

●General Description

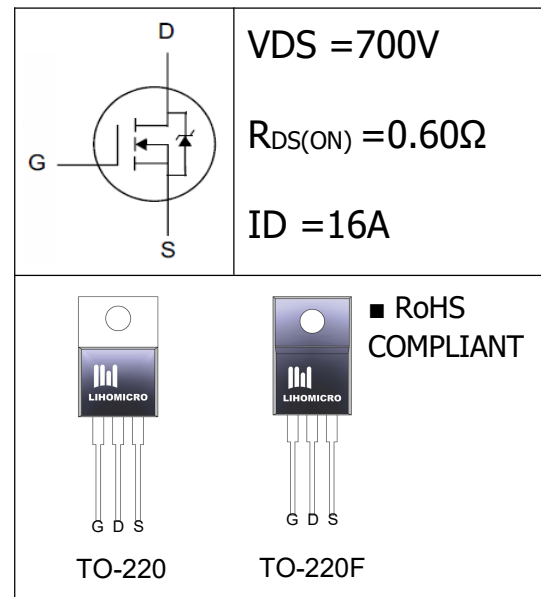
The N-Channel MOSFET LH16N70 has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

●Features

- Proprietary New Planar Technology
- $R_{DS(ON)}$, typ. = $0.60\ \Omega$ @ $V_{GS}=10V$
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

●Application

- Adaptor
- TV Main Power
- SMPS Power Supply
- LCD Panel Power



●Ordering Information:

Part Number	LH16N70	LH16N70
Package	TO-220	TO-220F
Basic Ordering Unit (pcs)	1000	1000
Normal Package Material Ordering Code	LH16N70T-TO220-TU	LH16N70F-TO220F-TU
Halogen Free Ordering Code	LH16N70T-TO220-TU-HF	LH16N70F-TO220F-TU-HF

●Absolute Maximum Ratings (TC =25°C)

PARAMETER	SYMBOL	Value		UNIT
Drain-Source Breakdown Voltage ¹	BV _{DSS}	700		V
Gate-Source Voltage	V _{GS}	±30		V
Continuous Drain Current	I _D	16		A
	I _D (T _C =100°C)	Figure 3		
Pulsed Drain Current at VGS=10V ²	I _{DM}	Figure 6		A
Single Pulse Avalanche Energy	E _{AS}	1100		mJ
Peak Diode Recovery dv/dt ³	dv/dt	5.0		V/ns
Power Dissipation	P _D	TO-220	TO-220F	W
		160	65	
Derating Factor above 25		1.28	0.52	
Operating Temperature	T _J	-55~+150		°C
Storage Temperature	T _{STG}	-55~+150		°C
Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	T _L	300		°C
	T _{PAK}	260		

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	700	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	4.0	V
Drain-source On Resistance ⁴	$R_{DS(ON)}$	$V_{GS}=10V, I_D=8A, T_J=25^\circ C$	--	0.60	0.75	Ω
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=700V, V_{GS}=0V, T_J=25^\circ C$	--	--	1	μA
		$V_{DS}=560V, V_{GS}=0V, T_J=125^\circ C$	--	--	100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	--	--	+100	nA
		$V_{GS}=-30V, V_{DS}=0V$	--	--	100	
Forward Transconductance	g_{FS}	$V_{DS}=15V, I_{DS}=8A$	--	15	--	S
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1MHz$	--	2400	--	pF
Output Capacitance	C_{oss}		--	225	--	
Reverse Transfer Capacitance	C_{rss}		--	105	--	
Turn -Off Delay Time	$T_d(off)$	$V_{GS}=10V, V_{DD}=325V, R_{G_ext}=25\Omega, I_D=16A$	--	88	--	ns
Fall time	t_f		--	43	--	
Turn-on delay time	$t_d(on)$		--	32	--	
Rise time	t_r		--	42	--	
Total Gate Charge(10V)	Q_g	$V_{DS}=325V, I_D=16A, f=1MHz$	--	40	--	nC
Gate-to-Source Charge	Q_{gs}		--	13	--	
Gate-to-Drain Charge	Q_{gd}		--	7.0	---	
Continuous Source Current ⁴	I_{SD}		--	--	16	A
Pulsed Source Current ⁴	I_{SM}		--	--	64	
Diode Forward Voltage	V_{SD}	$I_S=16A, V_{GS}=0V$	--	--	1.5	V
Reverse Recovery Time	t_{rr}	$I_f=16A, di_f/dt=100A/\mu s$	--	550	--	ns
Reverse Recovery Charge	Q_{rr}		--	4.2	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX		UNIT
		TO-220	TO-220F	
Thermal Resistance Junction-case	RthJC	0.78	1.92	°C/W
Thermal Resistance Junction-ambient	RthJA	62	100	°C/W

Notes:

1. T_J=+25 to +150
- 2.Repetitive rating; pulse width limited by maximum junction temperature.
3. ISD= 16A di/dt < 100 A/μs, VDD < BVDSS, T_J=+150 .
4. Pulse wi°Cdth≤380 s;°C d u ty cycle≤2%.

● **Typical Characteristics**

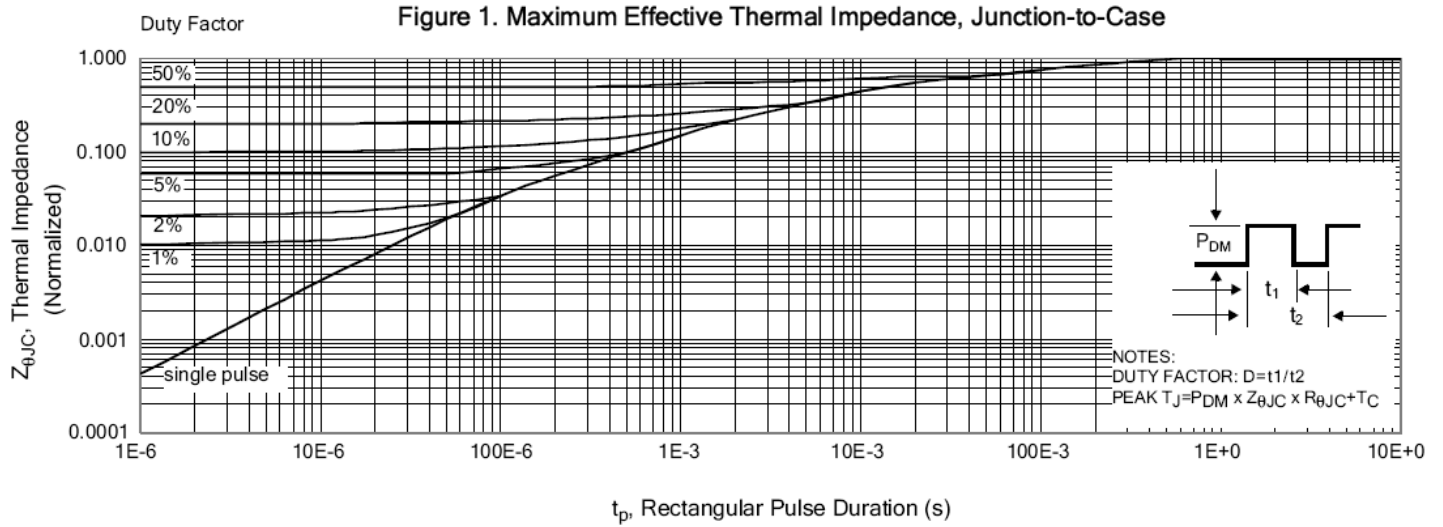


Figure 2. Maximum Power Dissipation vs Case Temperature

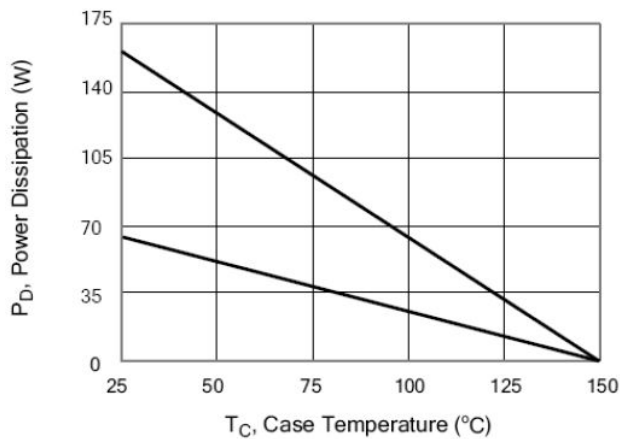


Figure 3. Maximum Continuous Drain Current vs Case Temperature

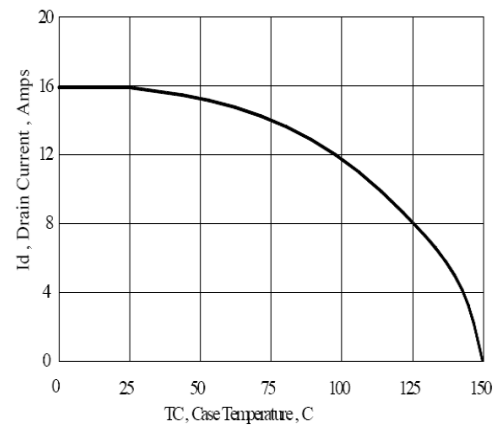


Figure 4. Typical Output Characteristics

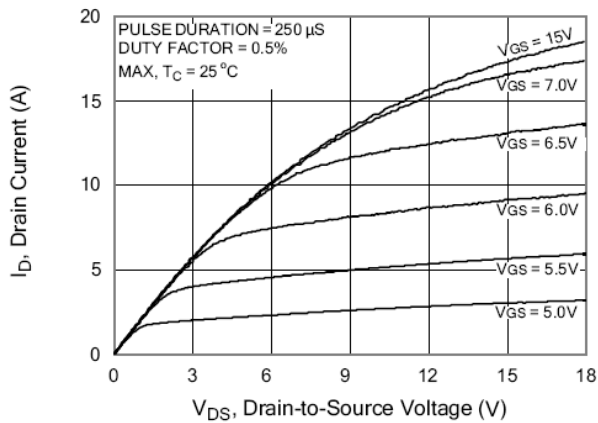
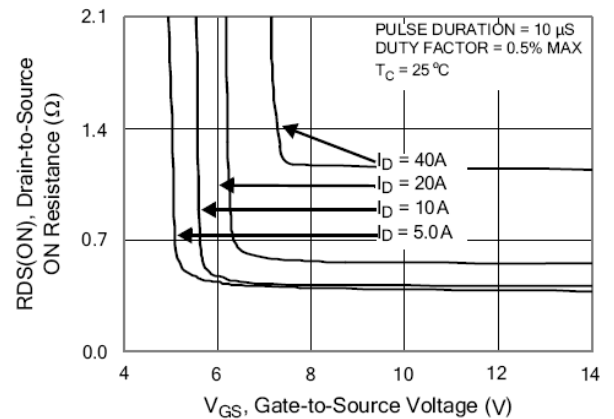


Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current



● **Typical Characteristics(cont.)**

Figure 6. Peak Current Capability

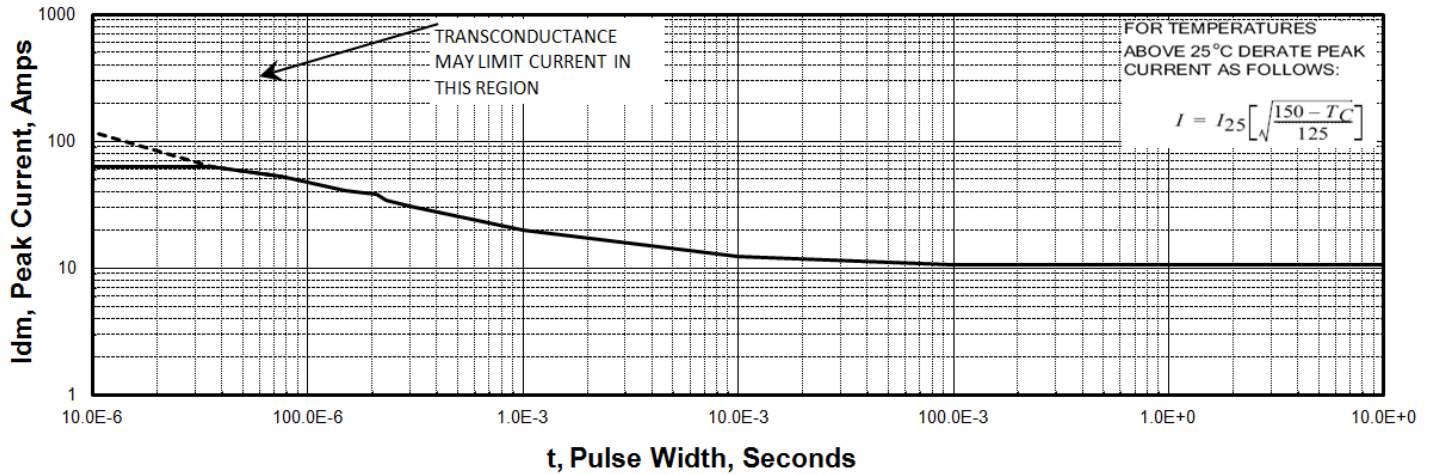


Figure 7. Typical Transfer Characteristics

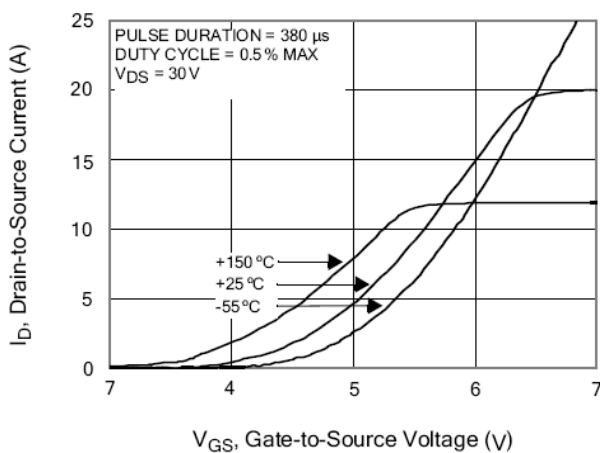


Figure 8. Unclamped Inductive Switching Capability

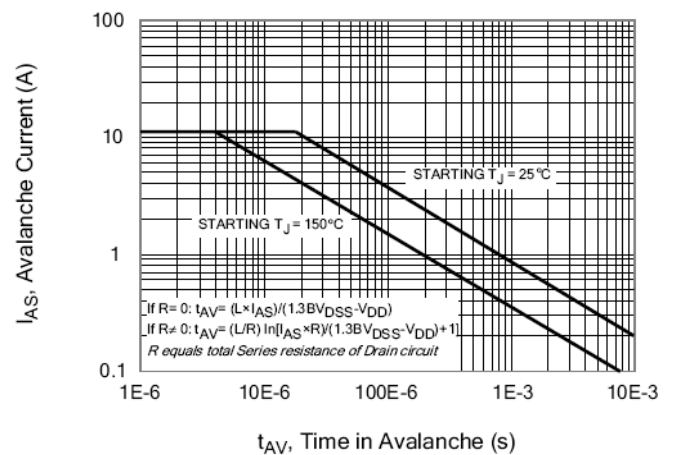


Figure 9. Drain to Source ON Resistance vs Drain Current

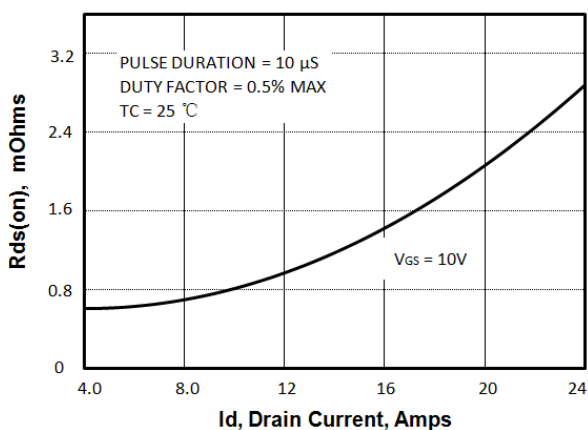
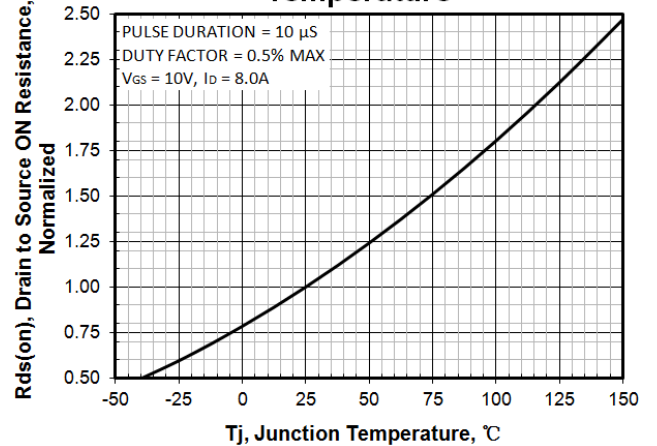


Figure 10. Rds(on) vs Junction Temperature



• **Typical Characteristics(cont.)**

Figure 11. Typical Breakdown Voltage vs Junction Temperature

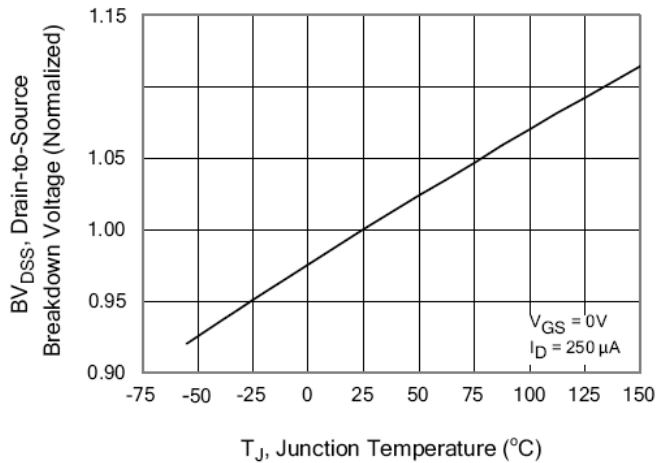


Figure 12. Typical Threshold Voltage vs Junction Temperature

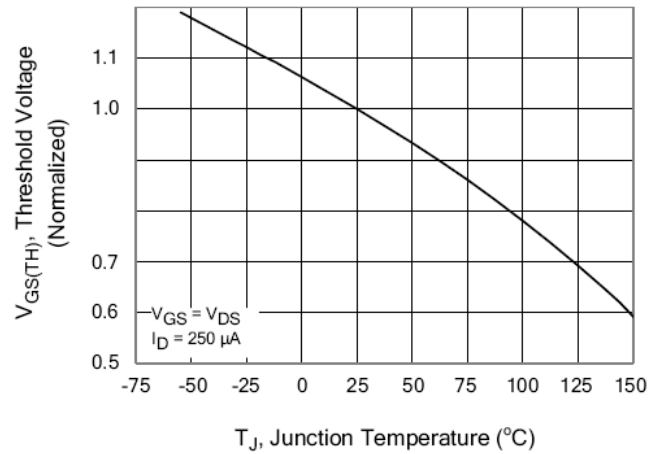


Figure 13. Maximum Safe Operating Area

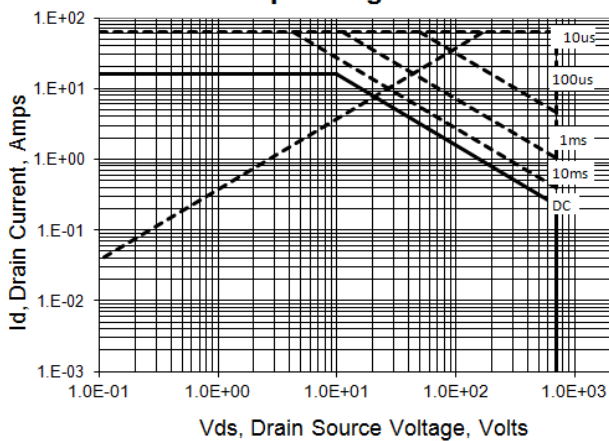


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

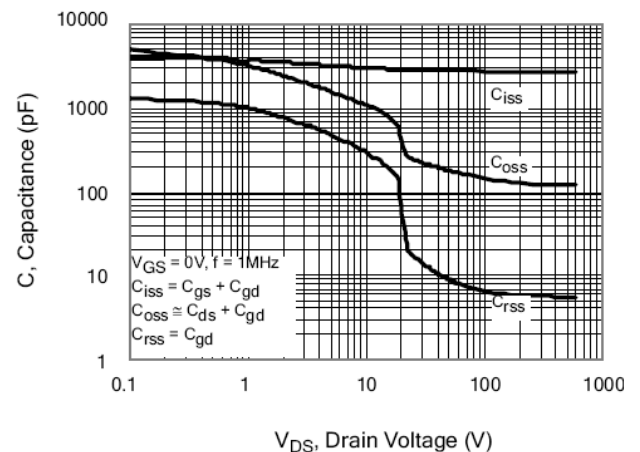


Figure 15. Typical Gate Charge

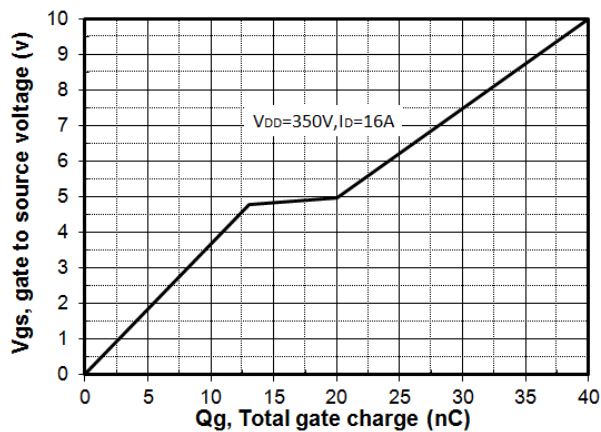
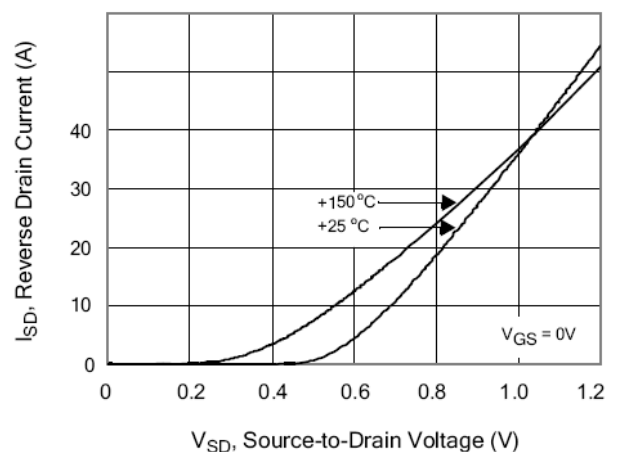


Figure 16. Typical Body Diode Transfer Characteristics



•Typical Characteristics(cont.)

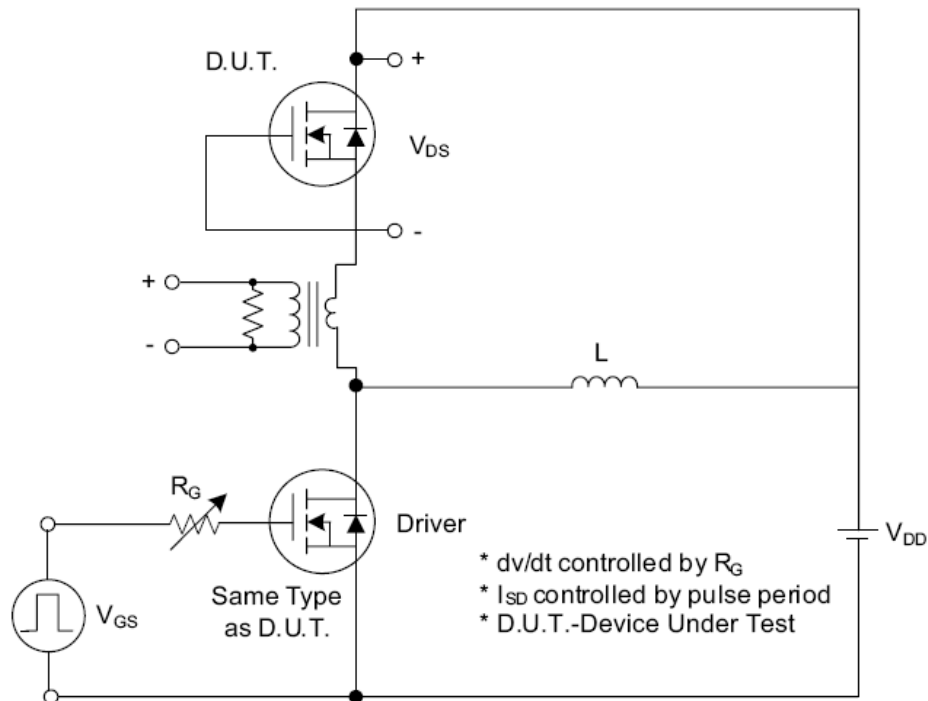


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

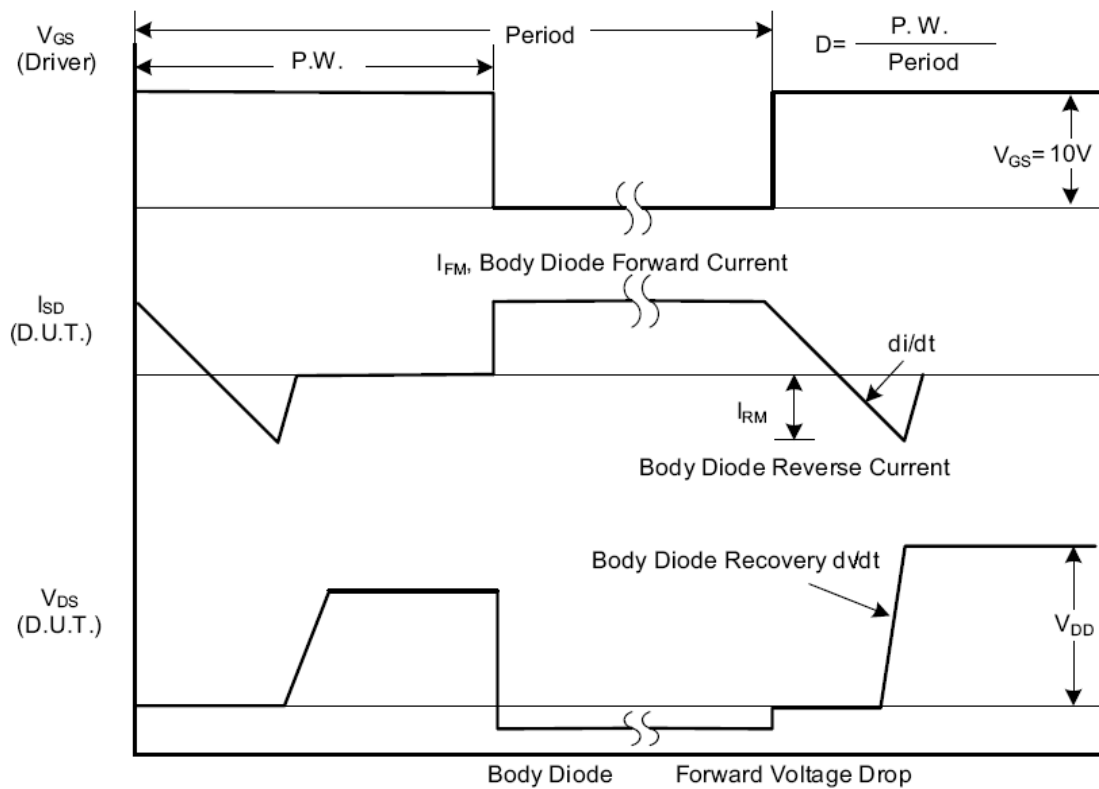


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

•Typical Characteristics(cont.)

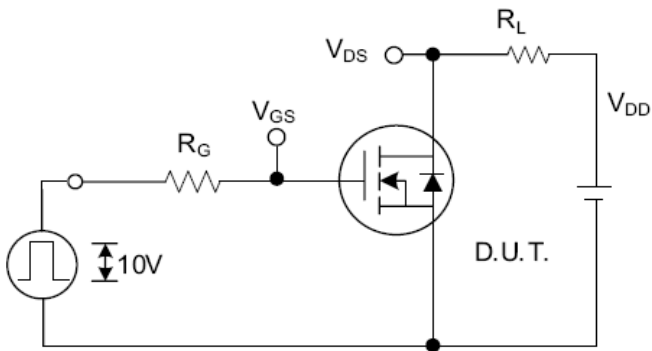


Fig. 2.1 Switching Test Circuit

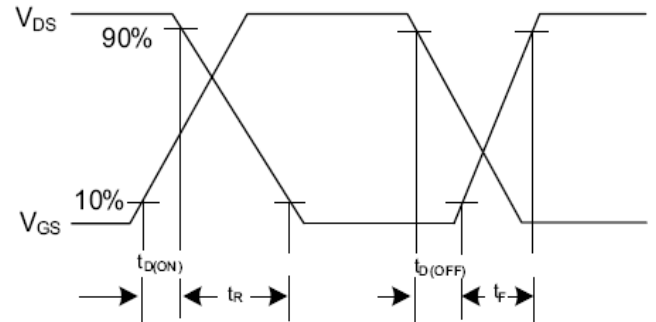


Fig. 2.2 Switching Waveforms

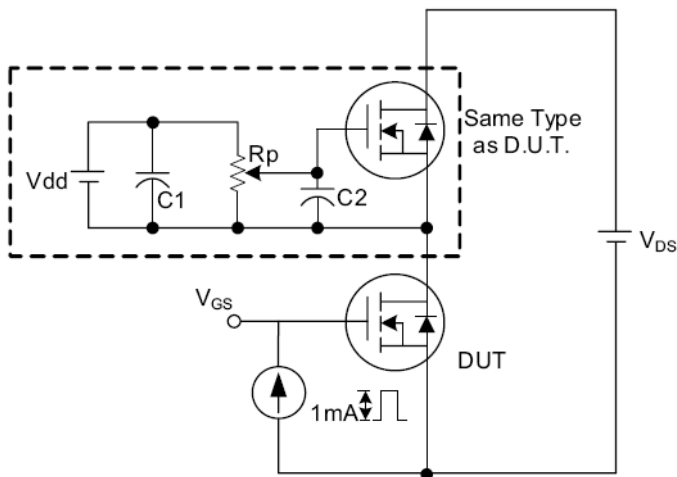


Fig. 3.1 Gate Charge Test Circuit

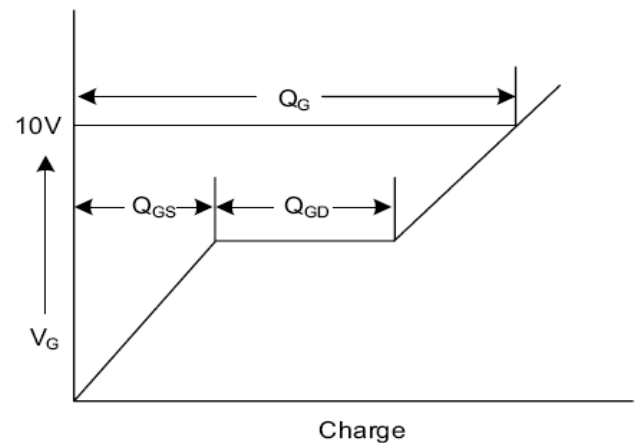


Fig. 3.2 Gate Charge Waveform

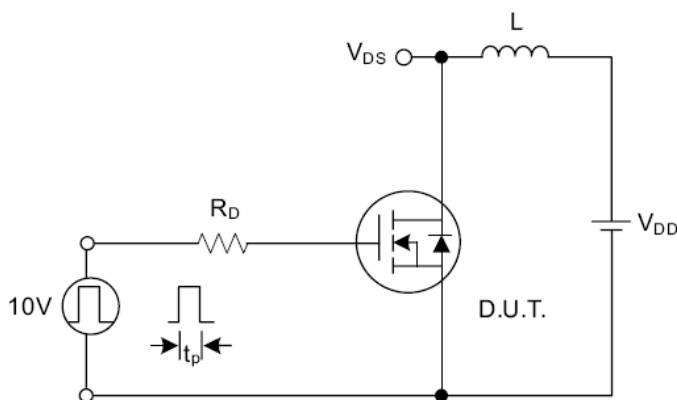


Fig. 4.1 Unclamped Inductive Switching Test Circuit

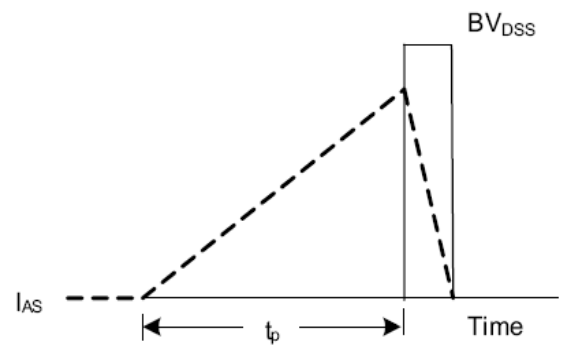
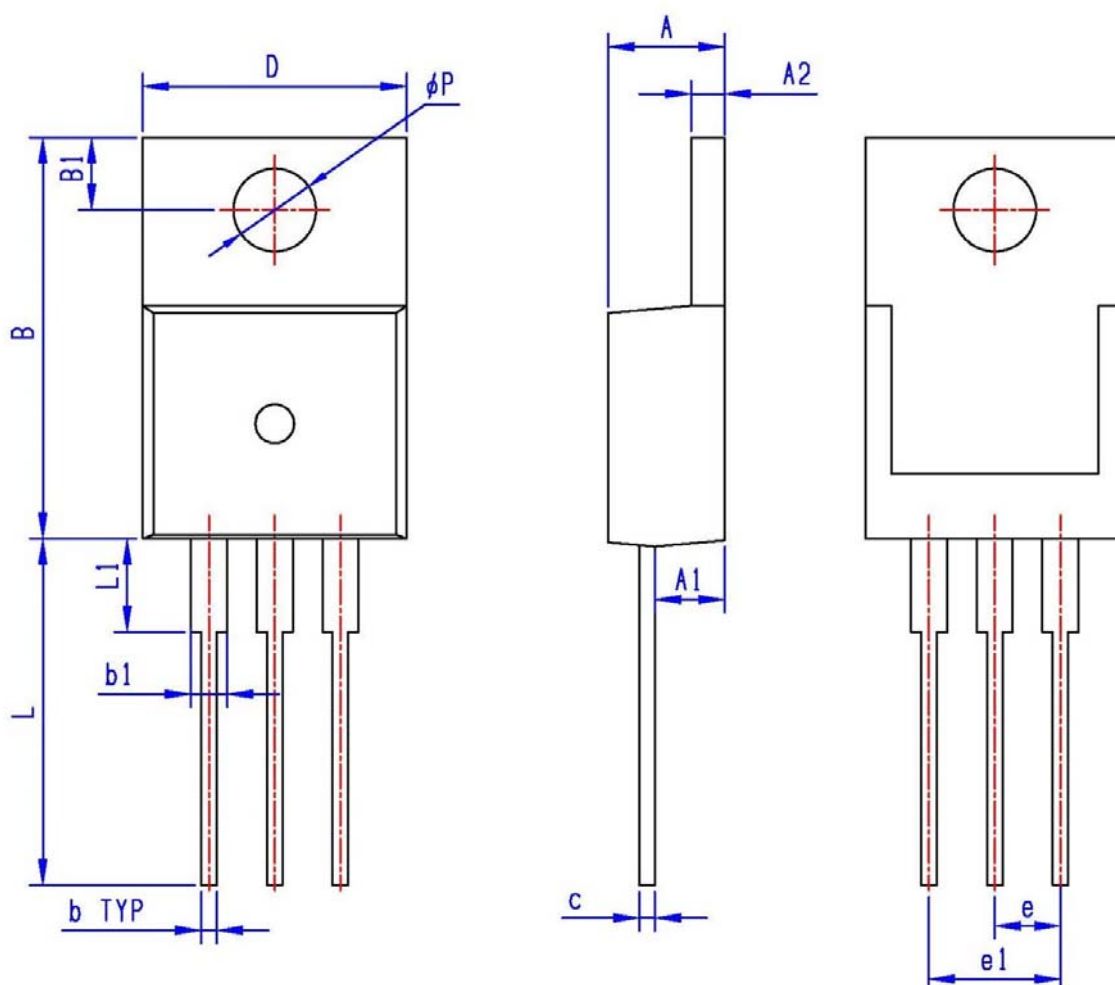


Fig. 4.2 Unclamped Inductive Switching Waveforms

●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	12.60	14.40
b1	1.10	1.70	L1	2.40	4.00
c	0.40	0.70	∅P	3.50	3.90
D	9.80	10.60			
B	15.20	16.20			



●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			

