SOT-23 Formed SMD Package

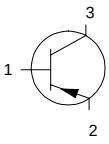
BSR20
BSR20A

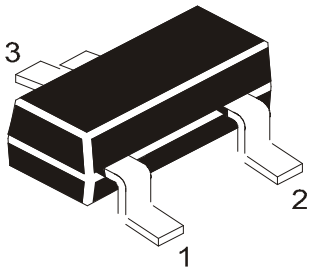
SILICON P–N–P HIGH–VOLTAGE TRANSISTORS

P–N–P high–voltage small–signal transistors

Marking
BSR20 = T35
BSR20A = T36

Pin configuration
1 = BASE
2 = EMITTER
3 = COLLECTOR





ABSOLUTE MAXIMUM RATINGS

			BSR20	***BSR20A***	
Collector–base boltage (open emitter)	$-V_{CB0}$	*max.*	*130*	*160*	*V*
Collector–emitter voltage (open base)	$-V_{CE0}$	*max.*	*120*	*150*	*V*
Collector current	$-I_C$	*max.*	*600*	*600*	*mA*
Total power dissipation up to T_{amb} = 25 °C	P_{tot}	*max.*	*250*	*250*	*mW*
Junction temperature	T_j	*max.*	*150*	*150*	*° C*
Collector–emitter saturation voltage					
I_C = 50 mA; I_B = 5 mA	V_{CEsat}	*max.*	*0,5*	*0,5*	*V*
D.C. current gain					
I_C = 10 mA; V_{CE} = –5 V	h_{FE}	*min.*	*40*	*60*	
		max.	*180*	*240*	

RATINGS *(at T_A = 25°C unless otherwise specified)*
Limiting values

			BSR20	***BSR20A***	
Collector–base voltage (open emitter)	$-V_{CBO}$	*max.*	*130*	*160*	*V*
Collector–emitter voltage (open base)	$-V_{CEO}$	*max.*	*120*	*150*	*V*
Emitter–base voltage (open collector)	$-V_{EBO}$	*max.*	*5*		*V*
Collector current	$-I_C$	*max.*	*600*		*mA*
Total power dissipation					
up to T_{amb} = 25 °C	P_{tot}	*max.*	*250*		*mW*
Junction temperature	T_j	*max.*	*150*		*° C*
Storage temperature	T_{stg}		*–55 to +150*		*° C*

THERMAL RESISTANCE

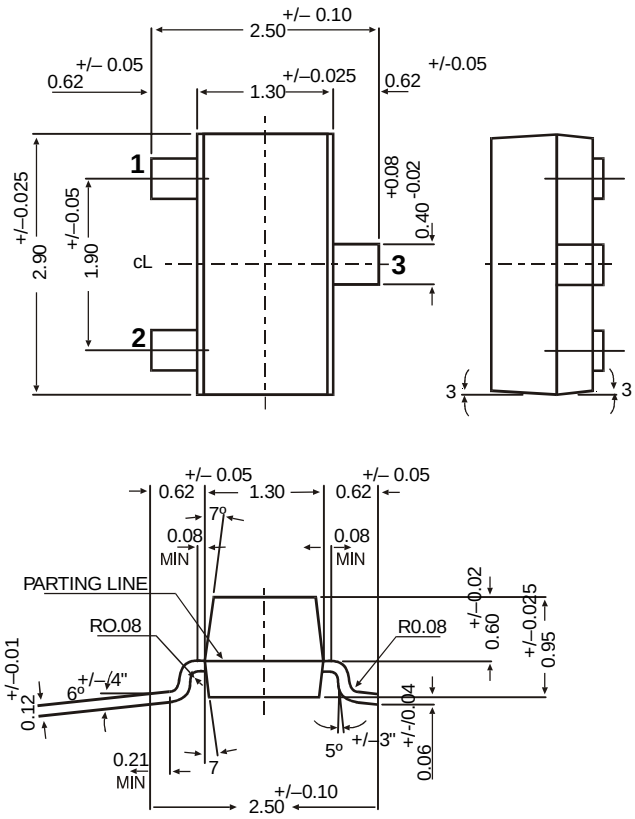
From junction to ambient	$R_{th\ j-a}$	=	*500*	K/W

CHARACTERISTICS
T_{amb} = 25 °C unless otherwise specified

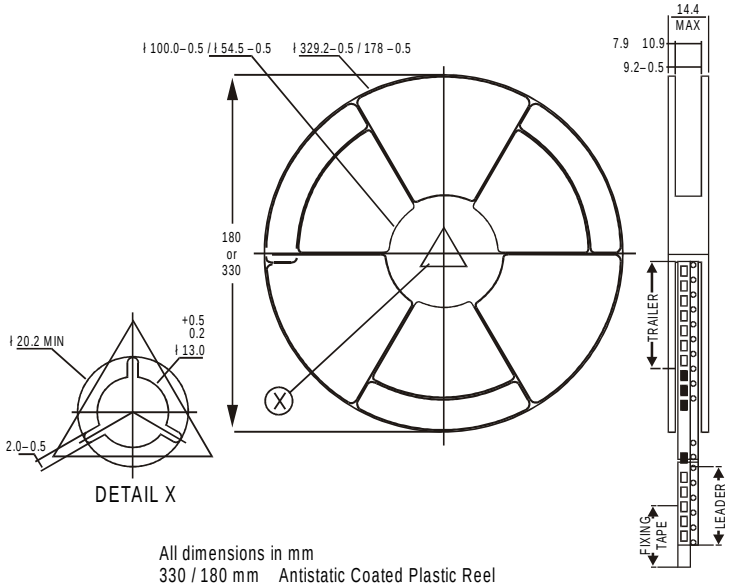
			BSR20	***BSR20A***	
Collector cut–off current					
I_E = 0; $-V_{CB}$ = 100 V	$-I_{CB0}$	*max.*	*100*		*nA*
I_E = 0; $-V_{CB}$ = 120 V	$-I_{CB0}$	*max.*		*50*	*nA*
I_E = 0; $-V_{CB}$ = 100 V; T_{amb} = 100 °C	$-I_{CB0}$	*max.*	*100*		*µA*
I_E = 0; $-V_{CB}$ = 120 V; T_{amb} = 100 °C	$-I_{CB0}$	*max.*		*50*	*µA*
Emitter cut–off current					
I_C = 0; $-V_{EB}$ = 4,0 V	$-I_{EB0}$	*max.*	*50*	*50*	*nA*
Breakdown voltages					
I_C = 1,0 mA; l_B = 0	$-V_{(BR)CE0}$	*min.*	*120*	*150*	*V*
I_C = 100 µA; I_E = 0	$-V_{(BR)CB0}$	*min.*	*130*	*160*	*V*
I_C = 0; I_E = 10µA	$-V_{(BR)EB0}$	*min.*	*5,0*	*5,0*	*V*
Saturation voltages					
$-I_C$ = 10 mA; $-I_B$ = 1,0 mA	$-V_{CEsat}$	*max.*	*0,2*	*0,2*	*V*
	$-V_{BEsat}$	*max.*	*1,0*	*1,0*	*V*
$-I_C$ = 50 mA; —l_B = 5,0 mA	$-V_{CEsat}$	*max.*	*0,5*	*0,5*	*V*
	$-V_{BEsat}$	*max.*	*1,0*	*1,0*	*V*
D.C. current gain					
I_C = 1,0 mA; $-V_{CE}$ = 5 V	h_{FE}	*min.*	*30*	*50*	
I_C = 10 mA; $-V_{CE}$ = 5 V	h_{FE}	*min.*	*40*	*60*	
		max.	*180*	*240*	
I_C = 50 mA; $-V_{CE}$ = 5 V	h_{FE}	*min.*	*40*	*50*	
Output capacitance at f = 1 MHz					
I_E = 0; $-V_{CB}$ = 10V	Co	*max.*	*6*	*6*	*pF*

			BSR20	***BSR20A***
Transition frequency at f = 100 MHz	f_T	*min.*	*100*	*100 MHz*
$-I_C$ *= 10 mA;* $-V_{CE}$ *= 10 V*		*max.*	*400*	*300 MHz*
Noise figure at R_S *= 1 kΩ*				
I_C *= 250μA;* $-V_{CE}$ *= 5 V;*				
f = 10 Hz to 15,7 kHz	*F*	*max.*	*8*	*8 dB*
Small Signal Current Gain	h_{fe}	*min.*	*30*	*40*
$-V_{CE}$ *= 10V;* $-I_C$ *= 1 mA; f = 1 KHz*		*max.*	*200*	*200*

SOT-23 Formed SMD Package



SOT-23 Package Reel Information
Reel specifications for Packing (13"/7" reels)

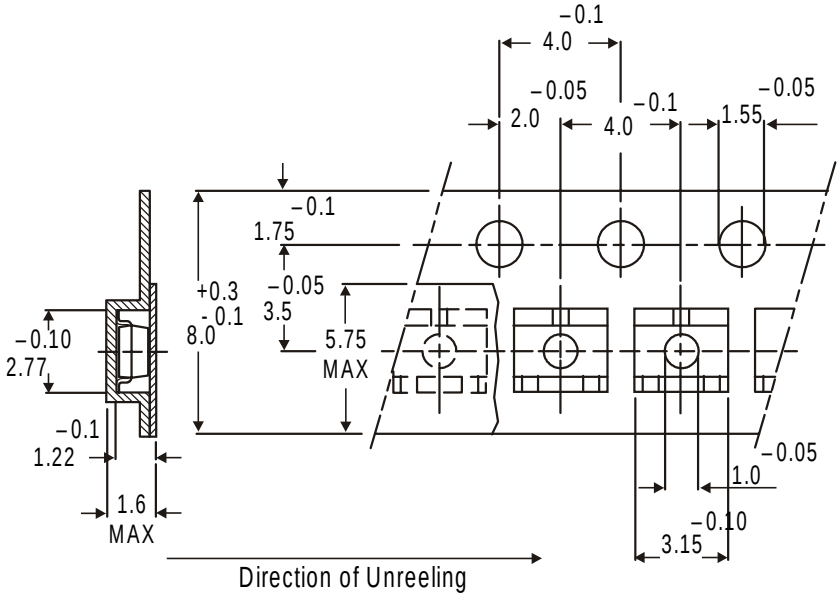


All dimensions in mm
330 / 180 mm Antistatic Coated Plastic Reel

NOTES:	8mm Tape Size of Reel 330 mm (13")	8mm Tape Size of Reel 180 mm (7")
No. of Devices	10,000 Pcs	3,000 Pcs

1. The bandolier of 330 mm reel contains at least 10,000 devices.
2. The bandolier of 180 mm reel contains at least 3,000 devices.
3. No more than 0.5% missing devices / reel. 50 empty compartments for 330 mm reel. 15 empty compartments for 180 mm reel.
4. Three consecutive empty places might be found provided this gap is followed by 6 consecutive devices.
5. The carrier tape (leader) starts with at least 75 empty positions (equivalent to 330 mm). In order to fix the carrier tape a self adhesive tape of 20 to 50 mm is applied. At the end of the bandolier at least 40 empty positions (equivalent to 160 mm) are there.

Tape Specification for SOT-23 Surface Mount Device



All dimensions in mm

Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
SOT-23 T&R	3K/reel	136 gm/3K pcs	3" x 7.5" x 7.5"	12.0K	17" x 15" x 13.5"	192.0K	12 kgs
			9" x 9" x 9"	51.0K	19" x 19" x 19"	408.0K	28 kgs
	10K/reel	415 gm/10K pcs	13" x 13" x 0.5"	10.0K	17" x 15" x 13.5"	300.0K	16 kgs

Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

CDIL is a registered Trademark of
Continental Device India Limited
C-120 Naraina Industrial Area, New Delhi 110 028, India.
Telephone + 91-11-2579 6150, 4141 1112 Fax + 91-11-2579 5290, 4141 1119
email@cdil.com www.cdilsemi.com