VST011N15HS

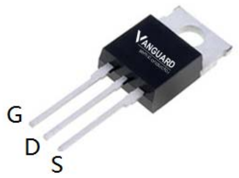
150V/106A N-Channel Advanced Power MOSFET

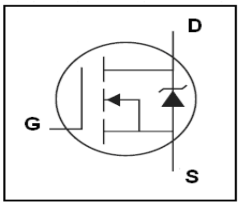
V_{DS}	150	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	9.2	mΩ
I_D	106	A

Features

- N-Channel
- Very low on-resistance
- 100% Avalanche Tested
- Fast Switching
- Repetitive Avalanche Allowed up to Tjmax
- Pb-free lead plating; RoHS compliant

TO-220AB





Part ID	Package Type	Marking	Tape and reel information
VST011N15HS	TO-220AB	011N15H	50pcs/Tube

Maximum ratings, at T_j=25 °C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		150	V
I_S	Diode continuous forward current	T_C =25°C	106	A
I_D	Continuous drain current@V_{GS}=10V	T_C =25°C	106	A
		T_C =100°C	67	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	250	A
EAS	Avalanche energy, single pulsed ②	I_D=30A	240	mJ
IAS	Avalanche energy, single pulsed ②		40	A
P_D	Maximum power dissipation	T_C =25°C	277	W
V_{GS}	Gate-Source voltage		±20	V
T_{STG} T_J	Storage and operating temperature range		-55 to 175	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.55	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	60.5	°C/W

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	150	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V_{DS}=120V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=120V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±25V,V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	3.3	4.3	5.3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance①	V_{GS}=10V, I_D=20A	--	9.2	11.0	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=75V,V_{GS}=0V, f=1MHz	--	3010	--	pF
C_{oss}	Output Capacitance		--	345	--	pF
C_{rss}	Reverse Transfer Capacitance		--	14	--	pF
Q_g	Total Gate Charge	V_{DS}=75V,I_D=20A, V_{GS}=10V	--	43	--	nC
Q_{gs}	Gate-Source Charge		--	18	--	nC
Q_{gd}	Gate-Drain Charge		--	10	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=75V, I_D=10A, R_G=3Ω, V_{GS}=10V	--	19	--	nS
t_r	Turn-on Rise Time		--	24	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	30	--	nS
t_f	Turn-Off Fall Time		--	8.5	--	nS
Source- Drain Diode Characteristics@ T_J = 25°C (unless otherwise stated)						
I_{SD}	Source-drain current(Body Diode)	T_c=25℃	--	--	106	A
I_{SDM}	Pulsed Source-drain current(Body Diode)①		--	--	250	A
V_{SD}	Forward on voltage	I_{SD}=1A,V_{GS}=0V	--	0.7	1.0	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=40A, V_{GS}=0V di/dt=100A/μs	--	75	--	nS
Q_{rr}	Reverse Recovery Charge			880		nC

NOTE:

① Pulse width ≤ 300μs; duty cycle≤ 2%.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH,R_G = 25Ω, I_{AS} = 30A, V_{GS} =10V. Part not recommended for use above this value

Typical Characteristics

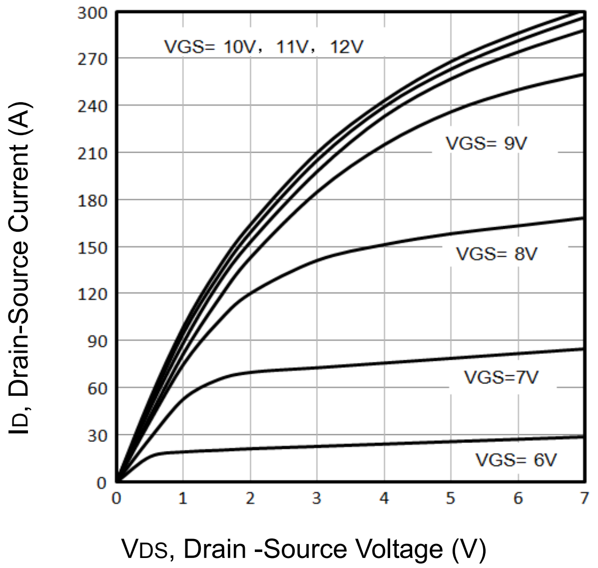


Fig1. Typical Output Characteristics

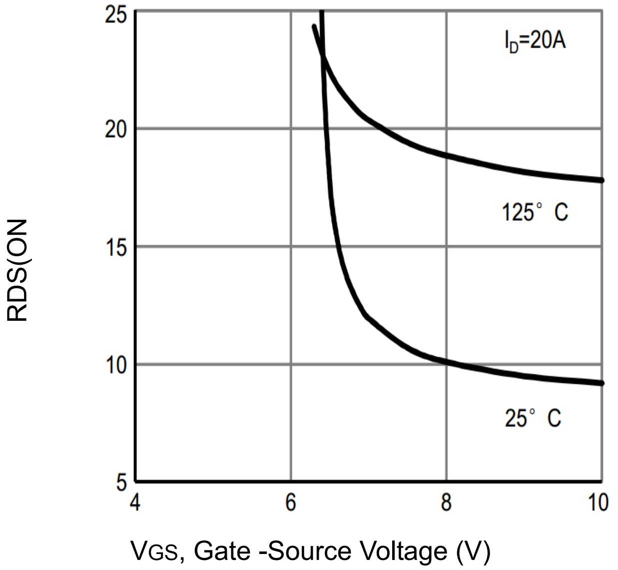


Fig 2: On-Resistance vs. Gate-Source Voltage

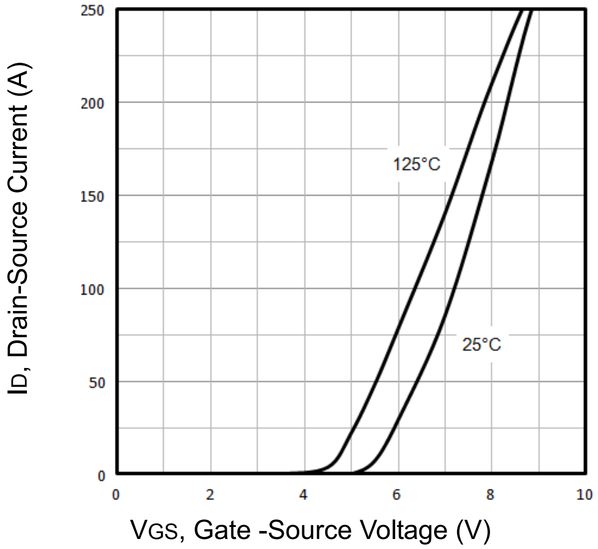


Fig3. Typical Transfer Characteristics

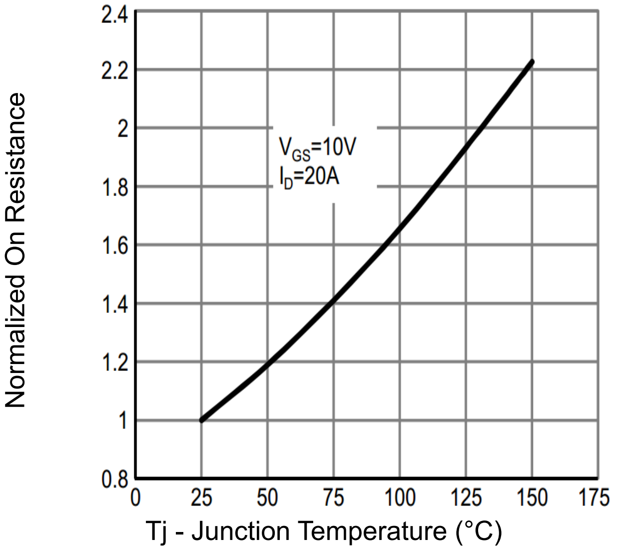


Fig4. Normalized On-Resistance Vs. Temperature

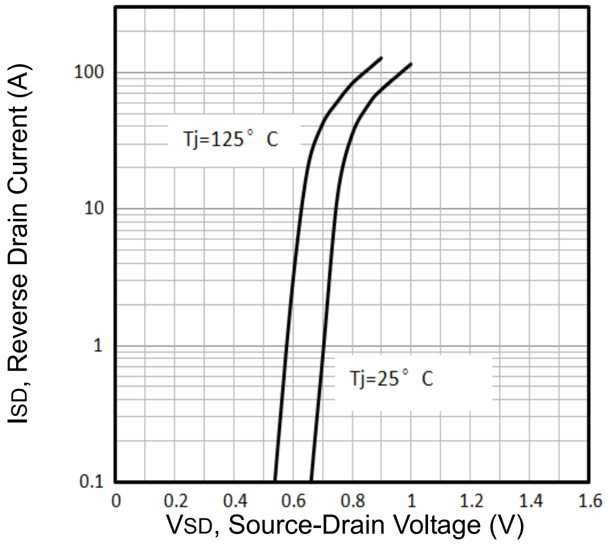


Fig5. Typical Source-Drain Diode Forward Voltage

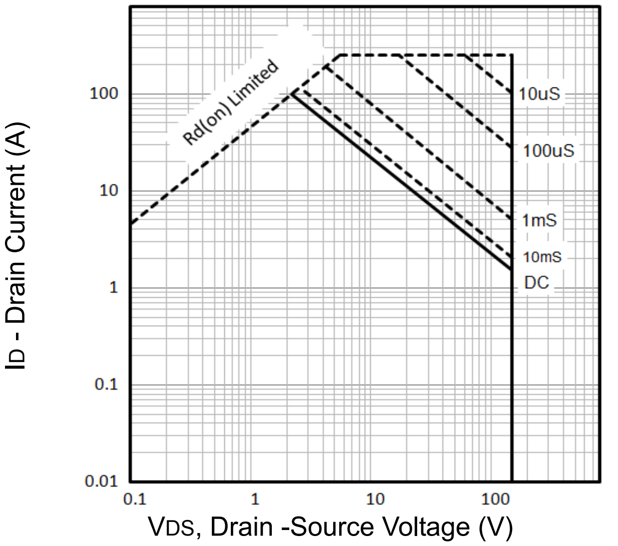


Fig6. Maximum Safe Operating Area

Typical Characteristics

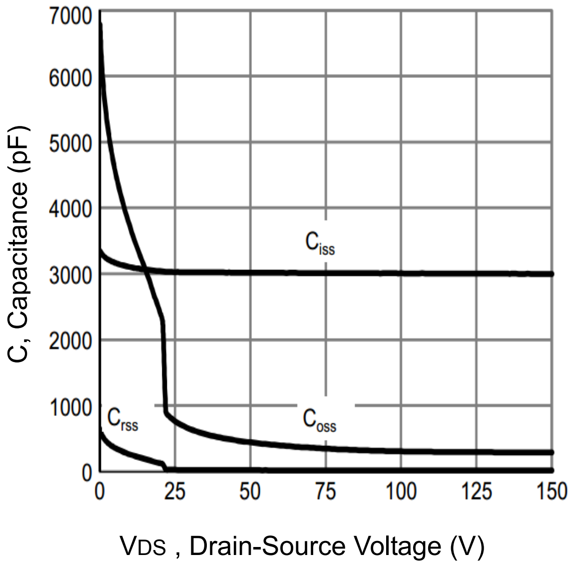


Fig7. Typical Capacitance Vs.Drain-Source Voltage

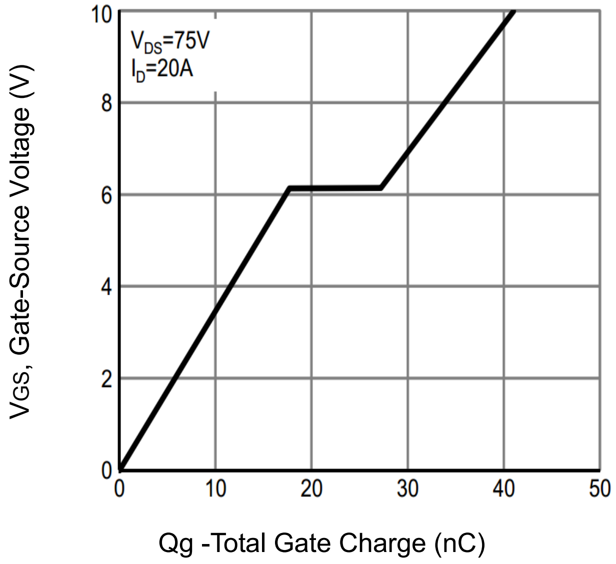


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

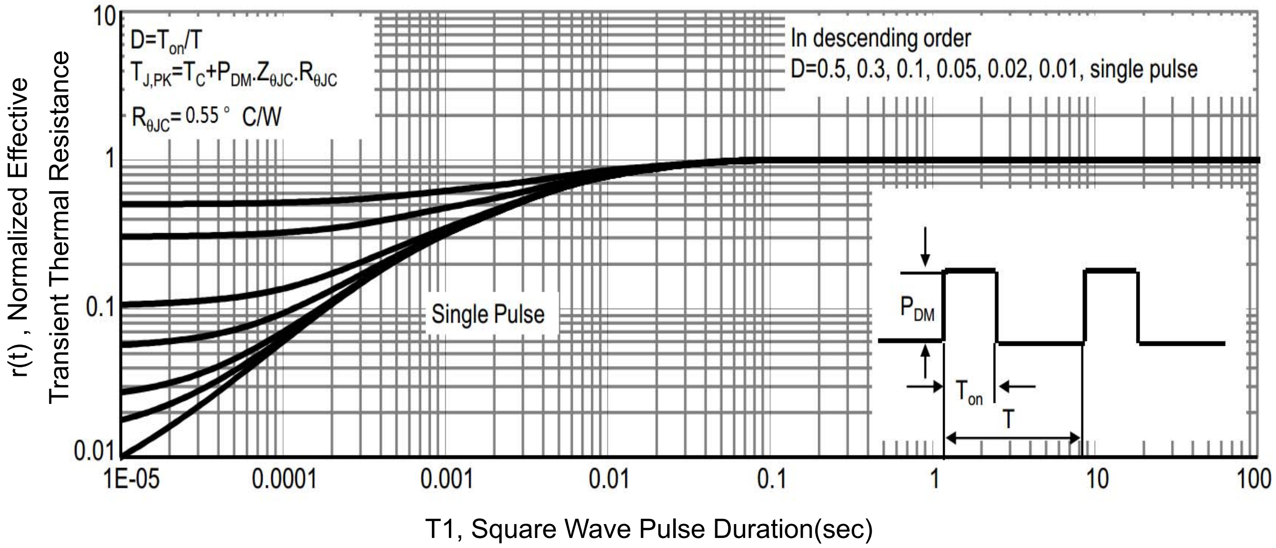


Fig9. T1 ,Transient Thermal Response Curve

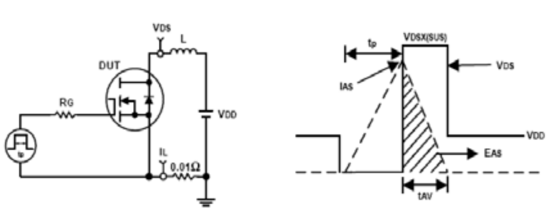


Fig11. Unclamped Inductive Test Circuit and waveforms

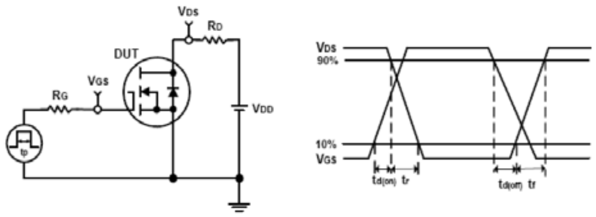
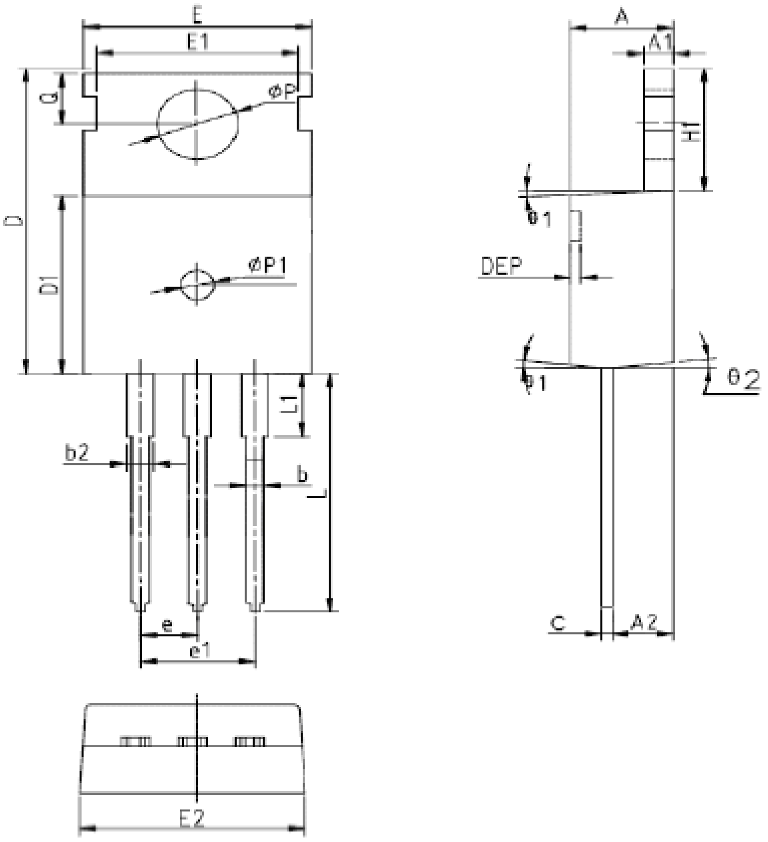


Fig12. Switching Time Test Circuit and waveforms

TO-220AB Package Outline



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185	Øp1	1.40	1.50	1.60	0.055	0.059	0.063
A1	1.27	1.30	1.33	0.050	0.051	0.052	e	2.54BSC			0.1BSC		
A2	2.35	2.40	2.50	0.093	0.094	0.098	e1	5.08BSC			0.2BSC		
b	0.77	-	0.90	0.030	-	0.035	H1	6.40	6.50	6.60	0.252	0.256	0.260
b2	1.23	-	1.36	0.048	-	0.054	L	12.75	-	13.17	0.502	-	0.519
C	0.48	0.50	0.52	0.019	0.020	0.021	L1	-	-	3.95	-	-	0.156
D	15.40	15.60	15.80	0.606	0.614	0.622	L2	2.50REF.			0.098REF.		
D1	9.00	9.10	9.20	0.354	0.358	0.362	Øp	3.57	3.60	3.63	0.141	0.142	0.143
DEP	0.05	0.10	0.20	0.002	0.004	0.008	Q	2.73	2.80	2.87	0.107	0.110	0.113
E	9.70	9.90	10.10	0.382	0.389	0.398	θ 1	5°	7°	9°	5°	7°	9°
E1	-	8.70	-	-	0.343	-	θ 2	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.401							

Customer Service

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