delay time	$t_d(on)$		--	16.5	--	
Rise time	t_r		--	170	--	
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=48V, I_D=25A, f=1MHz$	--	69	--	nC
Gate-to-Source Charge	Q_{gs}		--	11.7	--	
Gate-to-Drain Charge	Q_{gd}		--	13.1	---	
Continuous Diode Forward Current	I_S	--	--	--	110	A
Pulsed Source Current ³	I_{SM}	--	--	--	360	
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V, T_J=25^\circ C$	--	--	1.2	V
Reverse Recovery Time	t_{rr}	$I_f=25A, di_f/dt=100A/\mu s, T_J=25^\circ C$	--	26.8	--	ns
Reverse Recovery Charge	Q_{rr}		--	29	--	uC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX		UNIT
		TO-220	TO-252	
Thermal Resistance Junction-case	R_{thJC}	1.0	3.3	°C/W
Thermal Resistance Junction-ambient	R_{thJA}	62.5	62.5	°C/W

Notes:

1: Repetitive Rating: Pulse width limited by maximum junction temperature.

2: $V_{DD}=25V$, $V_{GS}=10V$, $L=0.5mH$, $I_{AS}=24A$, $R_G=25\Omega$, Starting $T_J=25^{\circ}C$.3: Pulse Test: Pulse Width $\leq 300\mu S$, Duty Cycle $\leq 2\%$.

• **Typical Characteristics**

Figure 1. Typ. Output Characteristics

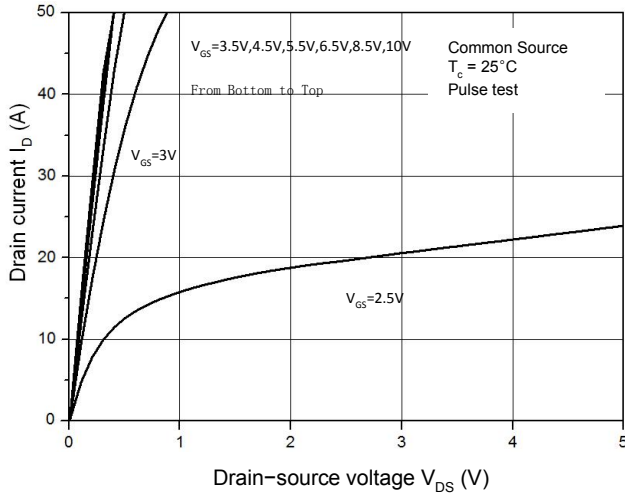


Figure 2. Transfer Characteristics

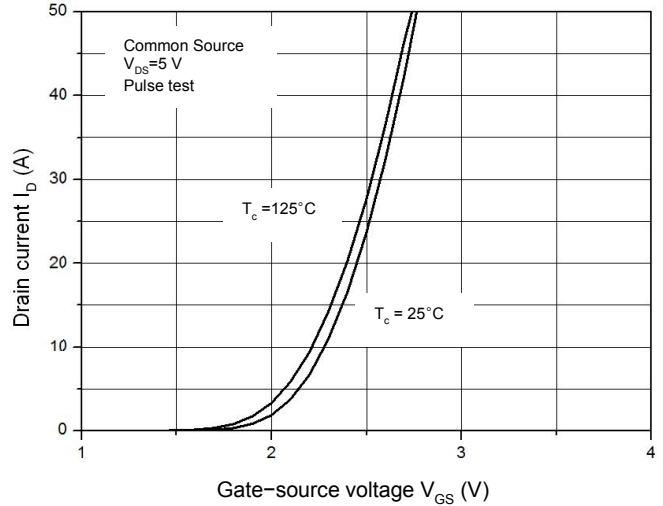


Figure 3. Capacitance Characteristics

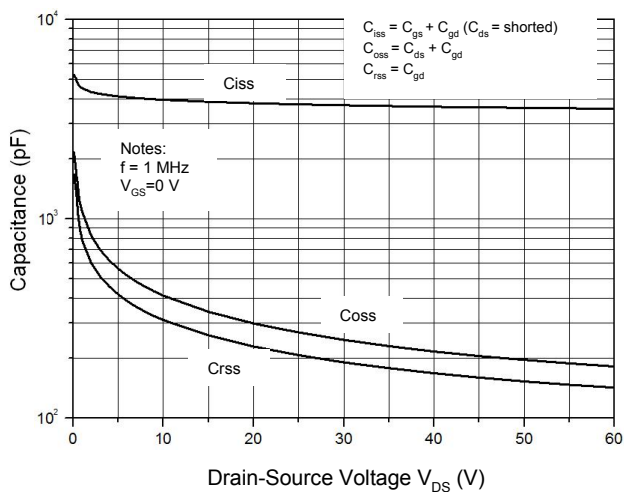


Figure 4. Gate Charge Waveform

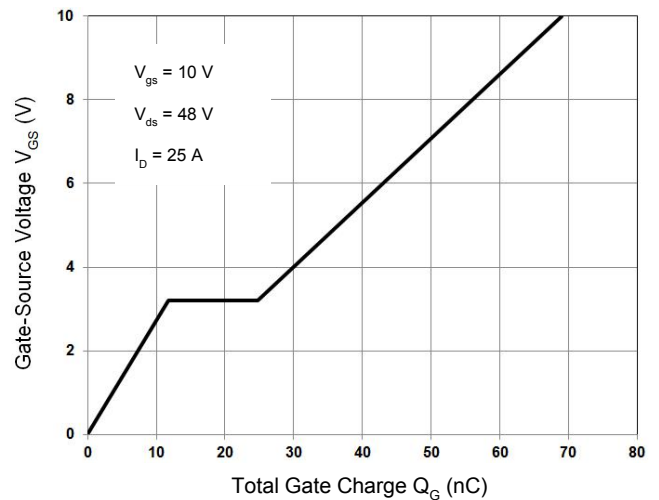


Figure 5. Body-Diode Characteristics

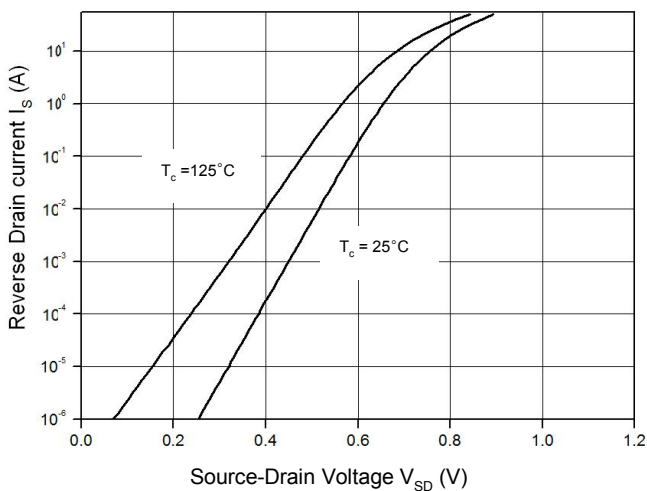
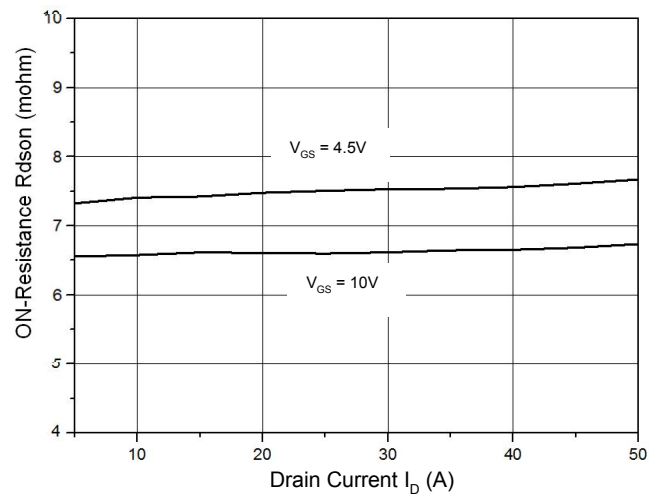


Figure 6. Rdson-Drain Current



● **Typical Characteristics**(cont.)

Figure 7. $R_{DS(on)}$ -Junction Temperature($^{\circ}\text{C}$)

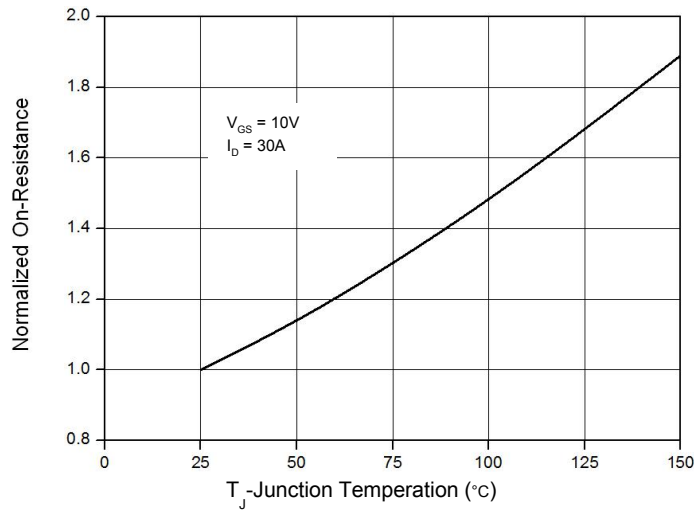


Figure 8-1 Maximum Safe Operating Area For TO-220

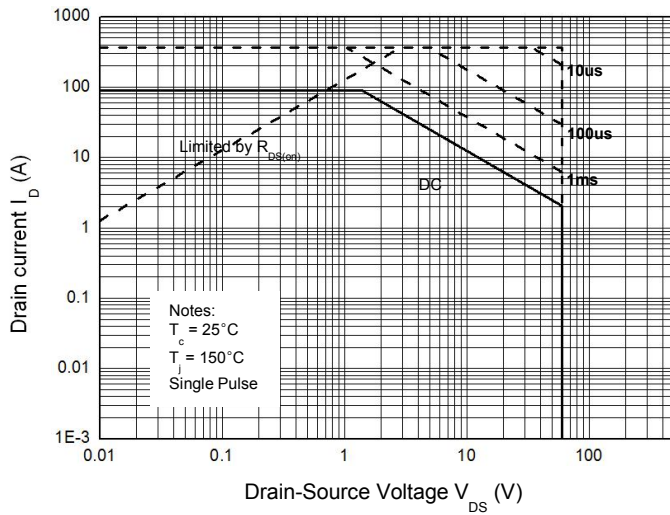


Figure 8-2 Maximum Safe Operating Area For TO-252

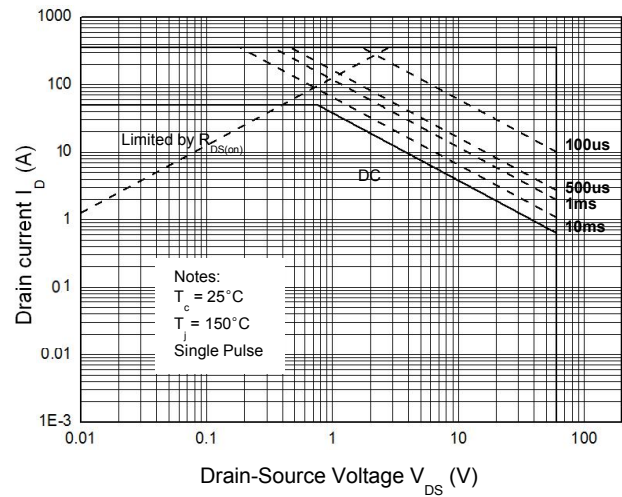


Figure 9-1. Normalized Maximum Transient Thermal Impedance (R_{thJC}) For TO-220

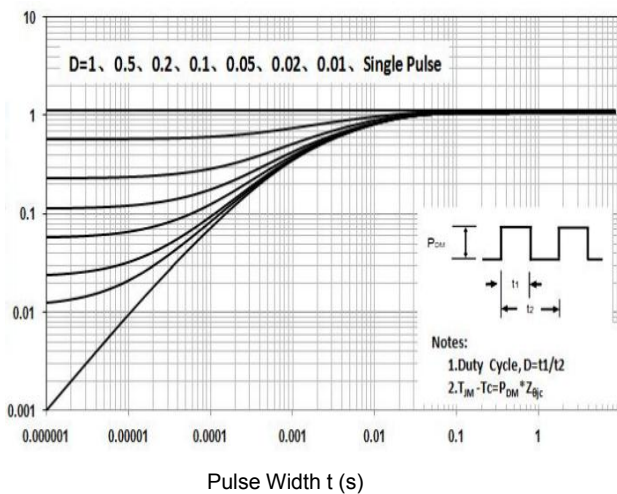
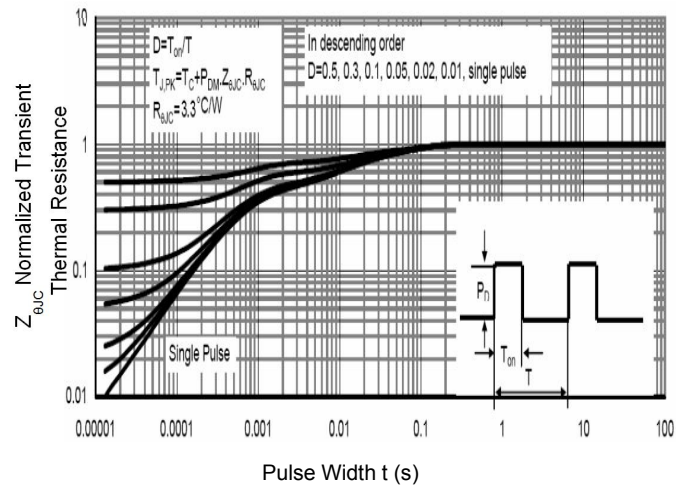


Figure 9-2. Normalized Maximum Transient Thermal Impedance (R_{thJC}) For TO-252



• Test Circuits & Waveforms

Figure 1. Gate Charge Test Circuit & Waveform

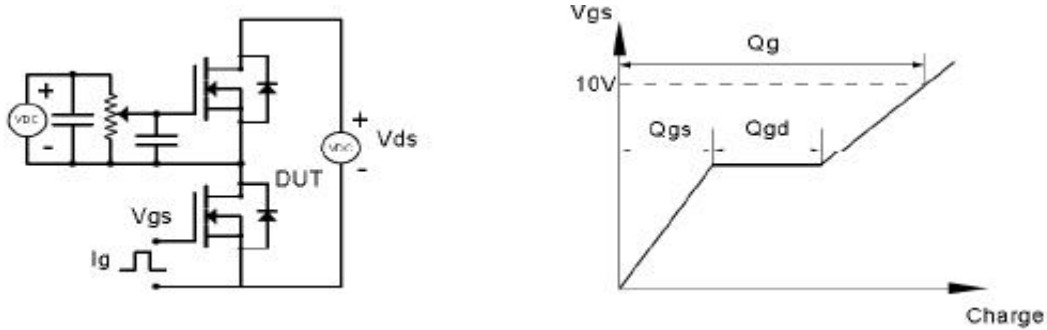


Figure 2. Resistive Switching Test Circuit & Waveforms

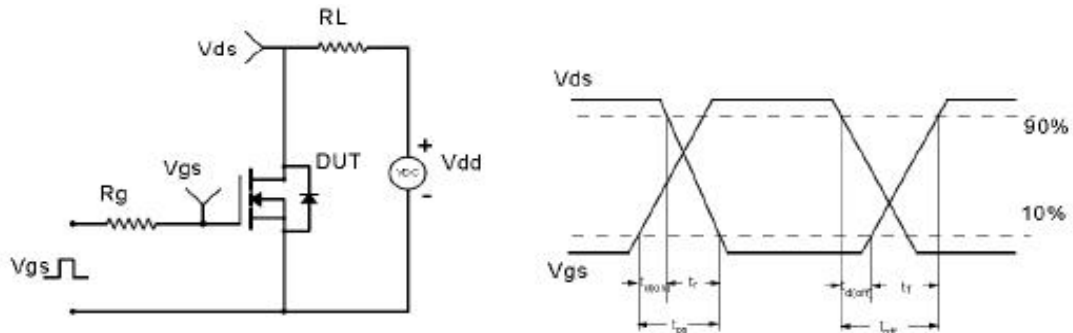


Figure 3. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

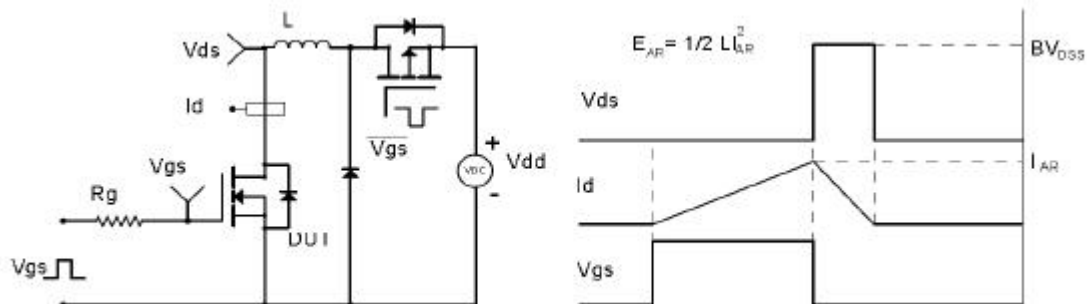
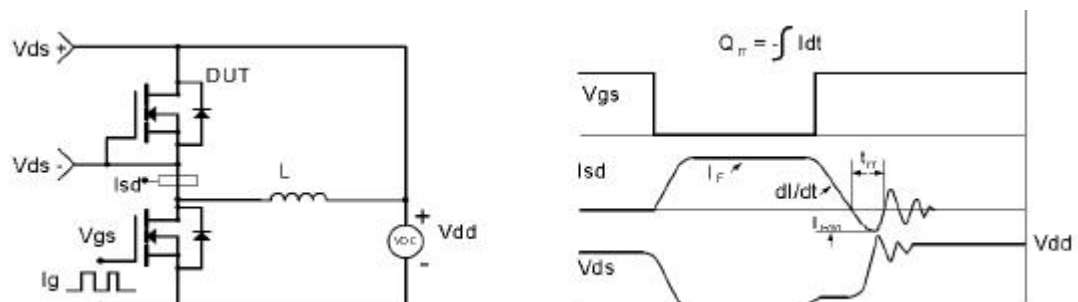


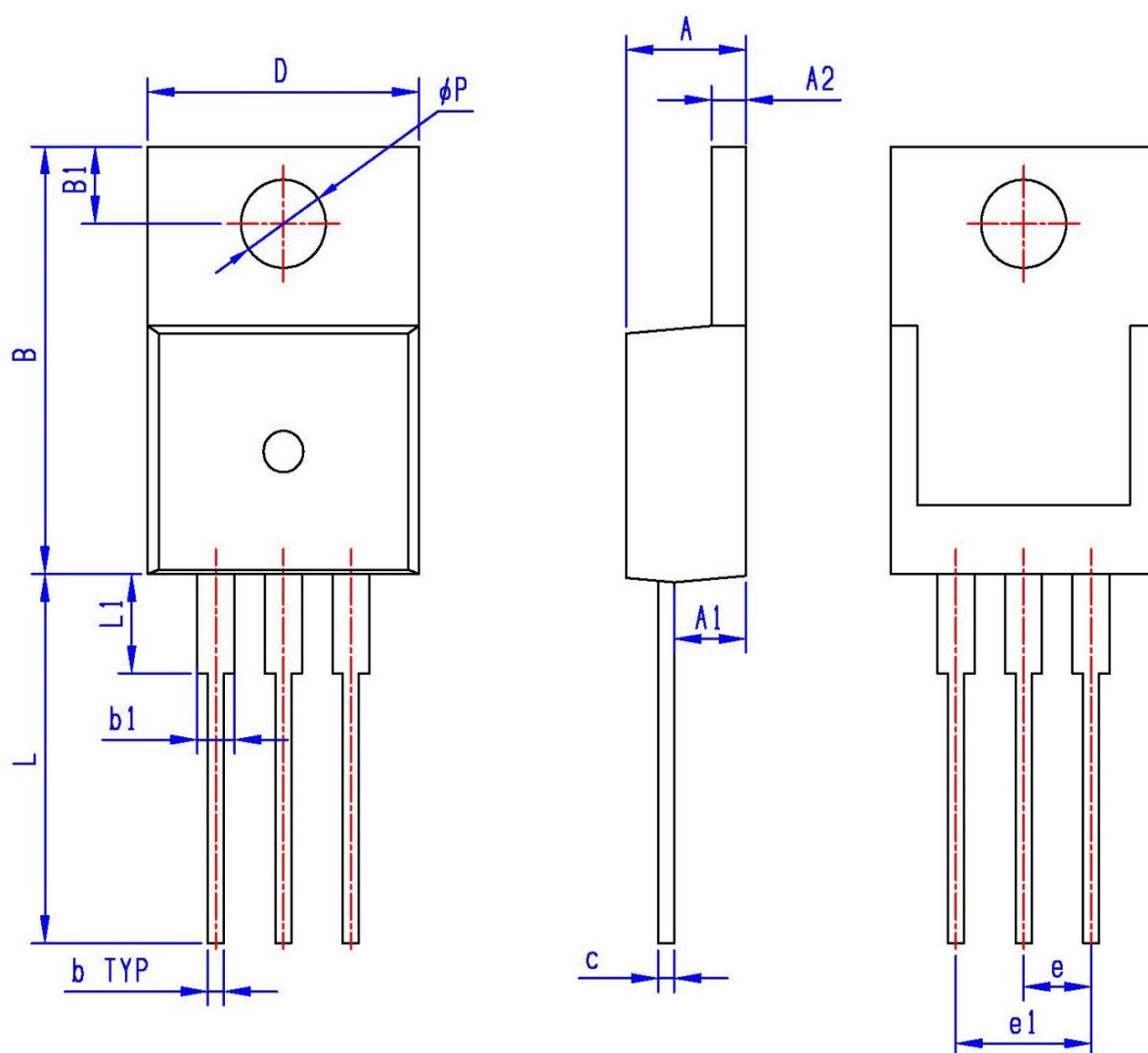
Figure 4. Diode Recovery Circuit & Waveform



●Dimensions (TO-220)

Unit:mm

SYMBOL	min	max	SYMBOL	min	max
A	4.25	4.85	B1	2.60	3.00
A1	2.30	3.00	e	2.40	2.70
A2	1.20	1.40	e1	4.95	5.25
b	0.60	0.90	L	12.40	14.20
b1	1.10	1.70	L1	2.40	3.40
c	0.40	0.70	∅P	3.50	3.90
D	9.80	10.60			
B	15.20	16.20			



●Dimensions (TO-252)

Unit:mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	L2	0.60	1.20
b	0.50	0.90	L3	1.20	1.80
b1	0.70	1.20	B	0.80	1.30
b2	0.40	0.70	C	0.40	0.70
D	6.20	6.80	D1	5.10	5.60
E	5.80	6.40	e1	2.10	2.45
L	3.60	4.60	e2	4.40	4.80
L1	0.80	1.60			

