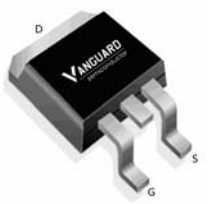
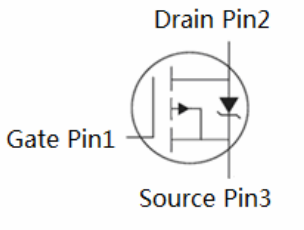
Features

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

V_{DS}	-100	V
$R_{DS(on),TYP}$@ V_{GS}=-10 V	25	mΩ
$R_{DS(on),TYP}$@ V_{GS}=-4.5 V	28	mΩ
I_D	-55	A

TO-263





Part ID	Package Type	Marking	Tape and reel information
VSM030P10MS	TO-263	030P10M	800pcs/Reel

Absolute Maximum Ratings

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		-100	V
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_C=25°C	-55	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested ①	T_C=25°C	-180	A
I_D	Continuous Drain current@V_{GS}=10V	T_C=25°C	-55	A
		T_C=100°C	-35	A
P_D	Maximum Power Dissipation	T_C=25°C	150	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.0	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient(ts<10s)		40	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ②		56	mJ

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	-100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V_{DS}=-100V,V_{GS}=0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=-100V,V_{GS}=0V	--	--	-10	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	-1.0	-1.6	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=-10V, I_D=-25A	--	25	30	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=-4.5V, I_D=-10A	--	28	35	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=-30V,V_{GS}=0V, f=1MHz	--	7270	--	pF
C_{oss}	Output Capacitance		--	315	--	pF
C_{rss}	Reverse Transfer Capacitance		--	205	--	pF
Q_g	Gate Resistance	f=1MHz		13.5		Ω
Q_g	Total Gate Charge	V_{DS}=-50V,I_D=-20A, V_{GS}=-4.5V	--	83	--	nC
Q_{gs}	Gate-Source Charge		--	15	--	nC
Q_{gd}	Gate-Drain Charge		--	36	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-50V, 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		--	160	--	nS
t_f	Turn-Off Fall Time		--	105	--	nS
Source- Drain Diode Characteristics@ T_J = 25°C (unless otherwise stated)						
I_{SD}	Source-drain current(Body Diode)	T_c=25℃	--	--	-55	A
V_{SD}	Forward on voltage	I_{SD}=-25A,V_{GS}=0V	--	0.86	-1.3	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=-10A, V_{GS}=0V di/dt=-100A/μs	--	65	--	nS
Q_{rr}	Reverse Recovery Charge			125		nC

NOTE:

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

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH,R_G = 25Ω, I_{AS} =-15A, V_{GS} =-10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

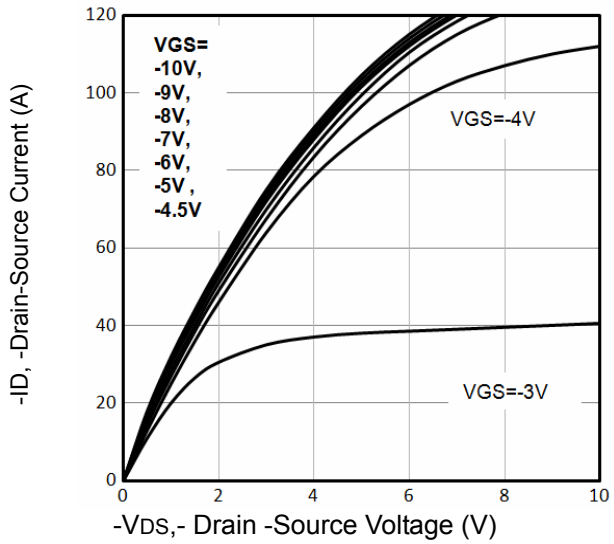


Fig1. Typical Output Characteristics

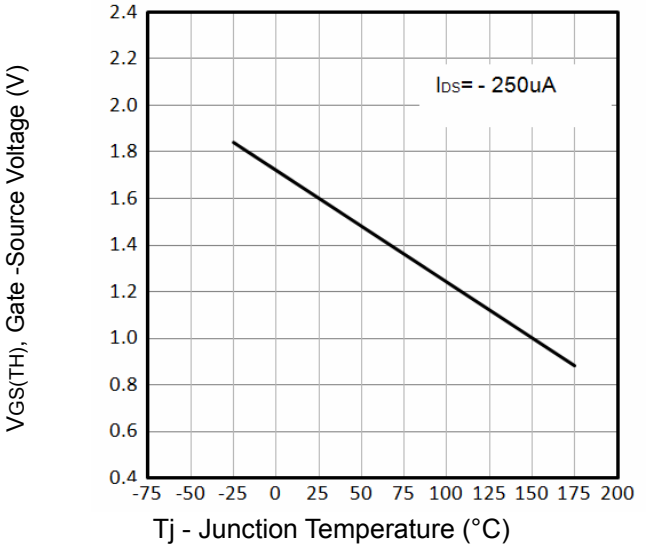


Fig2. Threshold Voltage Vs. Temperature

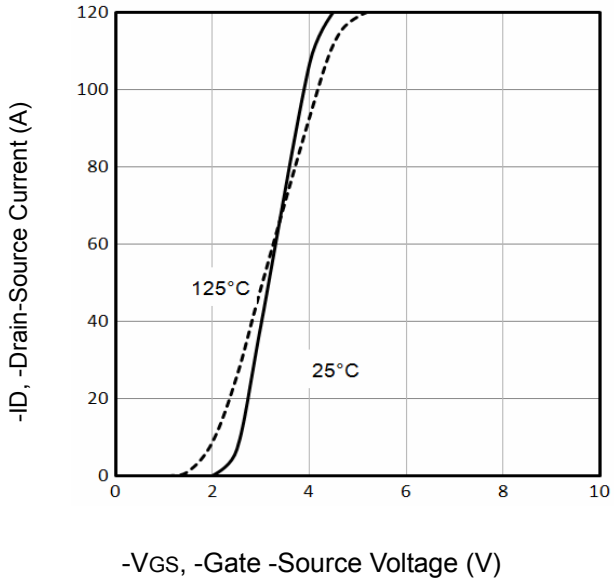


Fig3. Typical Transfer Characteristics

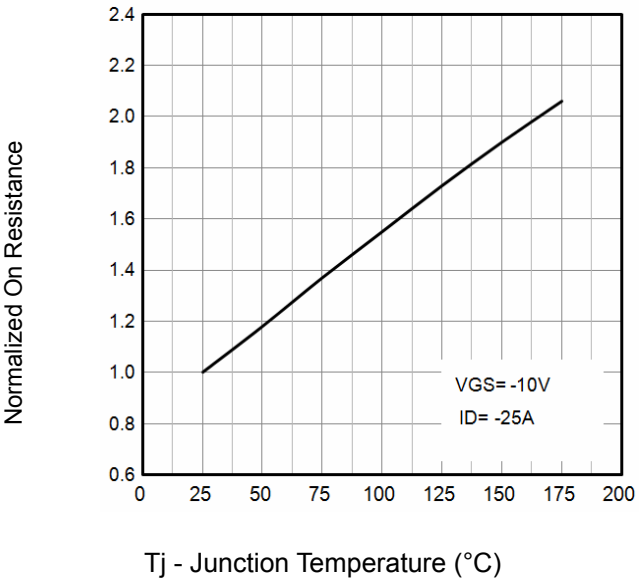


Fig4. Normalized On-Resistance Vs. Temperature

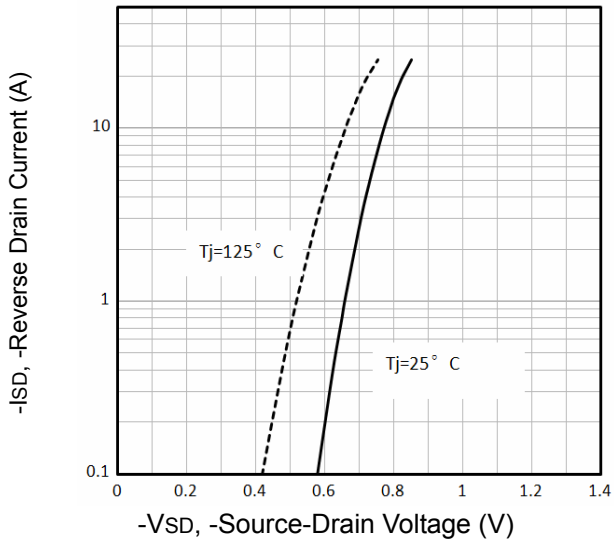


Fig5. Typical Source-Drain Diode Forward Voltage

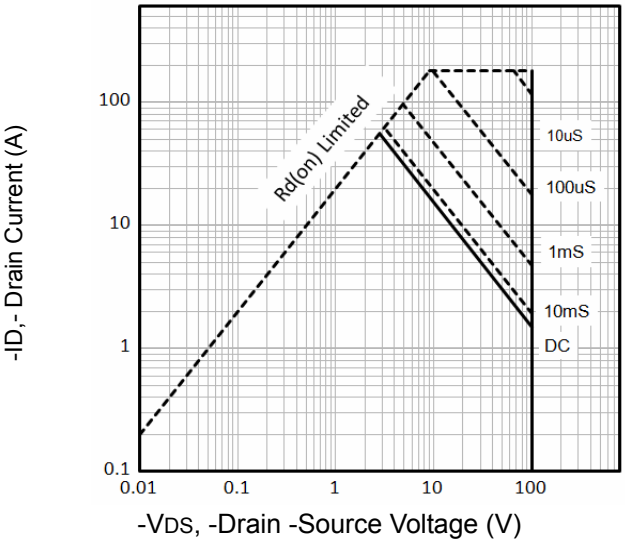


Fig6. Maximum Safe Operating Area

Typical Characteristics

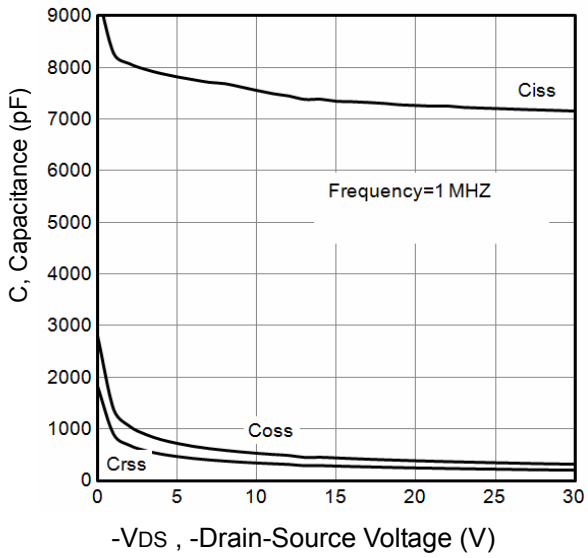


Fig7. Typical Capacitance Vs.Drain-Source Voltage

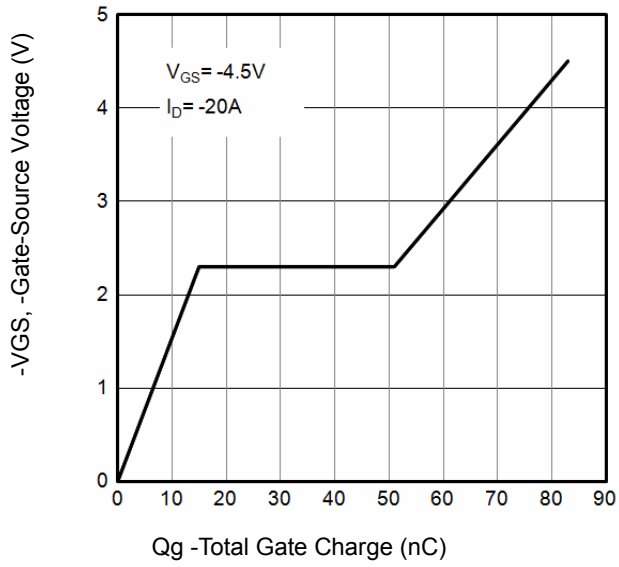


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

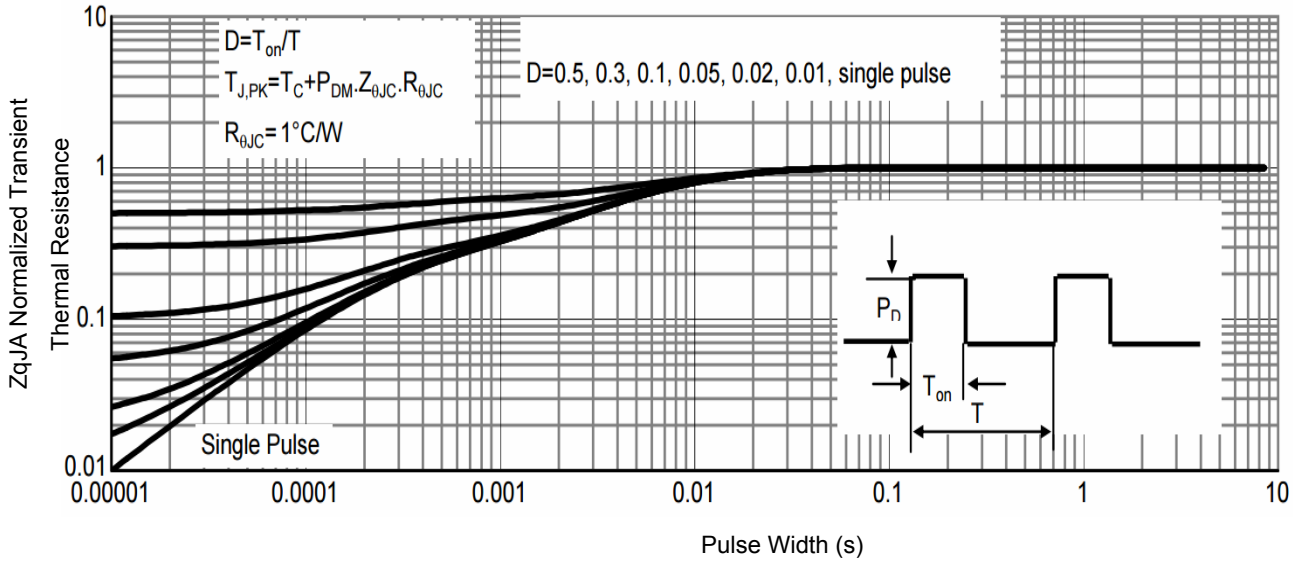


Fig9. Normalized Maximum Transient Thermal Impedance

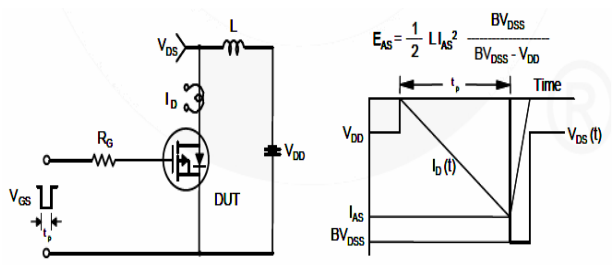


Fig10. Unclamped Inductive Test Circuit and Waveforms

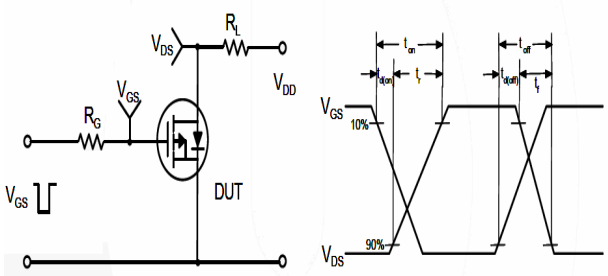
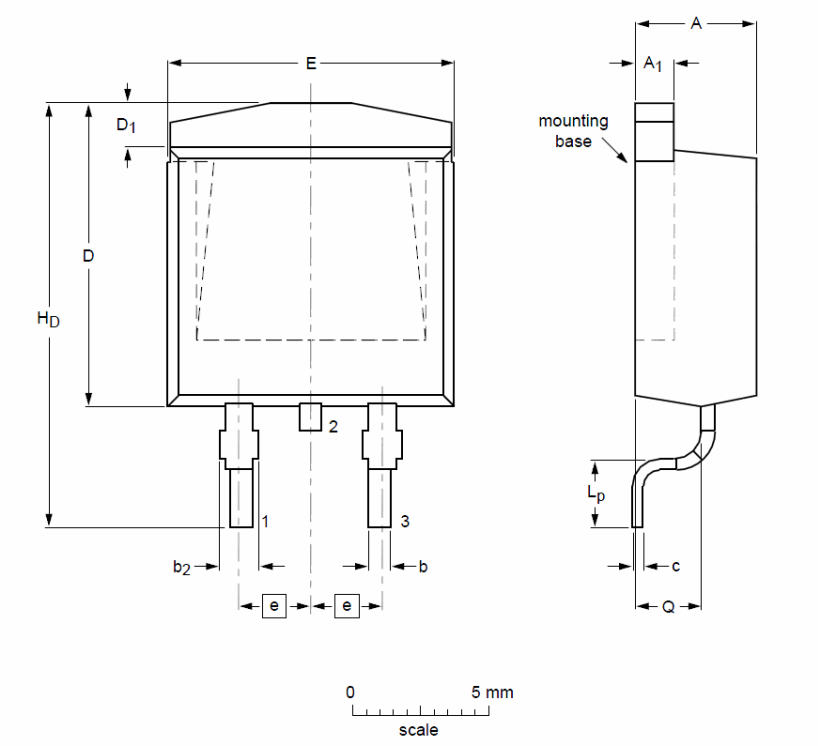


Fig11. Switching Time Test Circuit and waveforms

TO-263 Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	4.40	4.55	4.70	**A_1**	1.25	1.30	1.40
b	0.60	0.76	0.85	**b_2**	1.05	1.30	1.45
c	0.35	0.45	0.60	**D**	9.80	10.20	10.50
D_1	1.20	1.51	1.60	**E**	9.70	10.10	10.30
e	--	2.54	--	**H_D**	14.80	15.45	15.80
L_P	2.10	2.40	2.90	**Q**	2.20	2.50	2.60

Customer Service

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