

Features

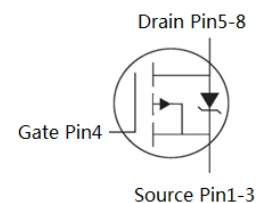
- P-Channel
- Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=-4.5\text{ V}$
- 100 Avalanche Tested
- Fast Switching
- Repetitive Avalanche Allowed up to T_{jmax}
- Pb-free lead plating; RoHS compliant



Part ID	Package Type	Marking	Tape and reel information
VSE008P03MS	PDFN3333	008P03M	5000pcs/reel

V_{DS}	-30	V
$R_{DS(on),TYP} @ V_{GS}=-10\text{ V}$	7.5	mΩ
$R_{DS(on),TYP} @ V_{GS}=-4.5\text{ V}$	10.5	mΩ
I_D	-35	A

PDFN3333



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

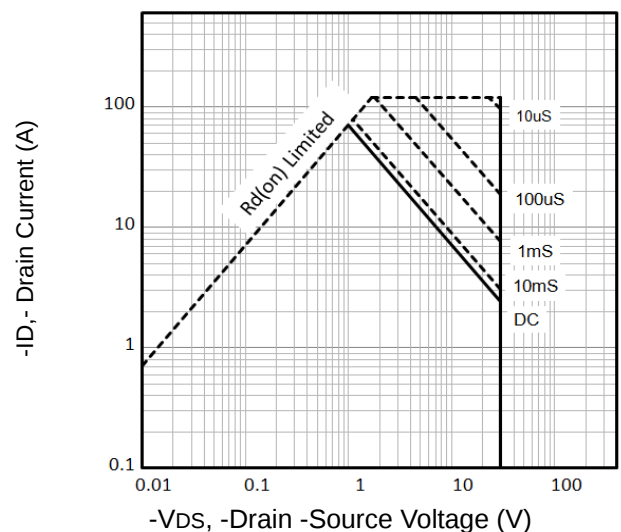
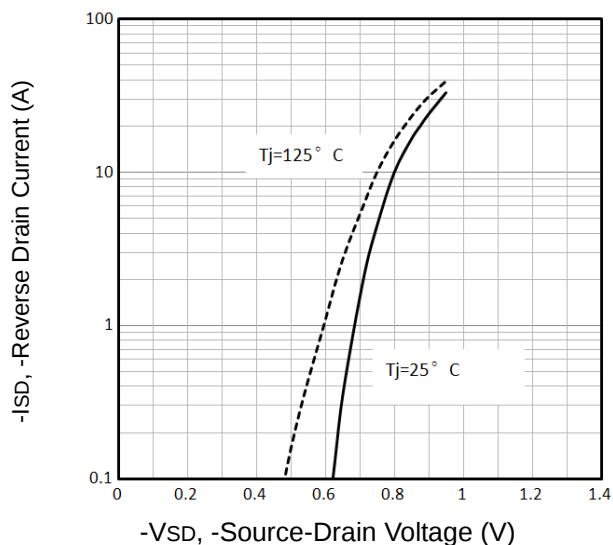
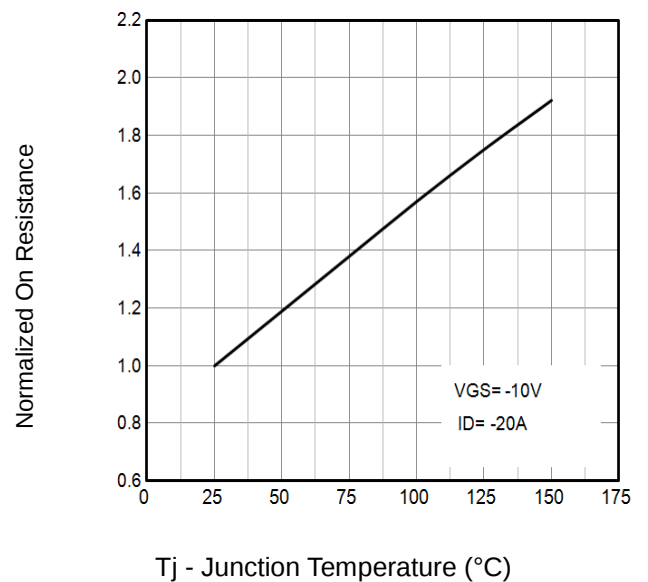
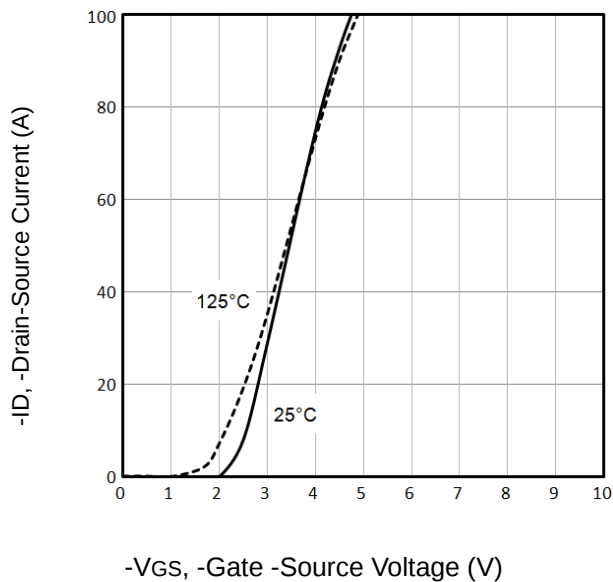
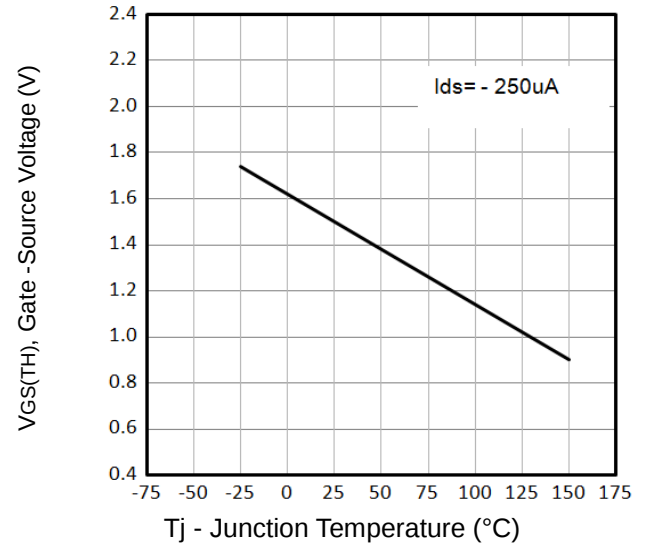
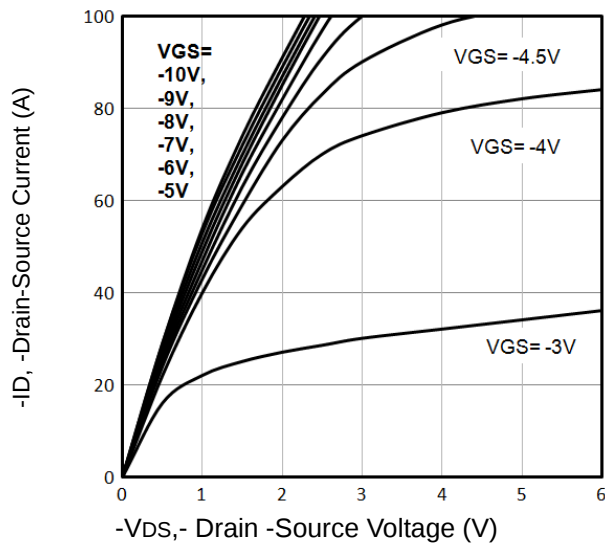
Symbol	Parameter		Rating	Unit
Common Ratings (Tc=25°C Unless Otherwise Noted)				
VGS	Gate-Source Voltage		±20	V
V(BR)DSS	Drain-Source Breakdown Voltage		-30	V
TJ	Maximum Junction Temperature		150	°C
TSTG	Storage Temperature Range		-55 to 150	°C
IS	Diode Continuous Forward Current	TC=25°C	-35	A
Mounted on Large Heat Sink				
ID	Continuous Drain current @VGS=-10V	TC=25°C	-35	A
		TC=100°C	-22	A
IDM	Pulse Drain Current Tested ①	TC=25°C	-120	A
PD	Maximum Power Dissipation	TC=25°C	73	W
RθJC	Thermal Resistance-Junction to Case		1.7	°C/W
RθJA	Thermal Resistance Junction-Ambient		50	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ②		25	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	-30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V _{DS} =-24V,V _{GS} =0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(Tc=125℃)	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	-1.5	-2.2	V
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =-10V, I _D =-20A	--	7.5	8.5	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =-4.5V, I _D =-5A	--	10.5	12.0	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance③	V _{GS} =-4.2V, I _D =-2A	--	11.5	14.0	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =-10V,V _{GS} =0V, f=1MHz	--	3130	--	pF
C _{oss}	Output Capacitance		--	520	--	pF
C _{rss}	Reverse Transfer Capacitance		--	415	--	pF
Q _g	Total Gate Charge	V _{DS} =-10V,I _D =-10A, V _{GS} =-10V	--	49	--	nC
Q _{gs}	Gate-Source Charge		--	12	--	nC
Q _{gd}	Gate-Drain Charge		--	9	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =-15V, I _D =-1A, R _G =6.8Ω, V _{GS} =-10V	--	15	--	nS
t _r	Turn-on Rise Time		--	10	--	nS
t _{d(off)}	Turn-Off Delay Time		--	41	--	nS
t _f	Turn-Off Fall Time		--	21	--	nS
Source- Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
I _{SD}	Source-drain current(Body Diode)	Tc=25℃	--	--	-35	A
V _{SD}	Forward on voltage	I _{SD} =-20A,V _{GS} =0V	--	-0.87	-1.3	V
t _{rr}	Reverse Recovery Time	T _J =25℃ ,I _{sd} =-10A, V _{GS} =0V di/dt=-100A/μs	--	22	--	nS
Q _{rr}	Reverse Recovery Charge				47	

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} = -10A, V_{GS} = -10V. Part not recommended for use above this value
- ③ Pulse width ≤ 300μs; duty cycles ≤ 2%.

Typical Characteristics



Typical Characteristics

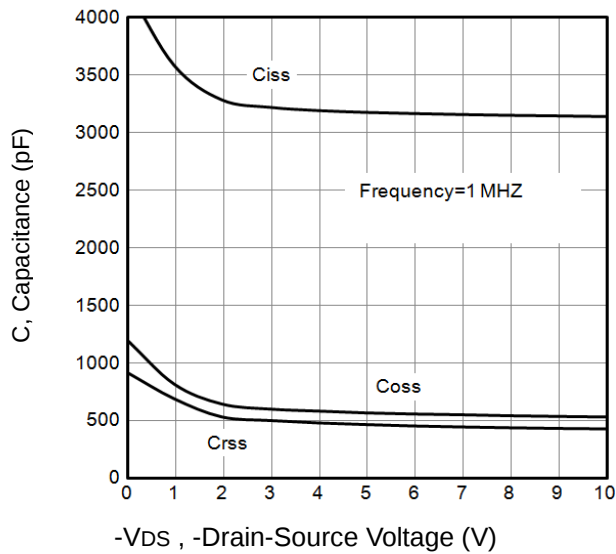


Fig7. Typical Capacitance Vs.Drain-Source Voltage

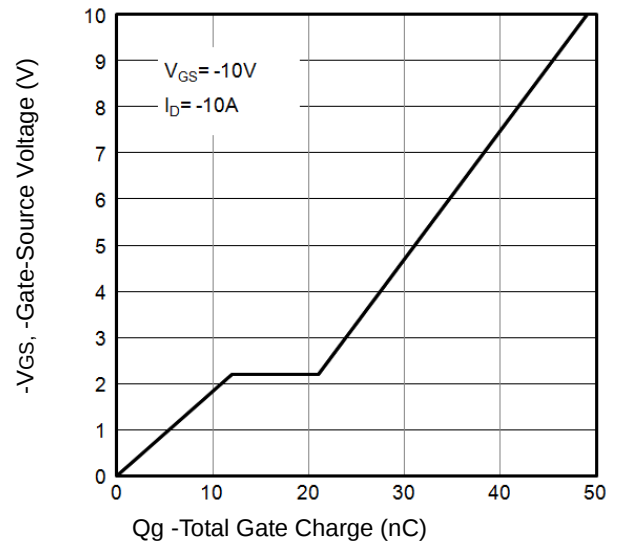


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

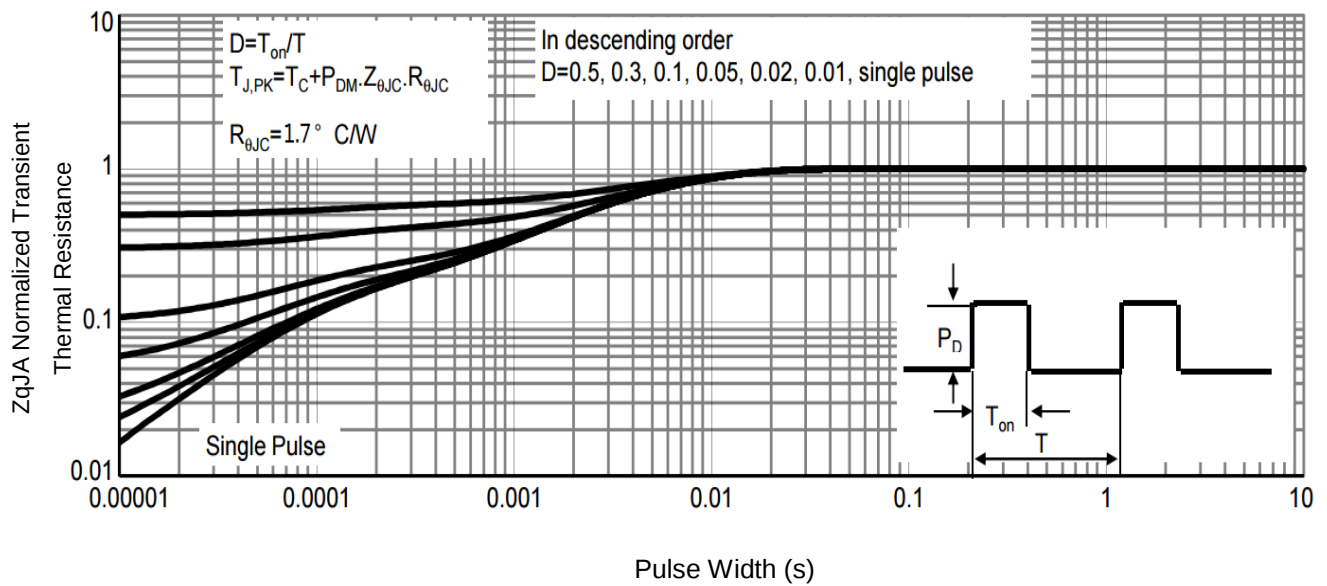


Figure 9: Normalized Maximum Transient Thermal

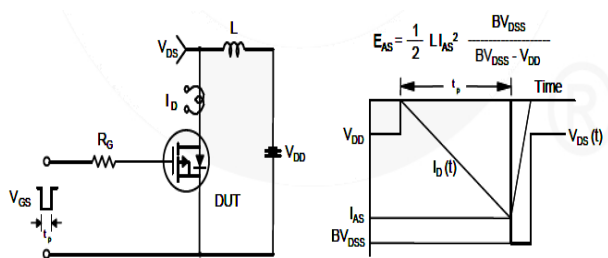


Fig10. Unclamped Inductive Test Circuit and Waveforms

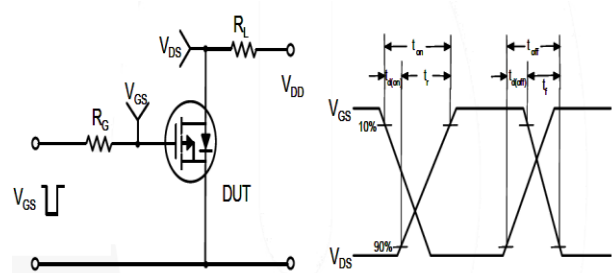
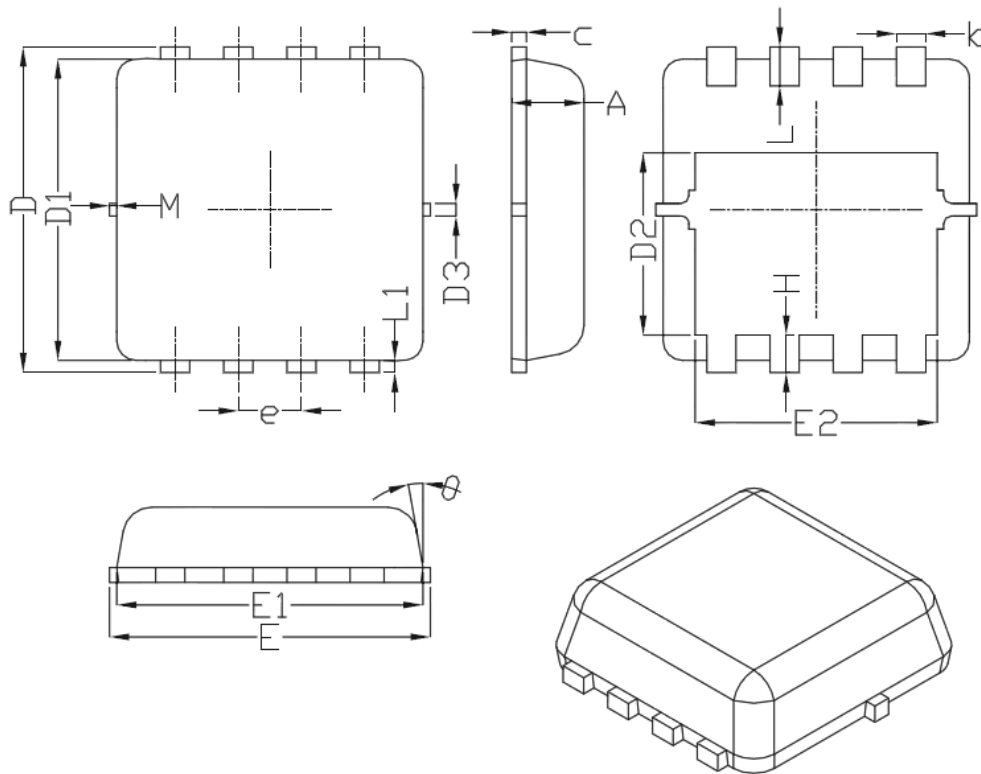


Fig11. Switching Time Test Circuit and waveforms

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

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