DESCRIPTION

The AM03N100 is available in TO-220, TO-220F, TO-251 and TO-252 packages.

BVDSS	RDSON	ID
1000V	6.2Ω	2.5A

FEATURE

- Fast Switching
- Low Crss
- 100% avalanche tested
- Improved dv/dt capability
- Zener - Protected

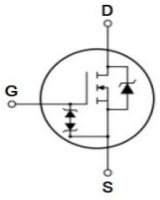
APPLICATION

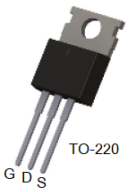
- High frequency switching mode power supply

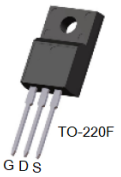
ORDERING INFORMATION

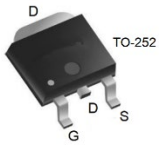
Package Type	Part Number	
TO-220 SPQ: 50pcs/Tube	T3	AM03N100T3U
		AM03N100T3VU
TO-220F SPQ: 50pcs/ Tube	T3F	AM03N100T3FU
		AM03N100T3FVU
TO-251 SPQ: 75 pcs/Tube	TD3	AM03N100TD3U
		AM03N100TD3VU
TO-252 SPQ: 2,500pcs/Reel	D	AM03N100DR
		AM03N100DVR
Note	U: Tube R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

PIN DESCRIPTION









Pin#		Symbol	Function
TO-220 TO-251	TO-252		
1	1	G	Gate
2	2,4	D	Drain
3	3	S	Source

ABSOLUTE MAXIMUM RATINGS

T_C = 25°C, unless otherwise specified.

V_{DSS}, Drain-to-Source Voltage		1000V
I_D, Continuous Drain Current		2.5A
I_D, Continuous Drain Current T_C = 100 °C		1.58A
I_{DM}, Pulsed Drain Current (1)		10A
V_{GS}, Gate-to-Source Voltage		±30V
E_{AS}, Single Pulse Avalanche Energy (2)		200mJ
$V_{ESD(G-S)}$, Gate source ESD (HBM-C= 100pF, R=1.5kΩ)		3000V
dv/dt, Peak Diode Recovery dv/dt (3)		5V/ns
P_D, Power Dissipation	TO-220	119W
	TO-220F	42W
	TO-251, TO-252	69W
P_D, Derating Factor above 25°C	TO-220	1W/℃
	TO-220F	0.35W/℃
	TO-251, TO-252	0.56W/℃
T_J, Operating Junction Temperature Range		150℃
T_{STG}, Storage Temperature Range		-55℃~+150℃
T_L, Maximum Temperature for Soldering		300℃
$R_{\theta JA}$, Junction-to-Ambient	TO-220	62.5℃/W
	TO-220F	62.5℃/W
	TO-251, TO-252	150℃/W
$R_{\theta JC}$, Junction-to-Case	TO-220	1.05℃/W
	TO-220F	2.97℃/W
	TO-251, TO-252	1.80℃/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) Pulse width limited by maximum junction temperature

(2) L=120mH, V_{Ds}=50V, Start T_J=25℃

(3) I_{SD} =3A,di/dt ≤100A/us, V_{DD}≤B_{VDS}, Start T_J=25℃

ELECTRICAL CHARACTERISTICS

T_C = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
OFF Characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}=0V, I_D=250μA	1000	-	-	V
BV_{DSS} Temperature Coefficient	ΔBV_{DSS} / ΔT_J	I_D=250μA Reference 25℃	-	0.75	-	V/℃
Drain to Source Leakage Current	I_{DSS}	V_{DS}=1000V, V_{GS}=0V, T_J=25℃	-	-	10	μA
		V_{DS}=800V, V_{GS}=0V, T_J=125℃	-	-	100	
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+25V	-	-	10	μA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-25V	-	-	10	μA
ON Characteristics						
Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=1.25A (4)	-	6.2	7.5	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS},I_D=250μA(4)	3.0	-	5.0	V
Forward Transconductance	g_{fs}	V_{DS}= 15V, I_D=2.5A (4)	2.0	-	-	S
Dynamic Characteristics						
Gate resistance	R_g	f=1.0MHz	-	4.5	-	Ω
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	530	-	pF
Output Capacitance	C_{oss}		-	45	-	
Reverse Transfer Capacitance	C_{rss}		-	2.5	-	
Switching Characteristics						
Turn-on Delay Time	$t_{d\ (ON)}$	I_D=2.5A, V_{DD}=500V, V_{GS}=10V, R_G=5Ω	-	23	-	ns
Rise Time	t_r		-	63	-	
Turn-Off Delay Time	$t_{d\ (OFF)}$		-	33	-	
Fall Time	t_f		-	61	-	
Total Gate Charge	Q_g	I_D=2.5A, V_{DD}=450V, V_{GS}=10V	-	13.8	-	nC
Gate to Source Charge	Q_{gs}		-	4.6	-	
Gate to Drain (“Miller”) Charge	Q_{gd}		-	4.8	-	

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Source-Drain Diode Characteristics						
Continuous Source Current (Body Diode)	I_S	T_C=25℃	-	--	2.5	A
Maximum Pulsed Current (Body Diode)	I_{SM}		-	-	10-	A
Diode Forward Voltage	V_{SD}	I_S=2.5A , V_{GS}=0V *	-	-	1.2	V
Reverse Recovery Time	T_{rr}	I_S=2.5A, T_J=25℃ dIF/dt =100A/μs, V_{GS}=0V	-	2103	-	ns
Reverse Recovery Charge	Q_{rr}		-	1979	-	nC
Gate-Source Zener Diode						
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS}=±1mA (Open Drain)	30	-	-	V

(4) Pulse width tp≤300μs, δ≤2%

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Safe Operating Area (TO-251/TO-252)

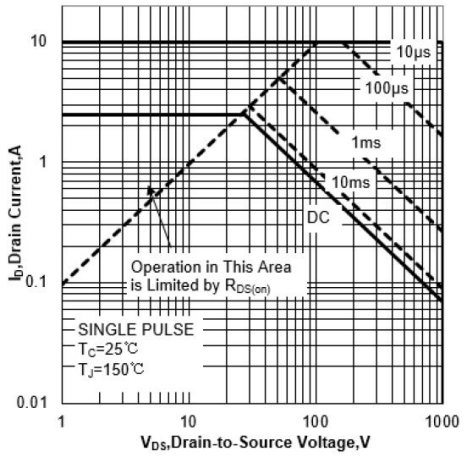


Fig 2. Safe Operating Area (TO-220F)

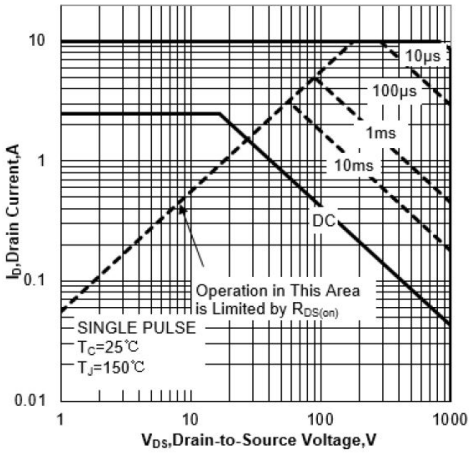


Fig 3. Safe Operating Area (TO-220)

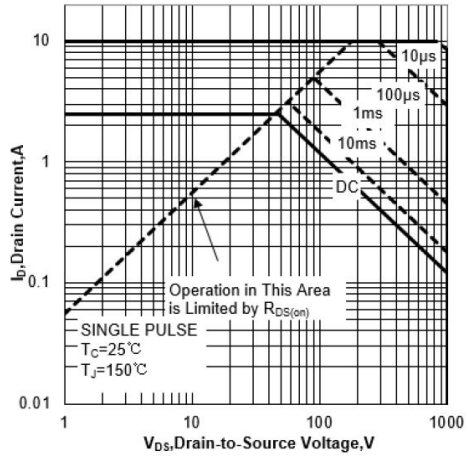


Fig 4. Power Dissipation (TO-251/TO-252)

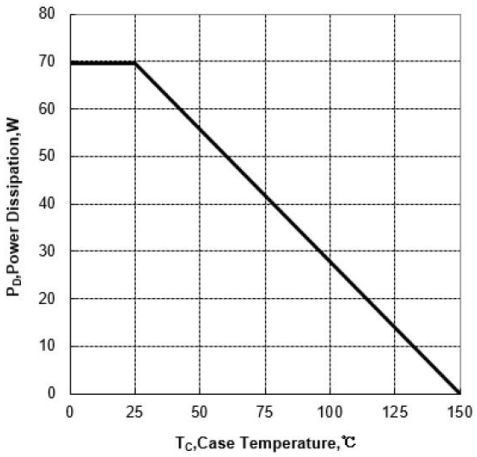


Fig 5. Power Dissipation (TO-220)

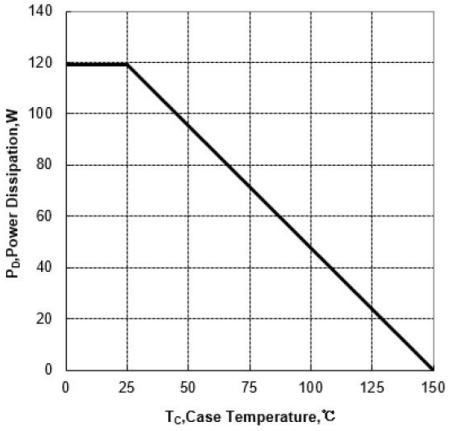


Fig 6. Power Dissipation (TO-220F)

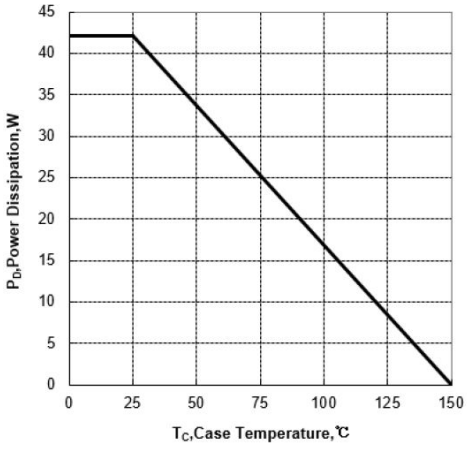


Fig7. Max Thermal impedance (TO-251/TO-252)

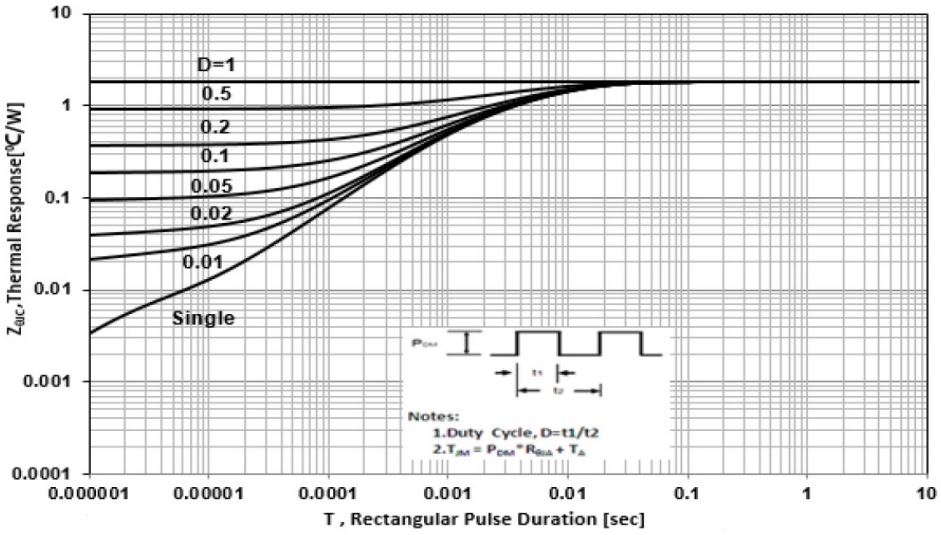


Fig 8. Max Thermal Impedance (TO-220)

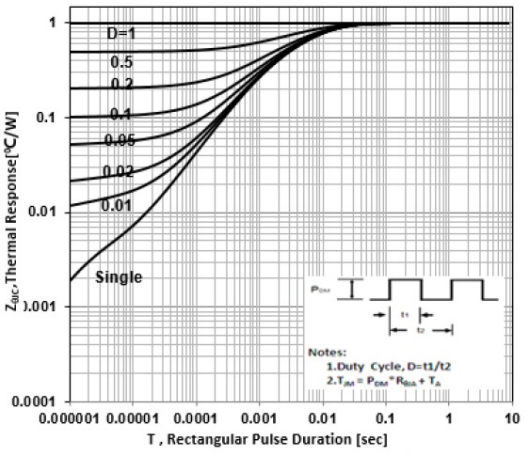


Fig 9. Max Thermal Impedance (TO-220F)

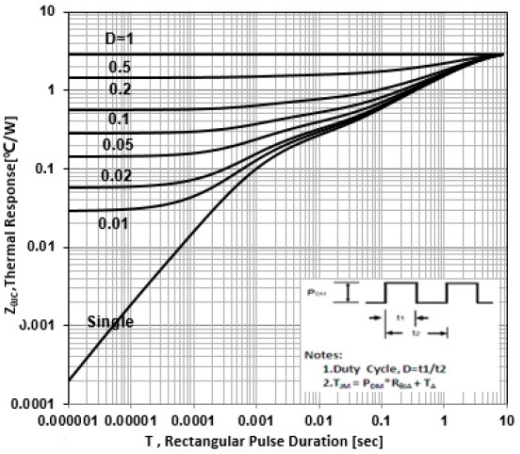


Fig 10. Typical Output Characteristics

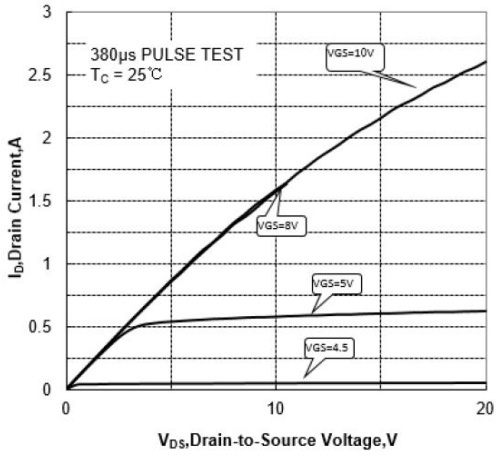


Fig 11. Typical Transfer Characteristics

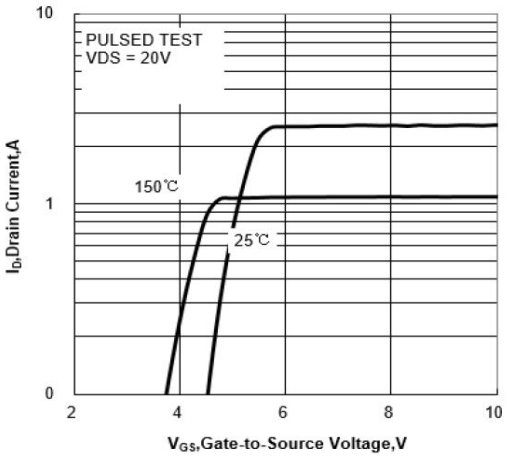


Fig 12. Typical Drain to Source ON Resistance vs. Drain Current

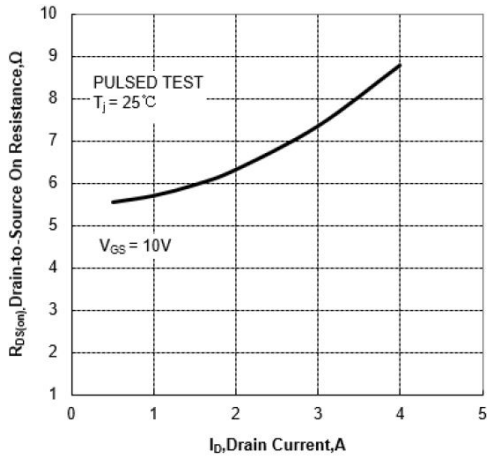


Fig 13. Typical Drain to Source on Resistance vs. Junction Temperature

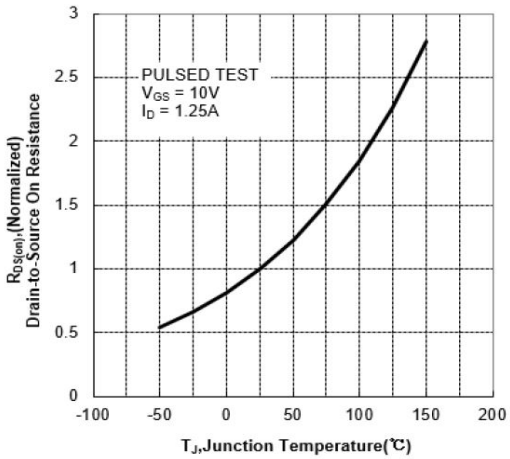


Fig 14. Typical Threshold Voltage vs. Junction Temperature

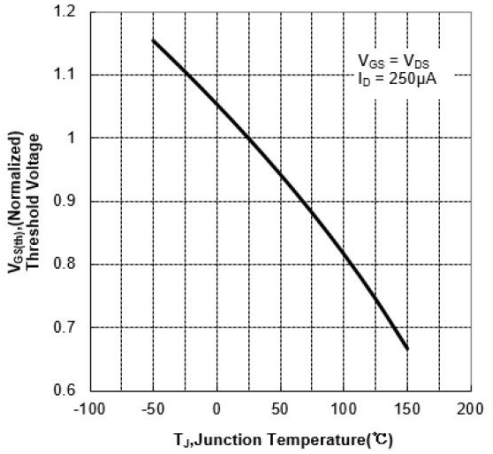


Fig 15. Typical Breakdown Voltage vs. Junction Temperature

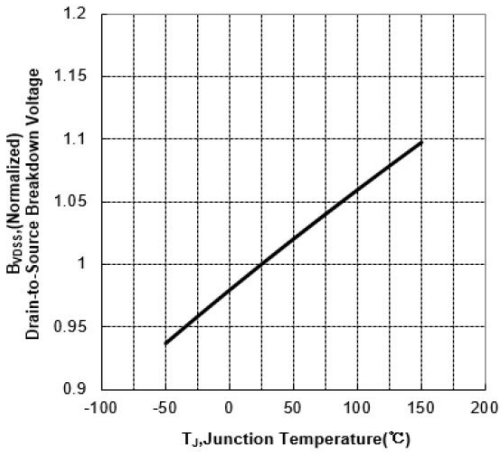


Fig 16. Typical Capacitance vs. Drain to Source Voltage

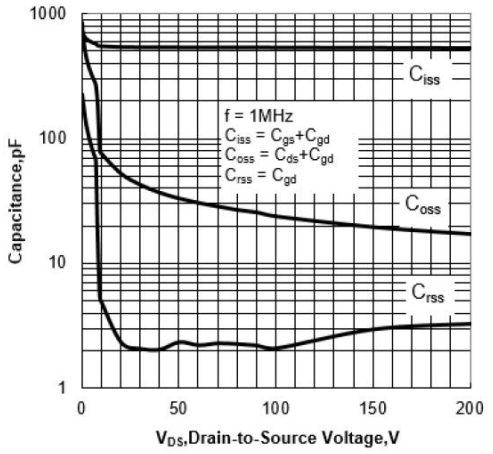


Fig 17. Typical Gate Charge vs. Gate to Source Voltage

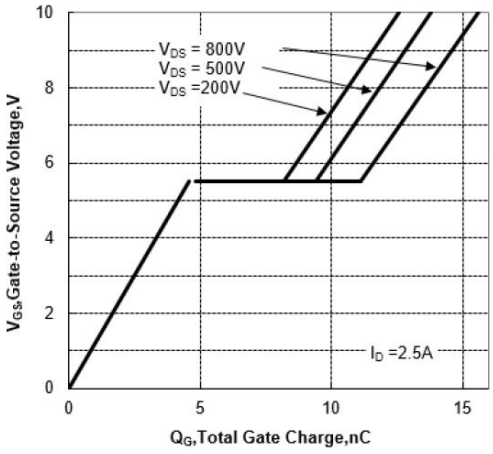


Fig 18. Gate Charge Test Circuit

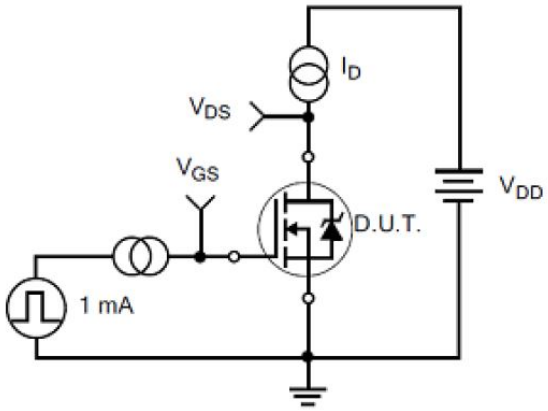


Fig 19. Gate Charge Waveforms

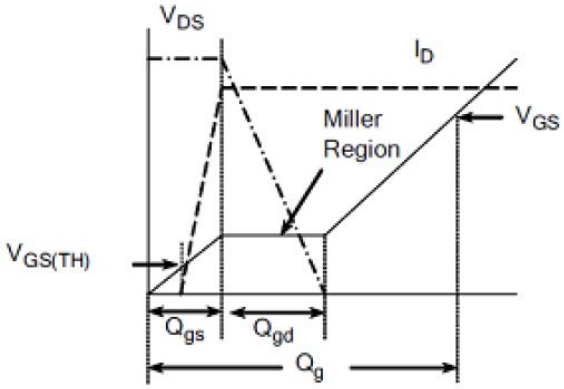


Fig 20. Resistive Switching Test Circuit

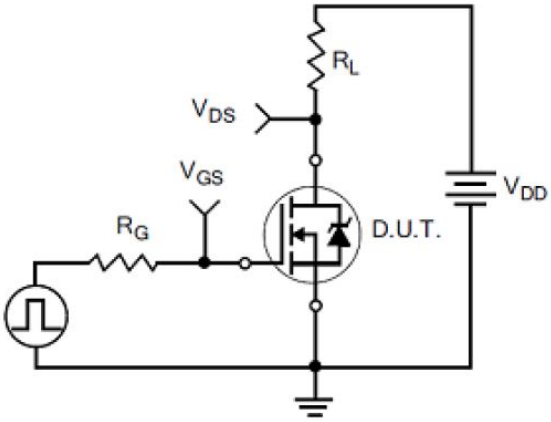


Fig 21. Resistive Switching Waveforms

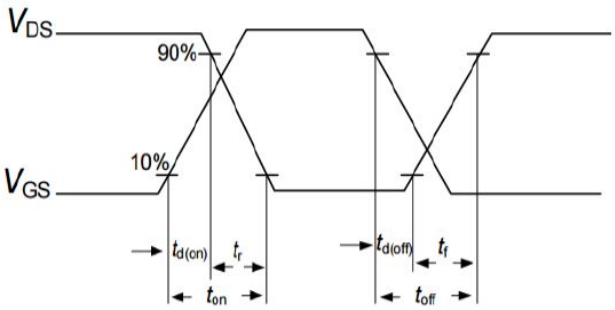


Fig 22. Diode Reverse Recovery Test Circuit

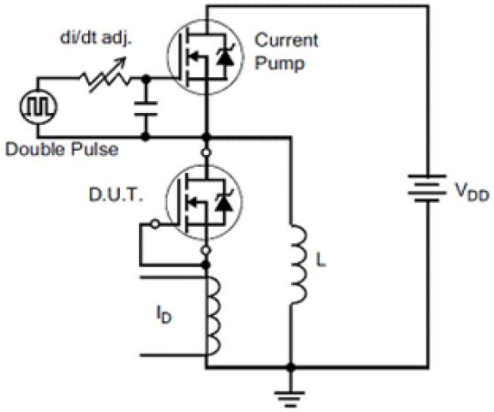


Fig 23. Diode Reverse Recovery Waveform

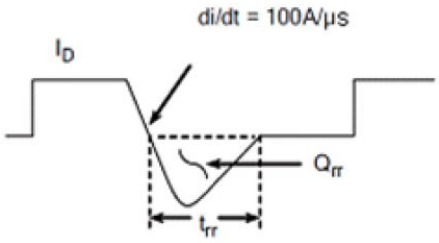


Fig 24. Unclamped Inductive Switching Test Circuit

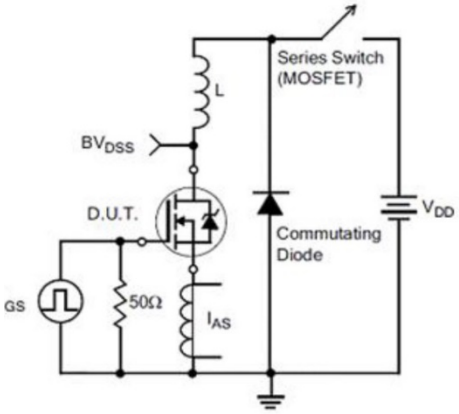
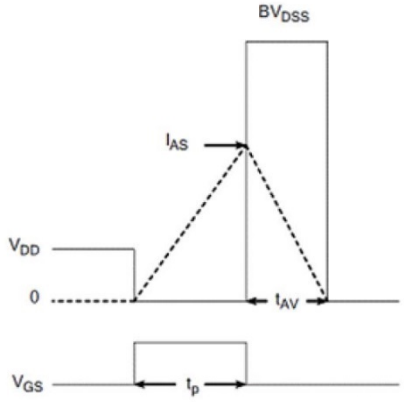
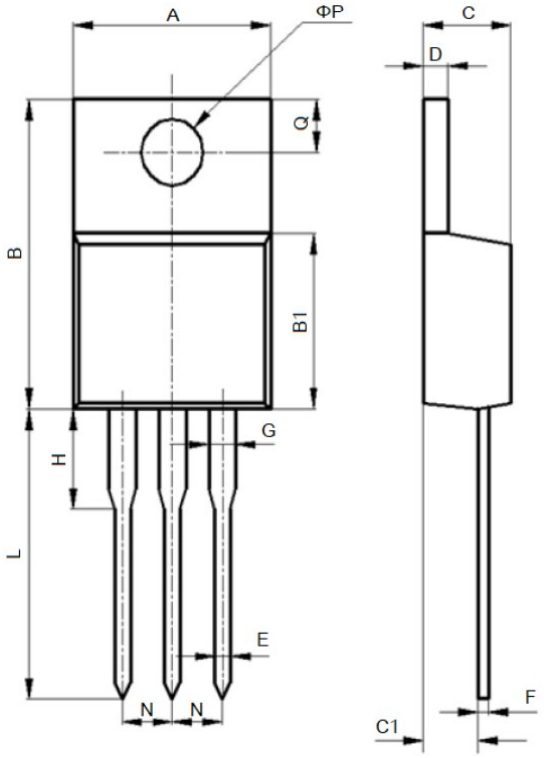


Fig 25. Unclamped Inductive Switching Waveform



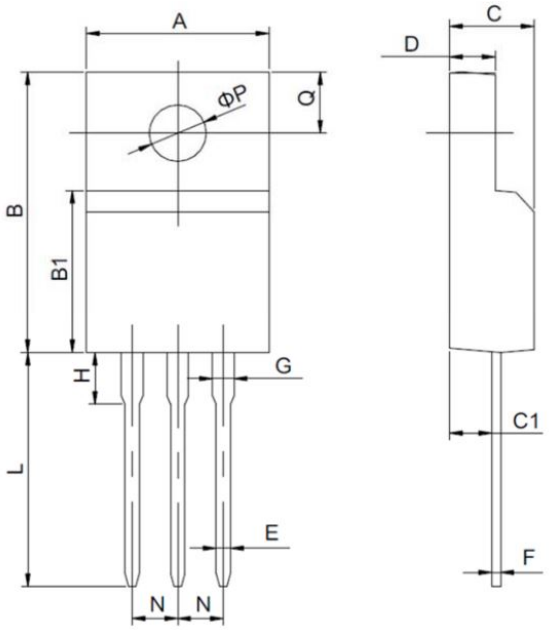
PACKAGE INFORMATION

Dimension in TO-220 (Unit: mm)



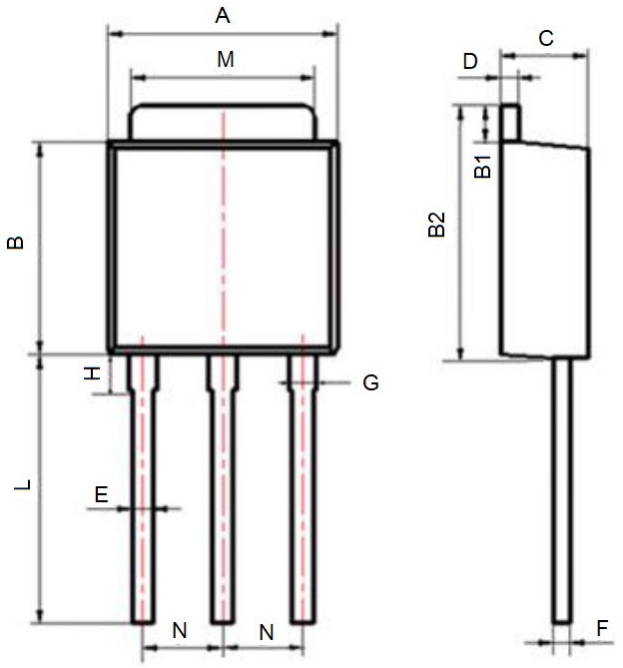
Symbol	Min.	Max.
A	9.600	10.600
B	15.000	16.000
B1	8.900	9.500
C	4.300	4.800
C1	2.300	3.100
D	1.200	1.400
E	0.700	0.900
F	0.300	0.600
G	1.170	1.370
H	2.700	3.800
L	12.600	14.800
N	2.340	2.740
Q	2.400	3.000
ΦP	3.500	3.900

Dimension in TO-220F (Unit: mm)



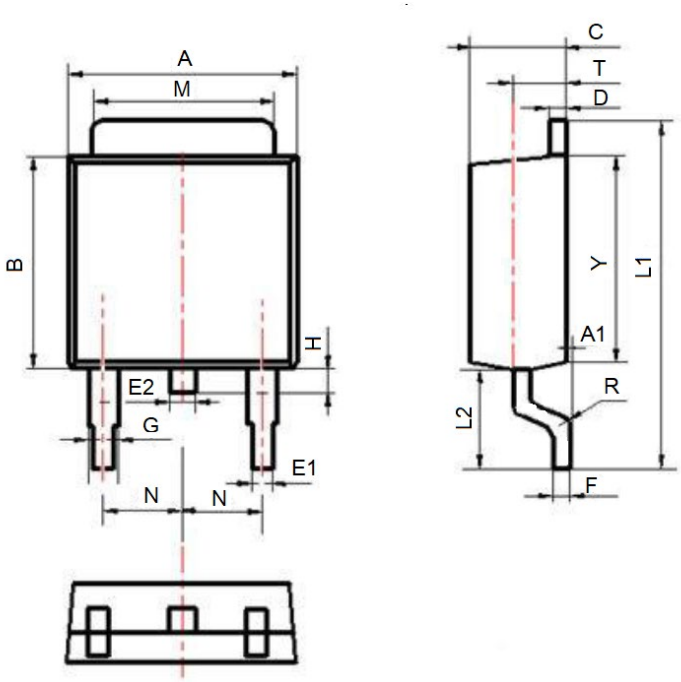
Symbol	Min.	Max.
A	9.600	10.400
B	15.400	16.200
B1	8.900	9.500
C	4.300	4.900
C1	2.100	3.000
D	2.400	3.000
E	0.600	1.000
F	0.300	0.600
G	1.120	1.420
H	1.600	3.800
L	12.000	14.000
N	2.340	2.740
Q	3.150	3.550
ΦP	2.900	3.300

Dimension in TO-251 (Unit: mm)



Symbol	Min.	Max.
A	6.300	6.900
B	5.700	6.300
B1	1.000	1.200
B2	6.800	7.400
C	2.100	2.500
D	0.300	0.600
E	0.500	0.700
F	0.300	0.600
G	0.700	1.000
H	1.600	2.400
L	3.900	4.300
M	5.100	5.500
N	2.090	2.490

Dimension in TO-252 (Unit: mm)



Symbol	MILLIMETERS	
	Min.	Max.
A	6.300	6.900
A1	0.000	0.130
B	5.700	6.300
C	2.100	2.500
D	0.300	0.600
E1	0.600	0.900
E2	0.700	1.000
F	0.300	0.600
G	0.700	1.200
L1	9.600	10.500
L2	2.700	3.100
H	0.600	1.000
M	5.100	5.500
N	2.090	2.490
R	0.300	
T	1.400	1.600
Y	5.100	6.300

IMPORTANT NOTICE

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