

Features

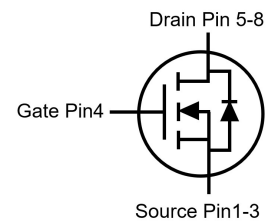
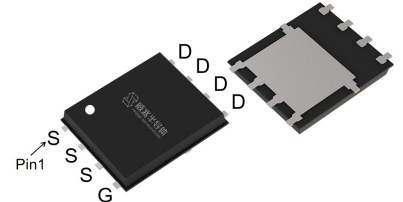
- Enhancement mode
- Very low on-resistance
- VitoMOS® II Technology
- Fast Switching and High efficiency
- 100% Avalanche tested, 100% Rg tested



Part ID	Package Type	Marking	Packing
VSP005NE8HS-G	PDFN5x6	005NE8H	3000PCS/Reel

V_{DS}	85	V
$R_{DS(on),TYP@ V_{GS}=10V}$	5	mΩ
$I_D(\text{Silicon Limited})$	56	A

PDFN5x6



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

Symbol	Parameter	Rating	Unit	
$V_{(BR)DSS}$	Drain-Source breakdown voltage	85	V	
V_{GS}	Gate-Source voltage	± 20	V	
I_S	Diode continuous forward current	$T_C = 25^\circ\text{C}$	56	A
I_D	Continuous drain current @ $V_{GS}=10V$ (Silicon limited)	$T_C = 25^\circ\text{C}$	56	A
I_D	Continuous drain current @ $V_{GS}=10V$ (Silicon limited)	$T_C = 100^\circ\text{C}$	35	A
I_{DM}	Pulse drain current tested ①	$T_C = 25^\circ\text{C}$	224	A
I_{DSM}	Continuous drain current @ $V_{GS}=10V$	$T_A = 25^\circ\text{C}$	16	A
		$T_A = 70^\circ\text{C}$	12	A
E_{AS}	Avalanche energy, single pulsed ②	529	mJ	
P_D	Maximum power dissipation ③	$T_C = 25^\circ\text{C}$	34	W
		$T_C = 100^\circ\text{C}$	14	W
P_{DSM}	Maximum power dissipation ④	$T_A = 25^\circ\text{C}$	2.6	W
		$T_A = 70^\circ\text{C}$	1.7	W
$T_{STG,TJ}$	Storage and Junction Temperature Range	-55 to 150	$^\circ\text{C}$	

Thermal Characteristics

Symbol	Parameter	Typical	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case ⑤	3.1	3.7	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ⑥	40	48	$^\circ\text{C/W}$

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	85	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _j =25°C)	V _{DS} =85V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _j =125°C) ^⑦	V _{DS} =85V, 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	2.6	3.1	3.6	V
R _{DS(on)}	Drain-Source On-State Resistance ^⑧	V _{GS} =10V, I _D =40A	--	5	6.5	mΩ
		T _j =100°C ^⑦	--	5.8	--	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance ^⑦	V _{DS} =40V, V _{GS} =0V, f=1MHz	--	4210	--	pF
C _{oss}	Output Capacitance ^⑦		--	695	--	pF
C _{rss}	Reverse Transfer Capacitance ^⑦		--	20	--	pF
R _g	Gate Resistance	f=1MHz	--	2.6	--	Ω
Q _g	Total Gate Charge ^⑦	V _{DS} =40V, I _D =40A, V _{GS} =10V	--	57	--	nC
Q _{gs}	Gate-Source Charge ^⑦		--	20	--	nC
Q _{gd}	Gate-Drain Charge ^⑦		--	13	--	nC
Switching Characteristics ^⑦						
T _{d(on)}	Turn-on Delay Time	V _{DD} =40V, I _D =40A, R _G =3Ω, V _{GS} =10V	--	15	--	ns
T _r	Turn-on Rise Time		--	52	--	ns
T _{d(off)}	Turn-Off Delay Time		--	37	--	ns
T _f	Turn-Off Fall Time		--	23	--	ns
Source- Drain Diode Characteristics @ T_j = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =40A, V _{GS} =0V	--	0.9	1.2	V
T _{rr}	Reverse Recovery Time ^⑦	I _{SD} =40A, V _{GS} =0V	--	52	--	ns
Q _{rr}	Reverse Recovery Charge ^⑦	di/dt=100A/μs	--	63	--	nC

NOTE:

- ① Single pulse; pulse width ≤ 100μs.
- ② EAS of 529mJ is based on starting T_j = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 46A, V_{GS} = 10V; 100% FT tested at L = 0.5mH, I_{AS} = 23A.
- ③ The power dissipation P_d is based on T_{j(max)}, using junction-to-case thermal resistance R_{θJC}.
- ④ The power dissipation P_{dsm} is based on T_{j(max)}, using junction-to-ambient thermal resistance R_{θJA}.
- ⑤ Thermal resistance from junction to soldering point (on the exposed drain pad).
- ⑥ These tests are performed with the device mounted on 1 in2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.
- ⑦ Guaranteed by design, not subject to production testing.
- ⑧ Pulse width ≤ 380μs; duty cycles ≤ 2%.

Typical Characteristics

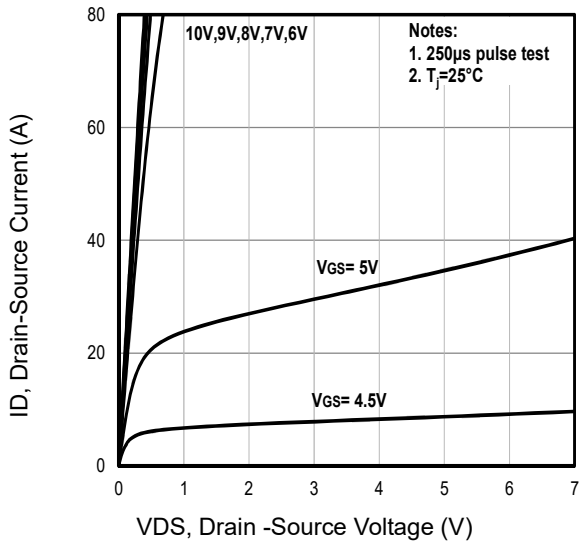


Fig1. Typical Output Characteristics

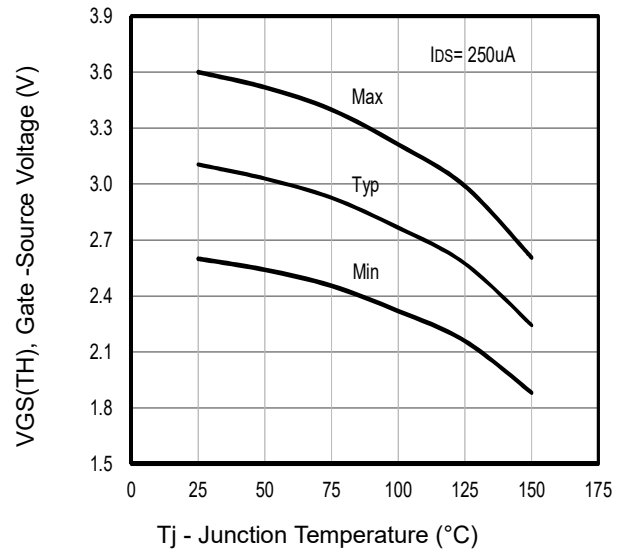


Fig2. Typical $V_{GS(TH)}$ Gate-Source Voltage Vs. T_j

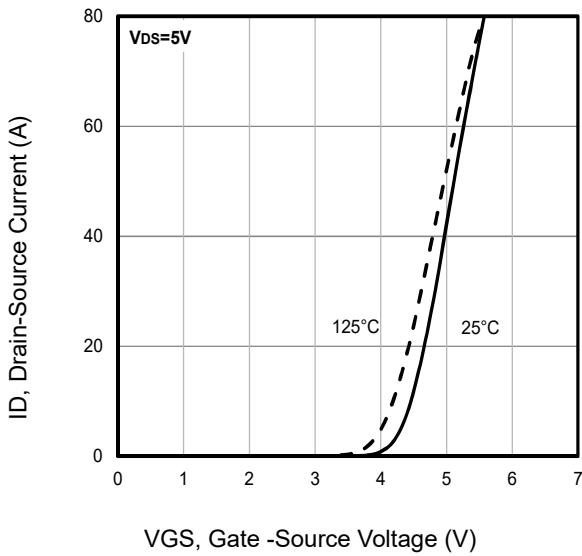


Fig3. Typical Transfer Characteristics

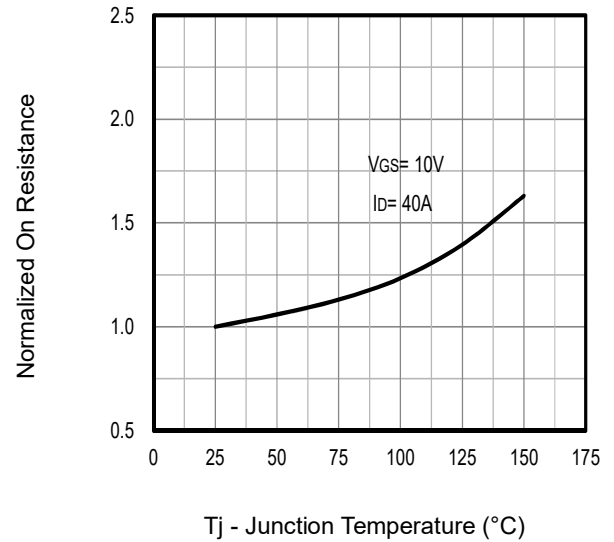


Fig4. Typical Normalized On-Resistance Vs. T_j

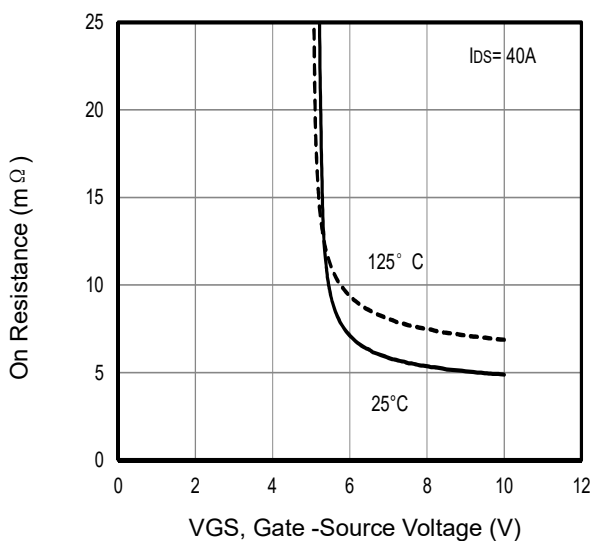


Fig5. Typical On Resistance Vs Gate-Source Voltage

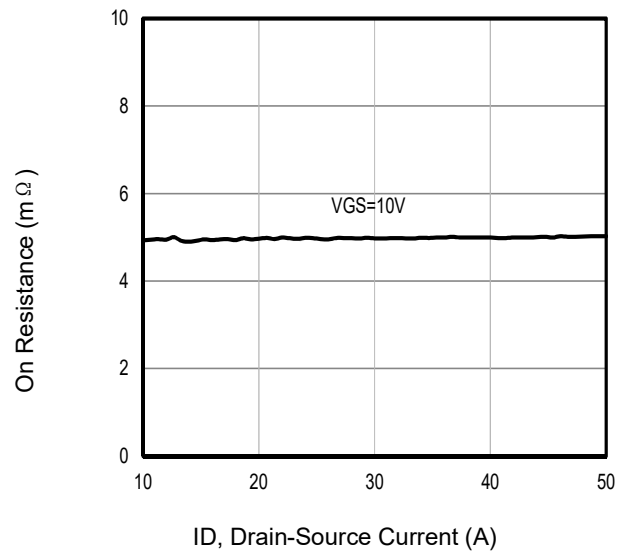


Fig6. Typical On Resistance Vs Drain Current

Typical Characteristics

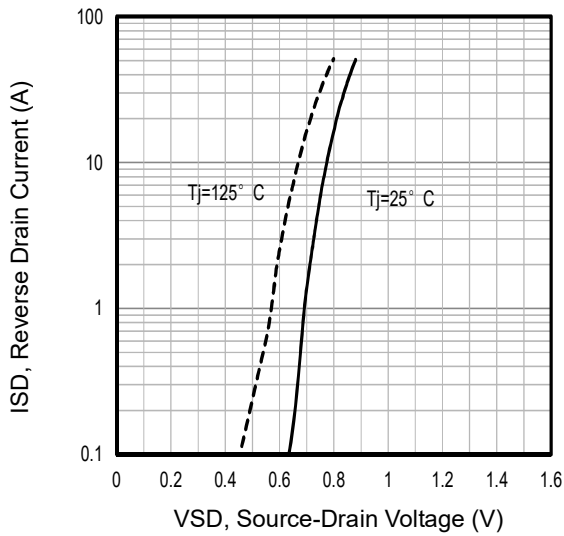


Fig7. Typical Source-Drain Diode Forward Voltage

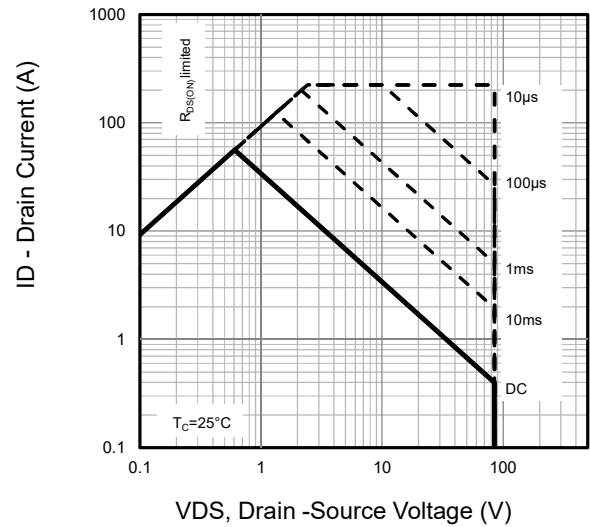


Fig8. Maximum Safe Operating Area

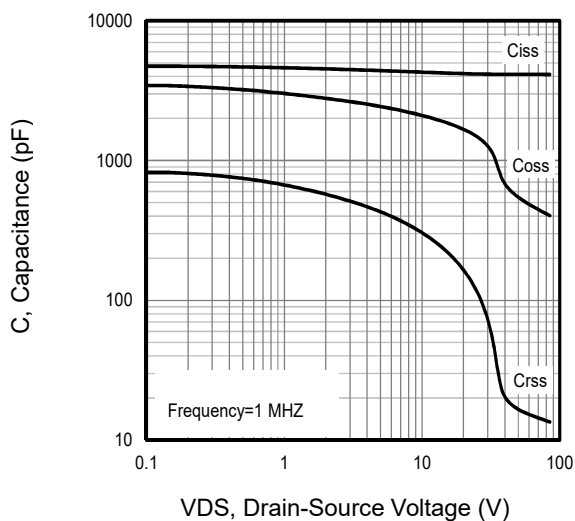


Fig9. Typical Capacitance Vs. Drain-Source Voltage

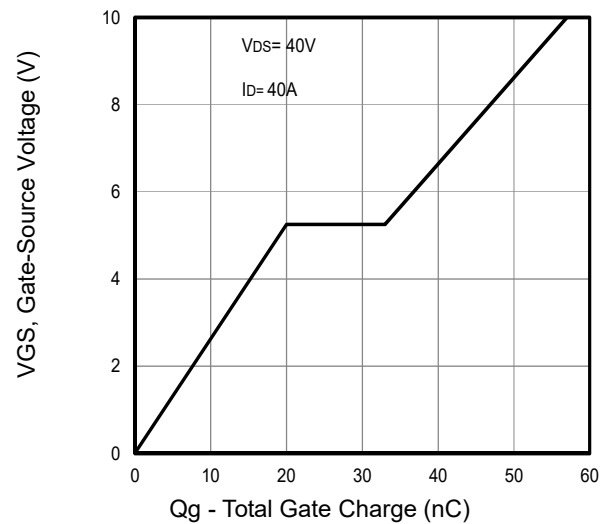


Fig10. Typical Gate Charge Vs. Gate-Source Voltage

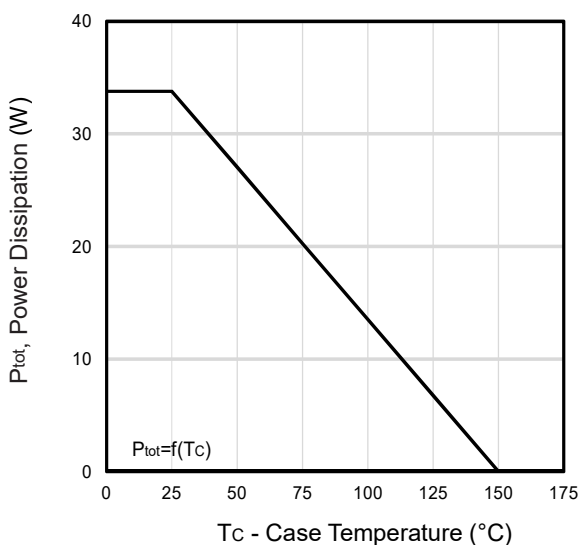


Fig11. Power Dissipation Vs. Case Temperature

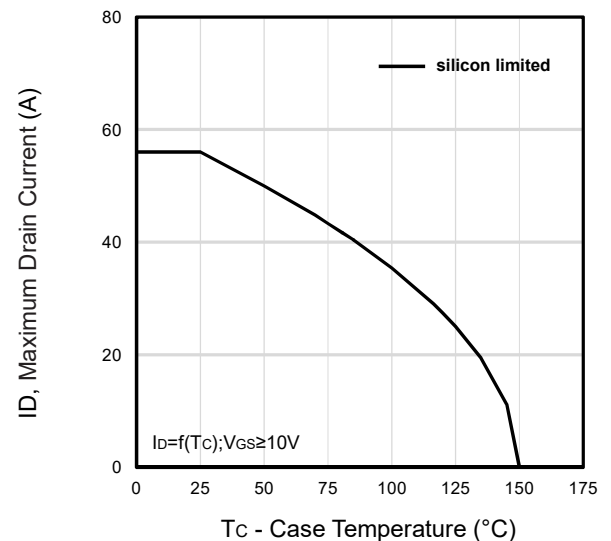


Fig12. Maximum Drain Current Vs. Case Temperature

Typical Characteristics

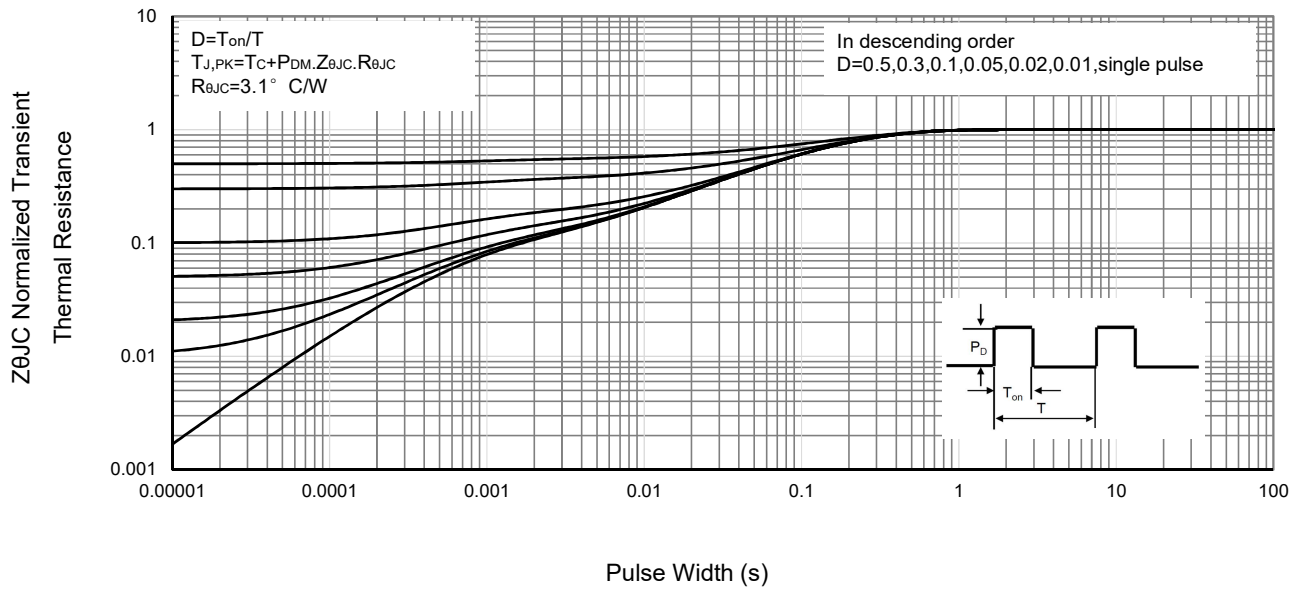


Fig13 . Normalized Maximum Transient Thermal Impedance

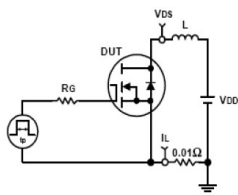


Fig14. Unclamped Inductive Test Circuit and waveforms

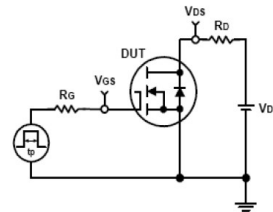
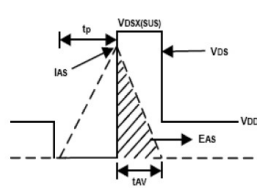
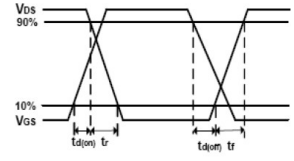
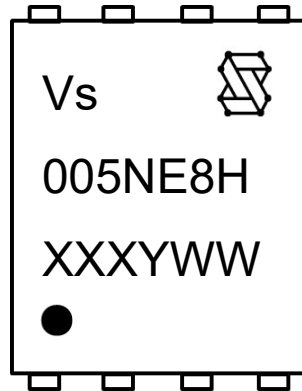


Fig15. Switching Time Test Circuit and waveforms



Marking Information



1st line: Vergiga Code (Vs), Vergiga Logo

2nd line: Part Number (005NE8H)

3rd line: Date code (XXXYWW)

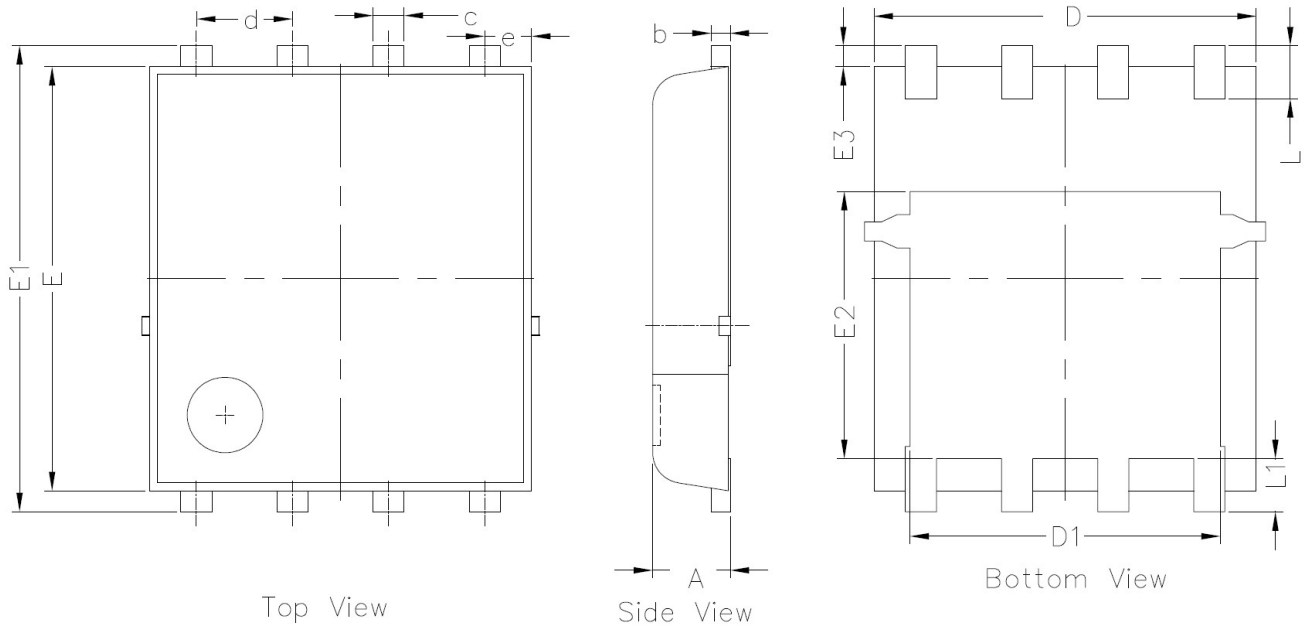
XXX: Wafer Lot Number Code, code changed with Lot Number

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

PDFN5x6 Package Outline Data



Symbol	DIMENSIONS (unit : mm)		
	Min	Typ	Max
A	0.900	1.000	1.100
b	0.246	0.254	0.312
c	0.310	0.410	0.510
d	1.27 BSC		
D	4.950	5.050	5.150
D1	4.000	4.100	4.200
E	5.500	5.600	5.700
E1	6.050	6.150	6.250
E2	3.425	3.525	3.625
E3	0.175	0.275	0.375
L	0.500	0.600	0.700
L1	0.600	0.700	0.800

Notes:

- 1.Refer to JEDEC MO-240 variation AA.
- 2.Dimensions "D" and "E" do NOT include mold flash protrusions or gate burrs.
- 3.Dimensions "D" and "E" include interterminal flash or protrusion. Interterminal flash or protrusion shall not exceed 0.25mm per side.

Customer Service

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