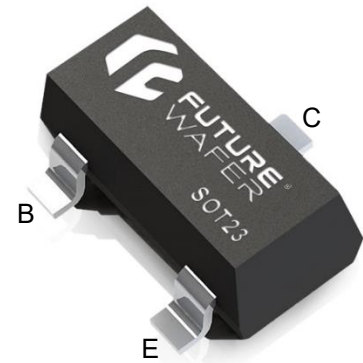


1. Synopsis

1-1. Feature List

- $BV_{CBO} > 20V$
- $I_C = 50mA$ High Collector Current
- Ideal for Low Power Amplification and Switching
- Pair of PNP Transistors that are Intrinsically Matched
- 2% Matching on Current Gain (h_{FE})
- 2mV Matching on Base-Emitter Voltage (V_{BE})
- Fully Internally Isolated in a Surface Mount Package



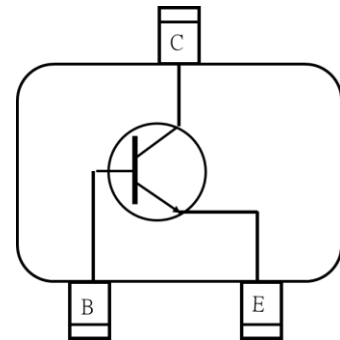
SOT23

1-2. Applications

- Current Mirrors
- Differential and Instrumentation Amplifiers
- Comparators

1-3. Mechanical Characteristics

- Molded JEDEC Package: SOT23
- Packing: Tape and Reel
- Flammability rating UL 94V-0
- Halogen Free
- JEDEC MSL Classification: LEVEL 1



Device Symbol

1-4. Device Characteristics



Maximum Ratings@25°C Unless Otherwise Specified

Parameter	Symbol	Values	Units
Collector-Base Voltage	V_{CBO}	20	V
Collector-Emitter Voltage	V_{CEO}	11	
Emitter-Base Voltage	V_{EBO}	3.0	
Collector Current	I_C	50	mA
Total Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_J	-55 ~ +150	°C
Storage Temperature	T_{STG}		

2. Contents

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3. Electrical Property

3-1. Electrical Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
Collector-Emitter Breakdown Voltage	V_{BR-CEO}	$I_C = 1mA, I_B = 0$	11	-	-	V
Collector-Base Breakdown Voltage	V_{BR-CBO}	$I_C = 10\mu A, I_E = 0$	20	-	-	
Emitter-Base Breakdown Voltage	V_{BR-EBO}	$I_E = 10\mu A, I_C = 0$	3.0	-	-	
Emitter-Base Cutoff Current	I_{EBO}	$V_{EB} = 2.0Vdc, I_C = 0$	-	-	500	nA
Collector-Base Cutoff Current	I_{CBO}	$V_{CE} = 10Vdc, I_E = 0$	-	-	500	

3-2. On Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
DC Current Gain	h_{FE}	$I_C = 5mA, V_{CE} = 10V$	56	-	240	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10mA, I_B = 5mA$	-	-	0.5	Vdc

3-3. Small Signal Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
Current Gain Bandwidth Product	f_T	$I_C = 10mA, V_{CE} = 10V$	-	3.2	-	GHZ
Collector Output Capacitance	C_{OBO}	$V_{CB} = 10V, f = 1MHz$	-	-	1.5	pF

3-4. Classification of h_{FE}

Type	2SC3838-R	2SC3838-S
Range	56-160	120-240

3-5. Ratings and Characteristics Curve

Fig 1. Typical DC Current Gain vs. Collector Current

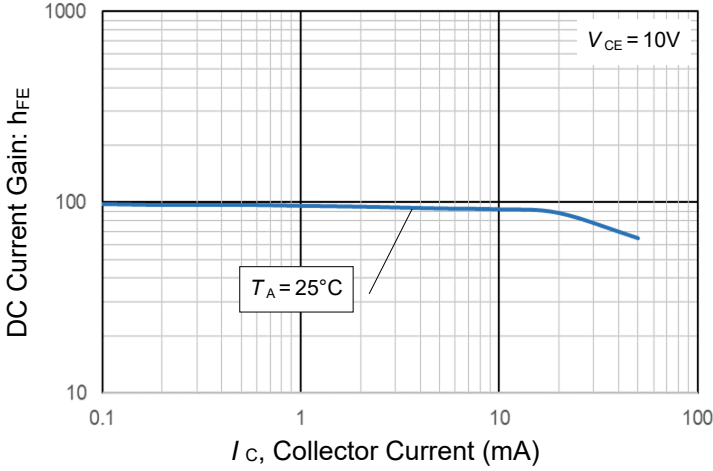


Fig 2. Gain Bandwidth Product vs. Emitter Current

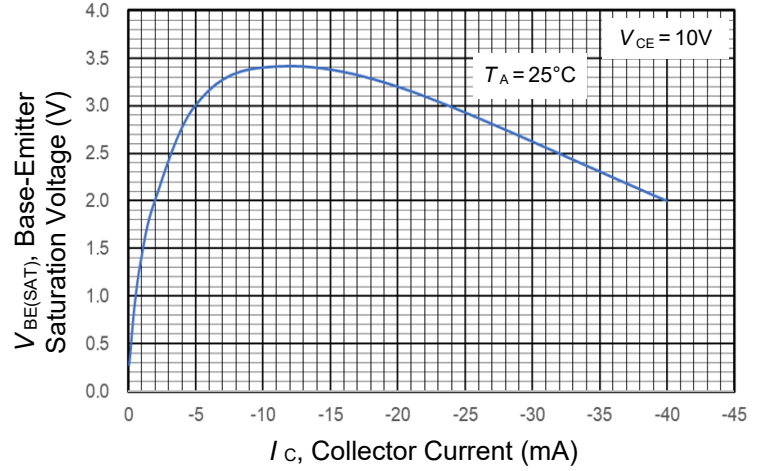


Fig 3. Typical Collector-Emitter Saturation Voltage vs. Collector Current

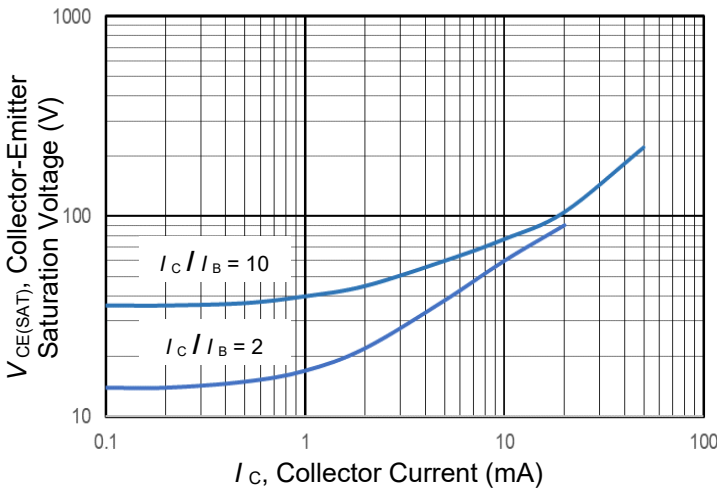


Fig 4. Input and Output Capacitance vs. Collector-Base Voltage

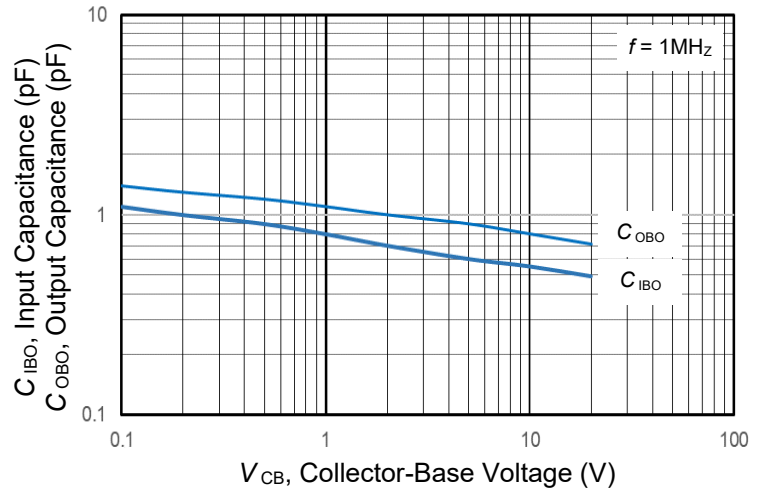


Fig 5. Collector-Base Time Constant vs. Collector Current

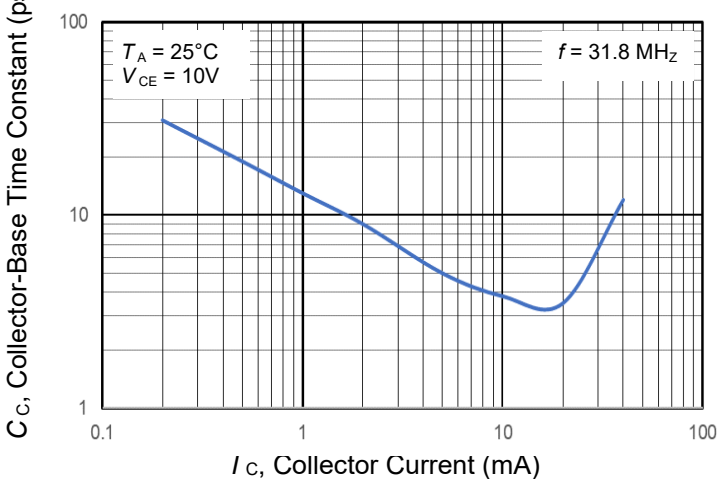
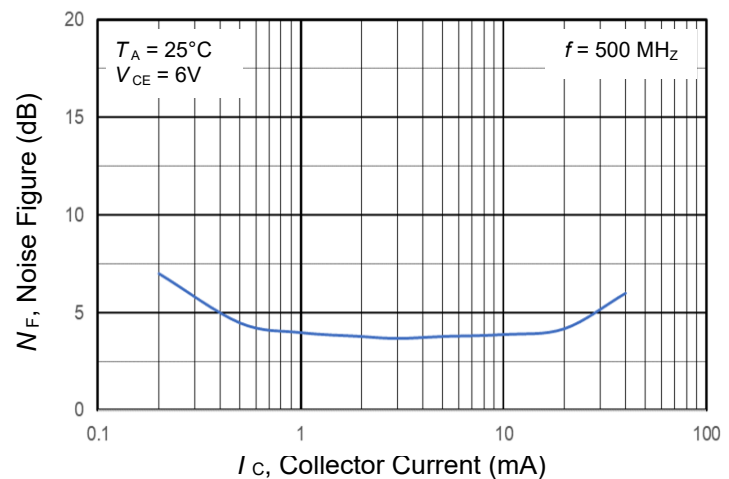
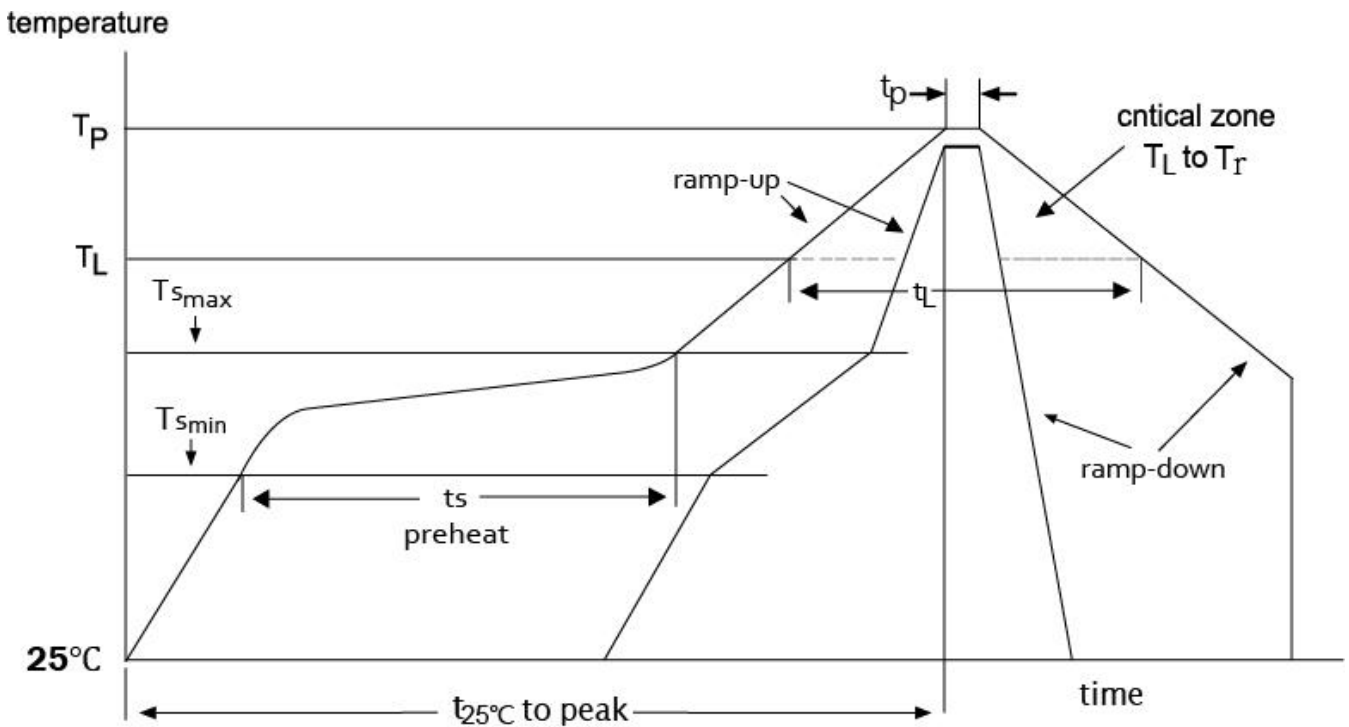


Fig 6. Noise Factor vs. Collector Current Characteristics



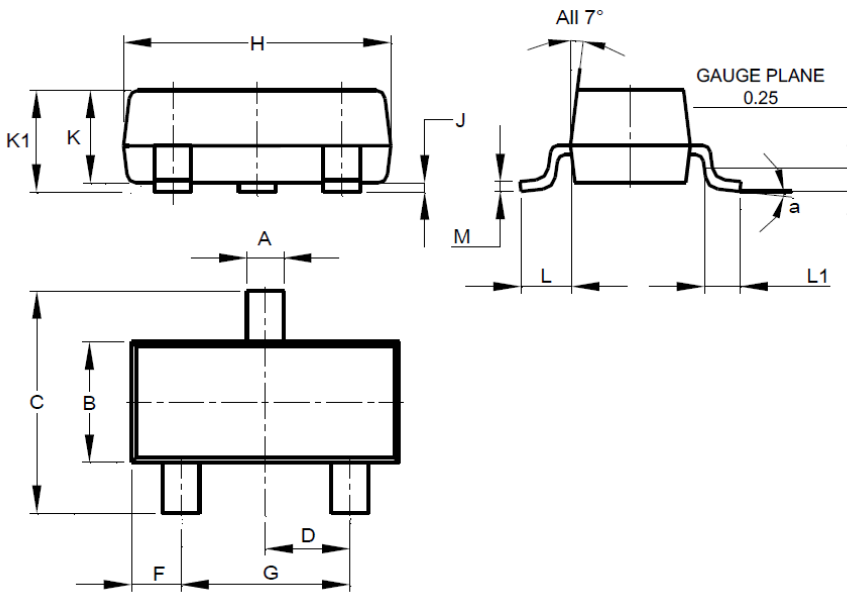
4. Soldering Parameters

Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-up rate (T _{smax} to T _p)	3 °C/s maximum	3 °C/s maximum
Preheat		
Temperature minimum (T _{smin})	100 °C	150 °C
Temperature maximum (T _{smax})	150 °C	200 °C
Time (t _{smin} to t _{smax})	60 s to 120 s	60 s to 180 s
Time maintained above		
Temperature (T _L)	183 °C	217 °C
Time (t _L)	60 s to 150 s	60 s to 150 s
Peak/classification temperature (T)	235 °C	260 °C
Number of allowed reflow cycles	3	3
Time within 5 °C of actual peak temperature (t _p)	10 s to 30 s	20 s to 40 s
Ramp-down rate	6 °C/s maximum	6 °C/s maximum
Time 25 °C to peak temperature	6 minutes maximum	8 minutes maximum



5. Package Information

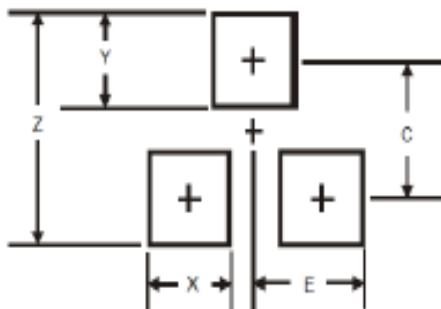
5-1. Dimension


SOT23

Dim	Min.	Max.	Typ.
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		

Unit:mm

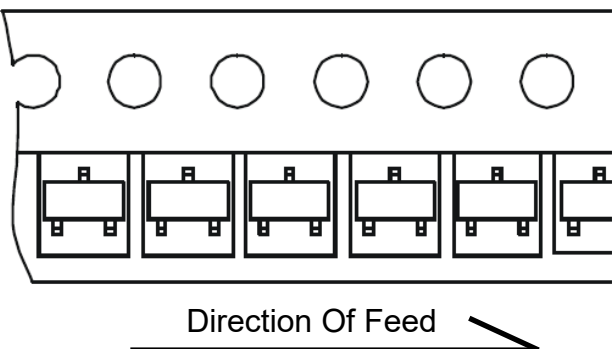

5-2. PCB Pad Layout Recommendation



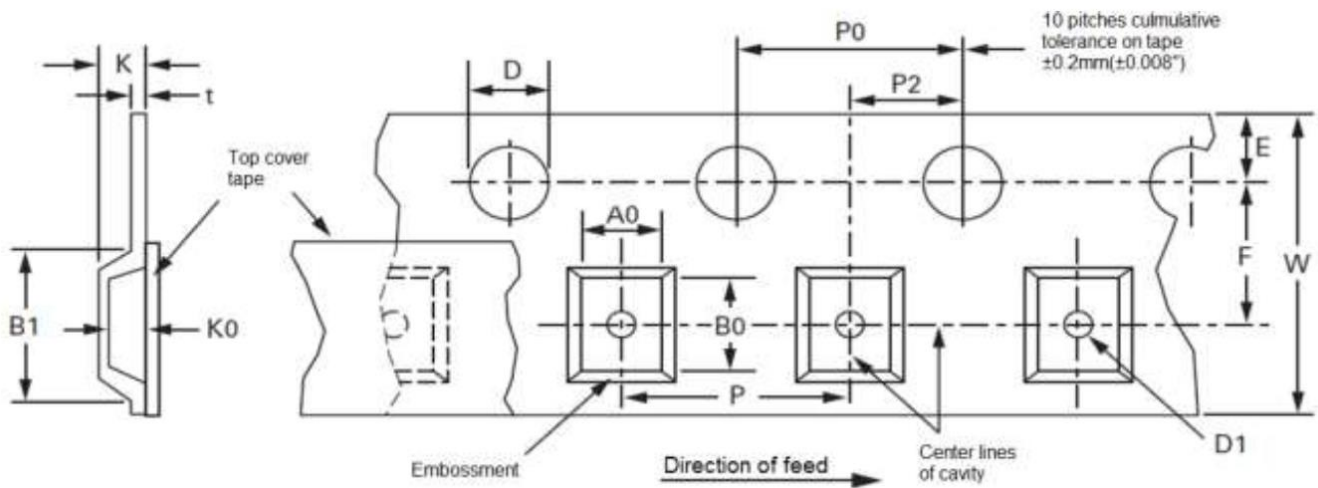
Dim	Millimeter
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

6. Packing

6-1. Taping and Reel Specification

Taping Width	Tape Orientation
8mm	 <p style="text-align: center;">Direction Of Feed </p>

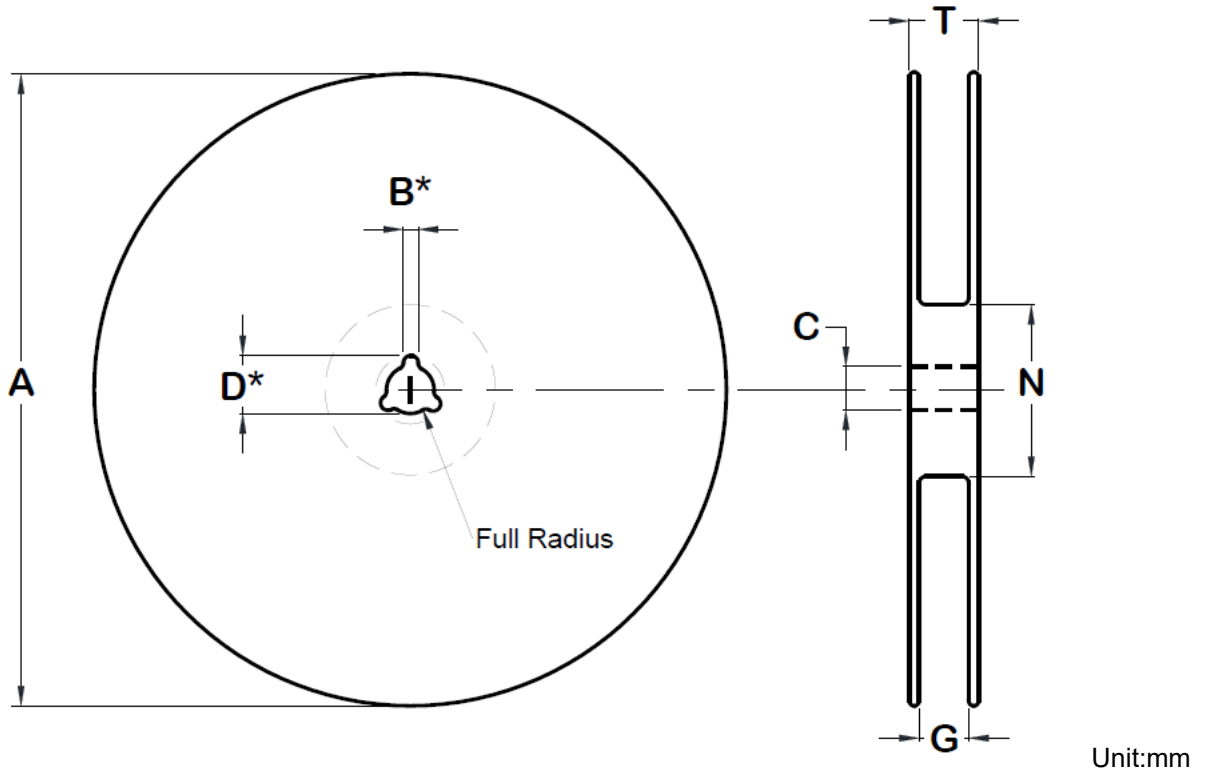
6-2. Embossed Carrier Tape Specification



Unit:mm

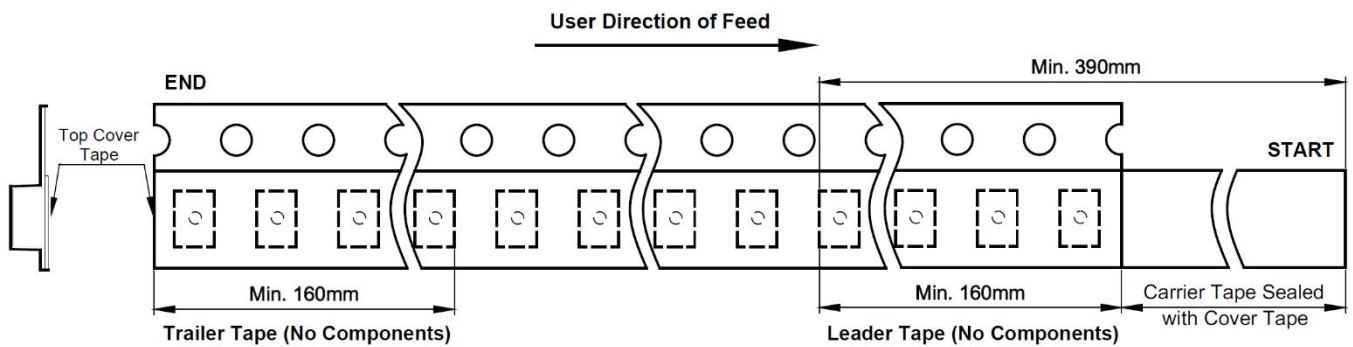
Dimension	W	B1	D	D1	E	F	K	P	P0	P2	t	W
Value	8 mm	4.5 Max.	1.5 ±0.10	0.35 min.	1.75 ±0.10	3.5 ±0.05	2.4 Max.	4.0 ±0.10	4.0 ±0.10	2.0 ±0.05	0.4 Max.	8.0 ±0.30
A0 / B0 / K0	Determined by Component Size. The Clearance Between The Component And The Cavity Must Comply to The Rotational and Lateral Movement Requirement Provided in Figures in The "Maximum Component Movement in Tape Pocket" Section.											

6-3. Surface Mount Reel Specification



Dimension	Tape Width	Reel Size	A	B	C	D	N	G	T
Value	8 mm	7"	178 ±2	2.0 +0.5-0	13 +0.5-0.2	20.5 ±0.2	55 ±5	8.4 +1.5/ -0.0	14.4

6-4. Tape Leader and Trailer Specification



7. Ordering Information

Part Number	Marking Code	Quantity	Component Package	Packaging Option
2SC3838	R25	3,000PCS	SOT23	Tape & Reel - 8mm tape / 7"reel

8. Version

8-1. History

Version	Date	File No.	Recording	Basis
A	14-Oct-2018	F51849S	New Create	Market
B	23-Oct-2019		Update Company Info.	System
2.0	27-Nov-2021		Update Version	System