

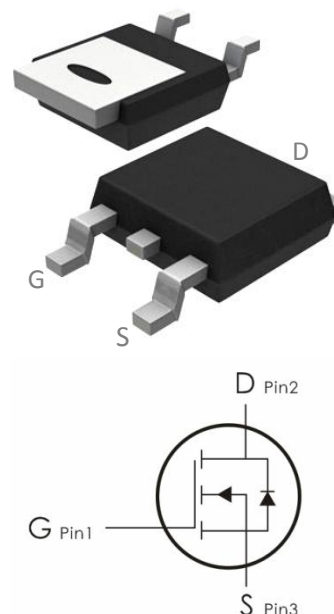
Description:

This 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) $V_{DS}=40V, I_D=30A, R_{DS(on)} < 20m\Omega @ V_{GS}=10V$ (Typ: $16m\Omega$)
- 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
DOD454A	D454A	TO- 252	2500 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- $T_C=25^\circ\text{C}$	30	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	21	
	Continuous Drain Current- $T_A=25^\circ\text{C}$	8.4	
	Continuous Drain Current- $T_A=70^\circ\text{C}$	6.7	
I_{DM}	Pulsed Drain Current ¹	80	A
E_{AS}	Single Pulsed Avalanche Energy ²	31.3	mJ
I_{AS}	Avalanche Current	25	A
P_D	Power Dissipation - $T_C=25^\circ\text{C}$	31.3	W
	Power Dissipation - $T_A=25^\circ\text{C}$	2	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	4	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
V _{(BR)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} =32V,T _J = 25 °C	---	---	1	μ A
		V _{GS} =0V, V _{DS} =32V,T _J = 55 °C	---	---	5	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	---	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V,I _D =15A	---	16	20	m Ω
		V _{GS} =4.5V,I _D =10A	---	23	29	m Ω
G _{FS}	Forward Transconductance	V _{DS} =5V, I _D =15A	---	34	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	2.1	---	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	1010	---	pF
C _{oss}	Output Capacitance		---	102	---	
C _{rss}	Reverse Transfer Capacitance		---	70	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =20V,I _D =15A, R _G =3.3Ω, V _{GS} =10V	---	2.8	---	ns
t _r	Rise Time		---	12.8	---	ns
t _{d(off)}	Turn-Off Delay Time	V _{DD} =20V,I _D =15A, R _G =3.3Ω, V _{GS} =10V	---	21.2	---	ns
t _f	Fall Time		---	6.4	---	ns
Q _g	Total Gate Charge	V _{DS} =32V, V _{GS} =4.5V, I _D =15A	---	10	---	nC
Q _{gs}	Gate-Source Charge		---	2.55	---	nC
Q _{gd}	Gate-Drain Charge		---	4.8	---	nC

Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	$I_S=1A, V_{GS}=0V, T_J = 25^\circ C$	---	---	1.2	V
I_S	Continuous Source Current	$V_G=V_D=0V$	---	---	30	A
I_{SM}	Pulsed Source Current		---	---	80	A
T_{rr}	Reverse Recovery Time	$I_F = 15 A, diF / dt = 100 A / \mu s$	---	10	---	ns
Q_{rr}	Reverse Recovery Charge	$T_J = 25^\circ C$	---	3.1	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : $T_J=25^\circ C, V_{DD}=20V, V_G=10V, L=0.5mH$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Characteristics: ($T_J=25^\circ C$ unless otherwise noted)

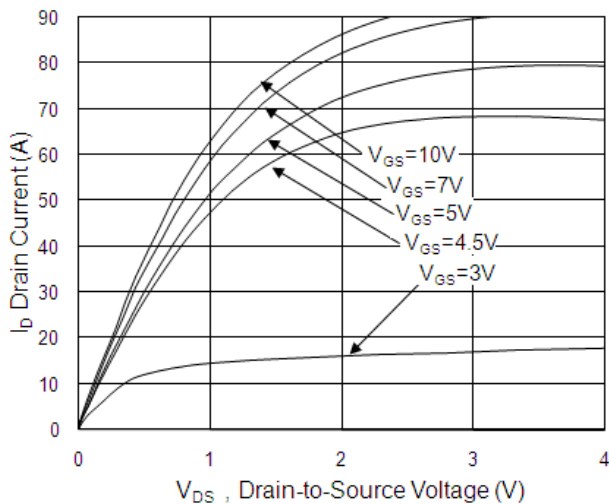


Fig.1 Typical Output Characteristics

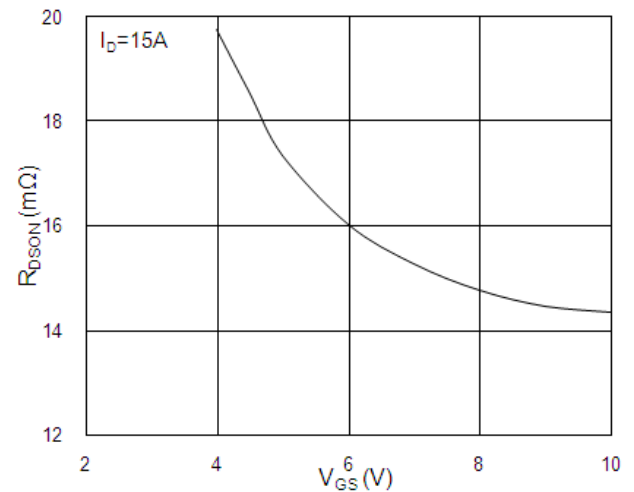


Fig.2 On-Resistance vs. G-S Voltage

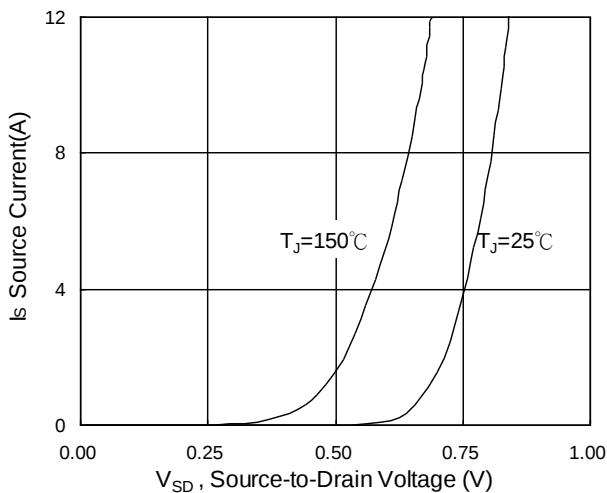


Fig.3 Forward Characteristics Of Reverse

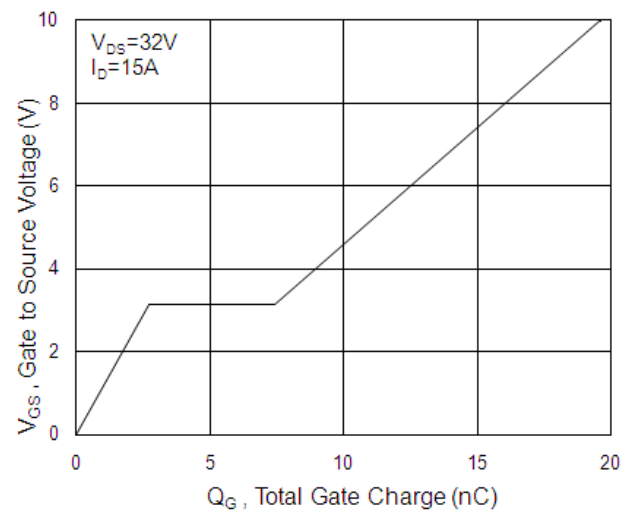


Fig.4 Gate-Charge Characteristics

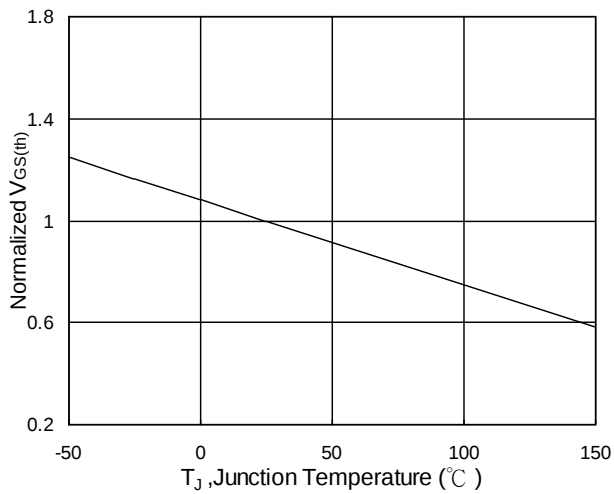


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

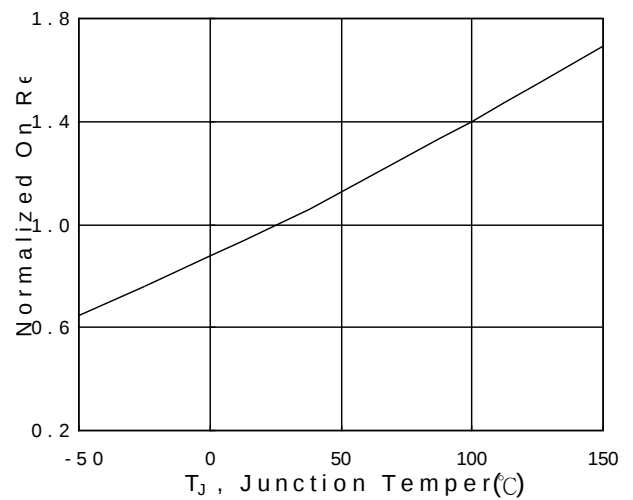


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

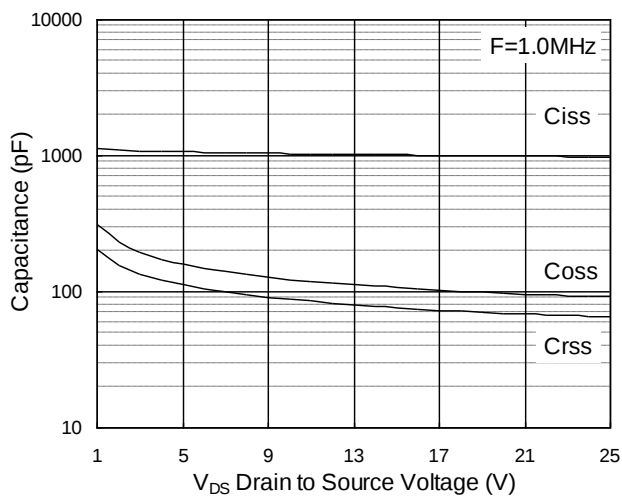


Fig.7 Capacitance

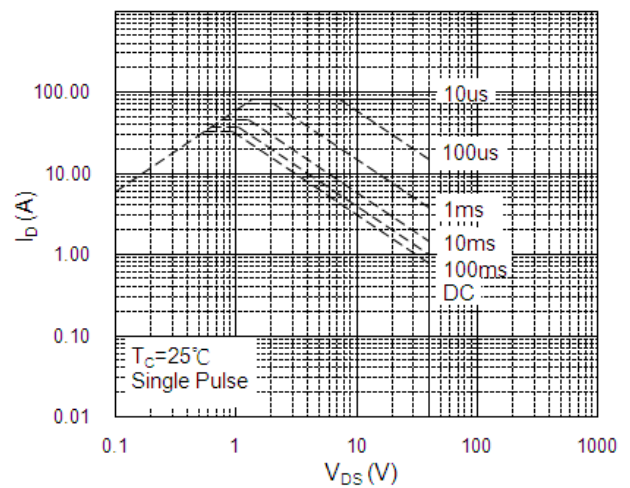


Fig.8 Safe Operating Area

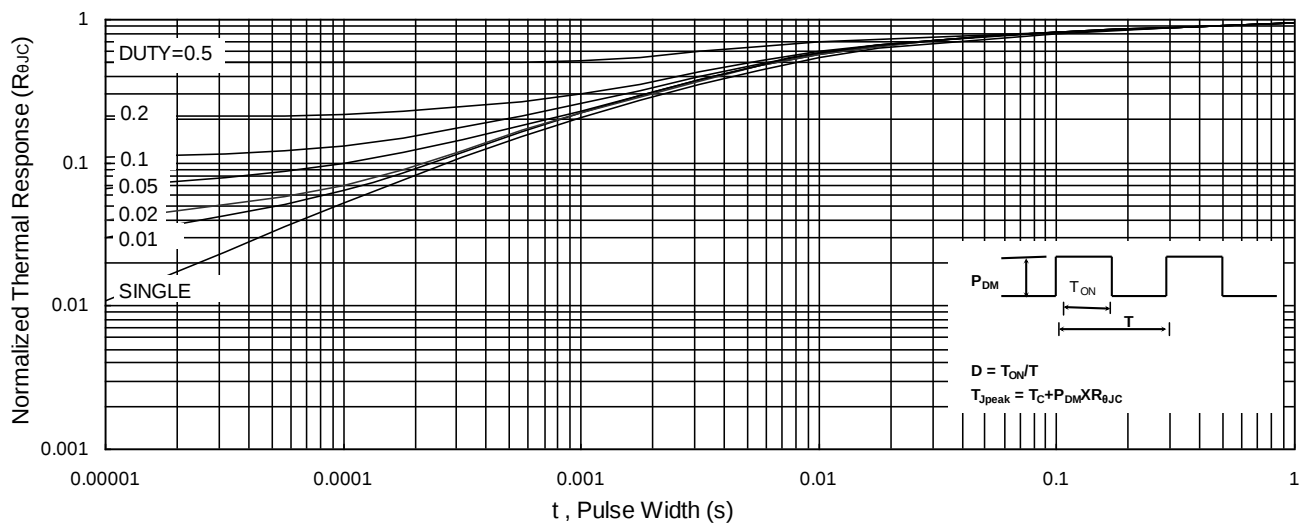


Fig.9 Normalized Maximum Transient Thermal Impedance

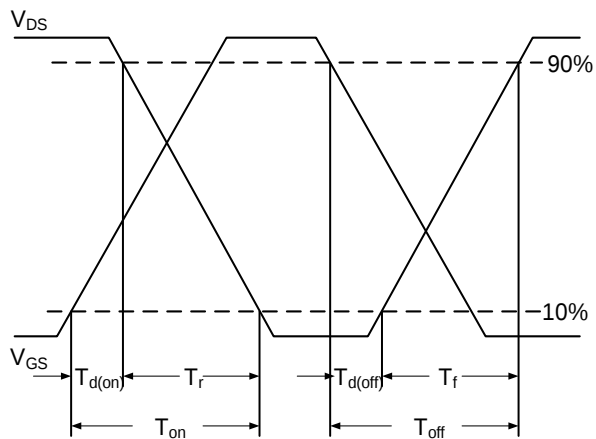


Fig.10 Switching Time Waveform

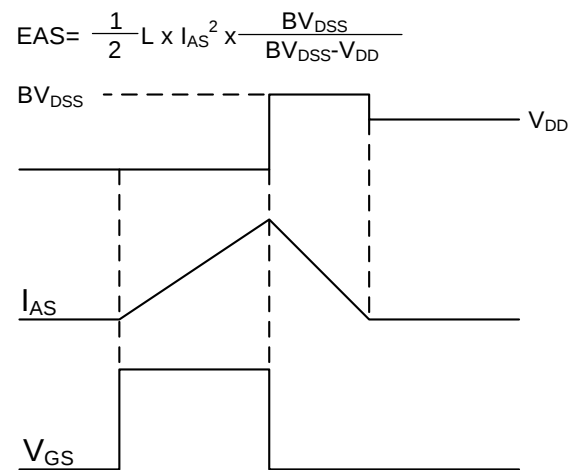
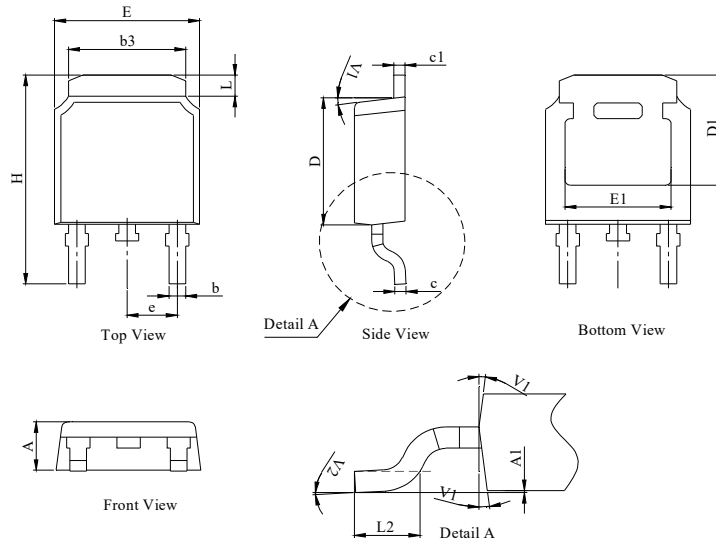


Fig.11 Unclamped Inductive Switching Waveform

TO-252 Package Information

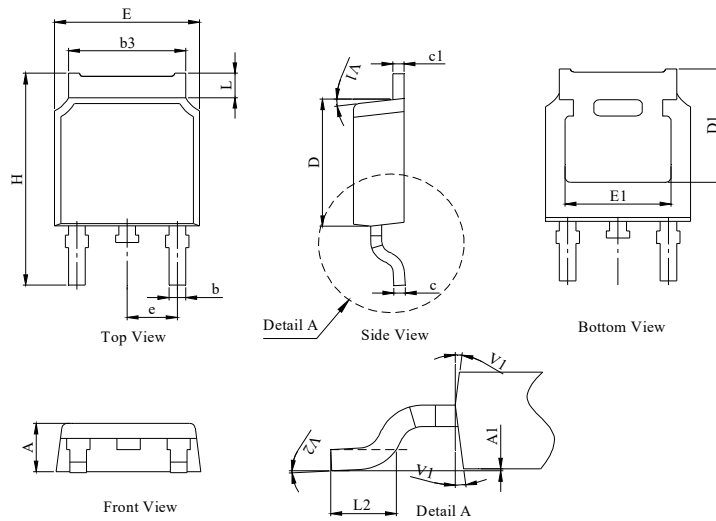
Package Outline Type-A

UNIT: mm



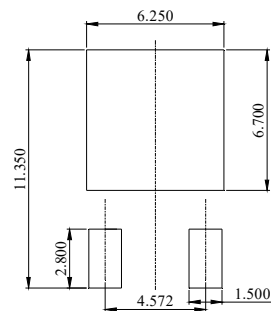
DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.18	2.30	2.39
A1	0	--	0.13
b	0.64	0.76	0.89
c	0.40	0.50	0.61
c1	0.46	0.50	0.58
D	5.97	6.10	6.23
D1	5.05	--	--
E	6.35	6.60	6.73
E1	4.32	--	--
b3	5.21	5.38	5.55
e	2.29 BSC		
H	9.40	10.00	10.40
L	0.89	--	1.27
L2	1.40	--	1.78
V1	7° REF		
V2	0°	--	6°

Package Outline Type-B



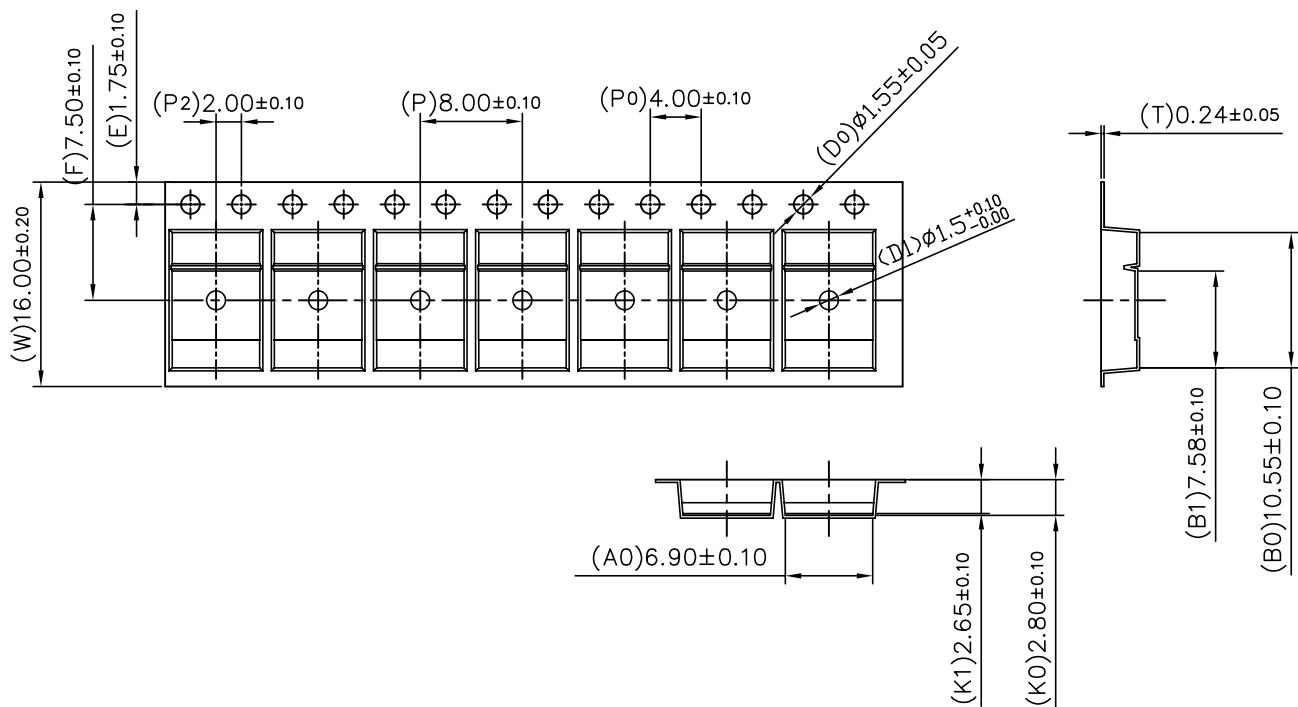
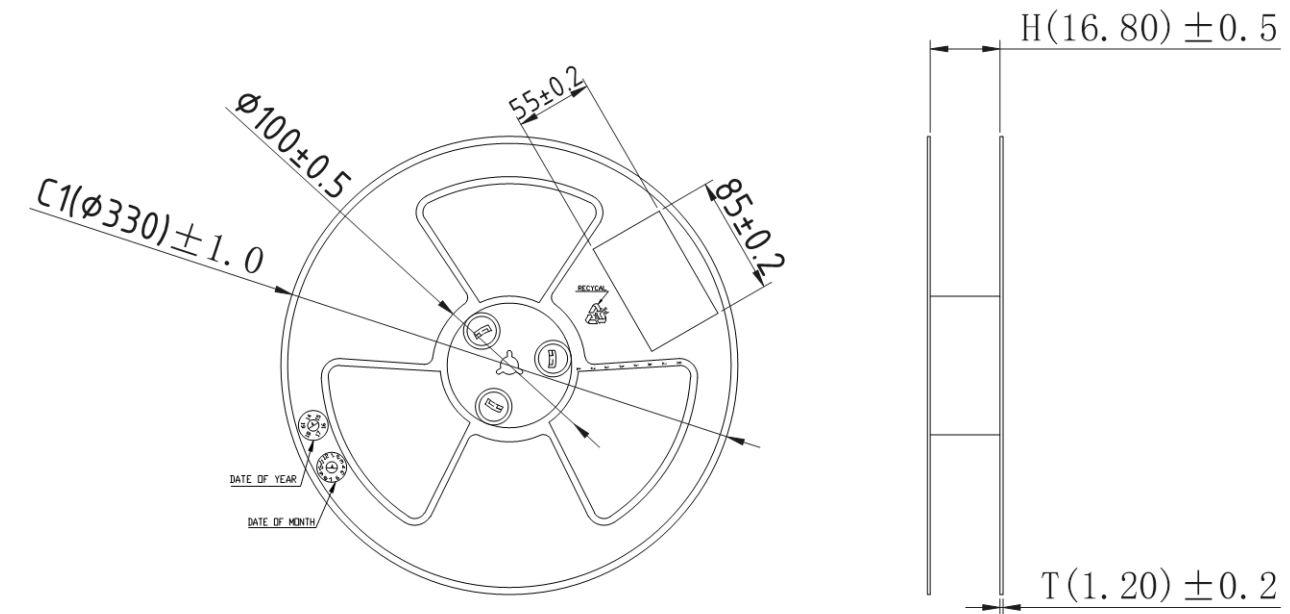
DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.10	2.30	2.40
A1	0	--	0.13
b	0.66	0.76	0.86
b3	5.21	5.38	5.55
c	0.40	0.50	0.60
c1	0.44	0.50	0.58
D	5.90	6.10	6.30
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.29 BSC		
H	9.50	10.00	10.70
L	1.09	--	1.21
L2	1.35	--	1.65
V1	7° REF		
V2	0°	--	6°

Recommended Soldering Footprint



Tape & Reel Information

Dimensions in mm



Pulling direction →

Marking Information:

①. Doingter LOGO

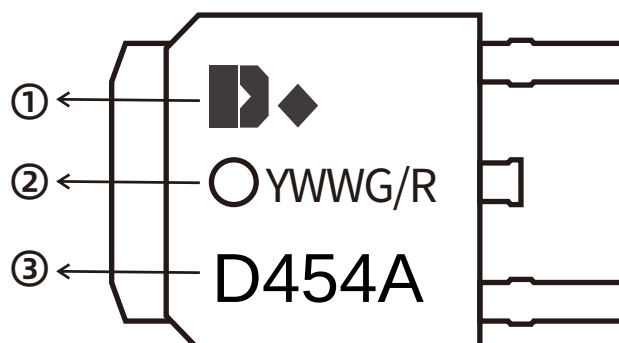
②. Date Code(YWWG / R)

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)
1.0	2020-11-29	Release of final version

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