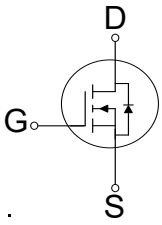
LH70R1K6

700V Super-Junction MOSFET

•General Description

The SJ MOSFET LH70R1K6 has the low $R_{DS(on)}$, low 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.



V_{DS}=700V

$R_{DS(ON)}$=1.4Ω

I_D=5.4A

■ RoHS COMPLIANT

TO-220F

TO-252

•Features

■Much lower Ron*A performance for On-state efficiency
■Much lower FOM for fast switching effciency

•Application

■LED/LCD/PDP TV and monitor Lighting
■Solar/Renewable/UPS-Micro Inverter System
■Power Supplies

•Ordering Information:

Part number	LH70R1K6	LH70R1K6
Package	TO-252	TO-220F
Basic ordering unit (pcs)	2500	1000
Normal Package Material Ordering Code	LH70R1K6T5-T0252-TAP	LH70R1K6F-T0220F-TU
Halogen Free Ordering Code	LH70R1K6T5-T0252-TAP-HF	LH70R1K6F-T0220F-TU-HF

•Absolute Maximum Ratings（TC =25℃）

PARAMETER		SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage		BV_{DSS}	700	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	T_C = 25°C	I_D	5.4	A
	T_C = 100°C		3.4	
Pulsed drain current (TC = 25°C, tp limited by Tjmax)[1]		I_D pulse	16.2	A
Single Pulse Avalanche Energy[2]		E_{AS}	26	mJ
Power Dissipation(TC=25℃)		P_D	5.4	W
Reverse diode dv/dt[3]		dv/dt	15	V/ns
Maximum diode commutation speed[3]		di_f/dt	50	V/ns
Operating Temperature and Storage Temperature Range		T_J/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=250uA	700	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250uA	2.0	3.0	4.0	V
Drain-source On Resistance[3]	$R_{DS(ON)}$	V_{GS} =10V, I_D=2.4A	--	1.4	1.6	Ω
Drain-Source Leakage Current	I_{DSS}	V_{DS}=700V,V_{GS}=0V,T_J=25℃	--	--	1	uA
		V_{DS}=700V,V_{GS}=0V,T_J=125℃	--	--	100	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30	--	--	±100	A
Gate Resistance	R_G	V_{GS}=0V,F=1.0MHz	--	24	--	Ω
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = 250V f = 1.0MHz	--	225	--	pF
Output Capacitance	Coss		--	300	--	
Reverse transfer Capacitance	Crss		--	12	--	
Turn-on delay time	Td(on)	V_{DD} =350V, I_D =5.4A R_G=25Ω	--	11	--	ns
Turn -Off Delay Time	Td(off)		--	30	--	
Rise time	Tr		--	25	--	
Fall time	Tf		--	24	--	
Total Gate Charge	Qg	I_D =5.4A, V_{DS} =560V V_{GS} =10V	--	6.1	---	nC
Gate-to-Source Charge	Qgs		--	1.3	--	
Gate-to-Drain Charge	Qgd		--	3.3	---	
Continuous Diode Forward Current	I_S	--	--	--	5.4	A
Pulsed Diode Forward Current[1]	I_{SM}	--	--	--	23	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=5.4A V_{GS} =0V	--	--	1.4	V
Reverse Recovery Time	trr	V_{RR}=100V, If=Is di_F/dt=100A/μs	--	358	--	ns
Reverse Recovery Charge	Qrr		--	1.5	--	uC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	Rth_{JC}	23	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	75	℃/W

Notes:

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

2. I_{AS} = 3.4A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C

3. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

●Typical Characteristics (T_J=25ºC,unless otherwise noted)

Figure 1. Output Characteristics

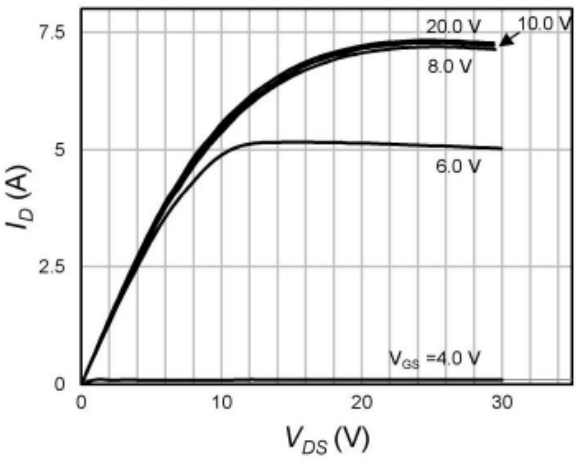


Figure 2.Drain-Souce On- State Resistance v.s. Drain Current

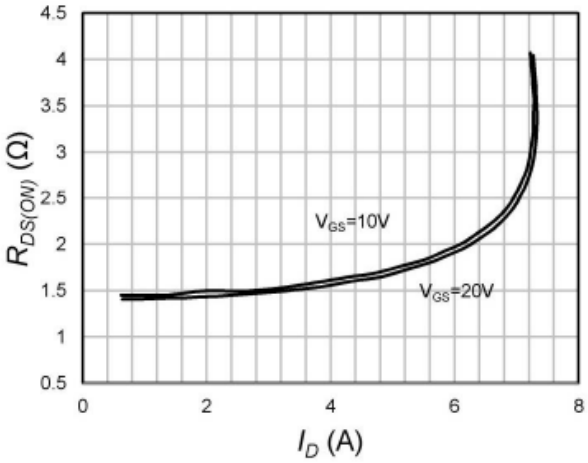


Figure 3. Capacitance

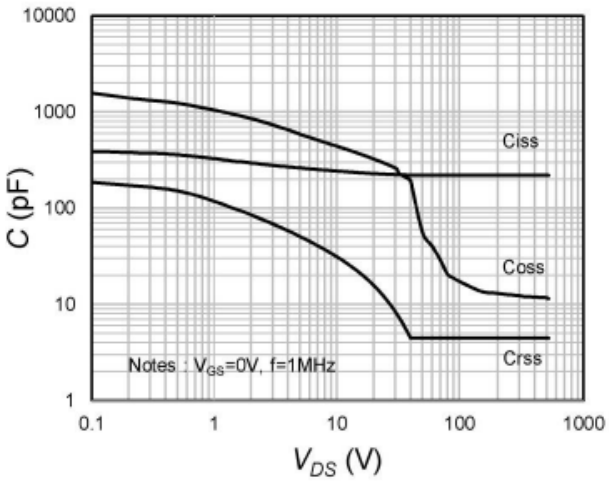


Figure 4.Drain-Souce Breakdown Voltage(Normalized)

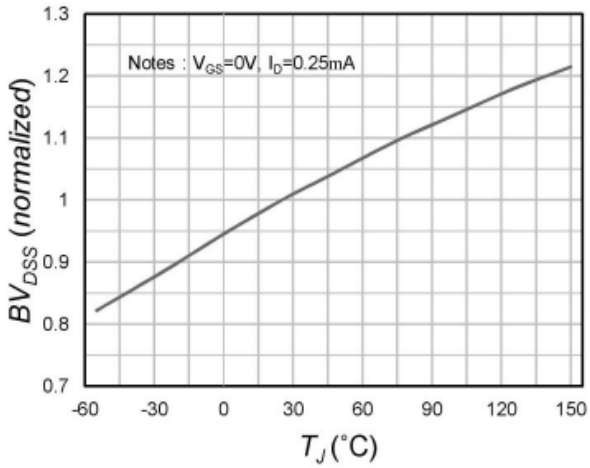


Figure 5. Transfer Characteristics

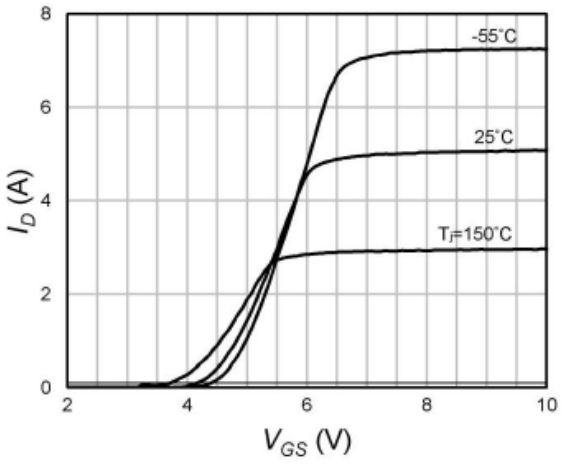
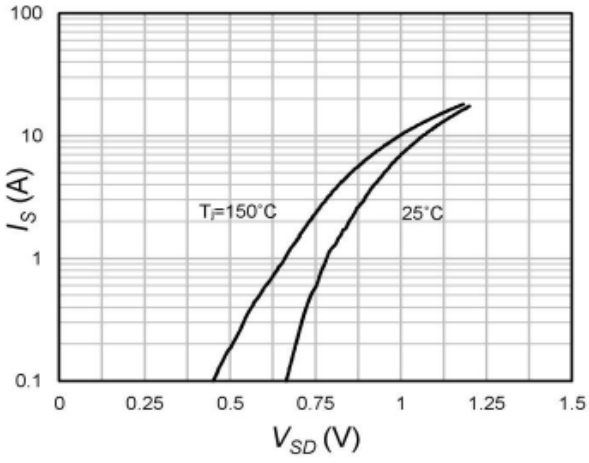


Figure 6. Forward Characteristics v.s. Reverse Diode



●Typical Characteristics (Cont.)

Figure 7.Vgs(th) V.S. Temprature

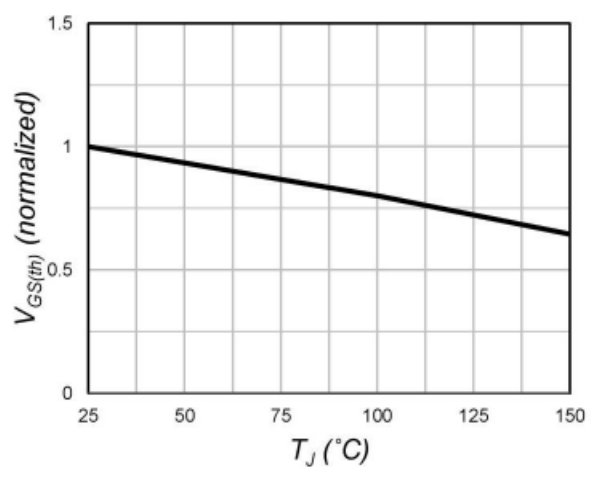


Figure 8.Max. Drain Current V.S. Case Temprature

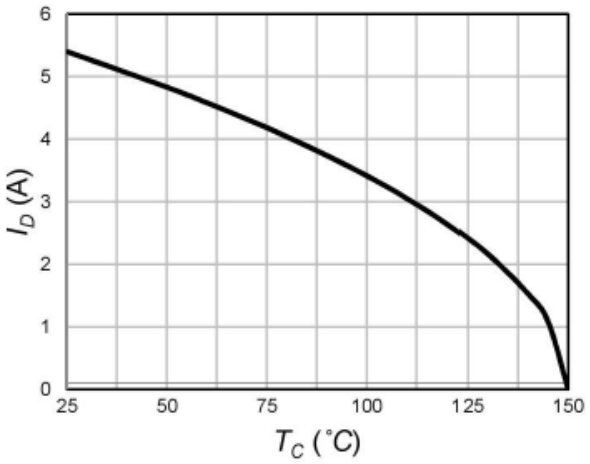


Figure 9.Power Dissipation

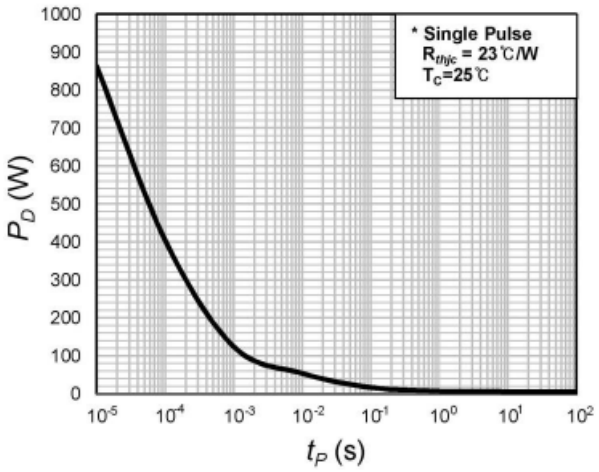


Figure 10.Output Capacitance Stored Energy

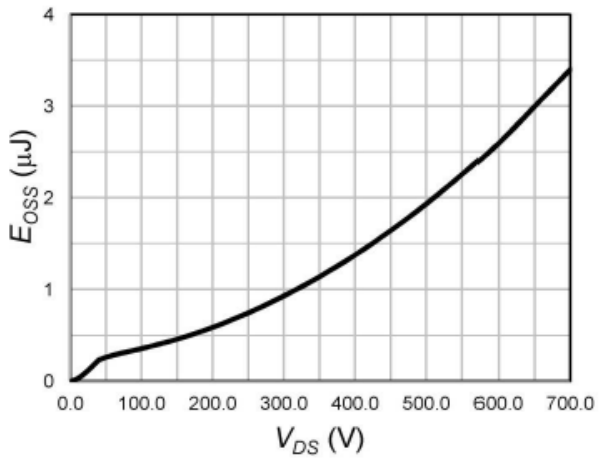


Figure 11. Transient Thermal Impedance

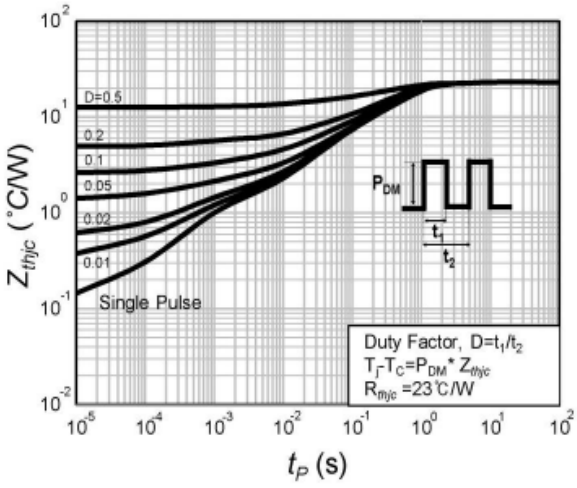
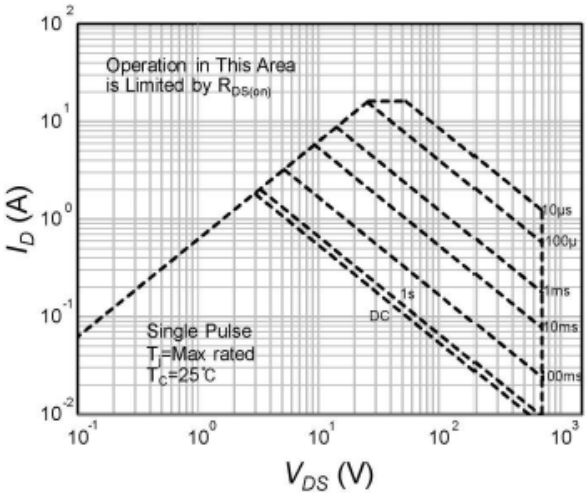


Figure 12. Safe operation area



• Test Circuit and Waveforms

Figure A：Gate Charge Test Circuit and Waveform

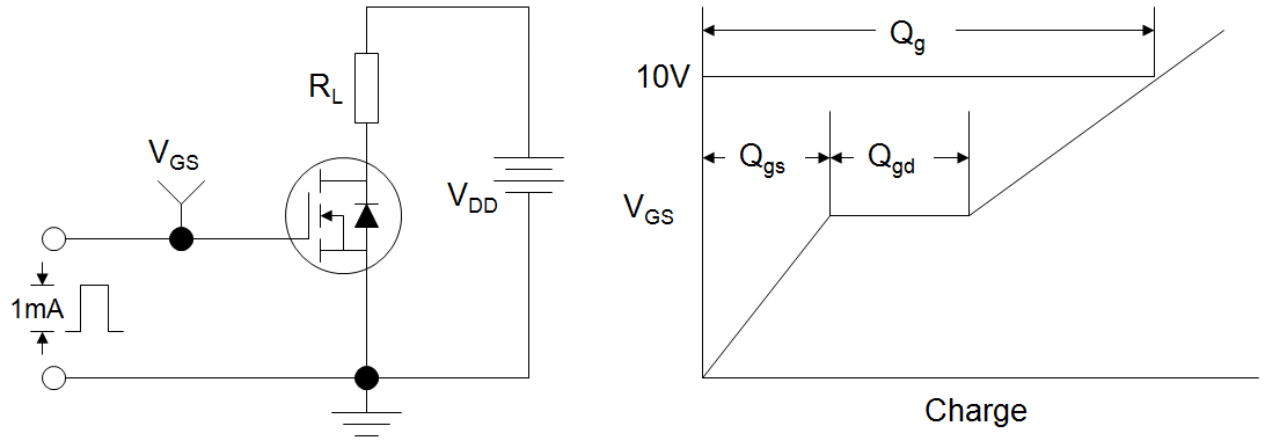


Figure B：Resistive Switching Test Circuit and Waveform

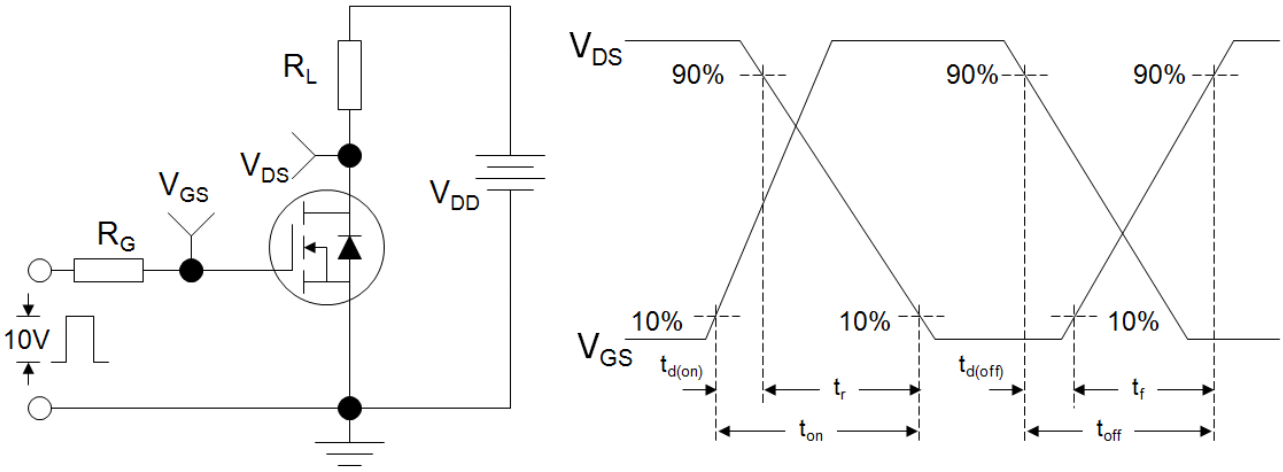
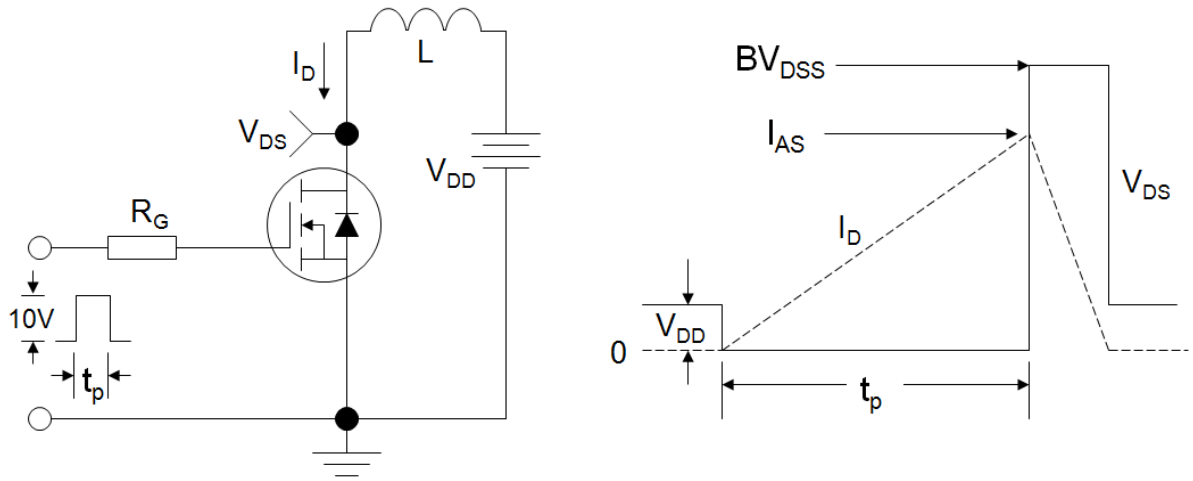


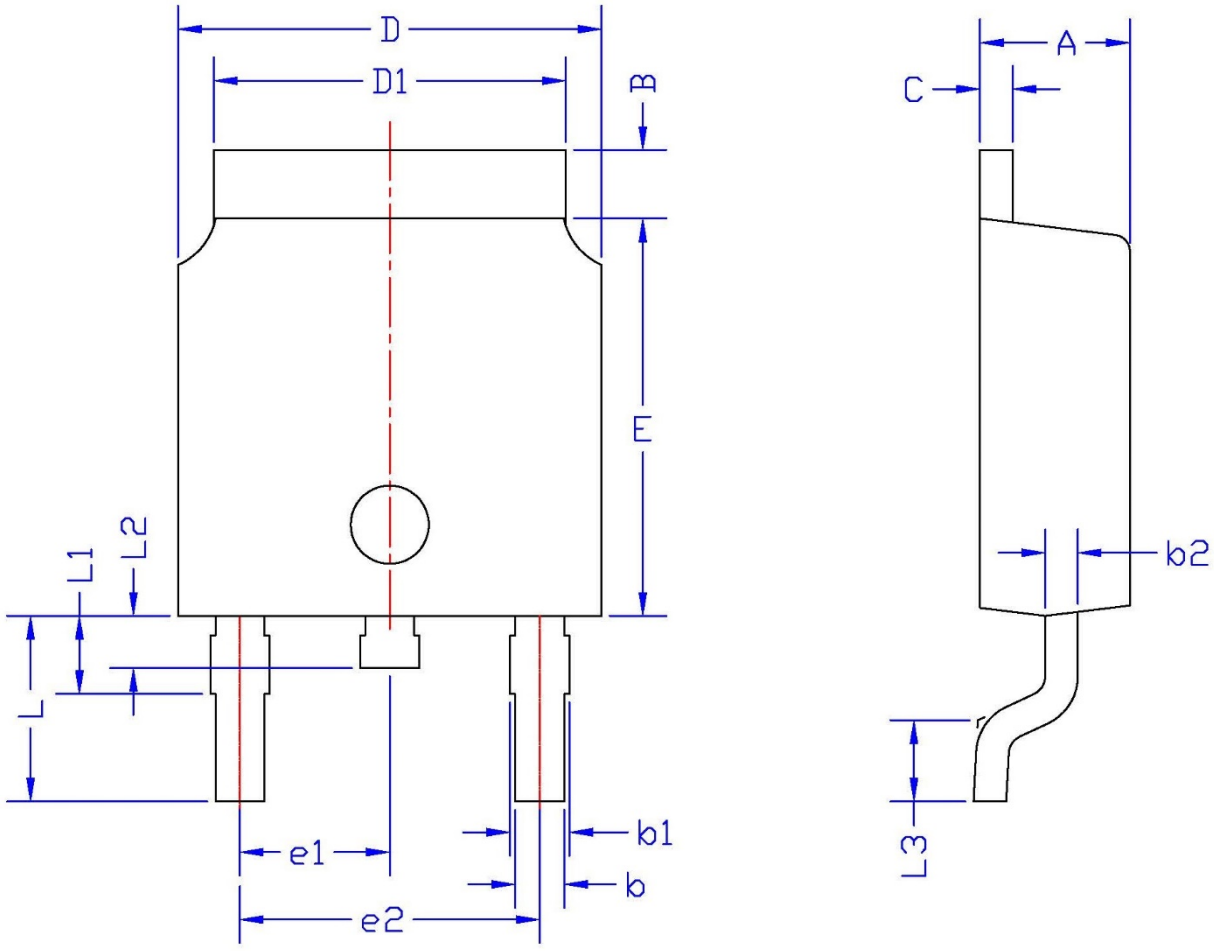
Figure C：Unclamped Inductive Switching Test Circuit and Waveform



●Dimensions（TO-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			



●Dimensions（TO-220F)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	4.20	4.80	E1	8.30	8.70
A1	2.50	2.90	e	2.40	2.70
A2	2.90	3.30	e1	4.95	5.25
b	0.40	0.80	F	2.50	2.90
b1	1.10	1.50	L	13.00	14.00
c	0.50	0.70	L1	3.00	4.00
D	9.80	10.60	⌀P	2.90	3.50
E	14.60	15.60