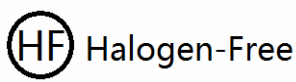


Features

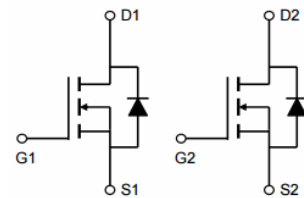
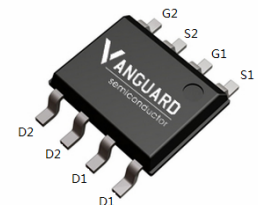
- Dual N-Channel, 5V Logic Level Control
- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5\text{ V}$
- Fast Switching
- High conversion efficiency
- Pb-free lead plating; RoHS compliant
- Green Product



Part ID	Package Type	Marking	Tape and reel information
VSO060N06MD	SOP8	060N06M	3000pcs/reel

V_{DS}	60	V
$R_{DS(on),TYP}@ V_{GS}=10\text{ V}$	38	mΩ
$R_{DS(on),TYP}@ V_{GS}=4.5\text{ V}$	45	mΩ
I_D	6	A

SOP8



Maximum ratings, at $T_J=25\text{ °C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		60	V
I_S	Diode continuous forward current	$T_C=25\text{ °C}$	6	A
I_D	Continuous drain current @ $V_{GS}=10\text{ V}$	$T_C=25\text{ °C}$	5	A
		$T_C=100\text{ °C}$	3.2	A
I_{DM}	Pulse drain current tested ①	$T_C=25\text{ °C}$	20	A
P_D	Maximum power dissipation	$T_C=25\text{ °C}$	2.5	W
V_{GS}	Gate-Source voltage		±20	V
T_{STG}	Storage temperature range		-55 to 175	°C
T_J	Maximum Junction Temperature		150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	20	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	50	°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	--	0.01	1	μA
	Zero Gate Voltage Drain Current(Tc=125°C)	V _{DS} =60V,V _{GS} =0V	--	5	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	2.0	3.0	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =5A	--	38	55	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =3A	--	45	60	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =30V,V _{GS} =0V, f=1MHz	--	930	--	pF
C _{oss}	Output Capacitance		--	225	--	pF
C _{rss}	Reverse Transfer Capacitance		--	30	--	pF
Q _g	Total Gate Charge	V _{DS} =30V,I _D =3A, V _{GS} =10V	--	30	--	nC
Q _{gs}	Gate-Source Charge		--	7	--	nC
Q _{gd}	Gate-Drain Charge		--	5	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =1A, R _G =6.8Ω, V _{GS} =10V	--	8	--	nS
t _r	Turn-on Rise Time		--	3	--	nS
t _{d(off)}	Turn-Off Delay Time		--	20	--	nS
t _f	Turn-Off Fall Time		--	11	--	nS
Source- Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
I _{SD}	Source-drain current(Body Diode)	T _c =25°C	--	--	5	A
V _{SD}	Forward on voltage	I _{SD} =5A,V _{GS} =0V	--	0.82	1.3	V
t _{rr}	Reverse Recovery Time	T _J =25°C,I _{sd} =5A, V _{GS} =0V di/dt=100A/μs	--	40	--	nS
Q _{rr}	Reverse Recovery Charge				36	

NOTE:

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

Typical Characteristics

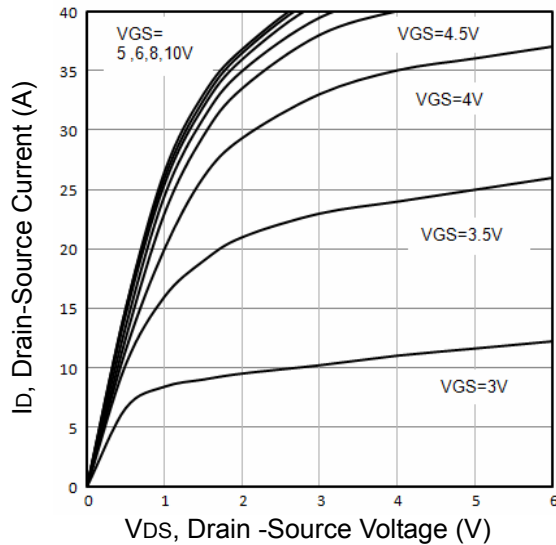


Fig1. Typical Output Characteristics

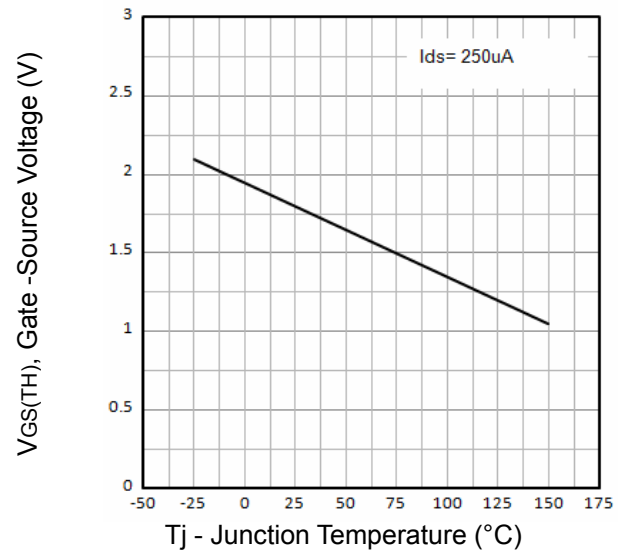


Fig2. Threshold Voltage Vs. Temperature

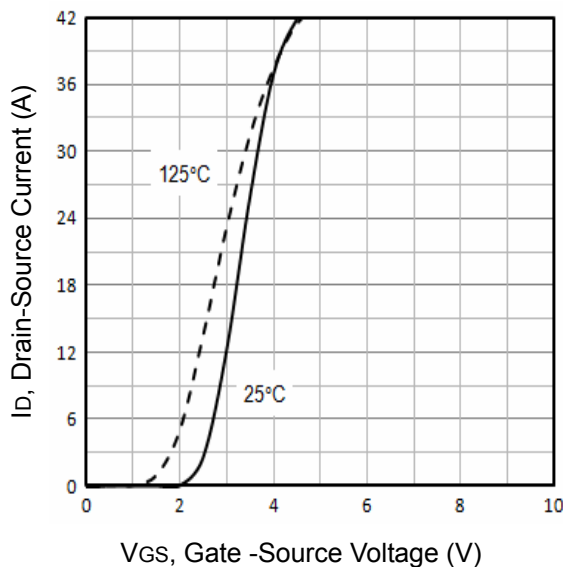


Fig3. Typical Transfer Characteristics

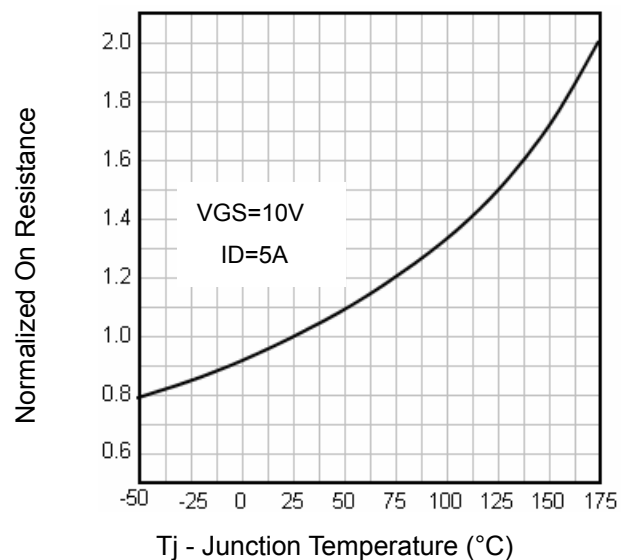


Fig4. Normalized On-Resistance Vs. Temperature

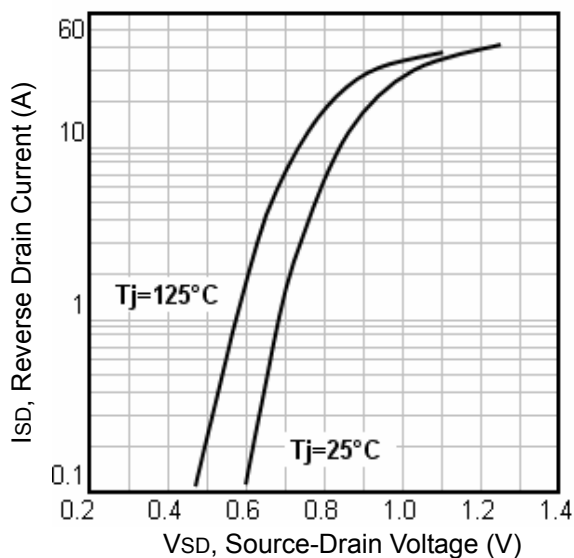


Fig5. Typical Source-Drain Diode Forward Voltage

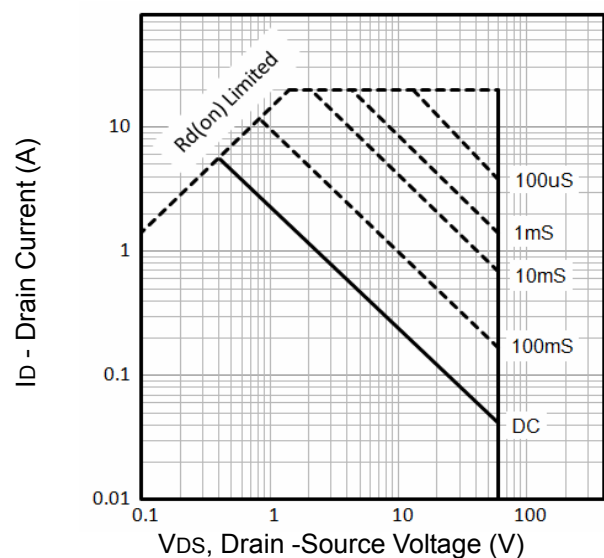


Fig6. Maximum Safe Operating Area

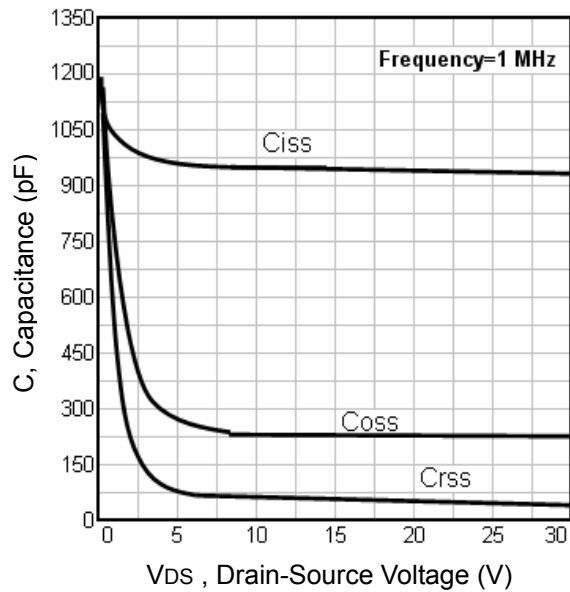


Fig7. Typical Capacitance Vs.Drain-Source Voltage

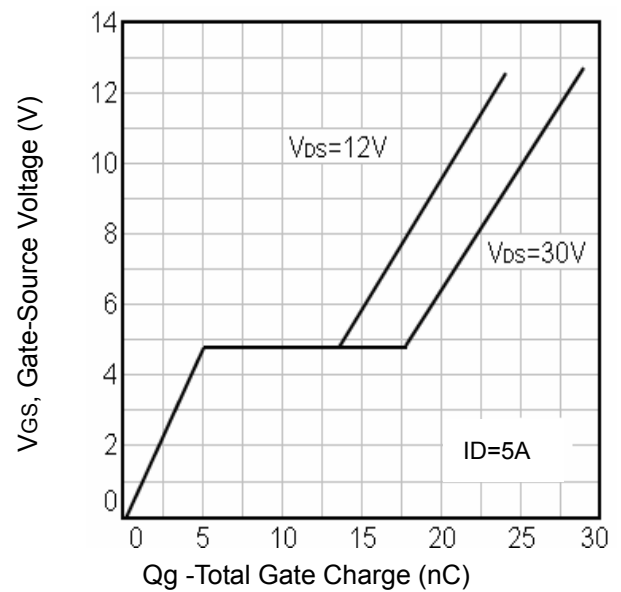


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

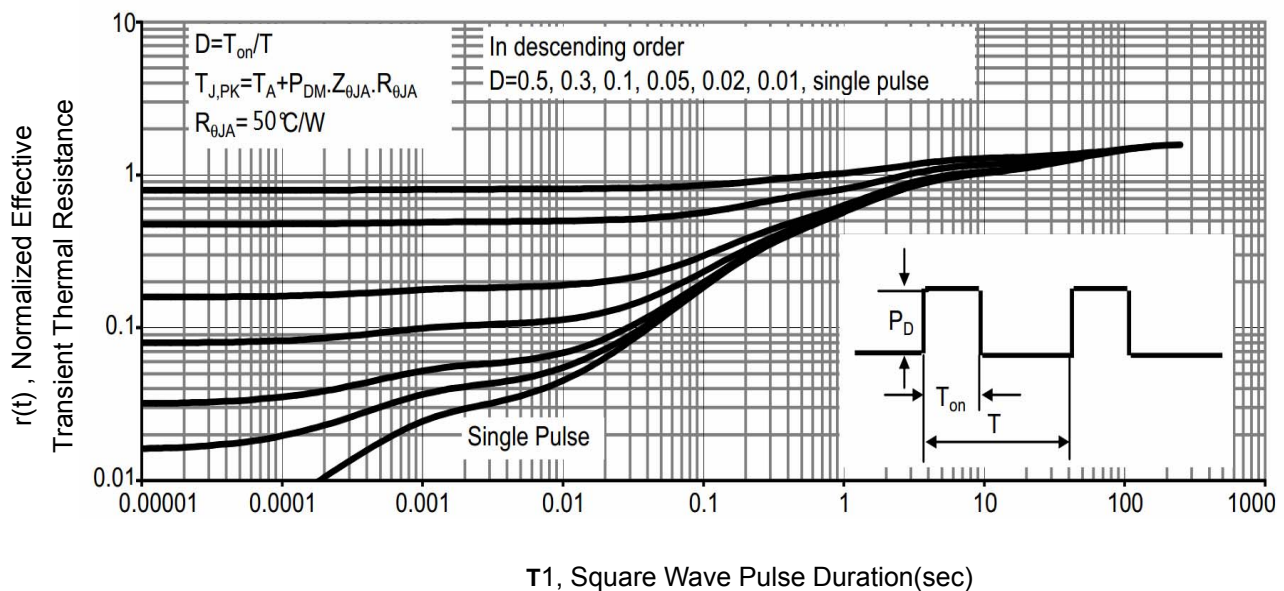


Fig9. T1 ,Transient Thermal Response Curve

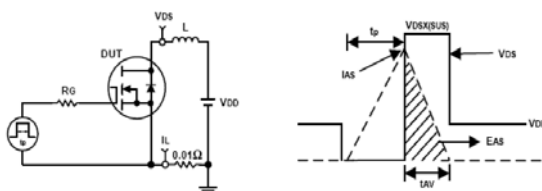


Fig11. Unclamped Inductive Test Circuit and waveforms

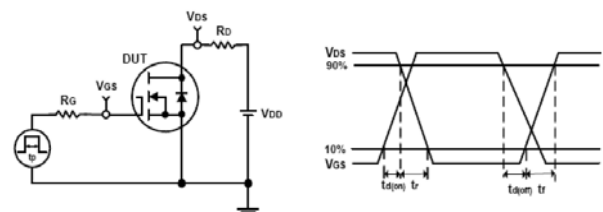
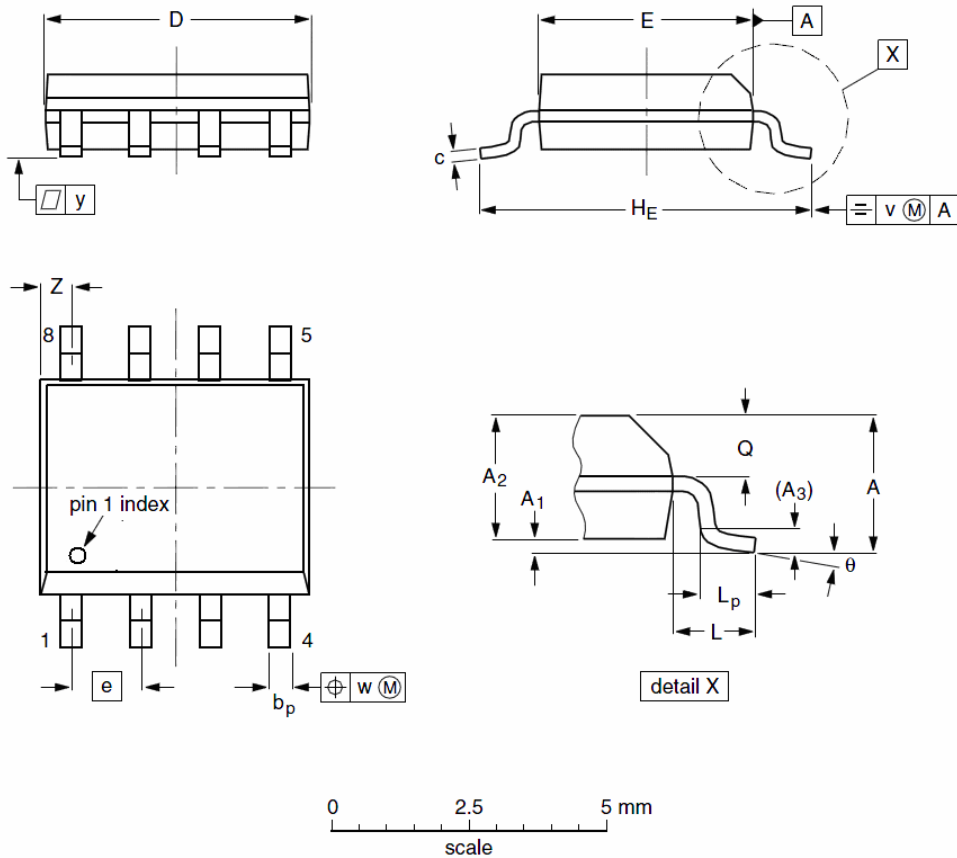


Fig12. Switching Time Test Circuit and waveforms

SOP8 Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	--	1.75	--	A₁	0.10	0.18	0.25
A₂	1.25	1.35	1.45	A₃	--	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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