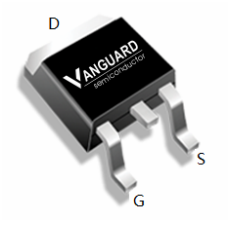
Features

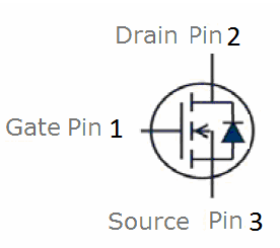
- N-Channel
- Enhancement mode
- Very low on-resistance @ V_{GS}=4.5 V
- Fast Switching
- Pb-free lead plating; RoHS compliant

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

TO-252



Pb-Free RoHS HF Halogen-Free



Part ID	Package Type	Marking	Tape and reel information
VSD080N06MS	TO-252	080N06	2500pcs/reel

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

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		60	V
VGS	Gate-Source voltage		±16	V
I_D	Continuous drain current@VGS=10V	T_C=25°C	15	A
		T_A=70°C	9.6	A
I_{DM}	Pulse drain current tested ①	T_C=25°C	35	A
P_D	Maximum power dissipation	T_C=25°C	30	W
I_S	Diode Continuous Forward Current	T_C=25°C	15	A
EAS	Avalanche energy, single pulsed ②	I_D=10A	5	mJ
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage and operating temperature range		-55 to 175	°C
Thermal characteristics				
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		60	°C/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		5	°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℃)	V_{DS}=60V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	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 Resistance②	V_{GS}=10V, I_D=10A	--	68	80	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=4.5V, I_D=5A	--	85	100	mΩ
gfs	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_{rss}	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%.

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Typical Characteristics

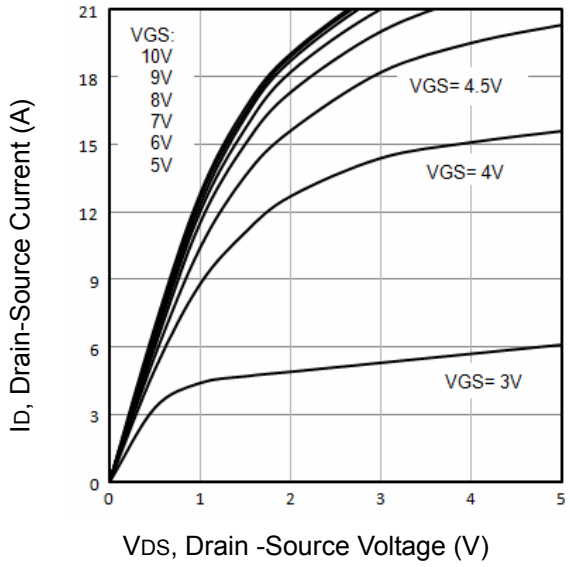


Fig1. Typical Output Characteristics

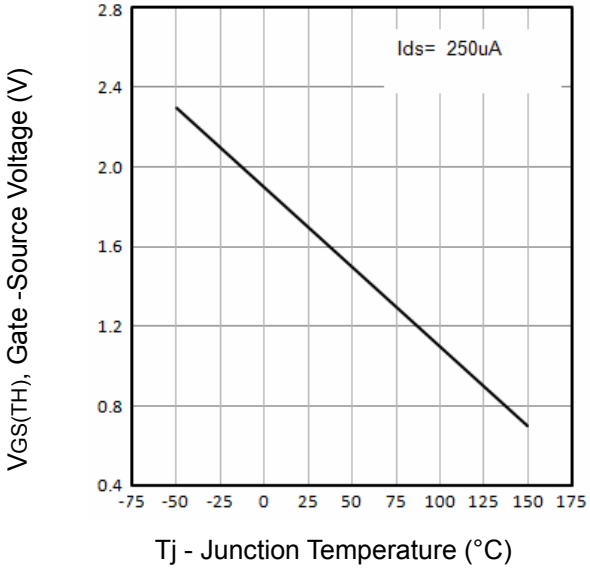


Fig2. Threshold Voltage Vs. Temperature

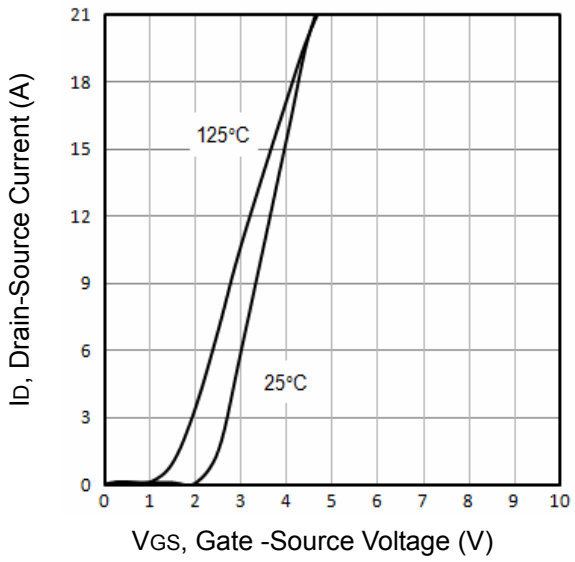


Fig3. Typical Transfer Characteristics

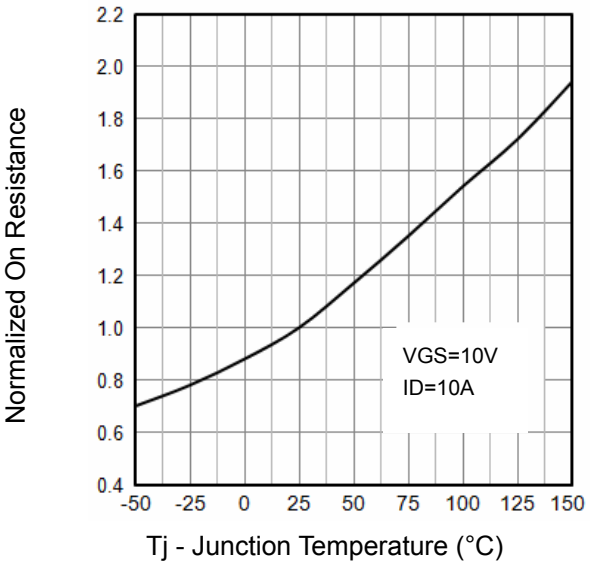


Fig4. Normalized On-Resistance Vs. Temperature

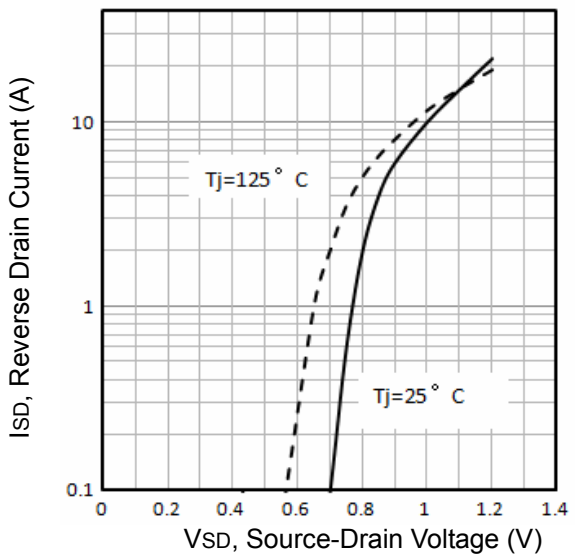


Fig5. Typical Source-Drain Diode Forward Voltage

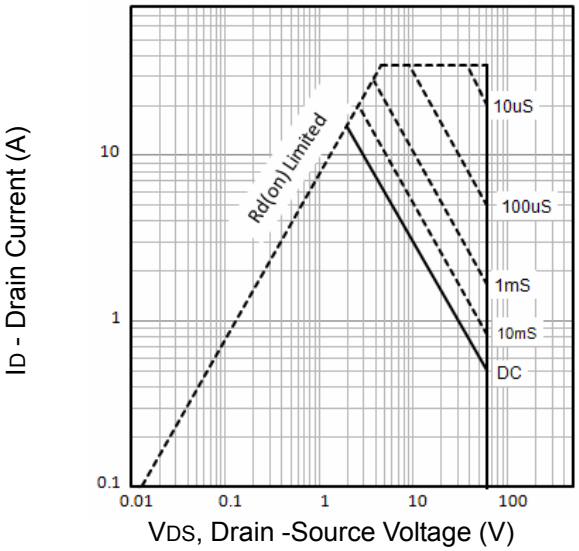


Fig6. Maximum Safe Operating Area

Typical Characteristics

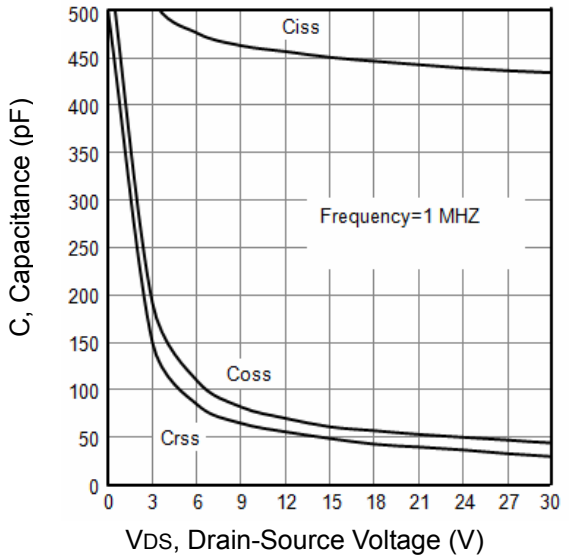


Fig7. Typical Capacitance Vs. Drain-Source Voltage

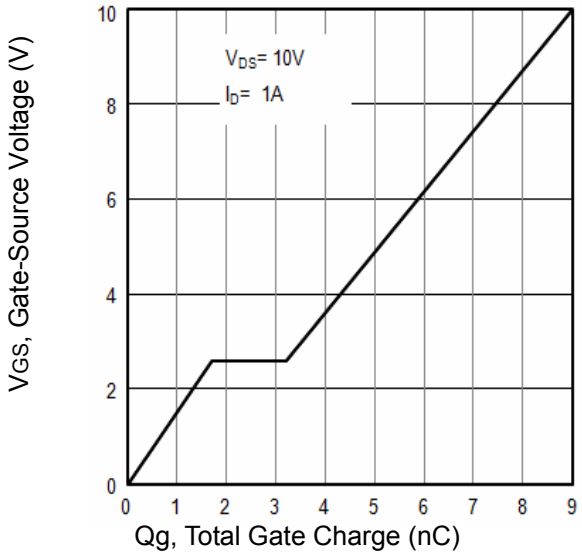


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

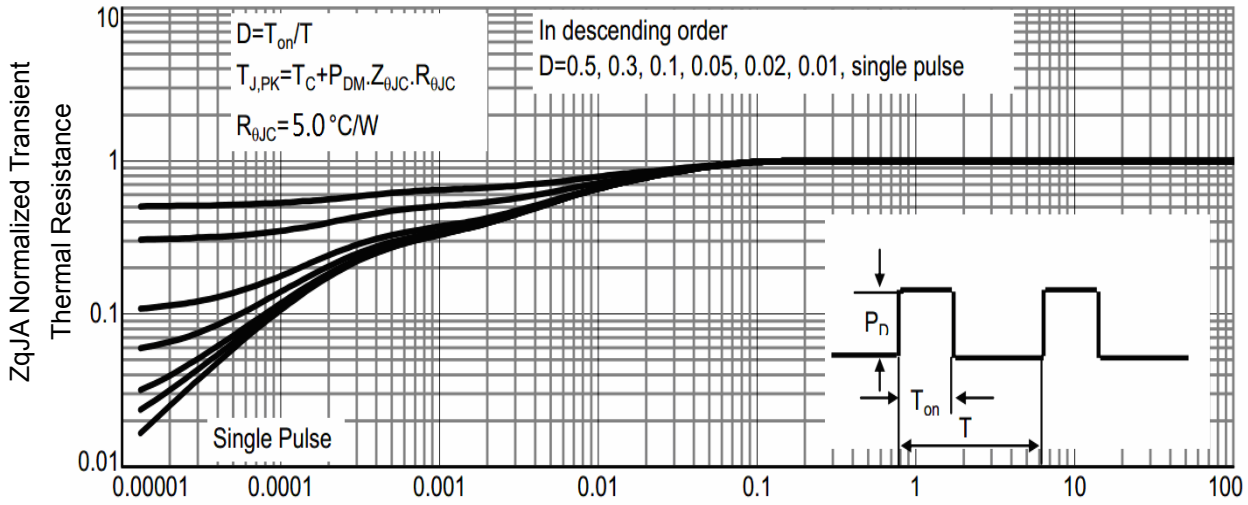


Figure 9: Normalized Maximum Transient Thermal

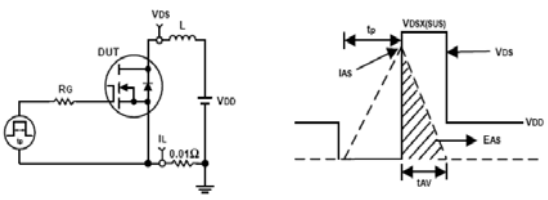


Fig10. Unclamped Inductive Test Circuit and waveforms

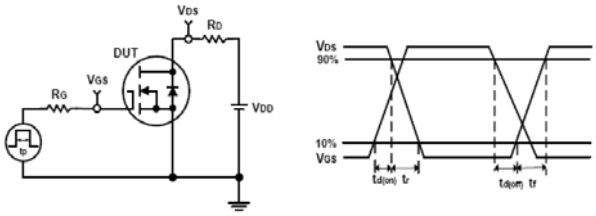
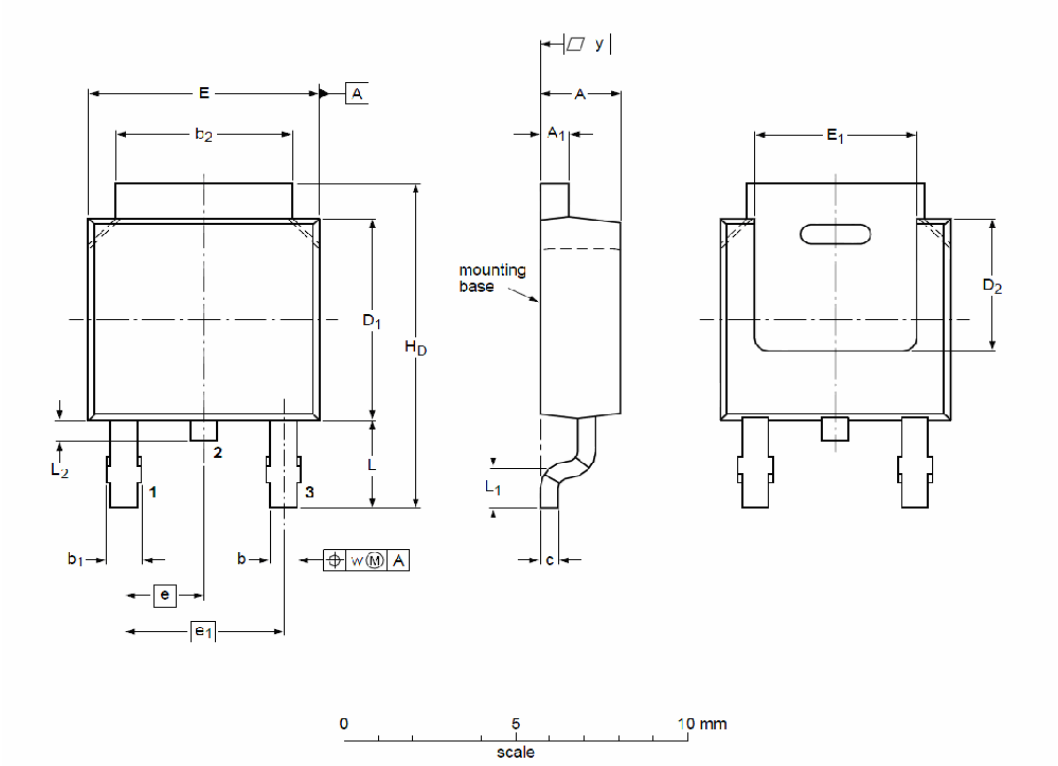


Fig11. Switching Time Test Circuit and waveforms

TO-252 Package Outline



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	2.22	2.30	2.38	**A_1**	0.46	0.58	0.93
b	0.71	0.79	0.89	**b_1**	0.90	0.98	1.10
b_2	5.00	5.30	5.46	**c**	0.20	0.40	0.56
D_1	5.98	6.05	6.22	**D_2**	--	4.00	--
E	6.47	6.60	6.73	**E_1**	5.10	5.28	5.45
e	--	2.28	--	**e_1**	--	4.57	--
H_D	9.60	10.08	10.40	**L**	2.75	2.95	3.05
L_1	--	0.50	--	**L_2**	0.80	0.90	1.10
w	--	0.20	--	**y**	0.20	--	--

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