VANGUARD semiconductor

VSI160N10MS

100V/8A N-Channel Advanced Power MOSFET

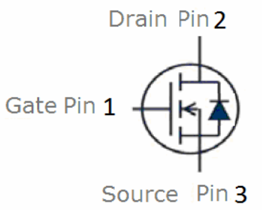
Features

- N-Channel
- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ V_{GS}=4.5 V
- Fast Switching
- Pb-free lead plating; RoHS compliant

V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10V	150	mΩ
$R_{DS(on),TYP}$@ V_{GS}=4.5 V	165	mΩ
I_D	8	A

TO-251-S

Pb-Free RoHS HF Halogen-Free



Part ID	Package Type	Marking	Tape and reel information
VSI160N10MS	TO-251-S	160N10	80pcs/Tube

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

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		100	V
I_S	Diode continuous forward current	T_C =25°C	8	A
I_D	Continuous drain current@V_{GS}=10V	T_C =25°C	8	A
		T_A =70°C	5	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	16	A
EAS	Avalanche energy, single pulsed ②	I_D=4A	2.4	mJ
P_D	Maximum power dissipation	T_A =25°C	20	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	7.5	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	60	°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	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	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±16V,V_{DS}=0V	--	--	±10	uA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	2.0	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=10V, I_D=5A	--	150	160	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=4.5V, I_D=3A	--	165	180	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1MHz	--	405	--	pF
C_{oss}	Output Capacitance		--	36	--	pF
C_{rss}	Reverse Transfer Capacitance		--	18	--	pF
Q_g	Total Gate Charge	V_{DS}=30V,I_D=1A, V_{GS}=10V	--	9	--	nC
Q_{gs}	Gate-Source Charge		--	1.5	--	nC
Q_{gd}	Gate-Drain Charge		--	2.1	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V, I_D=1A, R_G=6.8Ω, V_{GS}=10V	--	9	--	nS
t_r	Turn-on Rise Time		--	8.1	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	20	--	nS
t_f	Turn-Off Fall Time		--	13.5	--	nS
Source- Drain Diode Characteristics@ T_J = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=2.5A,V_{GS}=0V	--	0.81	1.3	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=1.5A, V_{GS}=0V di/dt=100A/μs	--	25	--	nS
Q_{rr}	Reverse Recovery Charge			31		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} = 4A, V_{GS} =10V. Part not recommended for use above this value

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

Typical Characteristics

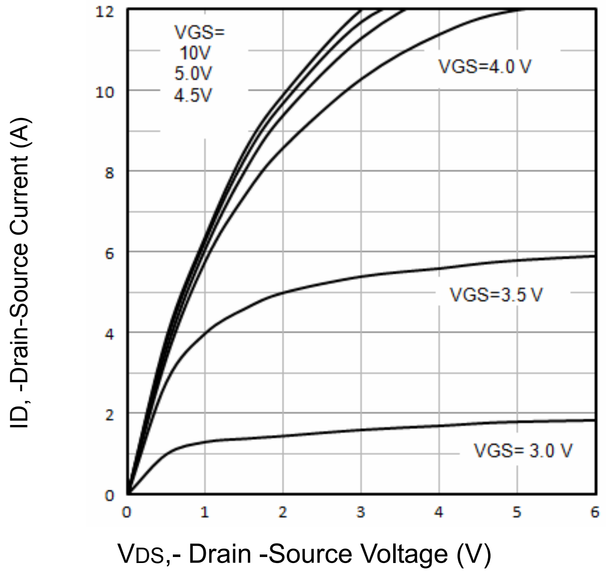


Fig1. Typical Output Characteristics

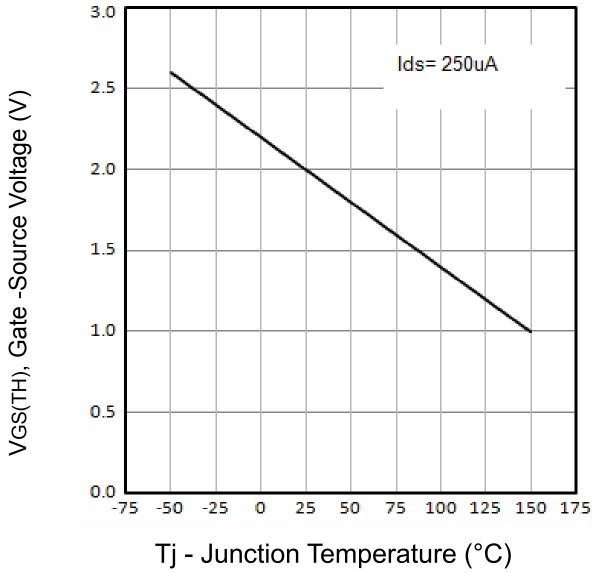


Fig2. Threshold Voltage Vs. Temperature

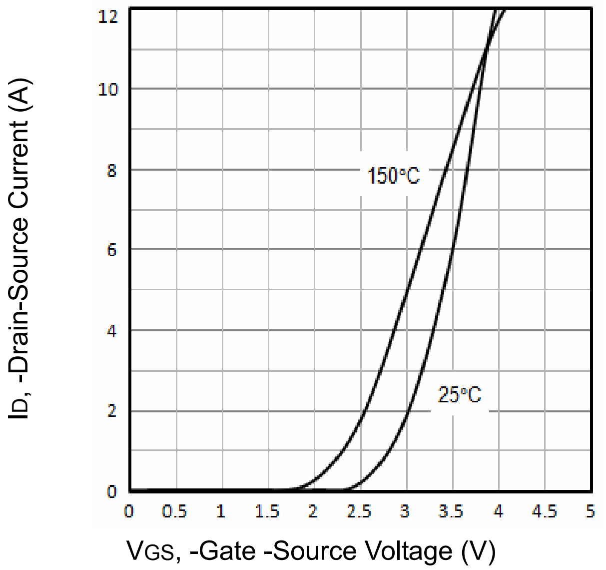


Fig3. Typical Transfer Characteristics

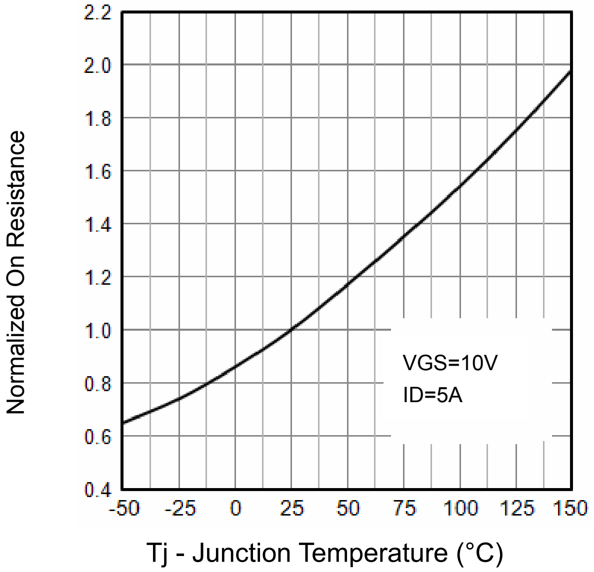


Fig4. Normalized On-Resistance Vs. Temperature

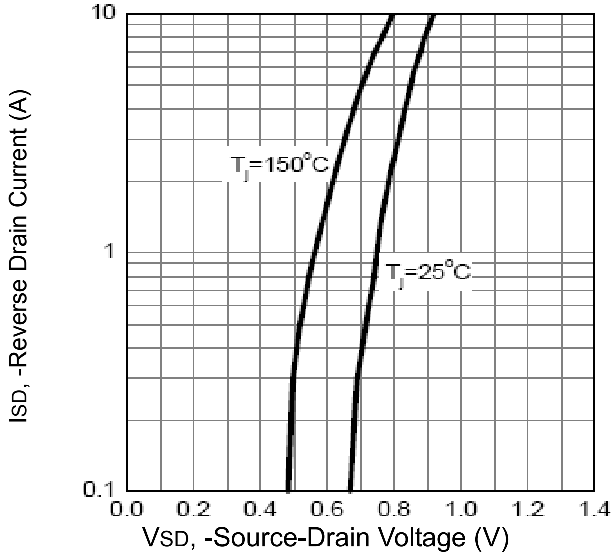


Fig5. Typical Source-Drain Diode Forward Voltage

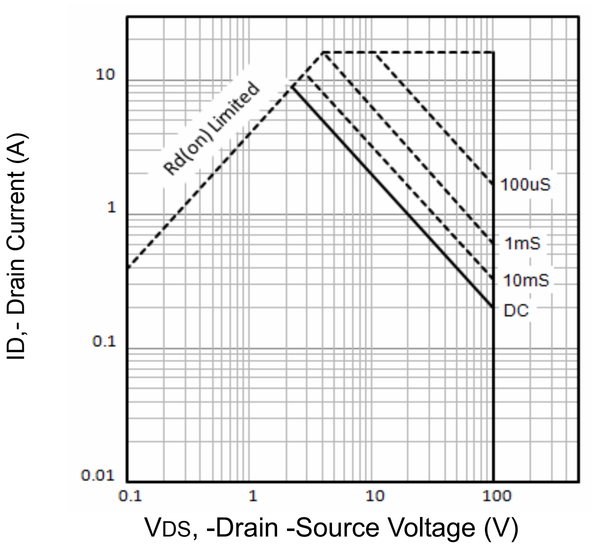


Fig6. Maximum Safe Operating Area

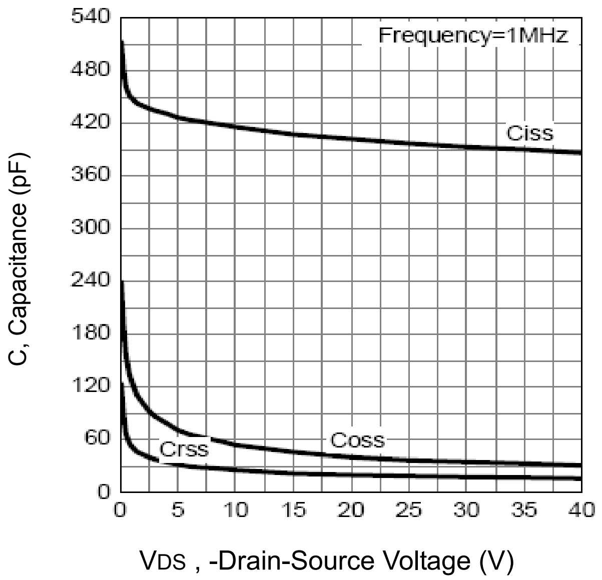


Fig7. Typical Capacitance Vs.Drain-Source Voltage

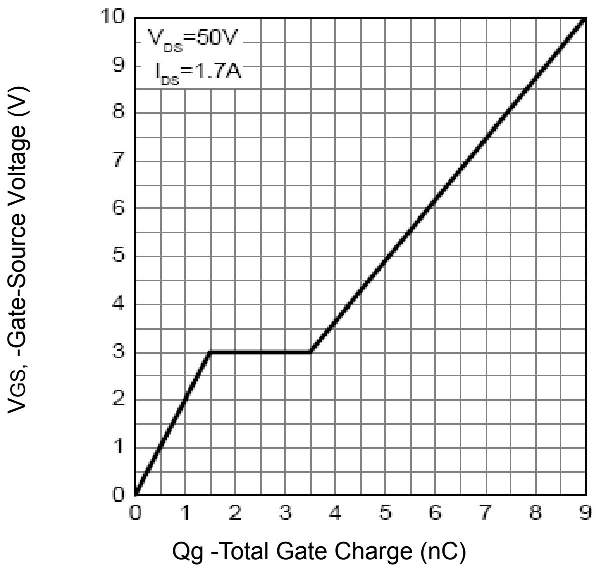


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

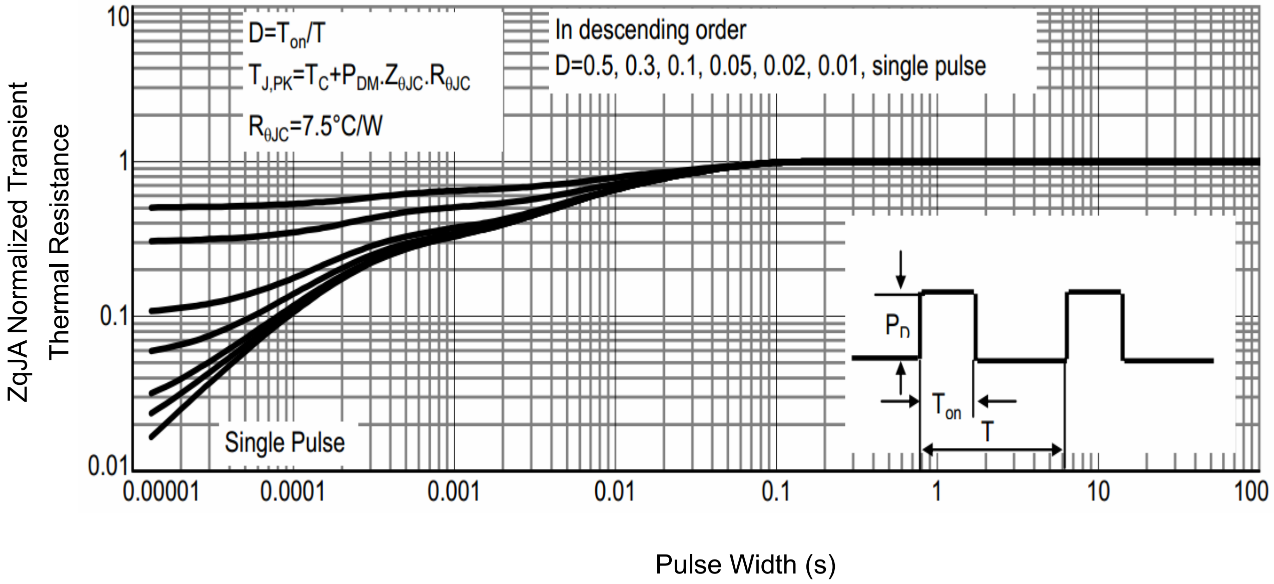


Figure 9: Normalized Maximum Transient Thermal

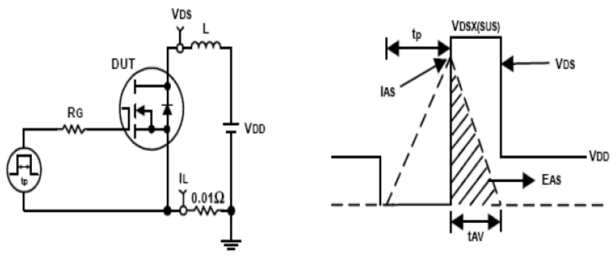


Fig10. Unclamped Inductive Test Circuit and Waveforms

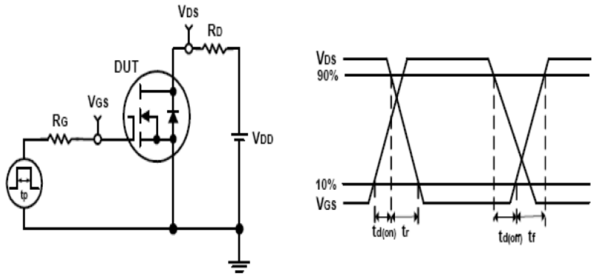
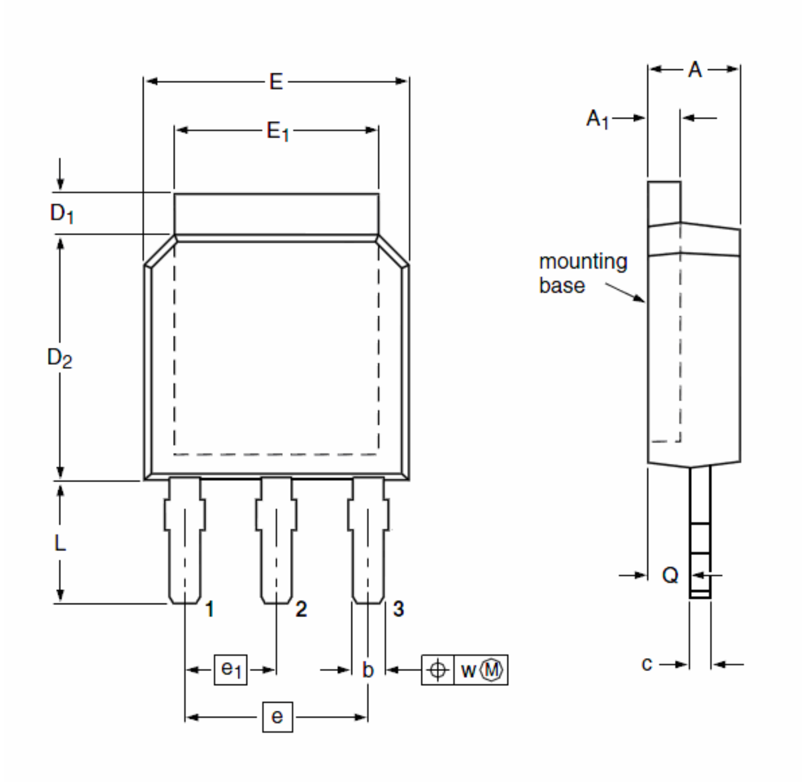


Fig11. Switching Time Test Circuit and waveforms

TO-251-S Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	2.10	2.30	2.50	**A_1**	0.40	0.48	0.60
b	0.65	0.75	0.85	**c**	0.40	0.50	0.60
D_1	0.65	0.90	1.20	**D_2**	5.90	6.08	6.25
E	6.35	6.58	6.80	**E_1**	5.10	5.28	5.50
e	--	2.28	--	**e_1**	--	4.57	--
L	4.75	5.15	5.85	**Q**	0.80	0.90	1.08
w	--	0.20	--				

Customer Service

Sales and Service:

Sales@vgsemi.com

Shen Zhen Vangaurd Semiconductor CO., LTD

TEL: (86-755) -26902410
FAX: (86-755) -26907027
WEB: **www.vgsemi.com**