Vanguard Semiconductor

VSE008NE2LS

25V/55A N-Channel Advanced Power MOSFET

Features

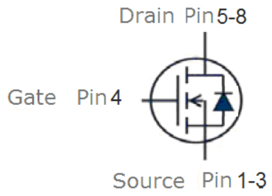
- N-Channel，3.3V Logic Level Control
- Low RDS(on) and High Efficiency
- Fast Switching
- Enhancement mode
- 100% Avalanche test
- Pb-free lead plating; RoHS compliant

Pb-Free RoHS HF Halogen-Free

V_{DS}	25	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	5.8	mΩ
$R_{DS(on),TYP}$@ V_{GS}=4.5 V	6.6	mΩ
I_D	55	A

PDFN3333

Part ID	Package Type	Marking	Tape and reel information
VSE008NE2LS	PDFN3333	008NE2L	5000PCS/Reel



Maximum ratings, at T_A =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		25	V
V_{GS}	Gate-Source voltage		±12	V
I_S	Diode continuous forward current	T_C =25°C	55	A
I_D	Continuous drain current @VGS=4.5V	T_C =25°C	55	A
		T_C =100°C	35	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	200	A
I_{DSM}	Continuous drain current @VGS=4.5V	T_A=25°C	19	A
		T_A=70°C	15	A
EAS	Avalanche energy, single pulsed ②		48	mJ
P_D	Maximum power dissipation	T_C =25°C	30	W
P_{DSM}	Maximum power dissipation ③	T_A=25°C	3.6	W
T_{STG} , T_J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	4.1	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-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	25	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T_j =125℃)	V_{DS}=24V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V,V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.6	1	1.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=15A	--	5.8	8	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance ④	V_{GS}=4.5V, I_D=10A	--	6.6	9	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V, f=1MHz	1000	1560	2000	pF
C_{oss}	Output Capacitance		100	170	240	pF
C_{rss}	Reverse Transfer Capacitance		75	125	175	pF
R_g	Gate Resistance	f=1MHz	--	4.5	--	Ω
Q_g	Total Gate Charge	V_{DS}=15V,I_D=15A, V_{GS}=4.5V	--	14	--	nC
Q_{gs}	Gate-Source Charge		--	5	--	nC
Q_{gd}	Gate-Drain Charge		--	5	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=15V, I_D=15A, R_G=3.0Ω, V_{GS}=4.5V	--	7	--	ns
t_r	Turn-on Rise Time		--	4	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	31	--	ns
t_f	Turn-Off Fall Time		--	5	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=10A,V_{GS}=0V	--	0.8	1.2	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=15A, V_{GS}=0V di/dt=500A/μs	--	12	--	ns
Q_{rr}	Reverse Recovery Charge			18		nC

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} = 11A, V_{GS} =4.5V. Part not recommended for use above this value

③ The power dissipation P_{DSM} is based on $R_{θJA}$ and the maximum allowed junction temperature of 150°C.

④ Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

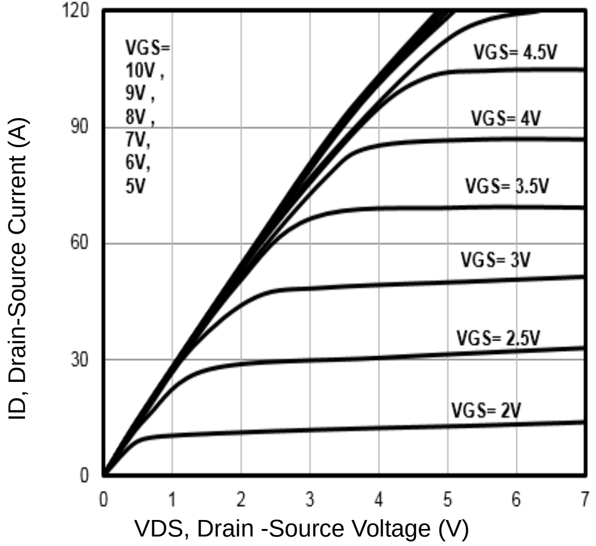


Fig1. Typical Output Characteristics

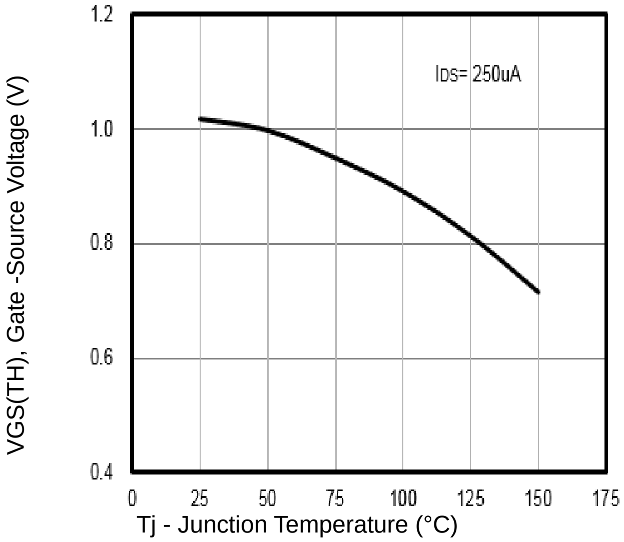


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

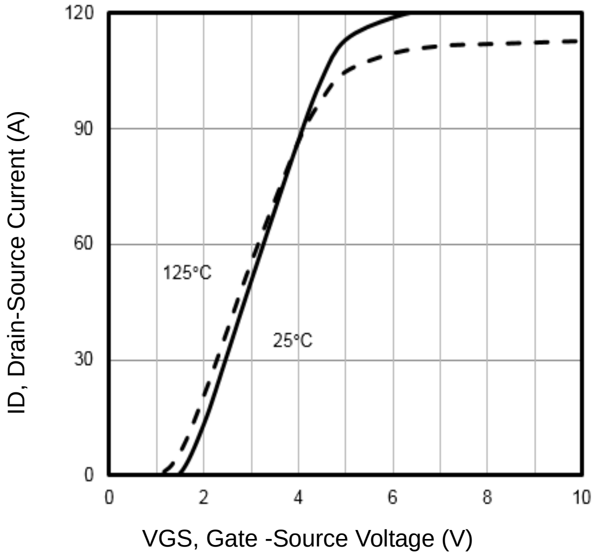


Fig3. Typical Transfer Characteristics

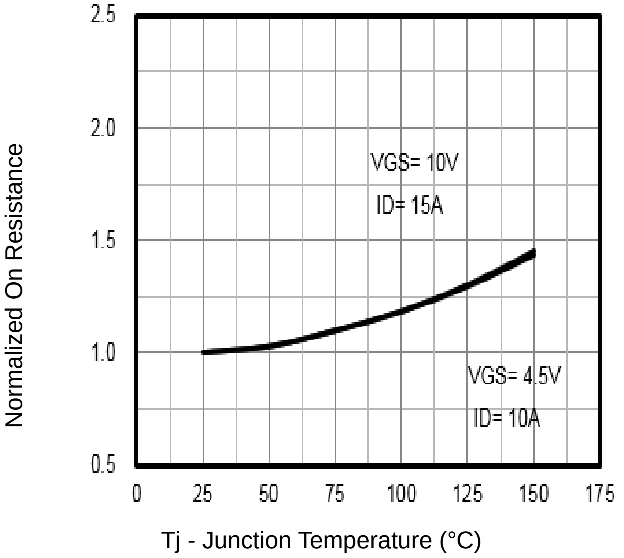


Fig4. Normalized On-Resistance Vs. Tj

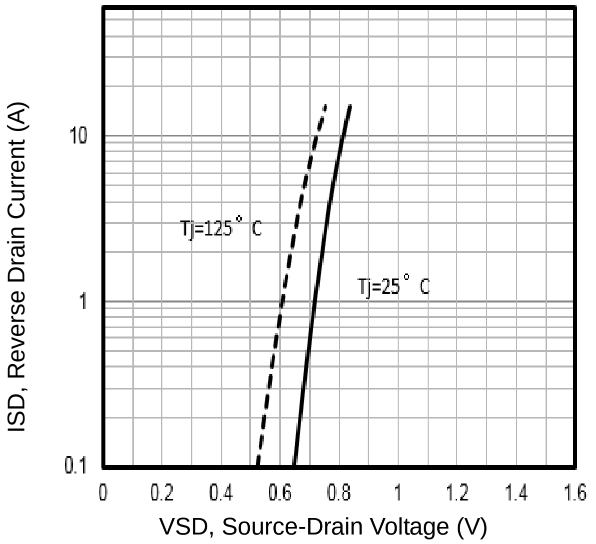


Fig5. Typical Source-Drain Diode Forward Voltage

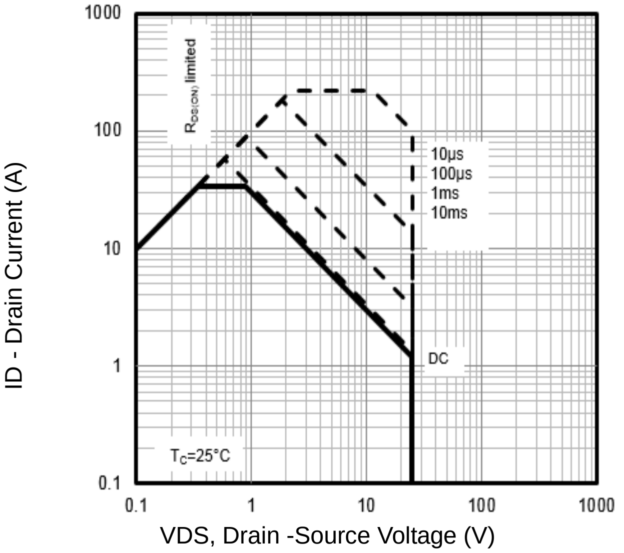


Fig6. Maximum Safe Operating Area

Typical Characteristics

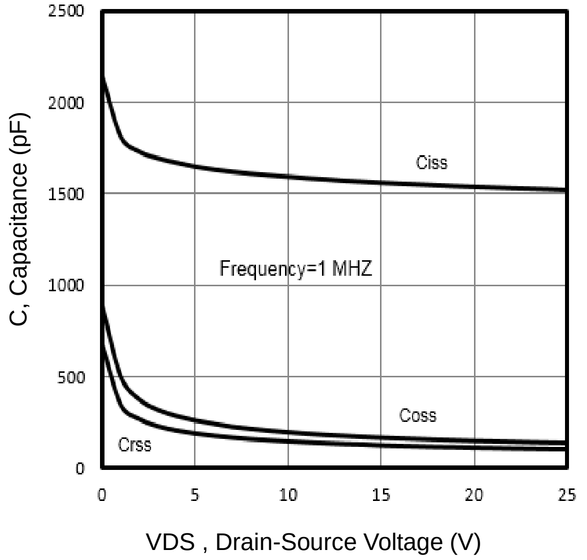


Fig7. Typical Capacitance Vs.Drain-Source Voltage

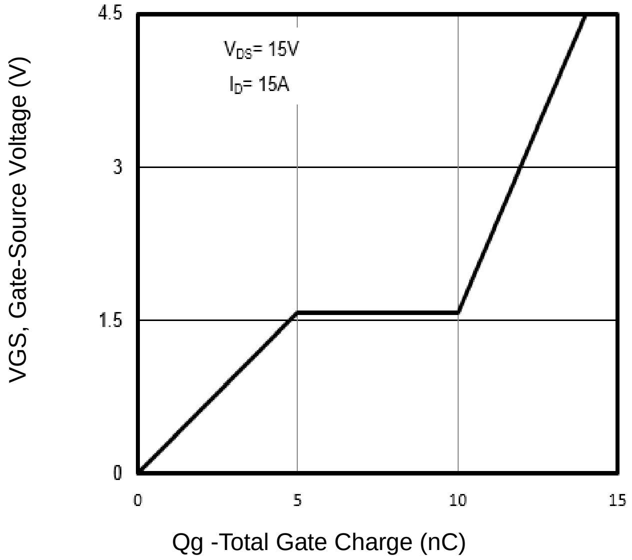


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

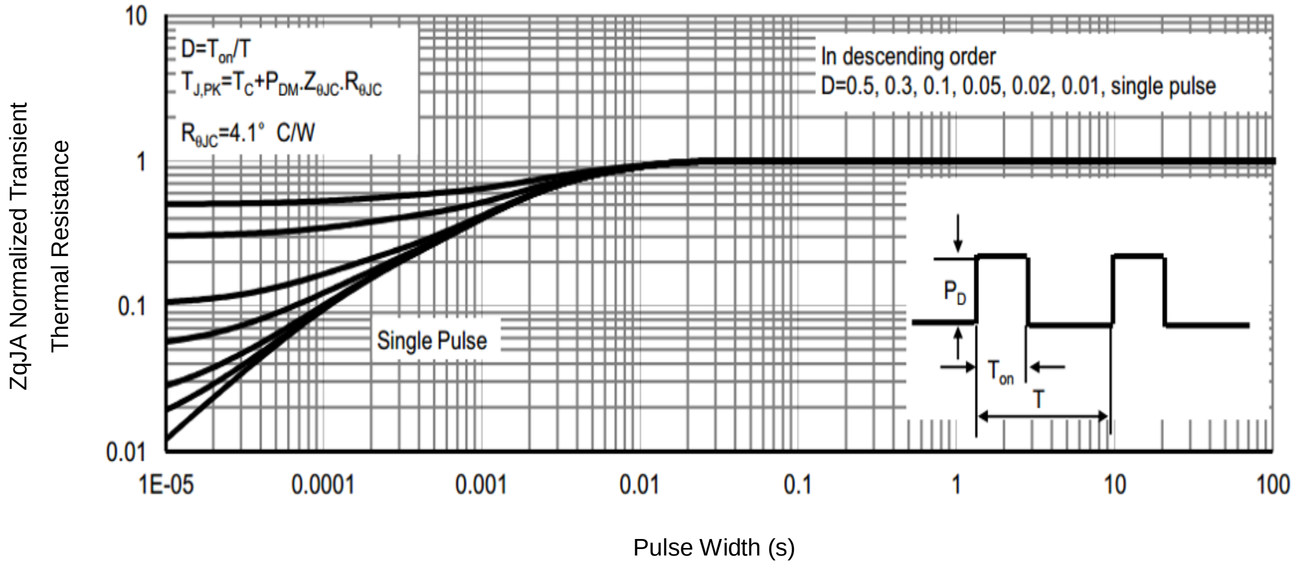


Fig9. Normalized Maximum Transient Thermal Impedance

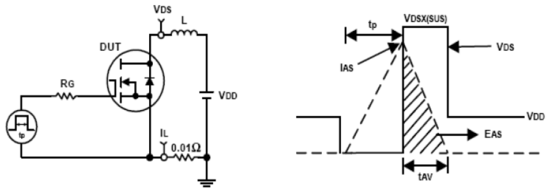


Fig10. Unclamped Inductive Test Circuit and waveforms

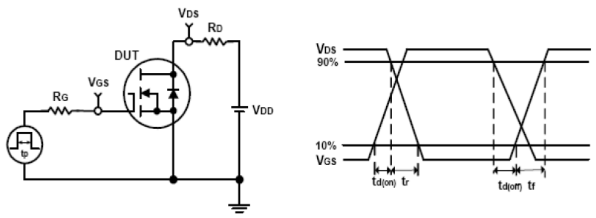
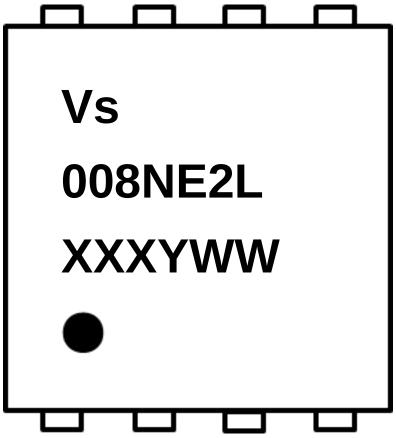


Fig11. Switching Time Test Circuit and waveforms

Marking Information



1st line：Vanguard Code（Vs）

2nd line：Part Number（008NE2L）

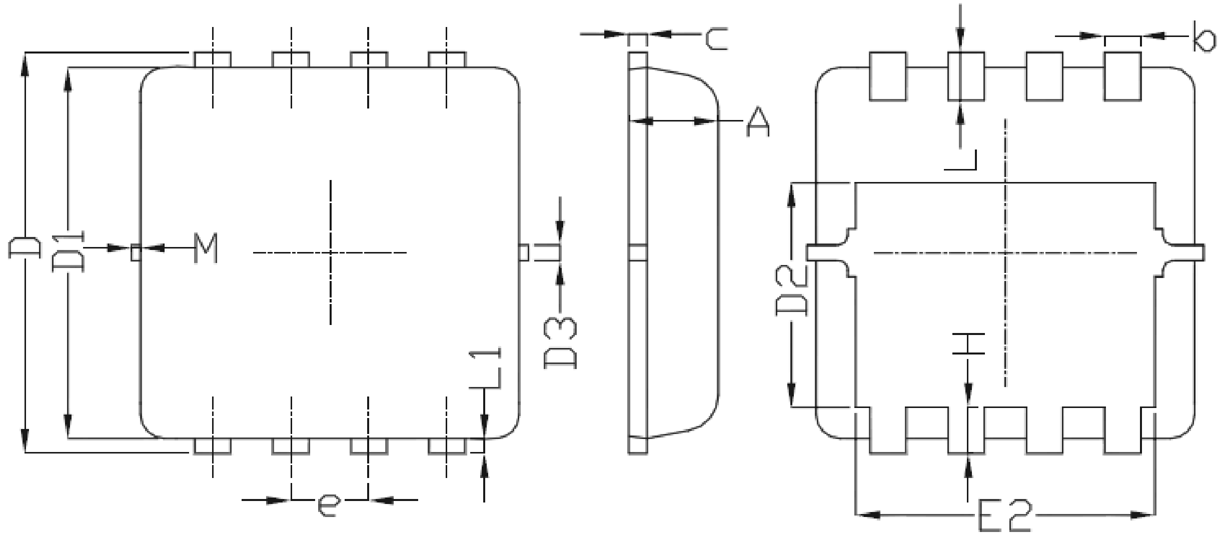
3rd line：Date code （XXXYWW）

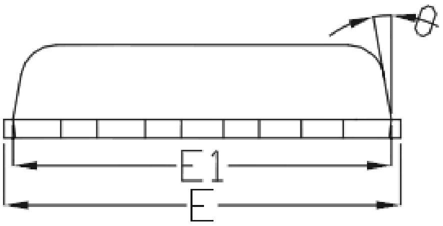
XXX：Wafer Lot Number

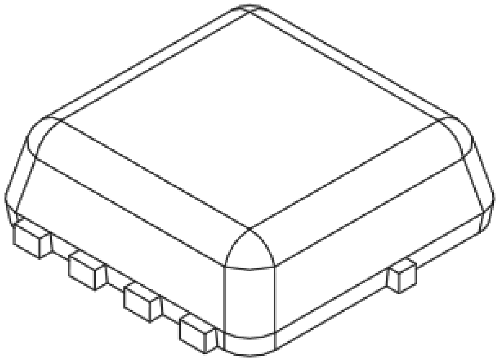
Y：Year Code，e.g. E means 2017

WW：Week Code

PDFN3333 Package Outline Data







Symbol	DIMENSIONS (unit : mm)		
	Min	Typ	Max
A	0.7	0.75	0.8
b	0.25	0.3	0.35
C	0.1	0.15	0.25
D	3.25	3.35	3.45
D1	3	3.1	3.2
D2	1.78	1.88	1.98
D3	--	0.13	--
E	3.2	3.3	3.4
E1	3	3.15	3.2
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.3	0.39	0.5
L	0.3	0.4	0.5
L1	--	0.13	--
θ	--	10°	12°
M	*	*	0.15
* Not specified			

Notes:

1. Follow JEDEC MO-240 variation CA.
2. Dimensions "D1" and "E1" do NOT include mold flash protrusions or gate burrs.
3. Dimensions "D1" and "E1" include interterminal flash or protrusion. Interterminal flash or protrusion shall not exceed 0.25mm per side.

Customer Service

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