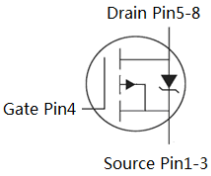
Features

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

V_{DS}	-30	V
$R_{DS(on),TYP}$@ V_{GS}=-10 V	14	mΩ
$R_{DS(on),TYP}$@ V_{GS}=-4.5V	18.5	mΩ
I_D	-34	A

PDFN3333

Pb-Free RoHS HF Halogen-Free



Part ID	Package Type	Marking	Tape and reel information
VSE018P03MS	PDFN3333	018P03M	5000pcs/Reel

Maximum ratings, at T_A =25°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°C	-34	A
I_D	Continuous drain current@VGS=-10V	T_C =25°C	-34	A
		T_C =100°C	-22	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	-136	A
EAS	Avalanche energy, single pulsed ③		25	mJ
P_D	Maximum power dissipation	T_C =25°C	32	W
VGS	Gate-Source voltage		±20	V
T_{STG} T_J	Storage and operating temperature range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	3.9	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	35	°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	V_{DS}=-30V,V_{GS}=0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T_j=125℃)	V_{DS}=-30V,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	-1.8	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ②	V_{GS}=-10V, I_D=-12A	--	14	18	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance ②	V_{GS}=-4.5V, I_D=-8A	--	18.5	24	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1MHz	--	1565	--	pF
C_{oss}	Output Capacitance		--	240	--	pF
C_{rss}	Reverse Transfer Capacitance		--	185	--	pF
R_g	Gate Resistance	f=1MHz	--	25	--	Ω
Q_g	Total Gate Charge	V_{DS}=-15V,I_D=-12A, V_{GS}=-10V	--	37	--	nC
Q_{gs}	Gate-Source Charge		--	7	--	nC
Q_{gd}	Gate-Drain Charge		--	12	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-15V, I_D=-12A, R_G=3Ω, V_{GS}=-10V	--	8	--	nS
t_r	Turn-on Rise Time		--	5	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	24	--	nS
t_f	Turn-Off Fall Time		--	5.5	--	nS
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=-12A,V_{GS}=0V	--	-0.85	-1.2	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=-12A, V_{GS}=0V di/dt=-100A/μs	--	33	--	nS
Q_{rr}	Reverse Recovery Charge			29		nC

NOTE:

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

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

③ Limited by TJmax, starting TJ = 25°C, L = 0.5mH,RG = 25Ω, IAS = -10A, VGS =-10V. Part not recommended for use above this value

Typical Characteristics

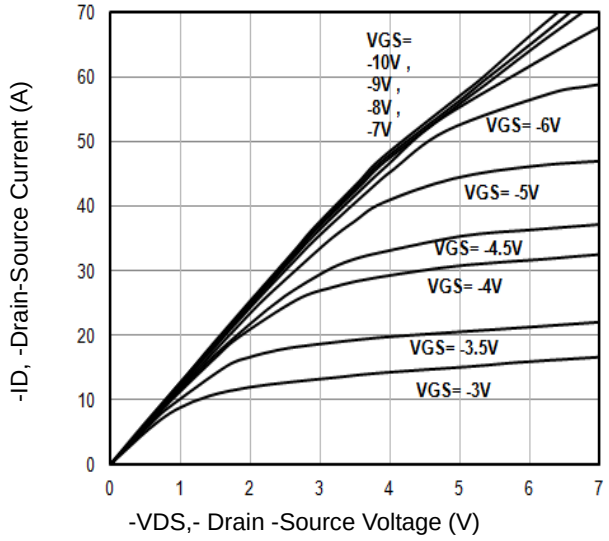


Fig1. Typical Output Characteristics

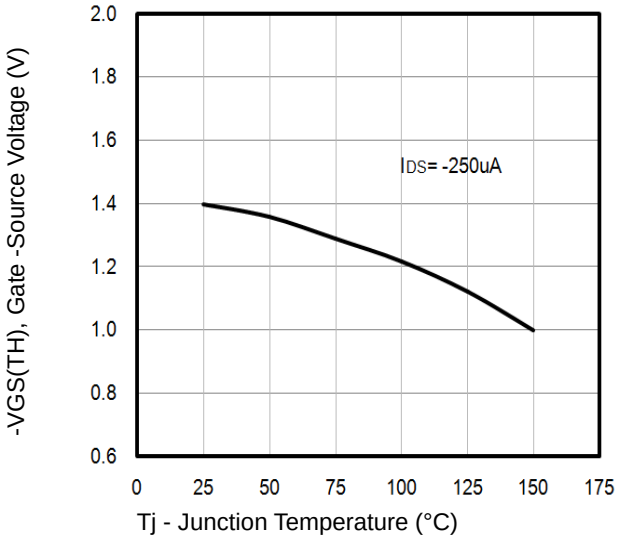


Fig2. $-V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

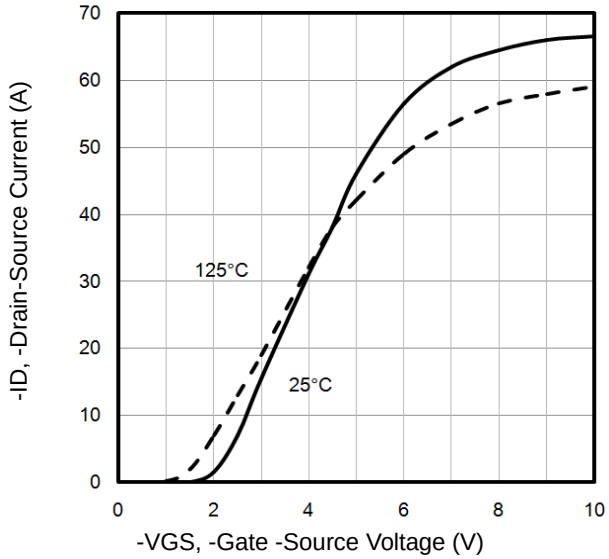


Fig3. Typical Transfer Characteristics

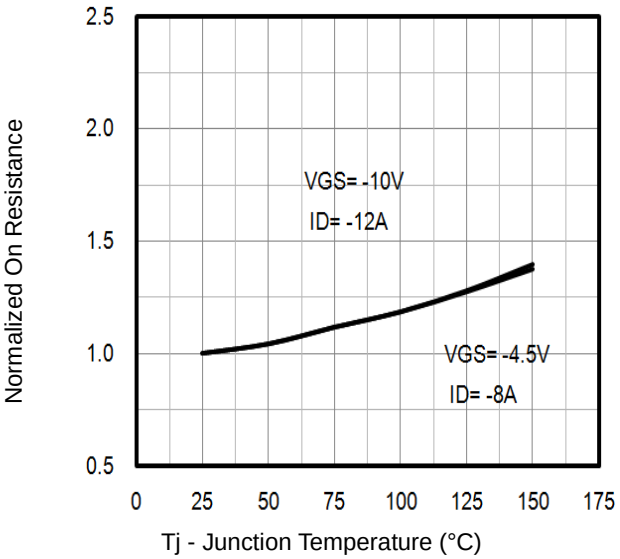


Fig4. Normalized On-Resistance Vs. Tj

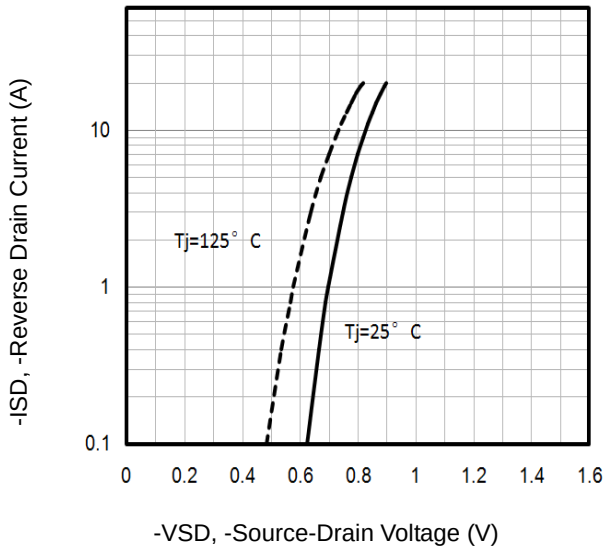


Fig5. Typical Source-Drain Diode Forward Voltage

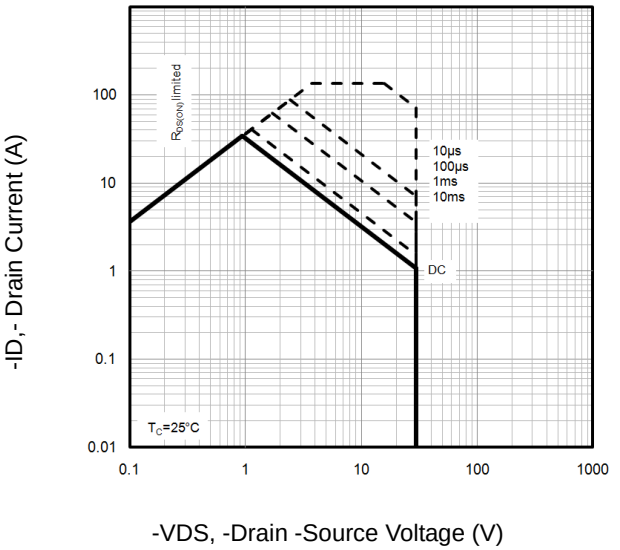


Fig6. Maximum Safe Operating Area

Typical Characteristics

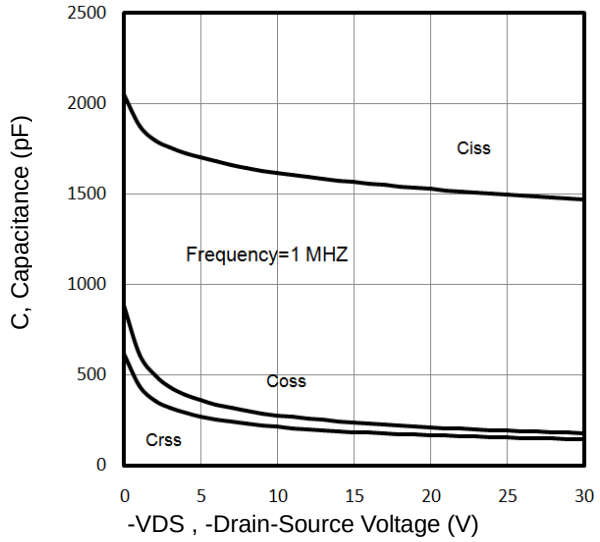


Fig7. Typical Capacitance Vs.Drain-Source Voltage

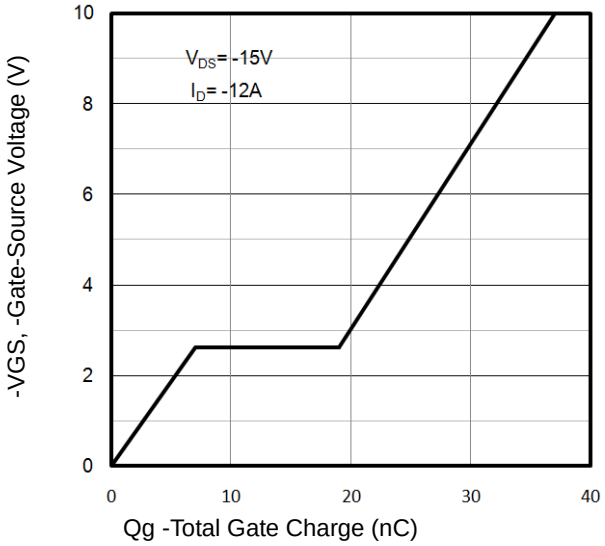


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

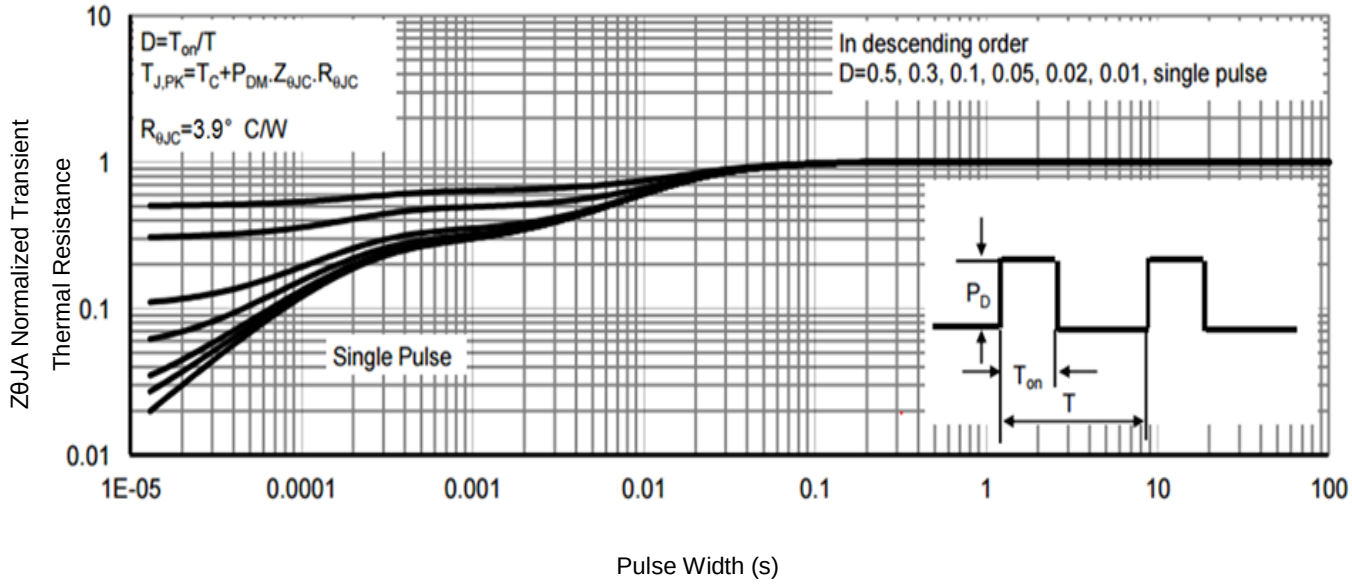


Fig9. Normalized Maximum Transient Thermal Impedance

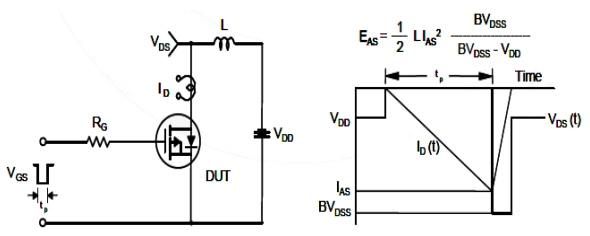


Fig10. Unclamped Inductive Test Circuit and Waveforms

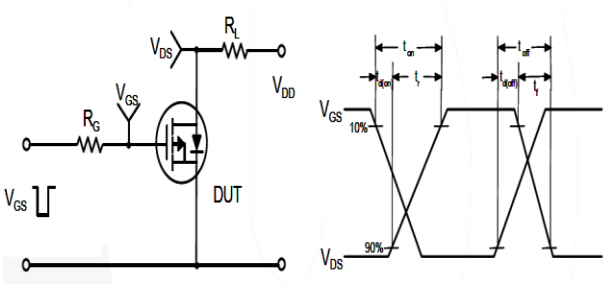
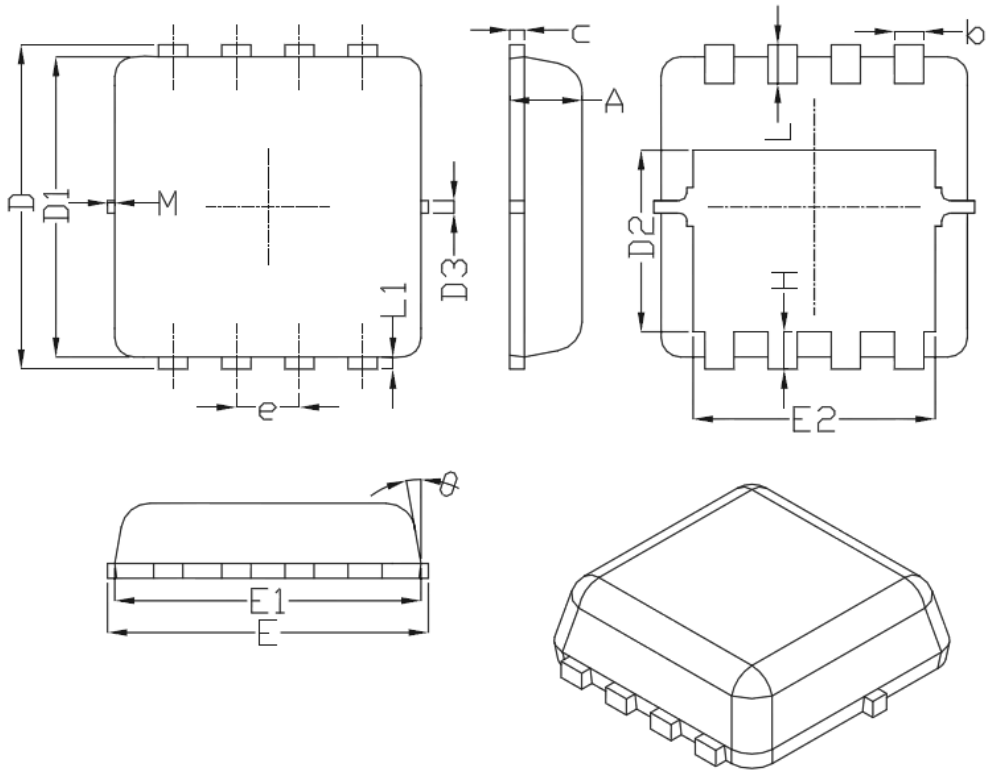


Fig11. Switching Time Test Circuit and waveforms

PDFN3333 Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.70	0.75	0.80	**b**	0.25	0.30	0.35
C	0.10	0.15	0.25	**D**	3.25	3.35	3.45
D1	3.00	3.10	3.20	**D2**	1.78	1.88	1.98
D3	--	0.13	--	**E**	3.20	3.30	3.40
E1	3.00	3.15	3.20	**E2**	2.39	2.49	2.59
e	0.65BSC			**H**	0.30	0.39	0.50
L	0.30	0.40	0.50	**L1**	--	0.13	--
θ	--	10°	12°	**M**	*	*	0.15
*Not specified							

Customer Service

Sales and Service:
sales@vgsemi.com

Vanguard Semiconductor CO., LTD
TEL: (86-755) -26902410
FAX: (86-755) -26907027
WEB: **www.vgsemi.com**