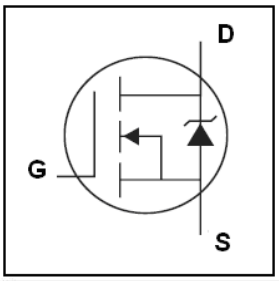
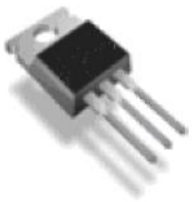
Features

- Low On-Resistance
- Fast Switching
- 100% Avalanche Tested
- Repetitive Avalanche Allowed up to Tjmax
- Lead-Free, RoHS Compliant



V_{DSS}	80V
$R_{DS(on)}$	4.8mΩ
I_D	150A



TO-220AB

Description

VS150N08AT designed by the trench processing techniques to achieve extremely low on-resistance. Additional features of this design are a 175°C junction operating temperature, fast switching speed and improved repetitive avalanche rating . These features combine to make this design an extremely efficient and reliable device for use in Motor applications and a wide variety of other applications.

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only;and functional operation of the device at these or any other condition beyond those indicated in the specifications is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and ower dissipation ratings are measured under board mounted and still air conditions. Ambient temperature (TA) is 25°C, unless otherwise specified.

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		80	V
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Maxium Diode Continuous Forward Current	T_C=25°C	150	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested ①	T_C=25°C	600	A
I_D	Continuous Drain current@V_{GS}=10V	T_C=25°C	150	A
P_D	Maximum Power Dissipation	T_C=25°C	300	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.50	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ②		900	mJ

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Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	80	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V_{DS}=80V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=80V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2	--	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance①	V_{GS}=10V, I_D=75A	--	4.8	6.0	mΩ
Dynamic Electrical Characteristics @ T_J= 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=40V,V_{GS}=0V, f=1MHz	--	5650	--	pF
C_{oss}	Output Capacitance		--	1200	--	pF
C_{rss}	Reverse Transfer Capacitance		--	600	--	pF
Q_g	Total Gate Charge	V_{DS}=60V,I_D=40A, V_{GS}=10V	--	142	--	nC
Q_{gs}	Gate-Source Charge		--	38	--	nC
Q_{gd}	Gate-Drain Charge		--	52	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=40V, I_D=20A, R_G=6.8Ω, V_{GS}=10V	--	18	--	nS
t_r	Turn-on Rise Time		--	60	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	70	--	nS
t_f	Turn-Off Fall Time		--	56	--	nS
Source- Drain Diode Characteristics@ T_J= 25°C (unless otherwise stated)						
I_{SD}	Source-drain current(Body Diode)	T_C=25℃	--	--	150	A
V_{SD}	Forward on voltage	I_{SD}=60A,V_{GS}=0V	--	0.88	1.3	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=75A, V_{GS}=0V di/dt=100A/μs	--	70	--	nS
Qrr	Reverse Recovery Charge			125		nC

Note:

① Pulse width ≤ 300μs; duty cycle≤ 2%; pulse width limited by max. junction temperature.

②Limited by TJmax, starting T_J = 25°C, L = 0.5mH,R_G = 25Ω, I_{AS} =48A, V_{GS} =10V.

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Typical Characteristics

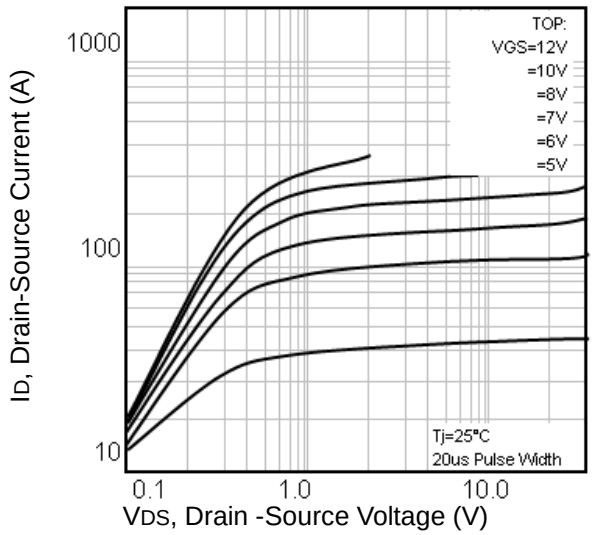

Fig1. Typical Output Characteristics

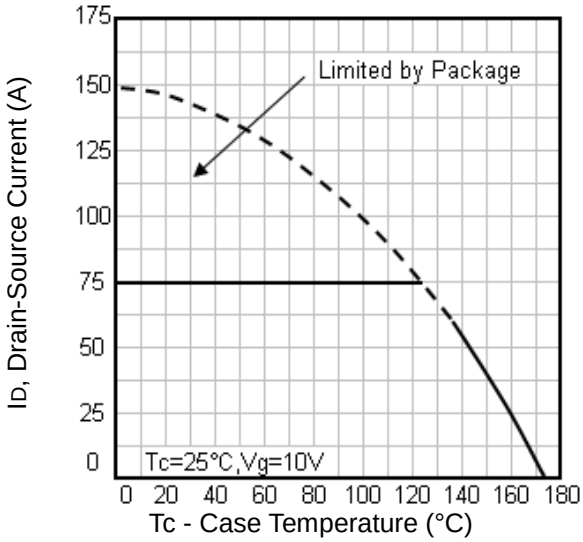

Fig2. Maximum Drain Current Vs.Case Temperature

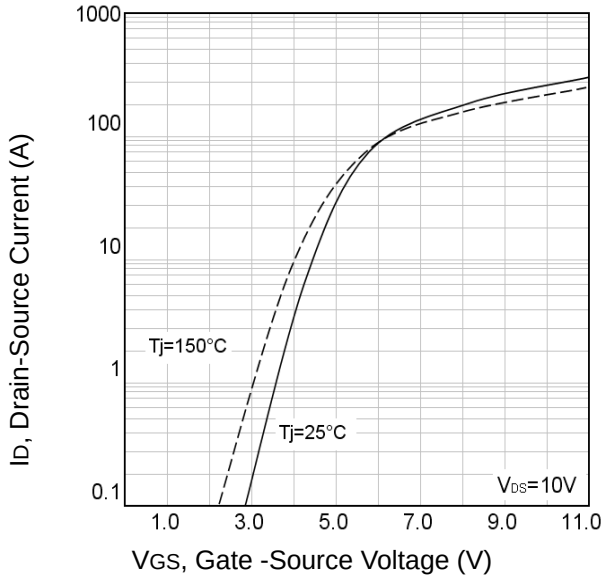

Fig3. Typical Transfer Characteristics

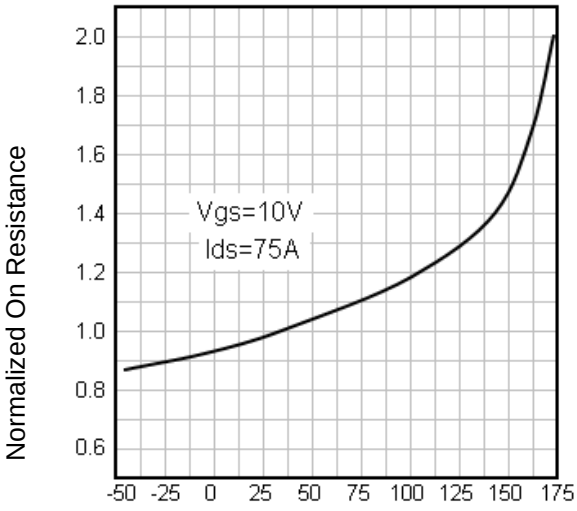

Fig4. Normalized On-Resistance Vs. Temperature

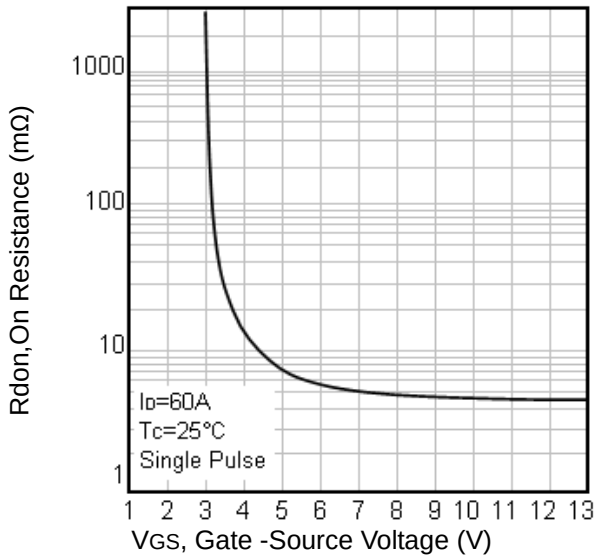

Fig5.Typical Forward Transconductance Vs. Drain Current

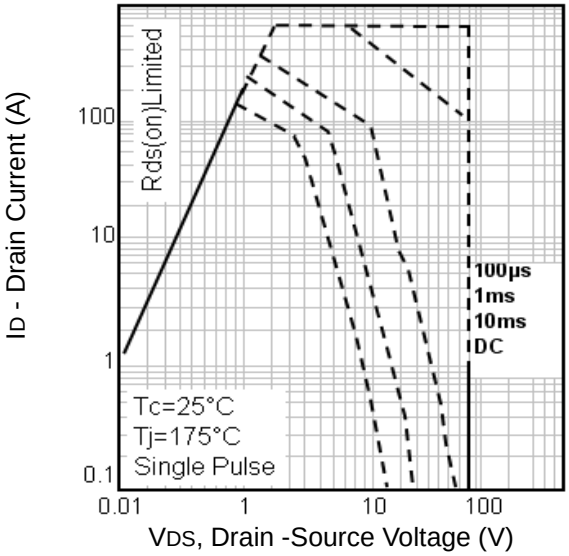

Fig6. Maximum Safe Operating Area

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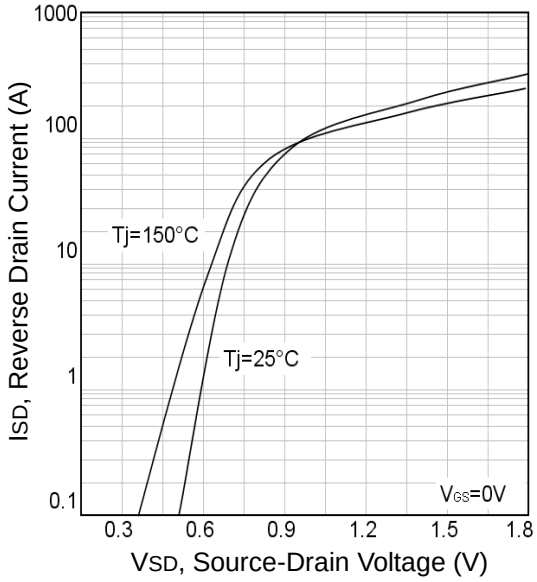

Fig7. Typical Source-Drain Diode Forward Voltage

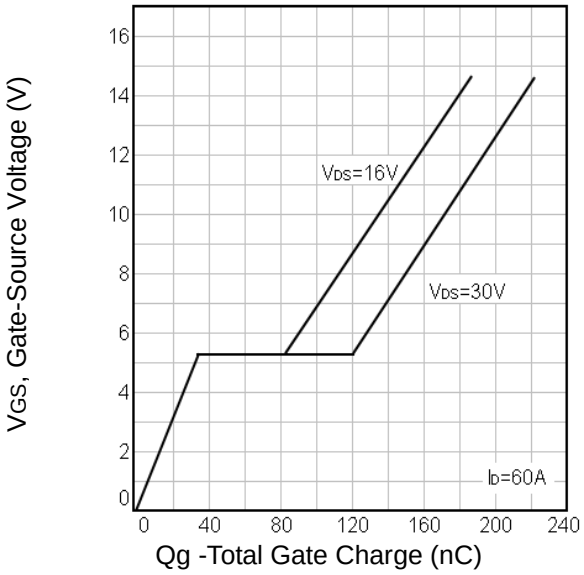

Fig8. Typical Gate Charge Vs.Gate-Source Voltage

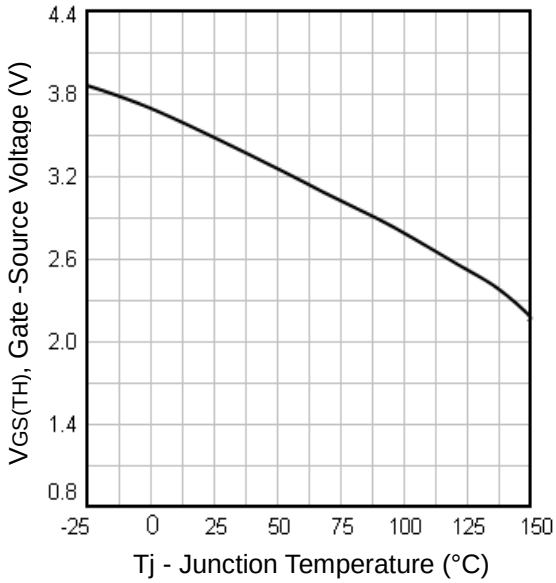

Fig9. Threshold Voltage Vs. Temperature

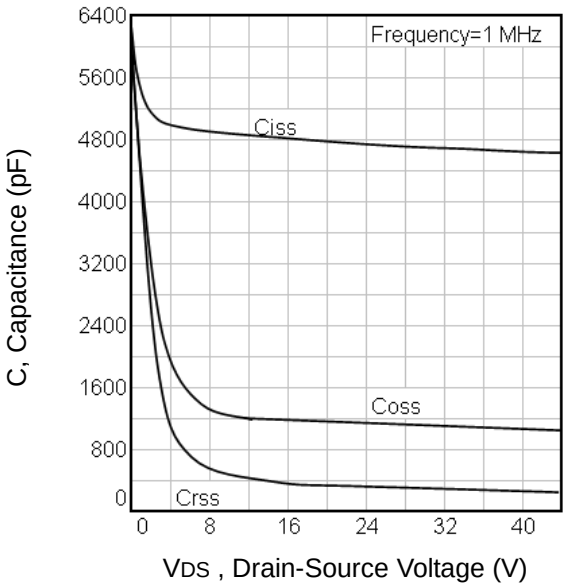

Fig10. Typical Capacitance Vs.Drain-Source Voltage

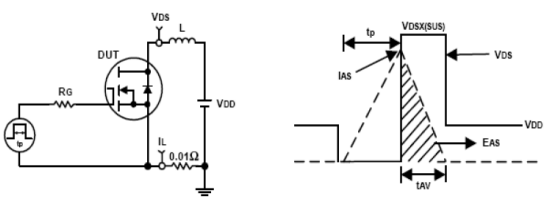

Fig11. Unclamped Inductive Test Circuit and Waveforms

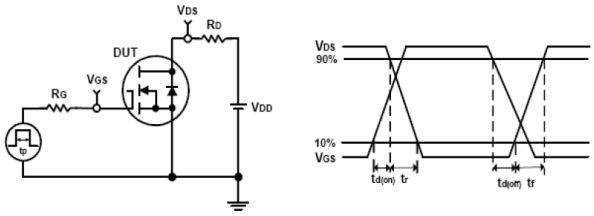

Fig12. Switching Time Test Circuit and Waveforms

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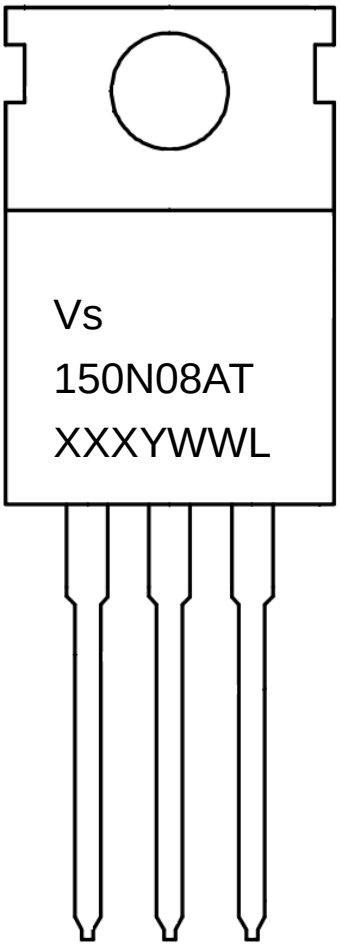
Marking & Packing Information



1st line： Company Code（Vs）
2nd line： Part Number（150N08AT）
3rd line： Date code （XXXYWWL）
XXX： Wafer Lot Number
Y： Year Code, e.g. E means 2017
WW： Week Code
L： class, e.g. A, B, etc

Packing： 50pcs/Tube
Min Unit QTY：1000pcs

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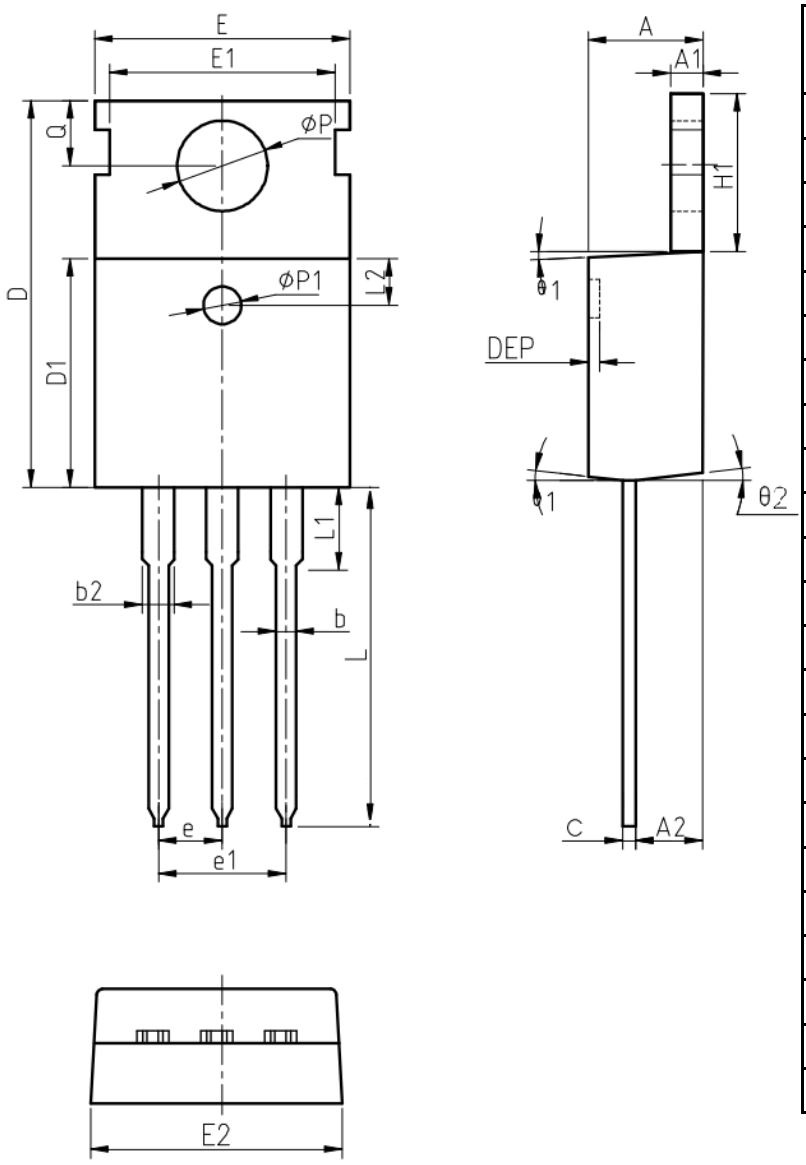
TO-220AB Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	4.30	4.52	4.70
A1	1.15	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	1.00
b2	1.17	1.32	1.50
c	0.45	0.50	0.61
D	15.30	15.65	15.90
D1	9.00	9.20	9.40
DEP	0.05	0.10	0.25
E	9.66	9.90	10.28
E1	-	8.70	-
E2	9.80	10.00	10.20
ΦP1	1.40	1.50	1.60
e	2.54 BSC		
e1	5.08 BSC		
H1	6.40	6.50	6.80
L	12.70	-	14.27
L1	-	-	3.95
L2	2.40	2.50	2.60
ΦP	3.53	3.60	3.70
Q	2.70	2.80	2.90
θ1	5 °	7 °	9 °
θ2	1 °	3 °	5 °

Notes:

1. Refer to JEDEC TO-220 variation AB
2. Dimension "D" and "E" do NOT include mold flash. Mold flash shall not exceed 0.127mm per side.

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