

800V Super Junction MOSFET
●General Description

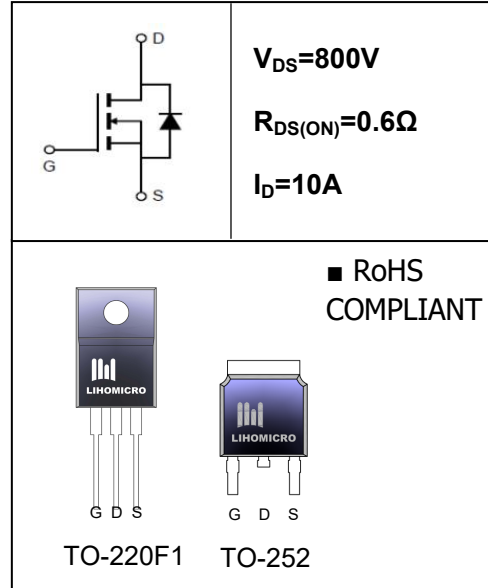
The SJ MOSFET LH80R600 has the low $R_{DS(on)}$, gate charge, fast switching and excellent avalanche characteristics. This device offers extremely fast and robust body diode, and is suitable for telecom and power supplies.

●Features

- Low Thermal Resistance
- Fast Switching
- High Input Resistance

●Application

- LED/LCD/PDP TV and monitor Lighting
- Power Supplies


●Ordering Information:

Part number	LH80R600	LH80R600
Package	TO-220F1	TO-252
Basic ordering unit (pcs)	1000	2500
Normal Package Material Ordering Code	LH80R600F1-T0220F1-TU	LH80R600T5-T0252-TAP
Halogen Free Ordering Code	LH80R600F1-T0220F1-TU-HF	LH80R600T5-T0252-TAP-HF

●Absolute Maximum Ratings (TC =25℃)

PARAMETER		SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage ¹		BV_{DSS}	800	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	TC = 25℃	I_D	10	A
	TC = 100℃		5.5	
Pulsed drain current (TC = 25℃, tp limited by Tjmax) ^{2,4}		I_{DM}	24	A
Single Pulse Avalanche Energy ²		E_{AS}	320	mJ
Power Dissipation(TC=25℃)		P_D	29	W
Peak Diode Recovery dv/dt ³		dv/dt	15	V/ns
Junction Temperature		T_J	-55~+150	℃
Storage Temperature		T_{STG}	-55~+150	℃

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	800	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	--	4.5	V
Drain-source On Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5.1A$	0.5	--	0.6	Ω
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=800V, V_{GS}=0V, T_J=25^\circ C$	--	--	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V$	--	--	10	μA
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=400V,$ $f=1.0MHz$	--	610	--	pF
Output Capacitance	C_{oss}		--	28	--	
Reverse transfer Capacitance	C_{rss}		--	1.2	--	
Turn -Off Delay Time ³	$T_d(off)$	$V_{DD}=400V,$ $I_D=8A,$ $V_{GS}=10V$ $R_G=25\Omega$	--	120	--	ns
Turn -On Delay Time ³	$T_d(on)$		--	19	--	
Rise Time	T_r		--	33	--	
Fall Time	T_f		--	20	--	
Total Gate Charge	Q_g	$I_D=8A,$ $V_{DS}=640V$ $V_{GS}=0\sim 10V$	--	18	--	nC
Gate-to-Source Charge	Q_{gs}		--	5.5	--	
Gate-to-Drain Charge	Q_{gd}		--	7.0	---	

●Reverse Diode Characteristics

Continuous Diode Forward Current	I_S	--	--	--	10	A
Pulsed Diode Forward Current	I_{SM}	--	--	--	24	A
Diode Forward Voltage	V_{SD}	$I_S=11A$ $V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	t_{rr}	$I_f=11A$ $di_F/dt=100A/\mu s$	--	400	--	ns
Reverse Recovery Charge	Q_{rr}		--	3.7	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	4	$^\circ C/W$
Thermal Resistance Junction-ambient	R_{thJA}	75	$^\circ C/W$

Notes:

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

2. $I_{AS}=3.5A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$

3. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

● **Typical Characteristics**

Figure 1. Output Characteristics

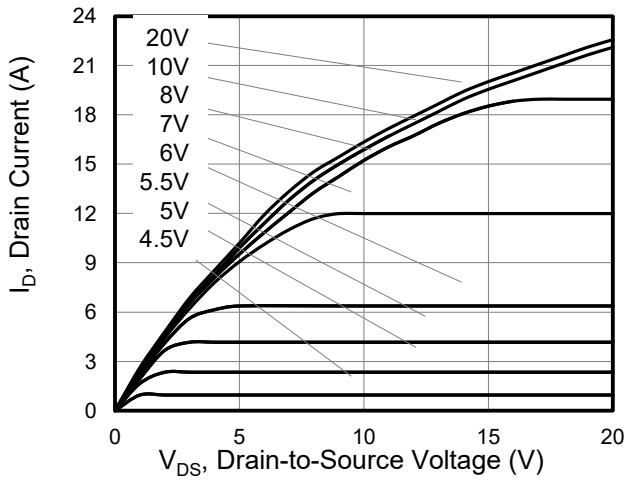


Figure 2. Transfer Characteristics

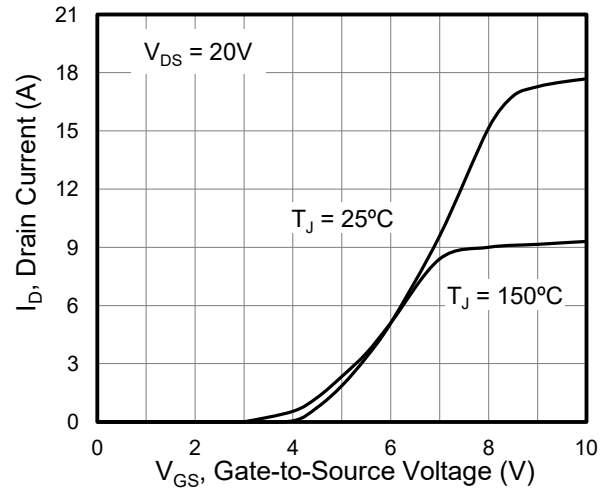


Figure 3. On-Resistance vs. Drain Current

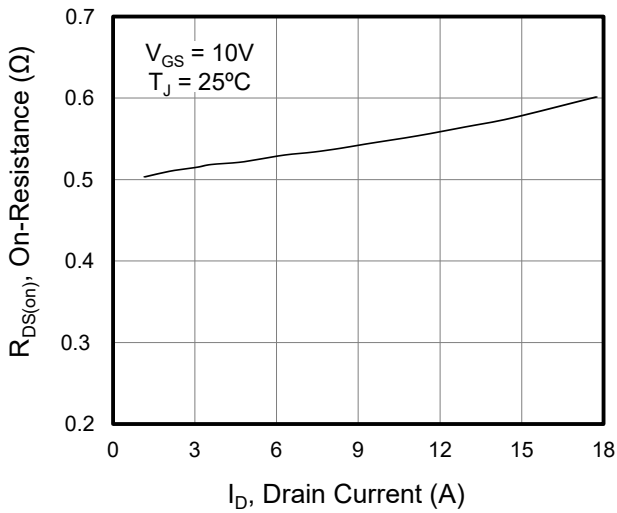


Figure 4. Capacitance

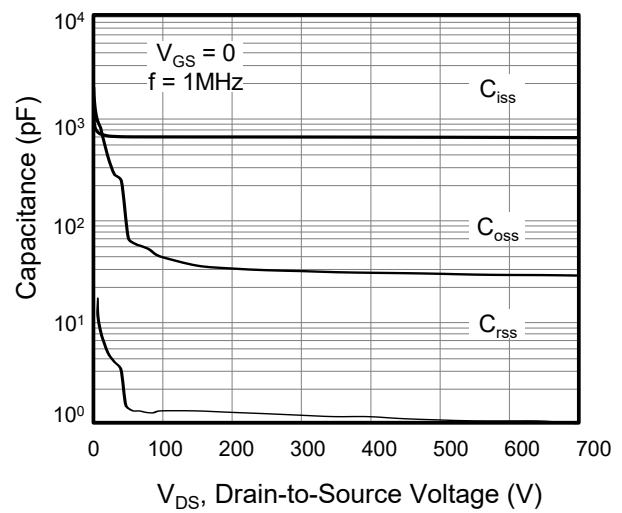


Figure 5. Gate Charge

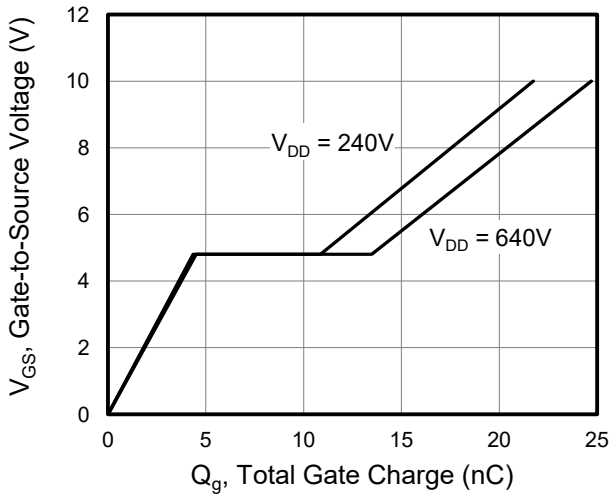
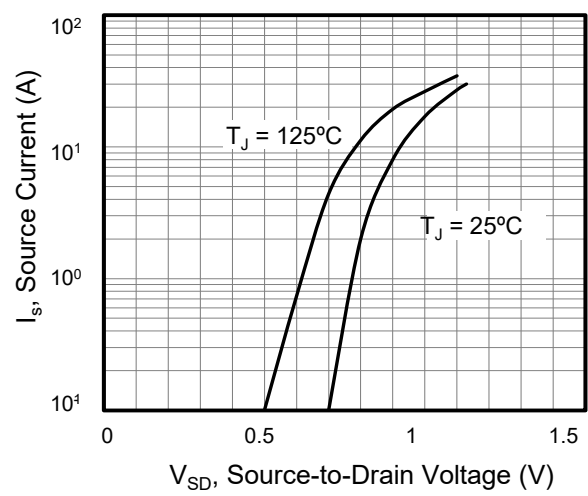


Figure 6. Body Diode Forward Voltage



●Typical Characteristics(Cont.)

Figure 7. On-Resistance vs. Junction Temperature

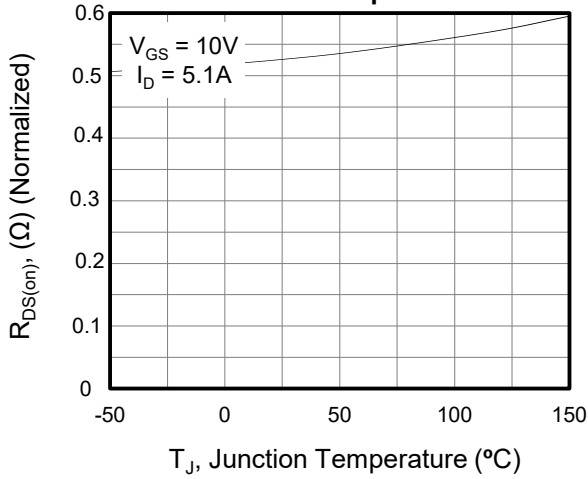


Figure 8. Breakdown voltage vs. Junction Temperature

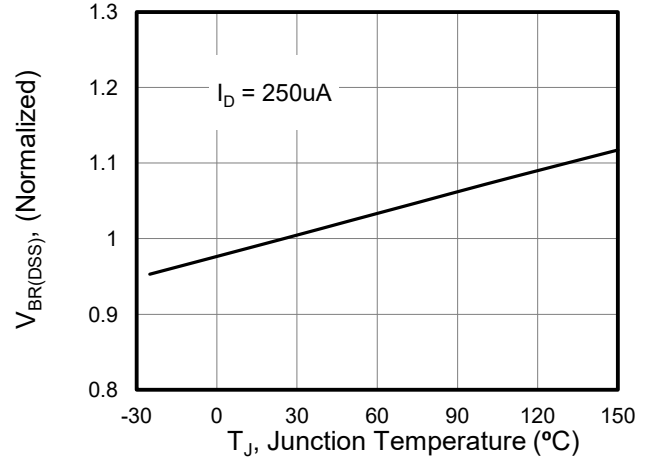


Figure 9. Transient Thermal Impedance

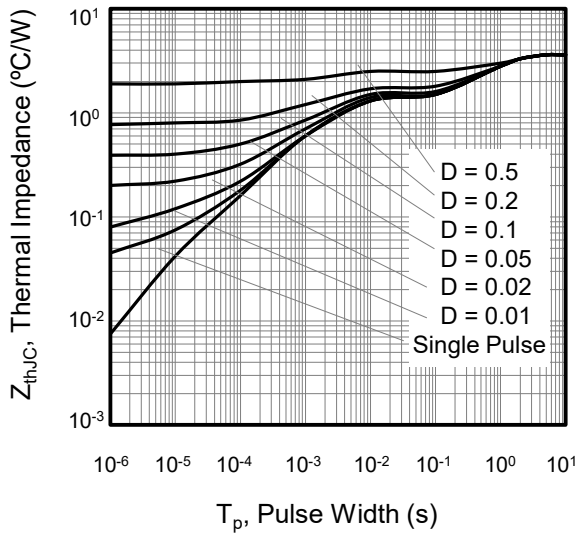
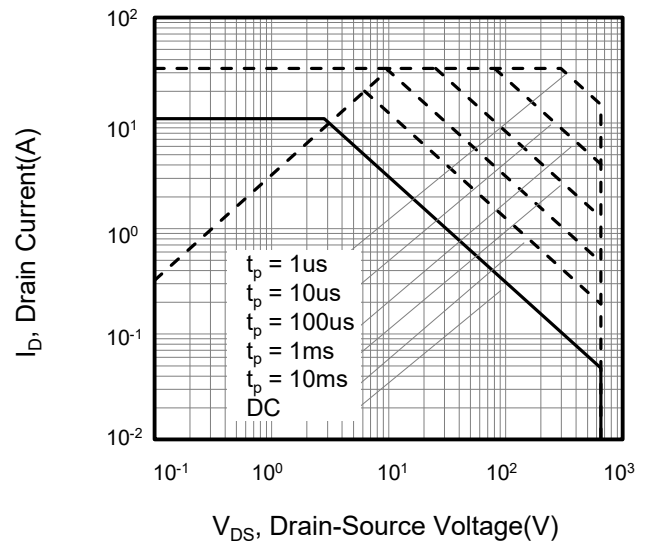


Figure 10. Safe operation area



• **Test Circuit and Waveforms**

Figure A: Gate Charge Test Circuit and Waveform

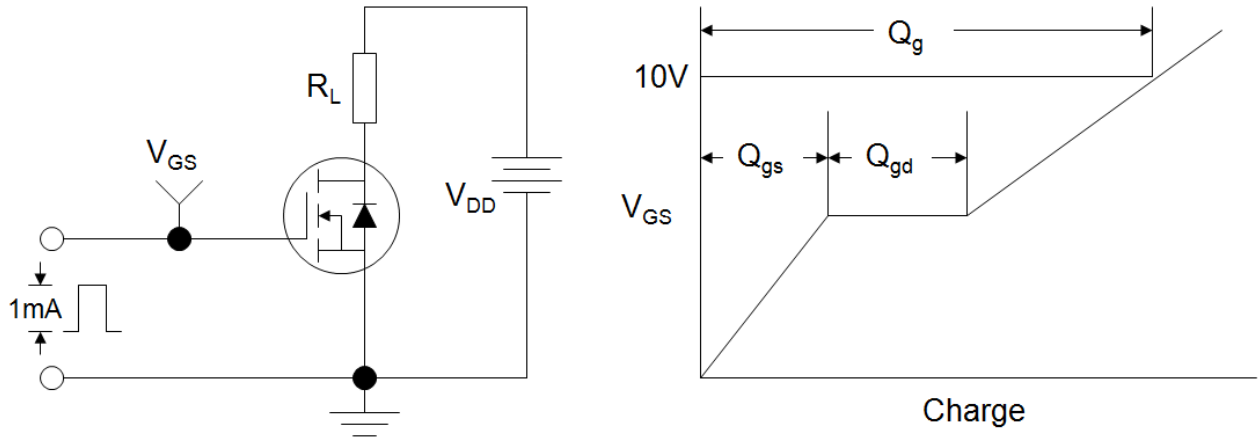


Figure B: Resistive Switching Test Circuit and Waveform

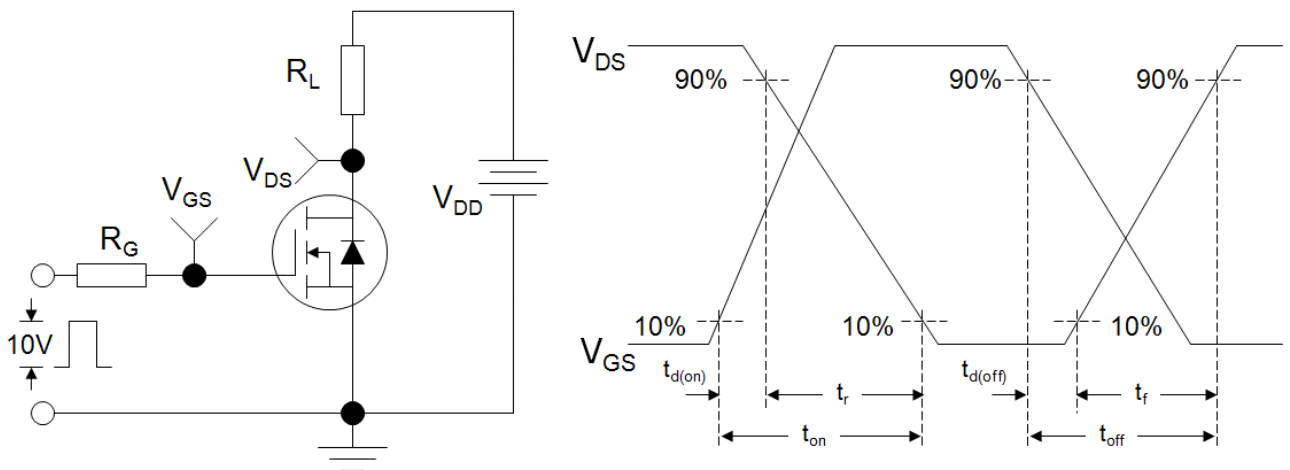
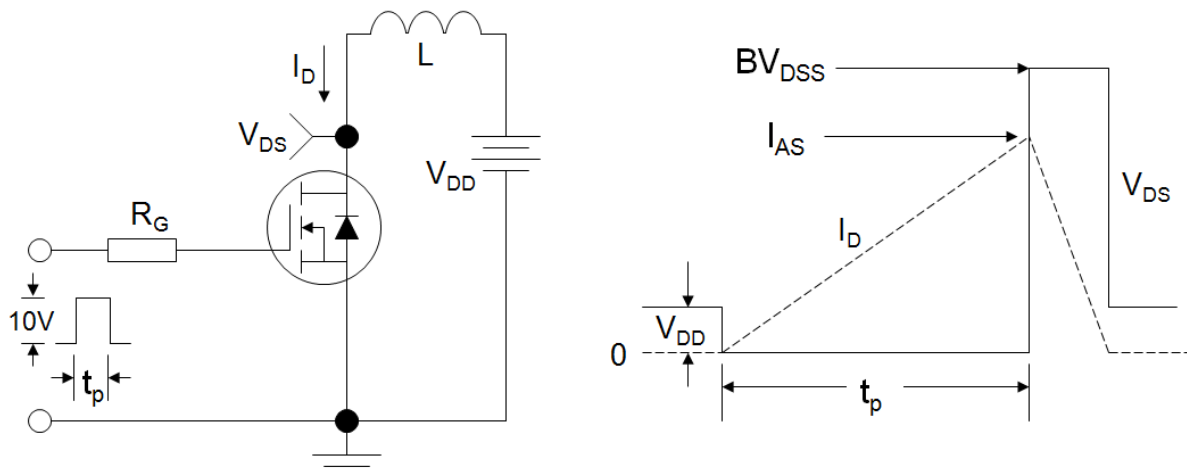


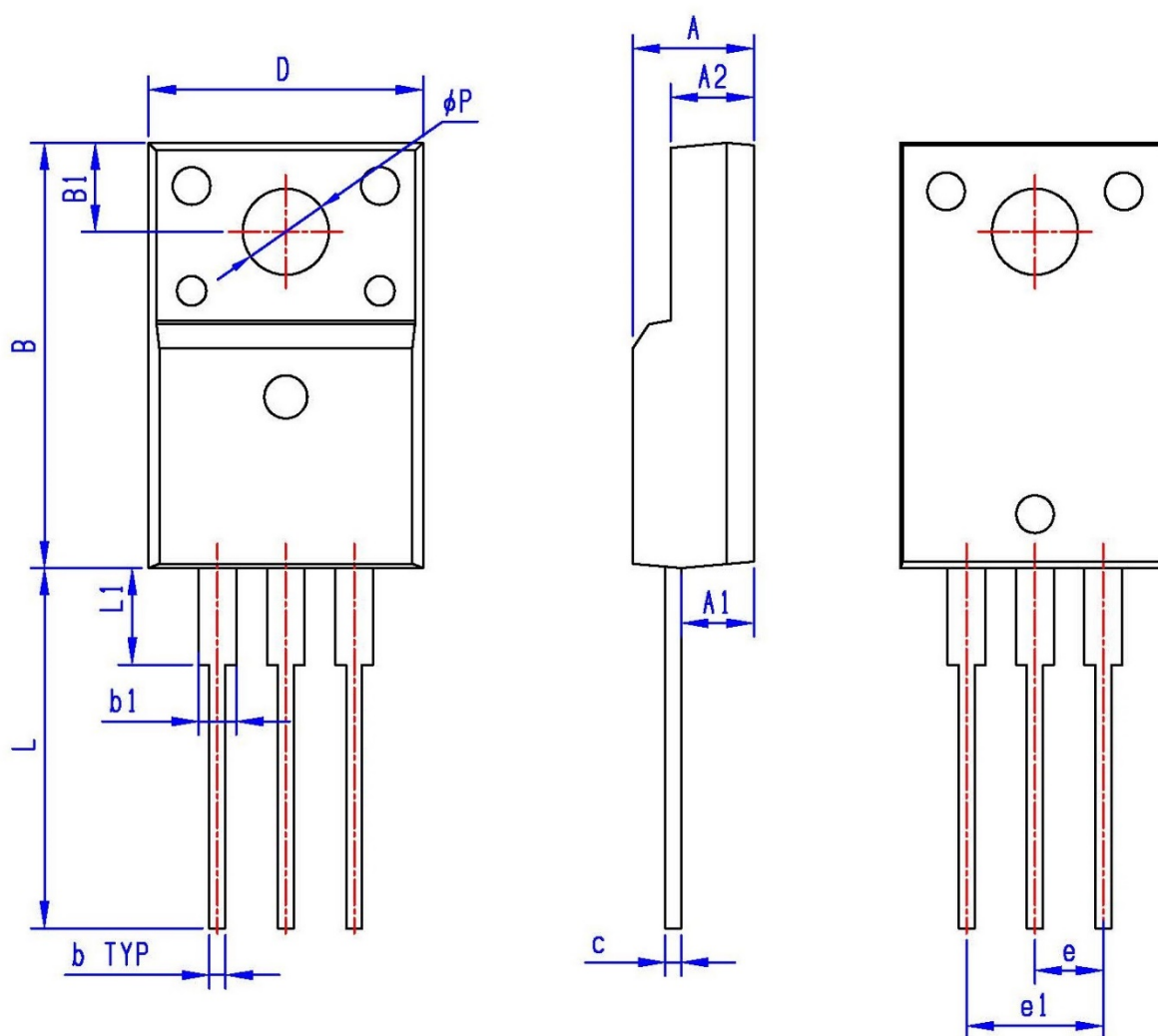
Figure C: Unclamped Inductive Switching Test Circuit and Waveform



•Dimensions (TO-220F1)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	4.40	4.90	B1	2.90	3.70
A1	2.40	3.00	e	2.40	2.70
A2	2.30	3.00	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	2.90	3.50
D	9.80	10.60			
B	15.40	16.40			



•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	2.60	3.60	e2	4.40	4.80
L1	0.80	1.60			

