

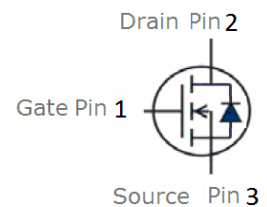
Features

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



Part ID	Package Type	Marking	Tape and reel information
VSI080N06MS	TO-251-S	080N06	80pcs/Tube

V_{DS}	60	V
$R_{DS(on),typ@VGS=10V}$	68	m Ω
$R_{DS(on),typ@VGS=4.5V}$	85	m Ω
I_D	15	A

TO-251-S


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

Symbol	Parameter	Rating	Unit	
$V_{(BR)DSS}$	Drain-Source breakdown voltage	60	V	
V_{GS}	Gate-Source voltage	± 16	V	
I_D	Continuous drain current@ $V_{GS}=10V$	$T_C=25^\circ\text{C}$	15	A
		$T_A=70^\circ\text{C}$	9.6	A
I_{DM}	Pulse drain current tested ①	$T_C=25^\circ\text{C}$	35	A
P_D	Maximum power dissipation	$T_C=25^\circ\text{C}$	30	W
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	15	A
EAS	Avalanche energy, single pulsed ②	$I_D=10A$	5	mJ
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$	
T_{STG}	Storage and operating temperature range	-55 to 175	$^\circ\text{C}$	
Thermal characteristics				
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	60	$^\circ\text{C/W}$	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	5	$^\circ\text{C/W}$	

Typical Electrical Characteristics

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(Tc=25°C)	V _{DS} =60V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125°C)	V _{DS} =60V, V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±16V, 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 Resistance ^②	V _{GS} =10V, I _D =10A	--	68	80	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ^②	V _{GS} =4.5V, I _D =5A	--	85	100	mΩ
g _{fs}	Forward Transconductance	V _{DS} = 15V, I _D =1.8A	3	--	--	S
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	--	435	--	pF
C _{oss}	Output Capacitance		--	40	--	pF
C _{riss}	Reverse Transfer Capacitance		--	28	--	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =1A, V _{GS} =10V	--	6	--	nC
Q _{gs}	Gate-Source Charge		--	1.7	--	nC
Q _{gd}	Gate-Drain Charge		--	1.5	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =1A, R _G =6.8Ω, V _{GS} =4.5V	--	6	--	nS
t _r	Turn-on Rise Time		--	15	--	nS
t _{d(off)}	Turn-Off Delay Time		--	16	--	nS
t _f	Turn-Off Fall Time		--	10	--	nS
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =10A, V _{GS} =0V	--	0.95	1.20	V

NOTE:

- ① Repetitive rating; pulse width limited by max. junction temperature
- ② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.1mH, R_G = 25Ω, I_{AS} = 10A, V_{GS} = 10V. Part not recommended for use above this value.
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

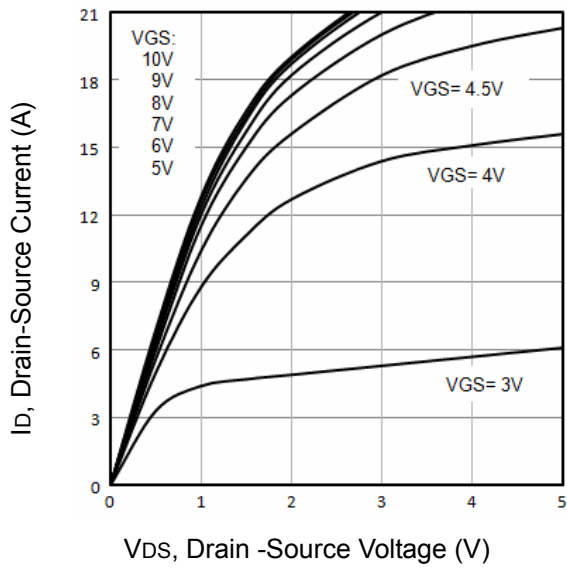


Fig1. Typical Output Characteristics

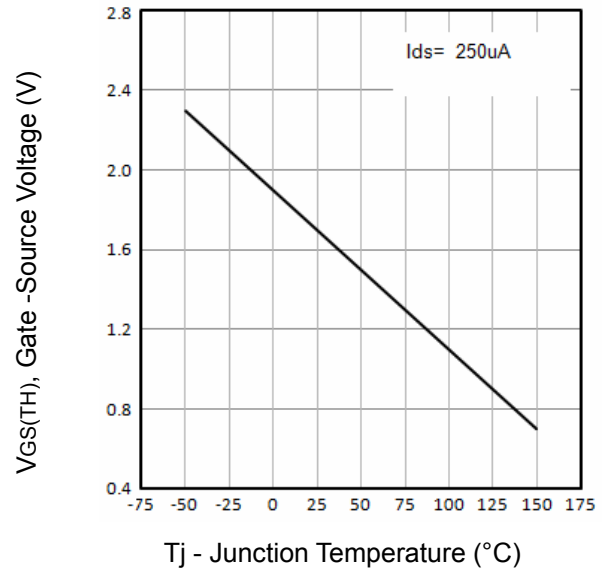


Fig2. Threshold Voltage Vs. Temperature

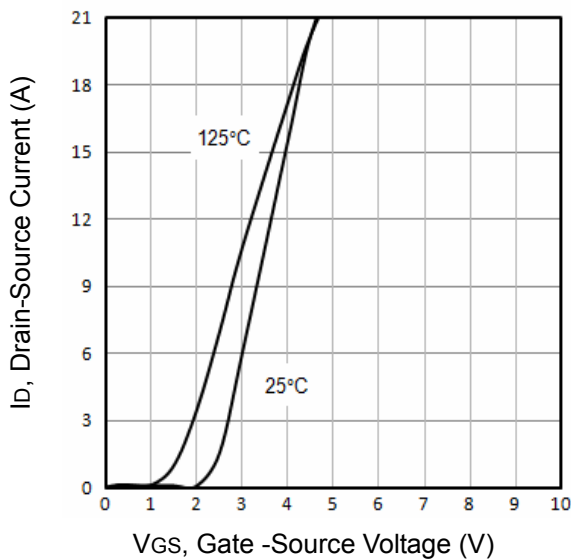


Fig3. Typical Transfer Characteristics

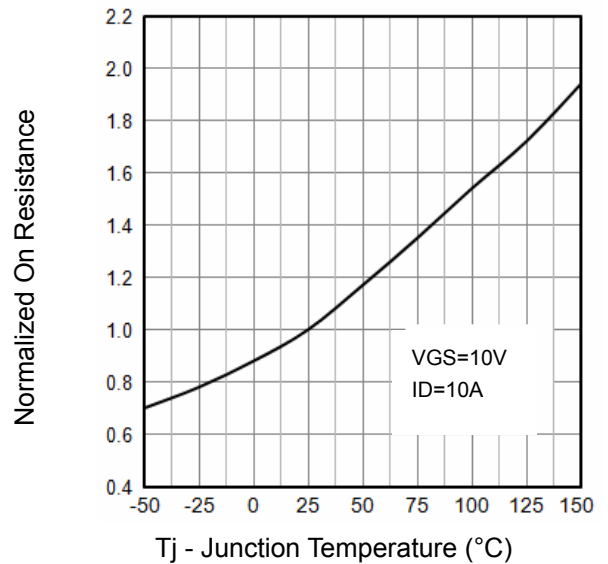


Fig4. Normalized On-Resistance Vs. Temperature

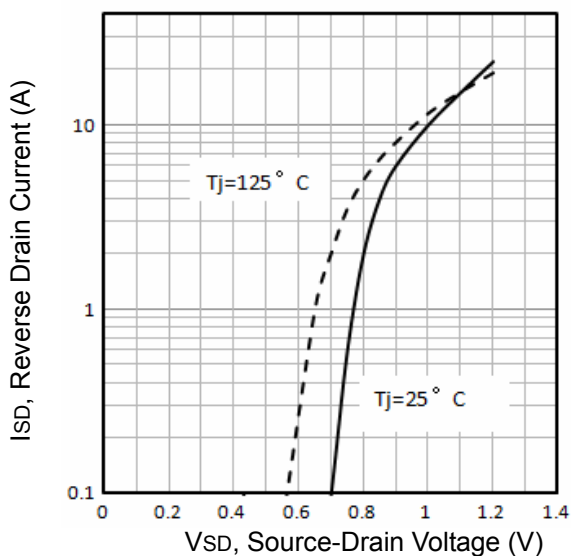


Fig5. Typical Source-Drain Diode Forward Voltage

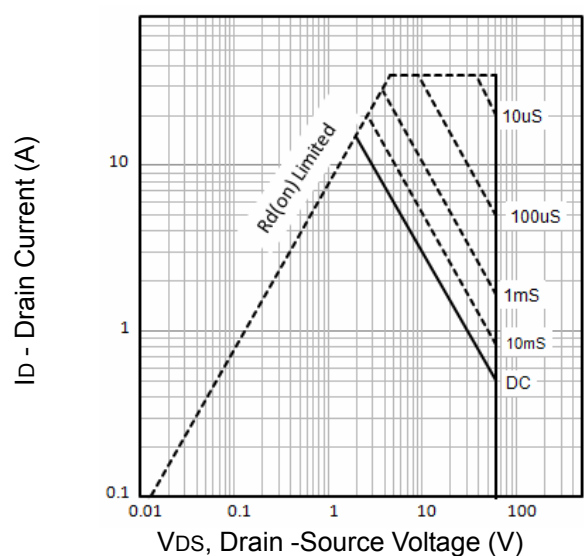


Fig6. Maximum Safe Operating Area

Typical Characteristics

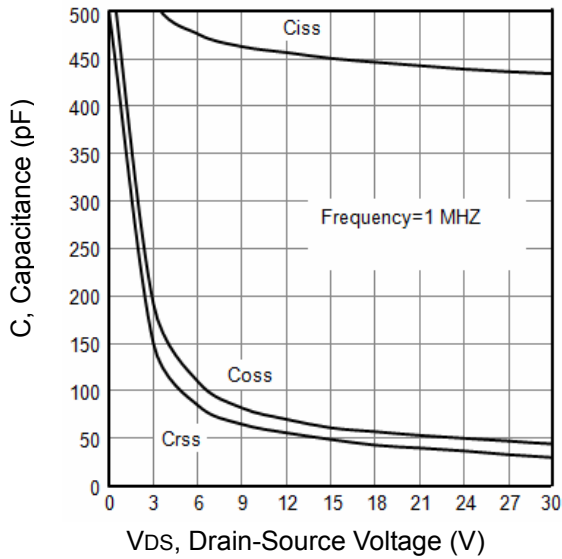


Fig7. Typical Capacitance Vs. Drain-Source Voltage

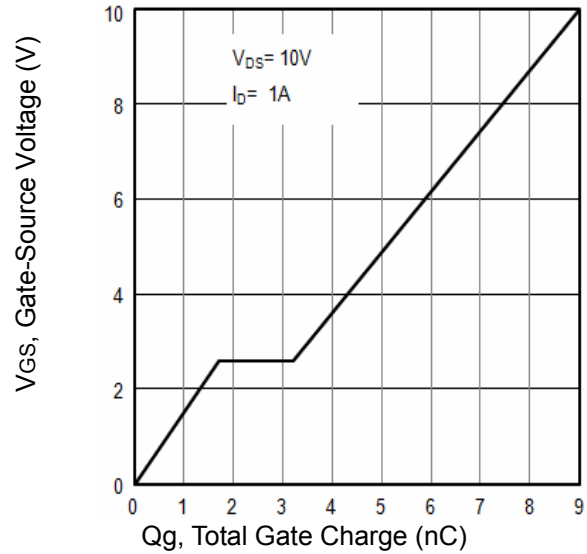


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

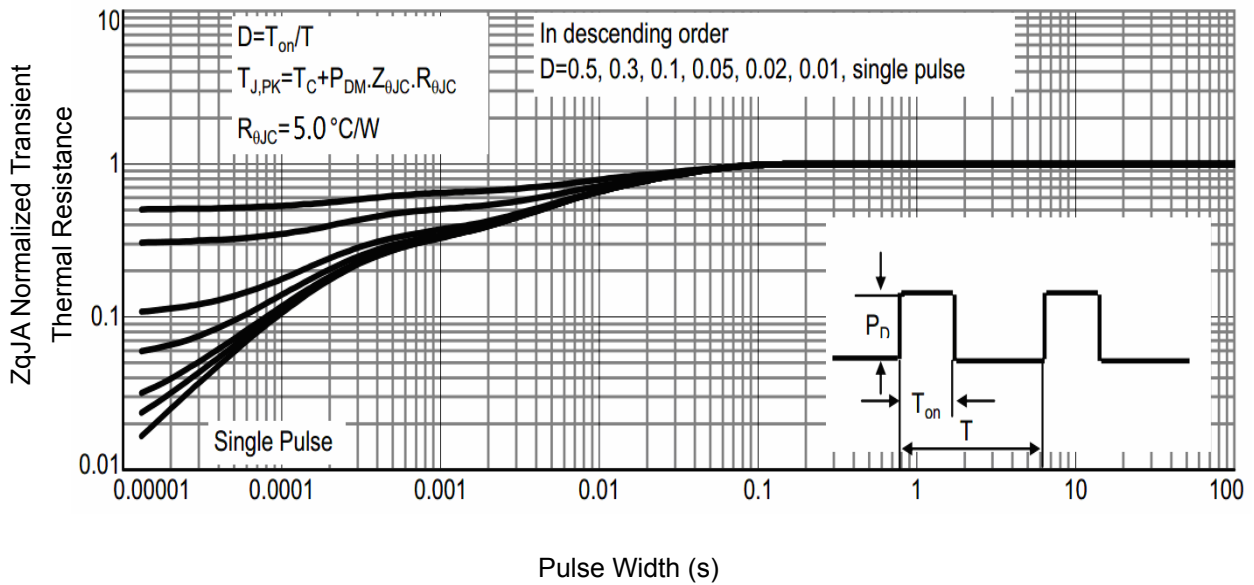


Figure 9: Normalized Maximum Transient Thermal

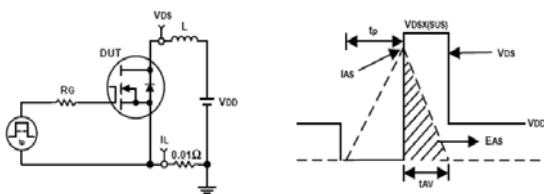


Fig10. Unclamped Inductive Test Circuit and waveforms

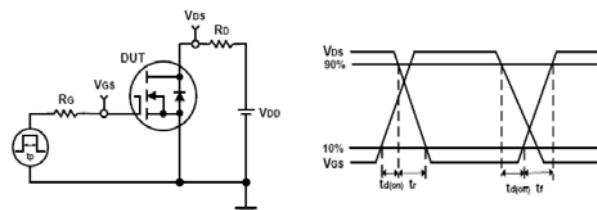
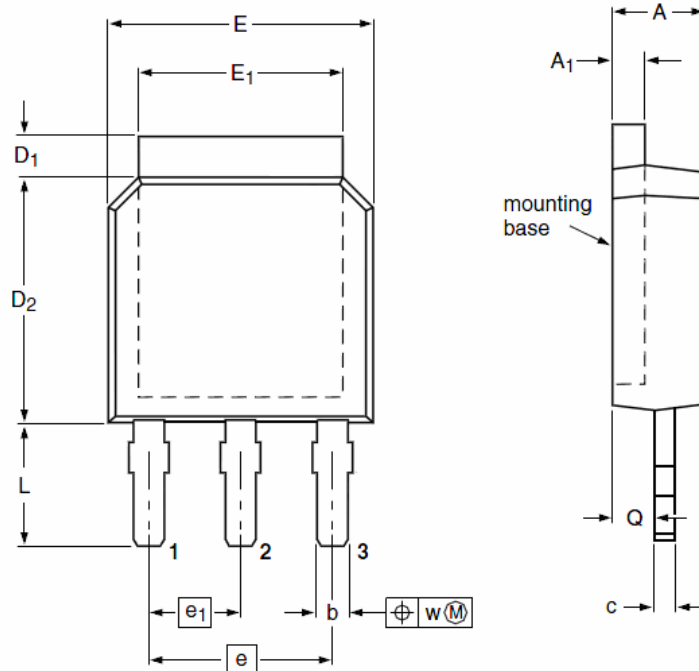


Fig11. Switching Time Test Circuit and waveforms

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 Vanguard Semiconductor CO., LTD

TEL: (86-755) -26902410

FAX: (86-755) -26907027

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