



**DESCRIPTION**

The AM75N20 is available in the TO-220 Package.

VDSS	RDSON	ID
200V	20mΩ	75A

**APPLICATION**

- Synchronous Rectification for AC/DC Quick Charger
- Battery management
- UPS (Uninterruptible Power Supplies)

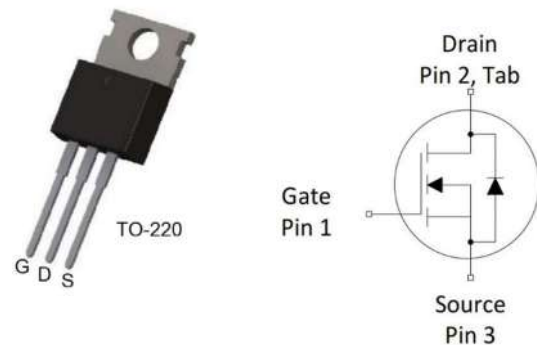
**ORDERING INFORMATION**

Package Type	Part Number	
TO-220 SPQ: 50pcs /Tube	T3	AM75N20T3VU
Note	U: Tube V: Halogen free Package	
AiT provides all RoHS products		

**FEATURE**

- Advanced Perfect MOS technology
- Low on Resistance
- Excellent  $Q_g \times R_{DS(on)}$  product (FOM)
- Excellent Low Ciss
- Qualified according to JEDEC criteria
- High Robustness and Reliability
- Increases Maximum Current Capability
- Low Power Loss, High Power Density
- Easy Paralleling

**PIN DESCRIPTION**



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

**ABSOLUTE MAXIMUM RATINGS**T<sub>C</sub>=25°C, unless otherwise Noted

V <sub>DS</sub> , Drain-Source Voltage		200V
I <sub>D</sub> , Continue Drain Current	T <sub>C</sub> = 25°C (Silicon Limit)	75A
	T <sub>C</sub> = 25°C (Package Limit)	180A
	T <sub>C</sub> = 100°C (Silicon Limit)	47A
	T <sub>a</sub> = 25°C	5.1A
I <sub>DM_Pulse</sub> , Pulsed Drain Current	T <sub>C</sub> = 25°C, t <sub>p</sub> =100uS	300A
E <sub>AS</sub> *, Avalanche Energy, Single Pulsed	L=0.5mH , V <sub>ds</sub> =50V	233mJ
V <sub>GS</sub> , Gate-Source voltage		±20V
P <sub>tot</sub> , Power Dissipation	T <sub>C</sub> = 25°C	347W
	T <sub>a</sub> = 25°C	1.60W
R <sub>θJC</sub> , Thermal Resistance, Junction-Case		0.36°C/W Max. (0.24°C/W Typ.)
R <sub>θJA</sub> , Thermal Resistance, Junction to Ambient		76°C/W
T <sub>J</sub> , Operating Temperature Range		-55°C~+150°C
T <sub>STG</sub> , Storage Temperature Range		-55°C~+150°C
T <sub>sold</sub> , Soldering Temperature, Wave Soldering Only Allowed at Leads (1.6mm from case for 10s)		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.

\*Pulse test: 300 μs pulse width, 2 % duty cycle



**ELECTRICAL CHARACTERISTICS**

T<sub>J</sub> = 25°C, unless otherwise Noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit	
<b>Static Characteristic</b>							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	200	-	-	V	
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	3.0		5.0	V	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 200V, V <sub>GS</sub> =0V	T <sub>J</sub> = 25°C	-	0.05	1	μA
			T <sub>J</sub> = 150°C	-	-	100	
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> =±20V	-	±10	±100	nA	
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =50A	-	20	24	mΩ	
Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =50A	-	78	-	S	
<b>Dynamic Characteristic</b>							
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, f=1MHz	-	5064	-	pF	
Output Capacitance	C <sub>oss</sub>		-	267	-		
Reverse Transfer Capacitance	C <sub>rss</sub>		-	88	-		
Total Gate Charge*	Q <sub>g</sub>	V <sub>DS</sub> = 100V, I <sub>D</sub> =50A, V <sub>GS</sub> = 10V	-	101	-	nC	
Gate-Source charge*	Q <sub>gS</sub>		-	37	-		
Gate-Drain charge*	Q <sub>gd</sub>		-	39	-		
Turn-On Delay Time*	t <sub>d(on)</sub>	V <sub>DD</sub> = 100V, I <sub>D</sub> =50A, V <sub>GS</sub> = 10V, R <sub>G</sub> =1.6Ω	-	21	-	ns	
Rise Time*	t <sub>r</sub>		-	38	-		
Turn-Off Delay Time*	t <sub>d(off)</sub>		-	45	-		
Fall Time*	t <sub>f</sub>		-	41	-		
Gate Resistance	R <sub>G</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	-	1.80	-	Ω	
<b>Body Diode Characteristic</b>							
Body Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>SD</sub> =50A	-	-	1.20	V	
Body Diode Continuous Forward Current*	I <sub>S</sub>	T <sub>C</sub> = 25°C	-	-	75	A	
Maximum Body-Diode Pulsed Current	I <sub>S_Pulse</sub>	T <sub>C</sub> = 25°C	-	-	300	A	
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =50A, V <sub>R</sub> = 100V	-	96	-	ns	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	di/dt=100A/us	-	458	-	μC	

\*Pulse test: 300 μs pulse width, 2 % duty cycle



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Output Characteristics

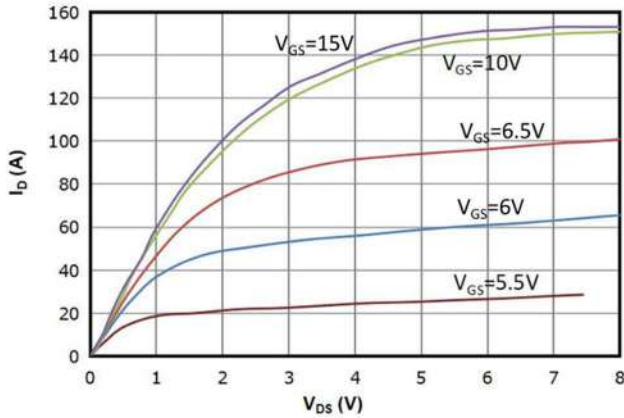


Fig 2. Transfer Characteristics

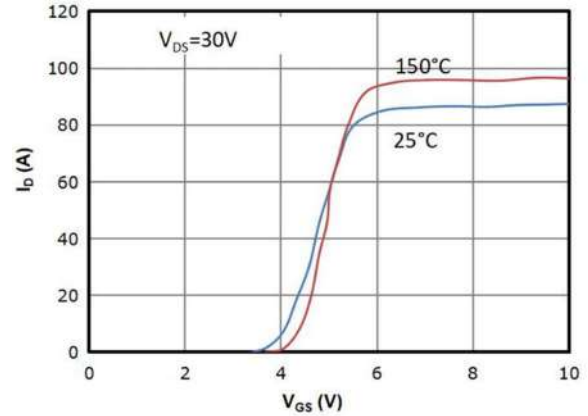


Fig 3.  $R_{ds(on)}$  vs. Drain Current and Gate Voltage

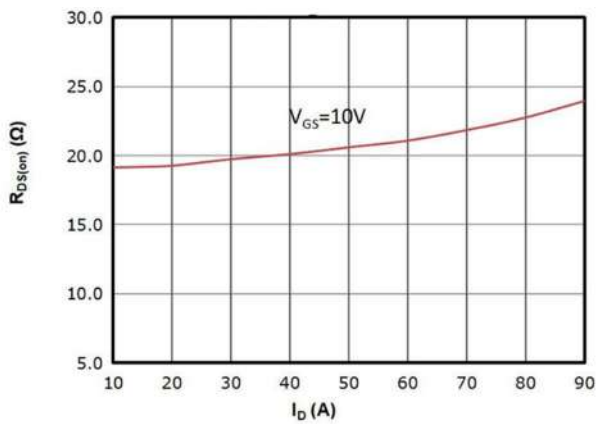


Fig 4.  $R_{ds(on)}$  vs. Gate Voltage

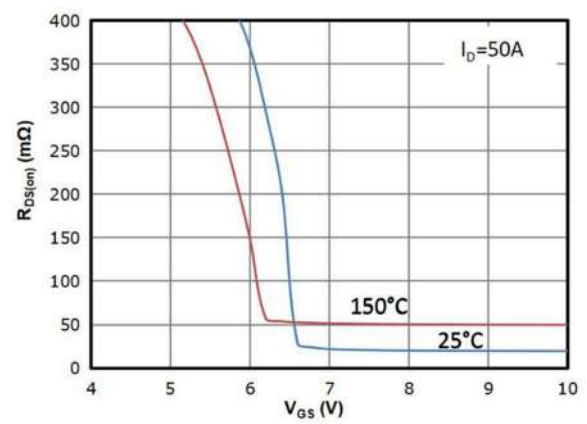


Fig 5.  $R_{ds(on)}$  vs. Temperature

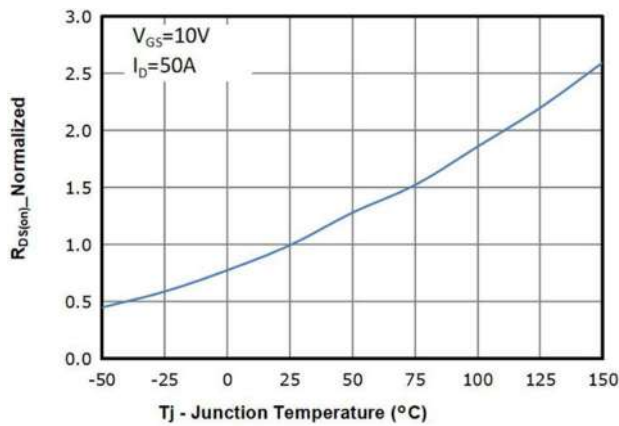


Fig 6.  $V_{gs(th)}$  vs. Temperature

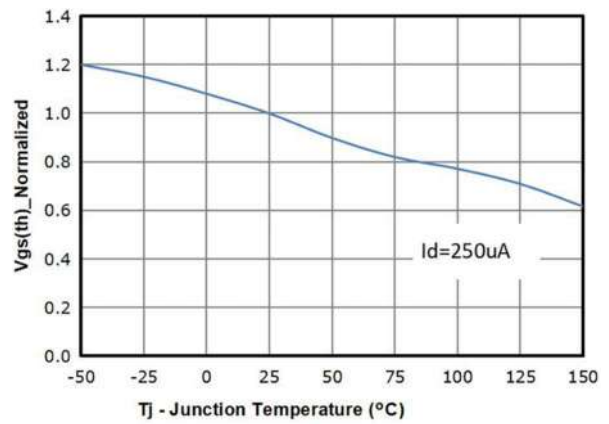




Fig 7.  $V_{DSS}$  vs. Temperature

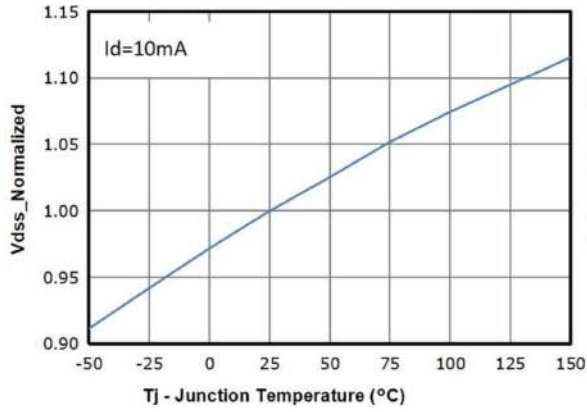


Fig 8. Capacitance Characteristics

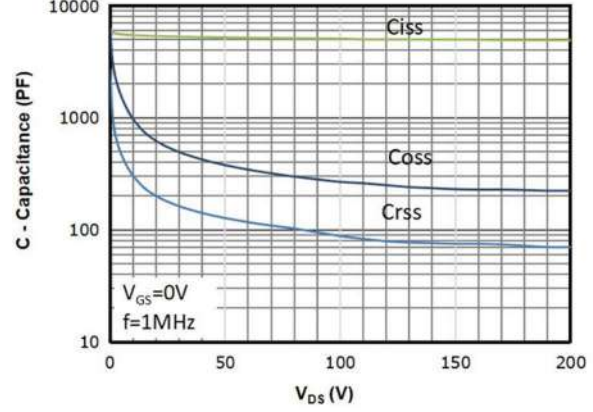


Fig 9. Gate Charge Characteristics

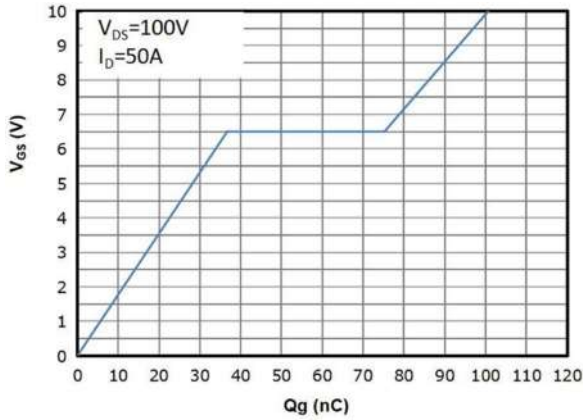


Fig 10. Body-Diode Forward Characteristics

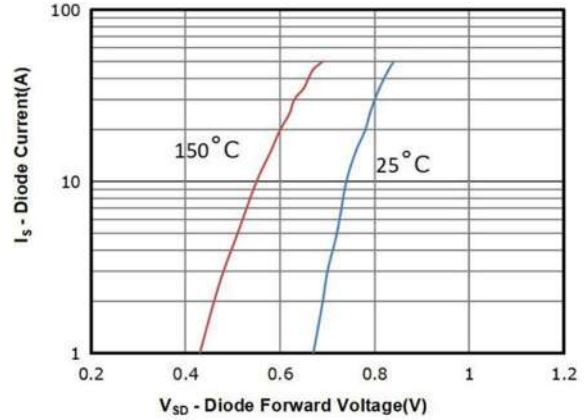


Fig 11. Power Dissipation

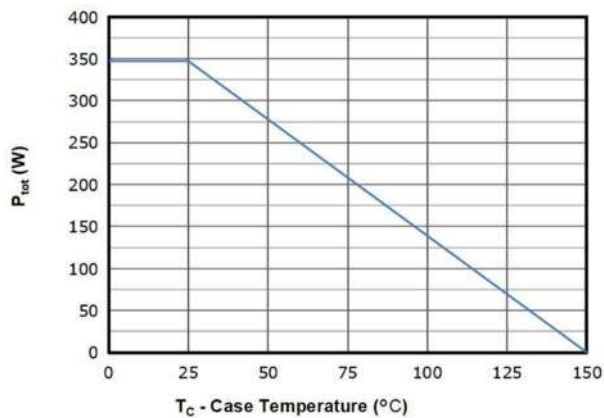


Fig 12. Drain Current Derating

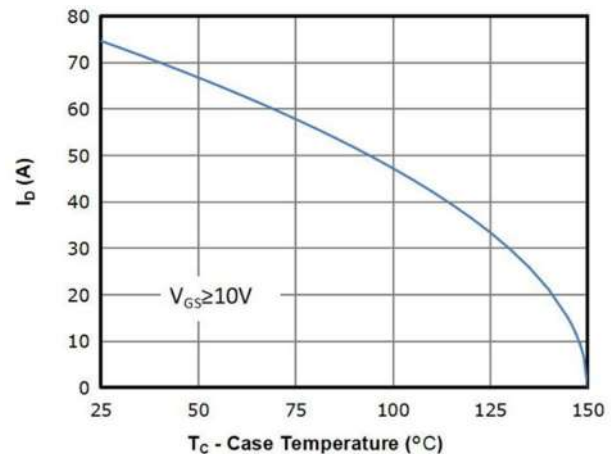




Fig 13. Safe Operating Area

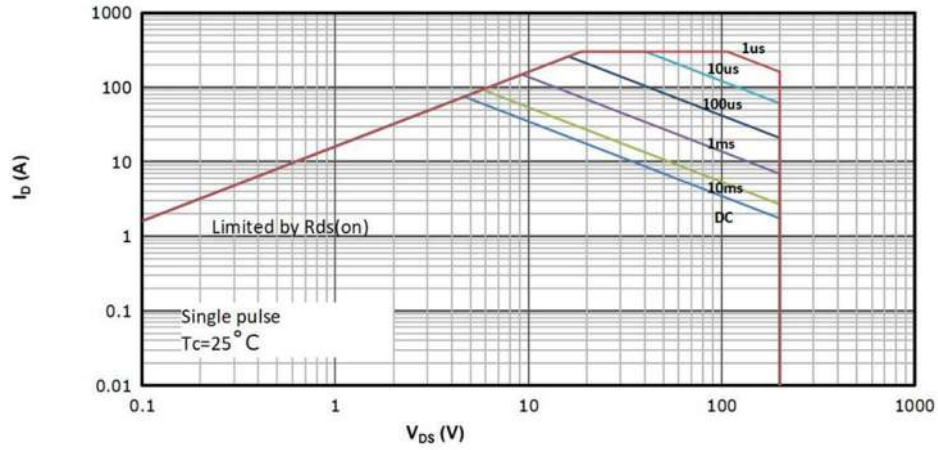


Fig 14. Max. Transient Thermal Impedance

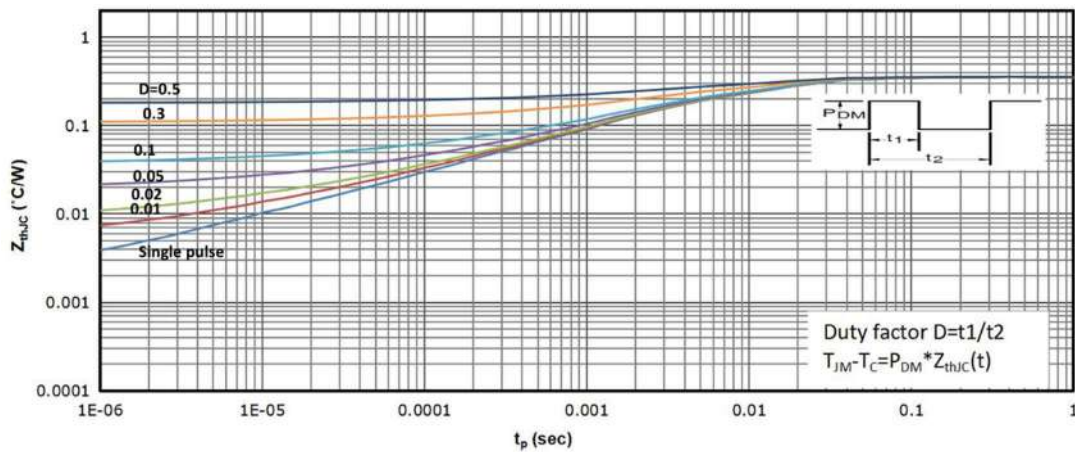


Fig 15. Gate Charge Test Circuit and Waveform

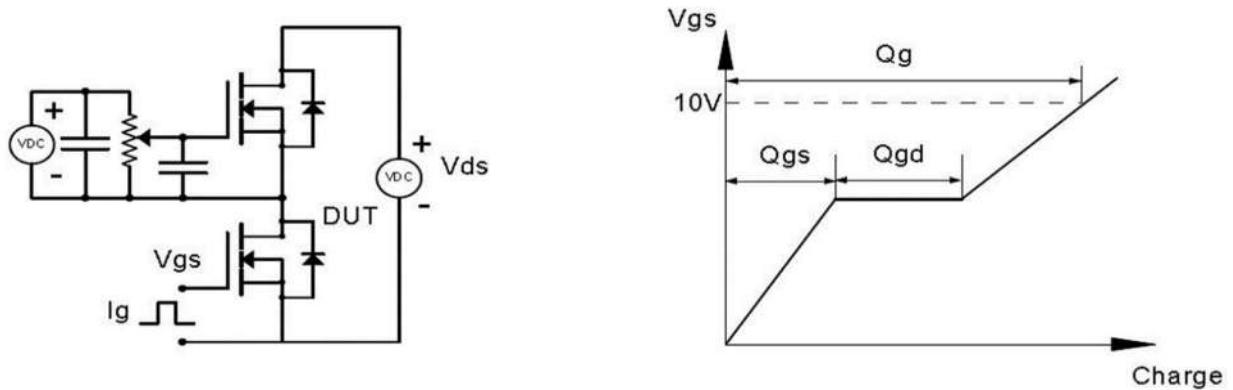




Fig 16. Resistive Switching Test Circuit and Waveform

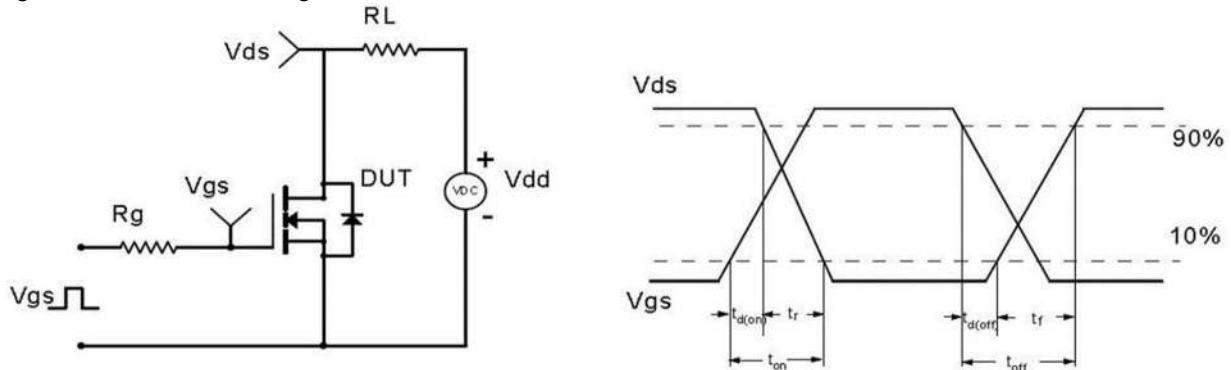


Fig 17. Unclamped Inductive Switching (UIS) Test Circuit and Waveform

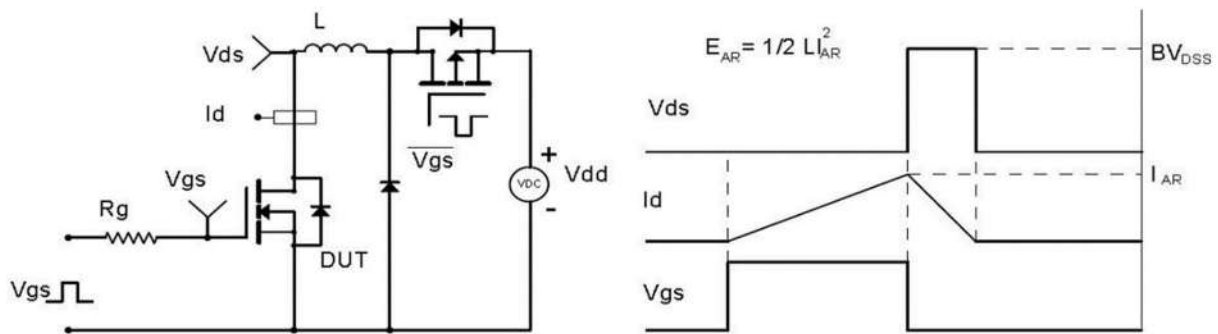
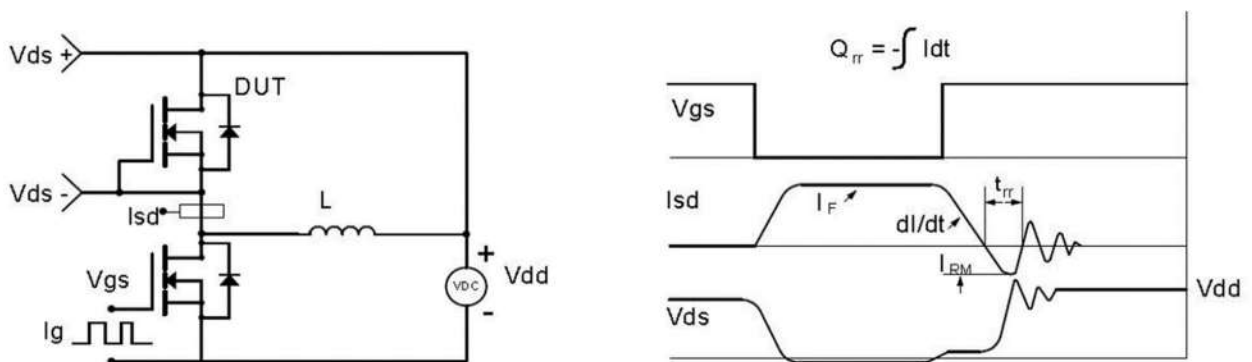


Fig 18. Diode Recovery Test Circuit and Waveform

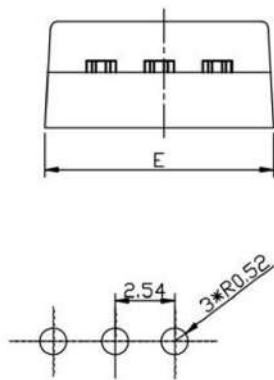
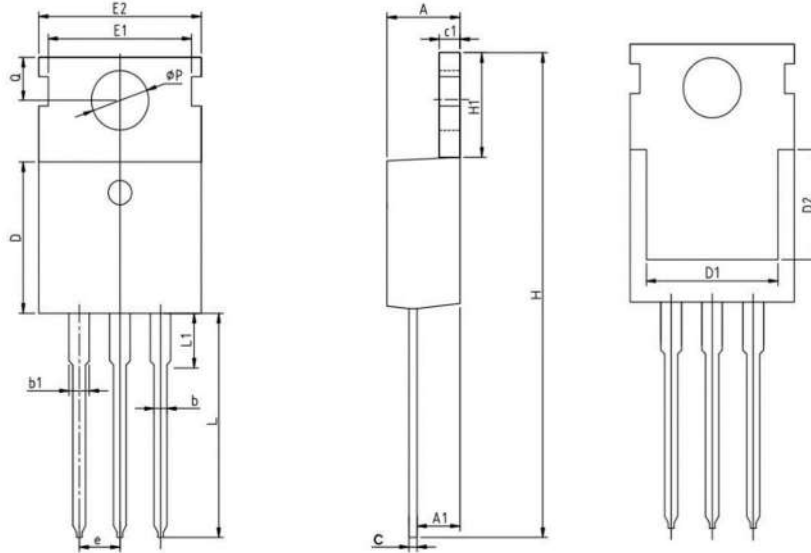






**PACKAGE INFORMATION**

Dimension in TO-220(Unit: mm)



RECOMMENDED LAND PATTERN

Symbol	Millimeter	
	Min.	Max.
A	4.400	4.800
A1	2.250	2.550
b	0.720	0.920
b1	1.120	1.420
c	0.400	0.600
c1	1.200	1.400
D	8.800	9.400
D1	7.750	8.150
D2	6.550	6.950
e	2.540	
E	9.650	10.350
E1	8.700	
E2	9.700	10.300
H	28.700	29.700
H1	6.250	6.850
L	13.200	13.800
L1	2.800	3.400
Q	2.600	3.000
φP	3.450	3.750





## **IMPORTANT NOTICE**

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