

BCP54,BCP55,BCP56

NPN TRANSISTOR



VOLTAGE: 45-100 Volts

CURRENT: 1.0 Amperes

Package: SOT-223

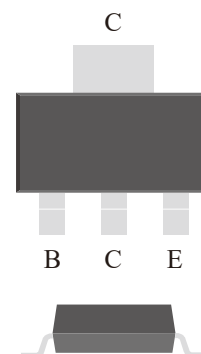
FEATURES

- NPN General-Purpose Small Signal Transistor.
- Small Temperature Drift And Low Cost.
- Extremely Low Saturation Voltage Drop
- The Summary Capacitor Is Suitable For High-Frequency Applications.

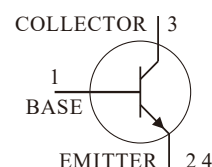
MECHANICAL DATA

- **Package:** Molding Compound Meets UL 94V-0 Flammability Rating.
The Material Of Product Compliance With RoHS Requirements.
- **Mounting Position:** Any.
- **Pin and polarity:**As Shown In The Figure On The Right.

Diagram:



Polarity:



Maximum Ratings (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	BCP 54	BCP 55	BCP 56	Unit
Collector-Base Voltage		V_{CBO}	45	60	100	V
Collector-Emitter Voltage		V_{CEO}	45	60	100	V
Emitter-Base Voltage		V_{EBO}	5			V
Collector Current	Continuous	I_C	1.0			A
Base Current		I_B	0.2			A

Thermal Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	BCP 54	BCP 55	BCP 56	Unit
Total Device Power Dissipation		P_D	1300			mW
Derating Factor	above 25°C	D_F	10.4			mW/°C
Operating Junction Temperature Range		T_J	-55	to	150	°C
Storage Temperature Range		T_{STD}	-55	to	150	
Thermal Resistance From Junction To Ambient With Steady-State	Device Mounted On 1 in2 FR-4 Board With 2oz. Copper	$R_{\theta JA}$	96.2			°C/W

H_{FE} Classification

Classification	BCP 54-10	BCP 55-10	BCP 56-10	BCP 54-16	BCP 55-16	BCP 56-16
HFE	63~160			100~250		

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ELECTRICAL CHARACTERISTICS (Ta= 25°C)

Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
BPC54						
Collector-Base Breakdown Voltage	IC= 100 uAdc,IE= 0	$V_{(BR)CBO}$	45	-	-	V
Collector-Emitter Breakdown Voltage	IC= 1 mAdc,IB= 0	$V_{(BR)CEO}$	45	-	-	V
Emitter-Base Breakdown Voltage	IE= 100 uAdc,IC= 0	$V_{(BR)EBO}$	5	-	-	V
Collector Cut-off Current	VCB= 34 Vdc,IE= 0	I_{CBO}	-	-	100	nA
Emitter Cut-off Current	VEB= 2.5 Vdc,IC= 0	I_{EBO}	-	-	100	nA
BPC55						
Collector-Base Breakdown Voltage	IC= 100 uAdc,IE= 0	$V_{(BR)CBO}$	60	-	-	V
Collector-Emitter Breakdown Voltage	IC= 1 mAdc,IB= 0	$V_{(BR)CEO}$	60	-	-	V
Emitter-Base Breakdown Voltage	IE= 100 uAdc,IC= 0	$V_{(BR)EBO}$	5	-	-	V
Collector Cutoff Current	VCB= 45 V,IE= 0	I_{CBO}	-	-	100	nA
Emitter Cutoff Current	VEB= 2.5 V,IC= 0	I_{EBO}	-	-	100	nA
BPC56						
Collector-Base Breakdown Voltage	IC= 100 uAdc,IE= 0	$V_{(BR)CBO}$	100	-	-	V
Collector-Emitter Breakdown Voltage	IC= 1 mAdc,IB= 0	$V_{(BR)CEO}$	100	-	-	V
Emitter-Base Breakdown Voltage	IE= 100 uAdc,IC= 0	$V_{(BR)EBO}$	5	-	-	V
Collector Cutoff Current	VCB= 75 V,IE= 0	I_{CBO}	-	-	100	nA
Emitter Cutoff Current	VEB= 2.5 V,IC= 0	I_{EBO}	-	-	100	nA
ON CHARACTERISTICS						
DC Current Gain	VCE= 2 V,IC= 5 mA	H_{FE}	25	-	-	-
	VCE= 2 V,IC= 150 mA		63	-	250	
	VCE= 2 V,IC= 500 mA		25	-	-	
Collector-Emitter Saturation Voltage	IC= 100 mA,IB= 10 mA	$V_{CE(Sat)}$	-	-	0.4	V
	IC= 500 mA,IB= 50 mA		-	-	0.5	
Base-Emitter Saturation Voltage	IC= 100 mA,VCE= 1.0 V	$V_{BE(Sat)}$	-	-	0.9	V
	IC= 500 mA,VCE= 2 V		-	-	1.0	
Transition Frequency, f= 100MHz	VCE= 10 V,IC= 10 mA	fT	-	100	-	MHZ

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Typical Characteristics Curves

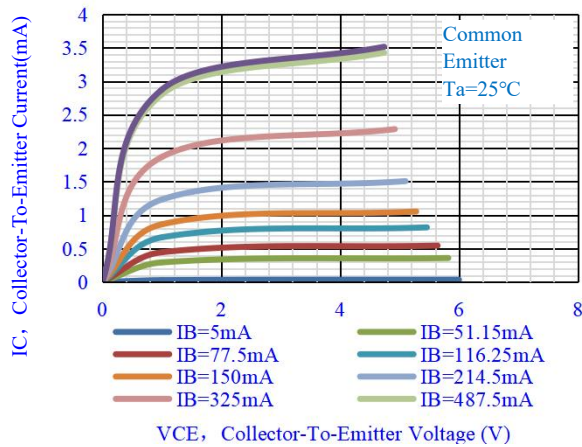


Fig.1-STATIC CHARACTERISTICS

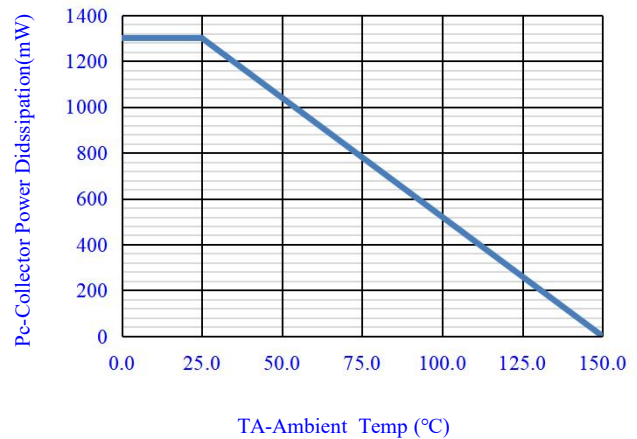


Fig.2-COLLECTOR POWER DISSIPATION vs. TA

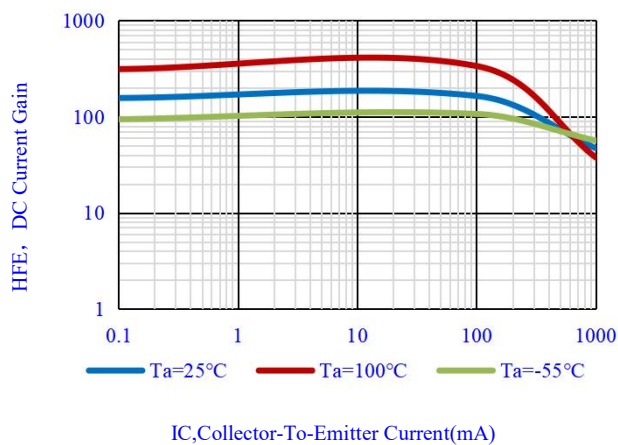


Fig.3-DC CURRENT GAIN vs. COLLECTOR CURRENT

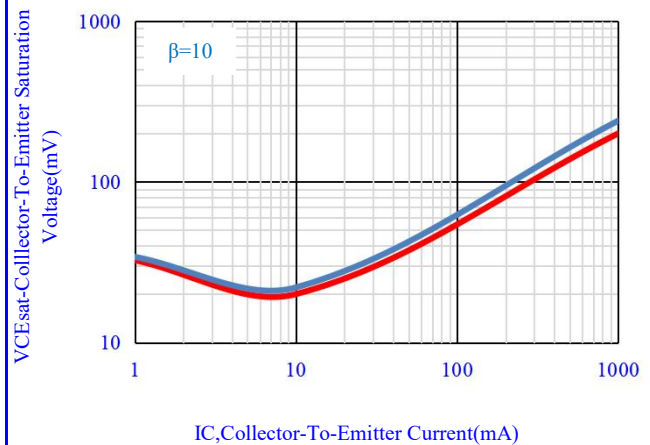


Fig.4-BASE-TO-EMITTER SATURATION VOLTAGE vs. COLLECTOR CURRENT

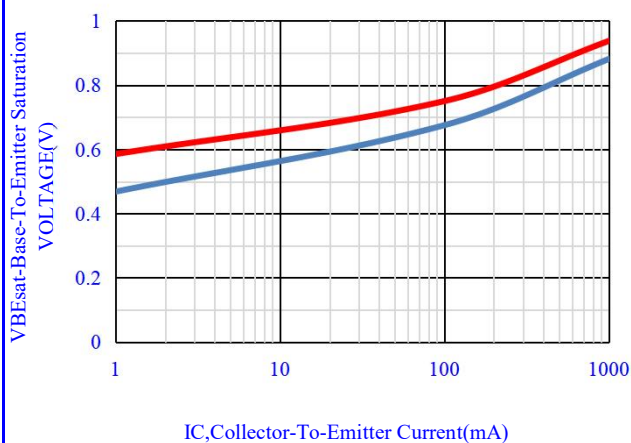


Fig.5-BASE-TO-EMITTER SATURATION VOLTAGE vs. COLLECTOR CURRENT

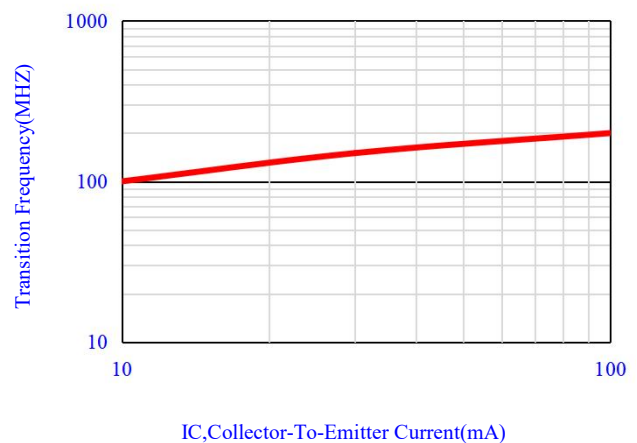


Fig.6-COLLECTOR CURRENT vs. TRANSITION FREQUENCY

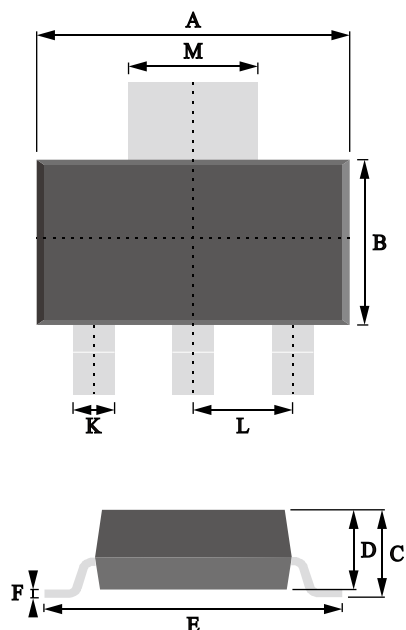
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OUTLINE DRAWINGS

SOT-223

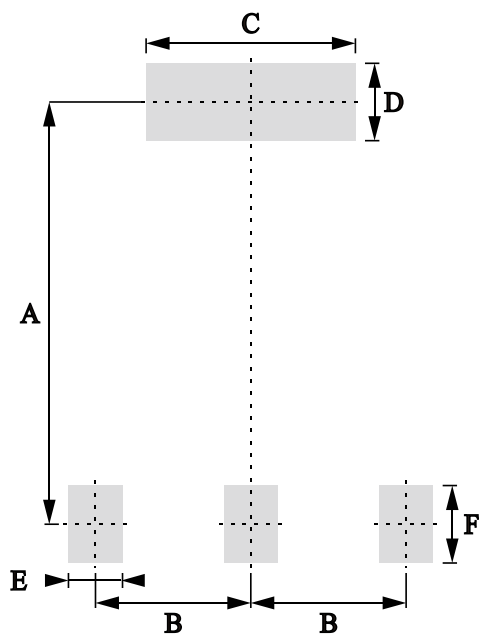


OUTLINE DIMENSIONS

Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.05	-	6.60	0.2382	-	0.2598
B	3.30	-	3.70	0.1299	-	0.1457
C	1.45	-	1.85	0.0571	-	0.0728
D	1.40	-	1.80	0.0551	-	0.0709
E	6.70	-	7.20	0.2638	-	0.2835
F	0.20	-	0.40	0.0079	-	0.0157
K	0.55	-	0.85	0.0217	-	0.0335
L	2.10	-	2.50	0.0827	-	0.0984
M	2.85	-	3.25	0.1122	-	0.1280

RECOMMENDED LAYOUT DRAWINGS

SOT-223



OUTLINE DIMENSIONS

Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	6.00	-	-	0.0000	-
B	-	2.30	-	-	0.0906	-
C	-	3.10	-	-	0.1220	-
D	-	1.10	-	-	0.0433	-
E	-	0.80	-	-	0.0315	-
F	-	1.10	-	-	0.0433	-

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MARKING INFORMATION



MARKING INSTRUCTIONS

NH=Niuhan Trademark
FF=Product Line Code,According To Actual C
YWW=Date Code,According To Actual Change
LLWWF=Inernal Code,According To Actual C
BPC5xyy=Make,xyy=410,510,610,416,516,616

PACKING INFORMATION

Package Type	Package Code	Product Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
SOT-223	P1	0.19	13" Reel	2500	5000	50000

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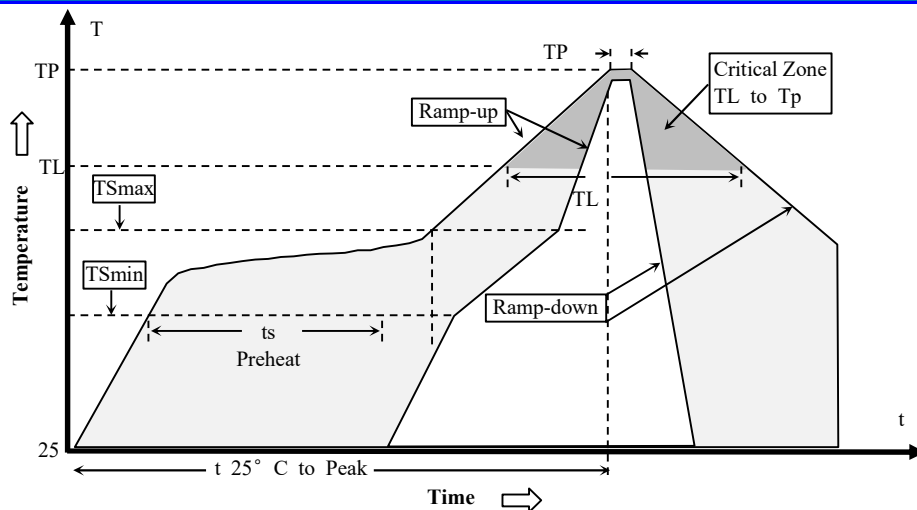
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Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat -Temperature Min(TS min) -Temperature Max(TS max) -Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (TL) - Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

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