



### DESCRIPTION

The AM10N65 is available in TO-220 and TO220F Packages.

### FEATURE

- RDS(ON),typ.=0.75  $\Omega$ @VGS=10V
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

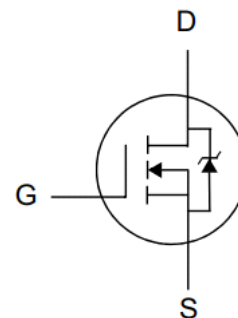
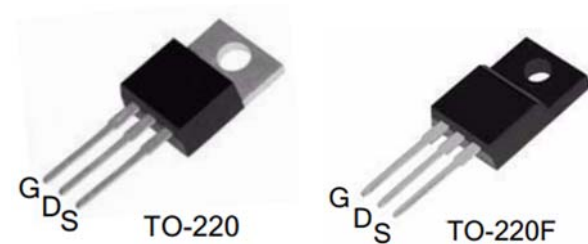
### APPLICATIONS

- Adaptor
- Charger
- SMPS Standby Power

### ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs/Tube	T3	AM10N65T3U
		AM10N65T3VU
TO220F SPQ: 50pcs/ Tube	T3F	AM10N65T3FU
		AM10N65T3FVU
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<sub>A</sub> = 25°C, unless otherwise specified.

Parameter	Symbol	TO-220	TO-220F	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>	650		V
Gate-to-Source Voltage	V <sub>GSS</sub>	±30		
Continuous Drain Current	I <sub>D</sub>	10		A
Pulsed Drain Current at V <sub>GS</sub> =10V	I <sub>DM</sub>	40		
Single Pulse Avalanche Energy	E <sub>AS</sub>	800		
Power Dissipation	P <sub>D</sub>	125	45	mJ
Derating Factor above 25°C		1.0	0.36	W
Soldering Temperature Distance of 1.6mm from case for 10 seconds	T <sub>L</sub>	300		W/°C
Operating and Storage Temperature Range	T <sub>J</sub> & T <sub>STG</sub>	-55 to 150		°C

## THERMAL RESISTANCE

Parameter	Symbol	TO-220	TO-220F	Unit
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	1.0	2.78	°C/W
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	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<sub>A</sub> = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	B <sub>VDS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	650	-	-	V
Drain-to-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V	-	-	1	uA
		V <sub>DS</sub> =520V, V <sub>GS</sub> =0V, T <sub>A</sub> =125°C	-	-	100	
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =+30V, V <sub>DS</sub> =0V	-	-	+100	nA
		V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V	-	-	-100	
<b>ON CHARACTERISTICS</b>						
Static Drain-to-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =5.0A	-	0.75	0.90	Ω
Gate Threshold Voltage,	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2.0	-	4.0	V
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =5.0A	-	8.0	-	S
<b>Dynamic CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz	-	1660	-	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	15	-	
Output Capacitance	C <sub>oss</sub>		-	130	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> =520V, I <sub>D</sub> =10A, V <sub>GS</sub> =0 to 10V	-	32	-	nC
Gate-to-Source Charge	Q <sub>gs</sub>		-	8.0	-	
Gate-to-Drain (Miller) Charge	Q <sub>gd</sub>		-	8.5	-	
<b>Resistive Switching CHARACTERISTICS</b>						
Turn-on Delay Time	t <sub>d(ON)</sub>	V <sub>DD</sub> =325V, I <sub>D</sub> =10A, V <sub>GS</sub> = 10V R <sub>G</sub> =4.7Ω	-	11	-	nS
Rise Time	t <sub>rise</sub>		-	15	-	
Turn-Off Delay Time	t <sub>d(OFF)</sub>		-	40	-	
Fall Time	t <sub>fall</sub>		-	17	-	
<b>Source-Drain Diode CHARACTERISTICS</b>						
Continuous Source Current*	I <sub>SD</sub>	Integral PN-diode in MOSFET	-	-	10	A
Pulsed Source Current*	I <sub>SM</sub>		-	-	40	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =10A, V <sub>GS</sub> =0V	-	-	1.5	V
Reverse Recovery Time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>F</sub> = I <sub>S</sub> ,	-	460	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>	di/dt=100A/μs	-	1.5	-	uC

\* Pulse width≤380μs; duty cycle≤2%



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Maximum Transient Thermal Impedance

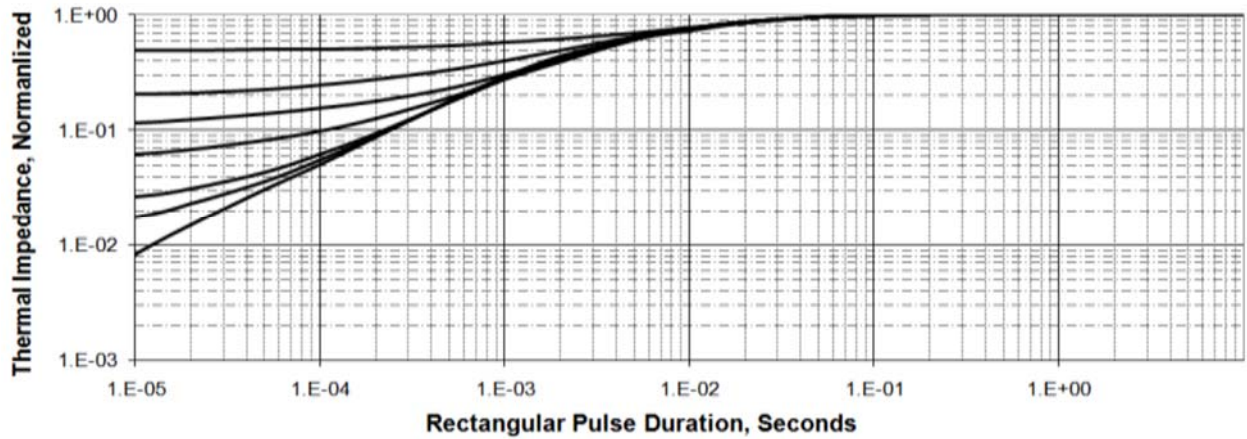


Fig 2. Max. Power Dissipation vs Case Temperature

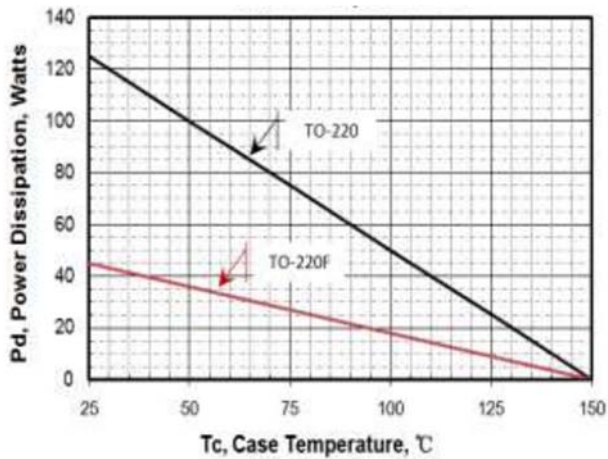


Fig 3. Maximum Continuous Drain Current Vs Tc

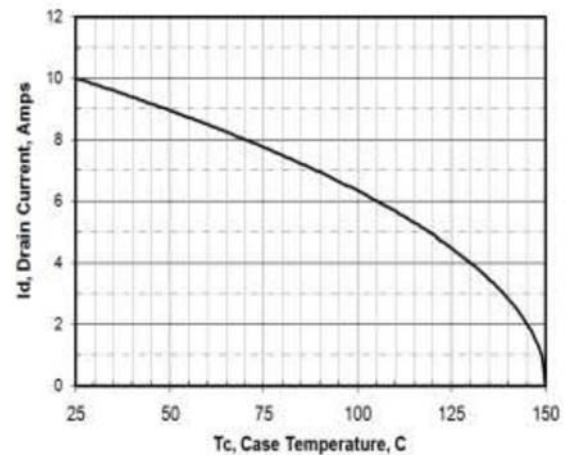


Fig 4. Output Characteristics

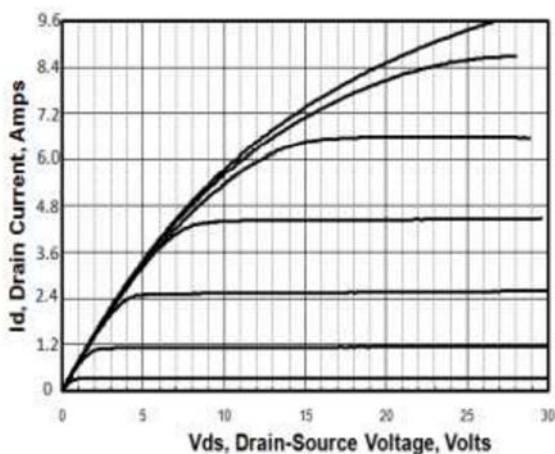


Fig 5. Rds(on) vs Gate Voltage

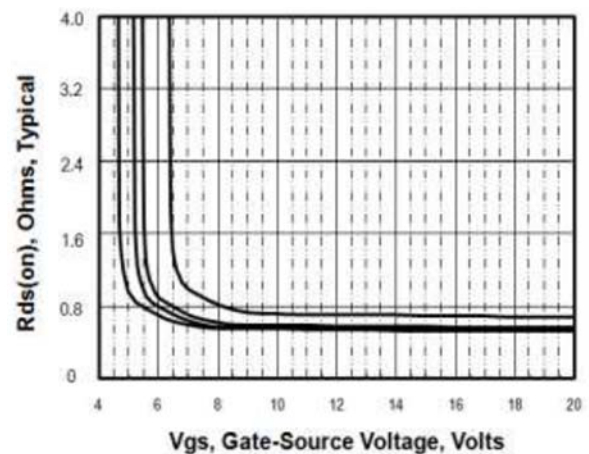




Fig 6. Peak Current Capability

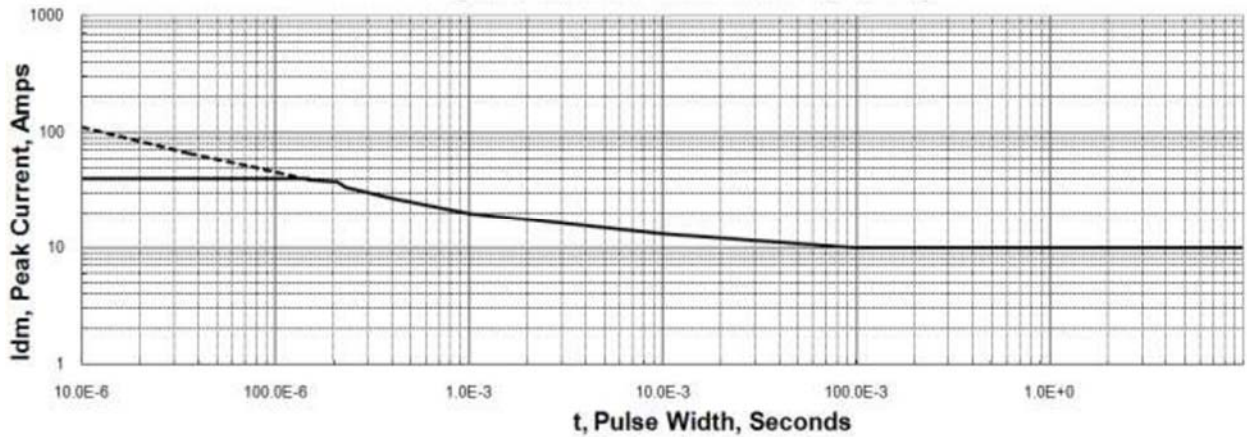


Fig 7. Transfer Characteristics

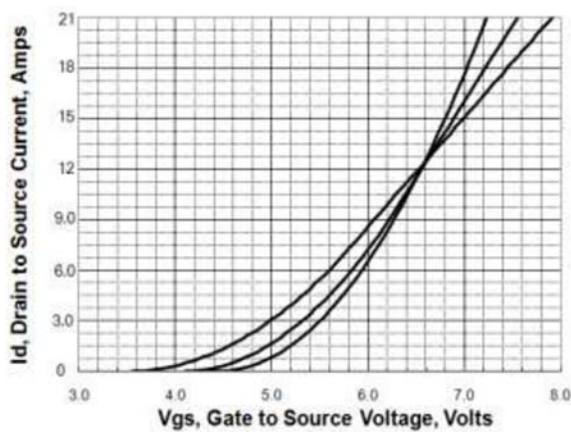


Fig 8. Unclamped Inductive Switching Capability

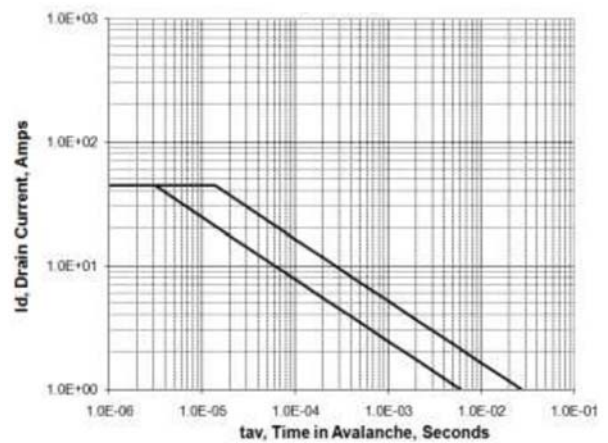


Fig 9. Drain to Source ON Resistance  
Vs Drain Current

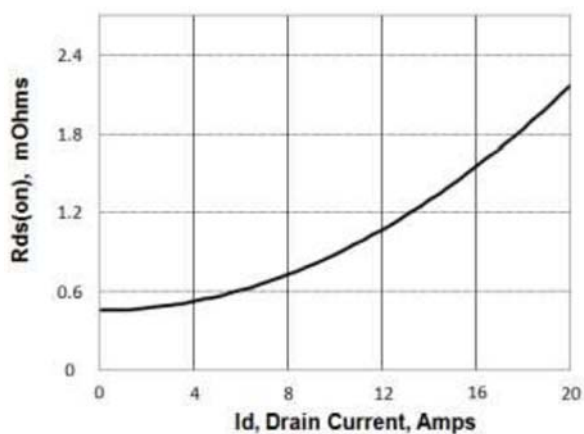


Fig 10. Rds(on) vs Junction Temperature

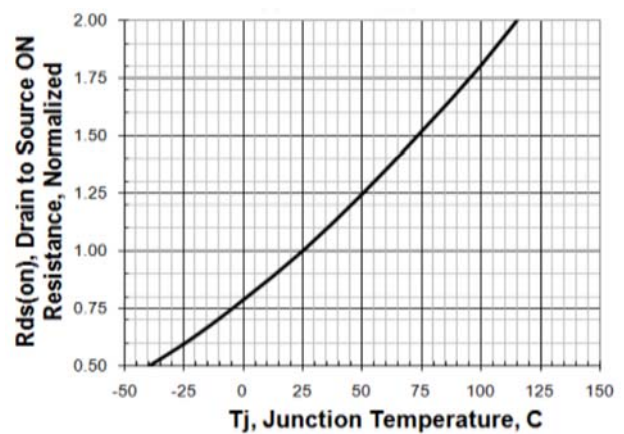




Fig 11. Breakdown Voltage vs Temperature

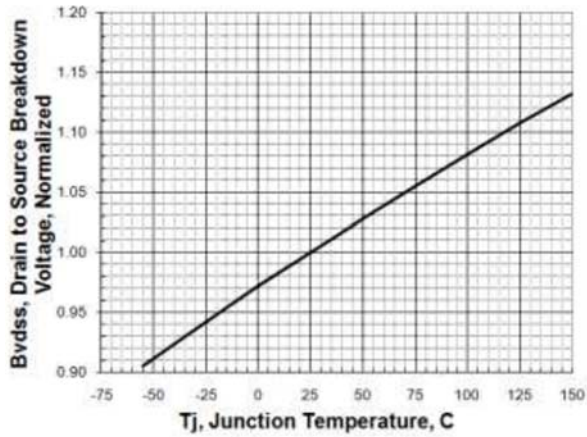


Fig 12. Threshold Voltage vs Temperature

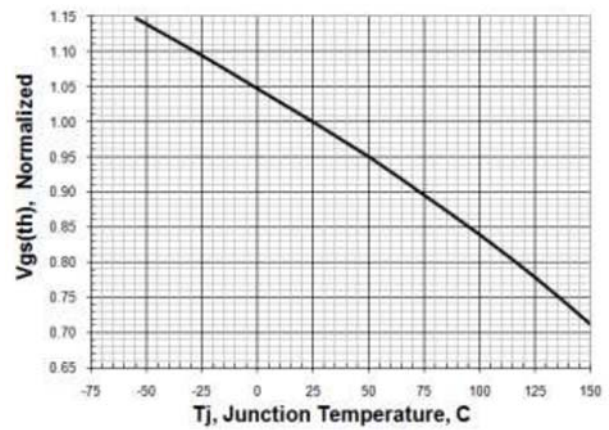


Fig 13. Maximum Continuous Drain Current vs Tc

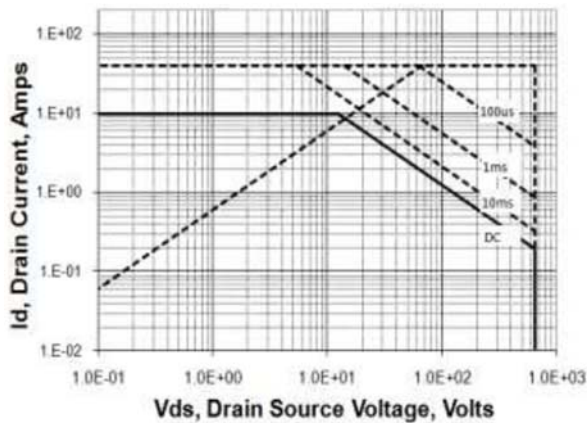


Fig 14. Max. Power Dissipation vs Tc

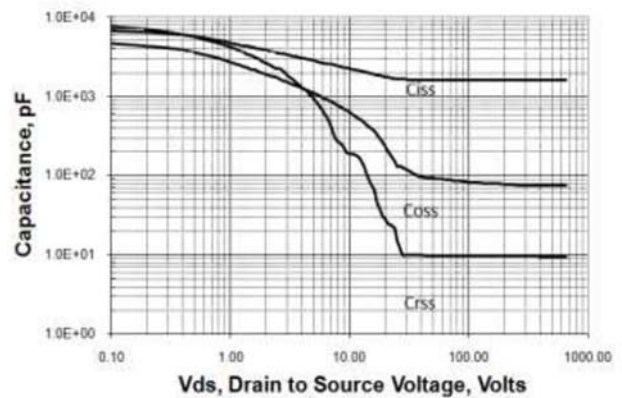


Fig 15. Peak Current Capability

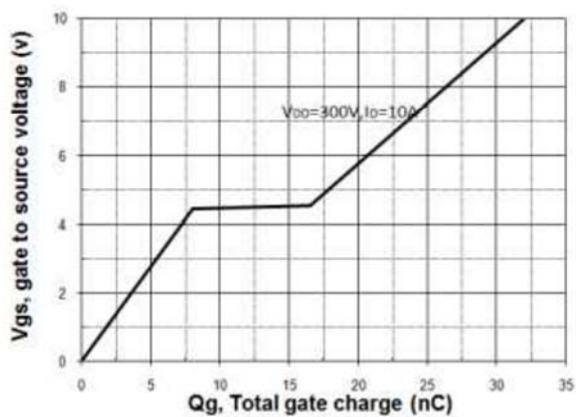
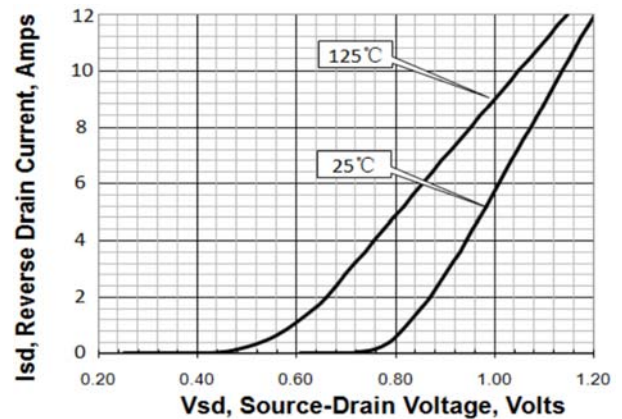


Fig 16. Peak Current Capability





## TEST CIRCUITS AND WAVEFORMS

Fig 17. Peak Diode Recovery dv/dt Test Circuit

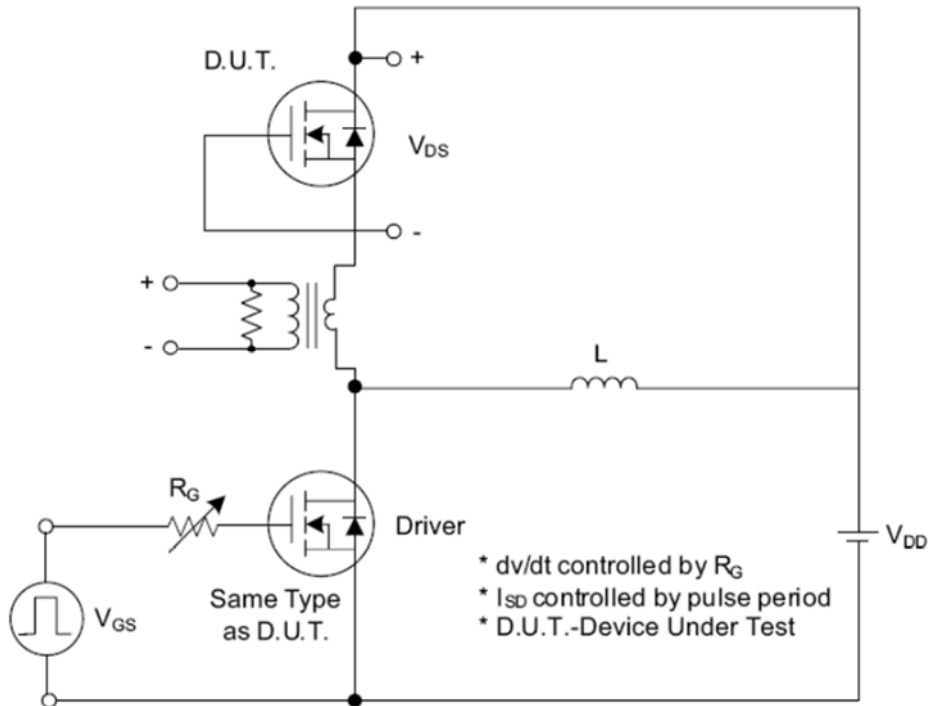


Fig 18. Peak Diode Recovery dv/dt Waveforms

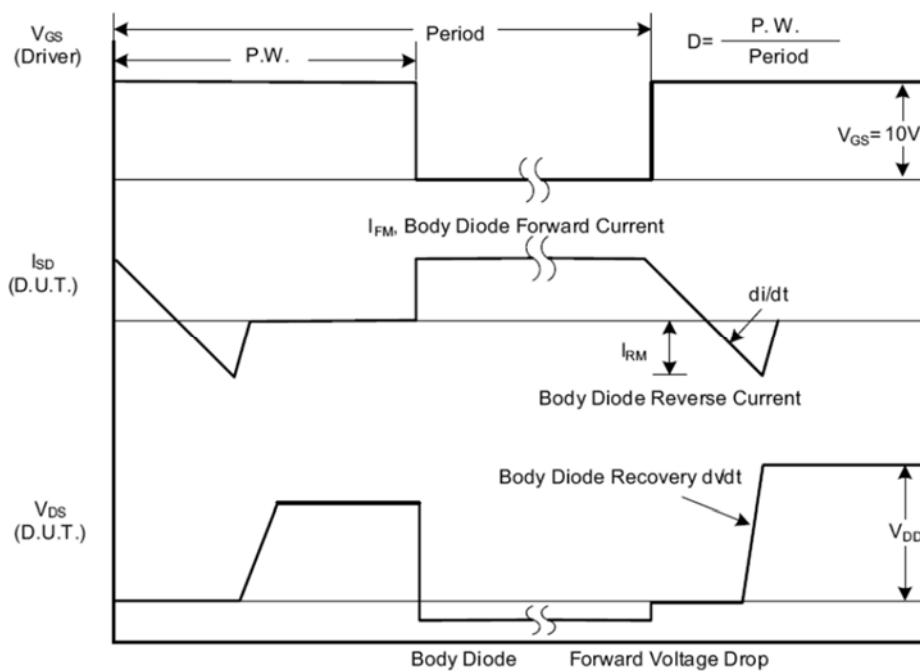




Fig19. Switching Test Circuit

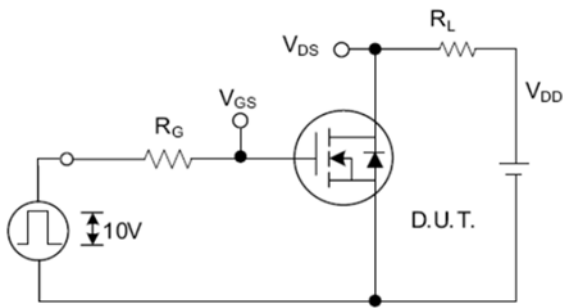


Fig 20. Switching Waveforms

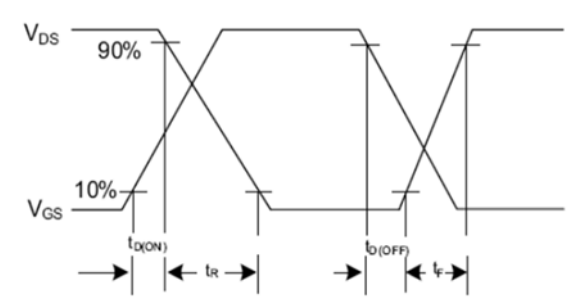


Fig 21. Gate Charge Test Circuit

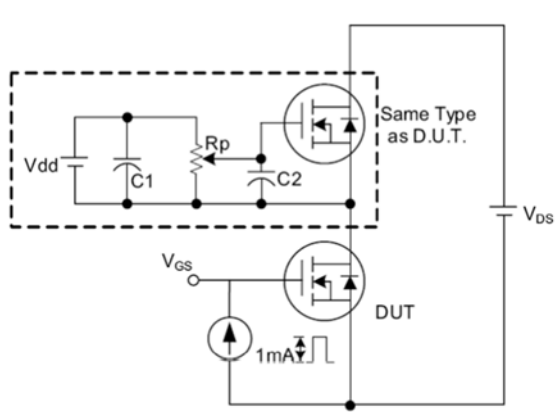


Fig 22. Gate Charge Waveform

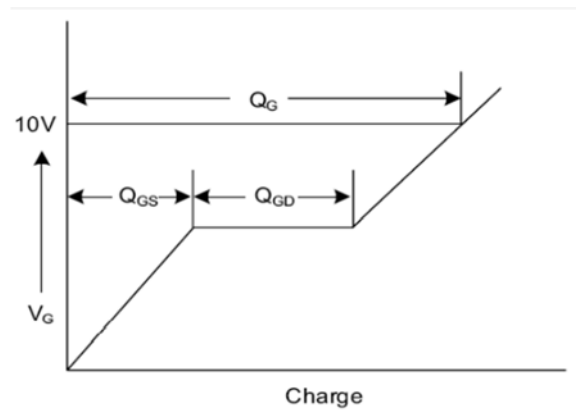


Fig 23. Unclamped Inductive Switching Test Circuit

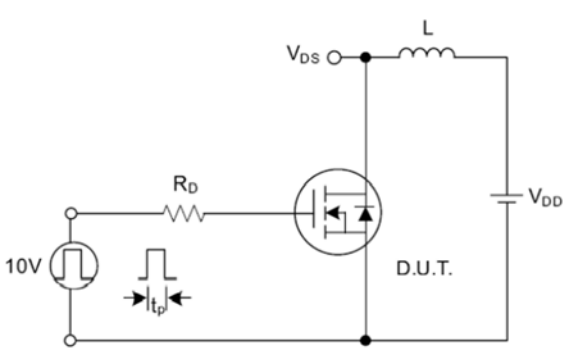
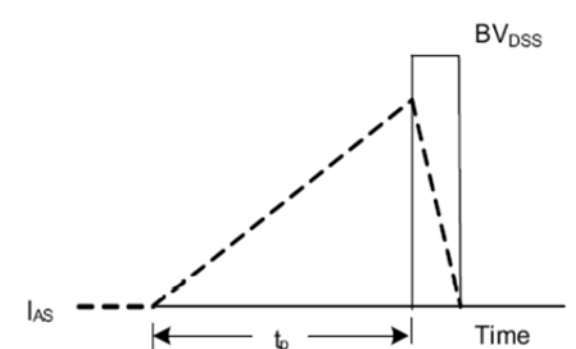


Fig 24. Unclamped Inductive Switching Waveforms

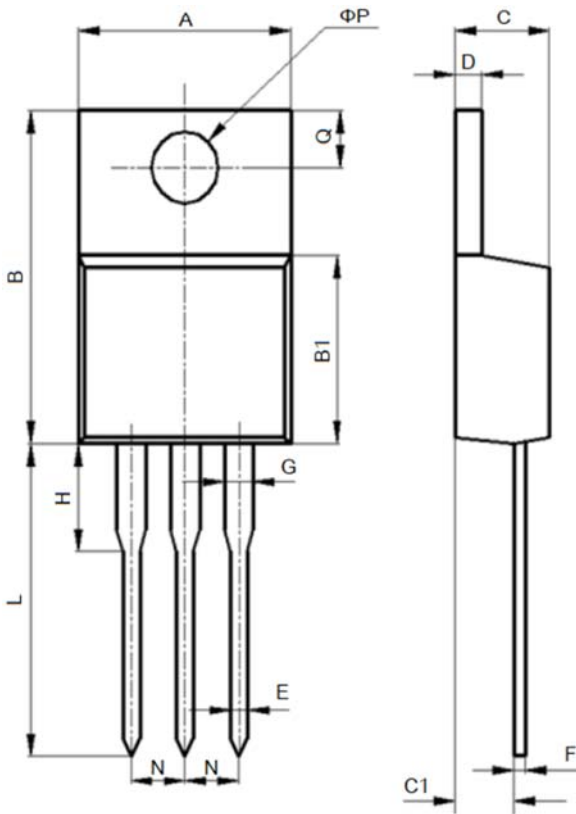






## PACKAGE INFORMATION

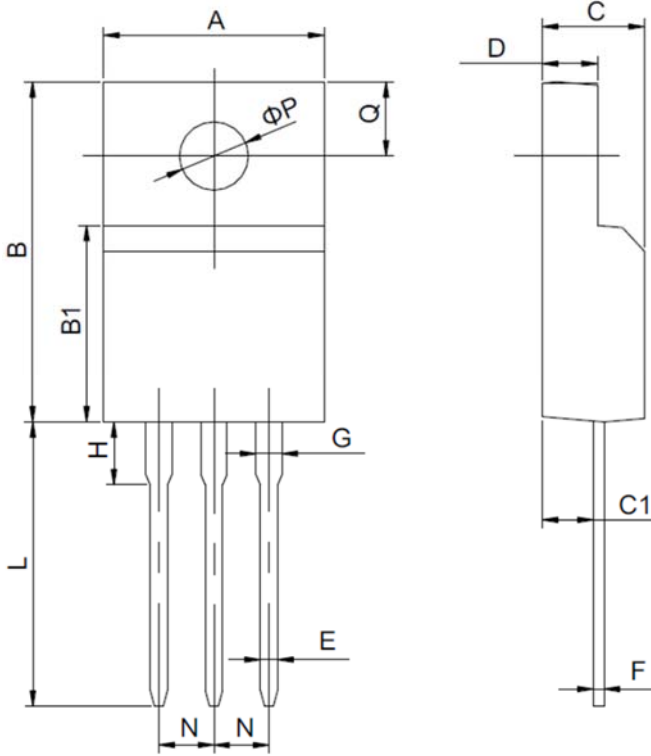
Dimension in TO-220 (Unit: mm)



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



## IMPORTANT NOTICE

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