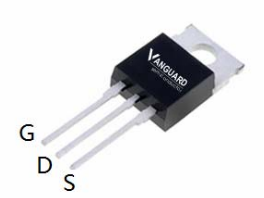
Features

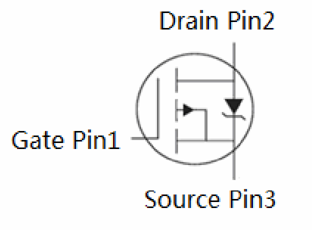
- P-Channel，-5V Logic Level Control
- Very low on-resistance RDS(on) @ V_{GS}=-4.5 V
- Fast Switching
- Enhancement mode
- 100% Avalanche Tested
- Pb-free lead plating; RoHS compliant

Pb-Free RoHS

V_{DS}	-60	V
$R_{DS(on),TYP}$@ V_{GS}=-10 V	8.5	mΩ
$R_{DS(on),TYP}$@ V_{GS}=-4.5V	10.5	mΩ
I_D	-80	A

TO-220AB





Part ID	Package Type	Marking	Tape and reel information
VST007P06MS	TO-220AB	007P06M	50pcs/Tube

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

Symbol	**Parameter**		**Rating**	**Unit**
Common Ratings (Tc=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		-60	V
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range①		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_C =25°C	-80	A
Mounted on Large Heat Sink				
I_D	Continuous Drain current @V_{GS}=-10V	T_C =25°C	-80	A
		T_C =100°C	-51	A
I_{DM}	Pulse Drain Current Tested ②	T_C =25°C	-300	A
P_D	Maximum Power Dissipation	T_C =25°C	115	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.3	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		48	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ③		56	mJ

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	VDS=-60V,VGS=0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	VDS=-60V,VGS=0V	--	--	-100	μA
I_{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-1.0	-1.6	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ②	VGS=-10V, ID=-35A	--	8.5	10.0	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance ②	VGS=-4.5V, ID=-10A	--	10.5	13.0	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	VDS=-30V,VGS=0V, f=1MHz	--	6985	--	pF
C_{oss}	Output Capacitance		--	450	--	pF
C_{rss}	Reverse Transfer Capacitance		--	290	--	pF
R_g	Gate Resistance	f=1MHz		13.8		Ω
Q_g	Total Gate Charge	VDS=-30V,ID=-20A, VGS=-10V	--	94	--	nC
Q_{gs}	Gate-Source Charge		--	21	--	nC
Q_{gd}	Gate-Drain Charge		--	25	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	VDD=-30V, ID=-5A, RG=6.8Ω, VGS=-10V	--	19	--	nS
t_r	Turn-on Rise Time		--	26	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	89	--	nS
t_f	Turn-Off Fall Time		--	45	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	ISD=-35A,VGS=0V	--	-0.88	-1.3	V
t_{rr}	Reverse Recovery Time	Tj=25℃,Isd=-20A, VGS=0V di/dt=-500A/μs	--	35	--	nS
Q_{rr}	Reverse Recovery Charge			175		nC

NOTE:

① Repetitive rating; pulse width limited by max. junction temperature.

②Pulse width ≤ 300μs; duty cycle≤ 2%.

③Limited by TJmax, starting TJ = 25°C, L = 0.5mH,RG = 25Ω, IAS = -15A, VGS =-10V. Part not recommended for use above this value

Typical Characteristics

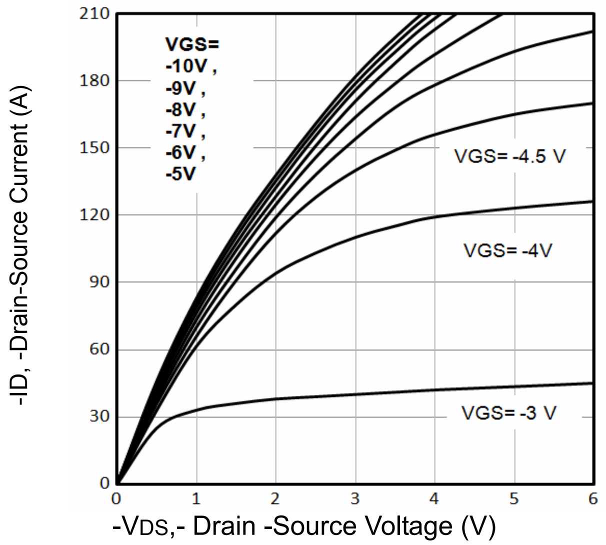


Fig1. Typical Output Characteristics

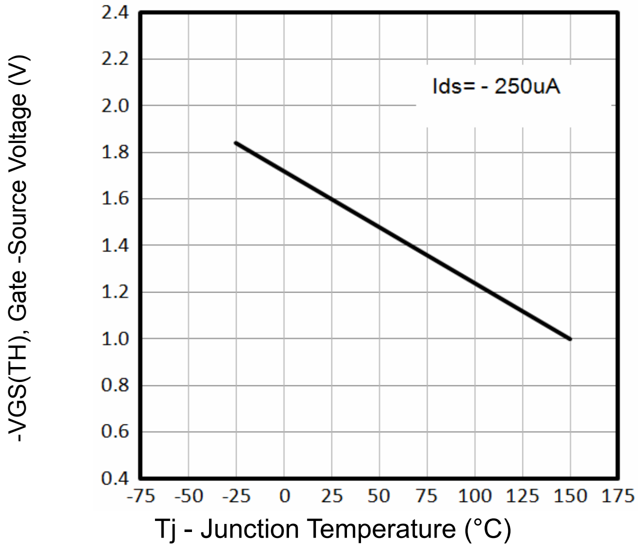


Fig2. Threshold Voltage Vs. Temperature

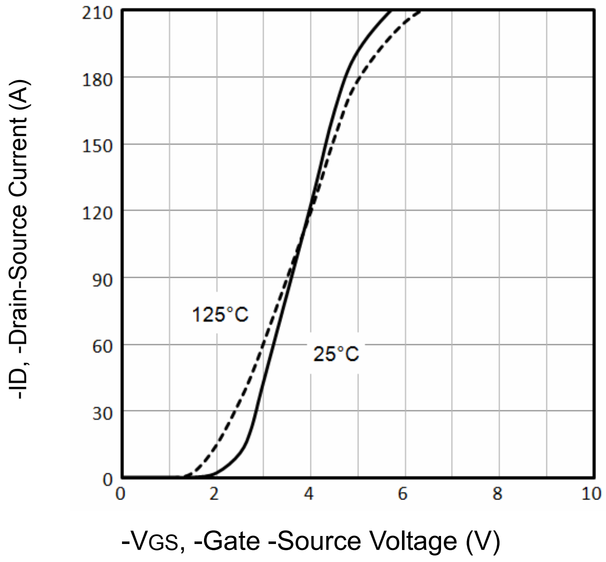


Fig3. Typical Transfer Characteristics

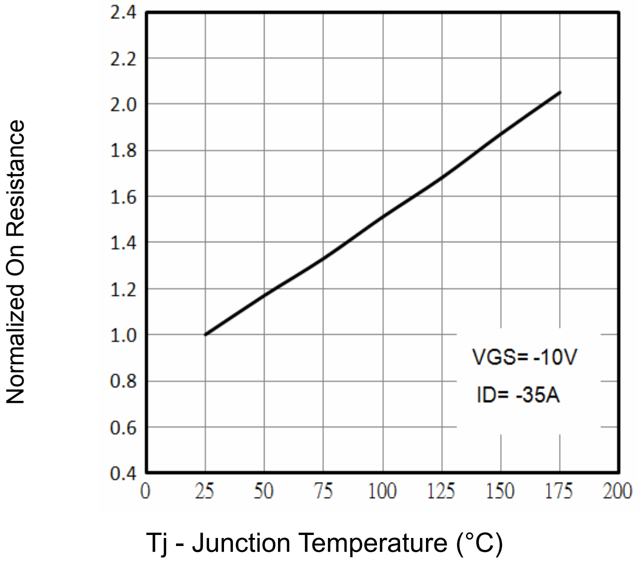


Fig4. Normalized On-Resistance Vs. Temperature

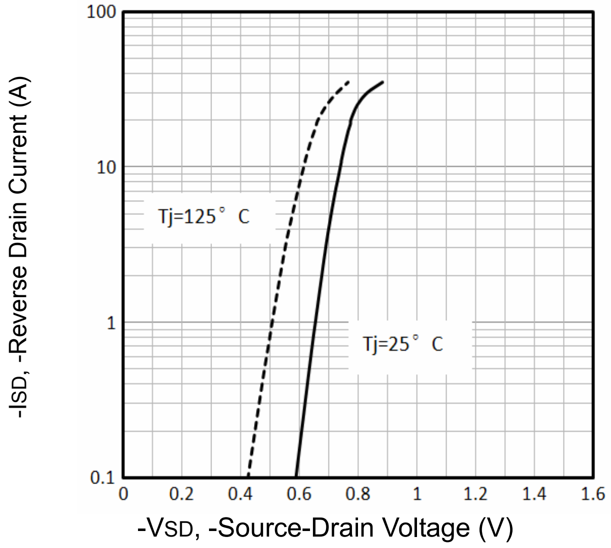


Fig5. Typical Source-Drain Diode Forward Voltage

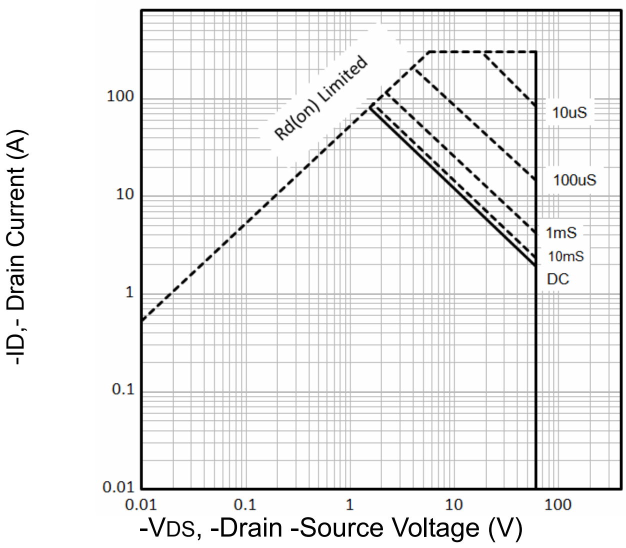


Fig6. Maximum Safe Operating Area

Typical Characteristics

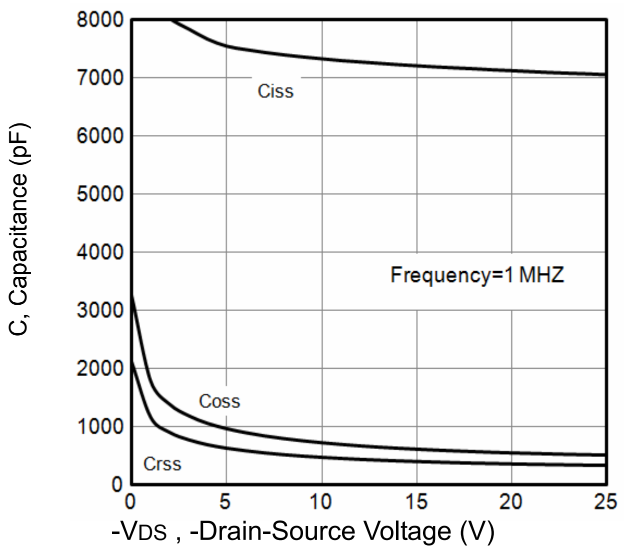


Fig7. Typical Capacitance Vs.Drain-Source Voltage

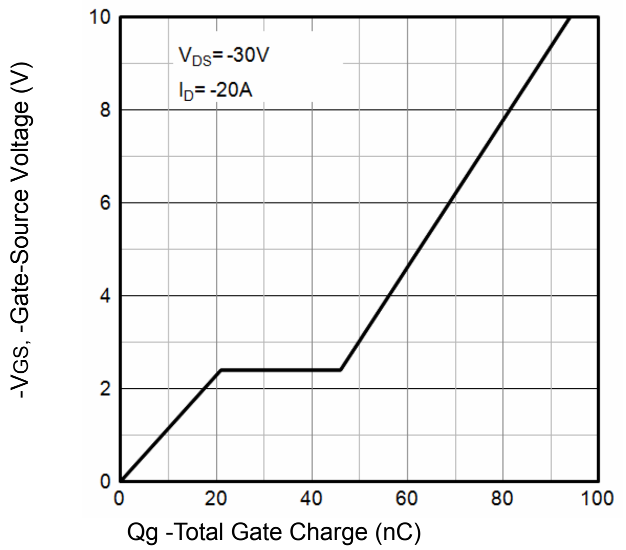


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

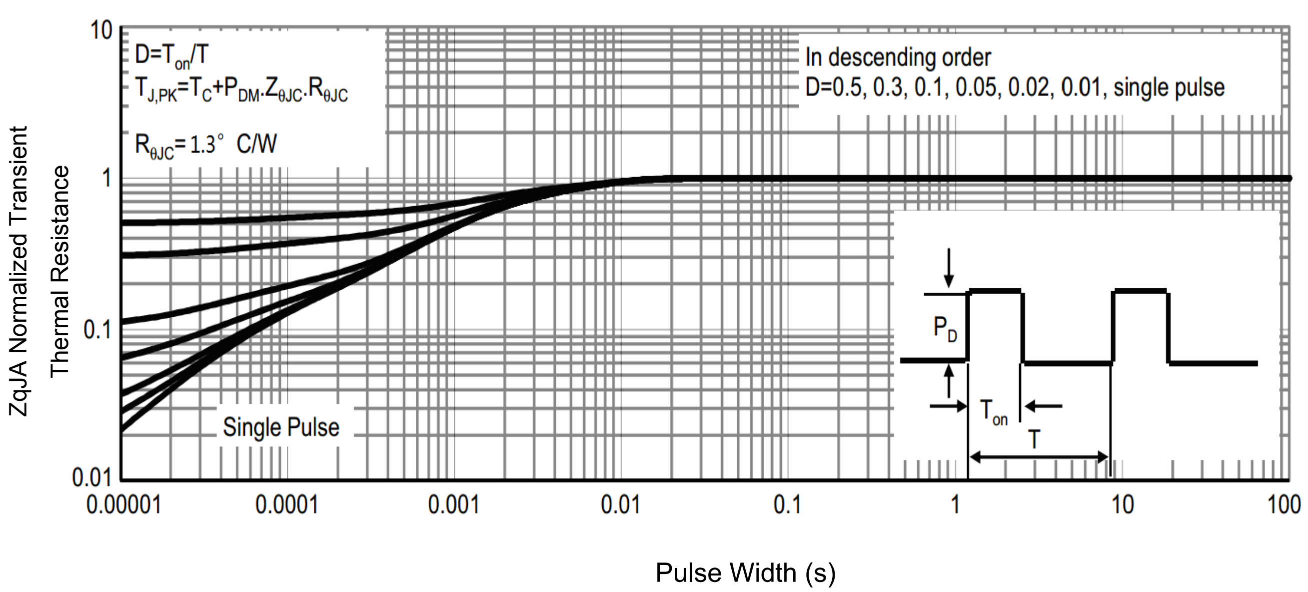


Fig9. Normalized Maximum Transient Thermal ImpedanceTj -Junction

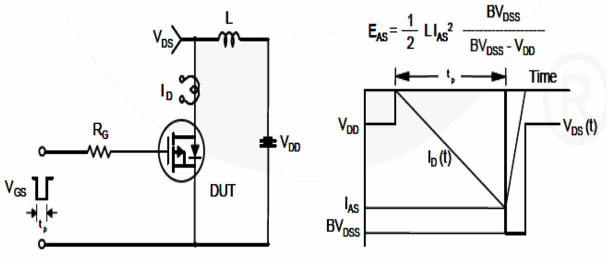


Fig10. Unclamped Inductive Test Circuit and Waveforms

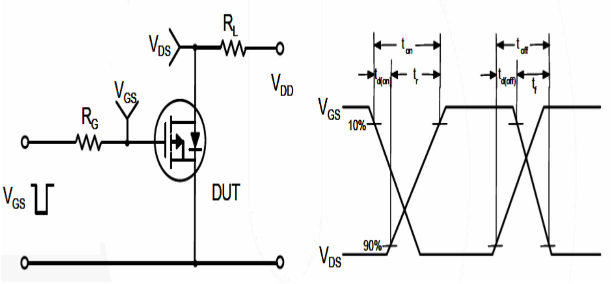
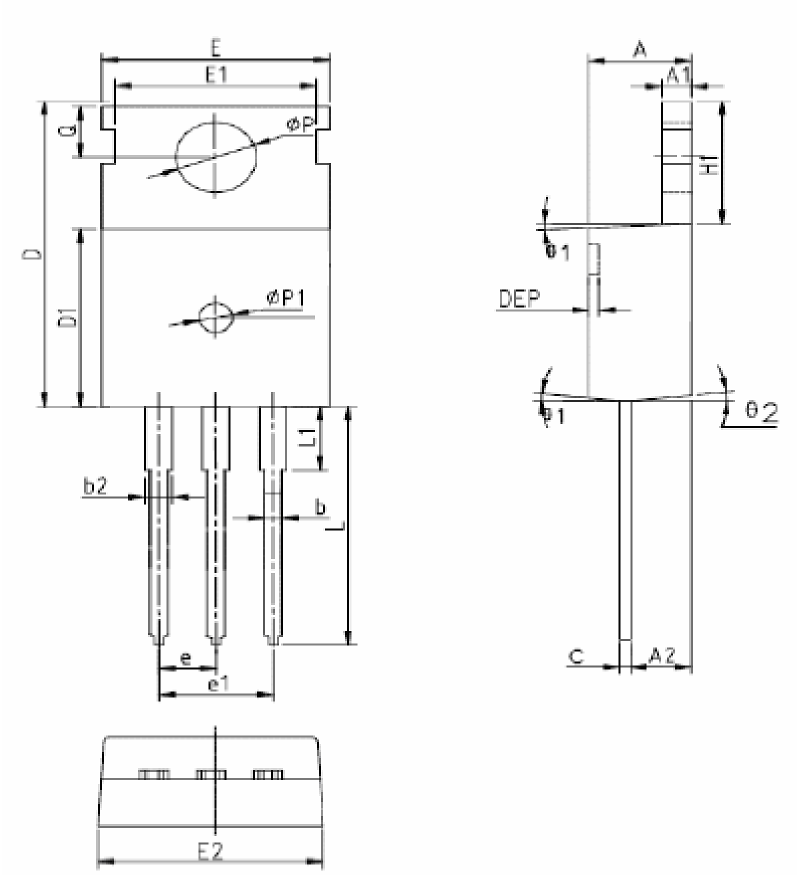


Fig11. Switching Time Test Circuit and waveforms

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	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	θ1	5°	7°	9°	5°	7°	9°
E1	-	8.70	-	-	0.343	-	θ2	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.401							

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