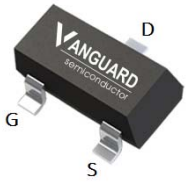
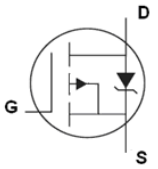
Features

- P-Channel，-5V Logic Level Control
- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ V_{GS}=-4.5 V
- Fast Switching
- High Effective
- Pb-free lead plating; RoHS compliant; Hg-Free

V_{DS}	-60	V
$R_{DS(on),TYP}$@ V_{GS}=-10 V	140	mΩ
$R_{DS(on),TYP}$@ V_{GS}=-4.5 V	170	mΩ
I_D	-2.1	A

SOT23





Pb-Free RoHS Halogen-Free

Part ID	Package Type	Marking	Tape and reel information
VSC180P06MS	SOT23	P06	3000pcs/reel

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

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		-60	V
I_S	Diode continuous forward current	T_A=25°C	-1.2	A
I_D	Continuous drain current@V_{GS}=10V	T_A=25°C	-2.1	A
		T_A=100°C	-1.3	A
I_{DM}	Pulse drain current tested ②	T_A=25°C	-8.4	A
P_D	Power dissipation	T_A=25°C	1.25	W
V_{GS}	Gate-Source voltage		±20	V
T_{STG}	Storage temperature range		-55 to 150	°C
T_J	Maximum Junction Temperature①		150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	80	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	100	°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	-60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current（T_A = =25℃）	V_{DS}=-60V,V_{GS}=0V	--	--	-1	μA
	Zero Gate Voltage Drain Current（T_A ==125℃）	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	-1.0	-2.0	-3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-10V, I_D=-2A	--	140	180	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-4.5V, I_D=-1A	--	170	200	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=-30V,V_{GS}=0V, f=1MHz	--	500	--	pF
C_{oss}	Output Capacitance		--	30	--	pF
C_{rss}	Reverse Transfer Capacitance		--	20	--	pF
Q_g	Total Gate Charge	V_{DS}=-30V,I_D=-2A, V_{GS}=-10V	--	12	--	nC
Q_{gs}	Gate-Source Charge		--	1.8	--	nC
Q_{gd}	Gate-Drain Charge		--	4.2	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-30V, I_D=-2A, R_G=6.8Ω, V_{GS}=-10V	--	8	--	nS
t_r	Turn-on Rise Time		--	10	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	22	--	nS
t_f	Turn-Off Fall Time		--	11	--	nS
Source- Drain Diode Characteristics@ T_J = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=-1A,V_{GS}=0V	--	-0.80	-1.0	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=-2A, V_{GS}=0V di/dt=-100A/μs	--	18	--	nS
Q_{rr}	Reverse Recovery Charge		--	10	--	nC

NOTE:

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

②Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

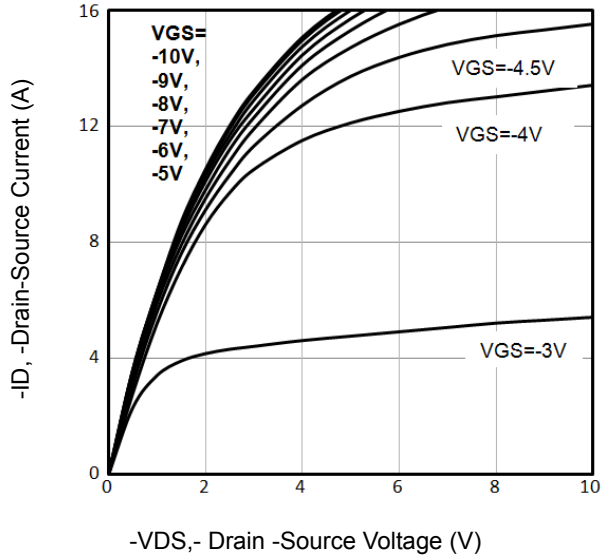


Fig1. Typical Output Characteristics

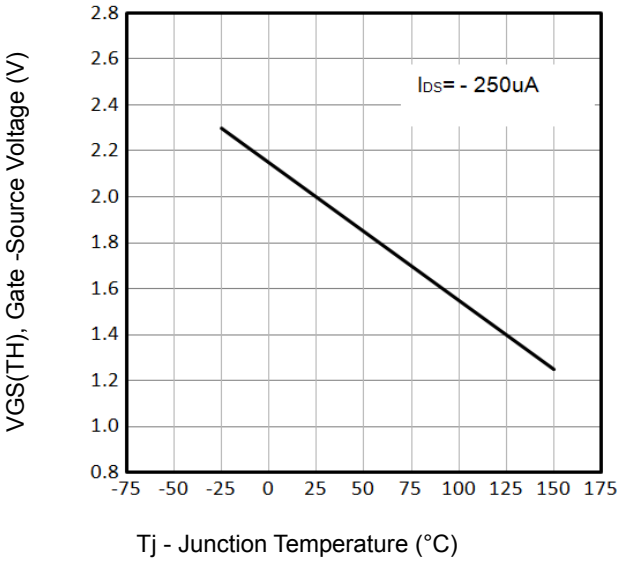


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

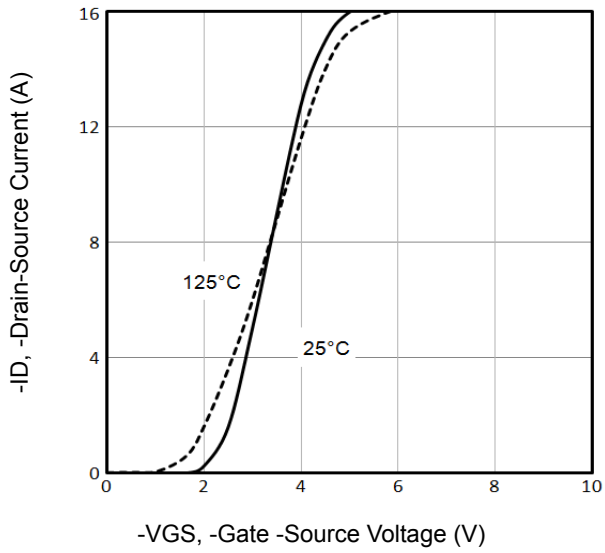


Fig3. Typical Transfer Characteristics

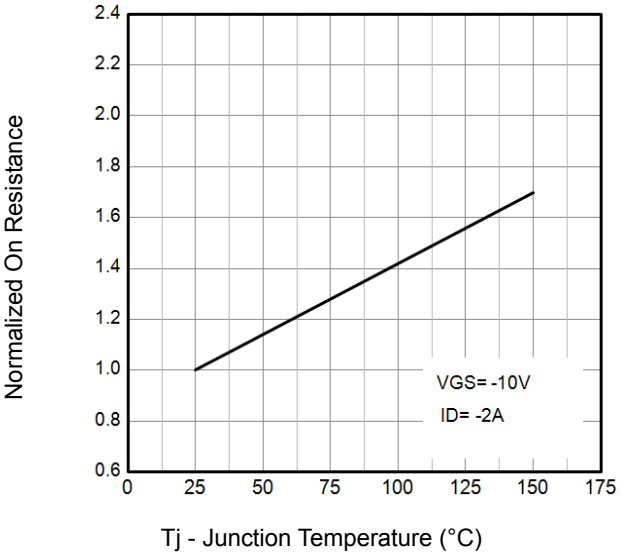


Fig4. Normalized On-Resistance Vs. Tj

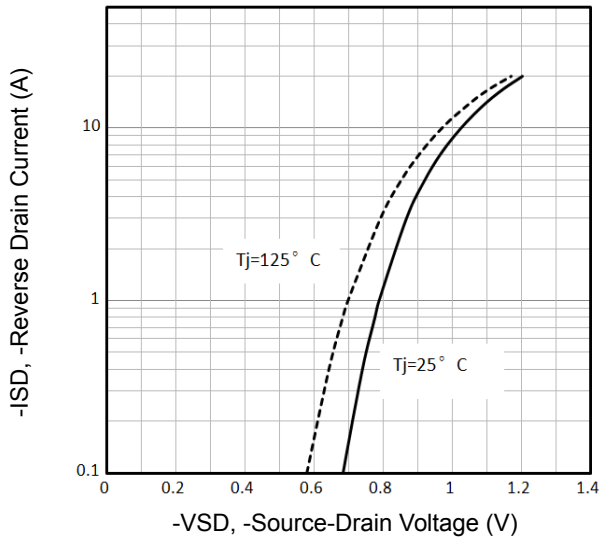


Fig5. Typical Source-Drain Diode Forward Voltage

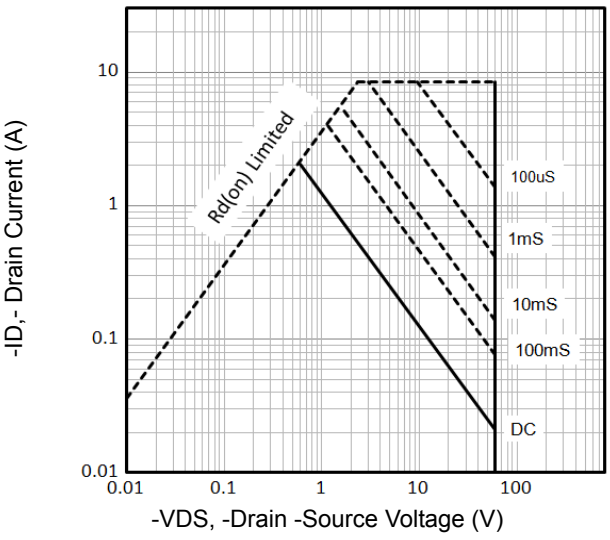


Fig6. Maximum Safe Operating Area

Typical Characteristics

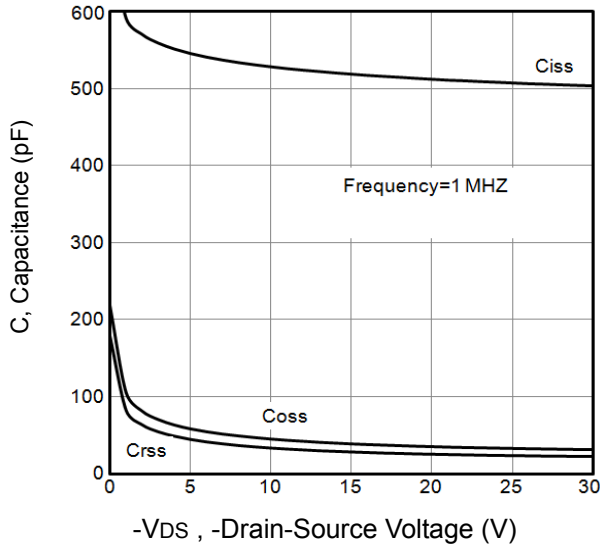


Fig7. Typical Capacitance Vs.Drain-Source Voltage

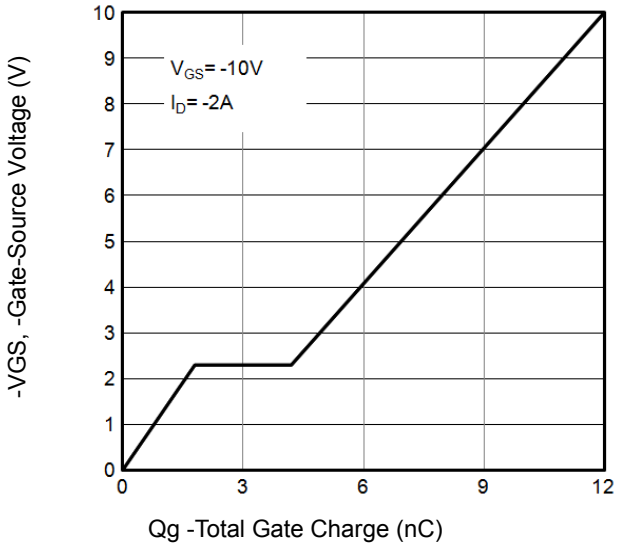


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

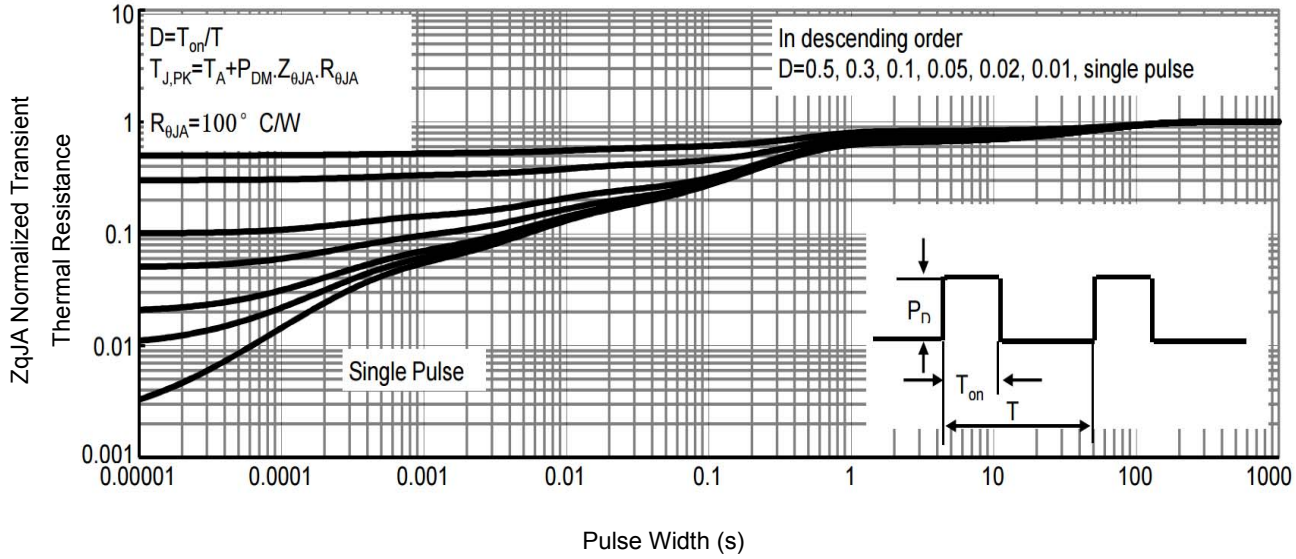


Fig9. Normalized Maximum Transient Thermal Impedance

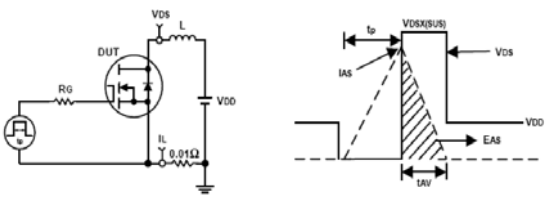


Fig10. Unclamped Inductive Test Circuit and Waveforms

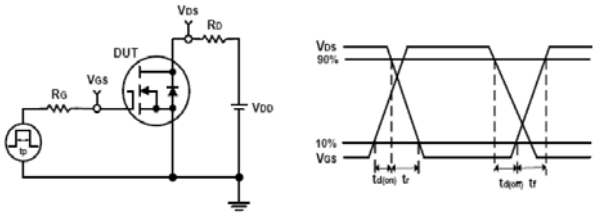
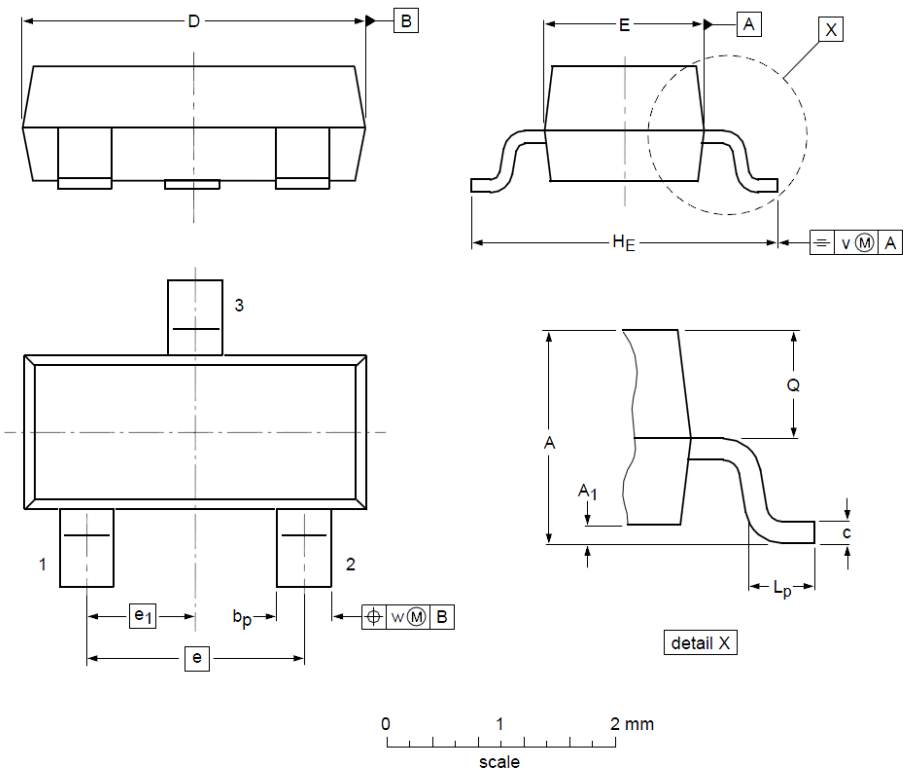


Fig11. Switching Time Test Circuit and waveforms

SOT23 Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.03	1.10	**A_1**	0.01	0.05	0.10
b_p	0.38	0.42	0.48	**c**	0.09	0.13	0.15
D	2.80	2.92	3.00	**E**	1.20	1.33	1.40
e	--	1.90	--	**e_1**	--	0.95	--
H_E	2.10	2.40	2.50	**L_p**	0.15	0.23	0.45
Q	0.45	0.49	0.55	**v**	--	0.20	--
w	--	0.10	--				

Customer Service

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