Vanguard Semiconductor

VS2622AA

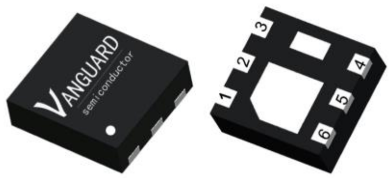
20V/45A N-Channel Advanced Power MOSFET

Features

- N-Channel，2.5V Logic Level Control
- Enhancement mode
- Low on-resistance $R_{DS(on)}$ @ V_{GS}=2.5 V
- Fast Switching
- Pb-free lead plating; RoHS compliant

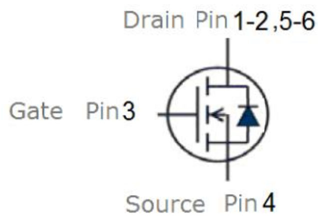
V_{DS}	20	V
$R_{DS(on),TYP}$@ V_{GS}=4.5 V	8.2	mΩ
$R_{DS(on),TYP}$@ V_{GS}=2.5 V	10	mΩ
I_D	45	A

TDFN2x2



Pb-Free RoHS HF Halogen-Free

Part ID	Package Type	Marking	Tape and reel information
VS2622AA	DFN2x2	2622	3000PCS/Reel



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

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		20	V
V_{GS}	Gate-Source voltage		±12	V
I_S	Diode continuous forward current	T_C =25°C	45	A
I_D	Continuous drain current@VGS=4.5V	T_C =25°C	45	A
		T_C =100°C	29	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	180	A
I_{DSM}	Continuous drain current @VGS=4.5V	T_A=25°C	13	A
		T_A=70°C	10	A
P_D	Maximum power dissipation	T_C =25°C	30	W
P_{DSM}	Maximum power dissipation ②	T_A=25°C	2.5	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	50	°C/W

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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	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T_j =125℃)	V_{DS}=20V,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	0.4	0.7	1	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ③	V_{GS}=4.5V, I_D=4.5A	--	8.2	11	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance ③	V_{GS}=3.3V, I_D=4A	--	9	12	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance ③	V_{GS}=2.5V, I_D=3A	--	10	14	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V, f=1MHz	900	1170	1400	pF
C_{oss}	Output Capacitance		100	195	300	pF
C_{rss}	Reverse Transfer Capacitance		80	165	250	pF
R_g	Gate Resistance	f=1MHz	--	2.4	--	Ω
Q_g	Total Gate Charge	V_{DS}=10V,I_D=4.5A, V_{GS}=4.5V	--	15	--	nC
Q_{gs}	Gate-Source Charge		--	6	--	nC
Q_{gd}	Gate-Drain Charge		--	7	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V, I_D=4.5A, R_G=3.0Ω, V_{GS}=4.5V	--	3.1	--	nS
t_r	Turn-on Rise Time		--	4.6	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	9	--	nS
t_f	Turn-Off Fall Time		--	9.4	--	nS
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=4.5A,V_{GS}=0V	--	0.8	1.2	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=4.5A, V_{GS}=0V di/dt=500A/μs	--	13	--	nS
Q_{rr}	Reverse Recovery Charge			17		nC

NOTE:

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

② The power dissipation P_{DSM} is based on $R_{θJA}$ and the maximum allowed junction temperature of 150°C.

③ Pulse width ≤ 300μs; duty cycle≤ 2%.

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Typical Characteristics

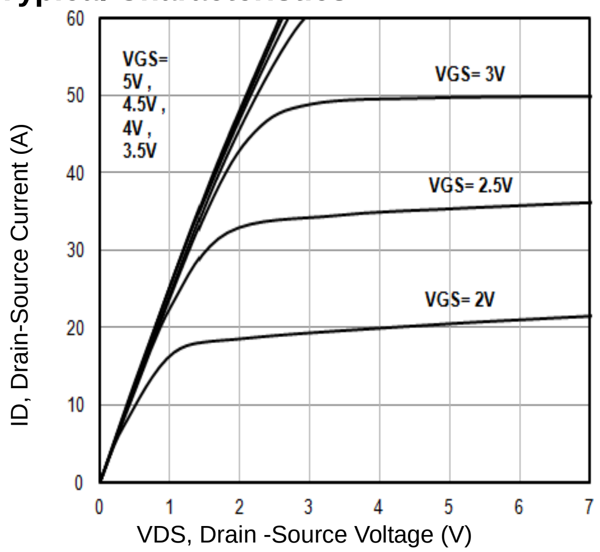

Fig1. Typical Output Characteristics

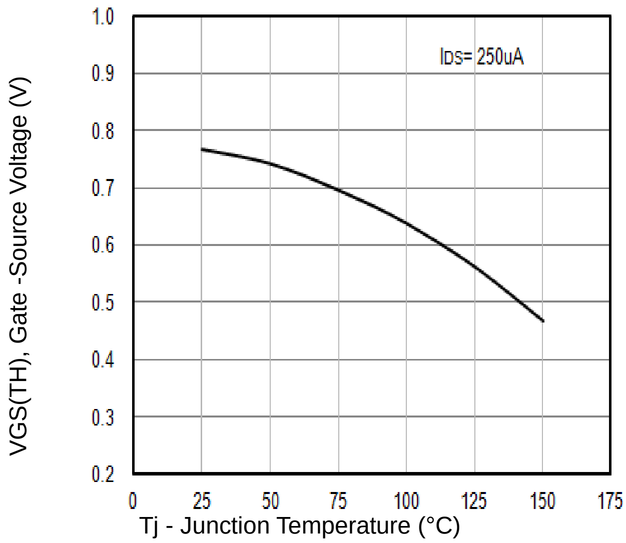

Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

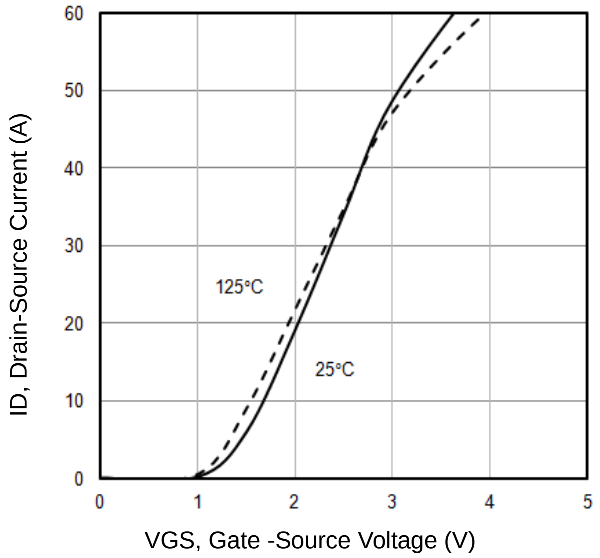

Fig3. Typical Transfer Characteristics

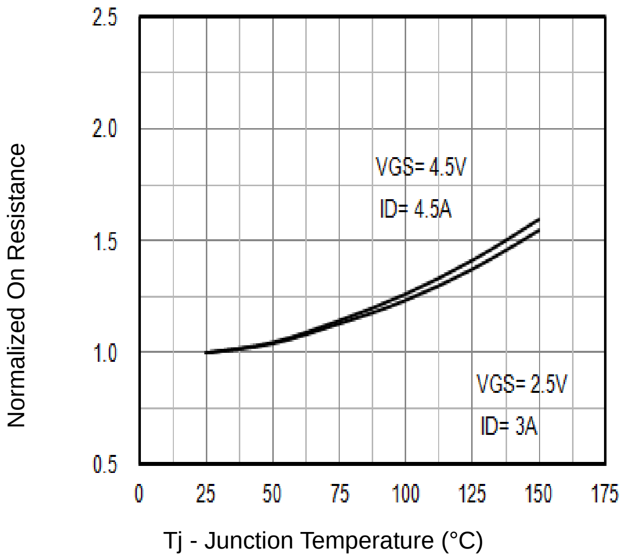

Fig4. Normalized On-Resistance Vs. Tj

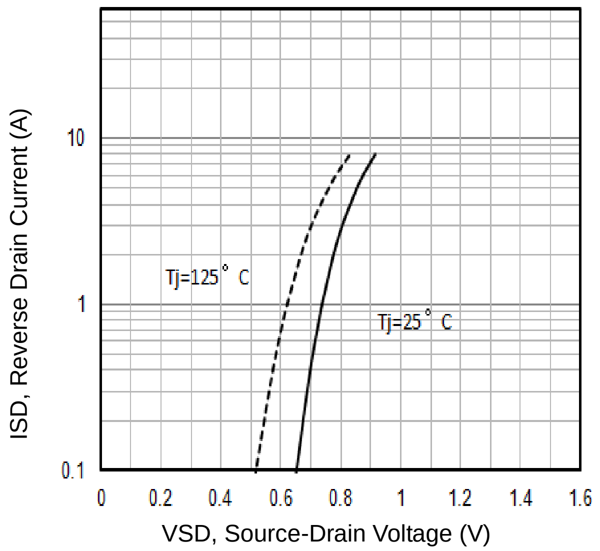

Fig5. Typical Source-Drain Diode Forward Voltage

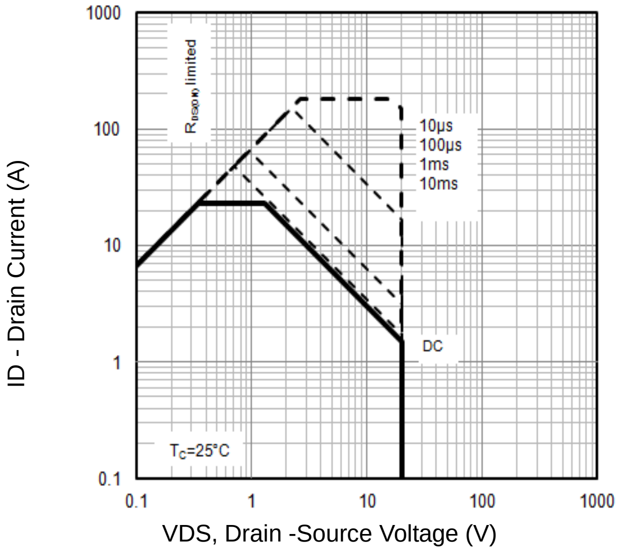

Fig6. Maximum Safe Operating Area

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Typical Characteristics

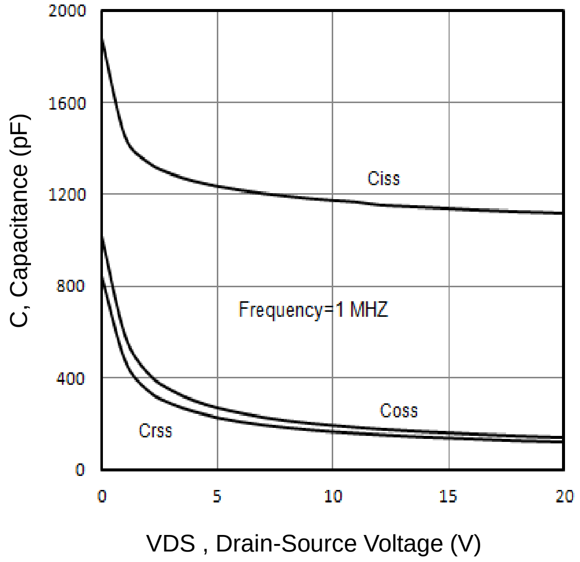

Fig7. Typical Capacitance Vs.Drain-Source Voltage

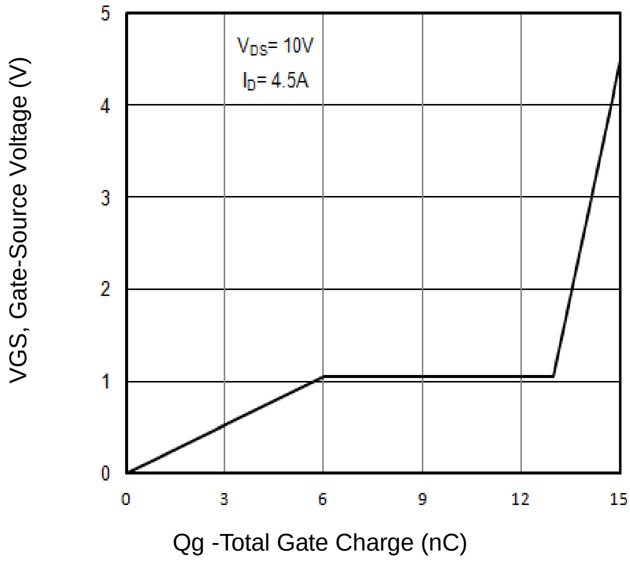

Fig8. Typical Gate Charge Vs.Gate-Source Voltage

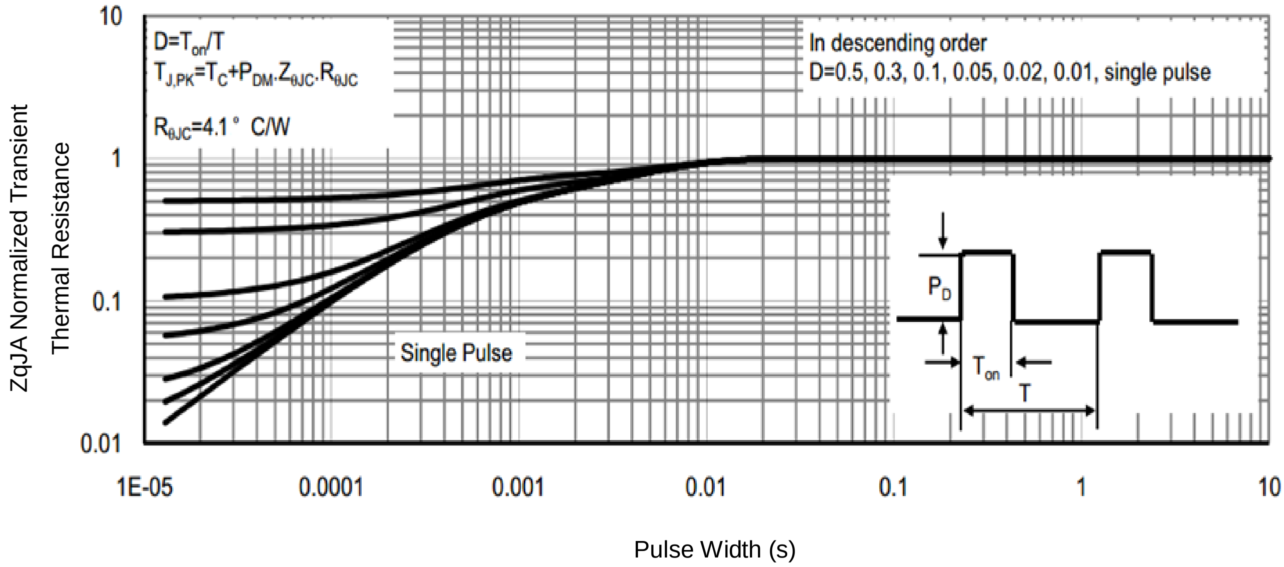

Fig9. Normalized Maximum Transient Thermal Impedance

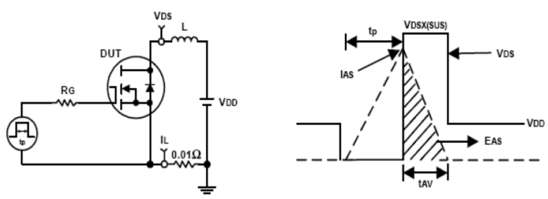

Fig10. Unclamped Inductive Test Circuit and waveforms

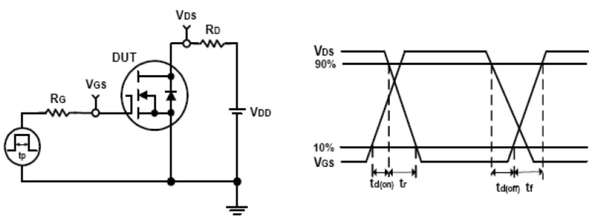

Fig11. Switching Time Test Circuit and waveforms

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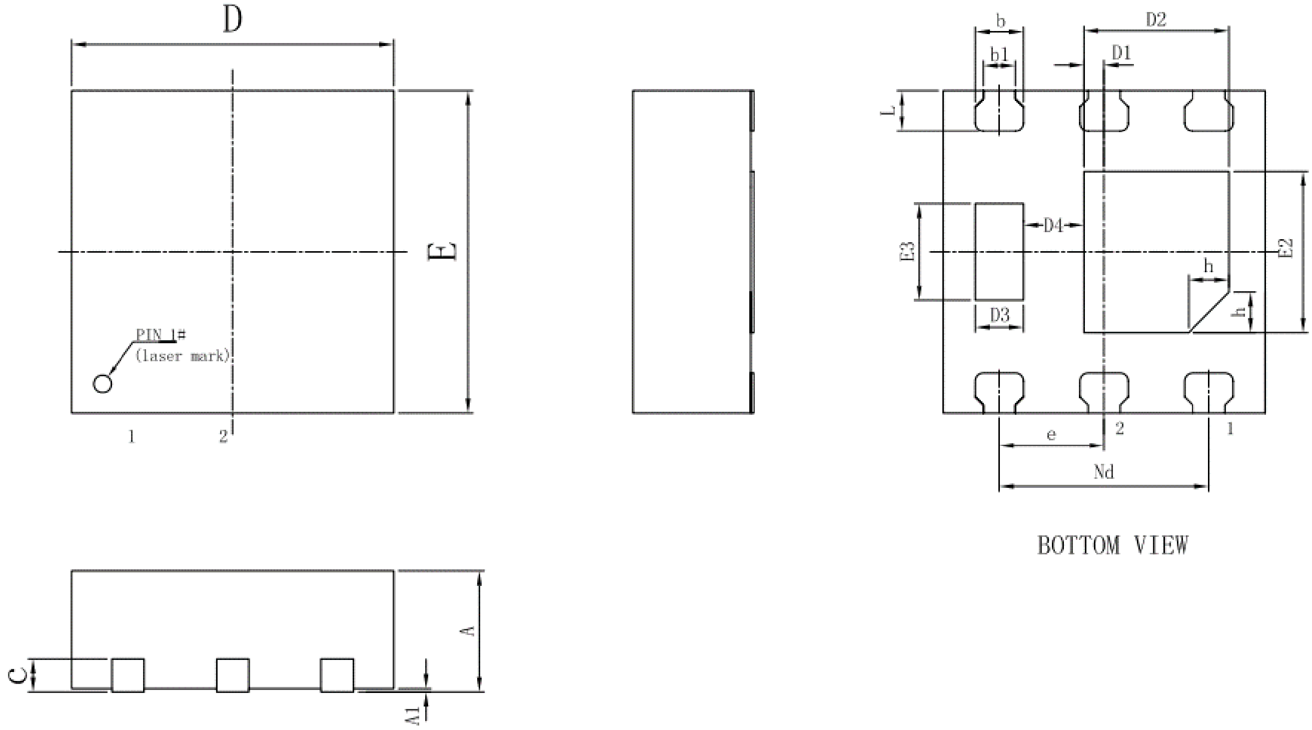
DFN2x2 Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	0.70	0.75	0.80
A1	--	0.02	0.05
b	0.25	0.30	0.35
b1	0.20 REF		
c	0.203 REF		
D	1.90	2.00	2.1
D1	0.08	0.125	0.18
D2	0.85	0.90	0.95
D3	0.25	0.3	0.35
D4	0.33	0.375	0.43
e	0.65 BSC		
Nd	1.30 BSC		
E	1.90	2.00	2.10
E2	0.95	1.00	1.05
E3	0.55	0.60	0.65
L	0.20	0.25	0.30
h	0.25 REF		

Customer Service

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