

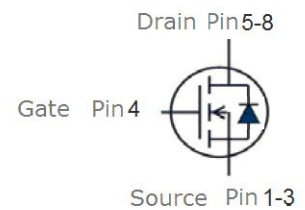
Features

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

V_{DS}	30	V
$R_{DS(on),TYP@V_{GS}=10V}$	5.0	m Ω
$R_{DS(on),TYP@V_{GS}=4.5V}$	6.0	m Ω
I_D	20	A



Part ID	Package Type	Marking	Tape and reel information
VSO008N03MS	SOP8	008N03M	3000pcs/reel



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

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	30	V
I_S	Diode continuous forward current	$T_C=25^\circ\text{C}$ 20	A
I_D	Continuous drain current @ $V_{GS}=10V$	$T_C=25^\circ\text{C}$ 20	A
		$T_A=70^\circ\text{C}$ 13	A
I_{DM}	Pulse drain current tested ①	$T_C=25^\circ\text{C}$ 80	A
P_D	Maximum power dissipation	$T_A=25^\circ\text{C}$ 2	W
V_{GS}	Gate-Source voltage	± 20	V
T_{STG}	Storage temperature range	-55 to 175	$^\circ\text{C}$
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JA}$	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	1.2	1.6	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance①	V _{GS} =10V, I _D =10A	--	5.0	8.0	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance①	V _{GS} =4.5V, I _D =8A	--	6.0	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	--	1720	--	pF
C _{oss}	Output Capacitance		--	220	--	pF
C _{rss}	Reverse Transfer Capacitance		--	165	--	pF
Q _g	Total Gate Charge	V _{GS} =10V	--	36	--	nC
		V _{GS} =4.5V	--	18.5	--	nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V, I _D =20A, V _{GS} =10V	--	5	--	nC
Q _{gd}	Gate-Drain Charge		--	8	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =15V, I _D =10A, R _G =6.8Ω, V _{GS} =10V	--	13.5	--	nS
t _r	Turn-on Rise Time		--	15	--	nS
t _{d(off)}	Turn-Off Delay Time		--	20	--	nS
t _f	Turn-Off Fall Time		--	14	--	nS
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
I _{SD}	Source-drain current(Body Diode)	T _c =25°C	--	--	20	A
V _{SD}	Forward on voltage	I _{SD} =10A, V _{GS} =0V	--	0.79	1.3	V
t _{rr}	Reverse Recovery Time	T _J =25°C, I _{sd} =15A, V _{GS} =0V di/dt=100A/μs	--	24	--	nS
Q _{rr}	Reverse Recovery Charge		--	13	--	nC

NOTE:

① Pulse width ≤ 300μs; duty cycle ≤ 2%.

② Repetitive rating; pulse width limited by max. junction temperature.

Typical Characteristics

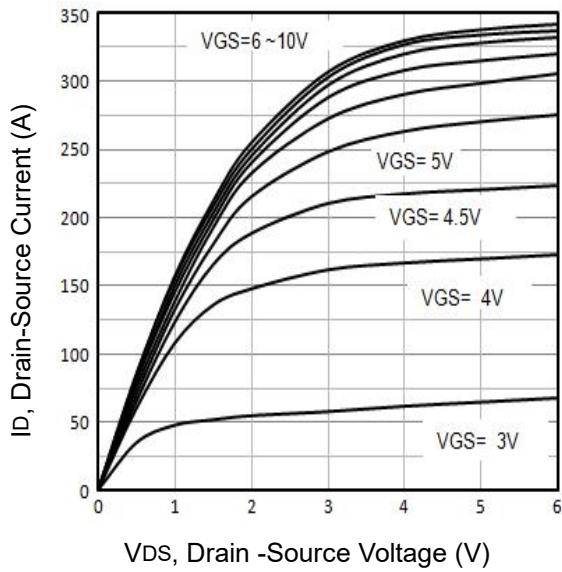


Fig1. Typical Output Characteristics

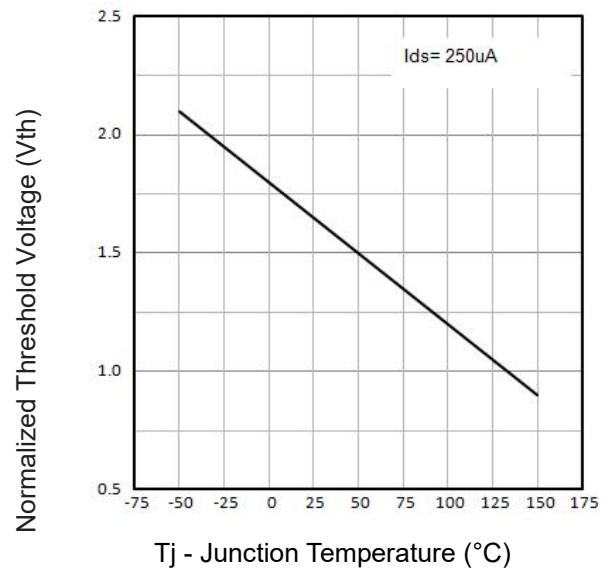


Fig2. Normalized Threshold Voltage Vs. Tc - Case

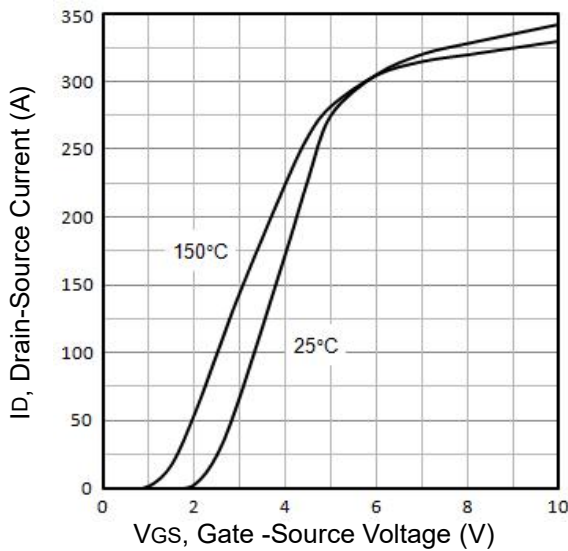


Fig3. Typical Transfer Characteristics

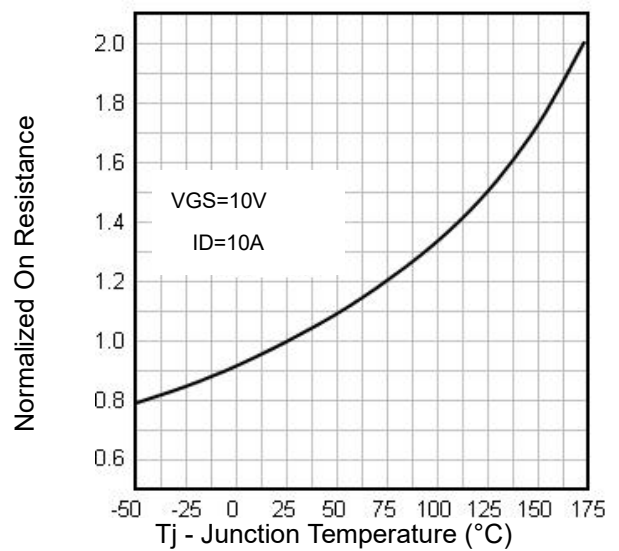


Fig4. Normalized On-Resistance Vs. Temperature

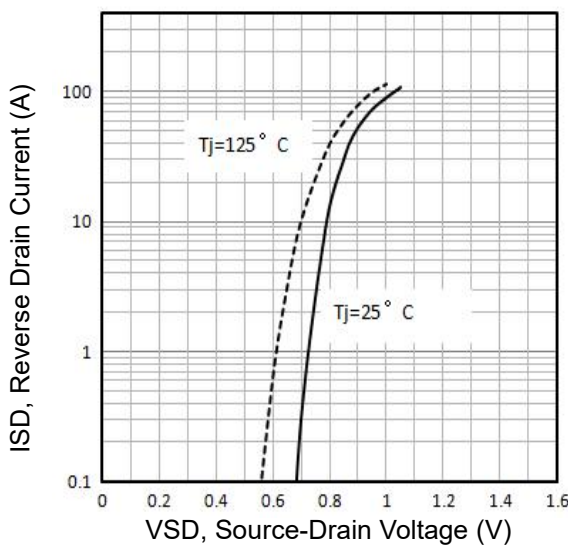


Fig5. Typical Source-Drain Diode Forward Voltage

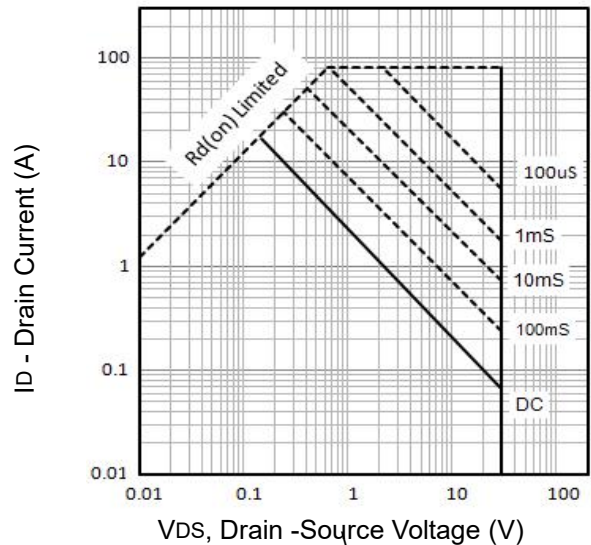


Fig6. Maximum Safe Operating Area

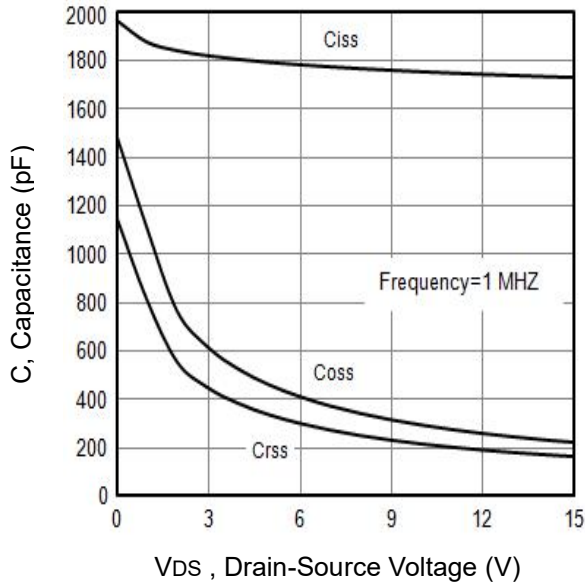


Fig7. Typical Capacitance Vs.Drain-Source Voltage

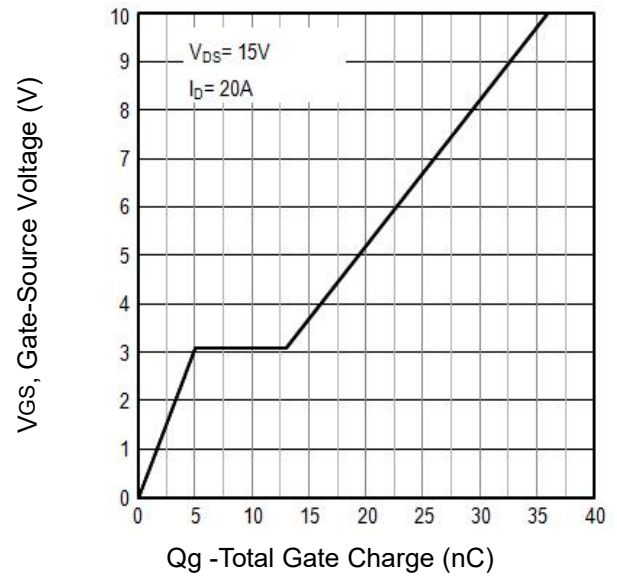


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

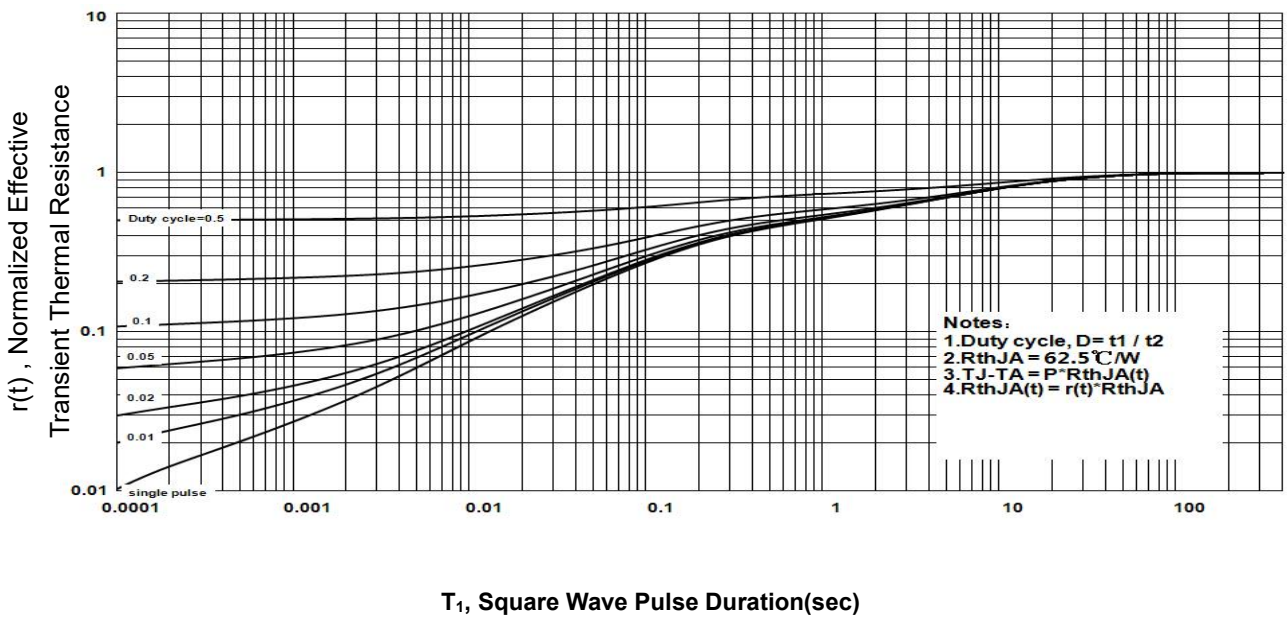


Fig9. T1, Transient Thermal Response Curve

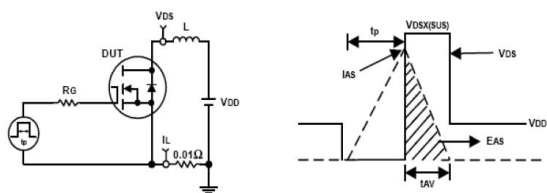


Fig10. Unclamped Inductive Test Circuit and waveforms

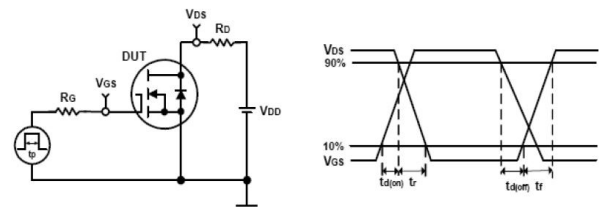
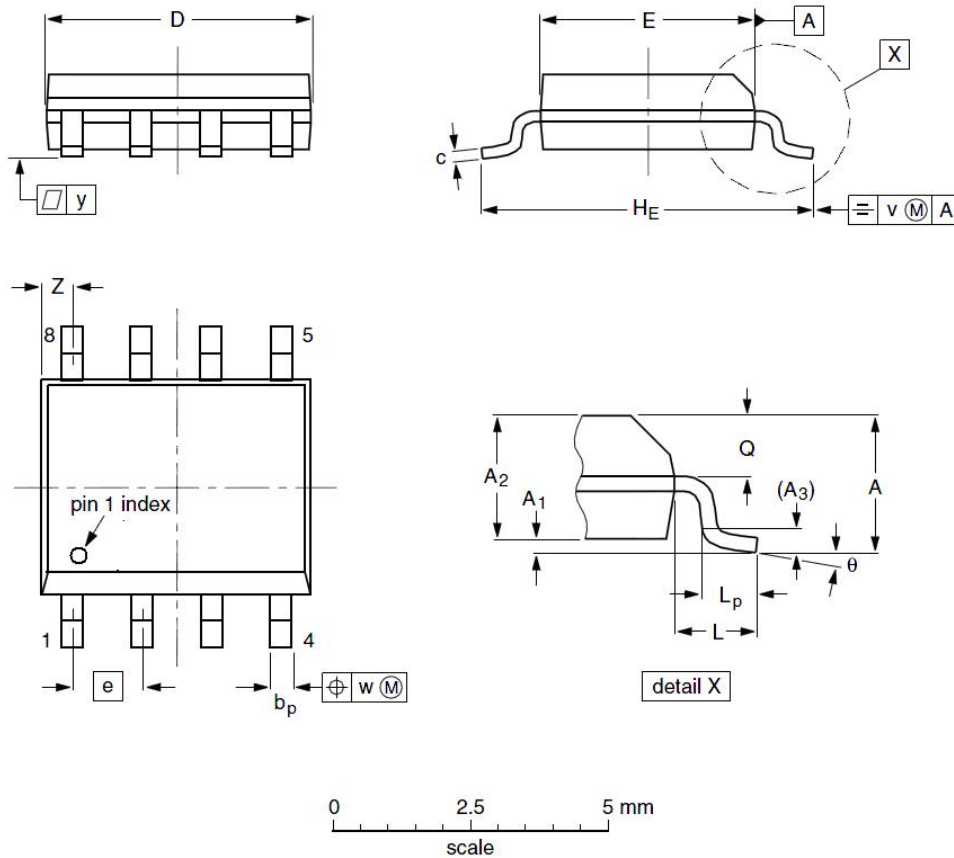


Fig11. Switching Time Test Circuit and waveforms

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°

Customer Service

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