

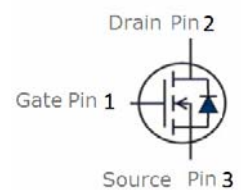
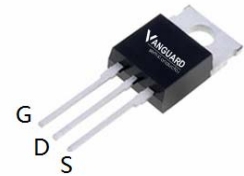
Features

- N-Channel, Logic level 10V
- Enhancement mode
- Very low on-resistance
- Fast Switching
- 100% Avalanche test
- Pb-free lead plating; RoHS compliant



V_{DS}	60	V
$R_{DS(on),TYP}@ V_{GS}=10\text{ V}$	5.0	m Ω
I_D	85	A

TO-220AB



Part ID	Package Type	Marking	Tape and reel information
VST007N06HS	TO-220AB	007N06H	50pcs/Tube

Maximum ratings, at $T_J=25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
Common Ratings (Tc=25°C Unless Otherwise Noted)				
VGS	Gate-Source Voltage		±20	V
V(BR)DSS	Drain-Source Breakdown Voltage		60	V
TJ	Maximum Junction Temperature		175	°C
TSTG	Storage Temperature Range		-55 to 150	°C
IS	Diode Continuous Forward Current	TC=25°C	85	A
Mounted on Large Heat Sink				
ID	Continuous Drain current@VGS=10V	TC=25°C	85	A
		TC=100°C	55	A
IDM	Pulse Drain Current Tested ①	TC=25°C	300	A
PD	Maximum Power Dissipation	TC=25°C	100	W
ROJC	Thermal Resistance-Junction to Case		1.5	°C/W
ROJA	Thermal Resistance Junction-Ambient		52.5	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ②		93	mJ

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T _c = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	60	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _c =25°C)	V _{DS} =60V,V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _c =125°C)	V _{DS} =60V,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	2.0	3.0	4.0	V
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =10V, I _D =50A	--	5.0	7.0	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =5V, I _D =10A	--	7.0	9.0	mΩ
Dynamic Electrical Characteristics @ T _c = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =20V,V _{GS} =0V, f=1MHz	--	3485	--	pF
C _{oss}	Output Capacitance		--	370	--	pF
C _{rss}	Reverse Transfer Capacitance		--	275	--	pF
Q _g	Total Gate Charge	V _{DS} =24V,I _D =10A, V _{GS} =10V	--	82	--	nC
Q _{gs}	Gate-Source Charge		--	13	--	nC
Q _{gd}	Gate-Drain Charge		--	17	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =5A, R _G =6.8Ω, V _{GS} =10V	--	26	--	nS
t _r	Turn-on Rise Time		--	125	--	nS
t _{d(off)}	Turn-Off Delay Time		--	58	--	nS
t _f	Turn-Off Fall Time		--	112	--	nS
Source- Drain Diode Characteristics@ T _c = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =40A,V _{GS} =0V	--	0.89	1.2	V
t _{rr}	Reverse Recovery Time	T _J =25°C ,I _{sd} =10A, V _{GS} =0V	--	38	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs		44		nC

NOTE:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.3mH, R_G = 25Ω, I_{AS} = 25A, V_{GS} = 10V. Part not recommended for use above this value
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

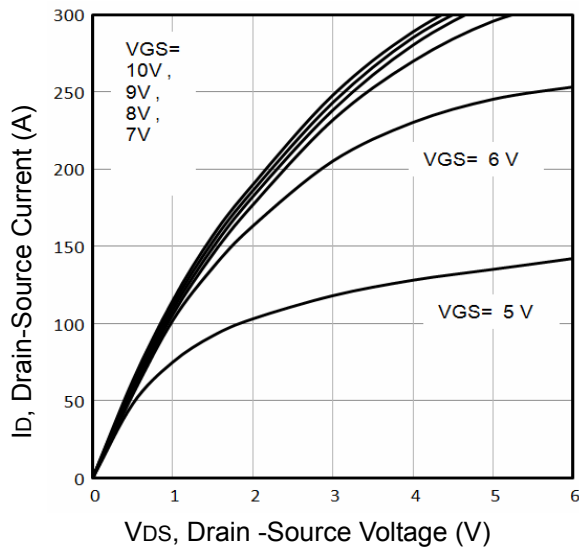


Fig1. Typical Output Characteristics

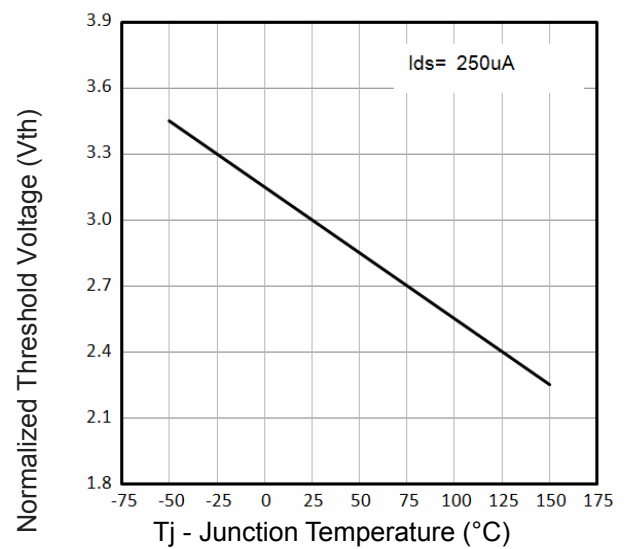


Fig2. Normalized Threshold Voltage Vs. Temperature

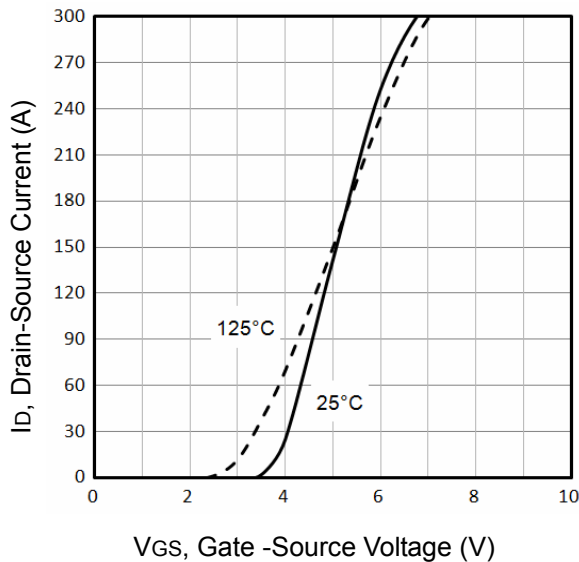


Fig3. Typical Transfer Characteristics

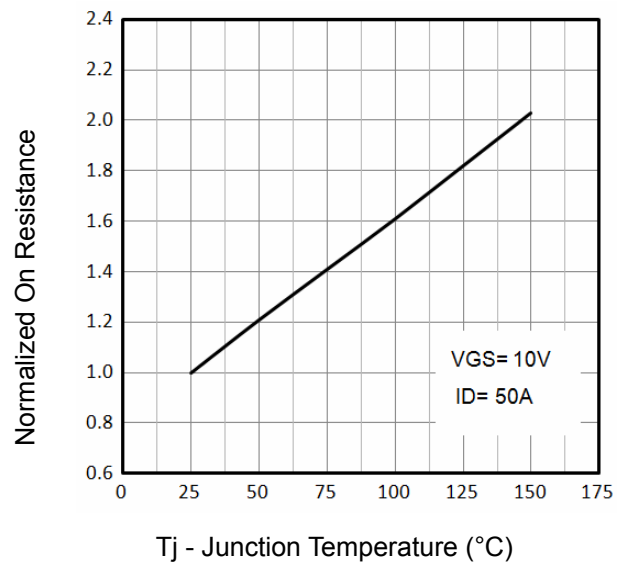


Fig4. Normalized On-Resistance Vs. Temperature

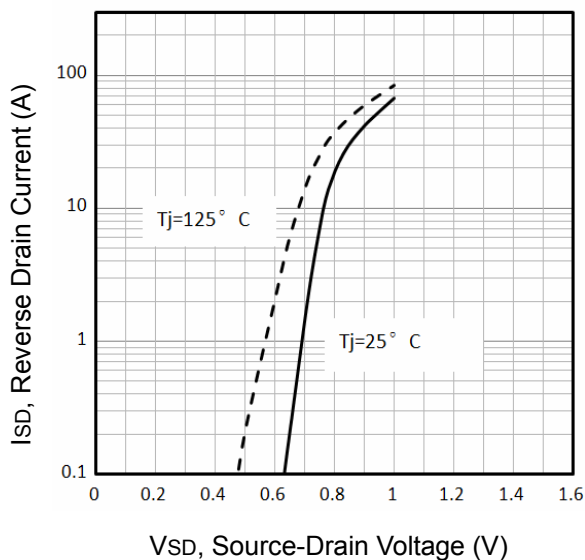


Fig5. Typical Source-Drain Diode Forward Voltage

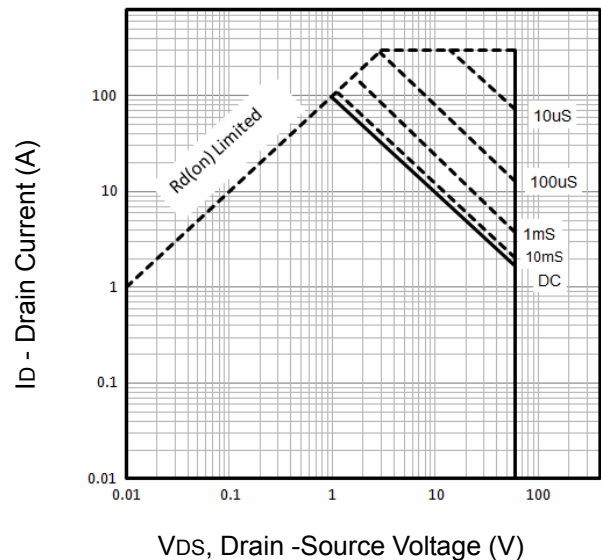


Fig6. Maximum Safe Operating Area

Typical Characteristics

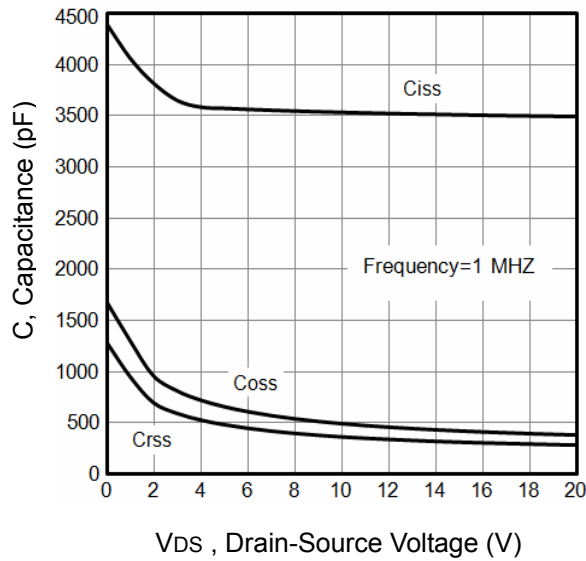


Fig7. Typical Capacitance Vs. Drain-Source Voltage

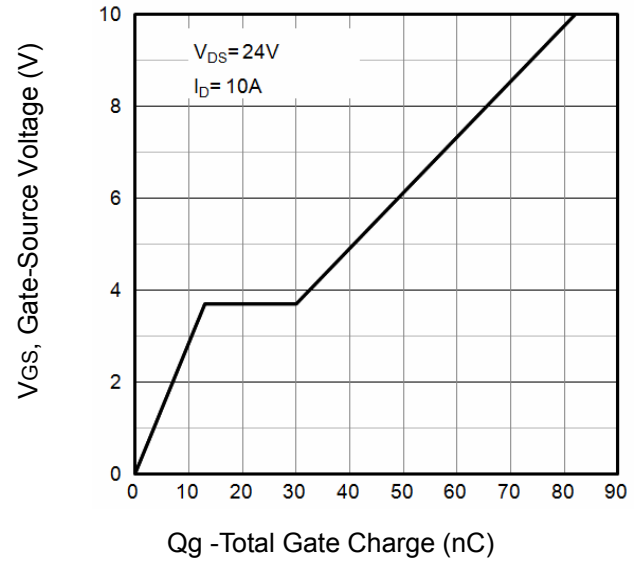


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

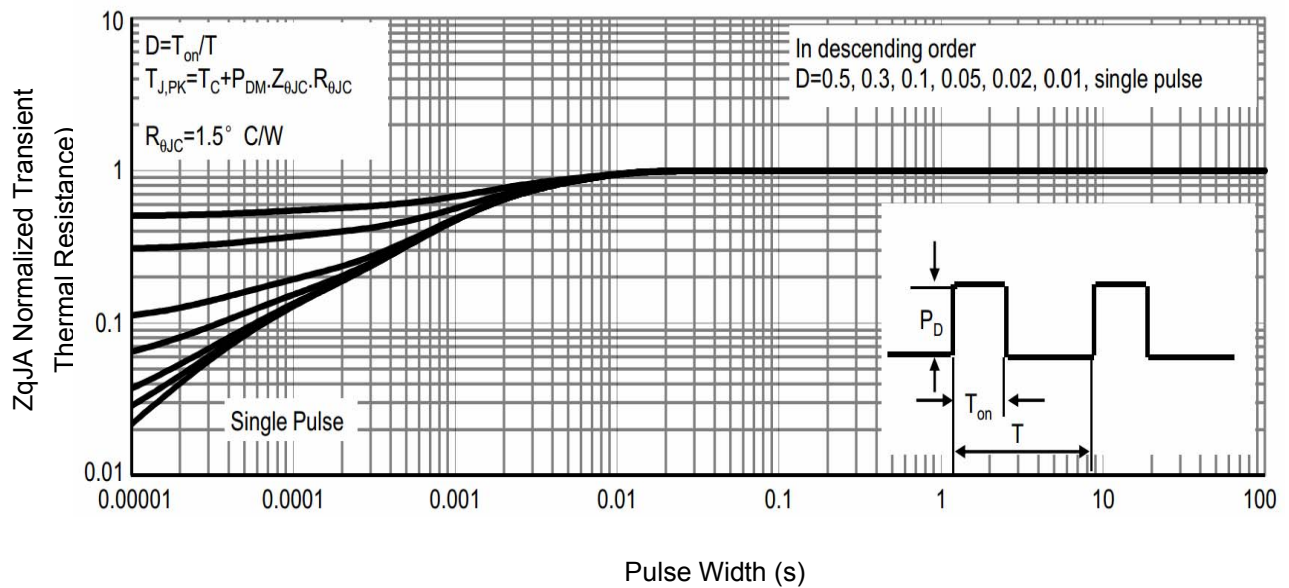


Fig9. Normalized Maximum Transient Thermal Impedance

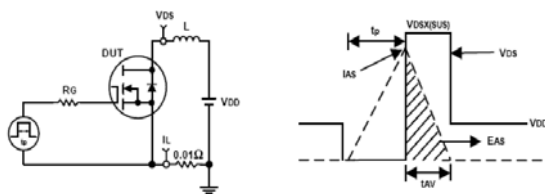


Fig10. Unclamped Inductive Test Circuit and waveforms

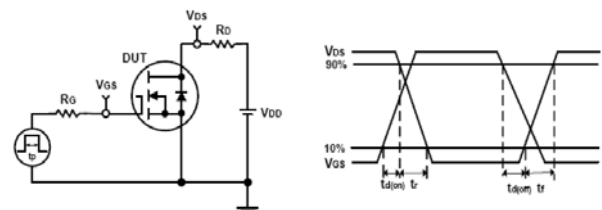
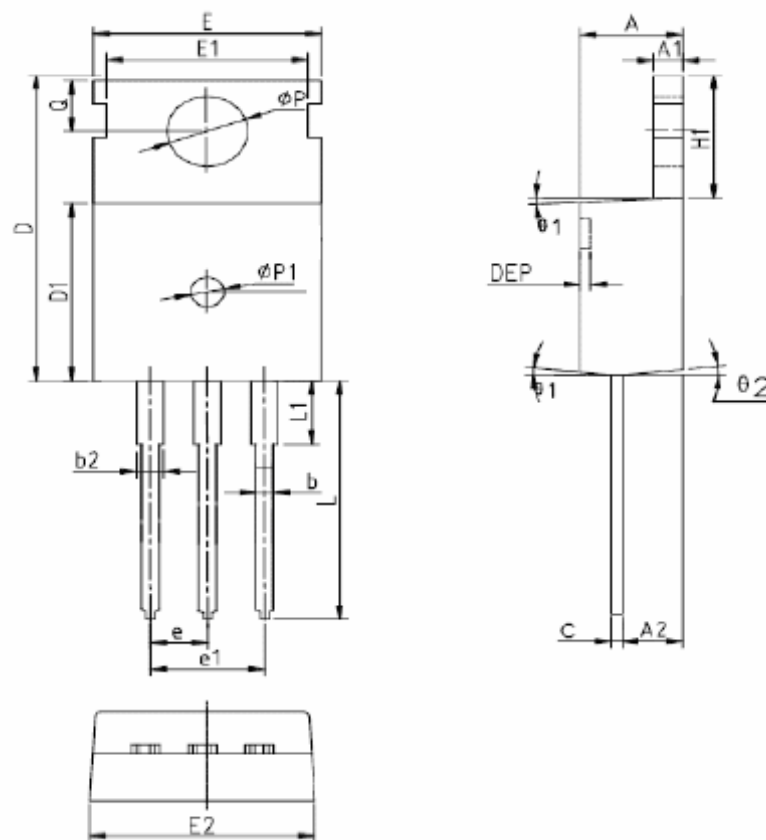


Fig11. Switching Time Test Circuit and waveforms

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	θp1	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	θp	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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