

Features

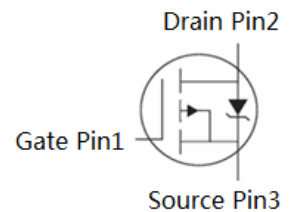
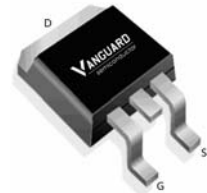
- P-Channel, -5V Logic level Control
- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=-4.5\text{ V}$
- Fast Switching
- 100% Avalanche Tested
- Pb-free lead plating; RoHS compliant

V_{DS}	-100	V
$R_{DS(on),TYP} @ V_{GS}=-10\text{ V}$	26	$m\Omega$
$R_{DS(on),TYP} @ V_{GS}=-4.5\text{ V}$	29	$m\Omega$
I_D	-55	A



Part ID	Package Type	Marking	Tape and reel information
VSD030P10MS	TO-252	030P10M	2500pcs/Reel

TO-252



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (Tc=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 _{θJC}	Thermal Resistance-Junction to Case		1.0	°C/W
R _{θJA}	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°C)	V _{DS} =-100V,V _{GS} =0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(Tc=125°C)	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	--	26	30	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =-4.5V, I _D =-10A	--	29	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°C	--	--	-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°C,I _{sd} =-10A, V _{GS} =0V	--	65	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=-100A/μs		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 cycles ≤ 2%.

Typical Characteristics

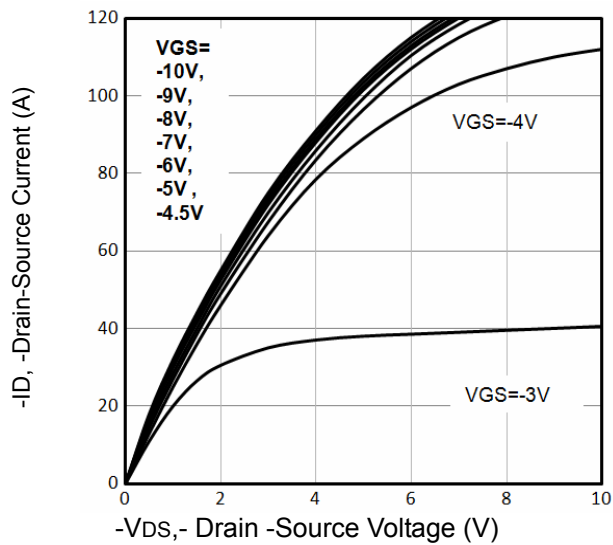


Fig1. Typical Output Characteristics

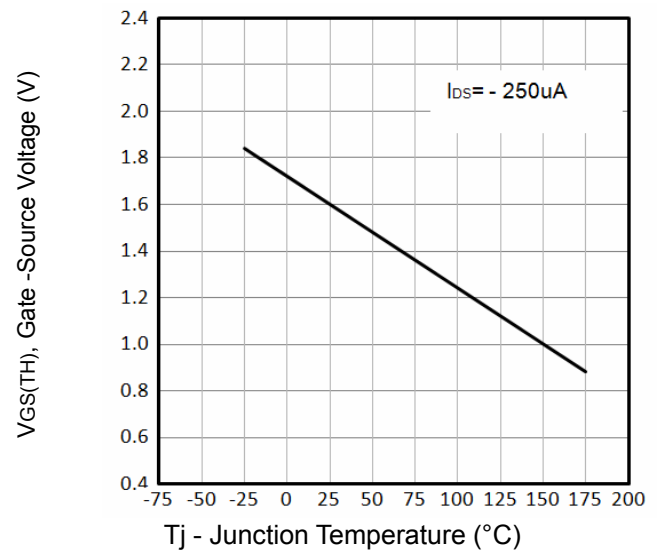


Fig2. Threshold Voltage Vs. Temperature

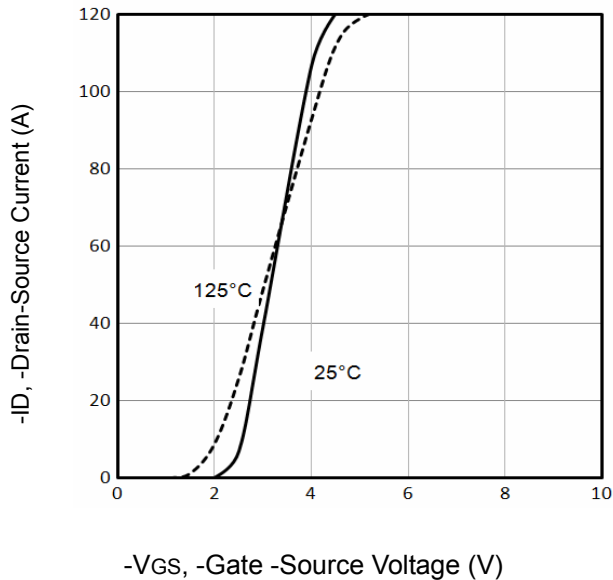


Fig3. Typical Transfer Characteristics

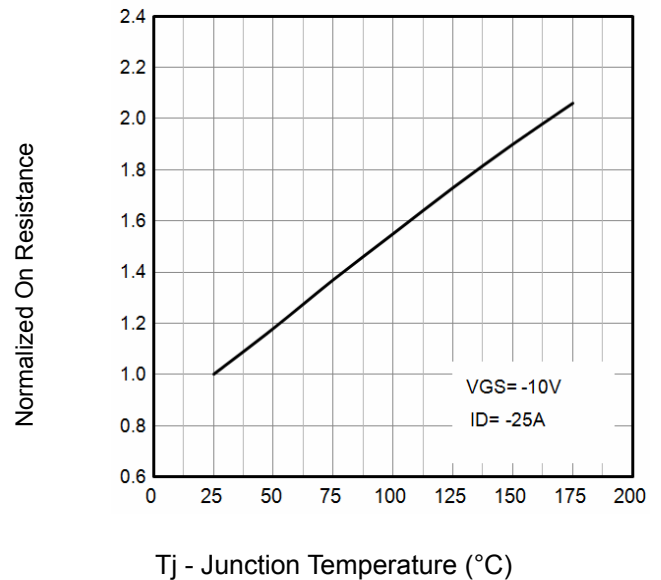


Fig4. Normalized On-Resistance Vs. Temperature

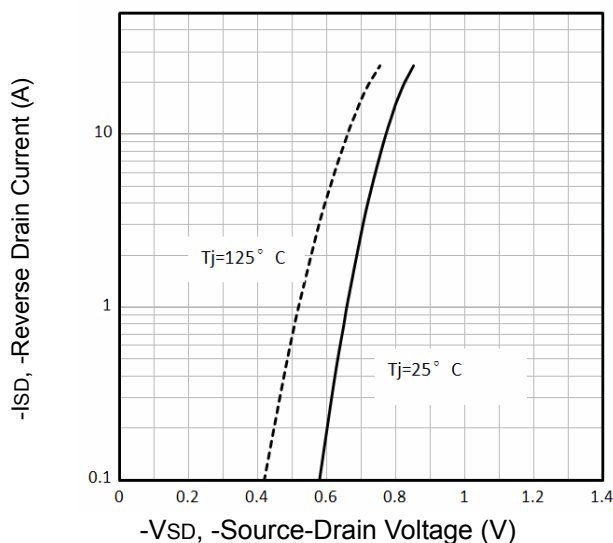


Fig5. Typical Source-Drain Diode Forward Voltage

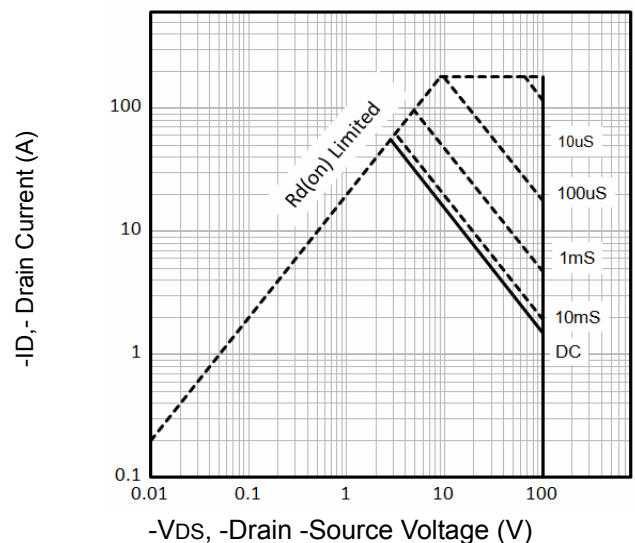


Fig6. Maximum Safe Operating Area

Typical Characteristics

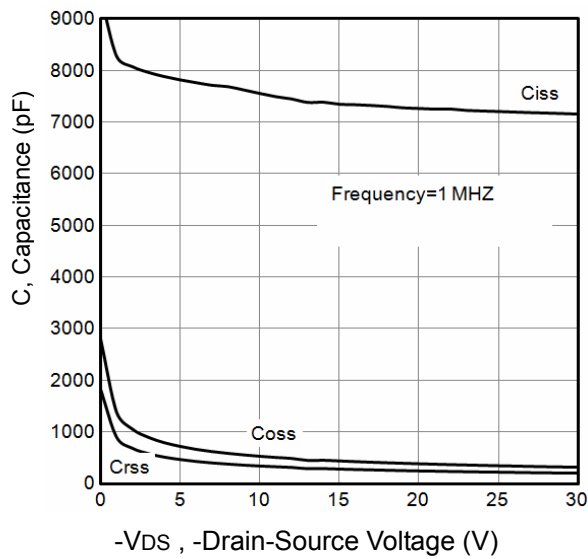


Fig7. Typical Capacitance Vs.Drain-Source Voltage

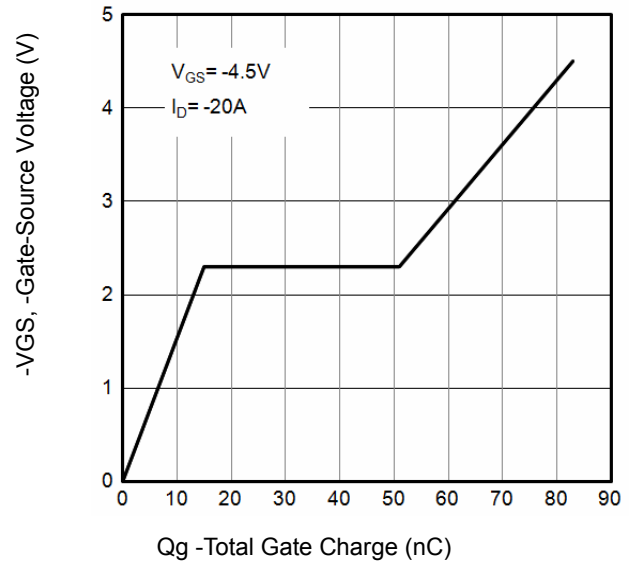


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

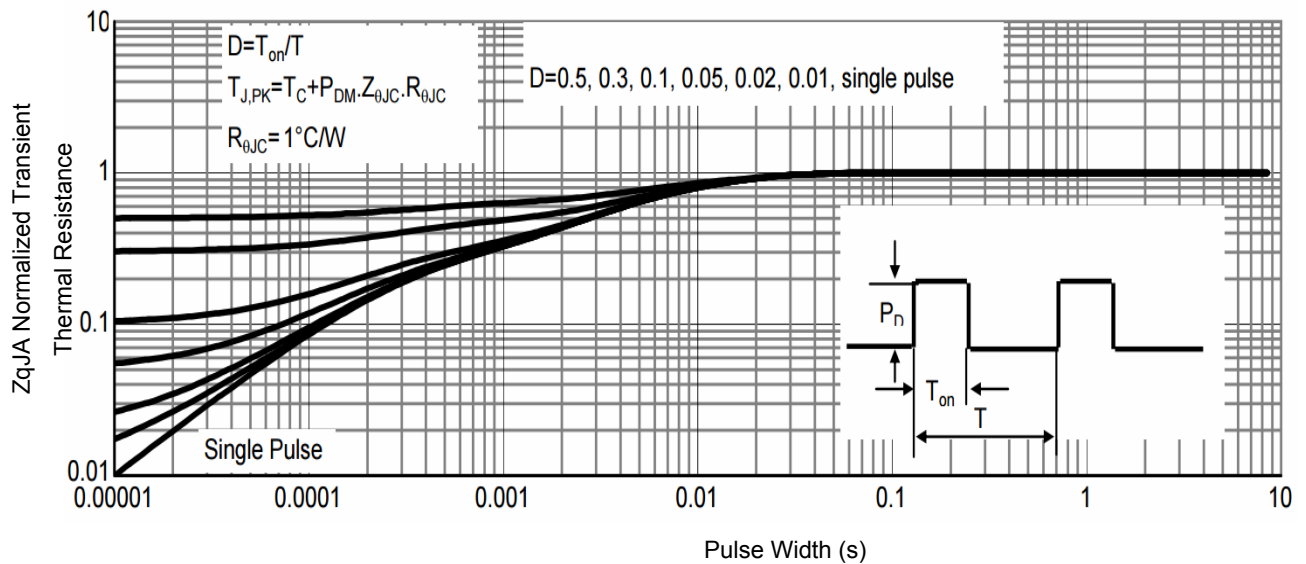


Fig9. Normalized Maximum Transient Thermal Impedance

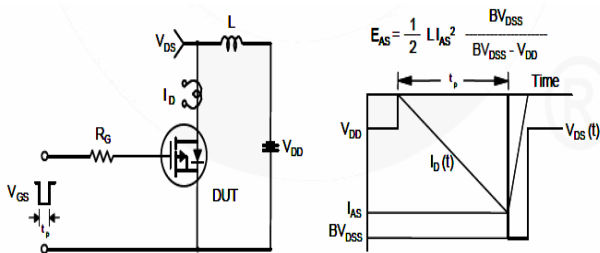


Fig10. Unclamped Inductive Test Circuit and Waveforms

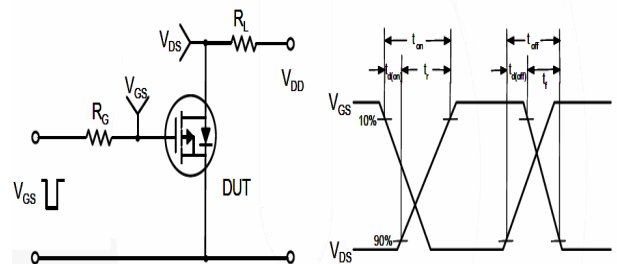
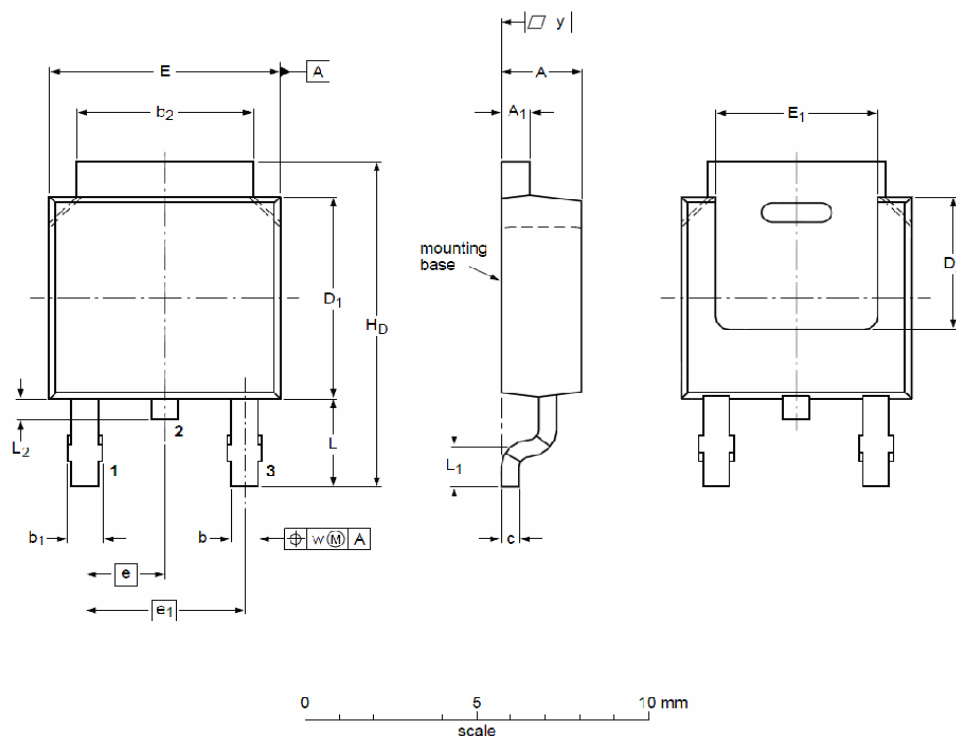


Fig11. Switching Time Test Circuit and waveforms

TO-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 ₀	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	--	--

Customer Service

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