

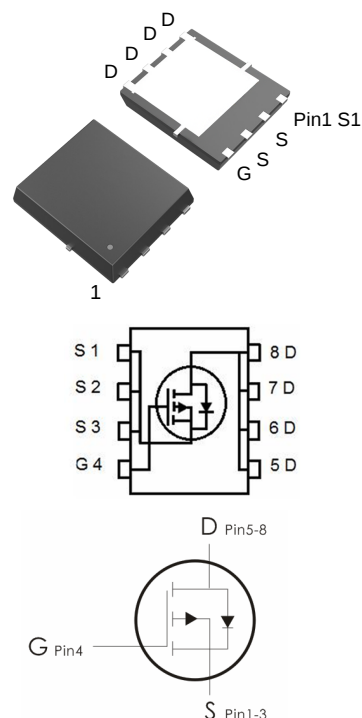
Description:

This P-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) $V_{DS}=-30V, I_D=-50A, R_{DS(ON)}<10m\Omega @V_{GS}=-10V$ (Typ: $8.5m\Omega$)
- 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
NC010PDG	C010PD	DFN5*6-8	5000 pcs/Reel

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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	-50	A
	Continuous Drain Current- $T_C=100^{\circ}C$ ¹	-35	
I_{DM}	Pulsed Drain Current ²	-200	
P_D	Power Dissipation	42	W
E_{AS}	Single pulse avalanche energy ³	100	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	3	$^{\circ}C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-30V	---	---	-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	-1.6	-3	V
R _{DS(ON)}	Drain-Source On Resistance ⁴	V _{GS} =-10V, I _D =-20A	---	8.5	10	m Ω
		V _{GS} =-4.5V, I _D =-10A	---	11	14	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	2350	---	pF
C _{oss}	Output Capacitance		---	321	--	
C _{rss}	Reverse Transfer Capacitance		---	233	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =-15V, I _D =-10A, R _L =3 Ω ,V _{GS} =-10V	---	6.3	---	ns
t _r	Rise Time		---	2.1	---	ns
t _{d(off)}	Turn-Off Delay Time		---	94	---	ns
t _f	Fall Time		---	54	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-10A	---	40	---	nC
Q _{gs}	Gate-Source Charge		---	7.3	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	10.5	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =-20A	---	---	-1.2	V
I _S	Continuous Drain Current	V _D =V _G =0V	---	---	-41.6	A
I _{SM}	Pulsed Drain Current		---	---	-166.6	A

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 : $T_J=25^{\circ}C, V_{DD}=15V, V_G=10V, L=0.5mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

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

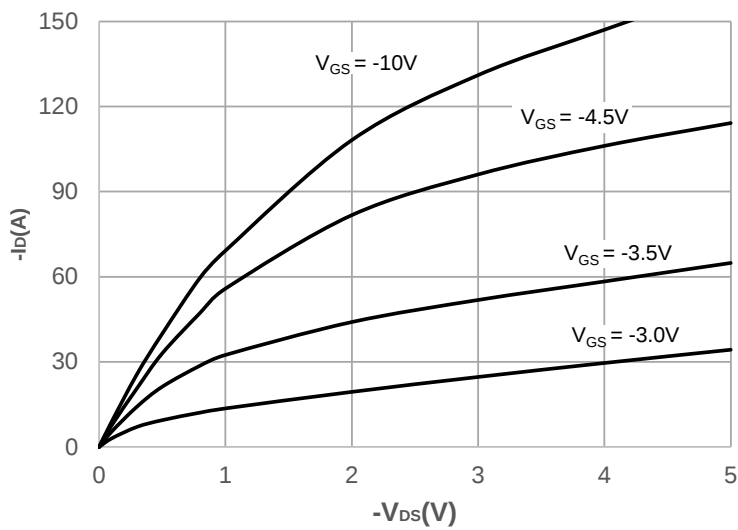


Figure 1: Output Characteristics

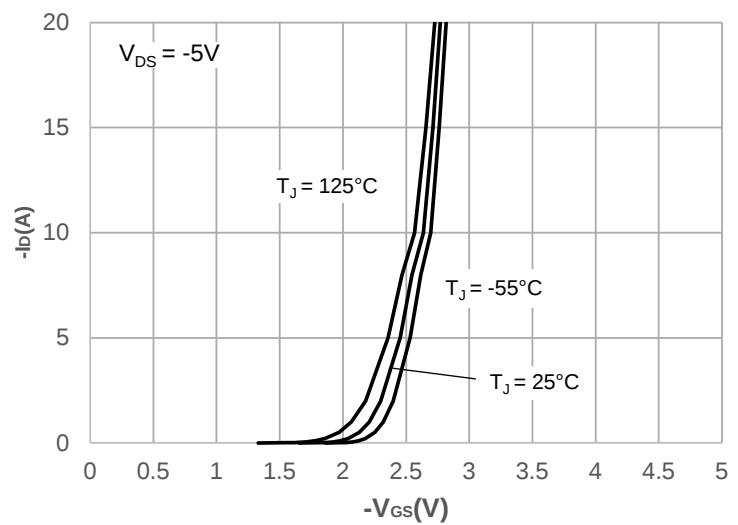


Figure 2: Typical Transfer Characteristics

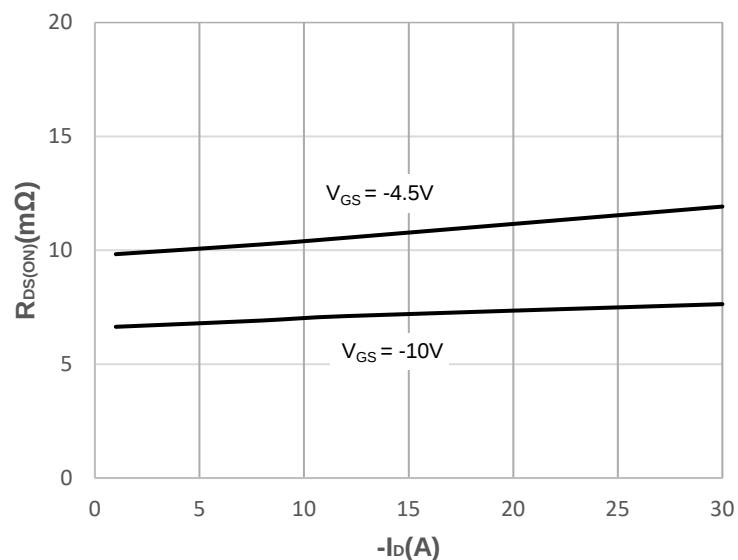


Figure 3: On-resistance vs. Drain Current

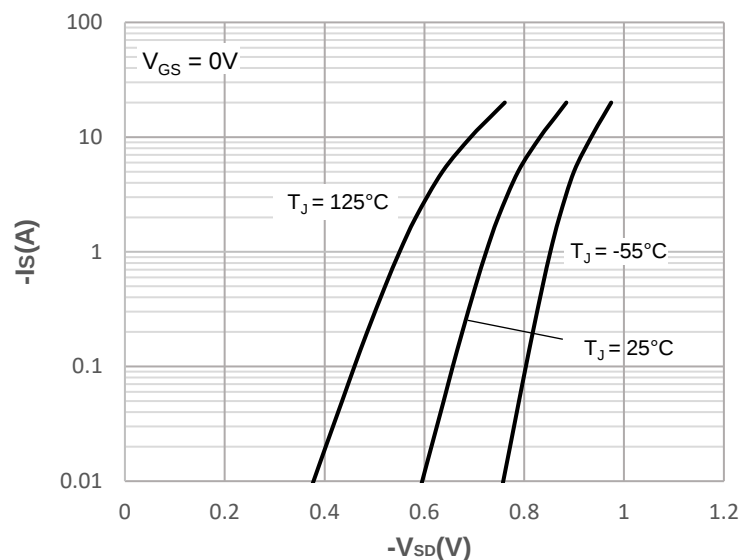


Figure 4: Body Diode Characteristics

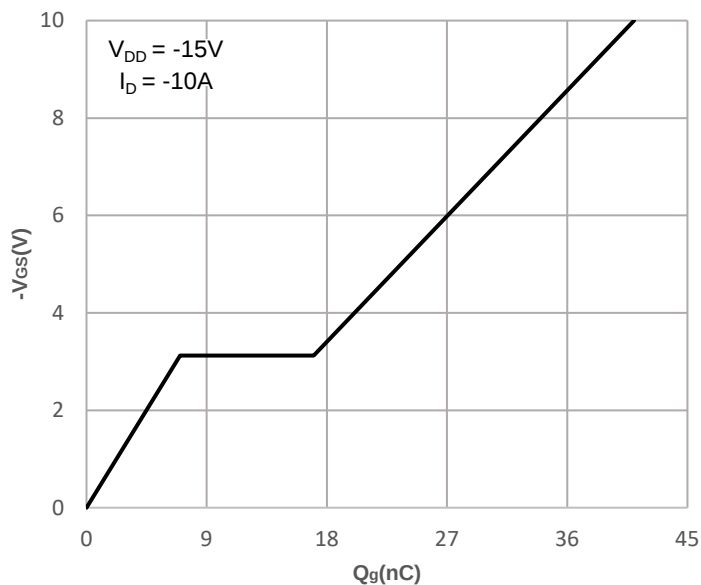


Figure 5: Gate Charge Characteristics

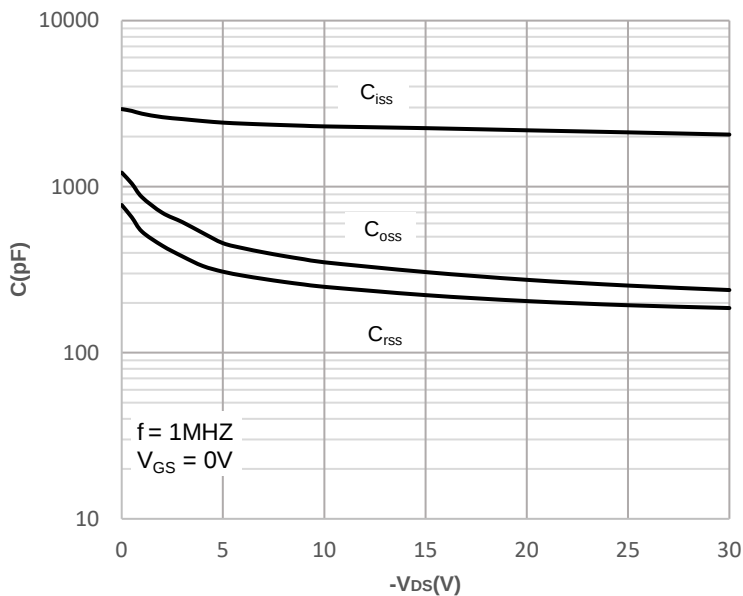


Figure 6: Capacitance Characteristics

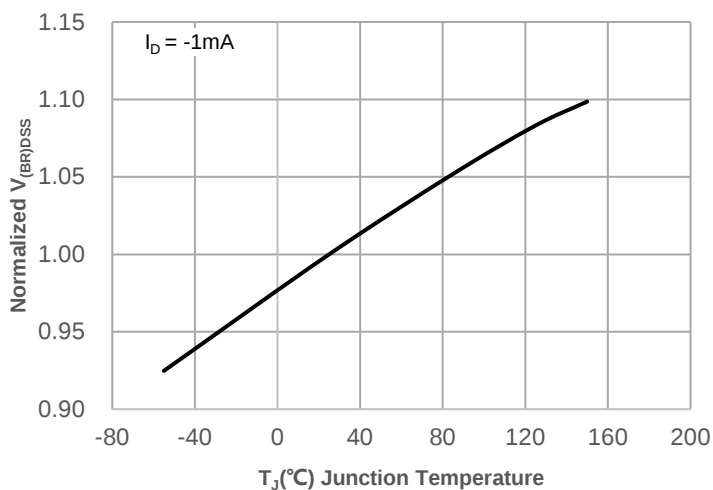


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

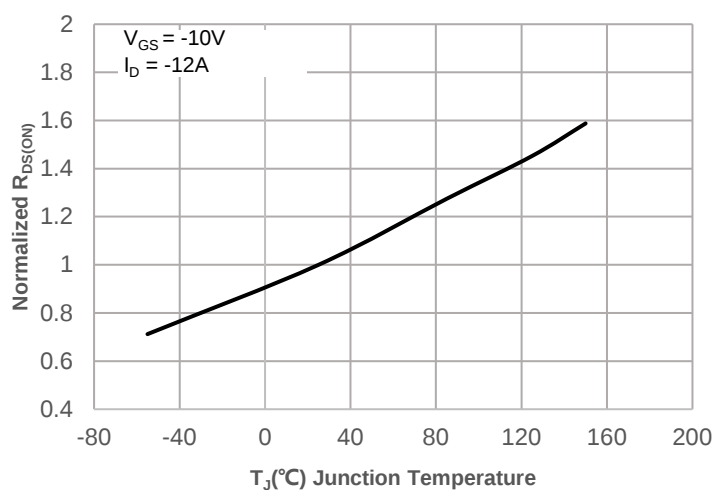


Figure 8: Normalized on Resistance vs. Junction Temperature

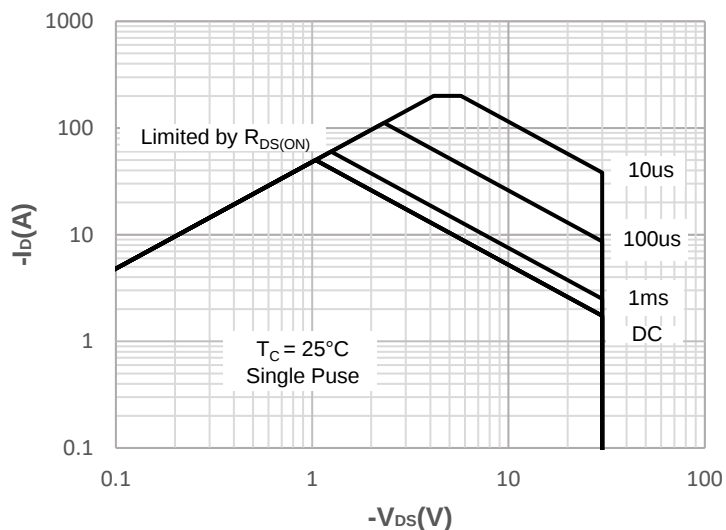


Figure 9: Maximum Safe Operating Area

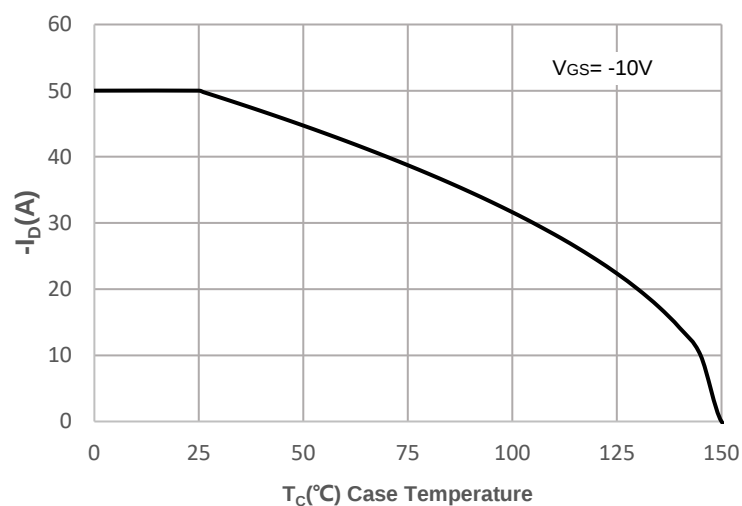


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

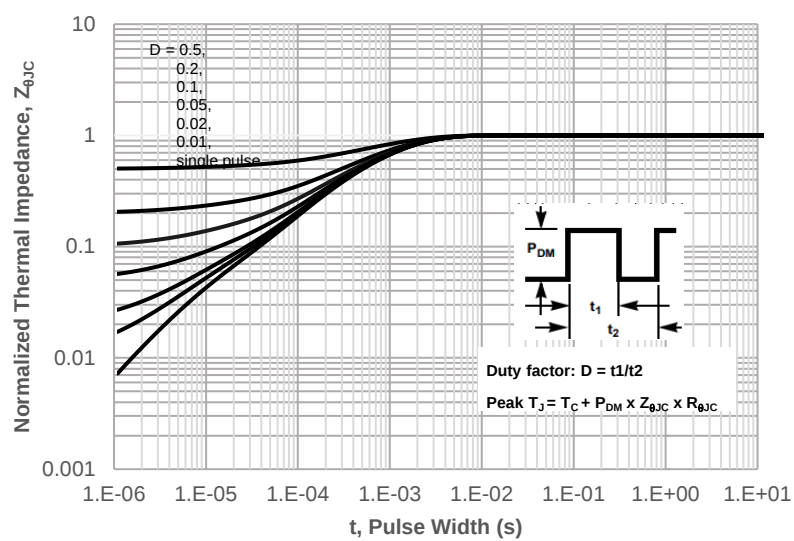


Figure 11: Normalized Maximum Transient Thermal Impedance

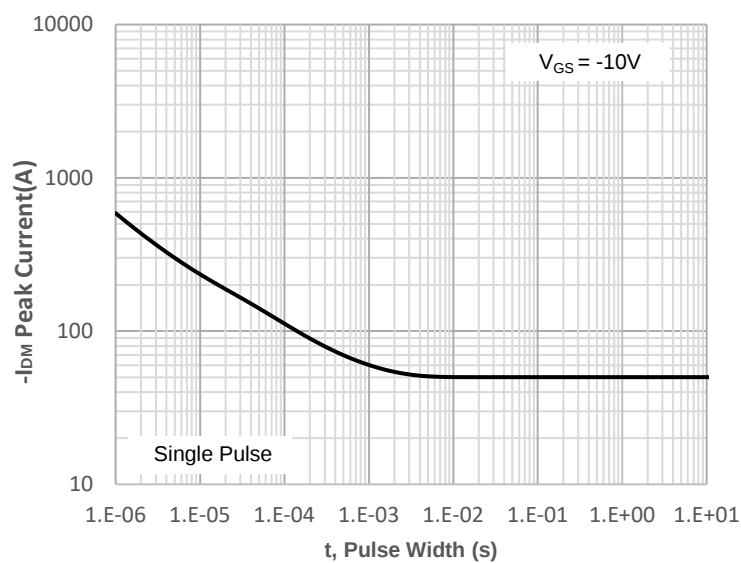
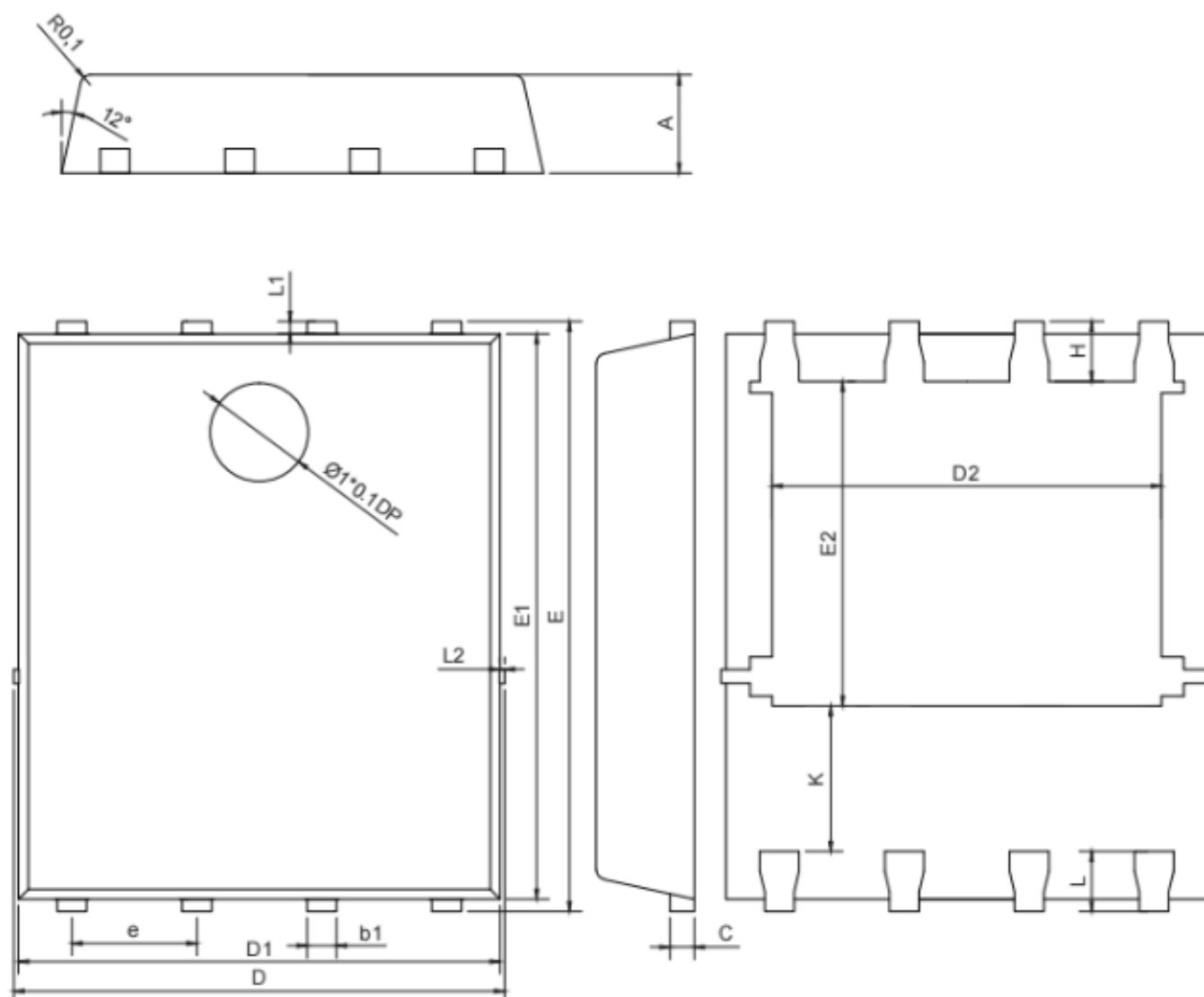


Figure 12: Peak Current Capacity

DFN5×6-8 Package Information:

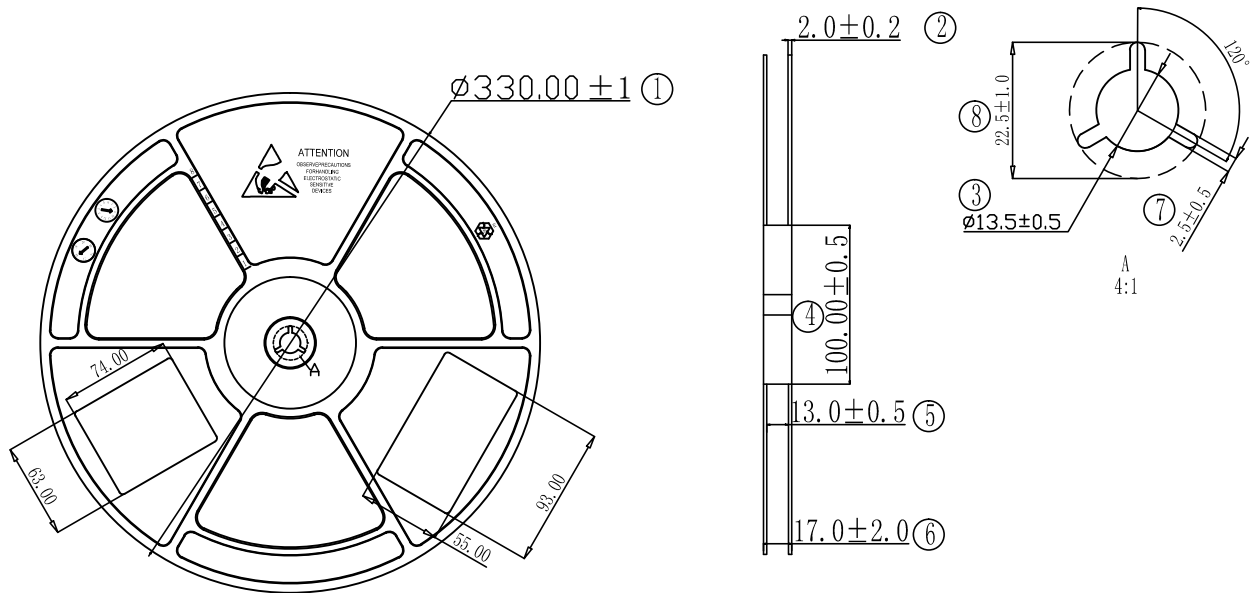


Dimensions

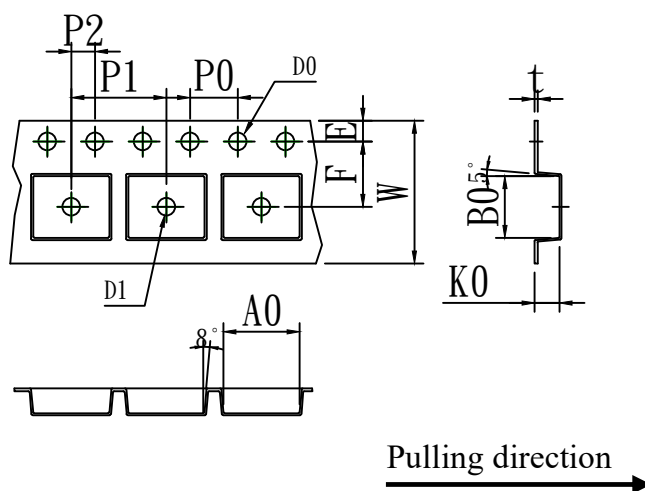
Unit	A	b	b1	c	D	D1	D2	e	E	E1	E2	H	K	L	L1	L2
mm	0.90 (1.00) 1.10	0.35 (0.40) 0.45	0.20 (0.30) 0.40	0.20 (0.25) 0.35	4.85 (5.05) 5.25	4.80 (4.90) 5.30	3.80 (4.10) 4.40	1.17 (1.27) 1.37	5.80 (6.00) 6.20	5.50 (5.75) 6.00	3.10 (3.35) 3.60	0.50 (0.65) 0.80	1.10 — —	0.51 (0.61) 0.71	0.05 (0.12) 0.20	— — 0.10

Tape & Reel Information

Dimensions in mm



Symbol	A0	B0	K0	D0	D1	P0	P1	10*P0
Spec	6.15±0.10	5.40±0.10	1.30±0.10	1.55±0.10	1.55±0.10	4.00±0.10	8.00±0.10	40.00±0.10
Symbol	W	E	F	P2	t			
Spec	12.00±0.10	1.75±0.10	5.50±0.10	2.00±0.10	0.20±0.05			



Marking Information:

①. Doingter LOGO

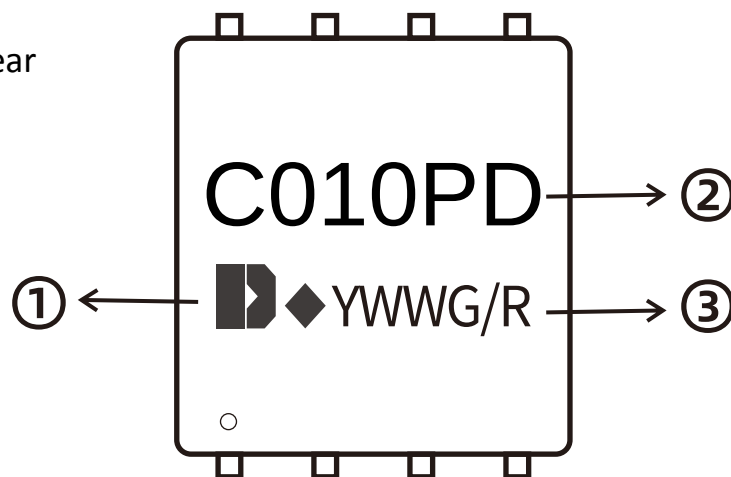
②. Part NO.

③. 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)
1.0	2026-04-12	Release of final version

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