

Description:

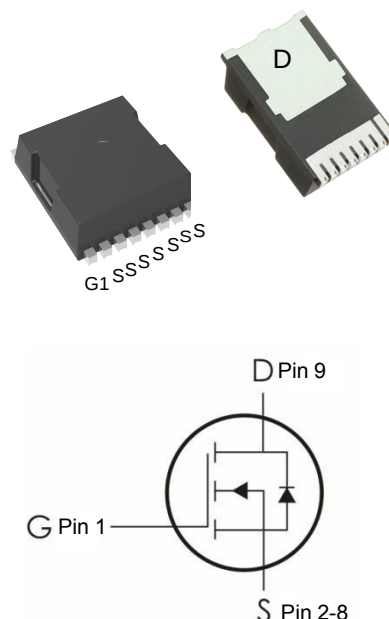
This N-Channel MOSFET uses advanced SGT technology and

design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=40V, I_D=320A, R_{DS(ON)} < 1.2m\Omega @ V_{GS}=10V$ (Typ: $0.75m\Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density SGT 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
DOL320N04T	320N04T	TOLLA-8	2000 pcs/Reel

Absolute Maximum Ratings: ($T_C=25^{\circ}\text{C}$ 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	320	A
	Continuous Drain Current- $T_C=100^{\circ}C$ ¹	220	
I_{DM}	Pulsed Drain Current ²	1200	
P_D	Power Dissipation	250	W
E_{AS}	Single pulse avalanche energy ³	576	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+175	$^{\circ}C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.6	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	45	$^{\circ}\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source 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	1.0	1.7	2	V
R _{DS(on)}	Drain-Source On Resistance ⁴	V _{GS} =10V, I _D =20A	---	0.75	1.2	m Ω
		V _{GS} =4.5V, I _D =10A	---	1	1.7	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	6200	---	pF
C _{oss}	Output Capacitance		---	2470	--	
C _{rss}	Reverse Transfer Capacitance		---	147	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =20V, I _D =20A, R _{ENG} =1.6 Ω ,V _{GS} =10V	---	31.5	---	ns
t _r	Rise Time		---	44	---	ns
t _{d(off)}	Turn-Off Delay Time		---	84	---	ns
t _f	Fall Time		---	32.5	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =20V, I _D =20A	---	125	---	nC
Q _{gs}	Gate-Source Charge		---	31	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	33.6	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =115A	---	---	1.2	V
I _S	Continuous Drain Current	V _D =V _G =0V	---	---	320	A
I _{SM}	Pulsed Drain Current		---	---	1200	A
T _{rr}	Reverse Recovery Time	I _F =50A, T _J =25 °C	---	99	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/us	---	62	---	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 : $T_J=25^{\circ}C, V_{DD}=20V, V_G=10V, L=0.5mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

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

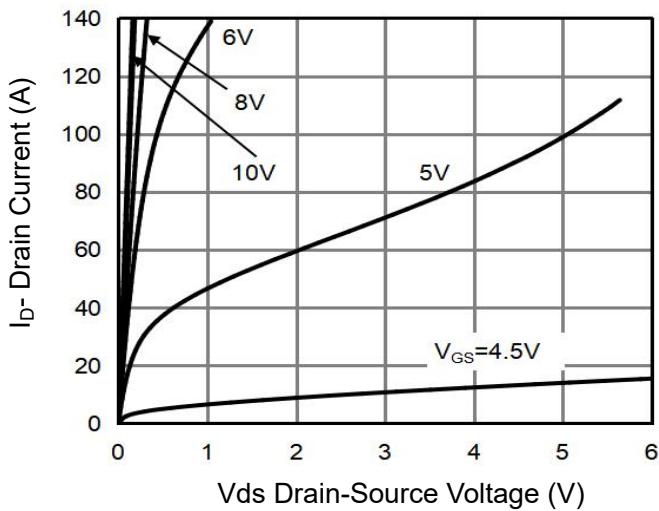


Figure 1 Output Characteristics

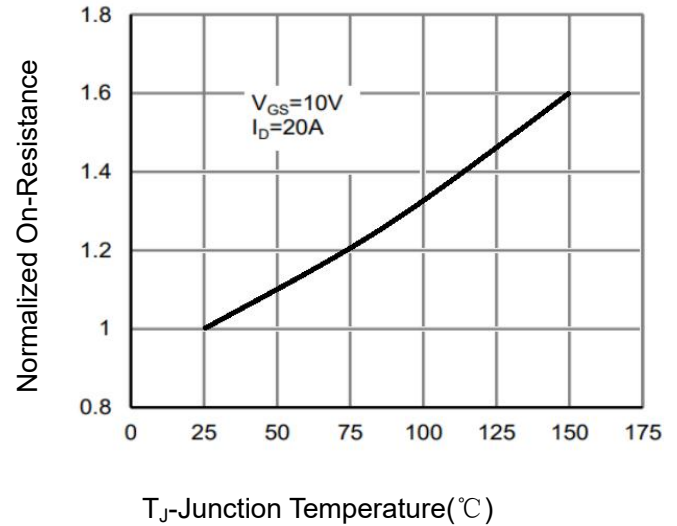


Figure 4 Rdson-Junction Temperature

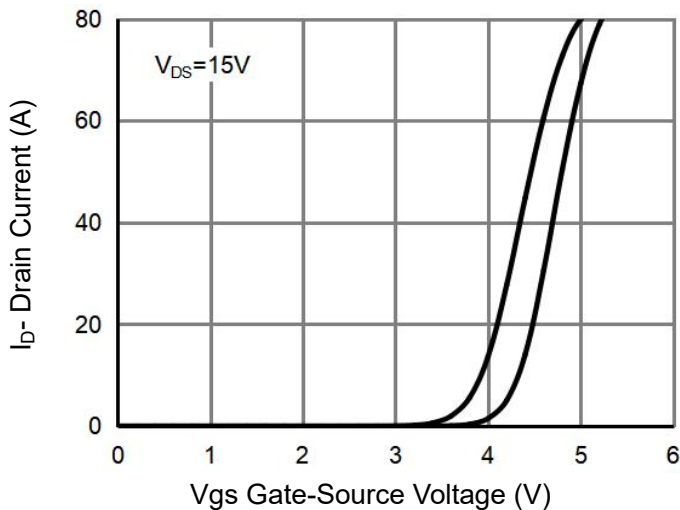


Figure 2 Transfer Characteristics

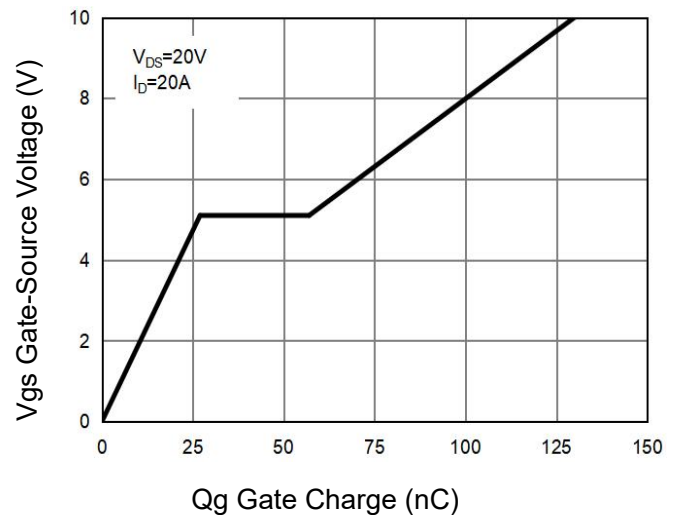


Figure 5 Gate Charge

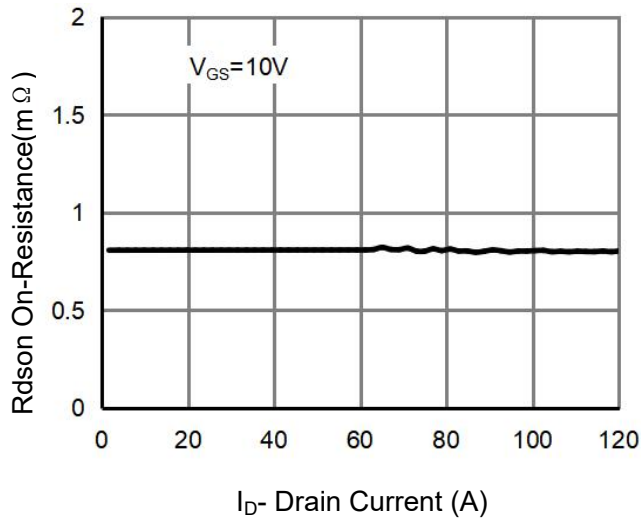


Figure 3 Rdson- Drain Current

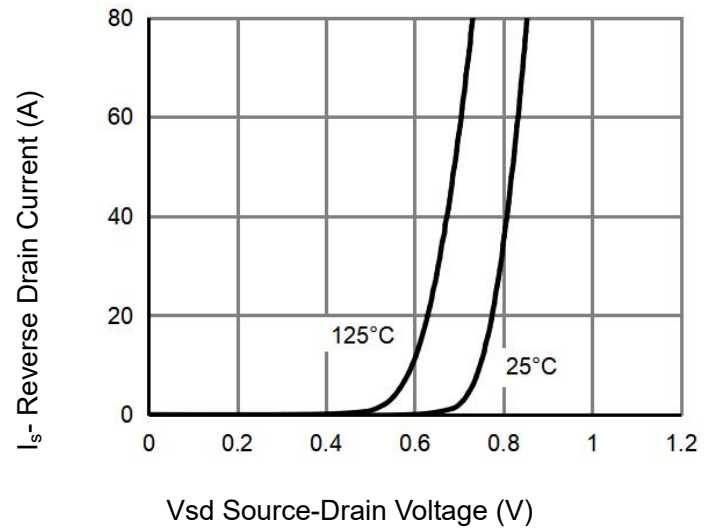


Figure 6 Source- Drain Diode Forward

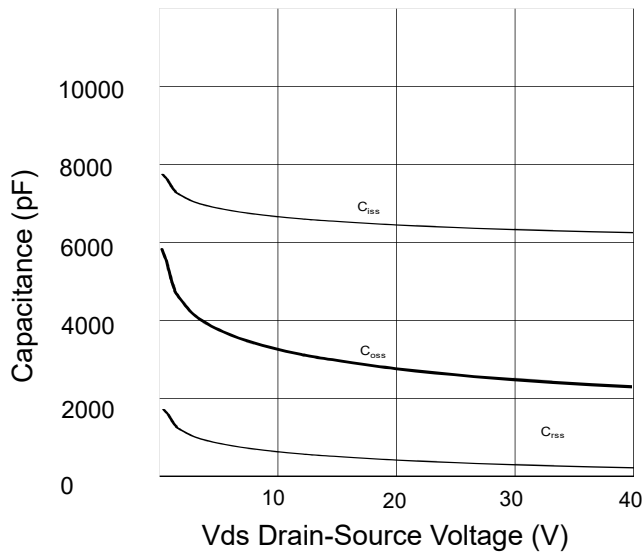


Figure 7 Capacitance vs Vds

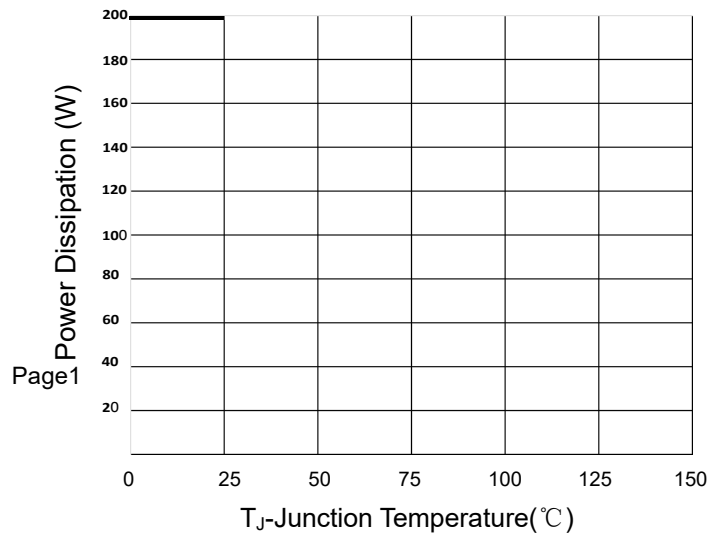


Figure 9 Power De-rating

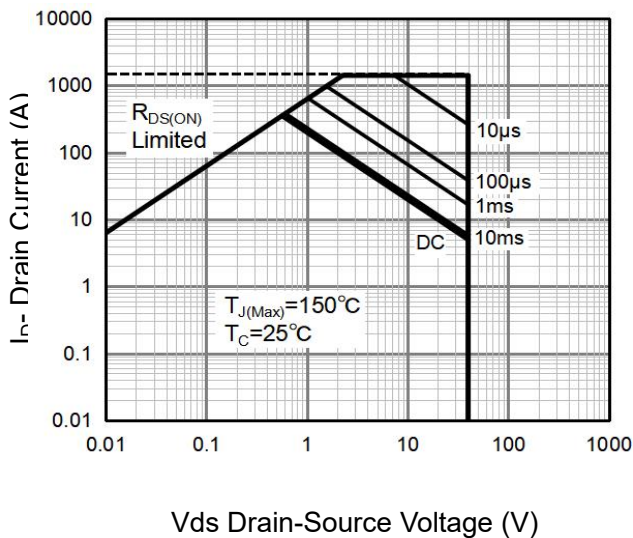


Figure 8 Safe Operation Area

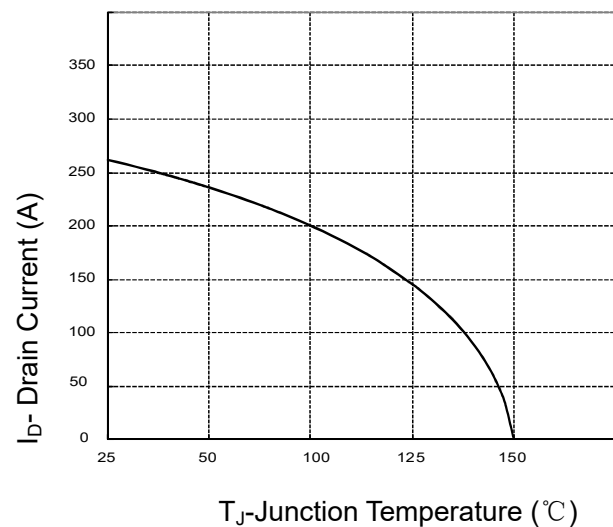


Figure 10 Current De-rating

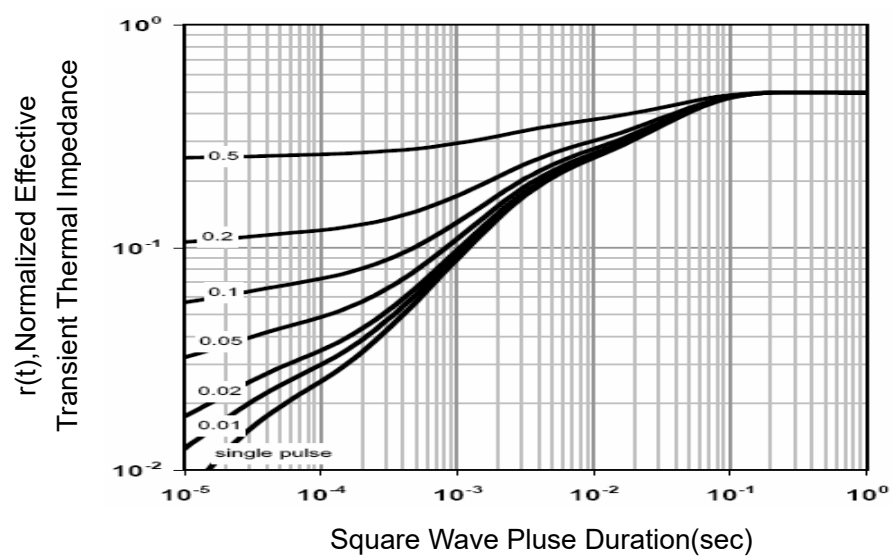
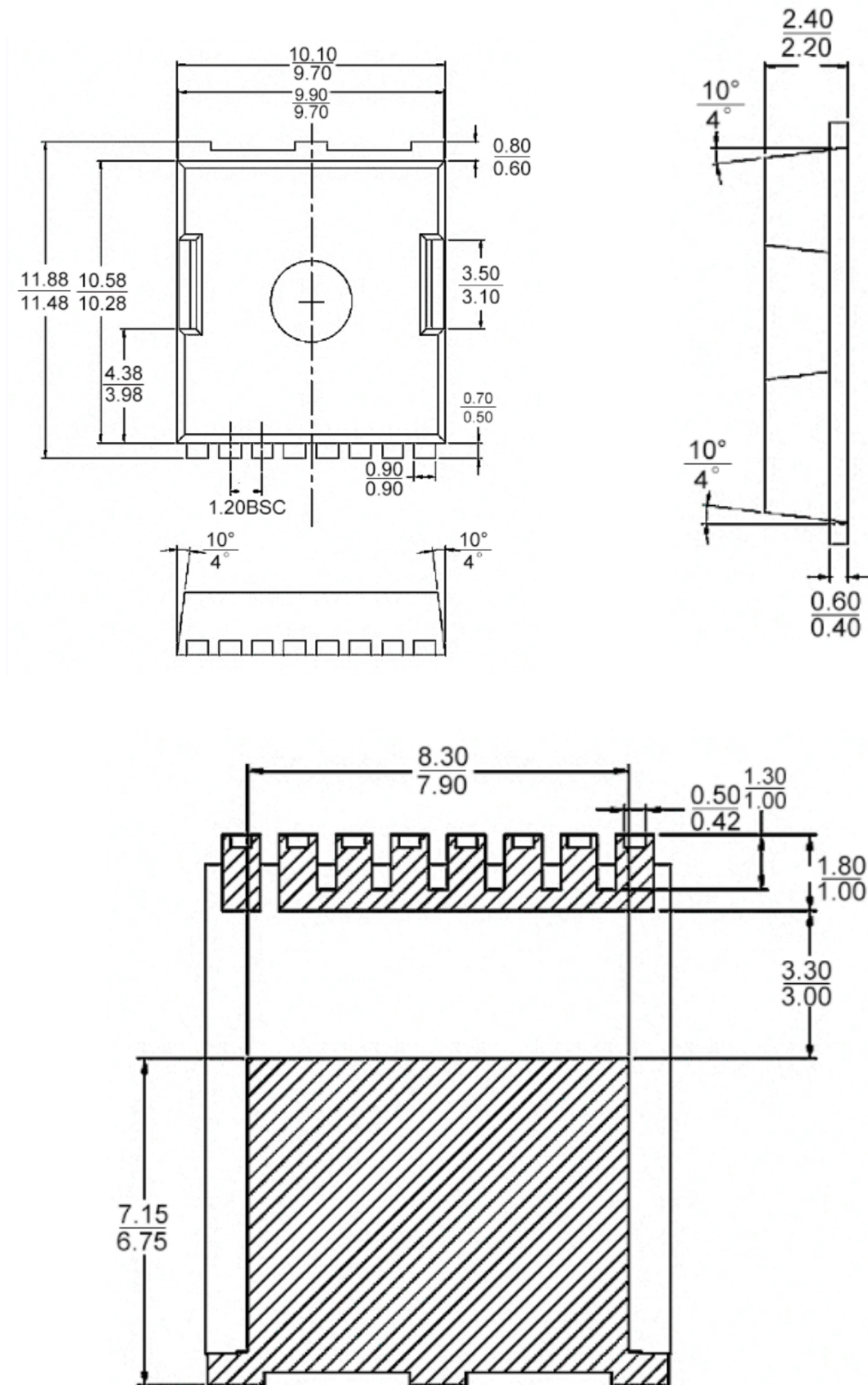
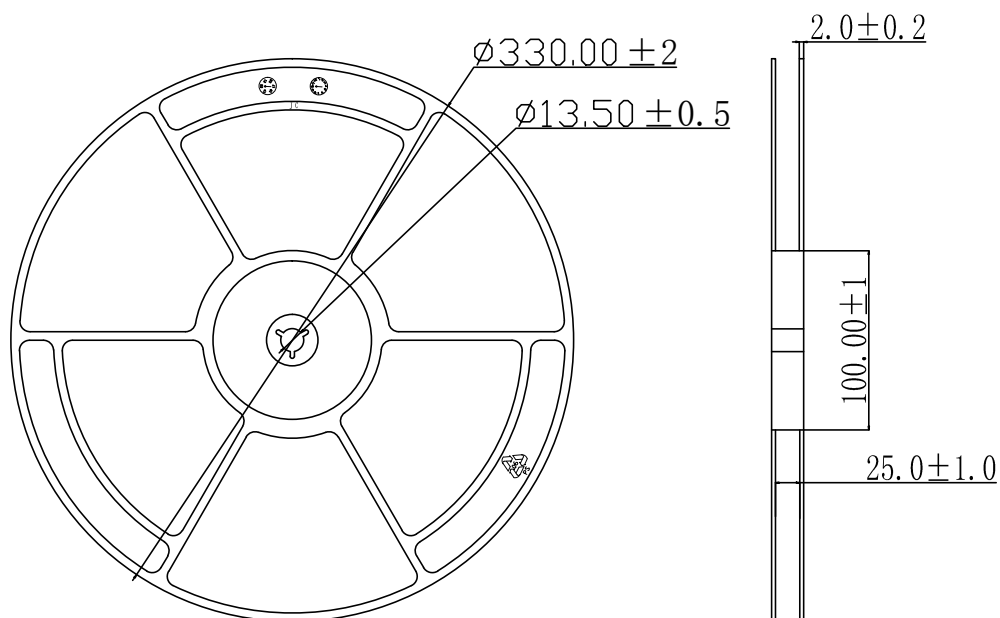


Figure 11 Normalized Maximum Transient Thermal Impedance

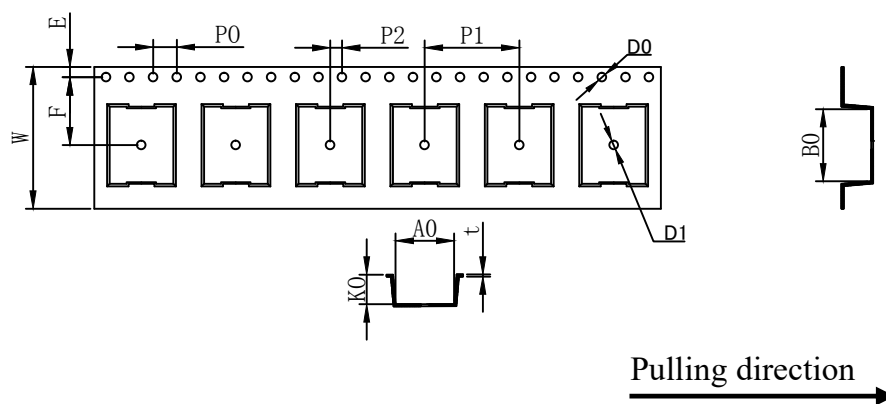
TOLLA-8 Package Information


Tape & Reel Information

Dimensions in mm



ITEM	A0	B0	D0	D1	E	F
TOLR	10.2 ± 0.1	12.05 ± 0.1	1.5 ± 0.1	1.5 ± 0.25	1.75 ± 0.1	11.5 ± 0.1
ITEM	W	t	K0	P0	P1	P2
TOLR	$24^{+0.3}_{-0.15}$	0.30 ± 0.05	2.55 ± 0.1	4.0 ± 0.1	12.0 ± 0.1	2.0 ± 0.1



Package Information:

①. Doingter LOGO

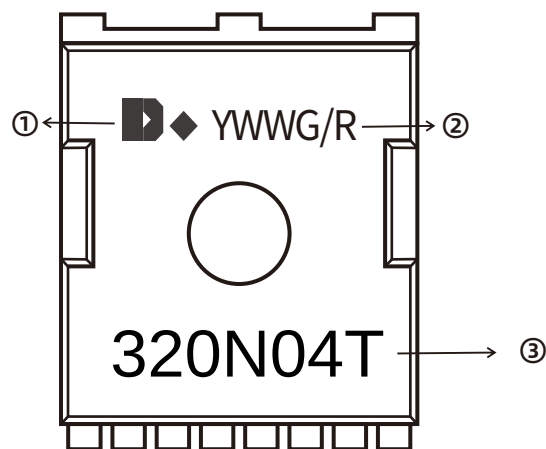
②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

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

③. Part NO.



Previous Version

Version	Date	Subjects (major changes since last revision)
1.1	2025-05-18	Release of final version

Attention :

- Information furnished in this document is believed to be accurate and reliable. However, Shenzhen Doingter Semiconductor Co.,Ltd. assumes noresponsibility for the consequences of use without consideration for such information nor use beyond it.
- Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, Shenzhen Doingter complies with the agreement. Products and information provided in this document have no infringement of patents.
- Shenzhen Doingter assumes noresponsibility for any infringement of other rights of third parties which may result from the use of such products and information. This document supersedes and replaces all information previously supplied.



Is

a registered trademark of Shenzhen Doingter Semiconductor Co., Ltd. Copyright © 2013

Shenzhen DoingterSemiconductor Co.,Ltd. Printed All rights reserved.