

Description:

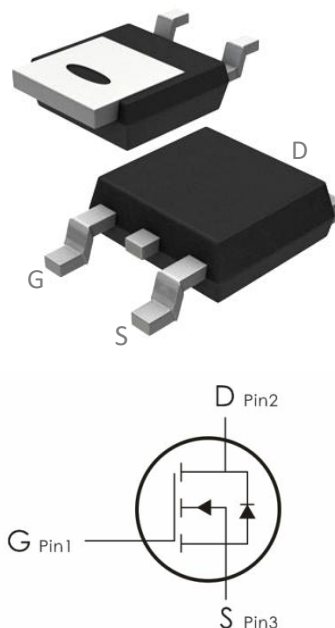
This N-Channel MOSFET uses advanced SGT technology and

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

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=40V, I_D=200A, R_{DS(ON)} < 1.6m\Omega @ V_{GS}=10V$ (Typ: $1.4m\Omega$)
- 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
DD1R4TDG	D1R4TD	TO- 252	2500 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	200	A
	Continuous Drain Current- $T_C=100^\circ C$ ¹	140	
	Pulsed Drain Current ²	600	
I_{DM}	Pulsed Drain Current ²	600	
P_D	Power Dissipation	179	W
E_{AS}	Single pulse avalanche energy ³	368	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	0.7	$^\circ C/W$

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	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	1.2	1.8	2.4	V
R _{DS(ON)}	Drain-Source On Resistance ⁴	V _{GS} =10V, I _D =20A	---	1.4	1.6	m Ω
		V _{GS} =4.5V, I _D =10A	---	1.7	2.3	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	---	ns
t _r	Rise Time		---	44	---	ns
t _{d(off)}	Turn-Off Delay Time		---	84	---	ns
t _f	Fall Time		---	32	---	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	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =1155A	---	---	1.2	V
I _S	Continuous Drain Curren	V _D =V _G =0V	---	---	166.6	A
I _{SM}	Pulsed Drain Current		---	---	500	A
T _{rr}	Reverse Recovery Time	I _F =20A, 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)

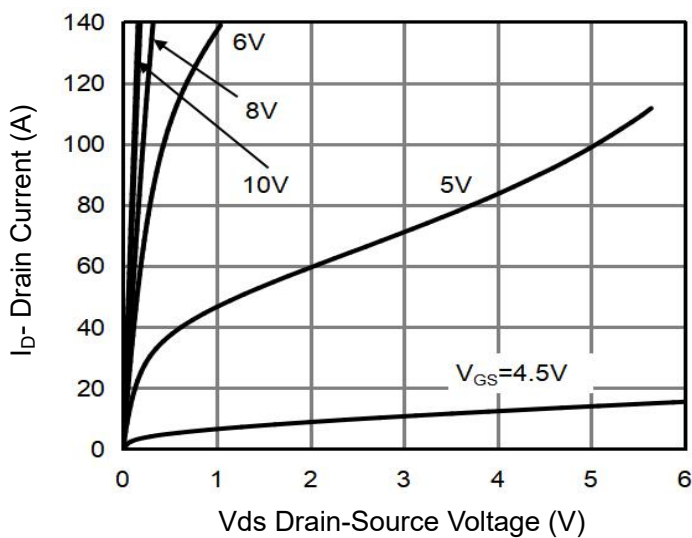


Figure 1 Output Characteristics

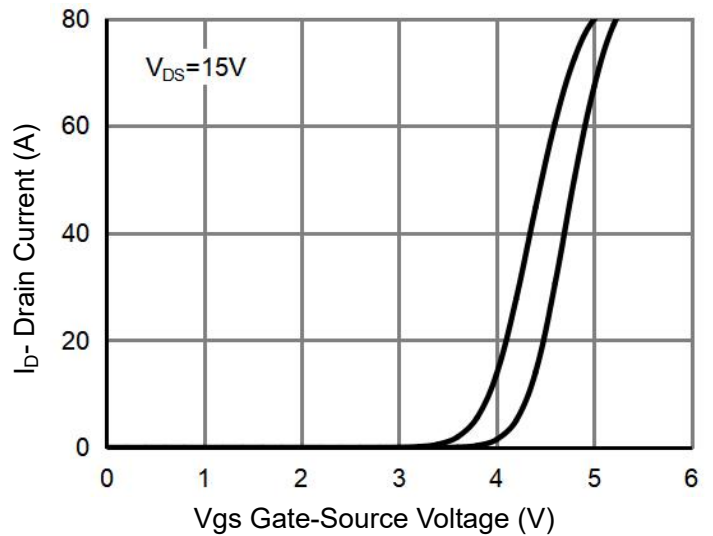


Figure 2 Transfer Characteristics

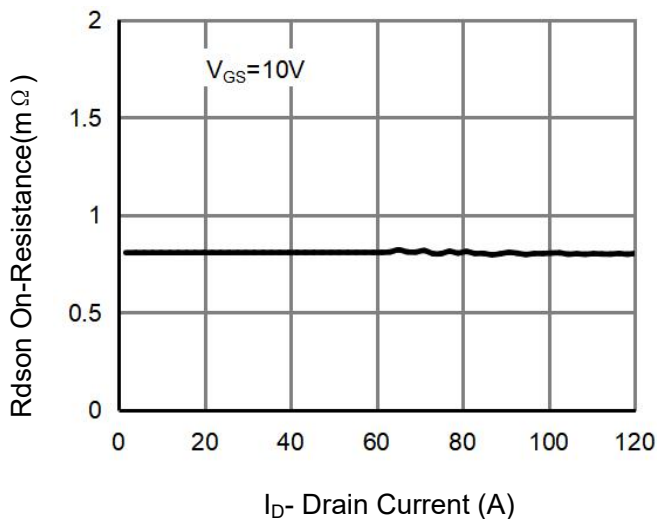


Figure 3 Rdson- Drain Current

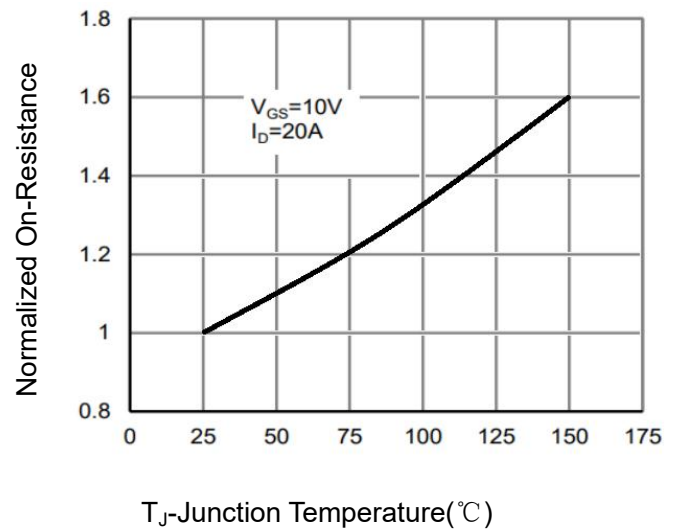


Figure 4 Rdson-Junction Temperature

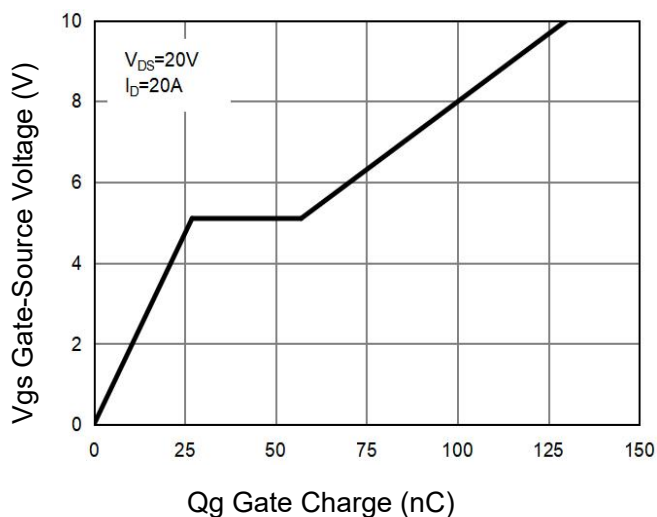


Figure 5 Gate Charge

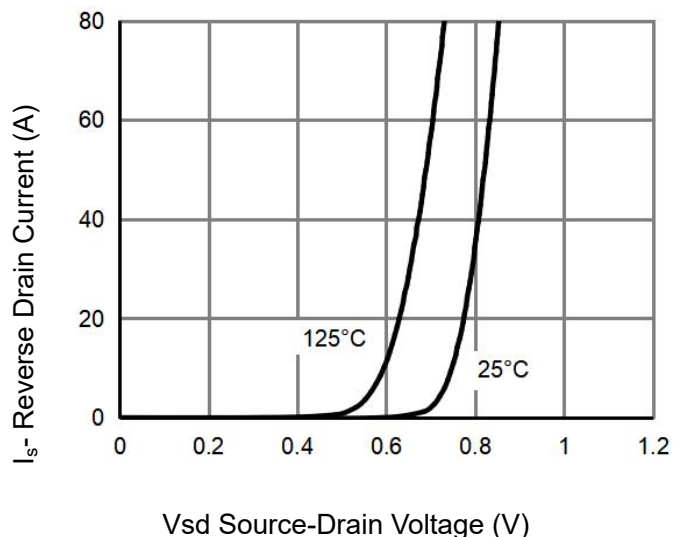


Figure 6 Source- Drain Diode Forward

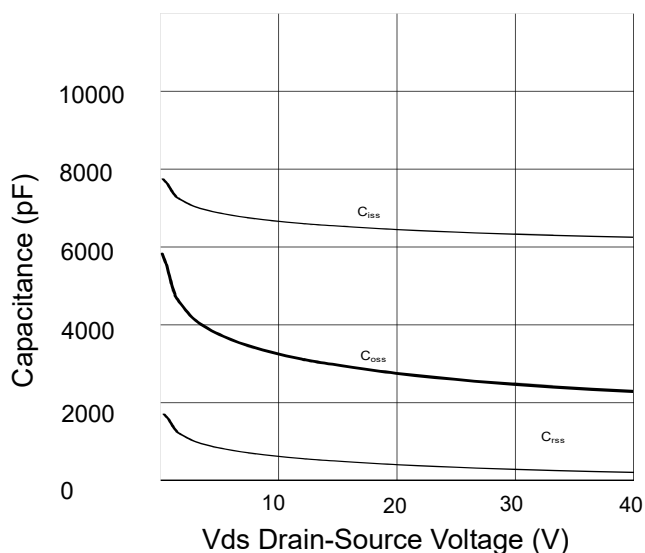


Figure 7 Capacitance vs Vds

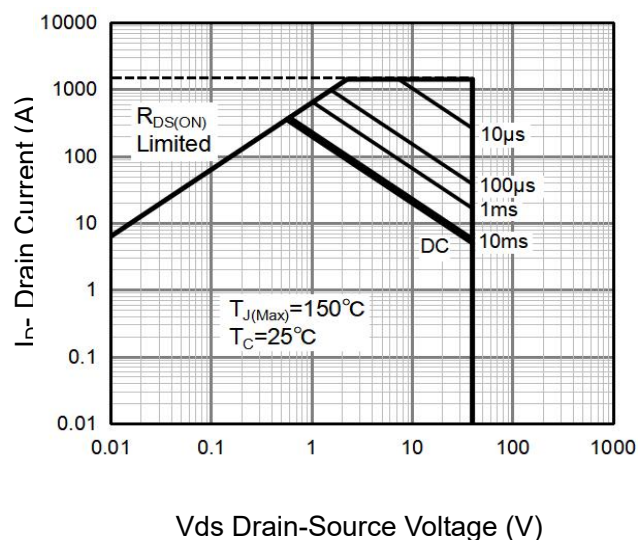


Figure 8 Safe Operation Area

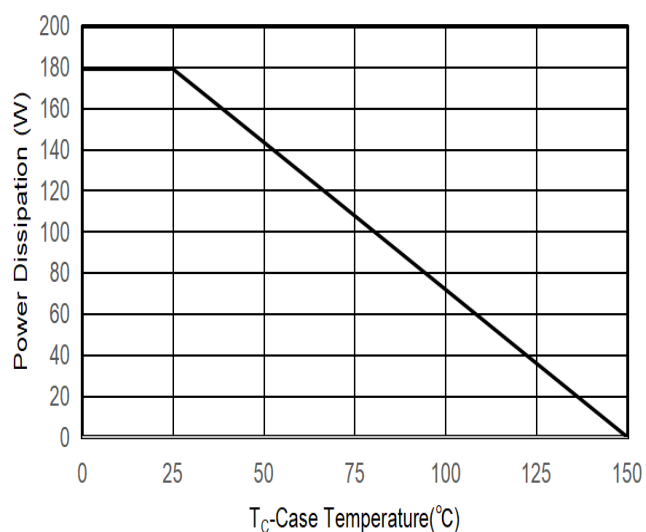


Figure 9 Power De-rating

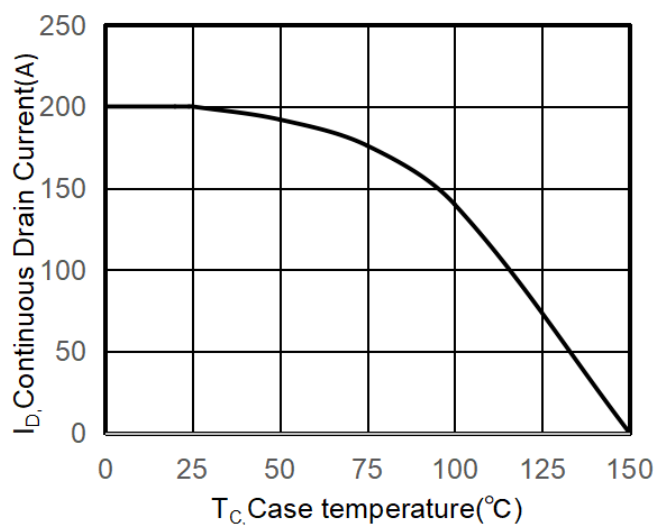


Figure 10 Current De-rating

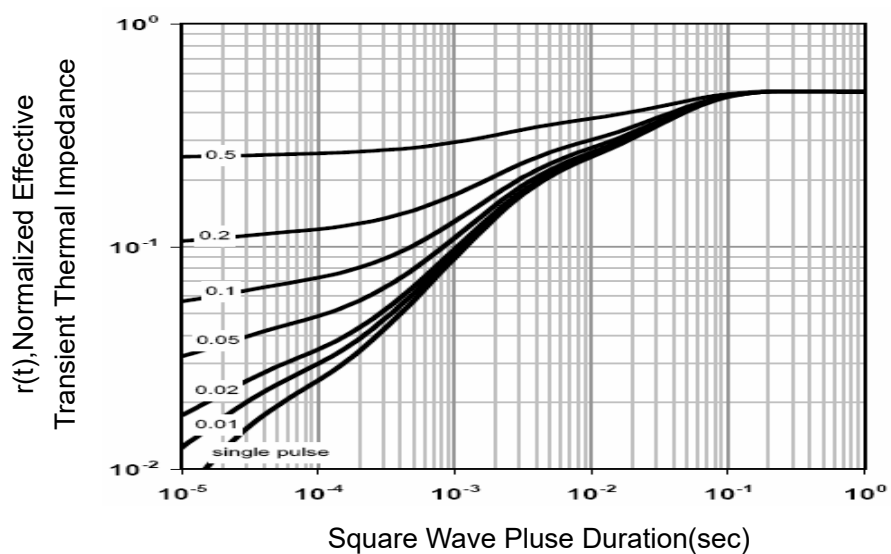
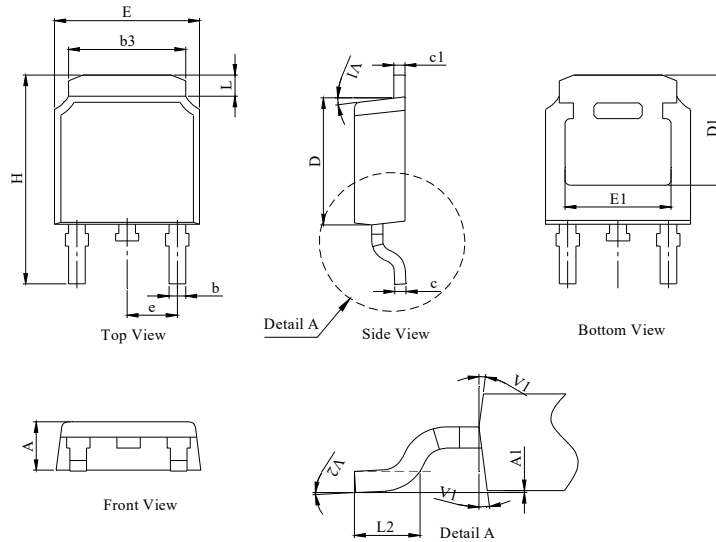


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252 Package Information

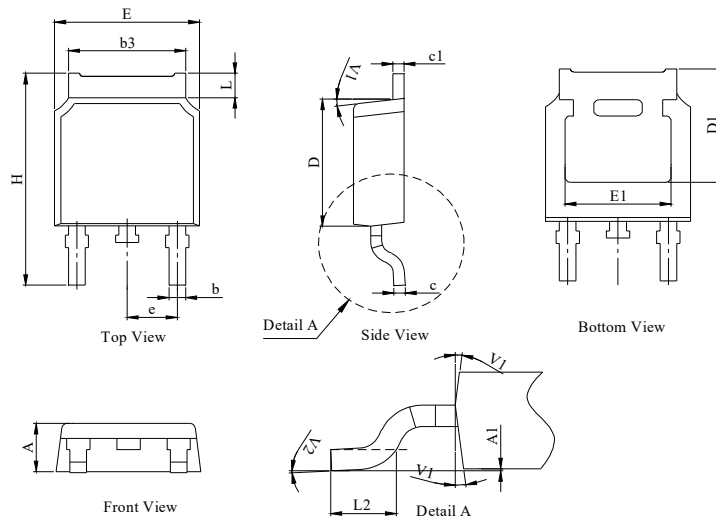
Package Outline Type-A

UNIT: mm



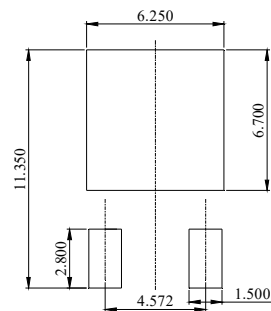
DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.18	2.30	2.39
A1	0	--	0.13
b	0.64	0.76	0.89
c	0.40	0.50	0.61
c1	0.46	0.50	0.58
D	5.97	6.10	6.23
D1	5.05	--	--
E	6.35	6.60	6.73
E1	4.32	--	--
b3	5.21	5.38	5.55
e	2.29 BSC		
H	9.40	10.00	10.40
L	0.89	--	1.27
L2	1.40	--	1.78
V1	7° REF		
V2	0°	--	6°

Package Outline Type-B

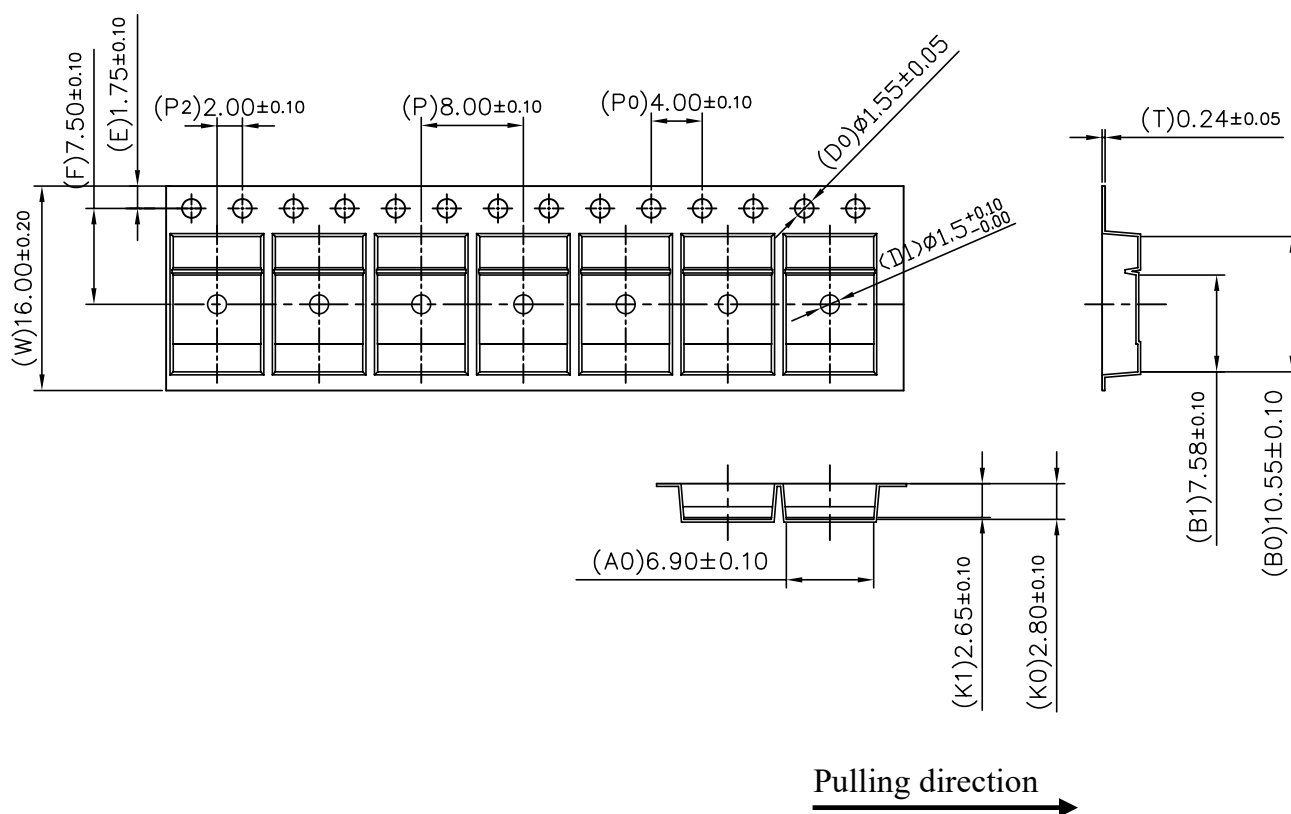
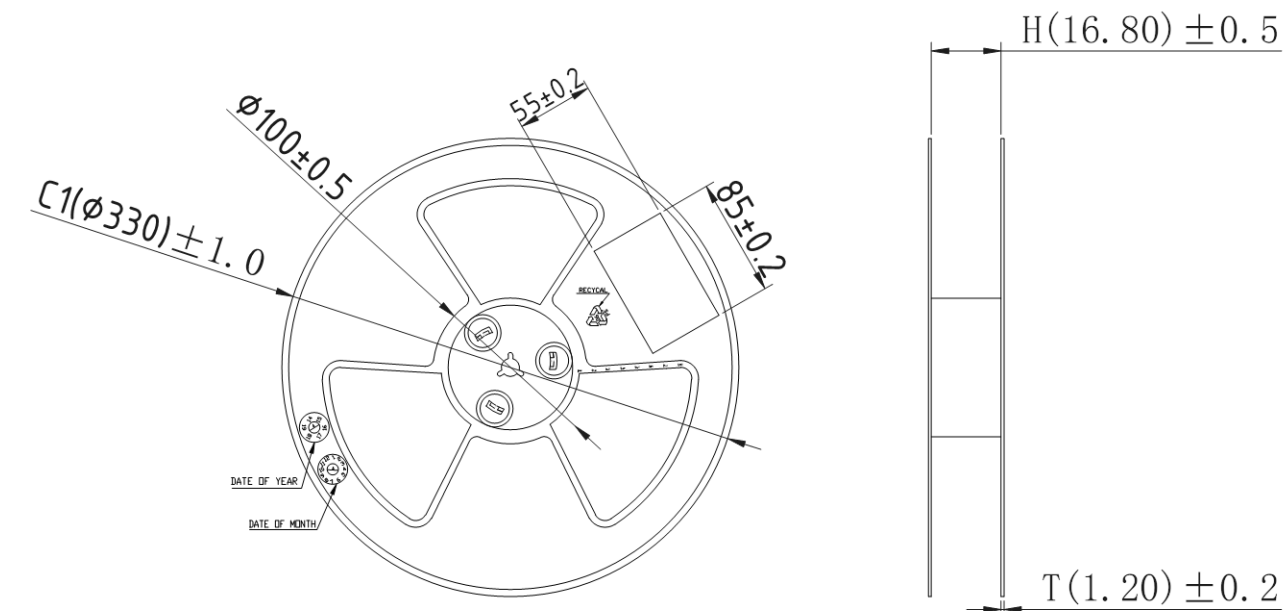


DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.10	2.30	2.40
A1	0	--	0.13
b	0.66	0.76	0.86
b3	5.21	5.38	5.55
c	0.40	0.50	0.60
c1	0.44	0.50	0.58
D	5.90	6.10	6.30
D1	5.30 REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.29 BSC		
H	9.50	10.00	10.70
L	1.09	--	1.21
L2	1.35	--	1.65
V1	7° REF		
V2	0°	--	6°

Recommended Soldering Footprint



Dimensions in mm



Marking Information:

①. Doingter LOGO

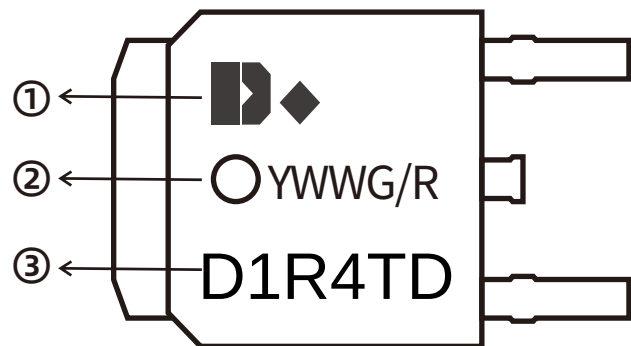
②. Date Code(YWWG / R)

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	2026-01-19	Release of final version

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