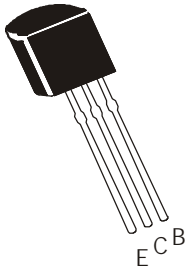


PNP EPITAXIAL PLANAR SILICON TRANSISTOR

**CSB1116
 CSB1116A
 TO-92
 BCE**



**Audio Frequency Power Amplifier And Medium Speed Switching
 Complementary CSD1616/1616A**

ABSOLUTE MAXIMUM RATINGS(Ta=25 deg C)

| DESCRIPTION | SYMBOL | CSB1116 | CSB1116A | UNIT |
|--|----------|------------|----------|-------|
| Collector -Base Voltage | VCBO | 60 | 80 | V |
| Collector -Emitter Voltage | VCEO | 50 | 60 | V |
| Emitter Base Voltage | VEBO | | 6 | V |
| Collector Current DC | IC | | 1 | A |
| Collector Current Pulse | IC* | | 2 | A |
| Collector Dissipation | PC | | 0.75 | W |
| Operating And Storage Junction Temperature Range | Tj, Tstg | 55 to +150 | | deg C |

*PW=10ms, duty Cycle=50%

ELECTRICAL CHARACTERISTICS (Ta=25 deg C Unless Specified)

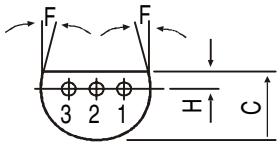
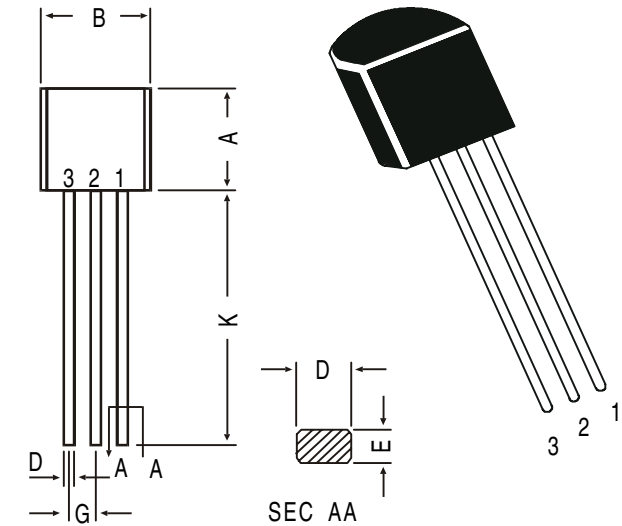
| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | TYP | MAX | UNIT |
|--------------------------------------|------------|-------------------------|----------|------|------|------|
| Collector Cut off Current | ICBO | VCB=60V, IE=0 | - | - | 100 | nA |
| Emitter Cut off Current | IEBO | VEB=6V, IC=0 | - | - | 100 | nA |
| DC Current Gain | hFE(1) * | IC=100mA, VCE=2V | CSB1116 | 135 | | 600 |
| | | | CSB1116A | 135 | | 400 |
| | hFE(2) * | IC=1A, VCE=2V | 81 | - | - | |
| Base Emitter On Voltage | VBE(on)* | VCE=2V, IC=50mA | 0.60 | - | 0.70 | V |
| Collector Emitter Saturation Voltage | VCE(Sat) * | IC=1A, IB=50mA | - | - | 0.35 | V |
| Base Emitter Saturation Voltage | VBE(Sat) * | IC=1A, IB=50mA | - | - | 1.2 | V |
| Dynamic Characteristics | | | | | | |
| Transition Frequency | ft | VCE=2V, IC=100mA, | 70 | - | - | MHz |
| Collector Output Capacitance | Cob | VCB=10V, IE=0 f=1MHz | - | 25 | - | pF |
| SWITCHING TIMES | | | | | | |
| Turn on time | ton | VCC=10V, IC=100mA | - | 0.07 | - | us |
| Storage time | tstg | IB1=IB2=10mA, | - | 0.7 | - | us |
| Fall time | tf | VBE(off)2=3V | - | 0.07 | - | us |

hFE(1) CLASSIFICATION CSB1116 Y: 135-270 G: 200-400 L: 300-600

*Pulse Test : PW=350us, Duty Cycle=2% Pulsed

TO-92 Plastic Package

TO-92 Transistors on Tape and Ammo Pack



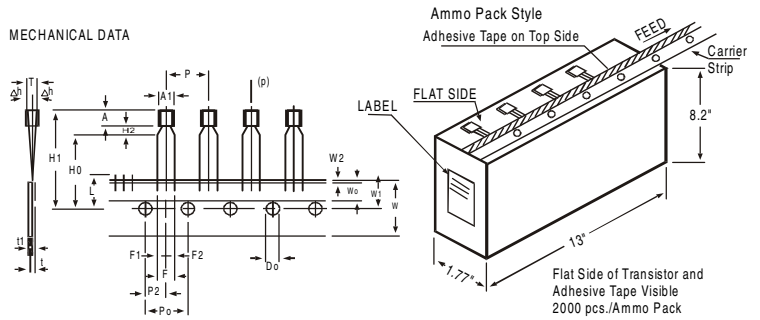
PIN CONFIGURATION

1. BASE
2. COLLECTOR
3. EMITTER

All dimensions in mm.

| DIM | MIN. | MAX. |
|-----|-------|------|
| A | 4.32 | 5.33 |
| B | 4.45 | 5.20 |
| C | 3.18 | 4.19 |
| D | 0.41 | 0.55 |
| E | 0.35 | 0.50 |
| F | 5 DEG | |
| G | 1.14 | 1.40 |
| H | 1.14 | 1.53 |
| K | 12.70 | — |

MECHANICAL DATA



All dimensions in mm unless specified otherwise

| ITEM | SYMBOL | SPECIFICATION | | | | REMARKS |
|--------------------------------------|------------|---------------|-------|------|--------------|--|
| | | MIN. | NOM. | MAX. | TOL. | |
| BODY WIDTH | A1 | 4.0 | | 4.8 | | |
| BODY HEIGHT | A | 4.8 | | 5.2 | | |
| BODY THICKNESS | T | 3.9 | | 4.2 | | |
| PITCH OF COMPONENT | P | | 12.7 | | ±1 | |
| FEED HOLE PITCH | Po | | 12.7 | | ±0.3 | CUMULATIVE PITCH ERROR 1.0 mm/20 PITCH |
| FEED HOLE CENTRE TO COMPONENT CENTRE | P2 | | 6.35 | | ±0.4 | TO BE MEASURED AT BOTTOM OF CLINCH |
| DISTANCE BETWEEN OUTER LEADS | F | | 5.08 | | +0.6 -0.2 | |
| COMPONENT ALIGNMENT | Δh | | 0 | 1 | | AT TOP OF BODY |
| TAPE WIDTH | W | | 18 | | ±0.5 | |
| HOLD-DOWN TAPE WIDTH | W0 | | 6 | | ±0.2 | |
| HOLE POSITION | W1 | | 9 | | +0.7 -0.5 | |
| HOLD-DOWN TAPE POSITION | W2 | | 0.5 | | ±0.2 | |
| LEAD WIRE CLINCH HEIGHT | Ho | | 16 | | ±0.5 | |
| COMPONENT HEIGHT | H1 | | 23.25 | | | |
| LENGTH OF SNIPPED LEADS | L | | 11.0 | | | |
| FEED HOLE DIAMETER | Do | | 4 | | ±0.2 | |
| TOTAL TAPE THICKNESS | t | | 1.2 | | | t1 0.3 - 0.6 |
| LEAD - TO - LEAD DISTANCE F1, | F2 | | 2.54 | | +0.4 -0.1 | |
| CLINCH HEIGHT | H2 | | | 3 | | |
| PULL - OUT FORCE | (P) | 6N | | | | |

NOTES

1. MAXIMUM ALIGNMENT DEVIATION BETWEEN LEADS NOT TO BE GREATER THAN 0.2 mm.
2. MAXIMUM NON-CUMULATIVE VARIATION BETWEEN TAPE FEED HOLES SHALL NOT EXCEED 1 mm IN 20 PITCHES.
3. HOLDDOWN TAPE NOT TO EXCEED BEYOND THE EDGE(S) OF CARRIER TAPE AND THERE SHALL BE NO EXPOSURE OF ADHESIVE.
4. NO MORE THAN 3 CONSECUTIVE MISSING COMPONENTS ARE PERMITTED.
5. A TAPE TRAILER, HAVING AT LEAST THREE FEED HOLES ARE REQUIRED AFTER THE LAST COMPONENT.
6. SPLICES SHALL NOT INTERFERE WITH THE SPROCKET FEED HOLES.

Packing Detail

| PACKAGE | STANDARD PACK | | INNER CARTON BOX | | OUTER CARTON BOX | | |
|------------|---------------|----------------|-------------------|------|-------------------|-------|----------|
| | Details | Net Weight/Qty | Size | Qty | Size | Qty | Gr Wt |
| TO-92 Bulk | 1K/polybag | 200 gm/1K pcs | 3" x 7.5" x 7.5" | 5.0K | 17" x 15" x 13.5" | 80.0K | 23 kgs |
| TO-92 T&A | 2K/ammo box | 645 gm/2K pcs | 12.5" x 8" x 1.8" | 2.0K | 17" x 15" x 13.5" | 32.0K | 12.5 kgs |

Customer Notes

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Discrete 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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