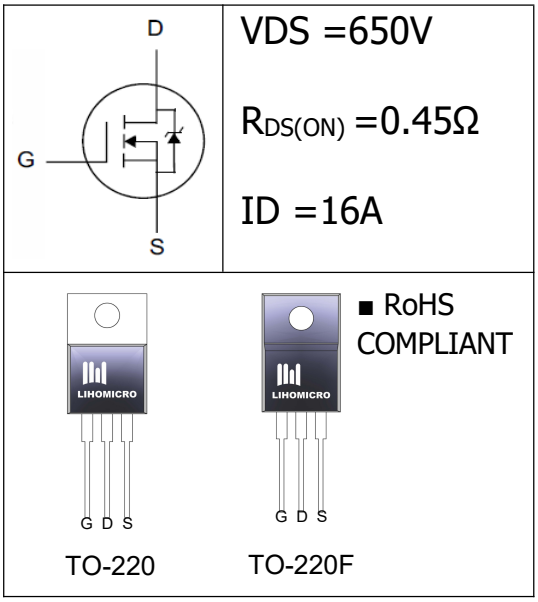
● General Description

The N-Channel MOSFET LH16N65 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

■RDS(ON),typ.=0.45 Ω @VGS=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	LH16N65	LH16N65
Package	TO-220	TO-220F
Basic Ordering Unit (pcs)	1000	1000
Normal Package Material Ordering Code	LH16N65T-TO220-TU	LH16N65F-TO220F-TU
Halogen Free Ordering Code	LH16N65T-TO220-TU-HF	LH16N65F-TO220F-TU-HF

● Absolute Maximum Ratings（TC =25℃）

PARAMETER	SYMBOL	Value		UNIT
Drain-Source Breakdown Voltage[1]	BV_{DSS}	650		V
Gate-Source Voltage	V_{GS}	±30		V
Continuous Drain Current	I_D	16		A
	I_D(TC=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		℃
Storage Temperature	T_{STG}	-55~+150		℃
Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	T_L	300		℃
	T_{PAK}	260		

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-SourceBreakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D=250uA	650	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250uA	2.0	--	4.0	V
Drain-source On Resistance[4]	$R_{DS(ON)}$	V_{GS} =10V, I_D=8A,T_J=25℃	--	0.45	0.55	Ω
Drain-Source Leakage Current	I_{DSS}	V_{DS}=650V,V_{GS}=0V,T_J=25℃	--	--	1	uA
		V_{DS}=520V,V_{GS}=0V,T_J=125℃	--	--	100	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±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	Ciss	V_{GS}=0V,V_{DS}=25V, f=1MHz	--	2400	--	pF
Output Capacitance	Coss		--	225	--	
Reverse Transfer Capacitance	Crss		--	105	--	
Turn -Off Delay Time	Td(off)	V_{GS}=10V, V_{DD}=325V, RG_ext=25Ω ,ID=16A	--	88	--	ns
Fall time	tf		--	43	--	
Turn-on delay time	td(on)		--	32	--	
Rise time	tr		--	42	--	
Total Gate Charge(10V)	Qg	V_{DS}=325V, I_D=16A, VGS=0-10V	--	40	--	nC
Gate-to-Source Charge	Qgs		--	13	--	
Gate-to-Drain Charge	Qgd		--	7.0	---	
Continuous Source Current[4]	I_{SD}		--	--	16	A
Pulsed Source Current[4]	I_{SM}		--	--	64	
Diode Forward Voltage	V_{SD}	Is=16A,V_{GS} =0V	--	--	1.5	V
Reverse Recovery Time	trr	If=16A,di_F/dt=100A/μs	--	550	--	ns
Reverse Recovery Charge	Qrr		--	4.2	--	uC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX		UNIT
		TO-220	TO-220F	
Thermal Resistance Junction-case	Rth_{JC}	0.78	1.92	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	62	100	℃/W

Notes:

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

●Typical Characteristics

Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

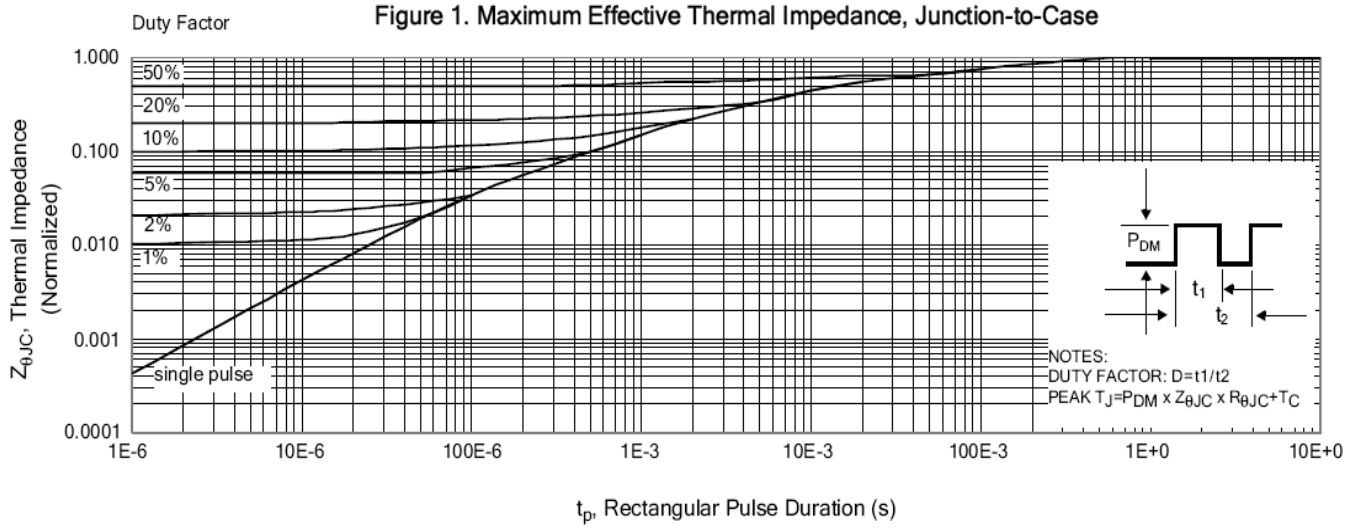


Figure 2. Maximum Power Dissipation vs Case Temperature

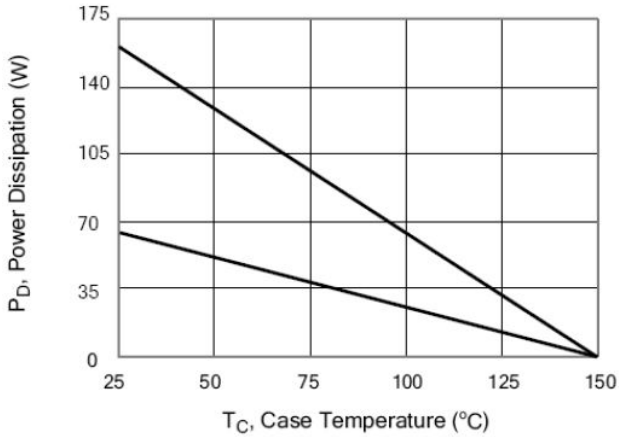


Figure 3. Maximum Continuous Drain Current vs Case Temperature

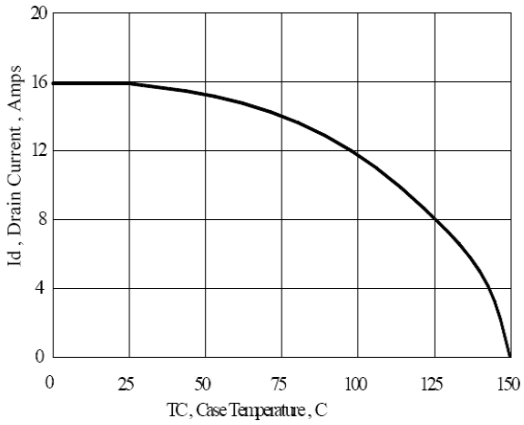


Figure 4. Typical Output Characteristics

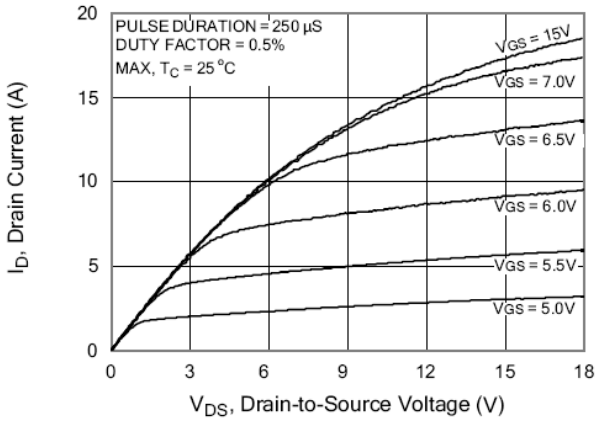
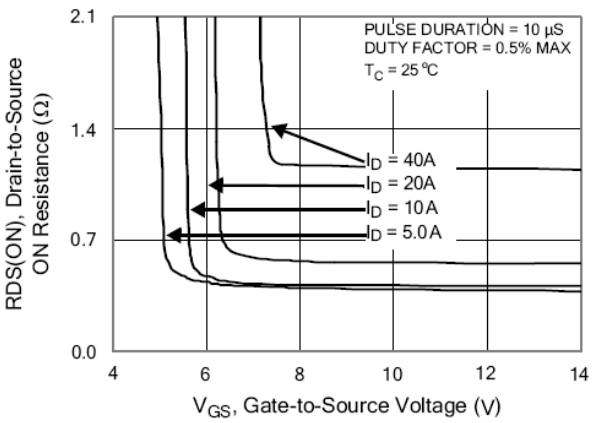


Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current



●Typical Characteristics(cont.)

Figure 6. Peak Current Capability

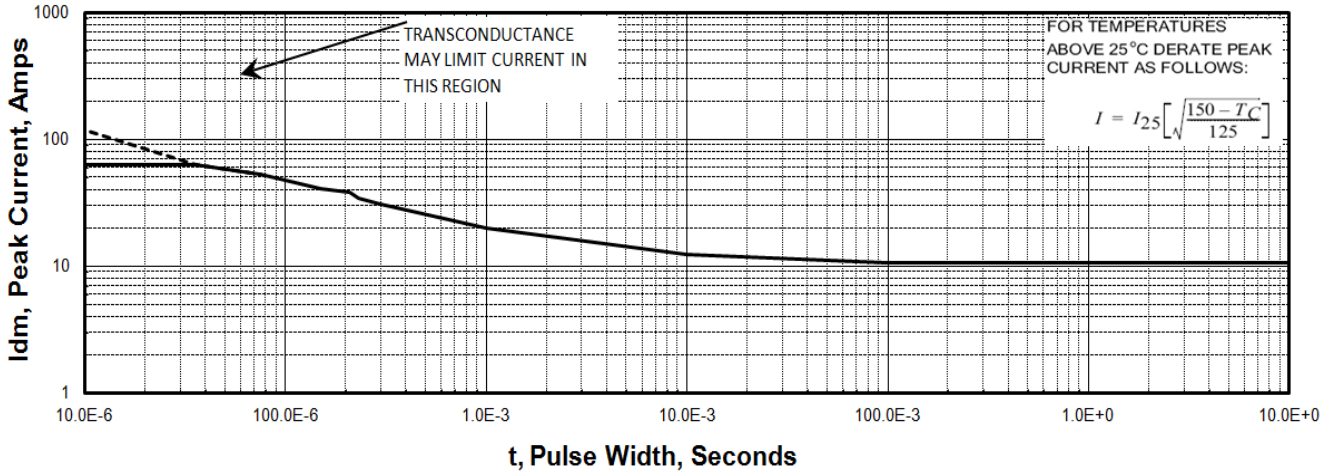


Figure 7. Typical Transfer Characteristics

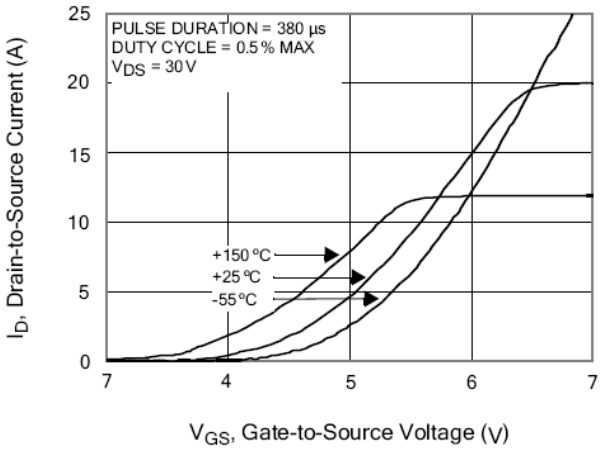


Figure 8. Unclamped Inductive Switching Capability

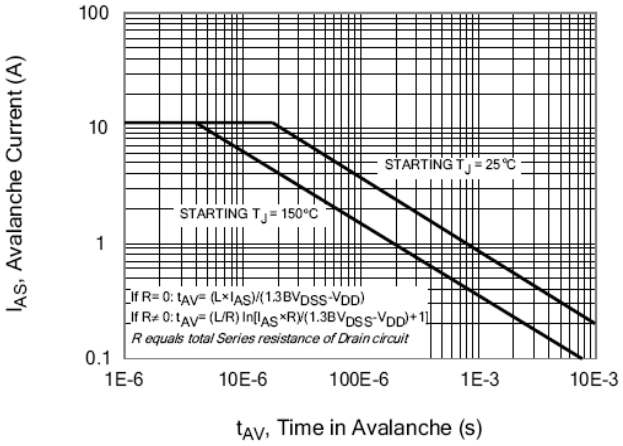


Figure 9. Drain to Source ON Resistance vs Drain Current

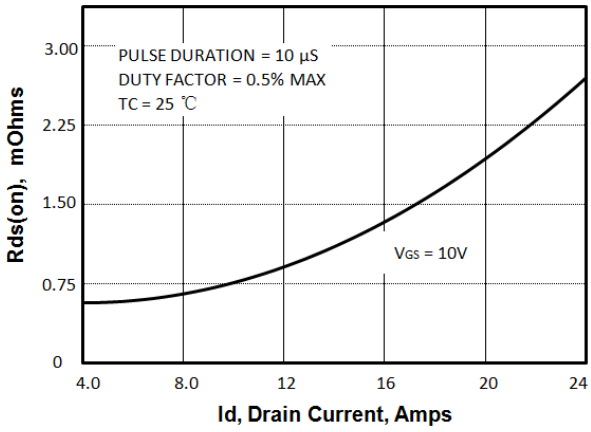
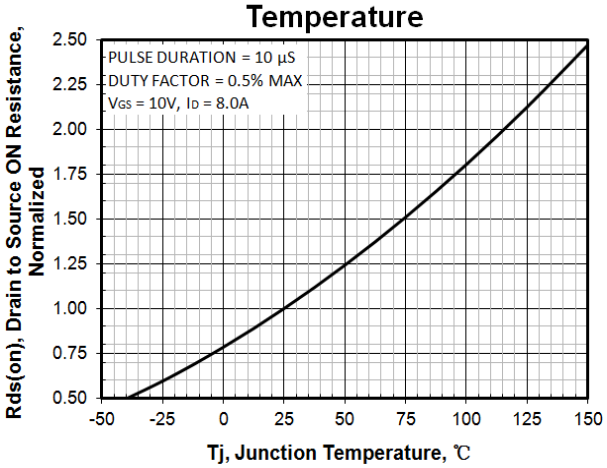


Figure 10. Rdson vs Junction Temperature



●Typical Characteristics(cont.)

Figure 11.Breakdown Voltage vs Temperature

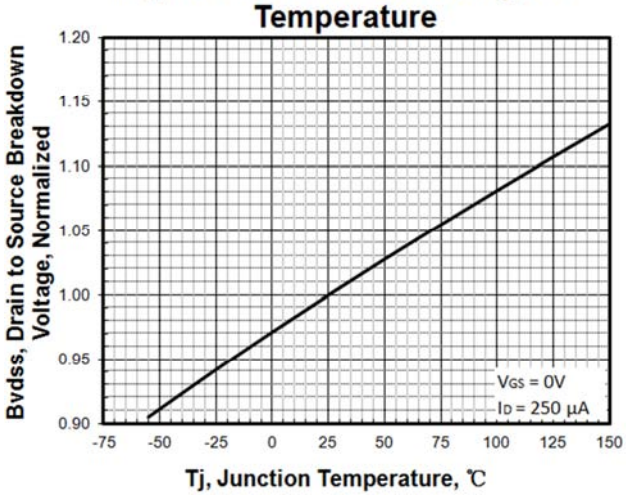
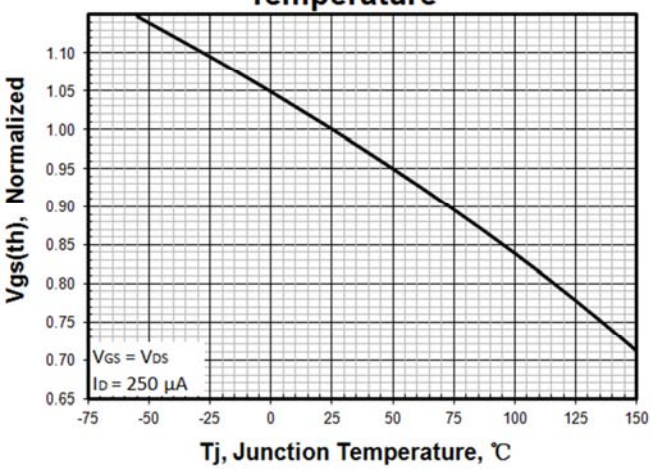
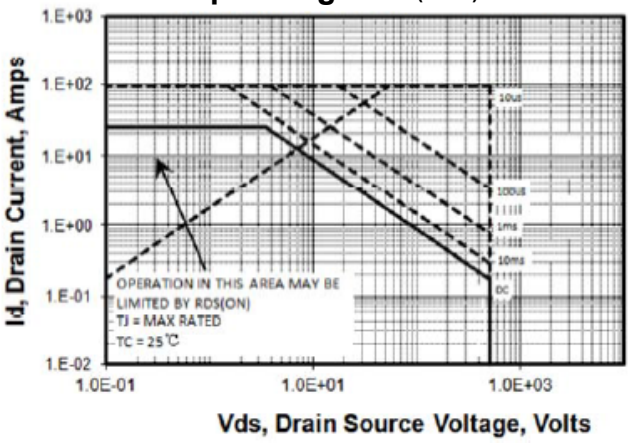


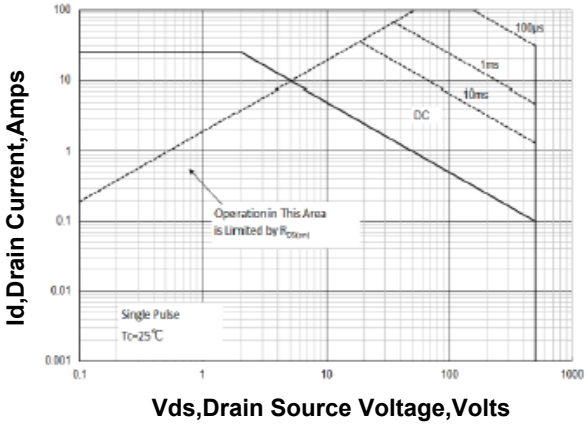
Figure 12.Threshold Voltage vs Temperature



Figute 13.Maximum Safe Operating Area(220F)



Figute 14.Maximum Safe Operating Area(220)



Figute 15.Capacitance vs Vds

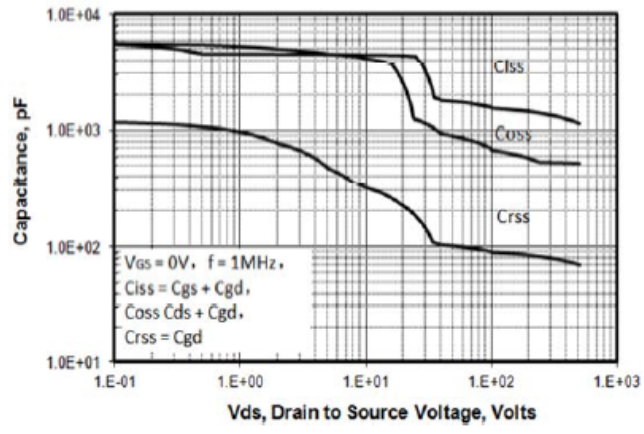
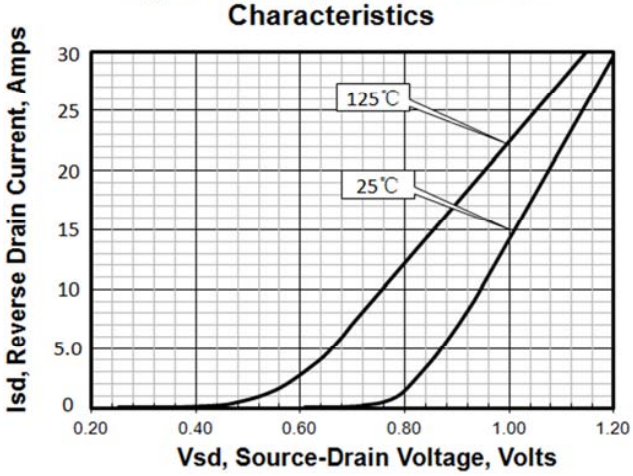


Figure 16.Body Diode Transfer Characteristics



●Typical Characteristics(cont.)

Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

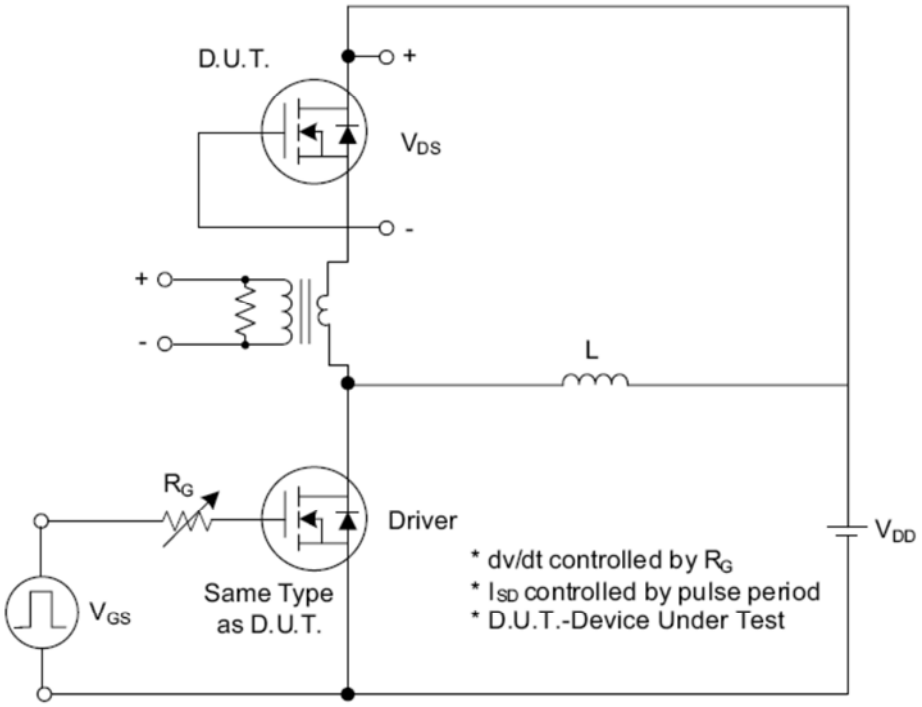
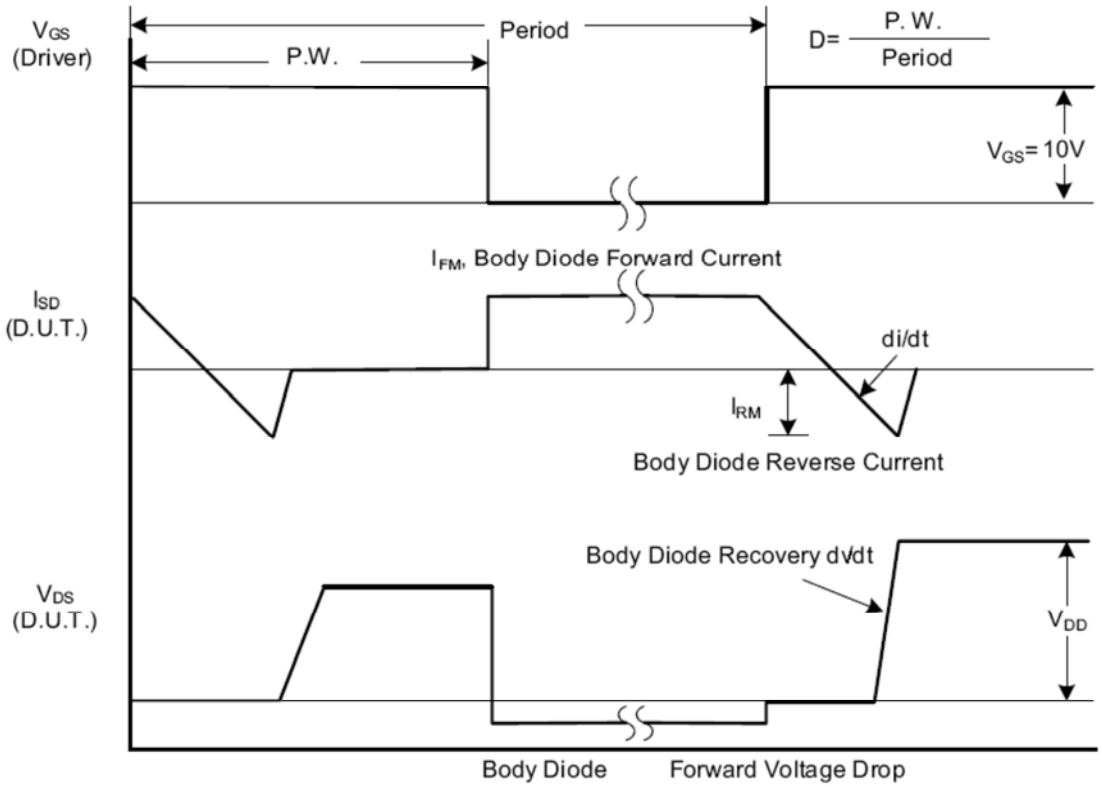


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms



●Typical Characteristics(cont.)

Fig.2.1 Switching Test Circuit

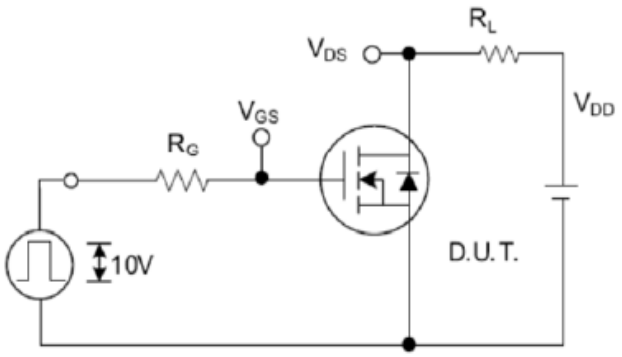


Fig.2.2 Switching Waveforms

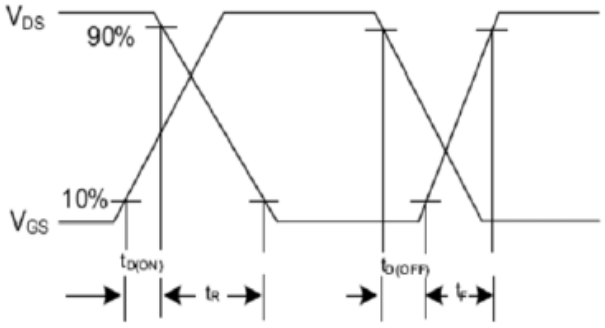


Fig.3.1 Gate Charge Test Circuit

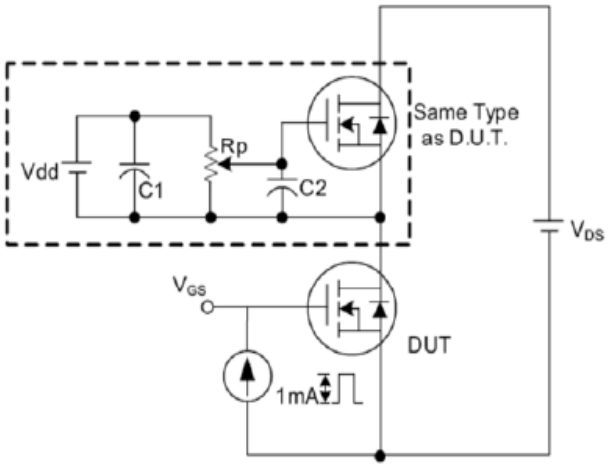


Fig.3.2 Gate Charge Waveform

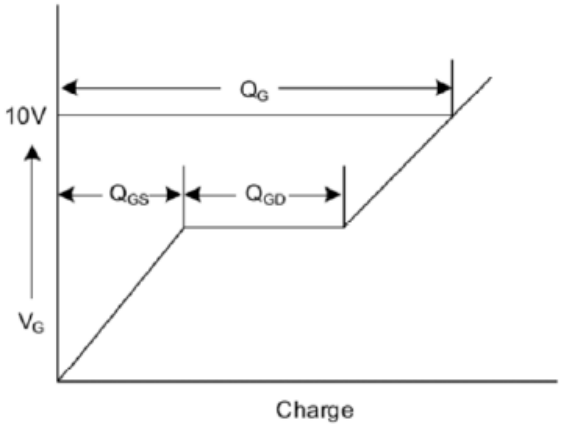


Fig.4.1 Unclamped Inductive Switching Test Circiut

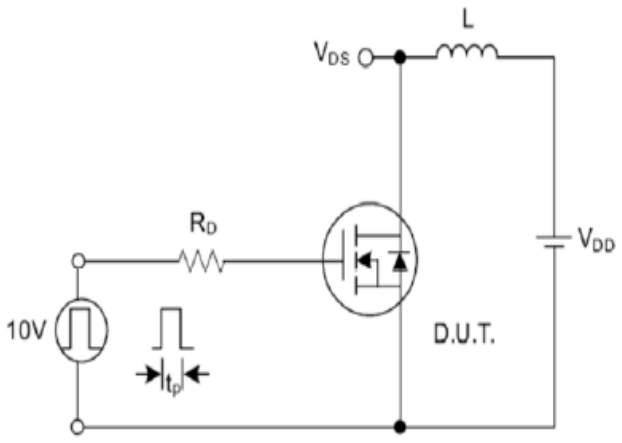
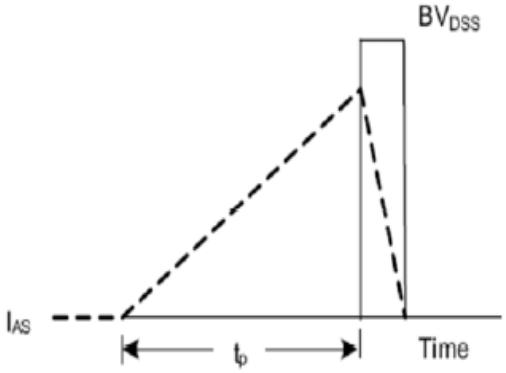


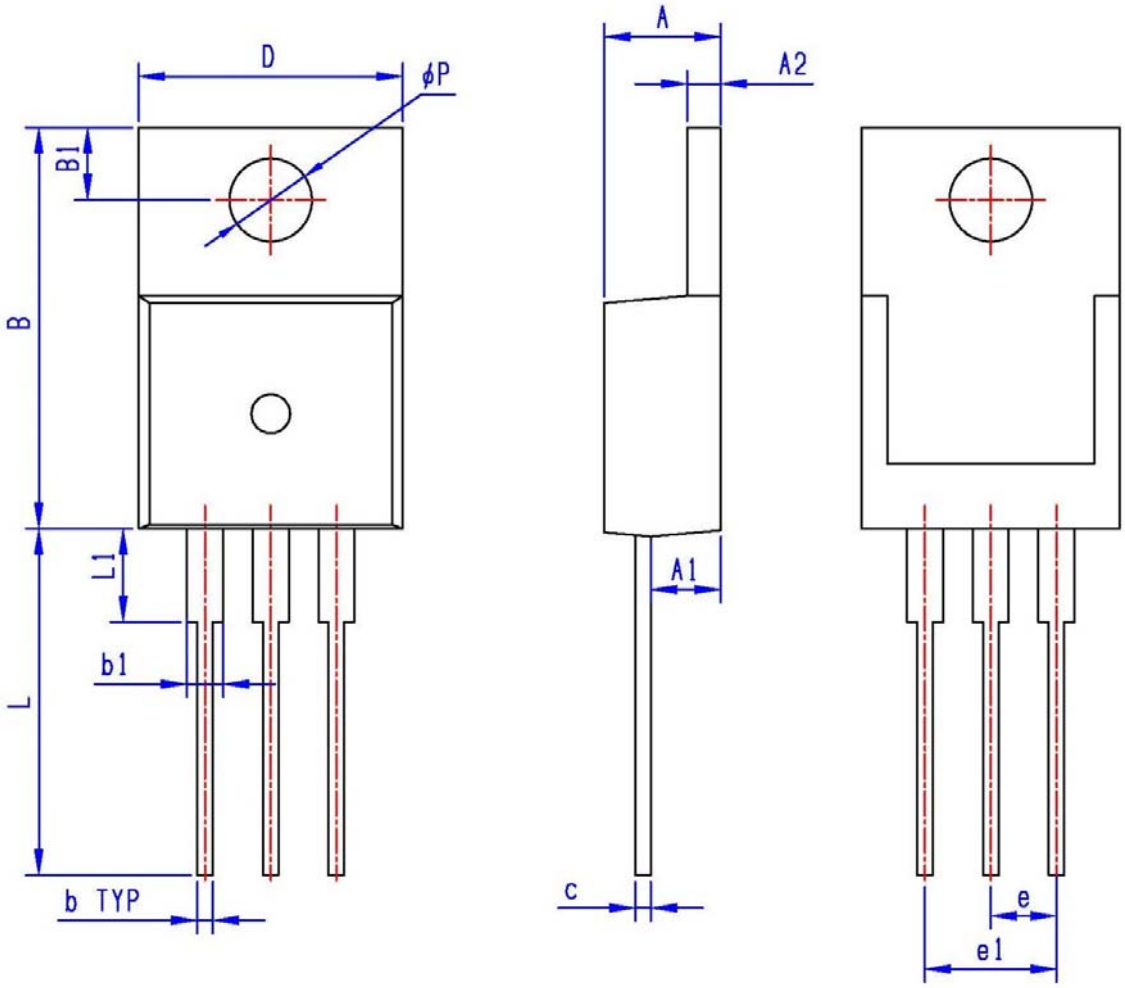
Fig.4.2 Unclamped Inductive Switching Waveforms



●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