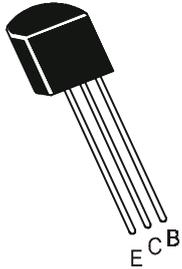


**NPN SILICON EPITAXIAL TRANSISTORS**

**CSC1213  
CSC1213A**



**TO-92  
Plastic Package**

**Low Frequency Amplifier.**

**ABSOLUTE MAXIMUM RATINGS (Ta=25°C unless specified otherwise)**

| DESCRIPTION                                      | SYMBOL         | CSC1213     | CSC1213A | UNIT |
|--|----------------|-------------|----------|------|
| Collector Emitter Voltage                        | $V_{CEO}$      | 35          | 50       | V    |
| Collector Base Voltage                           | $V_{CBO}$      | 35          | 50       | V    |
| Emitter Base Voltage                             | $V_{EBO}$      |             | 6        | V    |
| Collector Current                                | $I_C$          | 500         |          | mA   |
| Collector Power Dissipation                      | $P_C$          | 400         |          | mW   |
| Operating And Storage Junction Temperature Range | $T_j, T_{stg}$ | -55 to +150 |          | °C   |

**ELECTRICAL CHARACTERISTICS (Ta=25°C unless specified otherwise)**

| DESCRIPTION                          | SYMBOL                                   | MIN     | TYP  | MAX | UNIT |
|--------------------------------------|--|---------|------|-----|------|
| Collector Base Voltage               | $V_{CBO}$ $I_C=10\mu A, I_E=0$           |         |      |     |      |
|                                      |  | CSC1213 | 35   |     | V    |
| CSC1213A                             |  | 50      |      | V   |      |
| Collector Emitter Voltage            | $V_{CEO}$ $I_C=1mA, I_B=0$               |         |      |     |      |
|                                      |  | CSC1213 | 35   |     | V    |
| CSC1213A                             |  | 50      |      | V   |      |
| Emitter Base Voltage                 | $V_{EBO}$ $I_E=10\mu A, I_C=0$           | 4.0     |      |     | V    |
| Collector Cut off Current            | $I_{CBO}$ $V_{CB}=20V, I_E=0$            |         |      | 500 | nA   |
| DC Current Gain                      | $h_{FE}^*$ $V_{CE}=3V, I_C=10mA$         | 60      |      | 320 |      |
|                                      | $h_{FE}^{**}$ $V_{CE}=3V, I_C=500mA$     | 10      |      |     |      |
| Collector Emitter Saturation Voltage | $V_{CE(sat)}^{**}$ $I_C=150mA, I_B=15mA$ |         |      | 0.6 | V    |
| Base Emitter on Voltage              | $V_{BE(on)}$ $I_C=10mA, V_{CE}=3V$       |         | 0.64 |     | V    |

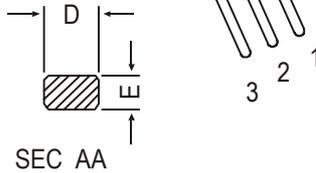
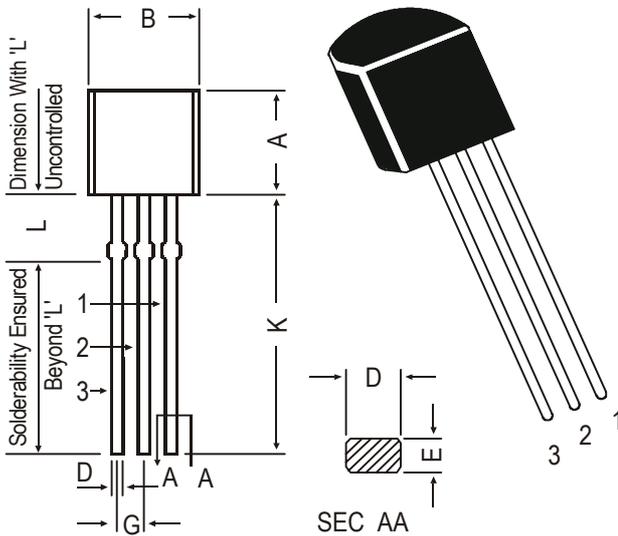
**\* hFE CLASSIFICATION**

| CSC1213 & CSC1213A | B      | C       | D       |
|--------------------|--------|---------|---------|
|                    | 60-120 | 100-200 | 160-320 |

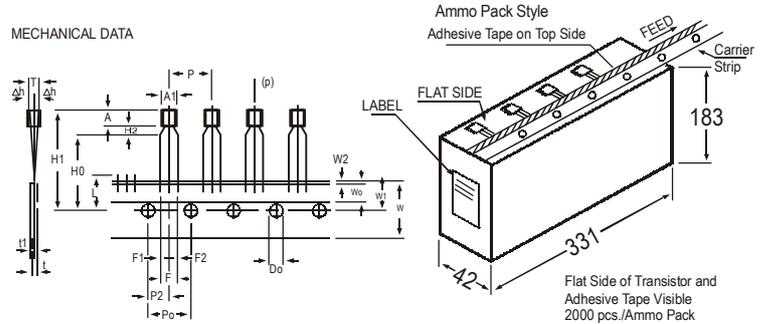
**\*\* Pulse Test**

TO-92 Plastic Package

TO-92 Transistors on Tape and Ammo Pack



MECHANICAL DATA



All dimensions in mm unless specified otherwise

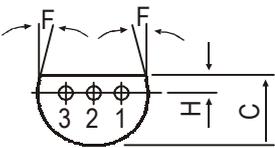
| ITEM                                 | SYMBOL | SPECIFICATION |      |       |              | REMARKS                            |
|--------------------------------------|--------|---------------|------|-------|--------------|------------------------------------|
|                                      |        | 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         |                                    |
| 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<br>-0.2 |                                    |
| COMPONENT ALIGNMENT                  | Δh     |               | 0    | 1     |              | AT TOP OF BODY                     |
| TAPE WIDTH                           | W      |               | 18   |       | ±0.5         |                                    |
| HOLD-DOWN TAPE WIDTH                 | Wo     |               | 6    |       | ±0.2         |                                    |
| HOLE POSITION                        | W1     |               | 9    |       | +0.7<br>-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<br>-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.

| 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 | —     |
| L   | 1.982 | 2.082 |

All dimensions in mm.



PIN CONFIGURATION

1. BASE
2. COLLECTOR
3. EMITTER

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"  | 5K  | 17" x 15" x 13.5" | 80K | 23 kgs   |
| TO-92 T&A  | 2K/ammo box   | 645 gm/2K pcs  | 12.5" x 8" x 1.8" | 2K  | 17" x 15" x 13.5" | 32K | 12.5 kgs |

### **Disclaimer**

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