

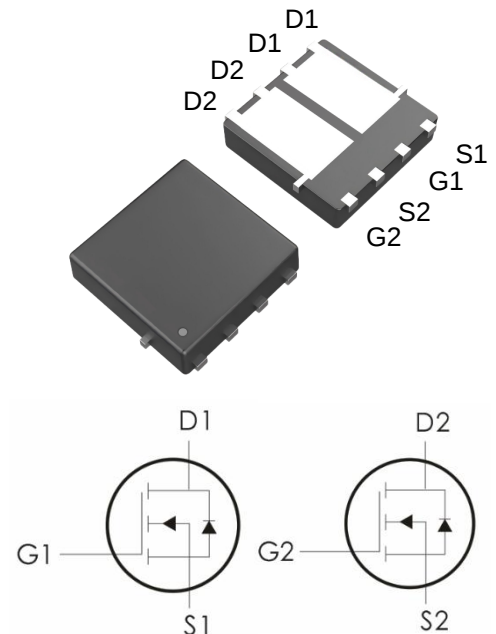
Description:

This Dual N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=40V, I_D=12A, R_{DS(on)} < 35m\Omega @ V_{GS}=10V$ (Typ: $28m\Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.
- 6) MSL3



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOZ12DN04	12DN04	DFN3*3-8D	5000 pcs/Reel

Absolute Maximum Ratings: ($T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	12	A
	Continuous Drain Current- $T_A=100^\circ C$ ¹	8.4	
I_{DM}	Pulsed Drain Current ²	48	
P_D	Power Dissipation	14	W
E_{AS}	Single pulse avalanche energy ³	5.5	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	8.9	$^\circ C/W$

Electrical Characteristics: ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	40	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =40V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.9	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ⁴	V _{GS} =10V, I _D =10A	---	28	35	m Ω
		V _{GS} =4.5V, I _D =5A	---	36	47	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	530	---	pF
C _{oss}	Output Capacitance		---	44	--	
C _{rss}	Reverse Transfer Capacitance		---	34	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =20V, I _D =3A, R _G =3 Ω ,V _{GS} =10V	---	4.6	---	ns
t _r	Rise Time		---	2	---	ns
t _{d(off)}	Turn-Off Delay Time		---	47	---	ns
t _f	Fall Time		---	372	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =20V, I _D =3A	---	11	---	nC
Q _{gs}	Gate-Source Charge		---	2.2	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	2	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =30A	---	---	1.2	V
I _S	Continuous Drain Curren	V _D =V _G =0V	---	---	12	A
I _{SM}	Pulsed Drain Current		---	---	48	A
T _{rr}	Reverse Recovery Time	I _F =3A, T _J =25 °C	---	8.5	---	ns
Q _{rr}	Reverse Recovery Charge	dl/dt=100A/us	---	3.8	---	nC

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : $T_J=25^{\circ}C, V_{DD}=20V, V_G=10V, L=0.1mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Characteristics: ($T_c=25^{\circ}C$ unless otherwise noted)

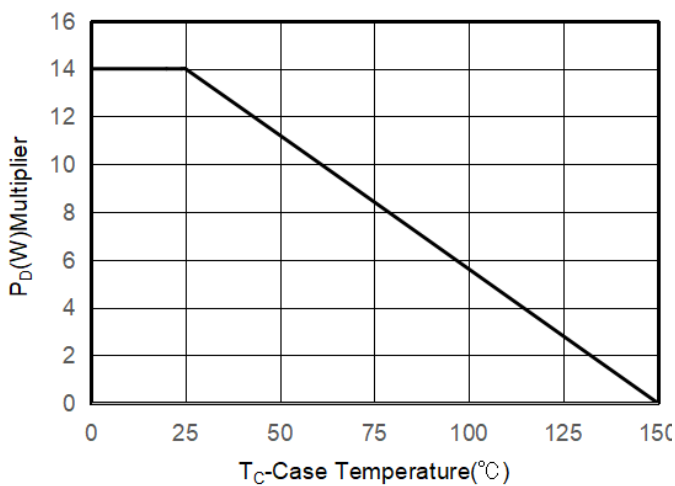


Figure 1: Power De-rating

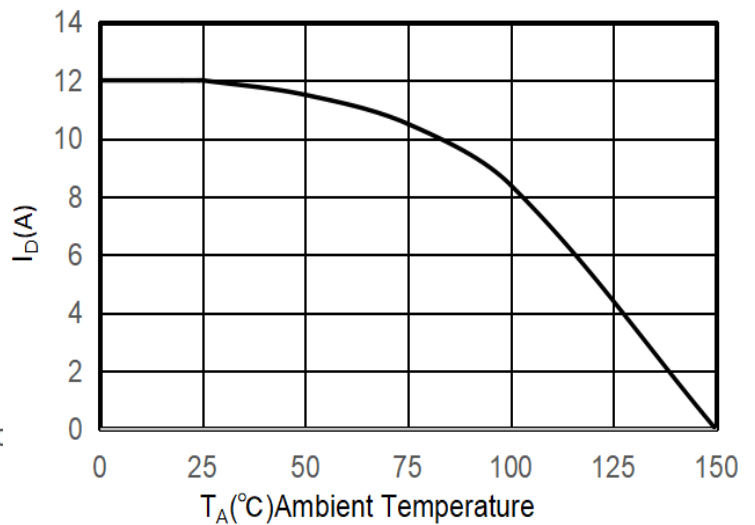


Figure 2: Current De-rating

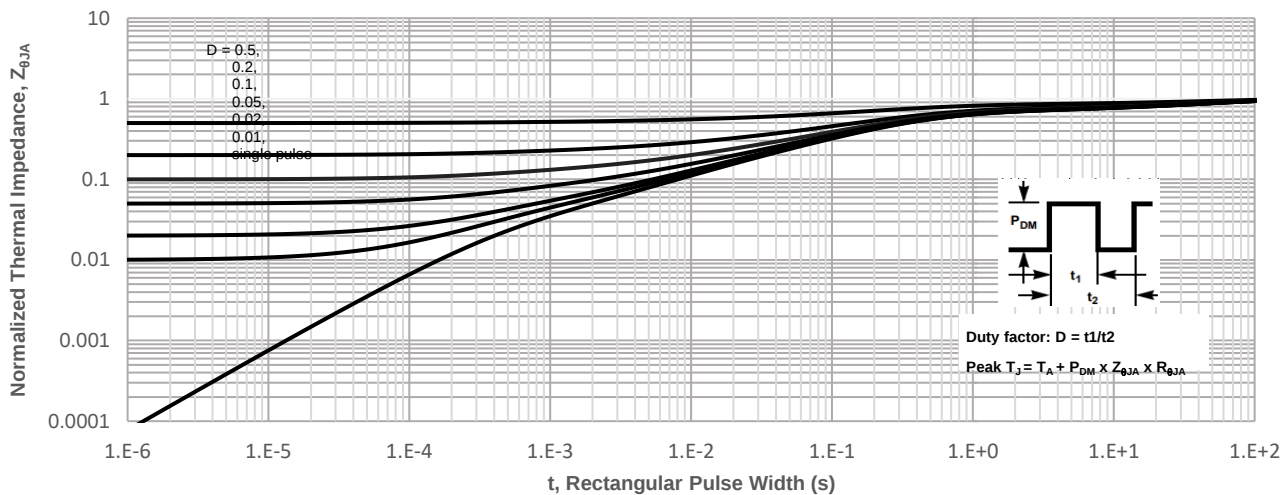


Figure 3: Normalized Maximum Transient Thermal Impedance

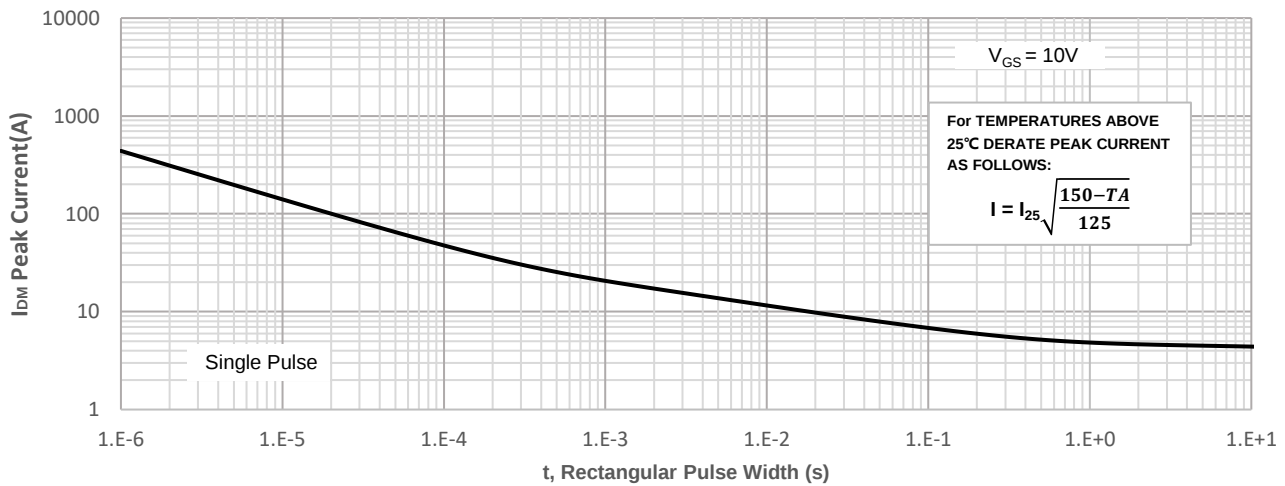


Figure 4: Peak Current Capacity

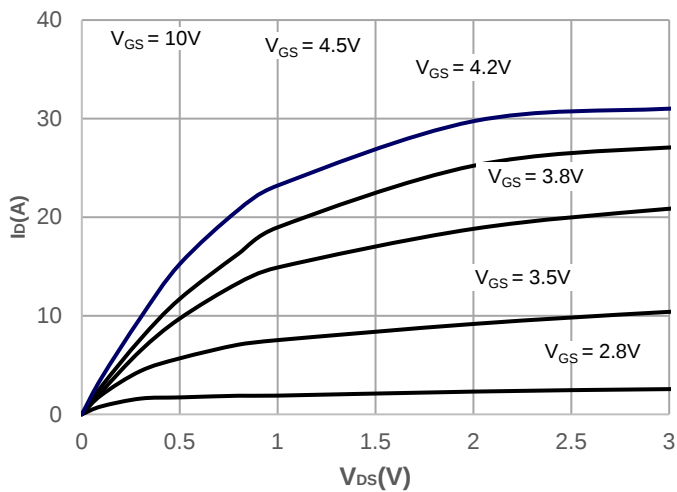


Figure 5: Output Characteristics

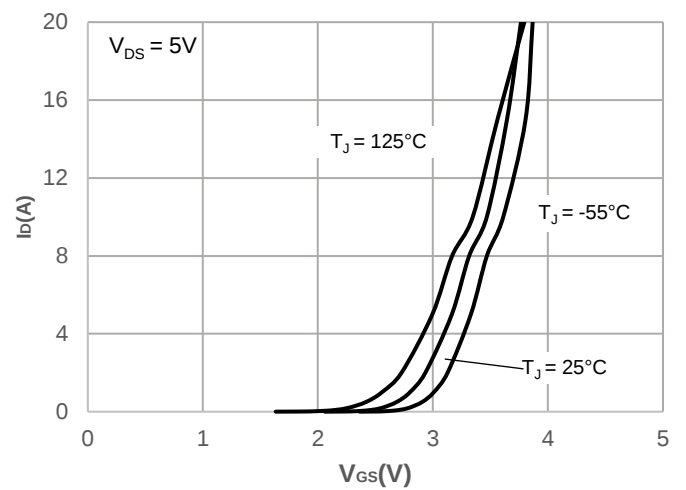


Figure 6: Typical Transfer Characteristics

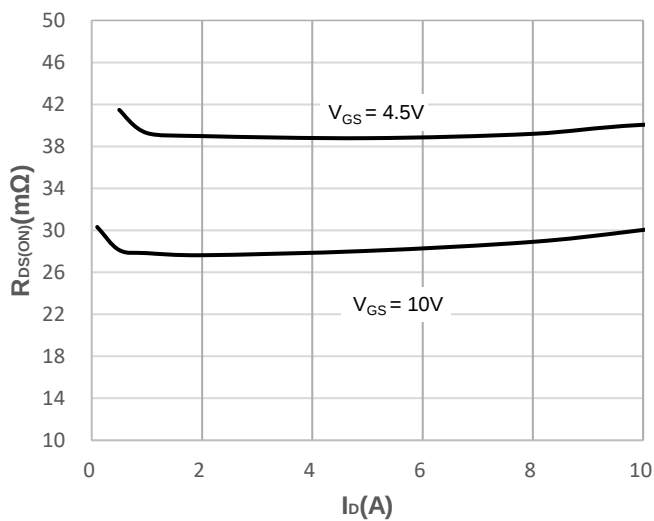


Figure 7: On-resistance vs. Drain Current

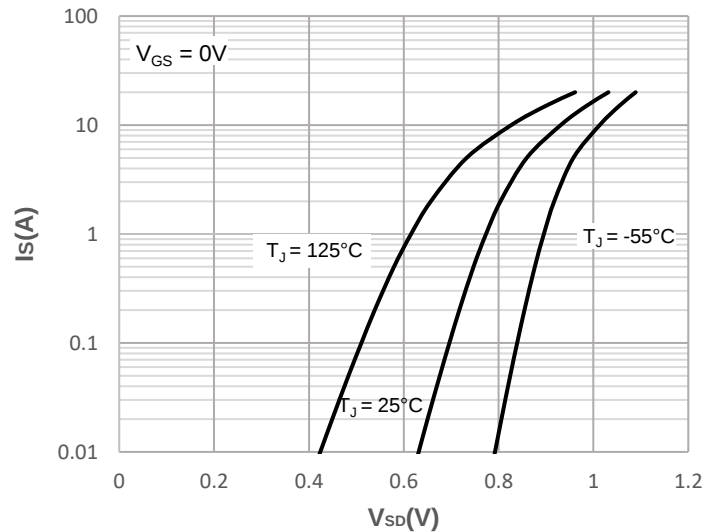


Figure 8: Body Diode Characteristics

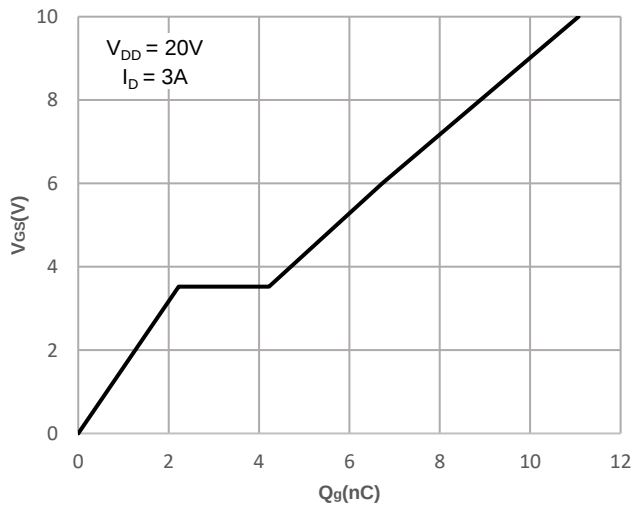


Figure 9: Gate Charge Characteristics

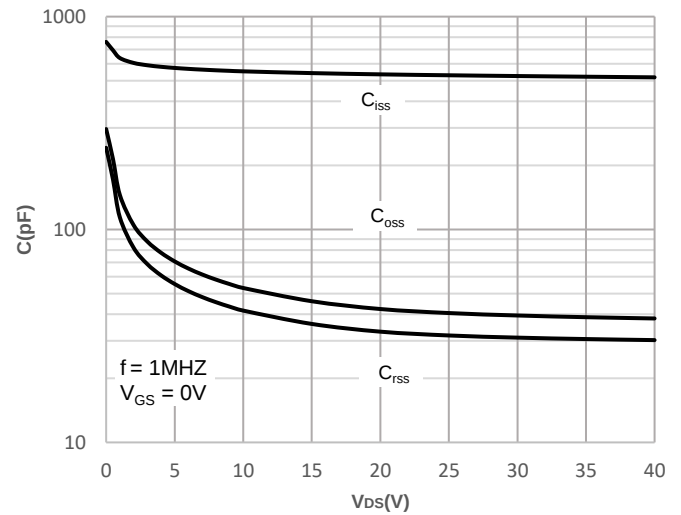


Figure 10: Capacitance Characteristics

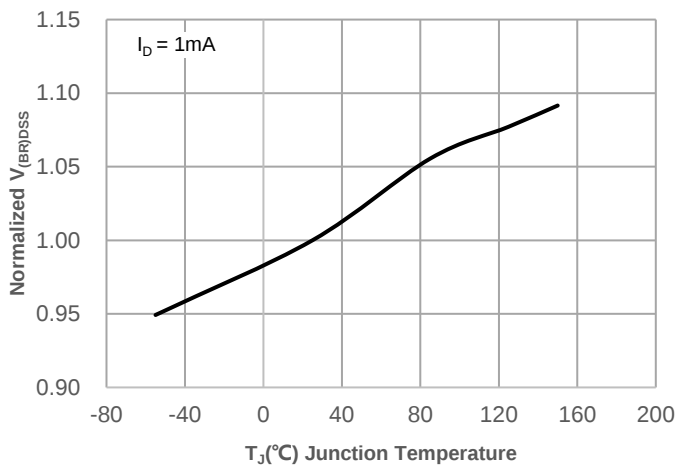


Figure 11: Normalized Breakdown voltage vs. Junction Temperature

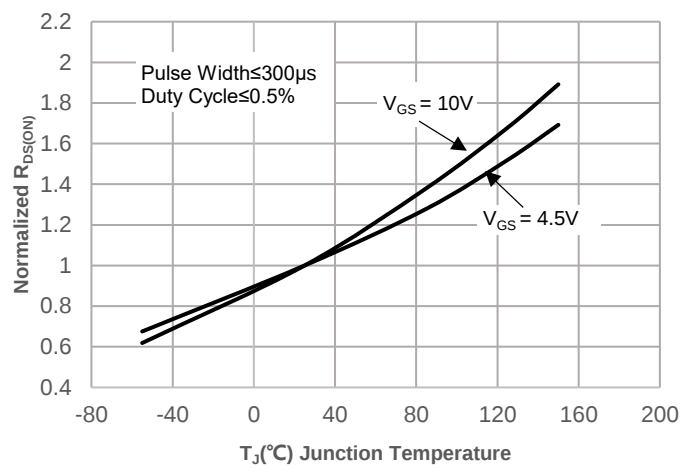


Figure 12: Normalized on Resistance vs. Junction Temperature

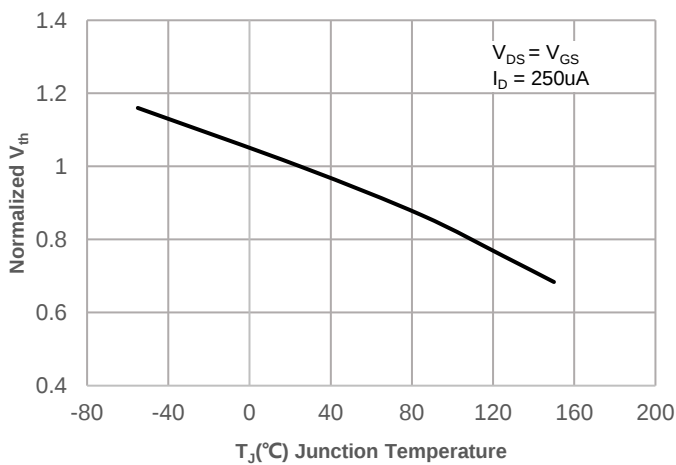


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

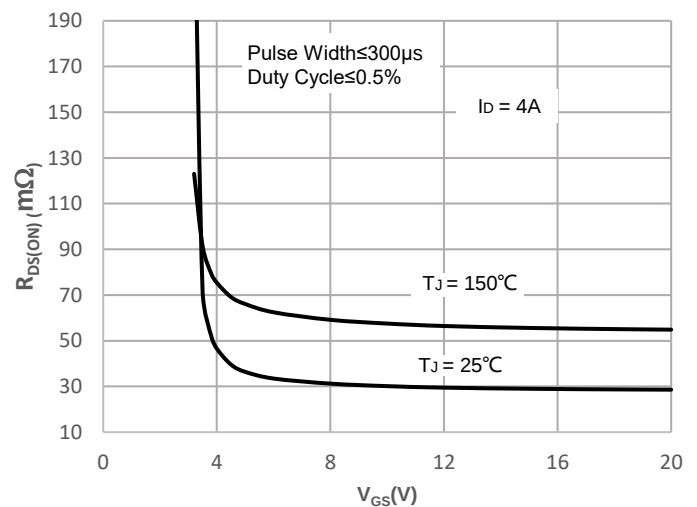


Figure 14: $R_{DS(on)}$ vs. V_{GS}

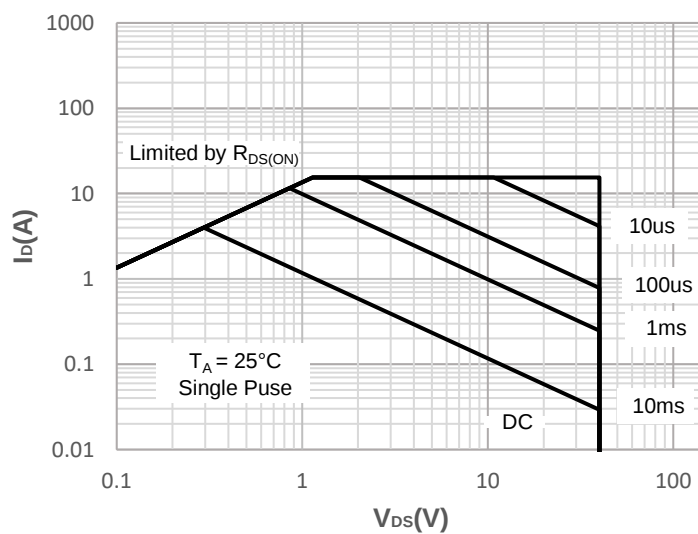
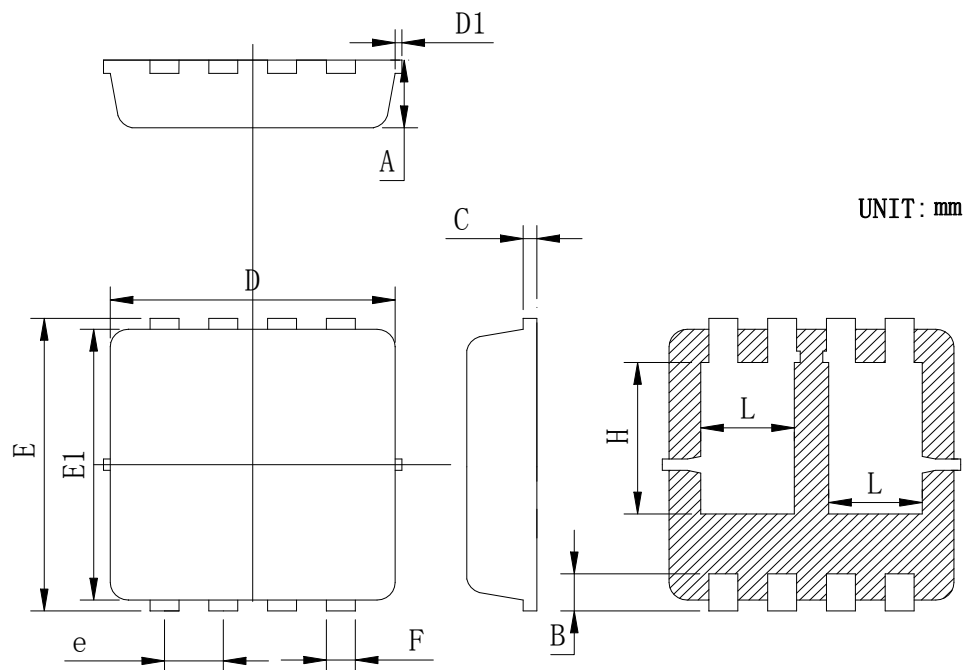


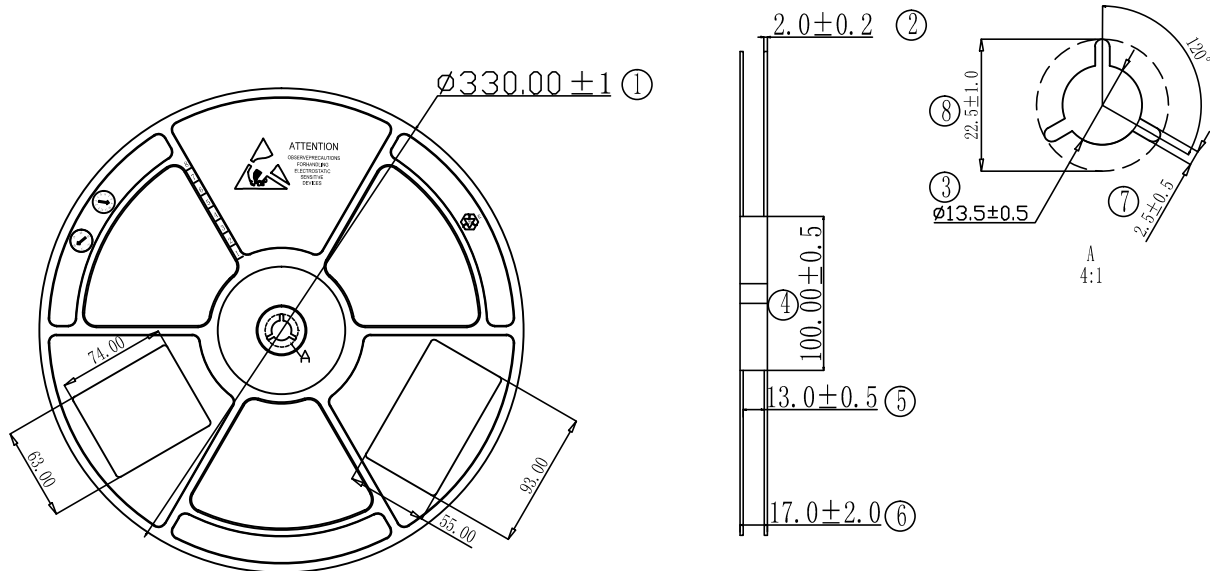
Figure 15: Maximum Safe Operating Area

DFN3X3-8D Package Outline Data


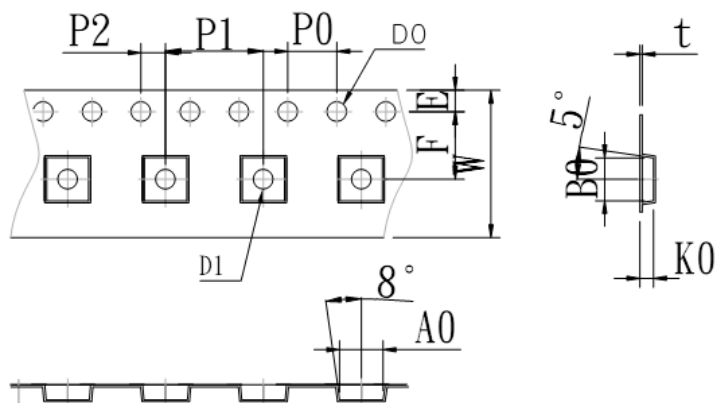
Symbol	Min	Typ	Max
A	0.725	0.775	0.825
B	0.28	0.38	0.48
C	0.13	0.15	0.20
D	3.05	3.15	3.25
D1			0.10
E	3.25	3.35	3.45
E1	3.0	3.1	3.2
e	0.60	0.65	0.70
F	0.27	0.32	0.37
H	1.63	1.73	1.83
L	0.93	1.03	1.13

Tape & Reel Information

Dimensions in mm



Symbol	A0	B0	K0	D0	D1	P0	P1	10*P0
Spec	3.55 $\pm$ 0.10	3.45 $\pm$ 0.10	1.13 $\pm$ 0.10	1.55 $\pm$ 0.10	1.55 $\pm$ 0.10	4.00 $\pm$ 0.10	8.00 $\pm$ 0.10	40.0 $\pm$ 0.10
Symbol	W	E	F	P2	t			
Spec	12.00 $\pm$ 0.10	1.75 $\pm$ 0.10	5.50 $\pm$ 0.10	2.00 $\pm$ 0.10	0.20 $\pm$ 0.05			



Pulling direction 

Marking Information:

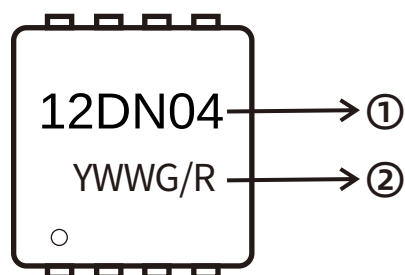
①. Part NO.

②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)



Previous Version

Version	Date	Subjects (major changes since last revision)
2.0	2025-04-01	Release of final version

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