

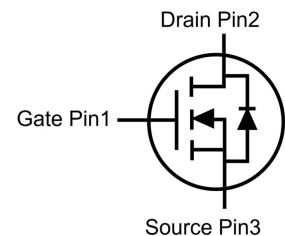
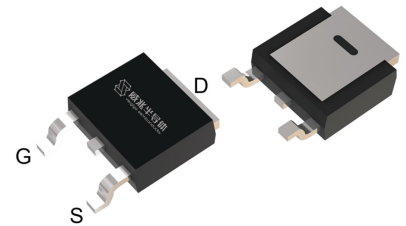
Features

- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=10\text{ V}$
- VitoMOS[®] II Technology
- Fast Switching and High efficiency
- 100% Avalanche test



Part ID	Package Type	Marking	Packing
VSD007N06MS-G	TO-252	007N06M	2500PCS/Reel

V_{DS}	60	V
$R_{DS(on),TYP}@ V_{GS}=10\text{V}$	4.8	m Ω
$R_{DS(on),TYP}@ V_{GS}=4.5\text{V}$	7.8	m Ω
I_D	88	A

TO-252


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

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	60	V
V_{GS}	Gate-Source voltage	± 20	V
I_S	Diode continuous forward current	$T_C = 25^\circ\text{C}$	88 A
I_D	Continuous drain current @ $V_{GS}=10\text{V}$	$T_C = 25^\circ\text{C}$	88 A
		$T_C = 100^\circ\text{C}$	63 A
I_{DM}	Pulse drain current tested ①	$T_C = 25^\circ\text{C}$	352 A
I_{DSM}	Continuous drain current @ $V_{GS}=10\text{V}$	$T_A = 25^\circ\text{C}$	11 A
		$T_A = 70^\circ\text{C}$	9 A
E_{AS}	Avalanche energy, single pulsed ②	25	mJ
P_D	Maximum power dissipation	$T_C = 25^\circ\text{C}$	75 W
P_{DSM}	Maximum power dissipation ③	$T_A = 25^\circ\text{C}$	1.3 W
$T_{STG,TJ}$	Storage and Junction Temperature Range	-55 to 175	$^\circ\text{C}$

Thermal Characteristics

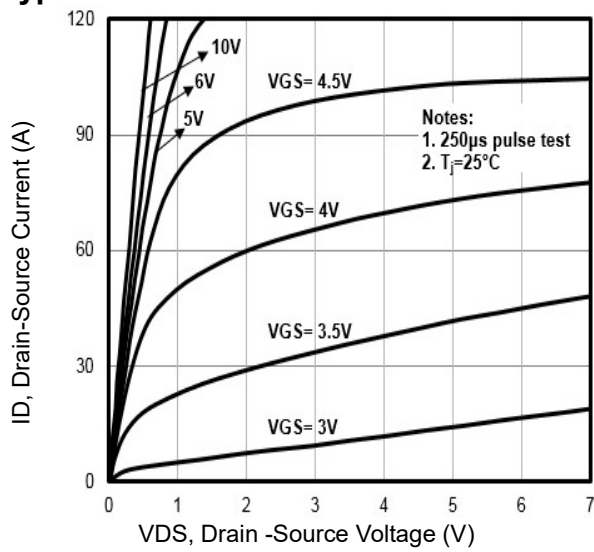
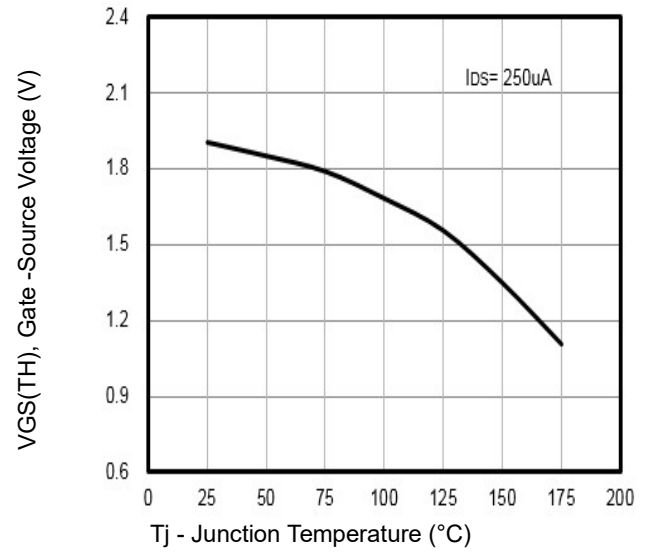
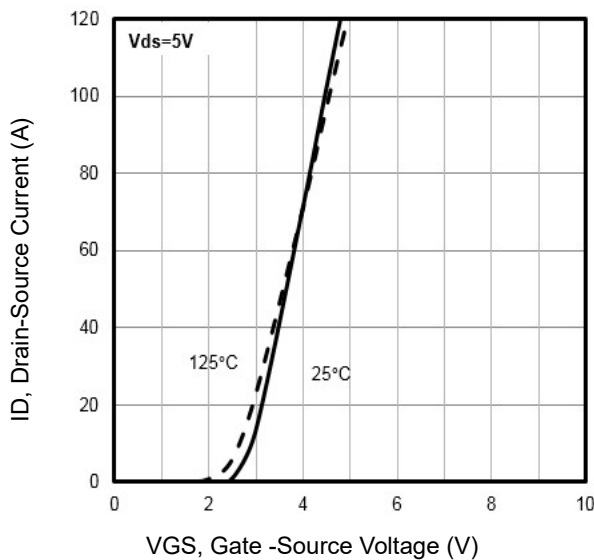
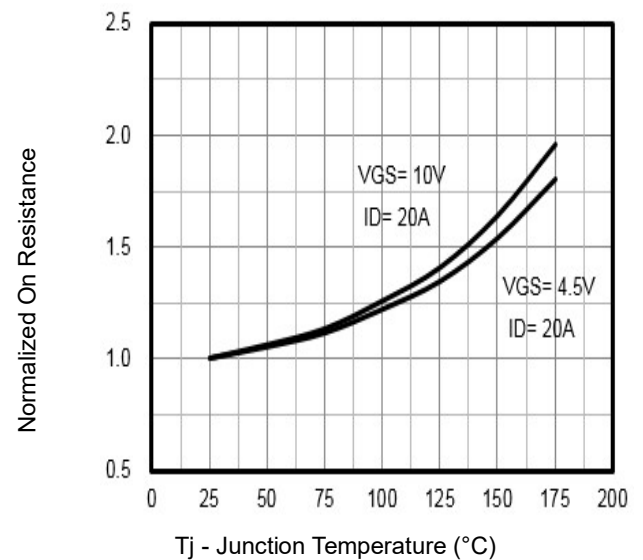
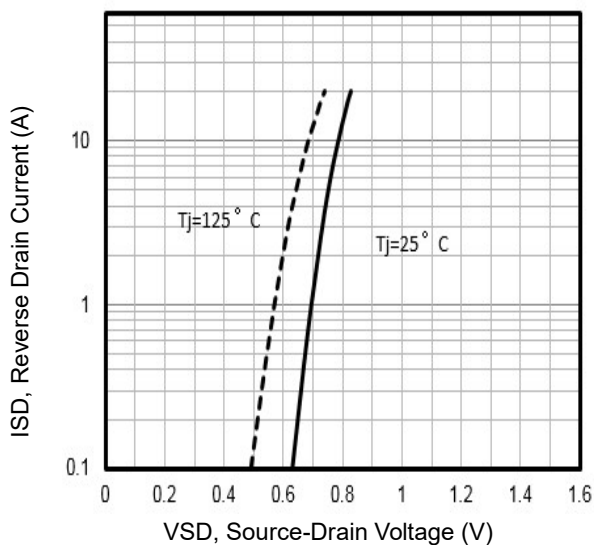
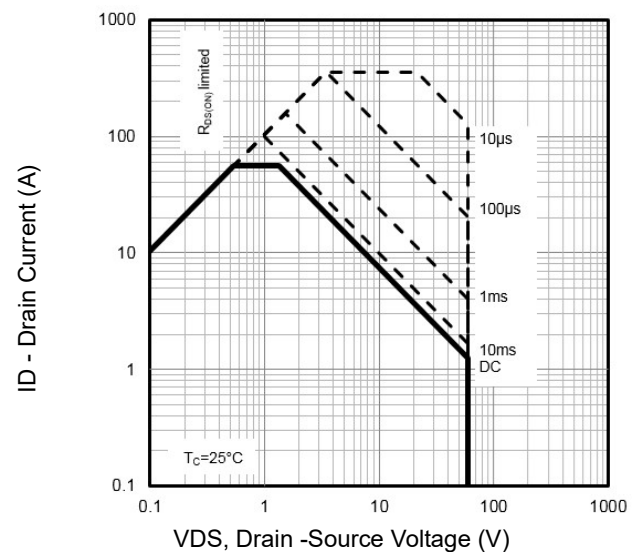
Symbol	Parameter	Typical	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2	2.4	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	100	120	$^\circ\text{C/W}$

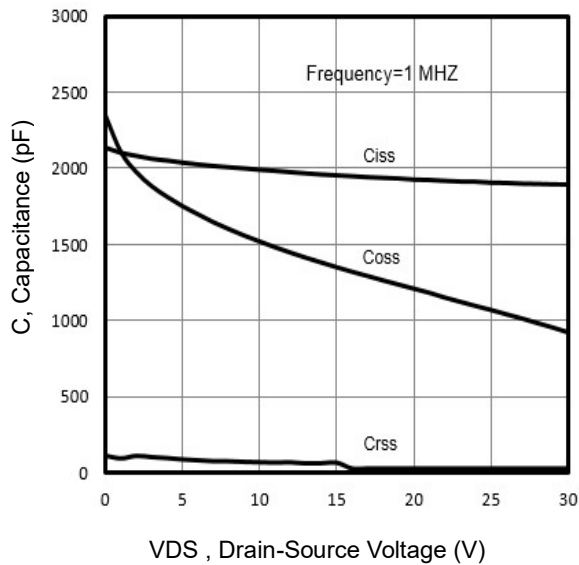
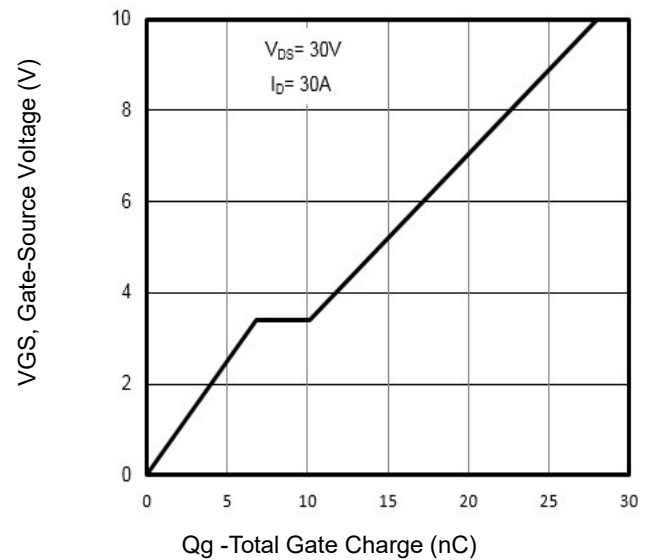
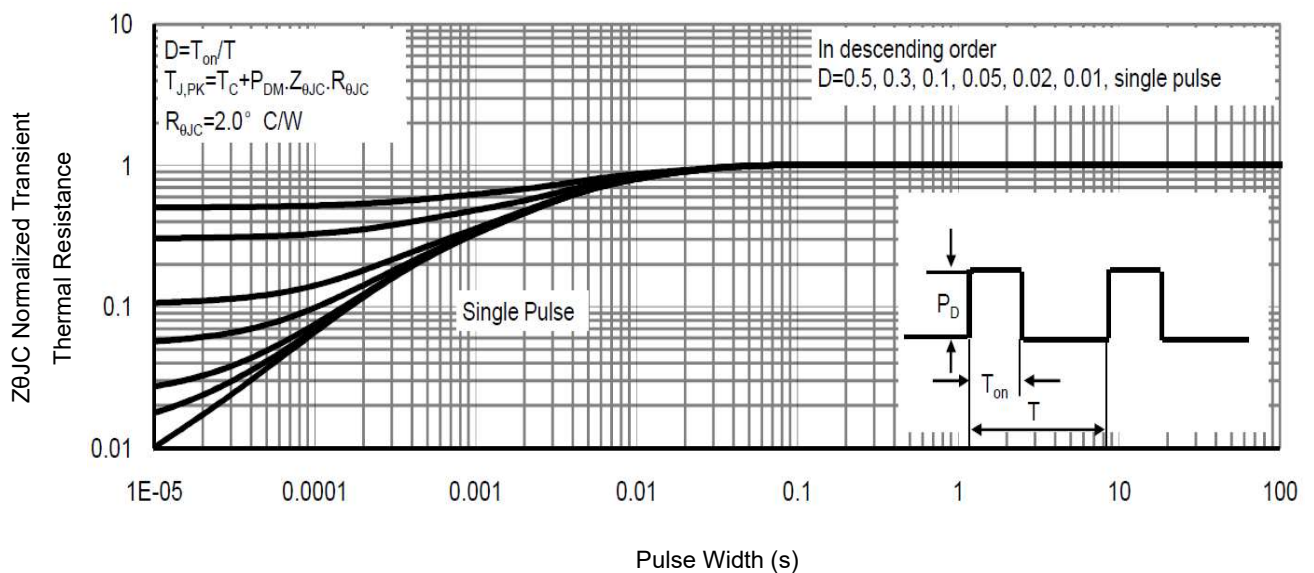
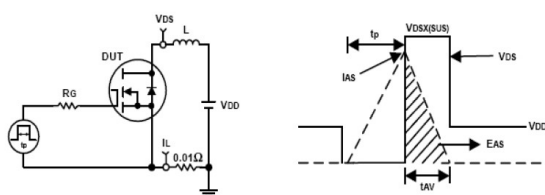
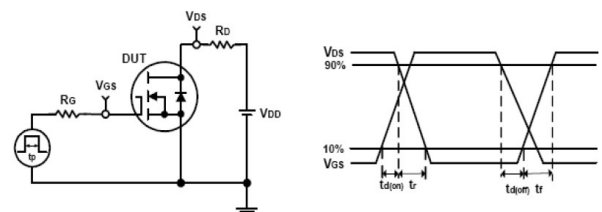
Electrical Characteristics

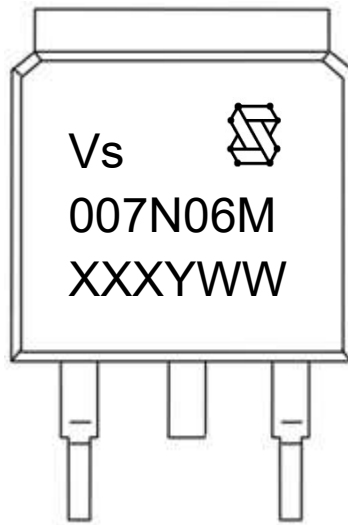
Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _j =125°C)	V _{DS} =60V, V _{GS} =0V	--	--	100	μA
IGSS	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	1.4	1.9	2.5	V
R _{DS(on)}	Drain-Source On-State Resistance ④	V _{GS} =10V, I _D =30A	--	4.8	6	mΩ
		T _j =100°C	--	5.9	--	mΩ
R _{DS(on)}	Drain-Source On-State Resistance ④	V _{GS} =4.5V, I _D =20A	--	7.8	10	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	1420	1895	2520	pF
C _{oss}	Output Capacitance		690	920	1225	pF
C _{rss}	Reverse Transfer Capacitance		25	35	45	pF
R _g	Gate Resistance	f=1MHz	0.5	1.3	5	Ω
Q _{g(10V)}	Total Gate Charge	V _{DS} =30V, I _D =30A, V _{GS} =10V	--	28	37	nC
Q _{g(4.5V)}	Total Gate Charge		--	13	17	nC
Q _{gs}	Gate-Source Charge		--	6.8	9	nC
Q _{gd}	Gate-Drain Charge		--	3.3	5	nC
Switching Characteristics						
T _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =30A, R _G =3Ω, V _{GS} =10V	--	8.2	--	ns
T _r	Turn-on Rise Time		--	43	--	ns
T _{d(off)}	Turn-Off Delay Time		--	21	--	ns
T _f	Turn-Off Fall Time		--	31	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =30A, V _{GS} =0V	--	0.9	1.2	V
T _{rr}	Reverse Recovery Time	T _j =25°C, I _{sd} =30A, V _{GS} =0V	--	31	62	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	--	20	40	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} = 10A, V_{GS} = 10V. 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 ≤ 380μs; duty cycle ≤ 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 (007N06M)

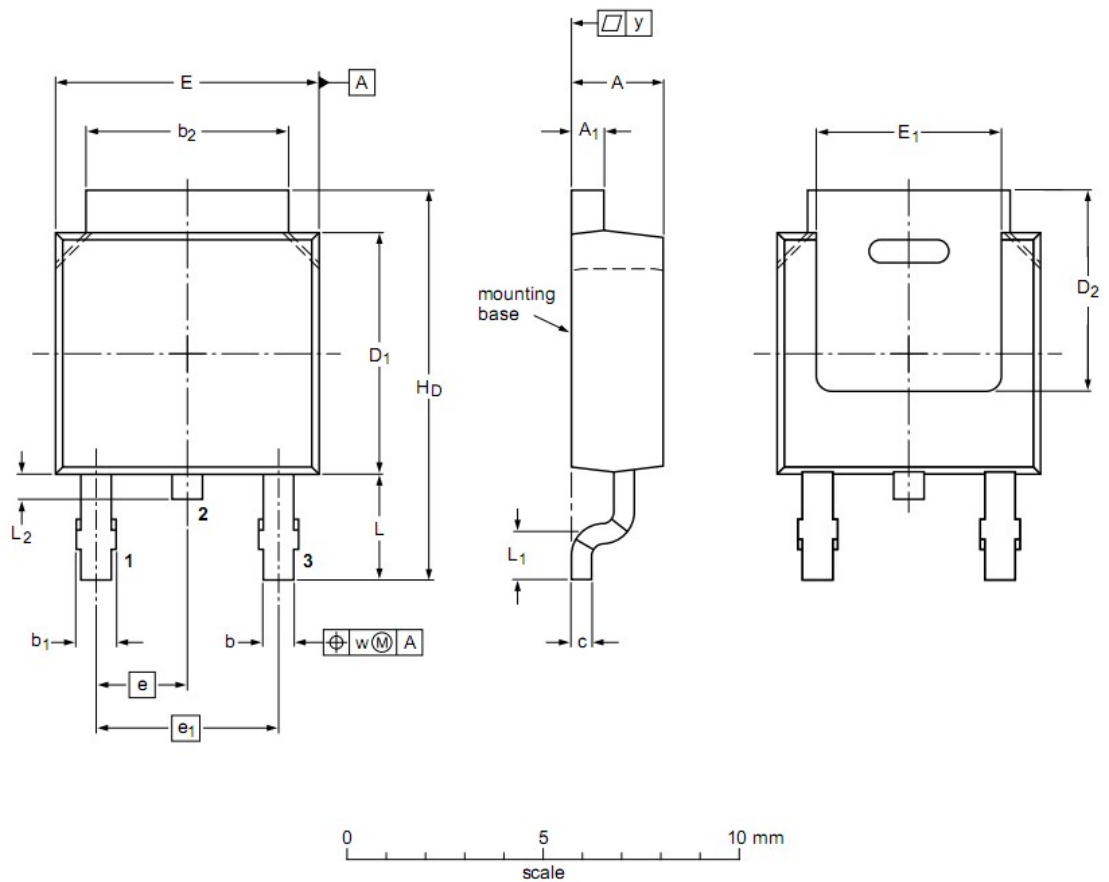
3rd line: Date code (XXXYWW)

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

TO-252 Package Outline Data


Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	2.20	2.30	2.38
A₁	0.46	0.50	0.63
b	0.64	0.76	0.89
b₁	0.77	0.85	1.14
b₂	5.00	5.33	5.46
c	0.458	0.508	0.558
D₁	5.98	6.10	6.223
D₂	5.21	--	--
E	6.40	6.60	6.731
E₁	4.40	--	--
e	2.286 BSC		
e₁	--	4.57	--
H_D	9.40	10.00	10.40
L	2.743 REF		
L₁	1.40	1.52	1.77
L₂	0.50	0.80	1.01
w	--	0.20	--
y	--	--	0.20

Notes:

1. Refer to JEDEC TO-252 variation AA
2. Dimension "E" does NOT include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.1524mm per side.
3. Dimension "D1" does NOT include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.1524mm per end.

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