

SOT-23 Formed SMD Package

**BSR13
BSR14**

SILICON PLANAR EPITAXIAL TRANSISTORS

N-P-N silicon transistors

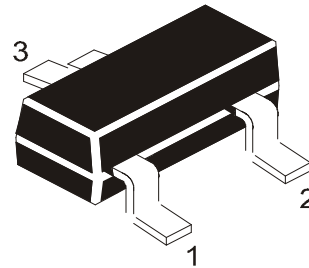
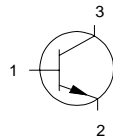
Marking

BSR13 = U7

BSR14 = U8

Pin configuration

- 1 = BASE
- 2 = EMITTER
- 3 = COLLECTOR



ABSOLUTE MAXIMUM RATINGS

Collector-base voltage (open emitter)
 Collector-emitter voltage (open base)
 Emitter-base voltage (open collector)
 Collector current (d.c.)
 Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$
 Junction temperature
 D.C. current gain
 $I_C = 150\text{ mA}; V_{CE} = 10\text{ V}$
 $I_C = 500\text{ mA}; V_{CE} = 10\text{ V}$
 Transition frequency at $f = 100\text{ MHz}$
 $I_C = 20\text{ mA}; V_{CE} = 20\text{ V}$

	BSR13	BSR14
V_{CB0} max.	60	75 V
V_{CE0} max.	30	40 V
V_{EB0} max.	5	6 V
I_C max.	800	mA
P_{tot} max.	250	mW
T_j max.	150	$^{\circ}\text{C}$
h_{FE}	100 to 300	
$h_{FE} >$	30	40
$f_T >$	250	300 MHz

BSR13
BSR14

RATINGS (at $T_A = 25^\circ\text{C}$ unless otherwise specified)

Limiting values

		BSR13	BSR14	
Collector-base voltage (open emitter)	V_{CB0}	max. 60	75	V
Collector-emitter voltage (open base)	V_{CE0}	max. 30	40	V
Emitter-base voltage (open collector)	V_{EB0}	max. 5	6	V
Collector current (d.c.)	I_C	max. 800		mA
Total power dissipation up to $T_{amb} = 25^\circ\text{C}$	P_{tot}	max. 250		mW
Storage temperature	T_{stg}	-55 to +150		$^\circ\text{C}$
Junction temperature	T_j	max. 150		$^\circ\text{C}$

THERMAL RESISTANCE

From junction to ambient

$R_{th\ j-a} =$	500	K/W
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CHARACTERISTICS

$T_j = 25^\circ\text{C}$ unless otherwise specified

Collector cut-off current

$I_E = 0; V_{CB} = 50\text{ V}$

$I_E = 0; V_{CB} = 60\text{ V}$

$I_E = 0; V_{CB} = 50\text{ V}; T_j = 150^\circ\text{C}$

$I_E = 0; V_{CB} = 60\text{ V}; T_j = 150^\circ\text{C}$

$V_{EB} = 3\text{ V}; V_{CE} = 60\text{ V}$

		BSR13	BSR14	
$I_{CB0} <$	30	-	nA	
$I_{CB0} <$	-	10	nA	
$I_{CB0} <$	10	-	μA	
$I_{CB0} <$	-	10	μA	
$I_{CEX} <$	-	10	nA	

Base current

with reverse biased emitter junction

$V_{EB} = 3\text{ V}; V_{CE} = 60\text{ V}$

$I_{BEX} <$	-	20	nA
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Emitter cut-off current

$I_C = 0; V_{EB} = 3\text{ V}$

$I_{EB0} <$	30	15	nA
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Saturation voltages

$I_C = 150\text{ mA}; I_B = 15\text{ mA}$

$V_{CEsat} <$	400	300	mV
$V_{BEsat} <$	1.3	-	V
V_{BEsat}	-	0,6 to 1,2	V

$I_C = 500\text{ mA}; I_B = 50\text{ mA}$

$V_{CEsat} <$	1.6	1.0	V
$V_{BEsat} <$	2.6	2.0	V

D.C. current gain

$I_C = 0,1\text{ mA}; V_{CE} = 10\text{ V}$

$I_C = 1\text{ mA}; V_{CE} = 10\text{ V}$

$I_C = 10\text{ mA}; V_{CE} = 10\text{ V}$

$I_C = 150\text{ mA}; V_{CE} = 10\text{ V}$

$I_C = 150\text{ mA}; V_{CE} = 1\text{ V}$

$I_C = 500\text{ mA}; V_{CE} = 10\text{ V}$ BSR13; R

$I_C = 500\text{ mA}; V_{CE} = 10\text{ V}$ BSR14; R

$h_{FE} >$	35
$h_{FE} >$	50
$h_{FE} >$	75
h_{FE}	100 to 300
$h_{FE} >$	50
$h_{FE} >$	30
$h_{FE} >$	40

Transition frequency at $f = 100\text{ MHz}$

$I_C = 20\text{ mA}; V_{CE} = 20\text{ V}$ BSR13; R

$I_C = 20\text{ mA}; V_{CE} = 20\text{ V}$ BSR14; R

$f_T >$	250	MHz
$f_T >$	300	MHz

Collector capacitance at $f = 1\text{ MHz}$

$I_E = I_e = 0; V_{CB} = 10\text{ V}$

$C_c <$	8	pF
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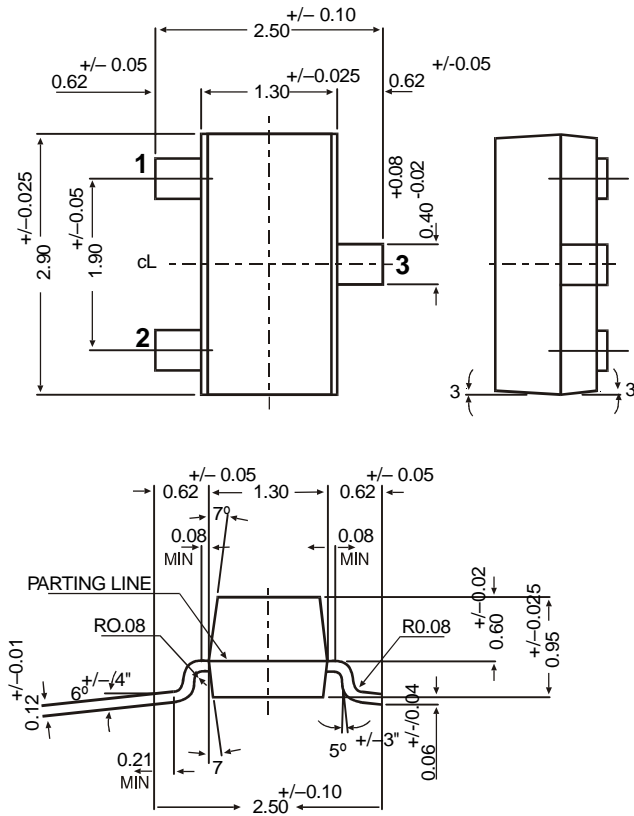
Small signal current gain

$I_C = 1\text{ mA}; V_{CE} = 10\text{ V}; f = 1\text{ KHz};$ BSR14

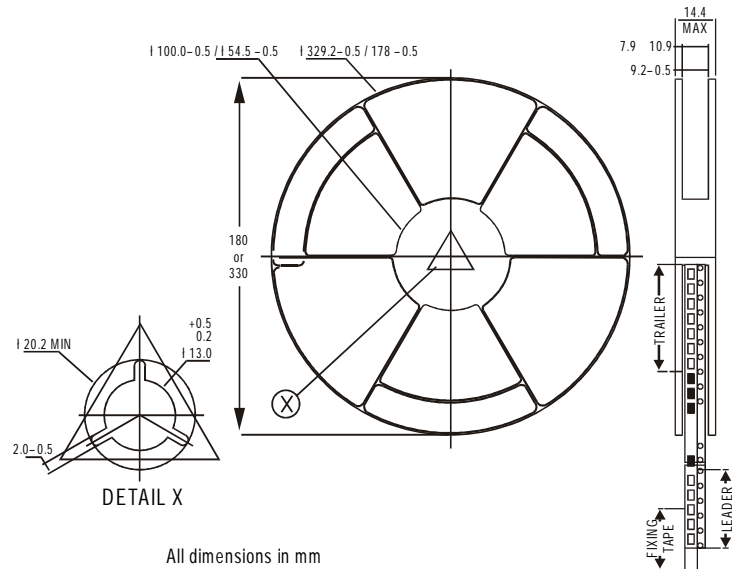
$I_C = 10\text{ mA}; V_{CE} = 10\text{ V}; f = 1\text{ KHz};$ BSR13

h_{fe}	50 to 300
h_{fe}	75 to 375

SOT-23 Formed SMD Package



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

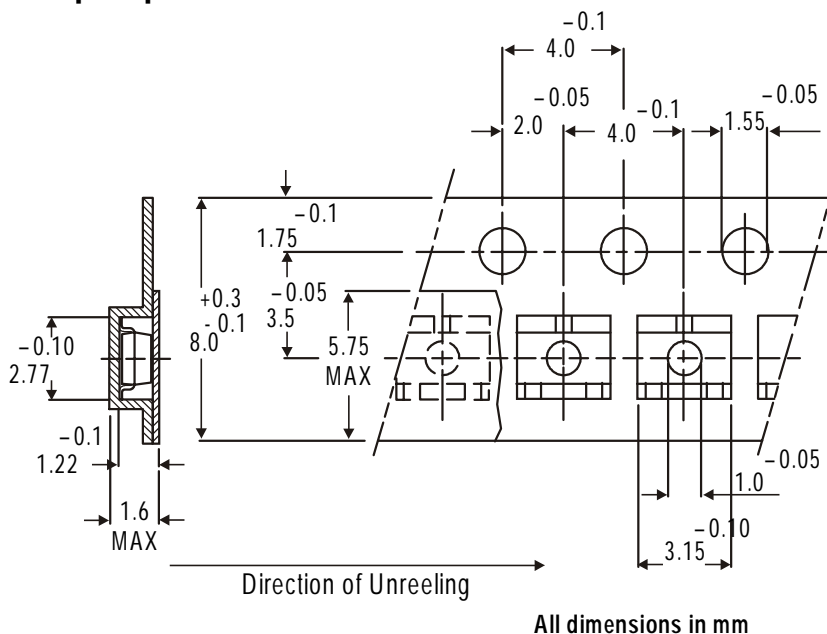


NOTES:

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



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

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Discrete Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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