

**DESCRIPTION**

The AM12N80T is available in the TO-220 Package.

BVDSS	RDSON	ID
800V	0.8Ω	12A

APPLICATIONS

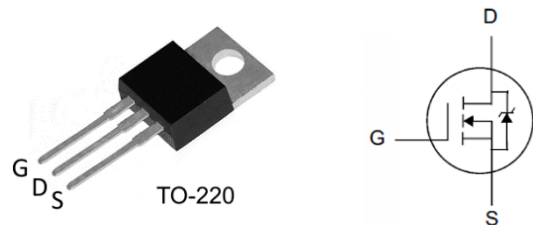
- ATX Power
- LCD Panel Power

ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs /Tube 1,000pcs/Box	T3	AM12N80T3U
Note	U: Tube Package	
AiT provides all RoHS products		

FEATURES

- 800V, 12A
- $R_{DS(ON)}$ Typ. = 0.8Ω @ $V_{GS} = 10V$
- Proprietary New Planar Technology
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

PIN DESCRIPTION

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

ABSOLUTE MAXIMUM RATINGS

$T_C=25^{\circ}C$, unless otherwise Noted

V_{DSS} , Drain-to-Source Voltage ⁽¹⁾	800V
V_{GSS} , Gate-to-Source Voltage	±30V
I_D , Continuous Drain Current	12A
$T_C = 100^{\circ}C$	See Fig. 3
I_{DM} , Pulsed Drain Current at $V_{GS}=10V$ ⁽²⁾	See Fig. 6
E_{AS} , Single Pulse Avalanche Energy	1200mJ
dv/dt , Peak Diode Recovery dv/dt ⁽³⁾	5V/ns
P_D , Power Dissipation	160W
P_D , Derating Factor above 25°C	1.28W/°C
$R_{\theta JC}$, Thermal Resistance, Junction to Case	0.78°C/W
$R_{\theta JA}$, Thermal Resistance, Junction-to-Ambient	62°C/W
T_{STG} , Storage Temperature Range	-55°C ~ +150°C
T_J , Operating Junction Temperature Range	-55°C ~ +150°C
T_L , Maximum Temperature for Soldering	300°C
T_{PAK} , Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	260°C

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) $T_J=+25^{\circ}C$ to $+150^{\circ}C$

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

(3) $I_{SD}= 12A$ di/dt < 100 A/μs, $V_{DD} < BV_{DSS}$, $T_J=+150^{\circ}C$

**ELECTRICAL CHARACTERISTICS**T_J = 25°C, unless otherwise Noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Off Characteristics						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	800	-	-	V
Drain-to- Source Leakage Current	I _{DSS}	V _{DS} =800V, V _{GS} =0V	-	-	1	μA
		V _{DS} =640V, V _{GS} =0V, T _J = 125°C	-	-	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						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	-	4.0	V
Static Drain-to-Source On-Resistance *	R _{DS(ON)}	V _{GS} =10V, I _D = 6A	-	0.8	1.1	Ω
Forward Transconductance*	g _{fs}	V _{DS} =20V, I _D =10A	-	20	-	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	-	1950	-	pF
Output Capacitance	C _{oss}		-	208	-	
Reverse Transfer Capacitance	C _{rss}		-	60	-	
Total Gate Charge	Q _g	V _{DD} = 640V , I _D =12V V _{GS} =0V ~ 10V	-	70	-	nC
Gate-to-Source Charge	Q _{gs}		-	11	-	
Gate-to-Drain (Miller) Charge	Q _{gd}		-	33	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DD} =400V, R _G =4.7Ω, V _{GS} =10V, I _D = 12A	-	20	-	ns
Turn-On Rise Time	t _r		-	12	-	
Turn-Off Delay Time	t _{d(off)}		-	70	-	
Turn-Off Fall Time	t _f		-	25	-	
Source- Drain Body Diode Characteristics						
Continuous Source Current*	I _{SD}	Integral PN-Diode in MOSFET	-	-	12	A
Pulsed Source Current*	I _{SM}		-	-	48	A
Diode Forward Current	V _{SD}	I _S = 12A, V _{GS} =0V	-	-	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 12A, V _{GS} =0V	-	600	-	ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/us	-	3.4	-	uC

* Pulse test: Pulse width ≤ 380μs, Duty Cycle ≤ 2%.



TYPICAL PERFORMANCE CHARACTERISTICS

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

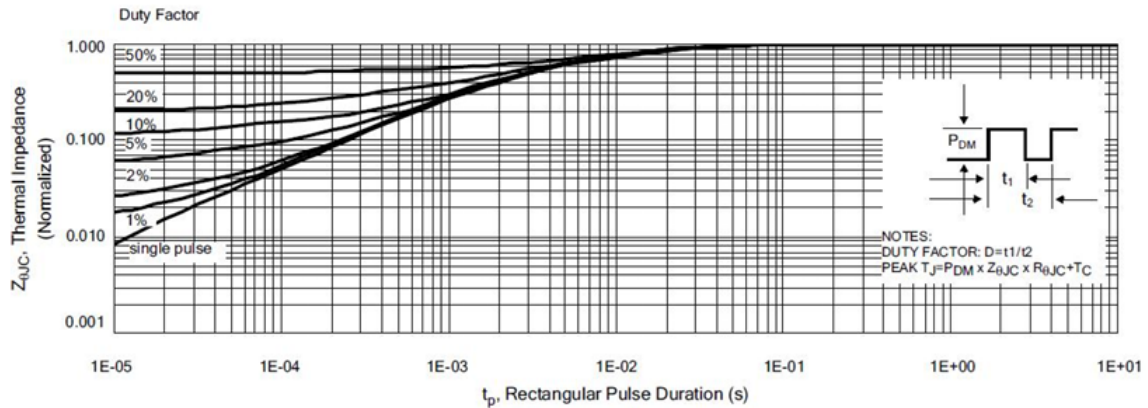


Fig 2. Maximum Power Dissipation vs. Case Temperature

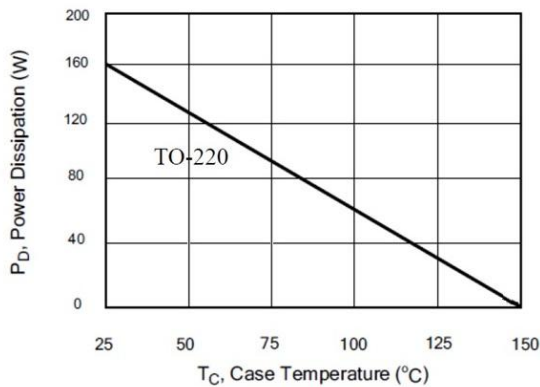


Fig 3. Maximum Continuous Drain Current vs. Case Temperature

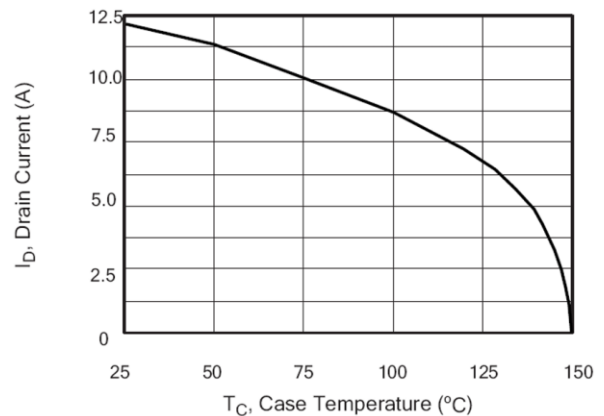


Fig 4. Typical Output Characteristics

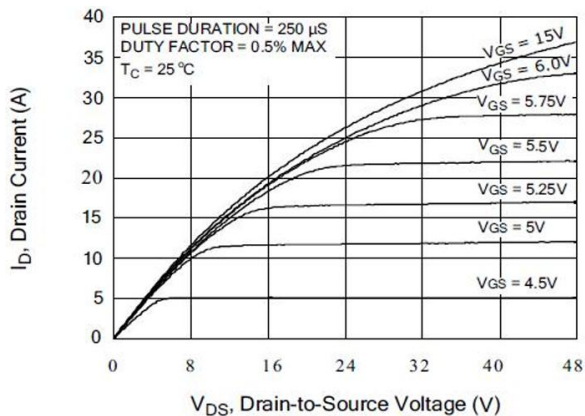


Fig 5. Typical Drain-to-Source ON Resistance vs. Gate Voltage and Drain Current

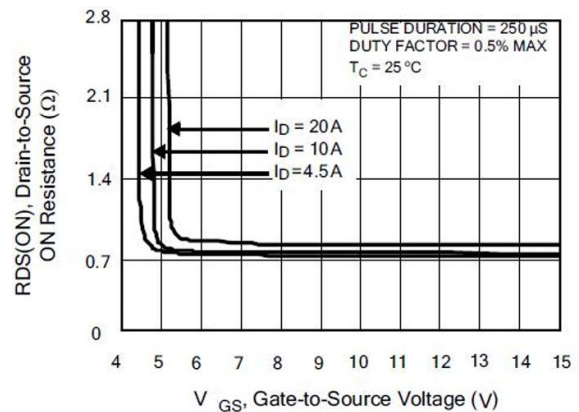




Fig 6. Maximum Peak Current Capability

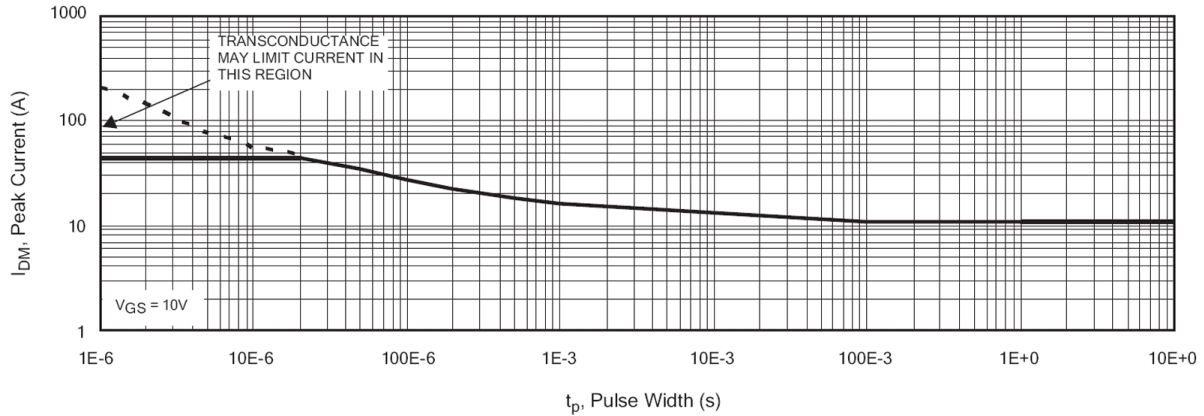


Fig 7. Typical Transfer Characteristics

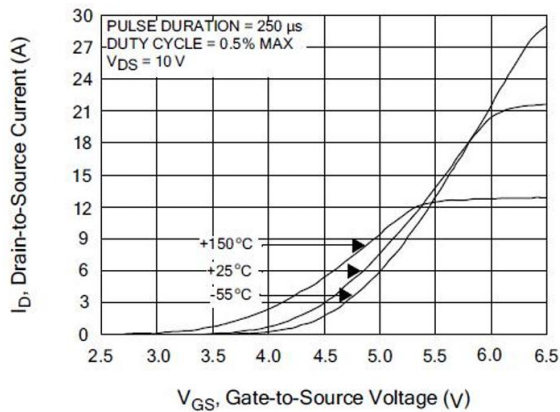


Fig 8. Unclamped Inductive Switching Capability

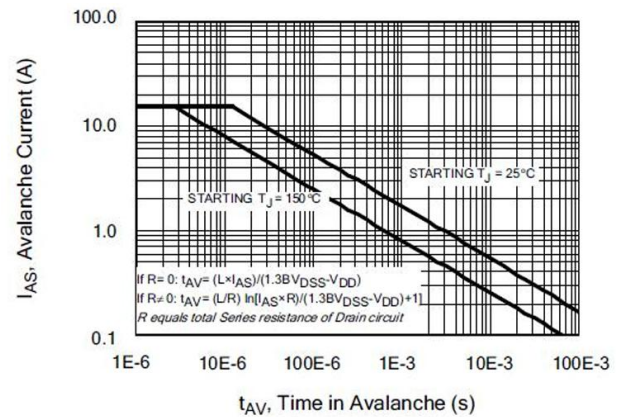


Fig 9. Typical Drain-to-Source ON Resistance vs. Drain Current

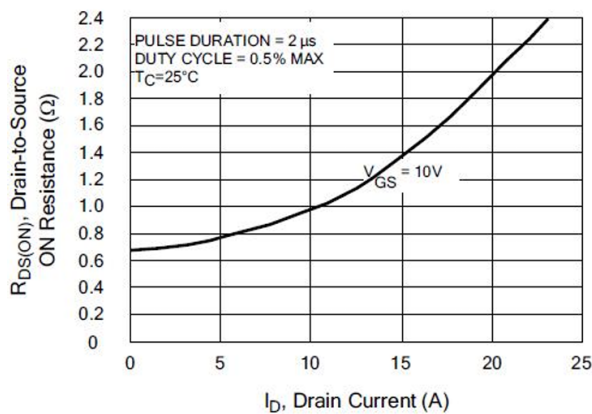


Fig 10. Typical Drain-to-Source ON Resistance vs. Junction Temperature

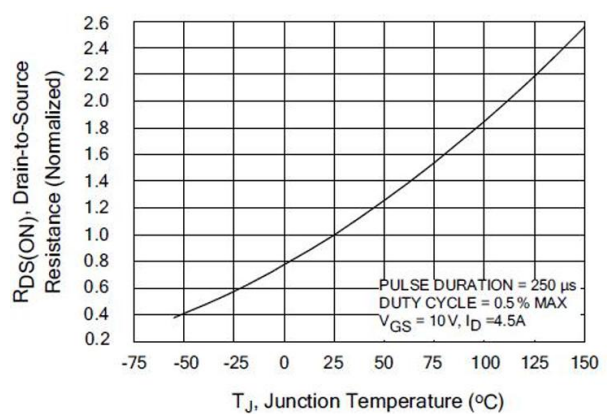




Fig 11. Typical Breakdown Voltage
vs. Junction Temperature

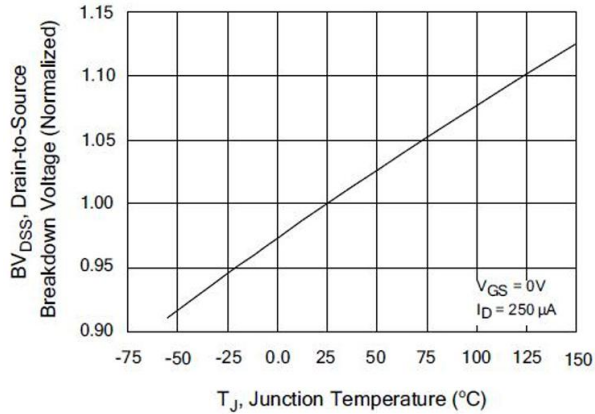


Fig 12. Typical Threshold Voltage
vs. Junction Temperature

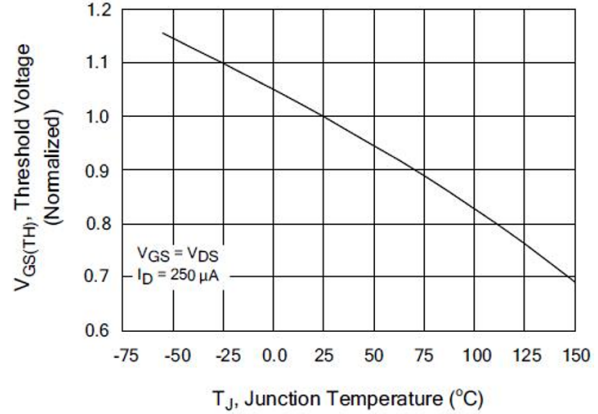


Fig 13. Maximum Forward Bias Safe Operating Area

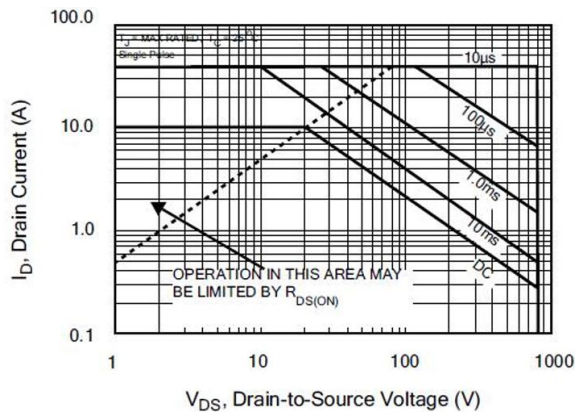


Fig 14. Typical Capacitance
vs. Drain-to-Source Voltage

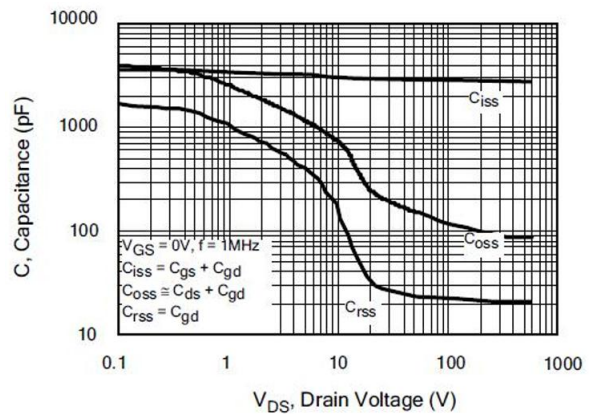


Fig 15. Typical Gate Charge
vs. Gate-to-Source Voltage

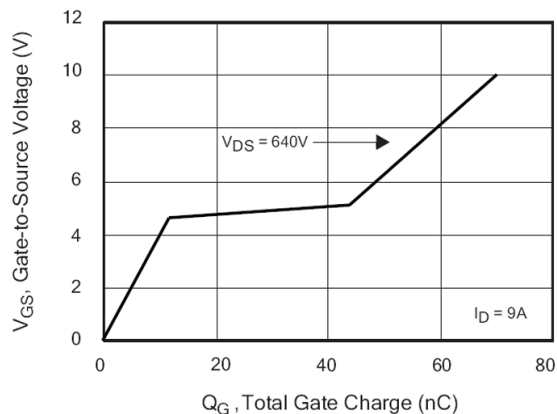
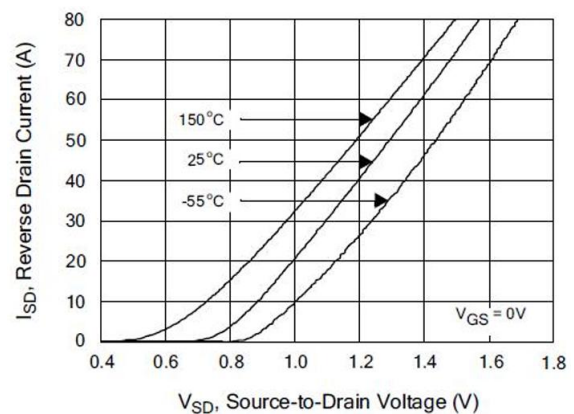


Fig 16. Typical Body Diode Transfer Characteristics





TEST CIRCUIT

Fig 17. Peak Diode Recovery dv/dt Test Circuit

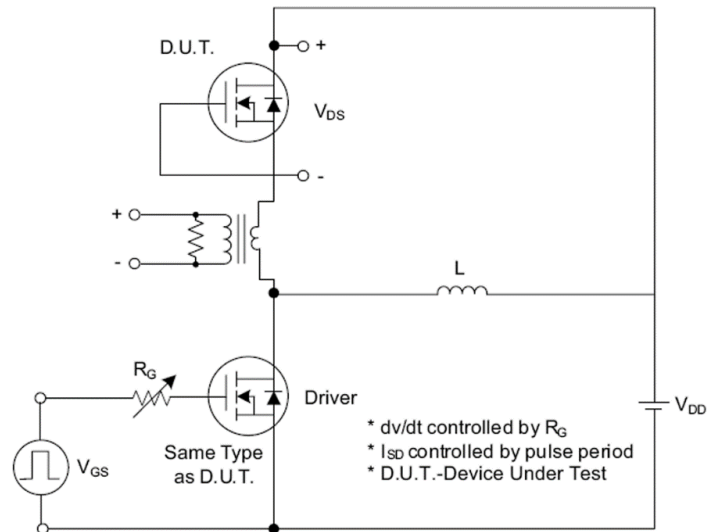


Fig 18. Peak Diode Recovery dv/dt Waveforms

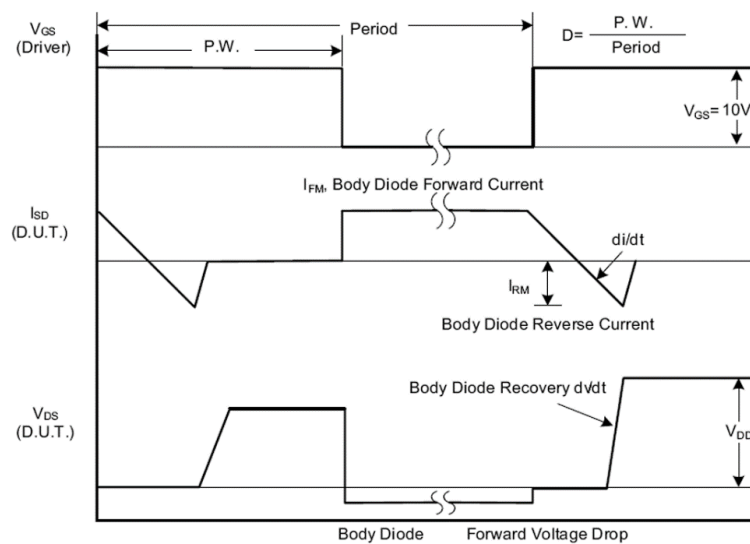




Fig 19. Switching Teat Circuit

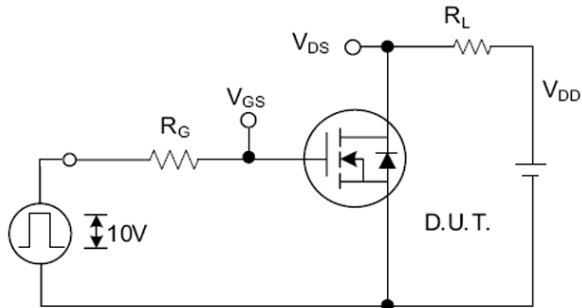


Fig 20. Switching Waveforms

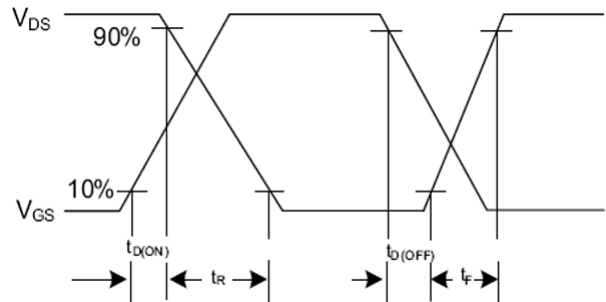


Fig 21. Gate Charge Test Circuit

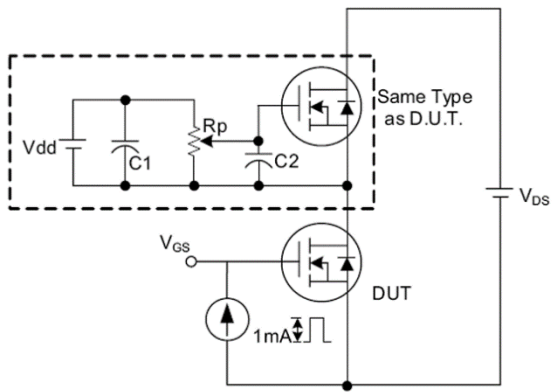


Fig 22. Gate Charge Waveform

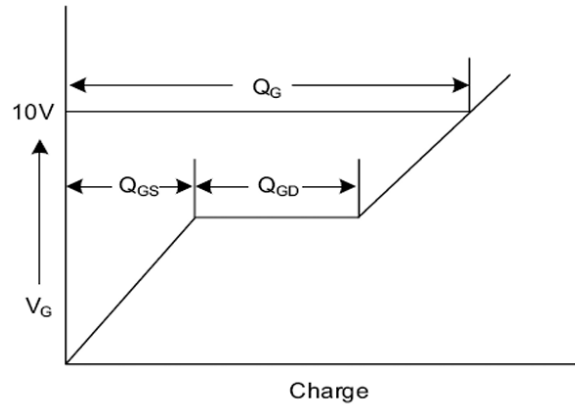


Fig 23. Unclamped Inductive Switching Teat Circuit

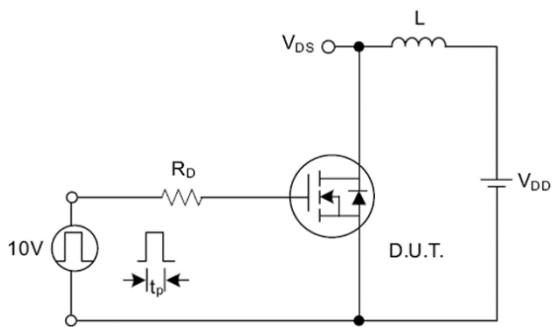
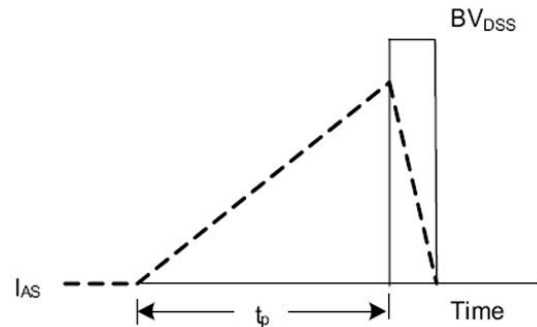


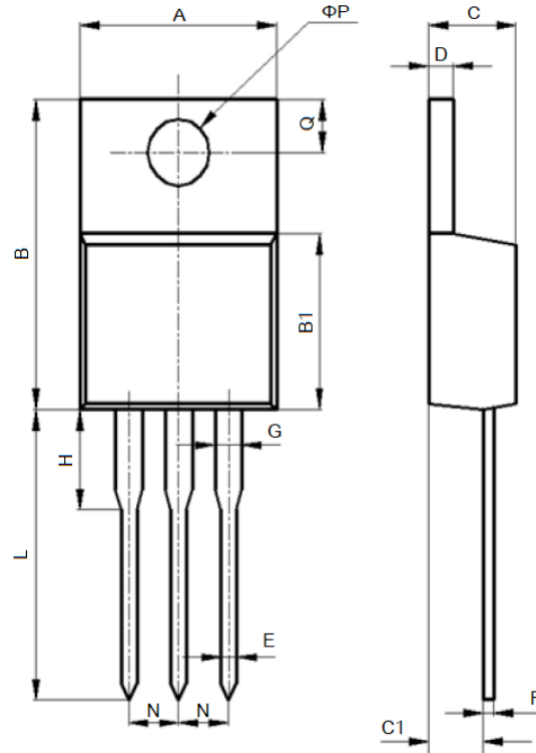
Fig 24. Unclamped Inductive Switching Waveform





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



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