

TO-252-2L Plastic-Encapsulate Transistors

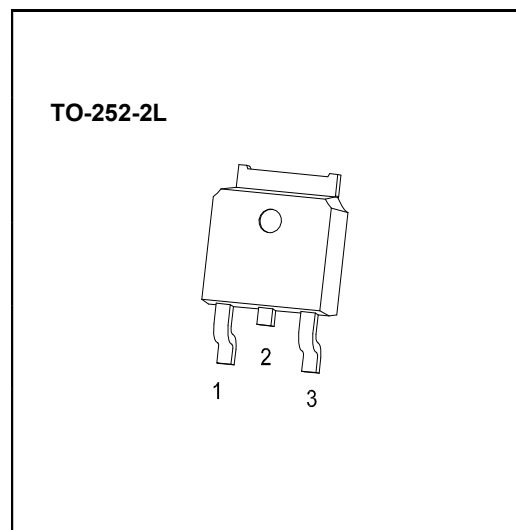
TRANSISTOR (NPN)

Features:

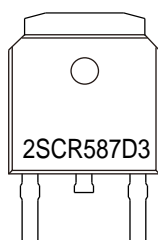
- 1) Suitable for Power Driver.
- 2) Complementary PNP Types : 2SAR587D3.
- 3) Low $V_{CE(sat)}$
 $V_{CE(sat)}=120mV(Max.)$.
 $(I_C/I_B=1A/100mA)$

Application:

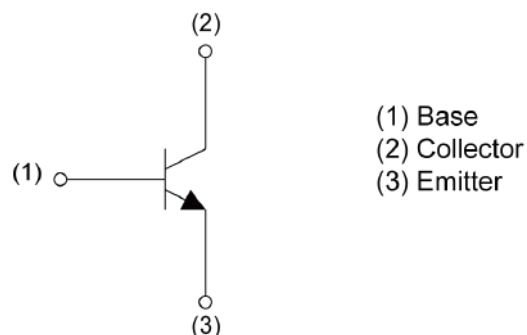
LOW FREQUENCY AMPLIFIER



Packaging specifications



Inner circuit



MAXIMUM RATINGS ($T_a=25^{\circ}C$ unless otherwise note)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	120	V
V_{CEO}	Collector-Emitter Voltage	120	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	3	A
P_C	Collector Power Dissipation	10	W
T_J	Junction Temperature	150	$^{\circ}C$
T_{stg}	Storage Temperature	-55 to +150	$^{\circ}C$

● **Absolute maximum ratings** ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Values	Unit
Collector-base voltage	V_{CBO}	120	V
Collector-emitter voltage	V_{CEO}	120	V
Emitter-base voltage	V_{EBO}	6	V
Collector current	I_C	3	A
	I_{CP}^{*1}	6	A
Power dissipation	P_D^{*2}	10	W
Junction temperature	T_j	150	$^\circ\text{C}$
Range of storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

● **Electrical characteristics** ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Collector-base breakdown voltage	BV_{CBO}	$I_C = 100\mu\text{A}$	120	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	$I_C = 1\text{mA}$	120	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = 100\mu\text{A}$	6	-	-	V
Collector cut-off current	I_{CBO}	$V_{CB} = 100\text{V}$	-	-	1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 4\text{V}$	-	-	1	μA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 1\text{A}, I_B = 100\text{mA}$	-	60	120	mV
DC current gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 100\text{mA}$	120	-	390	-
Transition frequency	f_T^{*3}	$V_{CE} = 10\text{V}, I_E = -1\text{A}, f = 100\text{MHz}$	-	250	-	MHz
Output capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$	-	35	-	pF

*1 $P_w=10\text{ms}$ Single Pulse

*2 $T_c=25^\circ\text{C}$

*3 Pulsed

Typical Characteristics

- Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

Fig.1 Grounded Emitter Propagation Characteristics

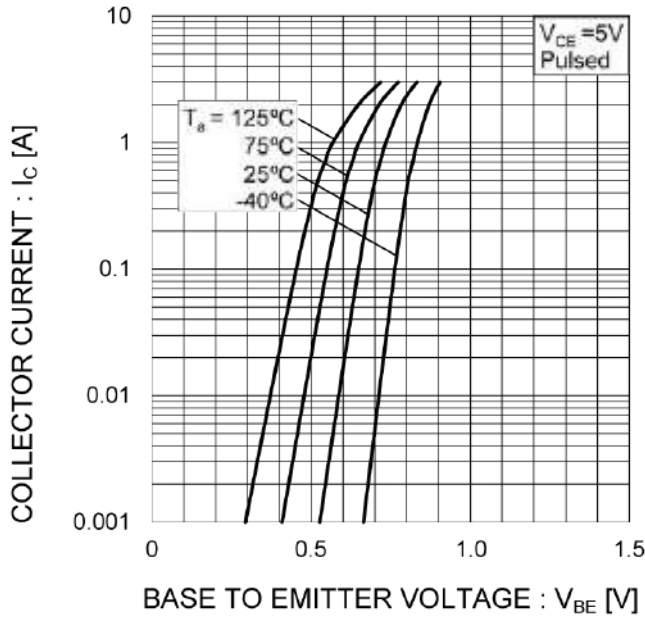


Fig.2 Typical Output Characteristics

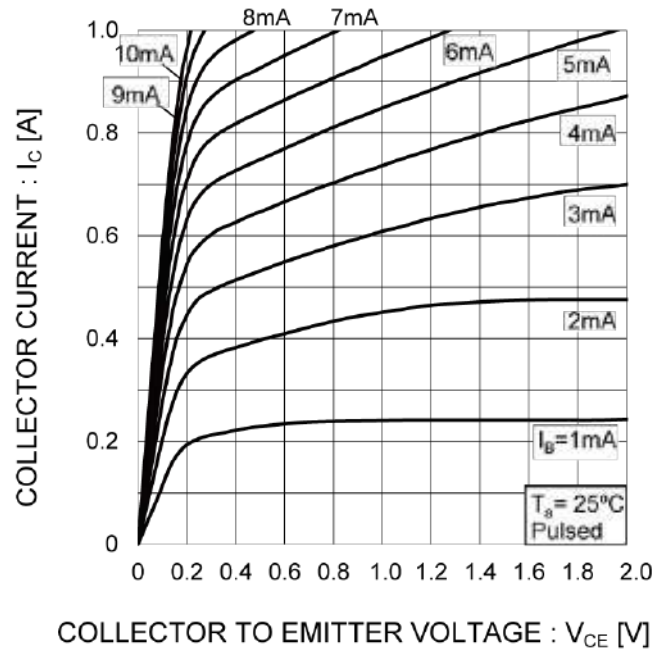


Fig.3 DC Current Gain vs. Collector Current(I)

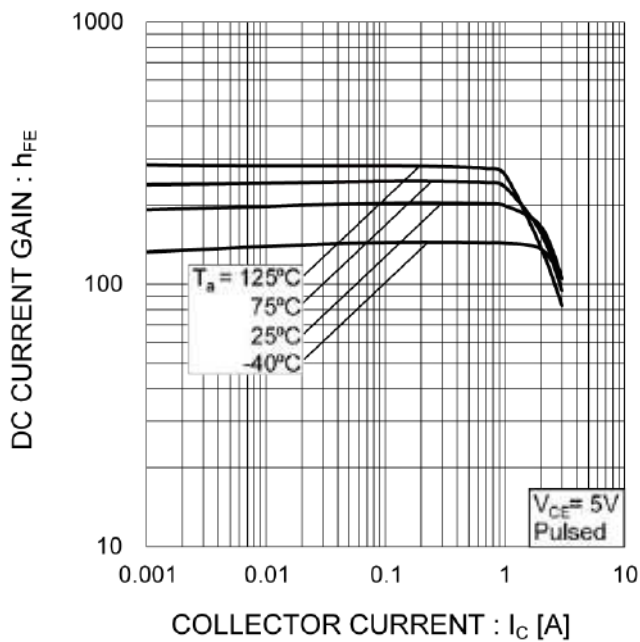
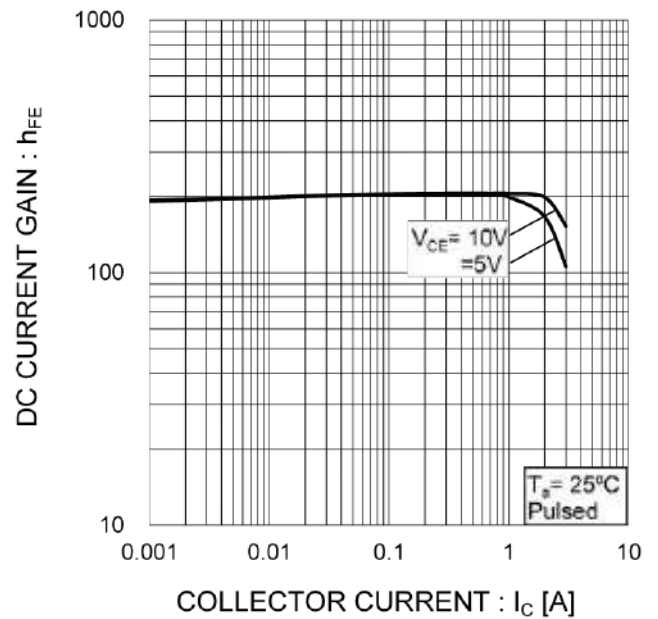


Fig.4 DC Current Gain vs. Collector Current(II)



Typical Characteristics

● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current(I)

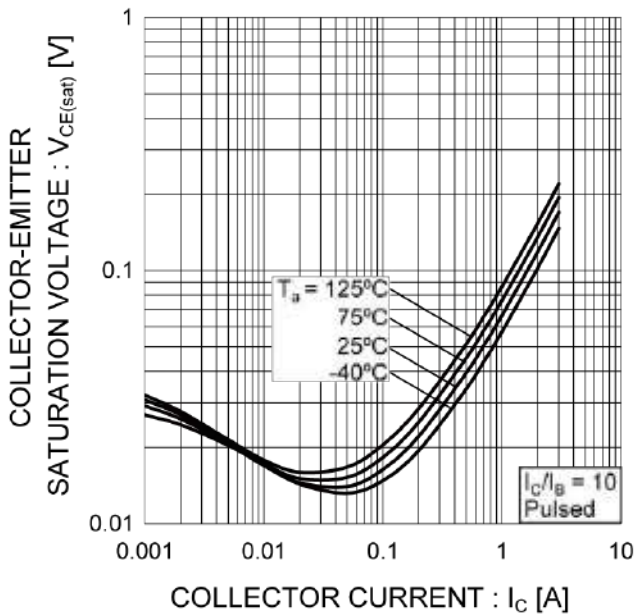


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current(II)

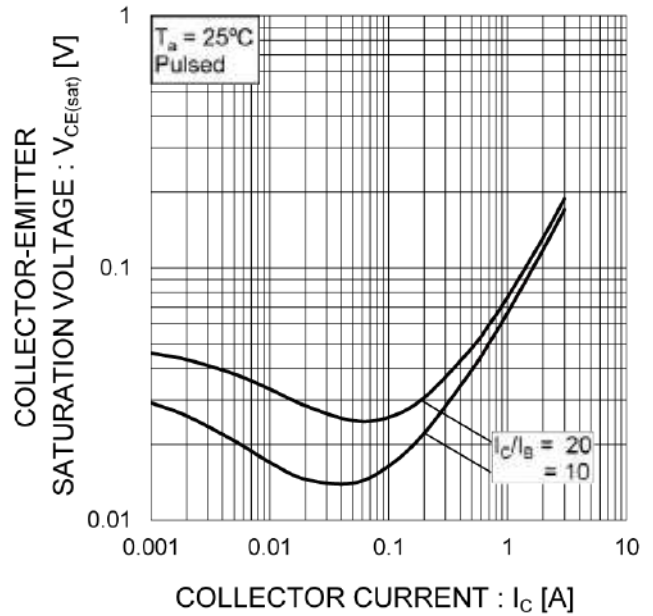


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

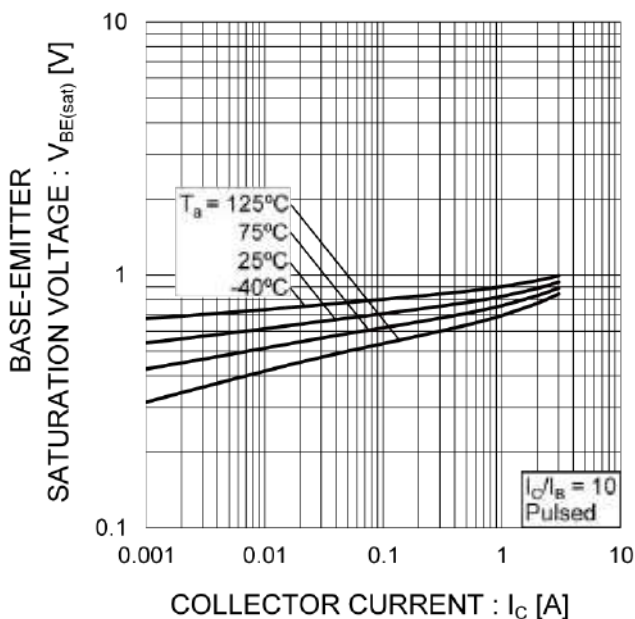
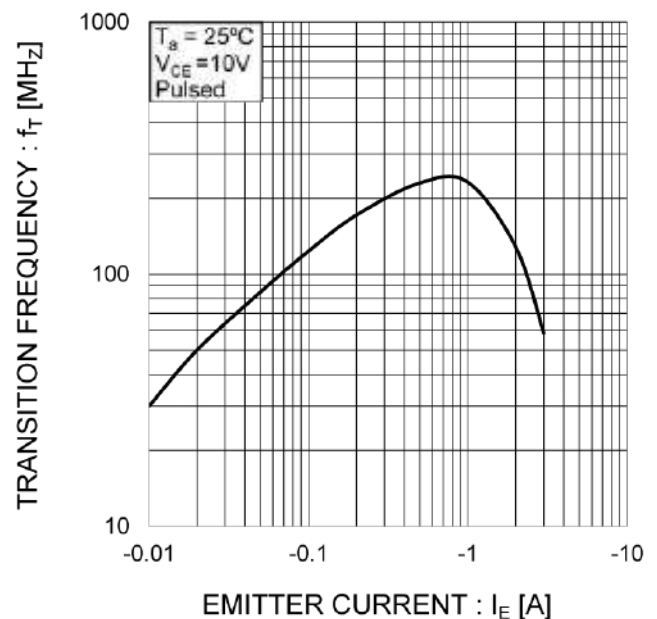


Fig.8 Gain Bandwidth Product vs. Emitter Current



Typical Characteristics

● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

Fig.9 Emitter input capacitance vs. Emitter-Base Voltage
 Collector output capacitance vs. Collector-Base Voltage

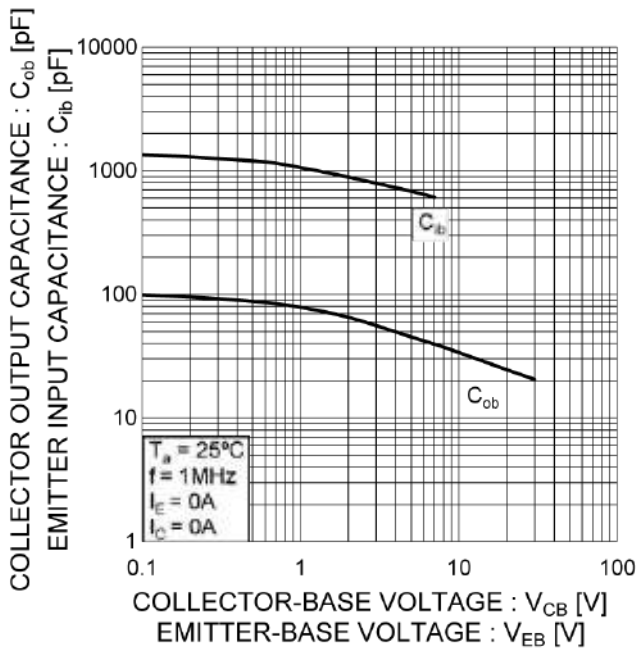
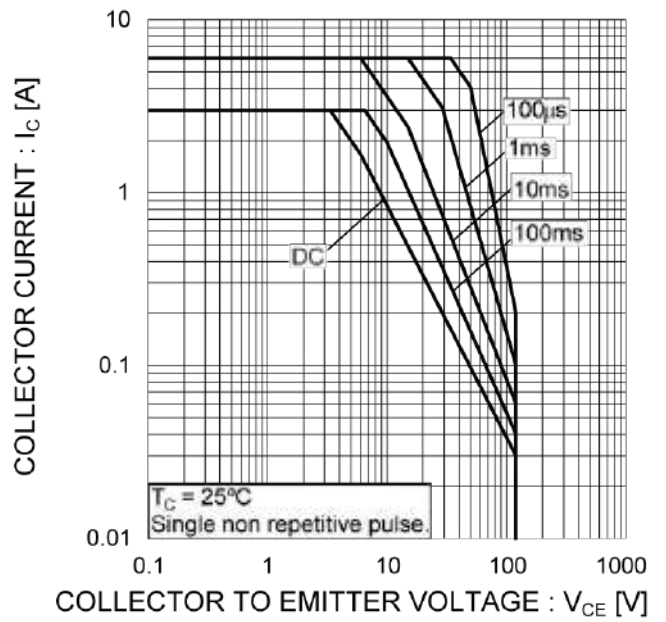
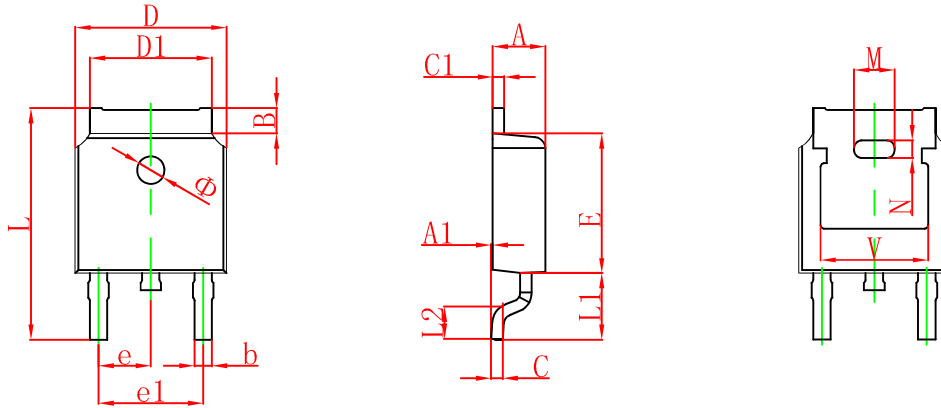


Fig.10 Safe Operating Area

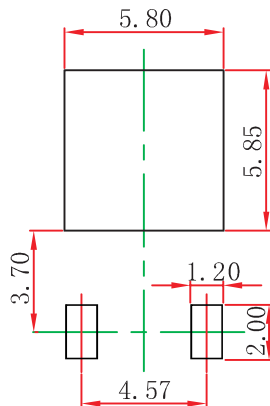


TO-252(4R)-2L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286 TYP.		0.090 TYP.	
e1	4.327	4.727	0.170	0.186
M	1.778 REF.		0.070 REF.	
N	0.762 REF.		0.018 REF.	
L	9.800	10.400	0.386	0.409
L1	2.9 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
V	4.830 REF.		0.190 REF.	
Φ	1.100	1.300	0.043	0.051

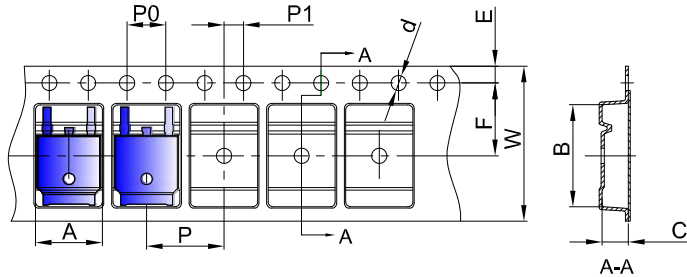
TO-252(4R)-2L Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.05mm.
 3. The pad layout is for reference purposes only.

To-252(4R)-2L Tape and Reel

TO-252 Embossed Carrier Tape



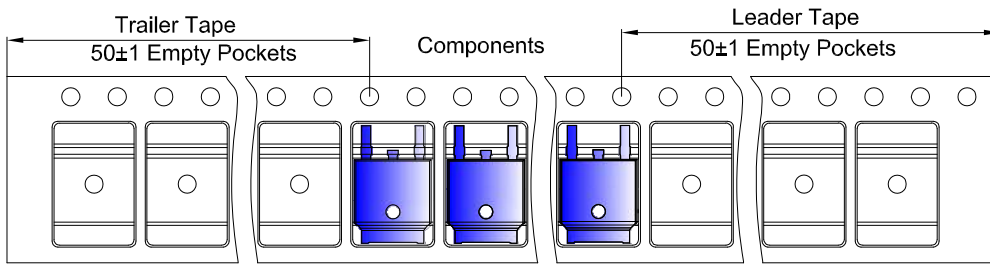
Packaging Description:

TO-252 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 25,00 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

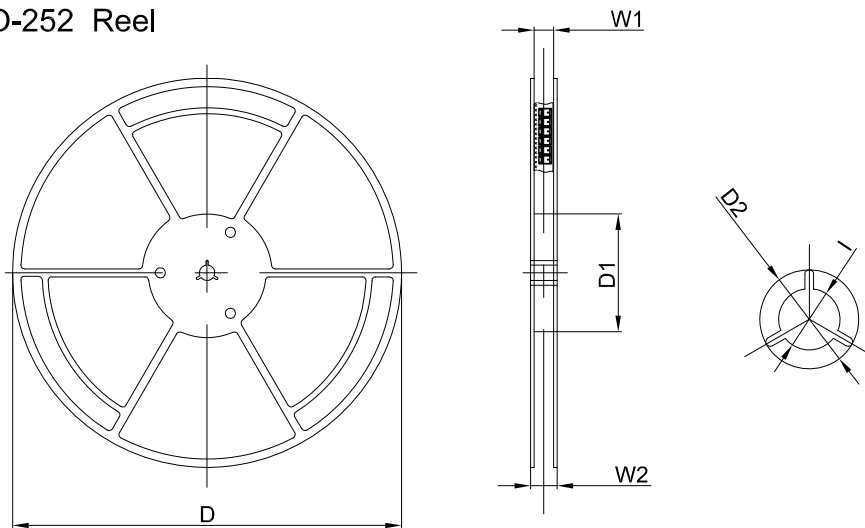
Dimensions are in millimeter

Pkg type	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00

TO-252 Tape Leader and Trailer



TO-252 Reel



Dimensions are in millimeter

Reel Option	D	D1	D2	W1	W2	I
13"Dia	330.00	100.00	Ø21.00	16.40	21.00	Ø13.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
2,500 pcs	13inch	2,500 pcs	340×336×29	25,000 pcs	353×346×365	