DESCRIPTION

The AM09N90 is available in a TO-247 and TO-220F packages.

BVDSS	RDSON	ID
900V	0.98Ω	9A

FEATURE

- Proprietary New Planar Technology
- $R_{DS(ON),\ typ.}$=0.98 Ω@V_{GS}=10V
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

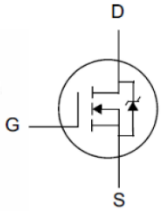
APPLICATIONS

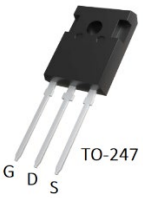
- Adaptor Charger
- SMPS Power Supply
- LCD Panel Power

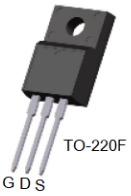
ORDERING INFORMATION

Package Type	Part Number	
TO-247 SPQ: 25pcs/ Tube	TL3F	AM09N90TL3FU
		AM09N90TL3FVU
TO-220F SPQ: 50pcs/ Tube	T3F	AM09N90T3FU
		AM09N90T3FVU
Note	U: Tube V: Halogen free Package	
AiT provides all RoHS products		

PIN DESCRIPTION







Pin #	Symbol	Function
1	G	Gate
2	D	Drain
3	S	Source

ABSOLUTE MAXIMUM RATINGS

V_{DSS}, Drain-to-Source Voltage (1)	+900V
V_{GSS}, Gate-to-Source Voltage	±30V
I_D, Continuous Drain Current	9.0A
$I_{D@\ Tc=100℃}$, Continuous Drain Current @ Tc=100℃	Fig.3
I_{DM}, Pulsed Drain Current at V_{GS}=10V (2)	Fig.6
E_{AS}, Single Pulse Avalanche Energy	580mJ
dv/dt, Peak Diode Recovery dv/dt (3)	5V/ns
P_D, Power Dissipation	75W
P_D, Derating Factor above 25℃	0.60W/℃
T_L, Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	+300℃
T_{PAK}, Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	+260℃
T_J, Operating Temperature Range	-55℃ ~ +150℃
T_{STG}, Storage Temperature Range	-55℃ ~ +150℃
$R_{\theta JC}$, Thermal Resistance, Junction-to-Case	1.67℃/W
$R_{\theta JA}$, Thermal Resistance, Junction-to-Ambient	100℃/W

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(1) T_J=+25℃ to +150℃

(2) Repetitive rating; pulse width limited by maximum junction temperature.

(3) I_{SD}= 9A di/dt < 100 A/μs, V_{DD} < BV_{DSS}, T_J=+150℃.

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
OFF Characteristics T_J = 25°C, unless otherwise specified						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA,	900	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=900V, V_{GS}=0V	-	-	1	μA
		V_{DS}=720V, V_{GS}=0V,T_J=125℃	-	-	100	
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=+30V, V_{DS}=0V	-	-	+100	nA
		V_{GS}=-30V, V_{DS}=0V	-	-	-100	
ON Characteristics T_J = 25°C, unless otherwise specified						
Static Drain-to-Source On-Resistance *	$R_{DS(ON)}$	V_{GS}=10V, I_D=4.5A	-	0.98	1.25	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=250μA	2.0	-	4.0	V
Forward Transconductance *	gfs	V_{DS}=30V, I_D=5A	-	9.2	-	S
Dynamic Characteristics Essentially independent of operating temperature						
Input Capacitance	C_{iss}	V_{GS}=0V,	-	2593	-	pF
Reverse Transfer Capacitance	C_{rss}	V_{DS}=25V,	-	12	-	
Output Capacitance	C_{oss}	f=1.0MHz	-	146	-	
Total Gate Charge	Q_g	V_{DD}=450V,	-	49	-	nC
Gate-to-Source Charge	Q_{gs}	I_D=9A,	-	13	-	
Gate-to-Drain (Miller) Charge	Q_{gd}	V_{GS}=0~+10V	-	17	-	
Resistive Switching Characteristics Essentially independent of operating temperature						
Turn-on Delay Time	$t_{d(ON)}$	V_{DD}=450V,	-	35	-	ns
Rise Time	t_r	I_D=9A,	-	41	-	
Turn-Off Delay Time	$t_{d(OFF)}$	V_{GS}=10V,	-	134	-	
Fall Time	t_f	R_G = 25Ω	-	45	-	
Source-Drain Body Diode Characteristics T_J = 25°C, unless otherwise specified						
Continuous Source Current *	I_{SD}	Integral PN-diode in MOSFET	-	-	9	A
Pulsed Source Current *	I_{SM}		-	-	36	
Diode Forward Voltage	V_{SD}	I_S=9A, V_{GS}=0V	-	-	1.5	V
Reverse recovery time	T_{rr}	V_{GS}=0V, I_F=9A,	-	562	-	ns
Reverse recovery charge	Q_{rr}	di/dt=100A/μs	-	3.5	-	μC

*Pulse width≤380μs; duty cycle≤2%

TYPICAL PERFORMANCE CHARACTERISTICS

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

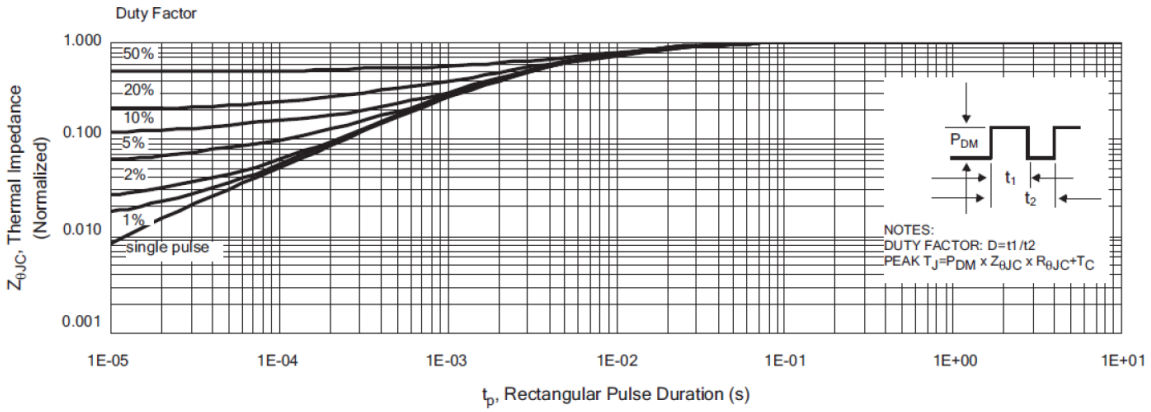


Fig.2 Max. Power Dissipation vs. Case Temperature

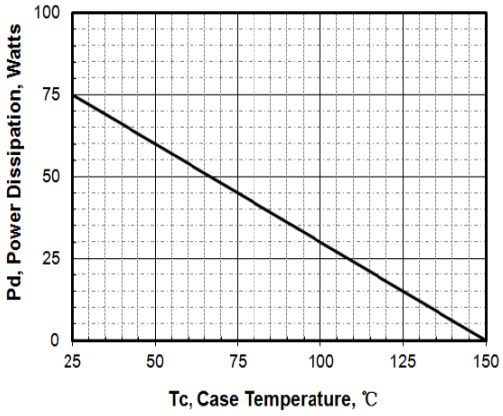


Fig.3 Maximum Continuous Drain Current vs. Case Temperature

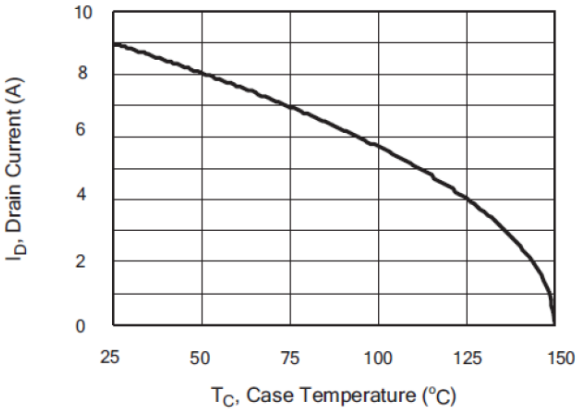


Fig.4 Typical Output Characteristics

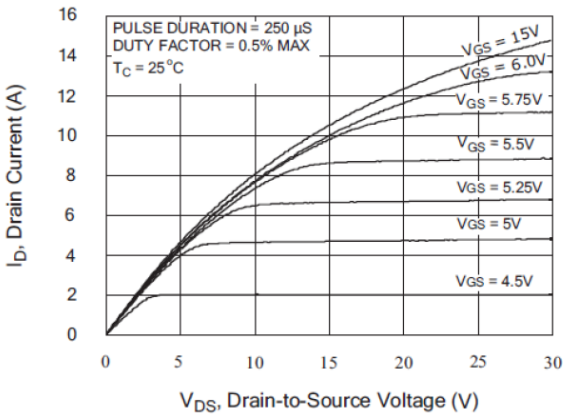


Fig.5 $R_{DS(ON)}$ vs. Gate Voltage

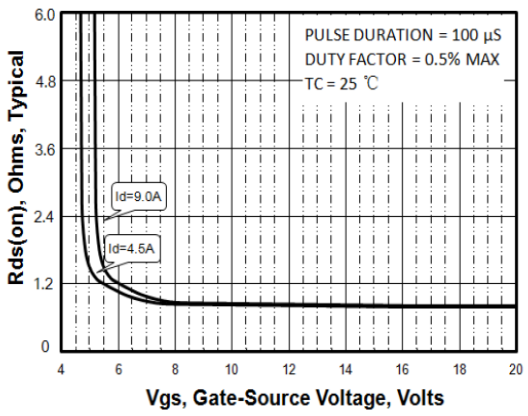


Fig.6 Maximum Peak Current Capability

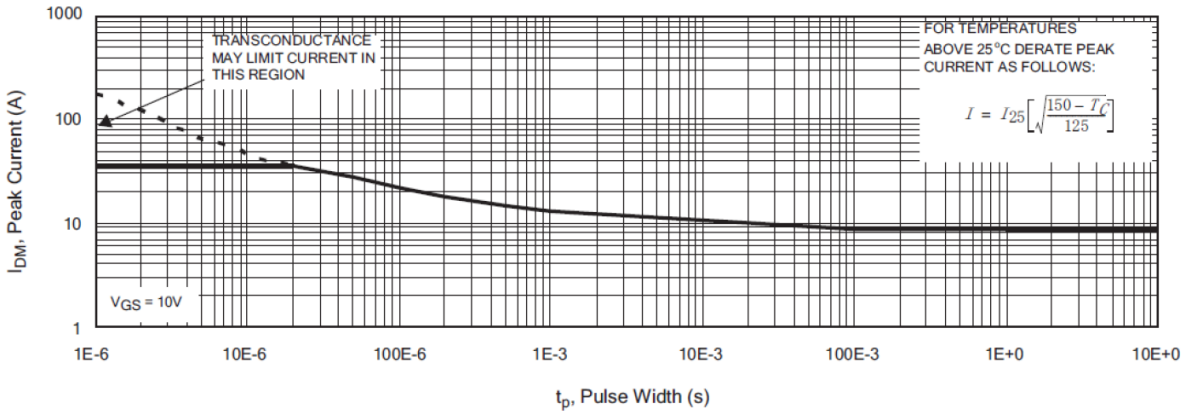


Fig.7 Typical Transfer Characteristics

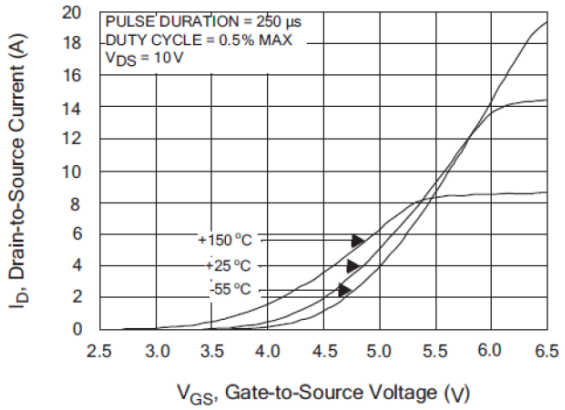


Fig.8 Unclamped Inductive Switching Capability

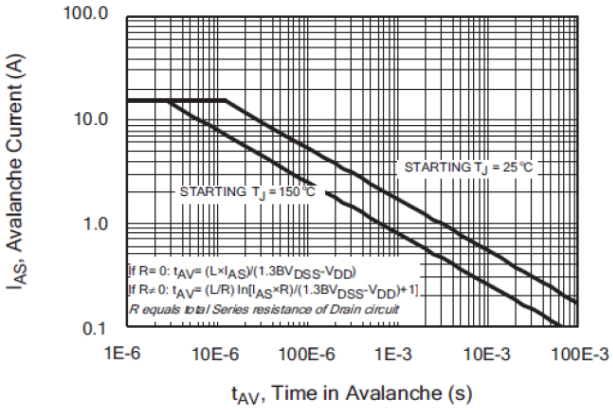


Fig.9 Typical Drain-to-Source On Resistance vs. Drain Current

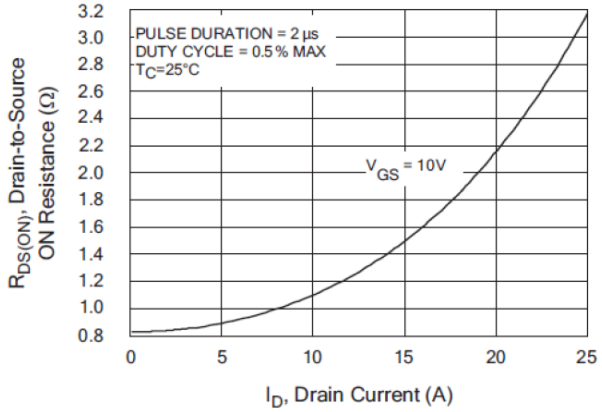


Fig.10 Typical Drain-to-Source On Resistance vs. Junction Temperature

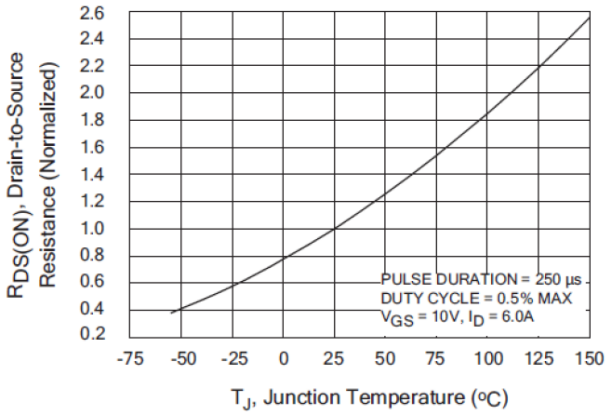


Fig.11 Typical Breakdown Voltage vs. Junction Temperature

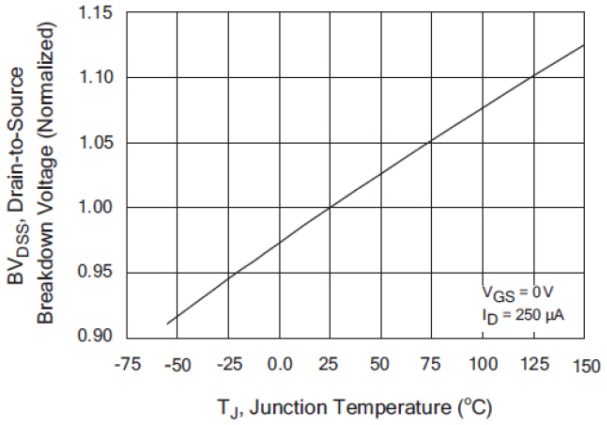


Fig.12 Typical Threshold Voltage vs. Junction Temperature

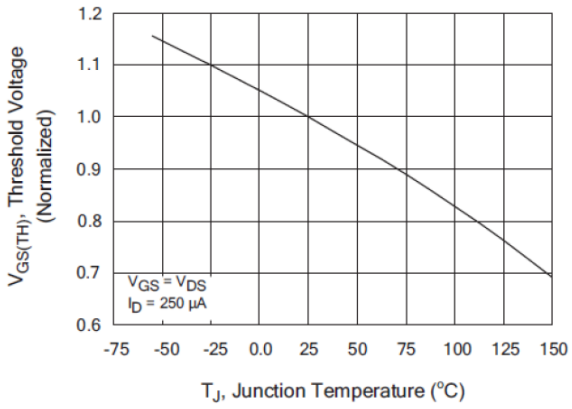


Fig.13 Maximum Forward Bias Safe Operating Area

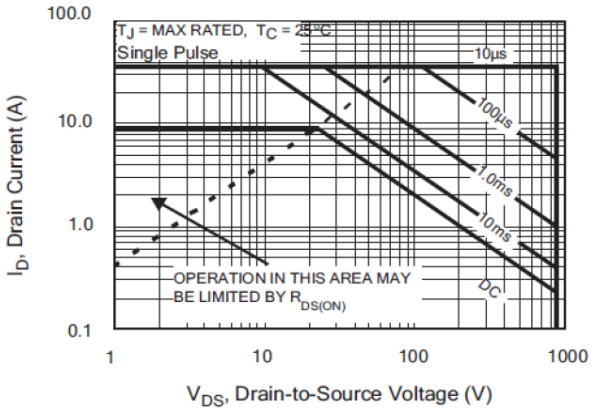


Fig.14 Typical Capacitance vs. Drain-to-Source Voltage

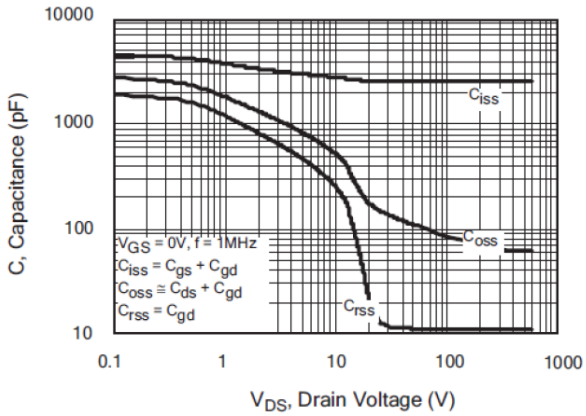


Fig.15 Typical Gate Charge vs. Gate-to-Source Voltage

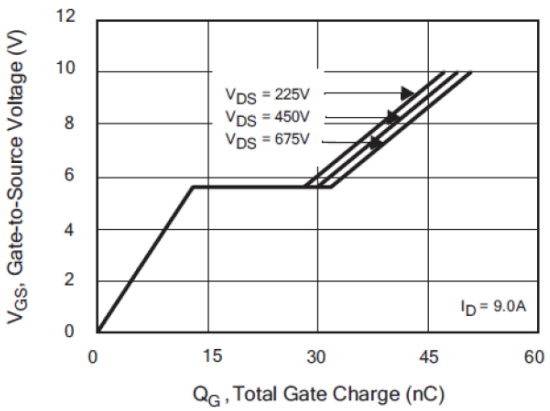


Fig.16 Typical Body Diode Transfer Characteristics

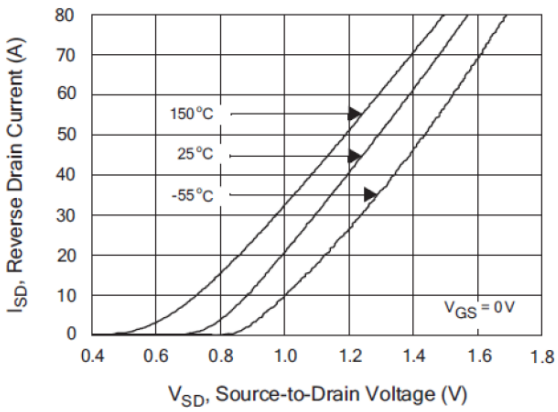


Fig.17 Peak Diode Recovery dv/dt Test Circuit

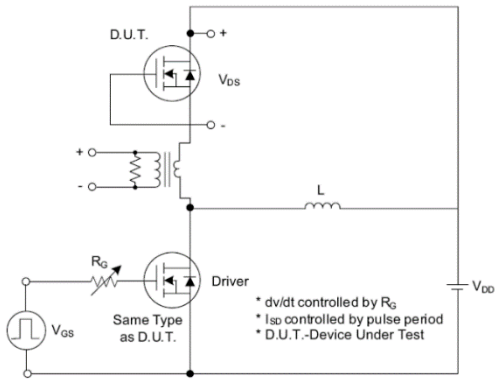


Fig.18 Peak Diode Recovery dv/dt Waveforms

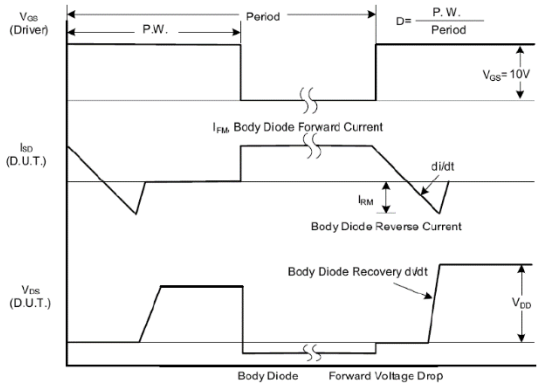


Fig.19 Switching Test Circuit

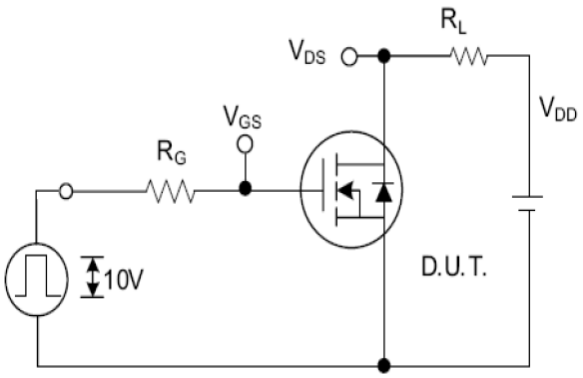


Fig.20 Switching Waveforms

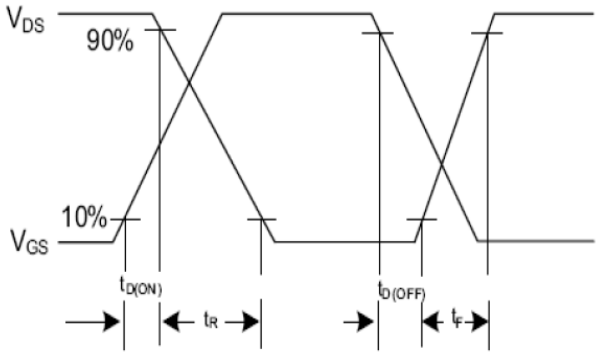


Fig.21 Gate Charge Test Circuit

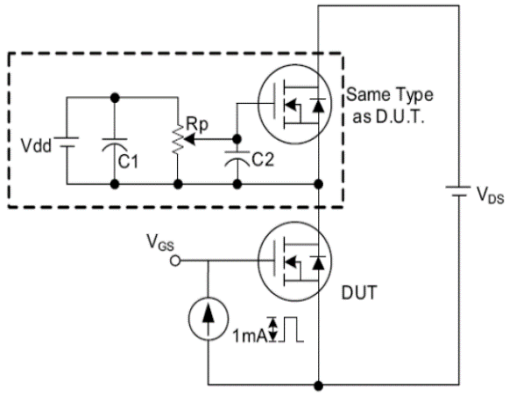


Fig.22 Gate Charge Waveform

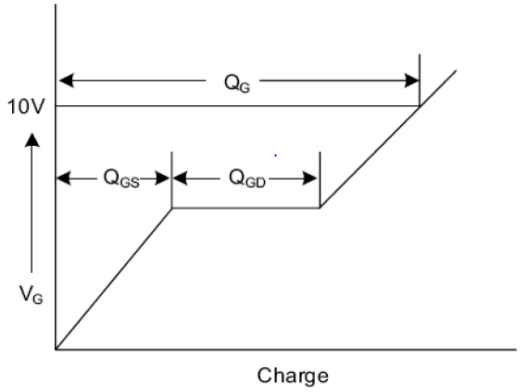


Fig.23 Unclamped Inductive Switching Test Circuit

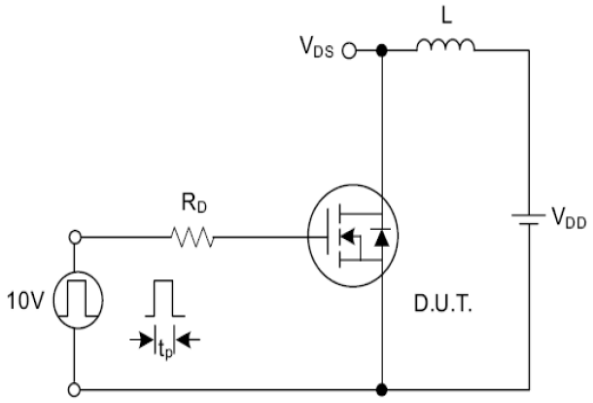
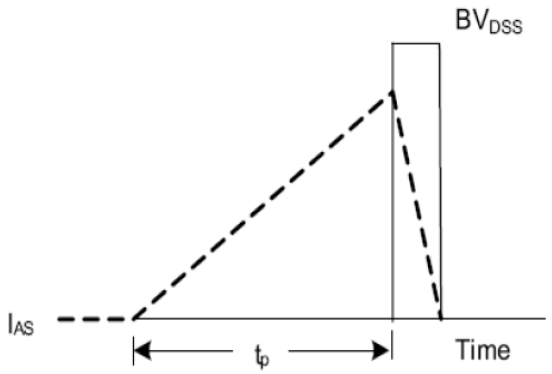
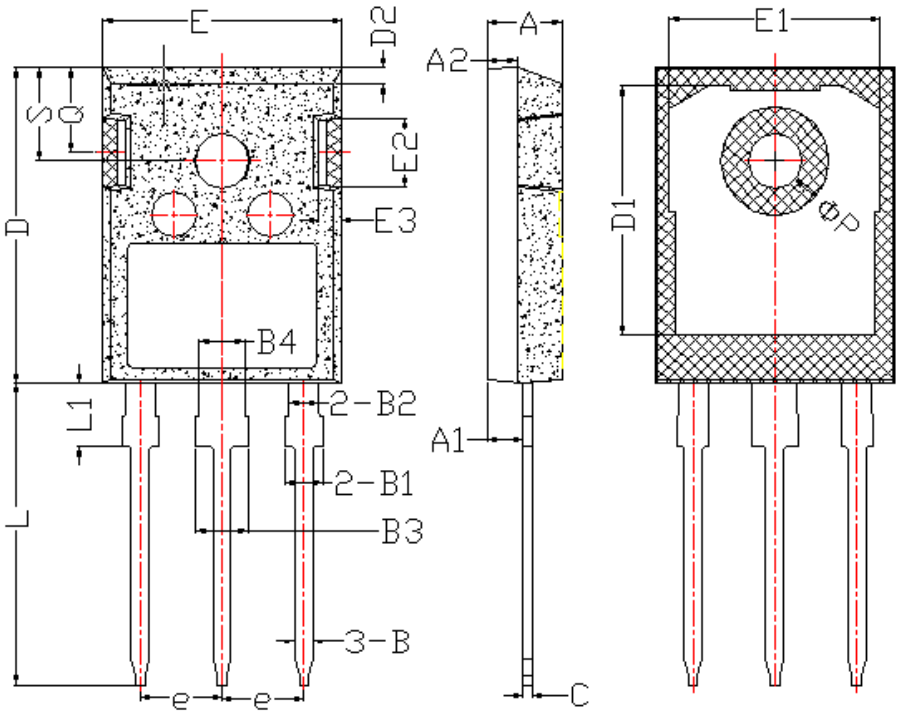


Fig.24 Unclamped Inductive Switching Waveforms



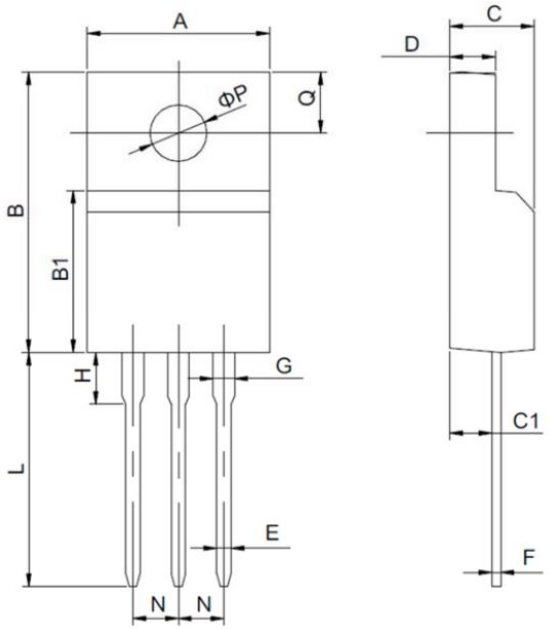
PACKAGE INFORMATIO

Dimension in TO-247 (Unit: mm)



Symbol	Min.	Max.
A	4.600	5.200
A1	2.200	2.600
B	0.900	1.400
B1	1.750	2.350
B2	1.750	2.150
B3	2.800	3.350
B4	2.800	3.150
C	0.500	0.700
D	20.600	21.300
D1	16.000	18.000
E	15.500	16.100
E1	13.000	14.700
E2	3.800	5.300
E3	0.800	2.600
e	5.200	5.700
L	19.000	20.500
L1	3.900	4.600
ΦP	3.300	3.700
Q	5.200	6.000
S	5.800	6.600

Dimension in TO-220F (Unit: mm)



Symbol	Min.	Max.
A	9.600	10.400
B	15.400	16.200
B1	8.900	9.500
C	4.300	4.900
C1	2.100	3.000
D	2.400	3.000
E	0.600	1.000
F	0.300	0.600
G	1.120	1.420
H	1.600	3.800
L	12.000	14.000
N	2.340	2.740
Q	3.150	3.550
ΦP	2.900	3.300

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