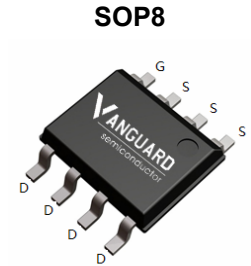


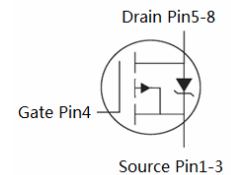
Features

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

V_{DS}	-30	V
$R_{DS(on),TYP@ V_{GS}=-10V}$	5.0	m Ω
$R_{DS(on),TYP@ V_{GS}=-4.5V}$	7.0	m Ω
I_D	-18	A



Part ID	Package Type	Marking	Tape and reel information
VSO004P03MS	SOP8	004P03M	3000pcs/Reel



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

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_c=25^\circ\text{C}$ Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage	± 20	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	-30	V	
T_j	Maximum Junction Temperature	150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range ①	-55 to 175	$^\circ\text{C}$	
I_s	Diode Continuous Forward Current	$T_c=25^\circ\text{C}$ -18	A	
Mounted on Large Heat Sink				
I_D	Continuous Drain current @ $V_{GS}=-10V$	$T_c=25^\circ\text{C}$	-18	A
		$T_c=100^\circ\text{C}$	-11.5	A
I_{DM}	Pulse Drain Current Tested ②	$T_c=25^\circ\text{C}$	-72	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	2	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		24	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		62.5	$^\circ\text{C/W}$

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	-30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(Tc=25°C)	V _{DS} =-24V,V _{GS} =0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(Tc=125°C)	V _{DS} =-24V,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	-1.6	-2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance ②	V _{GS} =-10V, I _D =-10A	--	5.0	6.0	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ②	V _{GS} =-4.5V, I _D =-5A	--	7.0	8.0	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =-15V,V _{GS} =0V, f=1MHz	--	5960	--	pF
C _{oss}	Output Capacitance		--	585	--	pF
C _{rss}	Reverse Transfer Capacitance		--	415	--	pF
Q _g	Total Gate Charge	V _{DS} =-15V,I _D =-10A, V _{GS} =-10V	--	85	--	nC
Q _{gs}	Gate-Source Charge		--	18	--	nC
Q _{gd}	Gate-Drain Charge		--	28	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =-15V, I _D =-5A, R _G =6.8Ω, V _{GS} =-10V	--	18	--	nS
t _r	Turn-on Rise Time		--	22	--	nS
t _{d(off)}	Turn-Off Delay Time		--	86	--	nS
t _f	Turn-Off Fall Time		--	45	--	nS
Source- Drain Diode Characteristics@ T_J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =-10A,V _{GS} =0V	--	-0.78	-1.3	V
t _{rr}	Reverse Recovery Time	T _J =25°C,I _{sd} =-10A, V _{GS} =0V	--	42	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=-100A/μs		33		nC

NOTE:

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

② Pulse width ≤ 300μs; duty cycles ≤ 2%.

Typical Characteristics

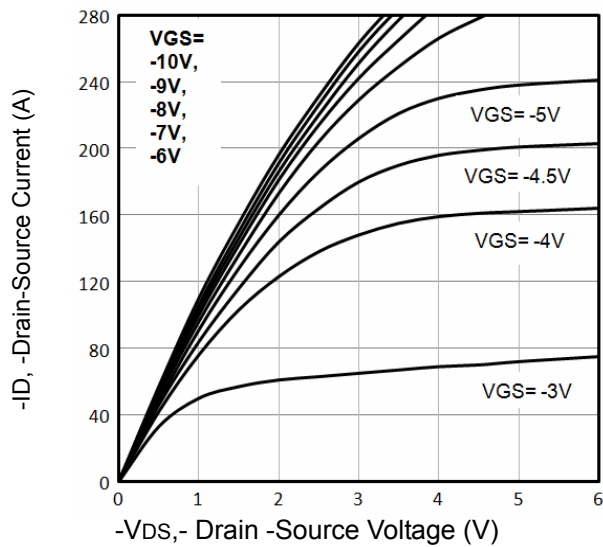


Fig1. Typical Output Characteristics

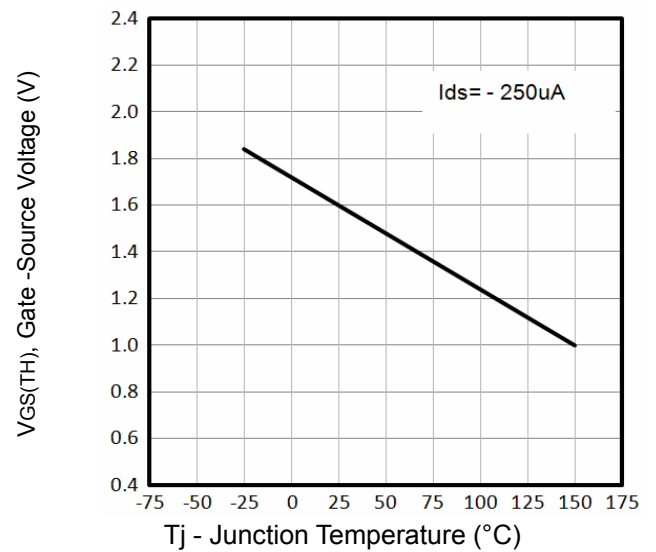


Fig2. Threshold Voltage Vs. Temperature

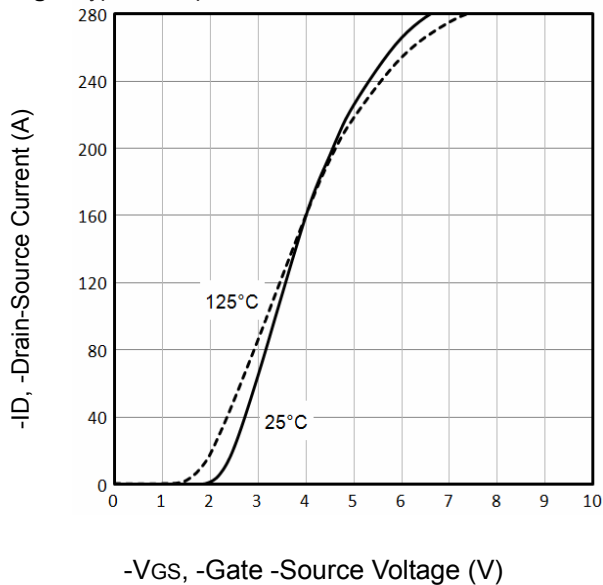


Fig3. Typical Transfer Characteristics

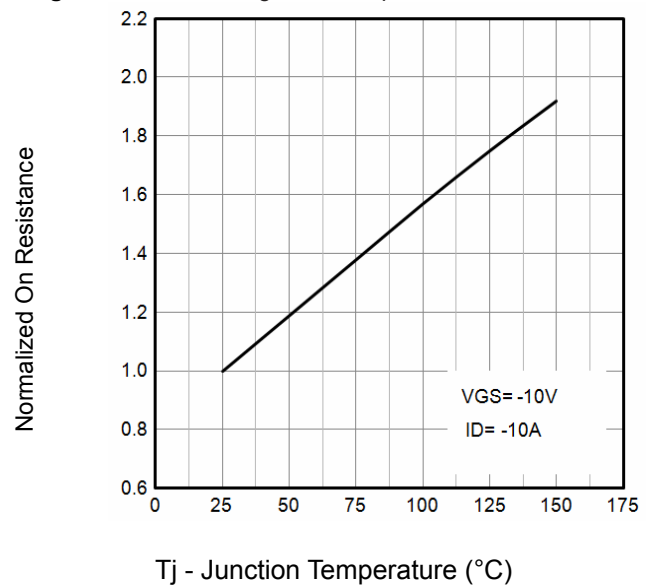


Fig4. Normalized On-Resistance Vs. Temperature

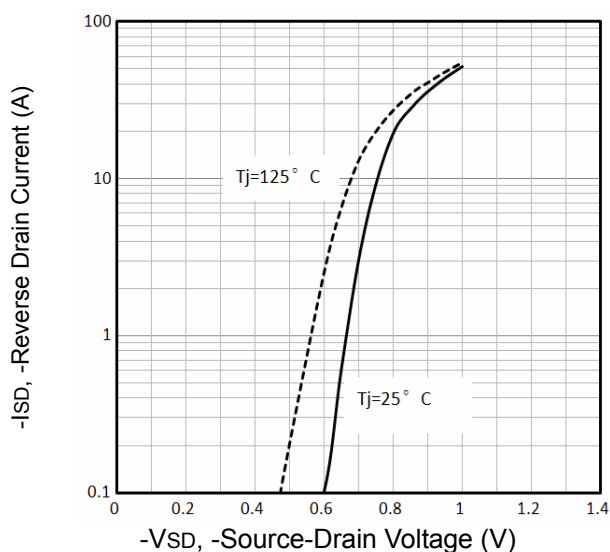


Fig5. Typical Source-Drain Diode Forward Voltage

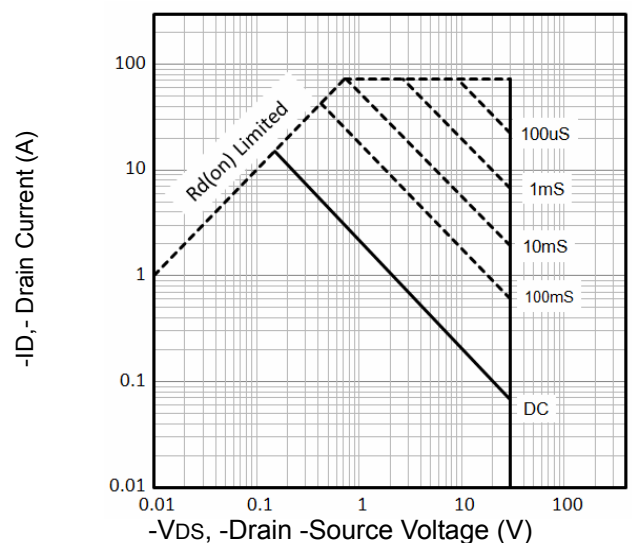


Fig6. Maximum Safe Operating Area

Typical Characteristics

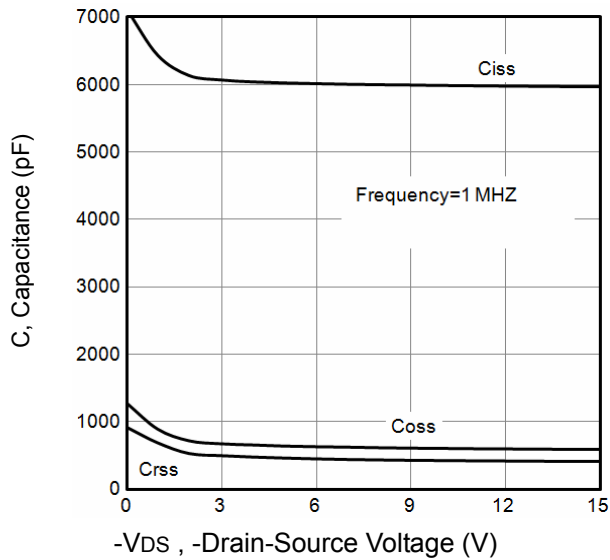


Fig7. Typical Capacitance Vs. Drain-Source Voltage

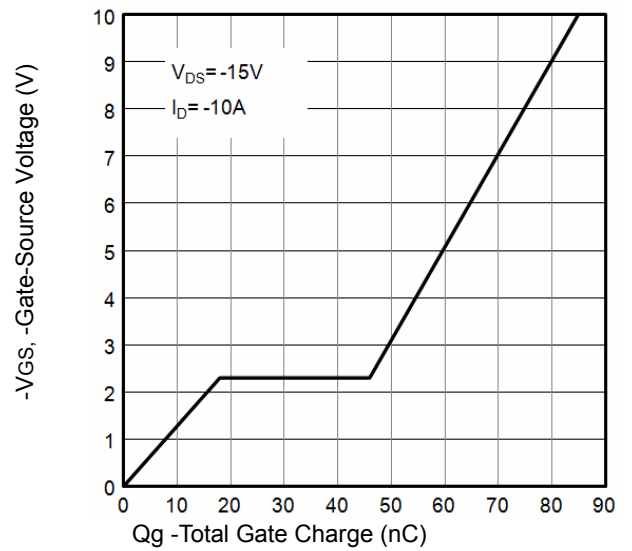


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

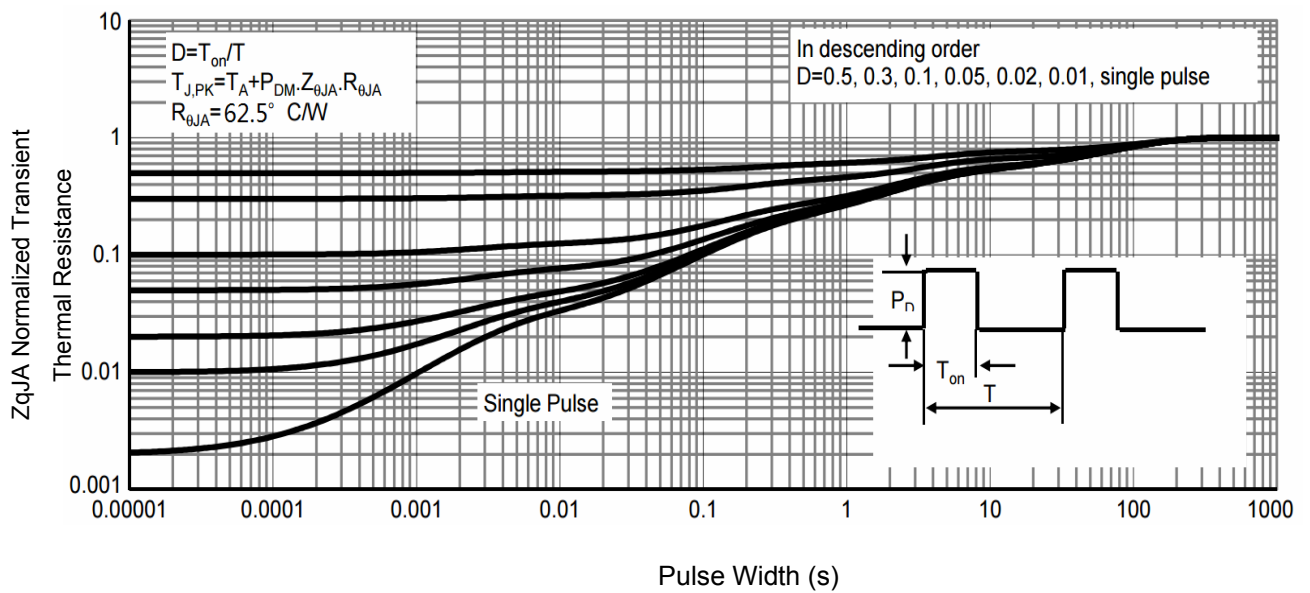


Fig9. Normalized Maximum Transient Thermal Impedance T_j -Junction

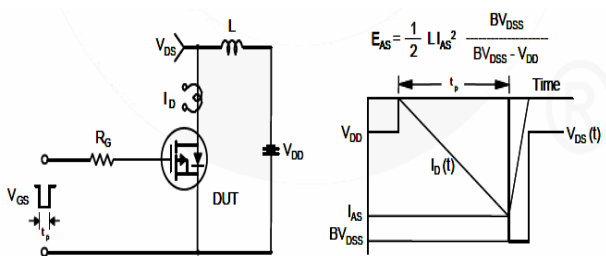


Fig10. Unclamped Inductive Test Circuit and Waveforms

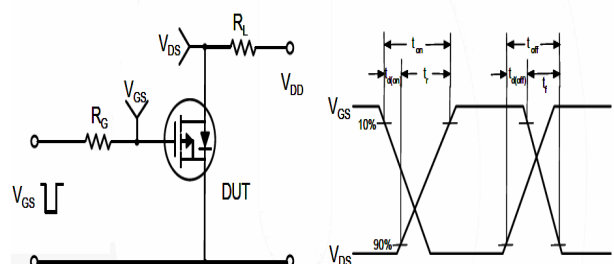
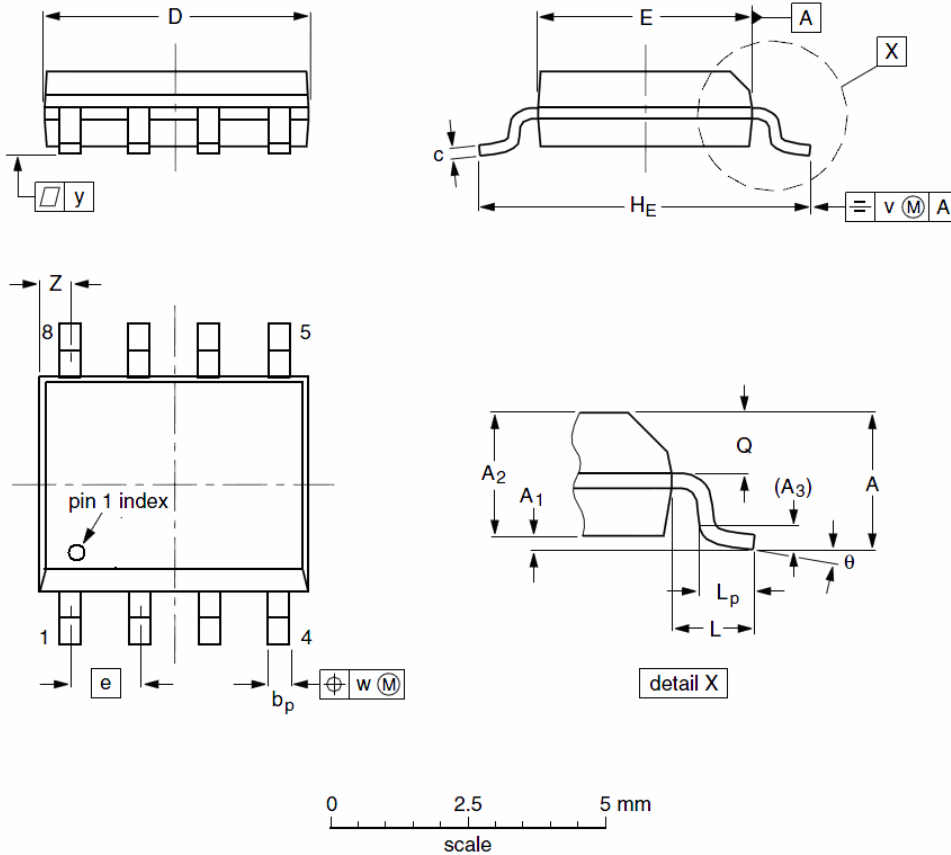


Fig11. Switching Time Test Circuit and waveforms

SOP8 Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	--	1.75	--	A ₁	0.10	0.18	0.25
A ₂	1.25	1.35	1.45	A ₃	--	0.25	--
b _p	0.36	0.42	0.49	c	0.19	0.22	0.25
D	4.80	4.92	5.00	E	3.80	3.90	4.00
e	--	1.27	--	H _E	5.80	5.98	6.20
L	--	1.05	--	L _p	0.40	0.68	1.00
Q	0.60	0.65	0.70	v	--	0.25	--
w	--	0.25	--	y	--	0.10	--
Z	0.30	0.50	0.70	θ	0°		8°

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