

Features

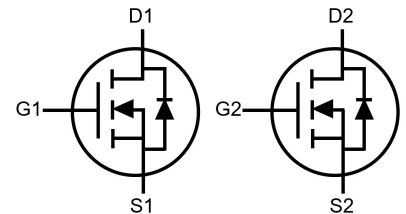
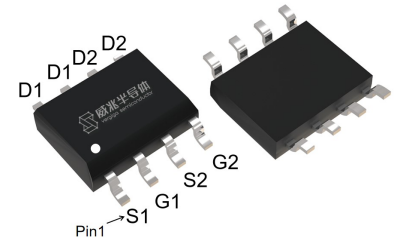
- Enhancement mode
- Low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5\text{ V}$
- VitoMOS® II Technology
- 100% Avalanche test
- Pb-free lead plating; RoHS compliant



Halogen-Free

V_{DS}	65	V
$R_{DS(on),TYP} @ V_{GS}=10\text{ V}$	12	mΩ
$R_{DS(on),TYP} @ V_{GS}=4.5\text{ V}$	20	mΩ
I_D	10	A

SOP8



Part ID	Package Type	Marking	Packing
VS6614DS	SOP8	6614DS	3000pcs/reel

Maximum ratings, at $T_A=25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		65	V
V_{GS}	Gate-Source voltage		± 20	V
I_S	Diode continuous forward current	$T_A=25^\circ\text{C}$	1.7	A
I_D	Continuous drain current @ $V_{GS}=10\text{V}$	$T_A=25^\circ\text{C}$	10	A
		$T_A=70^\circ\text{C}$	8	A
I_{DM}	Pulse drain current tested ①	$T_A=25^\circ\text{C}$	40	A
EAS	Avalanche energy, single pulsed ②		16	mJ
PD	Maximum power dissipation	$T_A=25^\circ\text{C}$	2	W
T_{STG}, T_J	Storage and junction temperature range		-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Max	Unit
$R_{\theta JL}$	Thermal Resistance, Junction-to-Lead	40	48	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	75	$^\circ\text{C/W}$

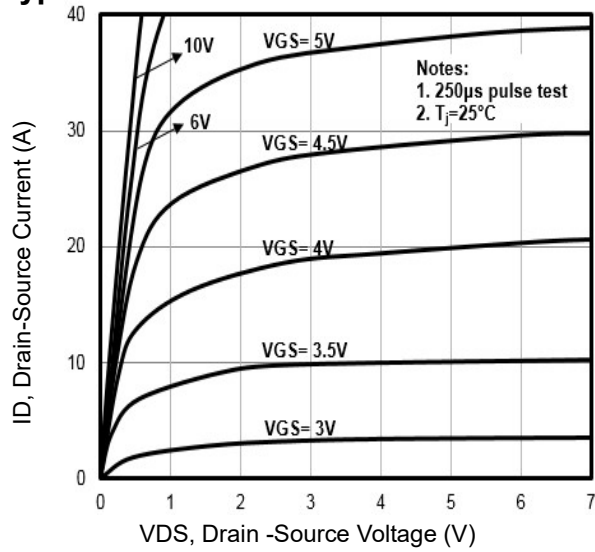
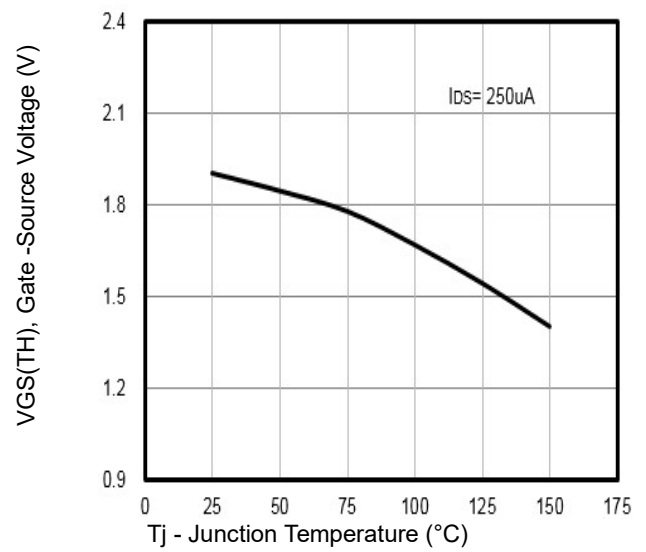
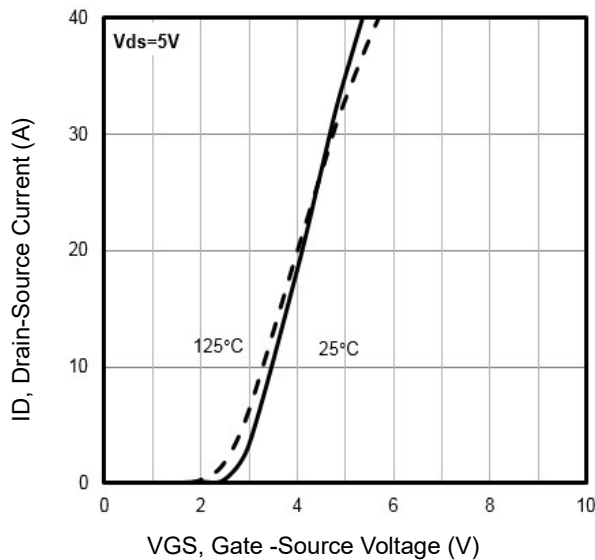
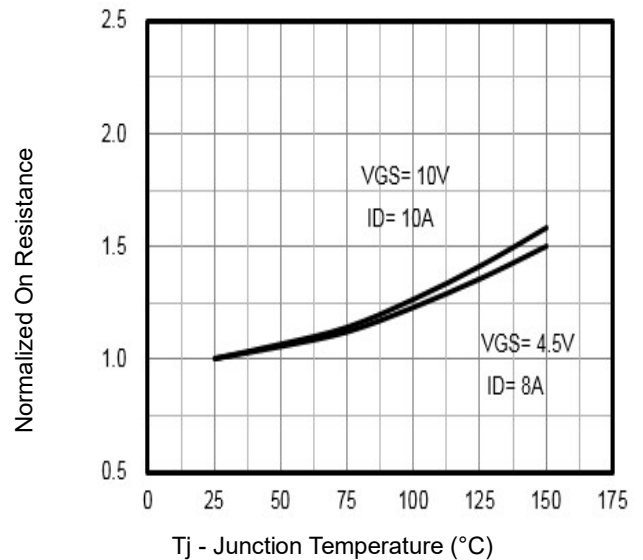
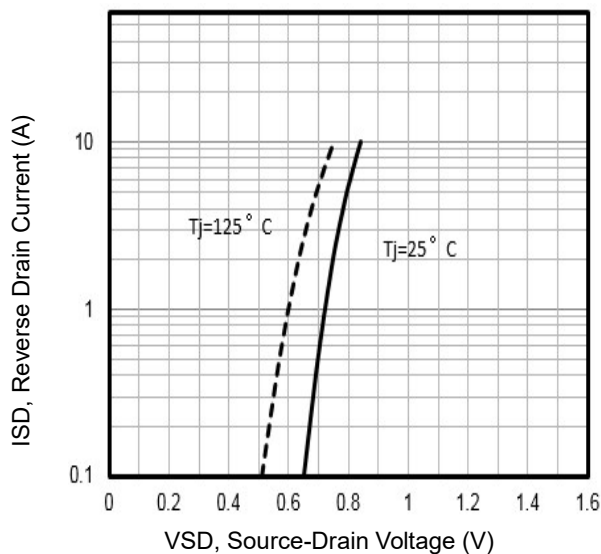
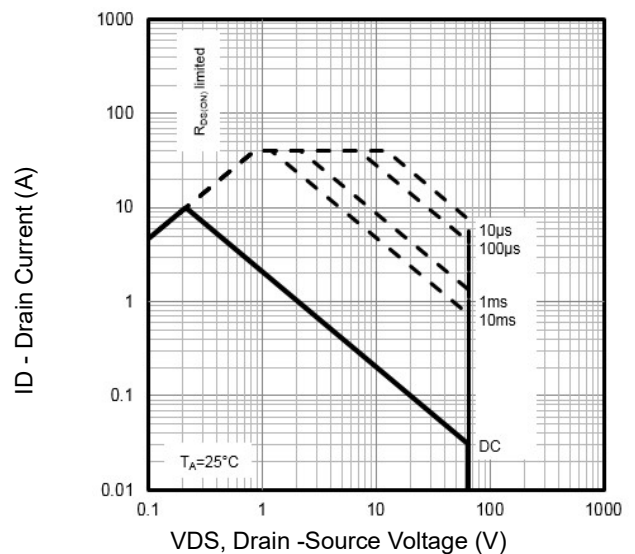
Electrical Characteristics

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	65	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _j =25°C)	V _{DS} =60V,V _{GS} =0V	--	--	1	uA
	Zero Gate Voltage Drain Current(T _j =125°C)	V _{DS} =60V,V _{GS} =0V	--	--	100	uA
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	1.5	1.9	2.5	V
R _{DS(on)}	Drain-Source On-State Resistance ③	V _{GS} =10V, I _D =10A	--	12	16	mΩ
		T _j =100°C	--	16	--	mΩ
R _{DS(on)}	Drain-Source On-State Resistance ③	V _{GS} =4.5V, I _D =8A	--	20	27	mΩ
Dynamic Electrical Characteristics @ T _j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =30V,V _{GS} =0V, f=1MHz	590	785	1045	pF
C _{oss}	Output Capacitance		295	390	520	pF
C _{rss}	Reverse Transfer Capacitance		1	9	20	pF
R _g	Gate Resistance	f=1MHz	0.2	1.1	3	Ω
Q _g (10V)	Total Gate Charge	V _{DS} =30V,I _D =10A, V _{GS} =10V		12	16	nC
Q _g (4.5V)	Total Gate Charge			5.9	7.8	nC
Q _{gs}	Gate-Source Charge			2.8	3.7	nC
Q _{gd}	Gate-Drain Charge			1.6	2.4	nC
Switching Characteristics						
T _d (on)	Turn-on Delay Time	V _{DD} =30V, I _D =10A, R _G =3.0Ω, V _{GS} =10V	--	6	--	ns
T _r	Turn-on Rise Time		--	17	--	ns
T _d (off)	Turn-Off Delay Time		--	12	--	ns
T _f	Turn-Off Fall Time		--	3.6	--	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°C ,I _{sd} =10A, V _{GS} =0V	--	19	38	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	--	6.6	13	nC

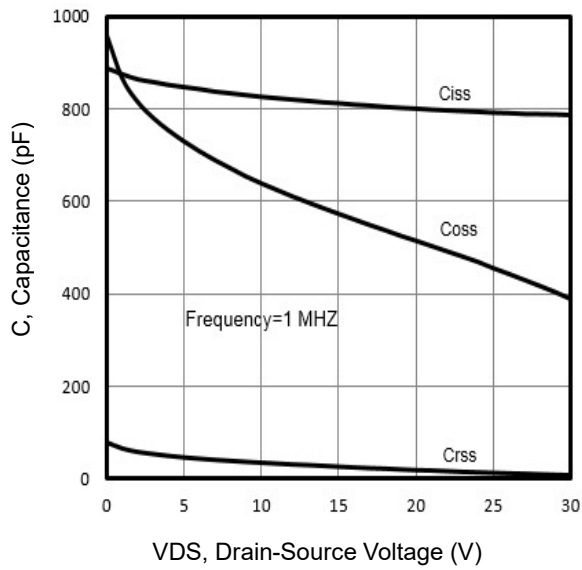
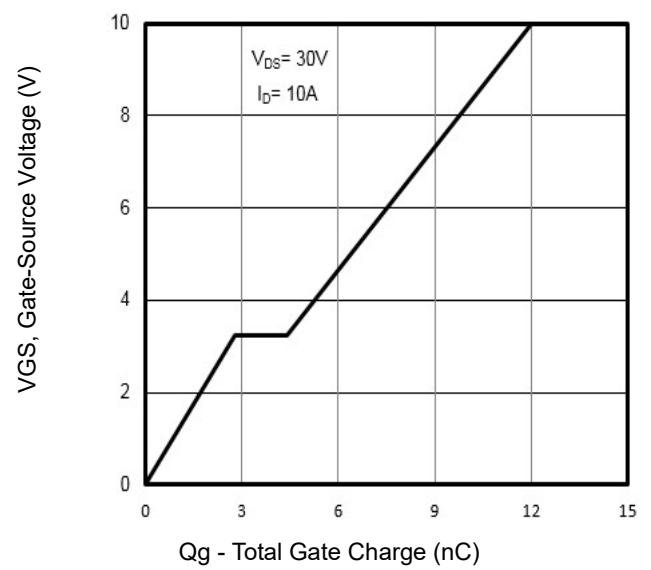
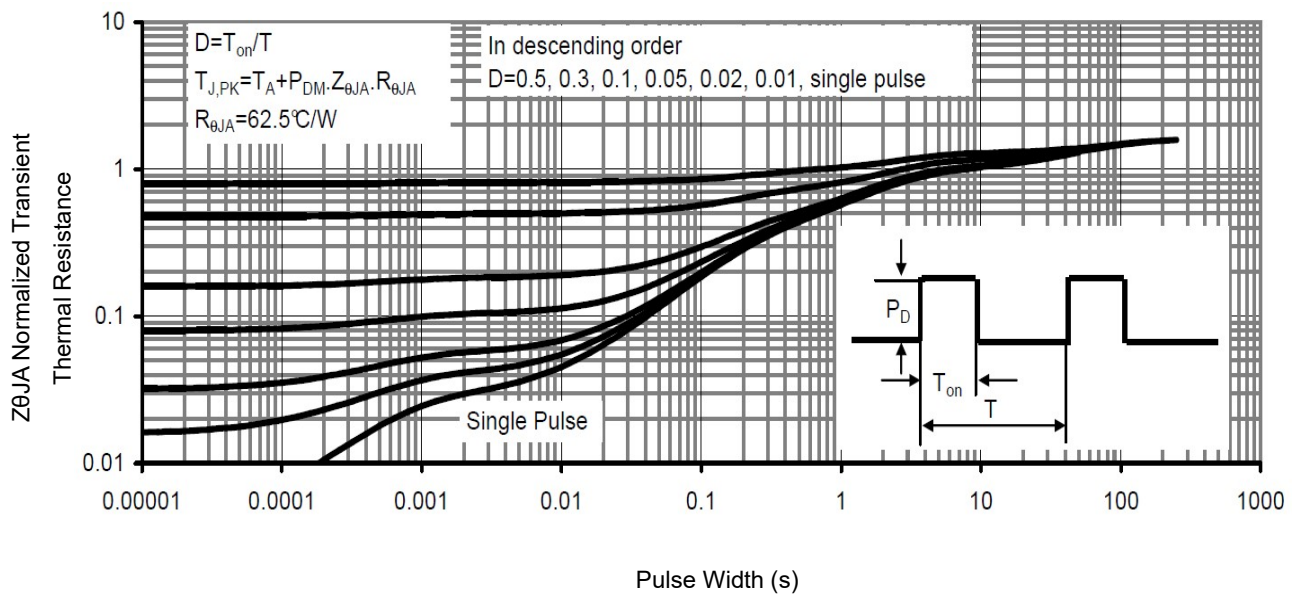
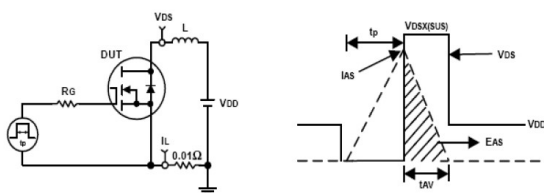
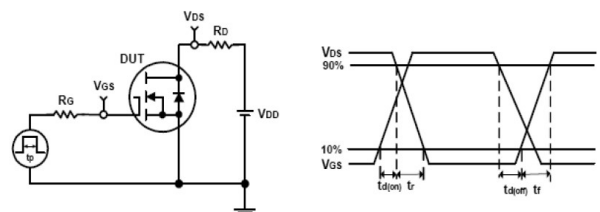
NOTE:

- ① Repetitive rating; pulse width limited by max junction temperature.
- ② Limited by T_{Jmax} , starting $T_J = 25^{\circ}\text{C}$, $L = 0.5\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 8A$, $V_{GS} = 10V$. Part not recommended for use above this value
- ③ Pulse width $\leq 380\mu s$; duty cycle $\leq 2\%$.

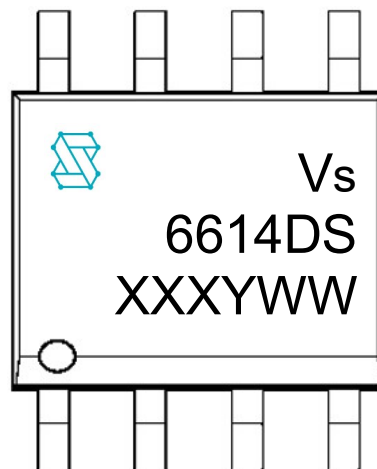
Typical Characteristics


Fig1. Typical Output Characteristics

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

Fig3. Typical Transfer Characteristics

Fig4. Normalized On-Resistance Vs. T_j

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: Vergiga Code (Vs), Vergiga Logo

2nd line: Part Number (6614DS)

3rd line: Date code (XXXYWW)

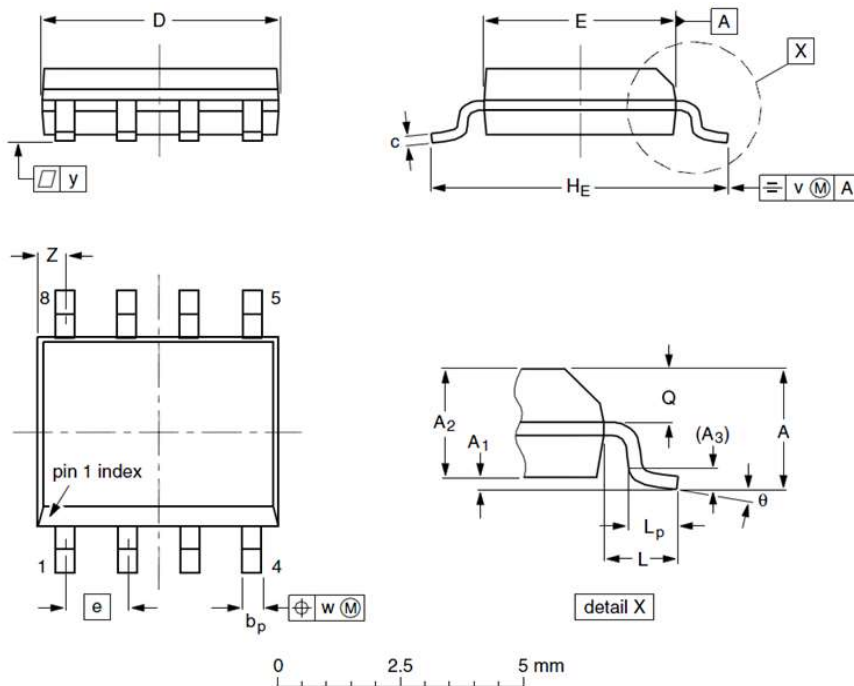
XXX: Wafer Lot Number Code , code changed with Lot Number

Y: Year Code , refer to table below

WW: Week Code (01 to 53)

Code	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030

SOP8 Package Outline Data



Label	Dimensions (unit: mm)		
	Min	Typ	Max
A	--	--	1.75
A ₁	0.10	0.18	0.25
A ₂	1.25	1.35	1.50
A ₃	--	0.25	--
b _p	0.36	0.42	0.51
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	6.00	6.20
L	--	1.05	--
L _p	0.40	0.68	1.00
Q	0.60	0.65	0.725
v	--	0.25	--
w	--	0.25	--
y	--	0.10	--
Z	0.30	0.50	0.70
θ	0°		8°

Notes:

1. Follow JEDEC MS-012.
2. Dimension "D" does NOT include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.15mm per side.
3. Dimension "E" does NOT include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.25mm per side.
4. Dimension "b_p" does NOT include dambar protrusion. Allowable dambar protrusion shall be 0.1mm total in excess of "b_p" dimension at maximum material condition. The dambar cannot be located on the lower radius of the foot.

Customer Service

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