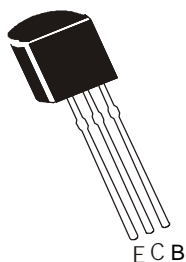


**NPN SILICON EPITAXIAL TRANSISTOR**

**CSD1616  
 TO-92  
 BCE**



**Audio Frequency Power Amplifier And Medium Speed Switching  
 Complementary CSB1116/1116A**

**ABSOLUTE MAXIMUM RATINGS(Ta=25deg C)**

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector -Base Voltage	VCBO	60	V
Collector -Emitter Voltage	VCEO	50	V
Emitter Base Voltage	VEBO	6.0	V
Collector Current (DC)	IC	1.0	A
Collector Current (Pulse)	IC*	2.0	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	135	-	600	
	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	-	-	0.30	V
Base Emitter Saturation Voltage	VBE(Sat)*	IC=1A, IB=50mA	-	-	1.2	V
<b>Dynamic Characteristics</b>						
Transition Frequency	ft	VCE=2V, IC=100mA,	100	-	-	MHz
Collector Output Capacitance	Cob	VCB=10V, IE=0 f=1MHz	-	19	-	pF

**SWITCHING TIMES**

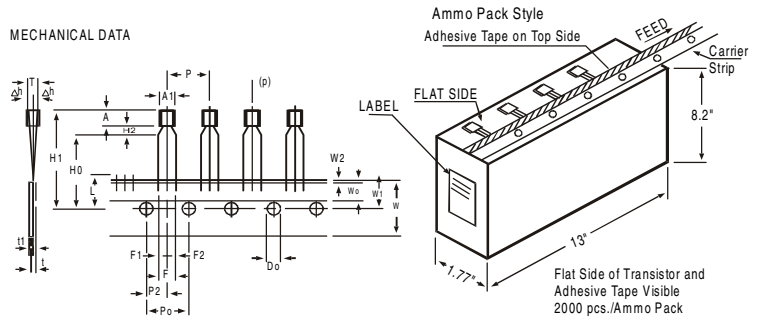
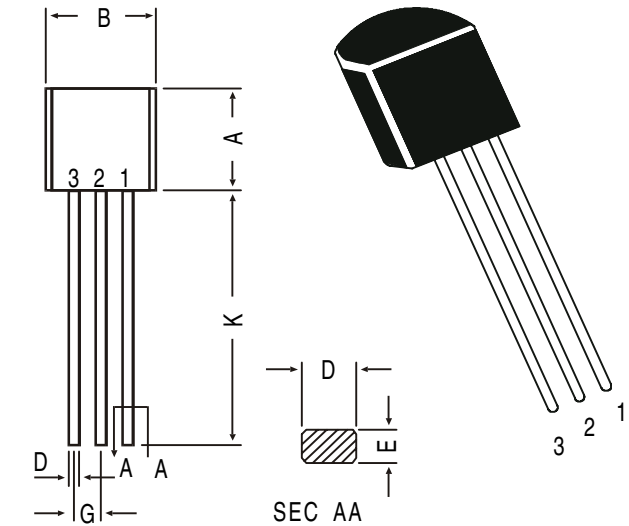
Turn on time	ton	VCC=10V, IC=100mA	-	0.07	-	us
Storage time	tstg	IB1=IB2=10mA,	-	0.95	-	us
Fall time	tf	VBE(off)2=3V	-	0.07	-	us

**hFE(1) \* CLASSIFICATION 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

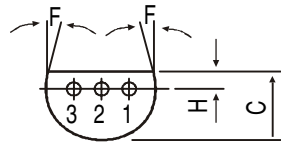


All dimensions in mm unless specified otherwise

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	P <sub>0</sub>		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	W <sub>0</sub>		6		±0.2	
HOLE POSITION	W <sub>1</sub>		9		+0.7 -0.5	
HOLD-DOWN TAPE POSITION	W <sub>2</sub>		0.5		±0.2	
LEAD WIRE CLINCH HEIGHT	H <sub>0</sub>		16		±0.5	
COMPONENT HEIGHT	H <sub>1</sub>		23.25			
LENGTH OF SNIPPED LEADS	L		11.0			
FEED HOLE DIAMETER	D <sub>0</sub>		4		±0.2	
TOTAL TAPE THICKNESS	t		1.2			t1 0.3 - 0.6
LEAD - TO - LEAD DISTANCE F1,	F <sub>2</sub>		2.54		+0.4 -0.1	
CLINCH HEIGHT	H <sub>2</sub>		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.



**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	—

### 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

### Disclaimer

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