



DESCRIPTION

The AM12N65 is available in TO-220 and TO220F Packages.

APPLICATIONS

- Adaptor
- Charger
- SMPS Standby Power

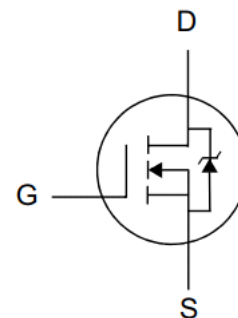
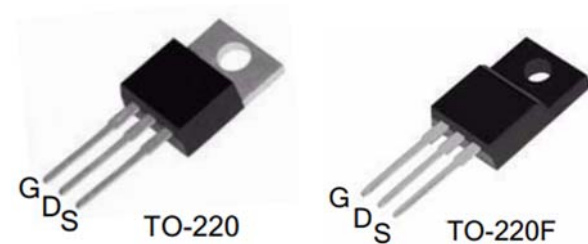
FEATURE

- RDS(ON),typ.=0.60 Ω @VGS=10V
- High Current Rating
- Lower Capacitance
- Lower Total Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs/Tube	T3	AM12N65T3U
		AM12N65T3VU
TO220F SPQ: 50pcs/ Tube	T3F	AM12N65T3FU
		AM12N65T3FVU
Note	V: Halogen free Package U: Tube	
AiT provides all RoHS products		

PIN DESCRIPTION



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



ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise specified.

Parameter	Symbol	TO-220	TO-220F	Unit
Drain-to-Source Voltage	V _{DSS}	650		V
Gate-to-Source Voltage	V _{GSS}	±30		
Continuous Drain Current	I _D	12		A
Pulsed Drain Current at V _{GS} =10V	I _{DM}	48		
Single Pulse Avalanche Energy	E _{AS}	450		
Power Dissipation	P _D	125	73	mJ
Derating Factor above 25°C		1.0	0.58	W
Soldering Temperature Distance of 1.6mm from case for 10 seconds	T _L	300		W/°C
Operating Temperature Range	T _J	-55 to 150		°C
Storage Temperature Range	T _{STG}	-55 to 150		°C
THERMAL RESISTANCE				
Parameter	Symbol	TO-220	TO-220F	Unit
Thermal Resistance, Junction-to-Case	R _{θJC}	1.0	1.71	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62	100	

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.

**ELECTRICAL CHARACTERISTICS**T_A = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	B _{VDS}	V _{GS} =0V, I _D =250μA	650			V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V			1	μA
		V _{DS} =520V, V _{GS} =0V, T _A =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						
Static Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =4.0A		0.60		Ω
Gate Threshold Voltage,	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Forward Transconductance	g _{fs}	V _{DS} =20V, I _D =10A		5.2		S
Dynamic CHARACTERISTICS						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		1990		pF
Reverse Transfer Capacitance	C _{rss}			33		
Output Capacitance	C _{oss}			150		
Total Gate Charge	Q _g	V _{DD} =480V, I _D =12A, V _{GS} =0 to 10V		52		nC
Gate-to-Source Charge	Q _{gs}			9		
Gate-to-Drain (Miller) Charge	Q _{gd}			20		
Resistive Switching CHARACTERISTICS						
Turn-on Delay Time	t _{d(ON)}	V _{DD} =300V, I _D =12A, V _{GS} = 10V R _G =25Ω		25		nS
Rise Time	t _{rise}			40		
Turn-Off Delay Time	t _{d(OFF)}			150		
Fall Time	t _{fall}			60		
Source-Drain Diode CHARACTERISTICS						
Continuous Source Current*	I _{SD}	Integral PN-diode in MOSFET			12	A
Pulsed Source Current*	I _{SM}				48	
Diode Forward Voltage	V _{SD}	I _S =10A, V _{GS} =0V			1.4	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _F =10A,		420		ns
Reverse Recovery Charge	Q _{rr}	diF/dt=100A/μs		6.0		μC

* Pulse width≤380μs; duty cycle≤2%



TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

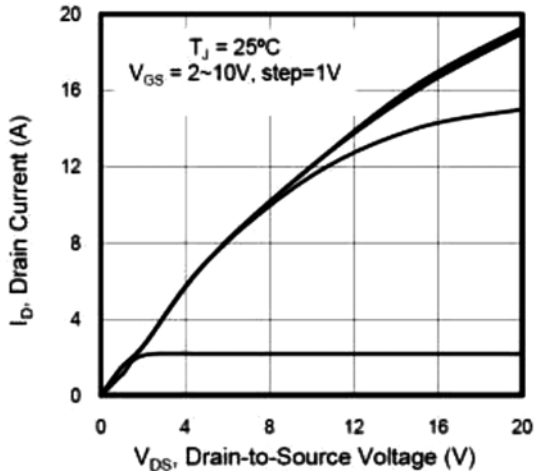


Fig 2. On-Resistance vs. Drain Current

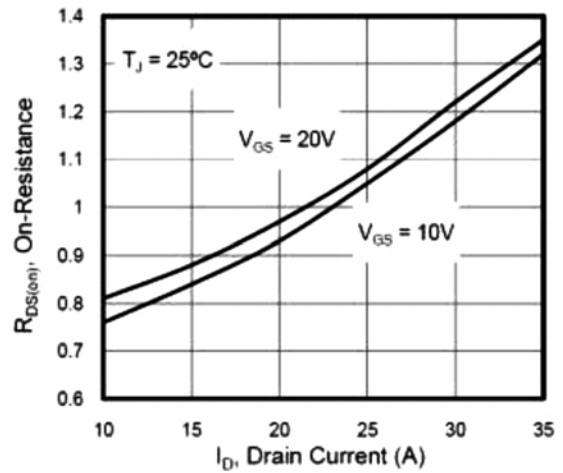


Fig 3. BV_{DSS} vs. Temperature

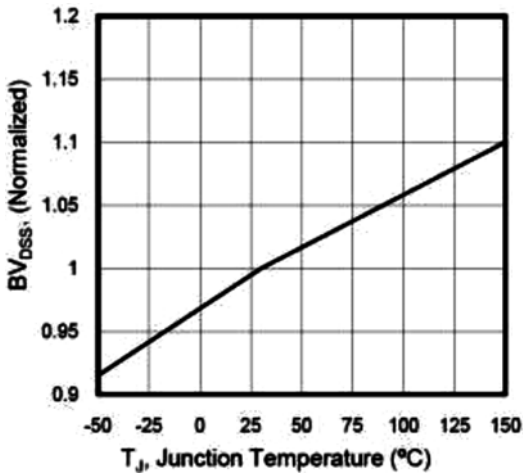


Fig 4. On-Resistance vs. Temperature

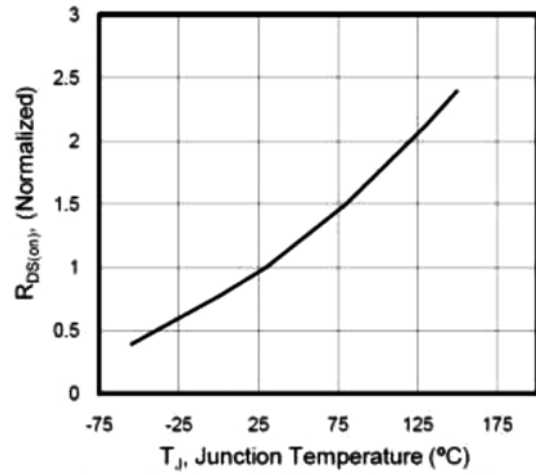


Fig 5. Gate Charge

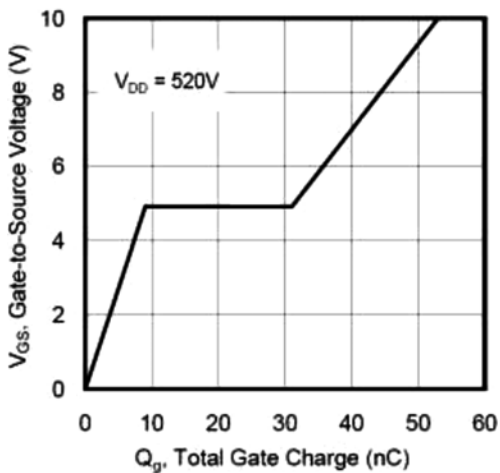


Fig 6. Body Diode Forward Voltage

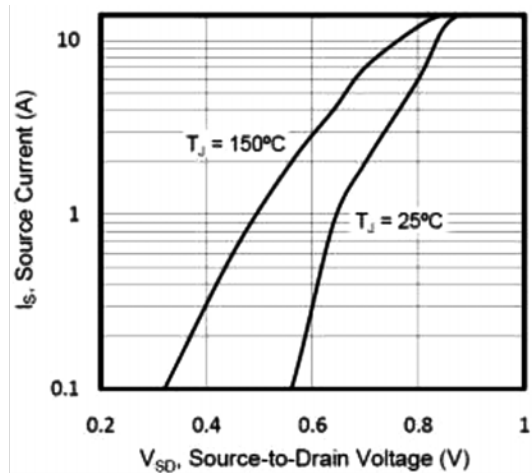




Fig 7. Safe Operating Area

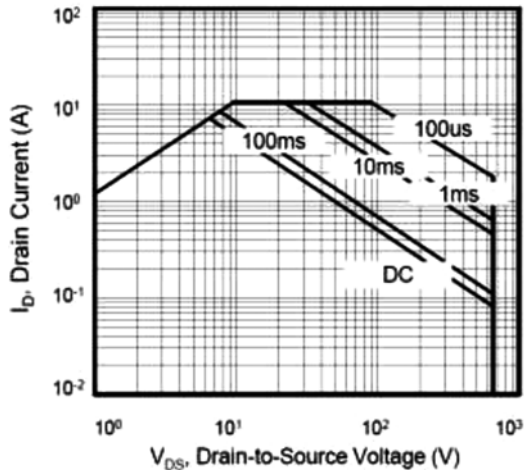


Fig 8. Transient Thermal Impedance

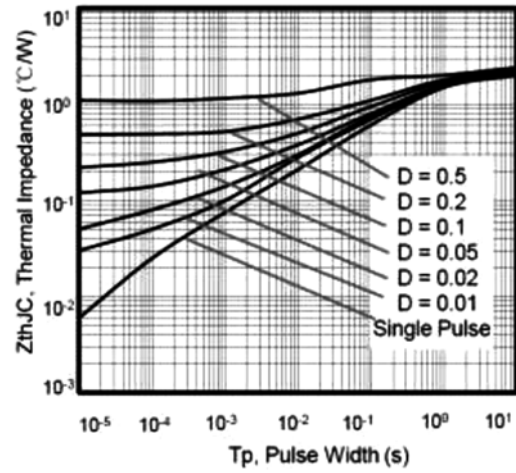


Fig 9. Maximum Continuous Drain Current vs Tc

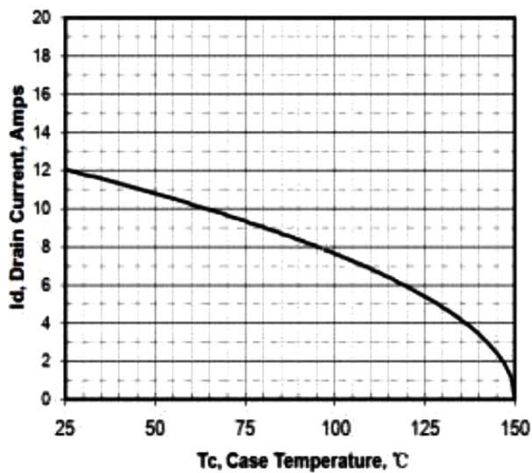


Fig 10. Max. Power Dissipation vs Tc

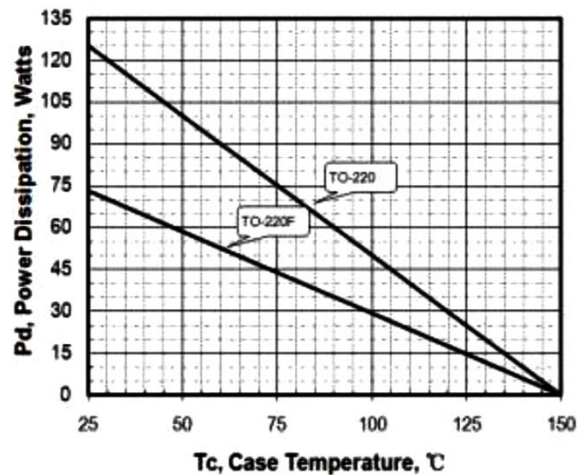
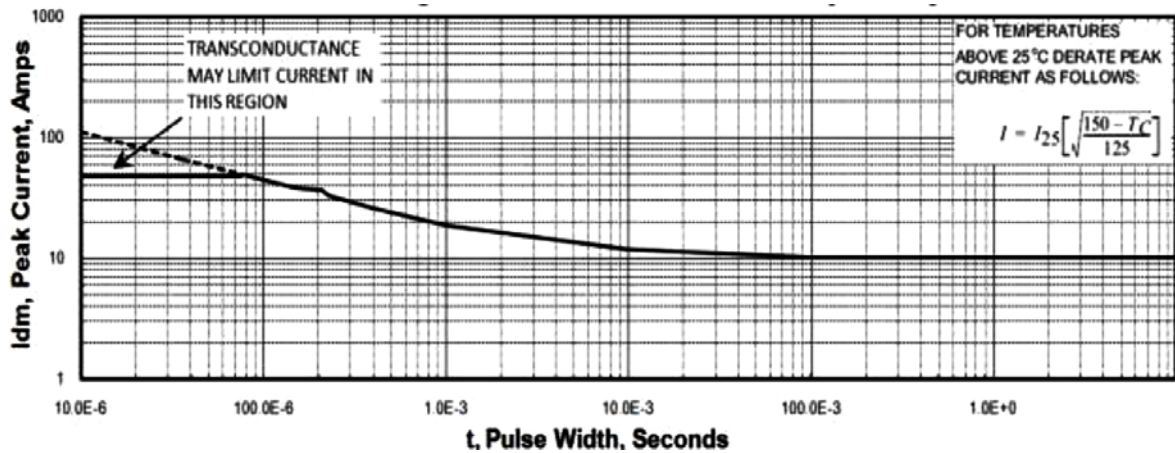


Fig 11. Peak Current Capability





TEST CIRCUITS AND WAVEFORMS

Fig 12. Peak Diode Recovery dv/dt Test Circuit

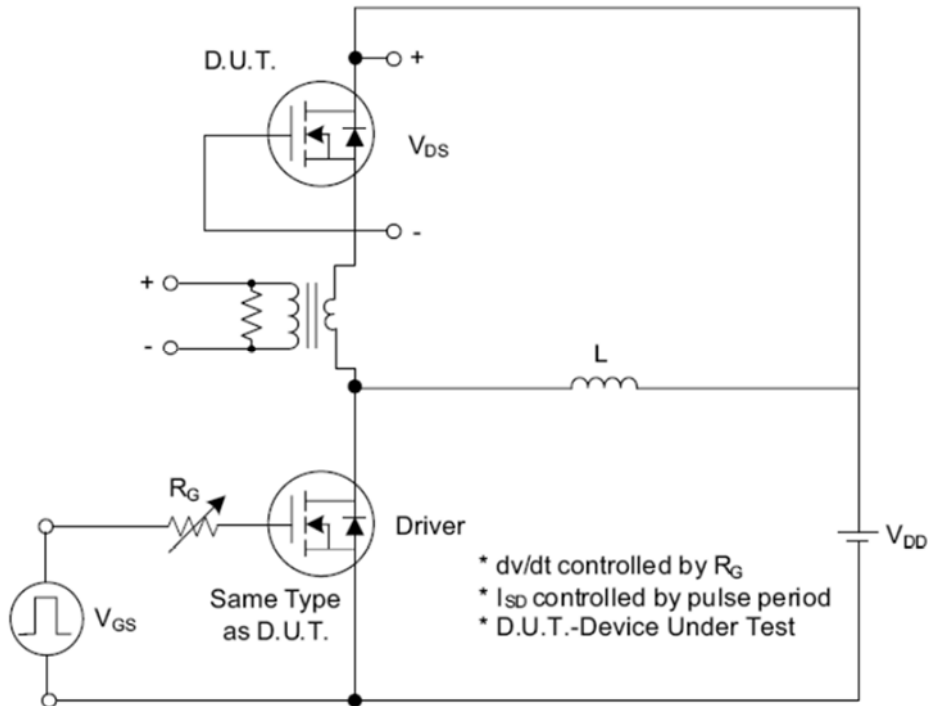


Fig 13. Peak Diode Recovery dv/dt Waveforms

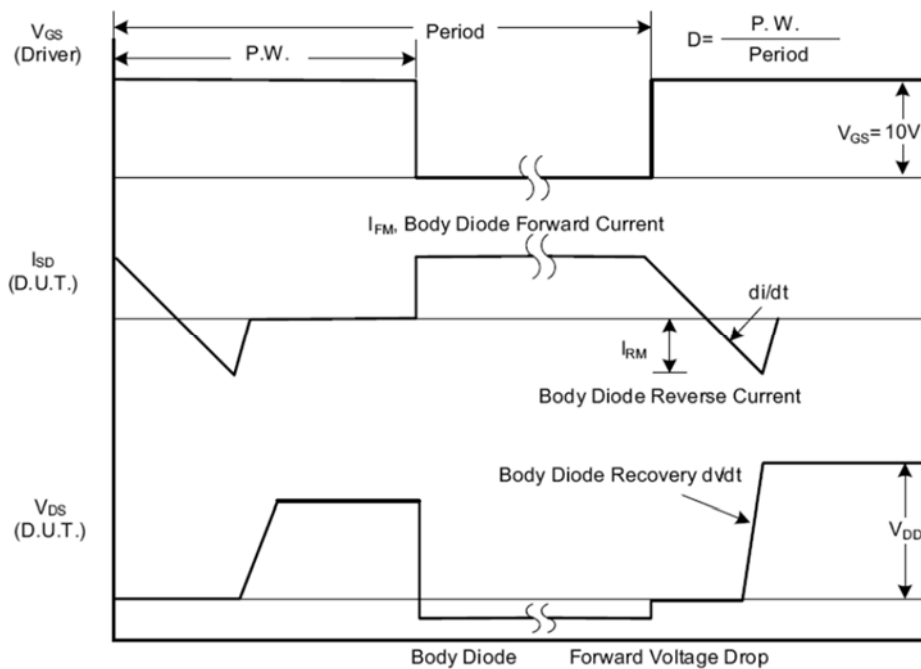




Fig14. Switching Test Circuit

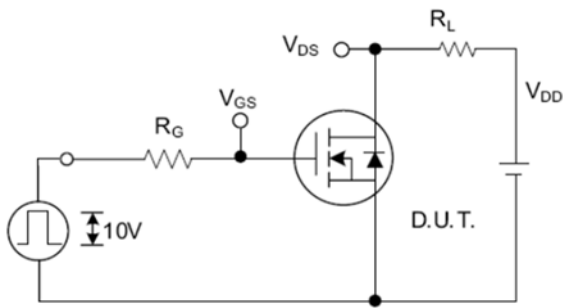


Fig 15. Switching Waveforms

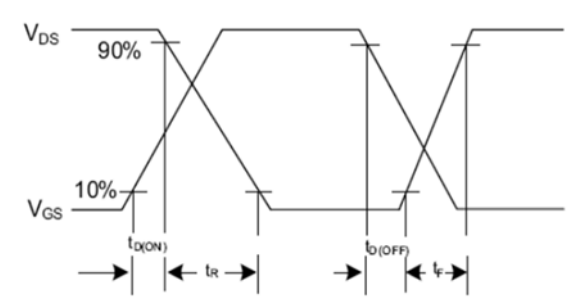


Fig 16. Gate Charge Test Circuit

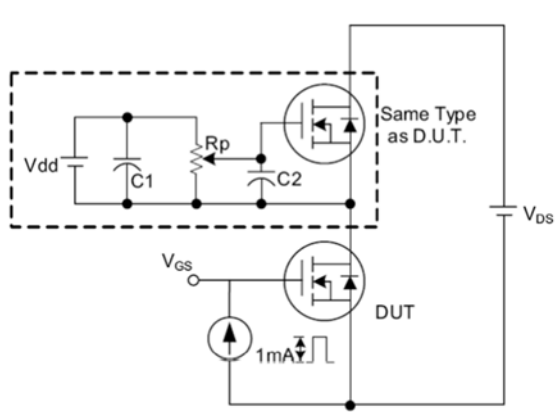


Fig 17. Gate Charge Waveform

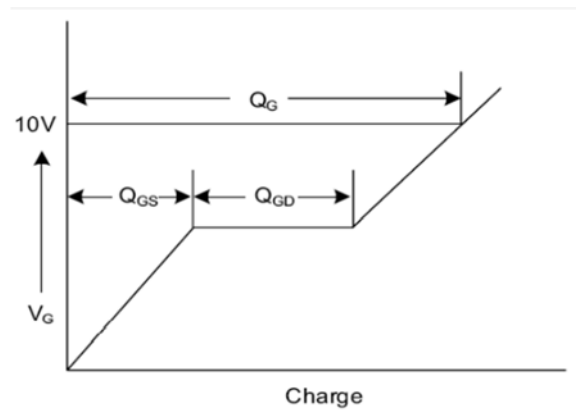


Fig 18. Unclamped Inductive Switching Test Circuit

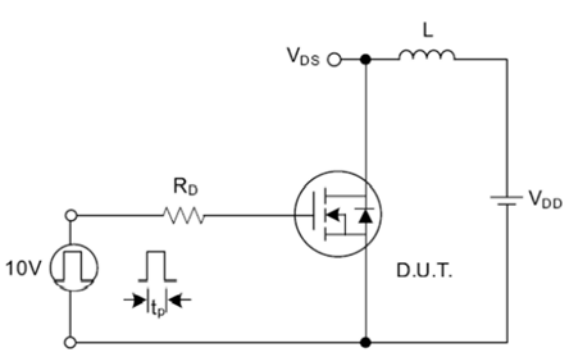
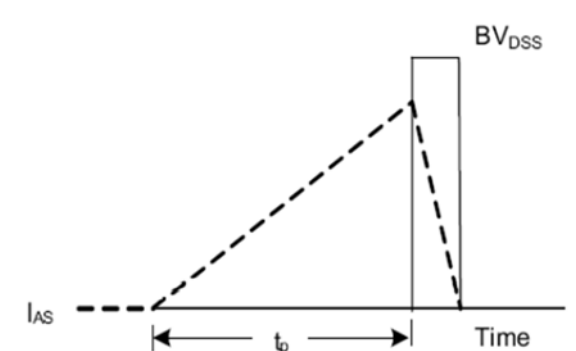


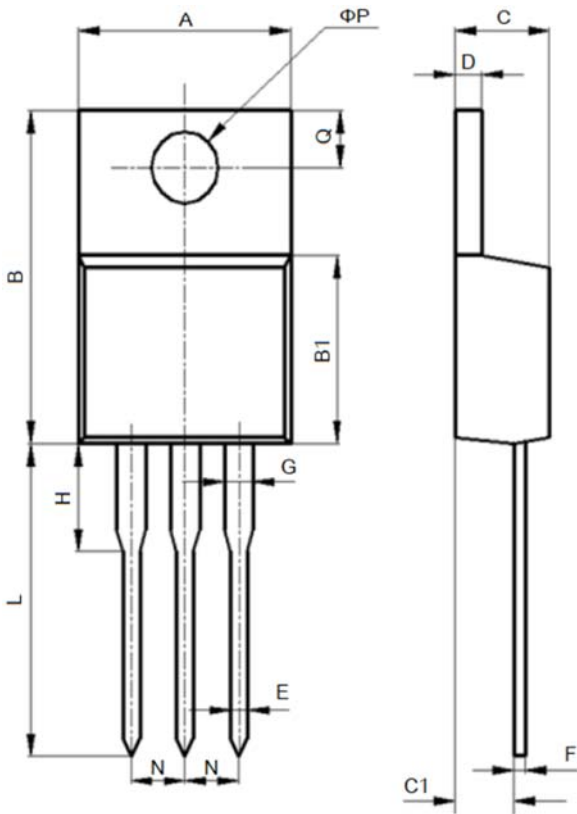
Fig 19. Unclamped Inductive Switching Waveforms





PACKAGE INFORMATION

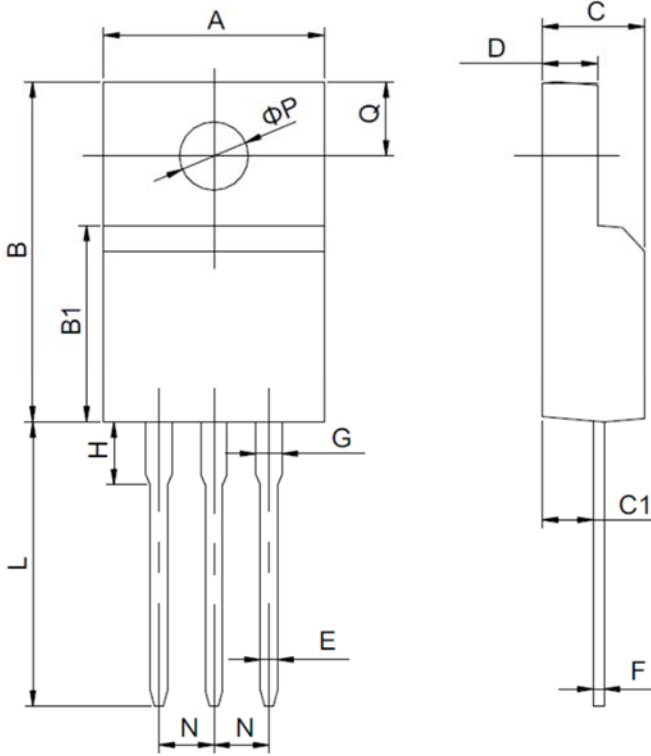
Dimension in TO-220 (Unit: mm)



Symbol	Min.	Max.
A	10.1	10.5
B	15.2	15.6
B1	9.00	9.40
C	4.40	4.60
C1	2.40	3.00
D	1.20	1.40
E	0.70	0.90
F	0.40	0.60
G	1.17	1.37
H	3.30	3.80
L	13.1	13.7
N	2.34	2.74
Q	2.40	3.00
ΦP	3.70	3.90



Dimension in TO-220F (Unit: mm)



Symbol	Min.	Max.
A	9.70	10.30
B	15.50	16.10
B1	8.99	9.39
C	4.40	4.80
C1	2.15	2.55
D	2.50	2.90
E	0.70	0.90
F	0.40	0.60
G	1.12	1.42
H	3.40	3.80
L	12.6	13.6
N	2.34	2.74
Q	3.15	3.55
ΦP	3.00	3.30



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