

# Central<sup>TM</sup> Semiconductor Corp.

145 Adams Ave., Hauppauge, NY 11788 USA  
Phone (631) 435-1110 FAX (631) 435-1824

Manufacturers of World Class Discrete Semiconductors  
www.centralsemi.com

CM5943

NPN SILICON  
HIGH FREQUENCY TRANSISTOR

JEDEC TO-39 CASE

## DESCRIPTION

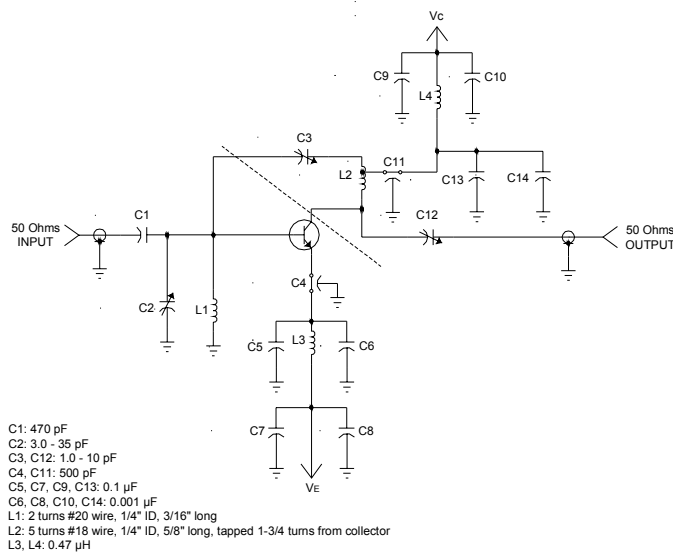
The CENTRAL SEMICONDUCTOR CM5943 is a Silicon NPN RF Transistor, mounted in a hermetically sealed package, designed for high frequency amplifier and non-saturated switching applications. This device is a replacement for the 2N5943.

## MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

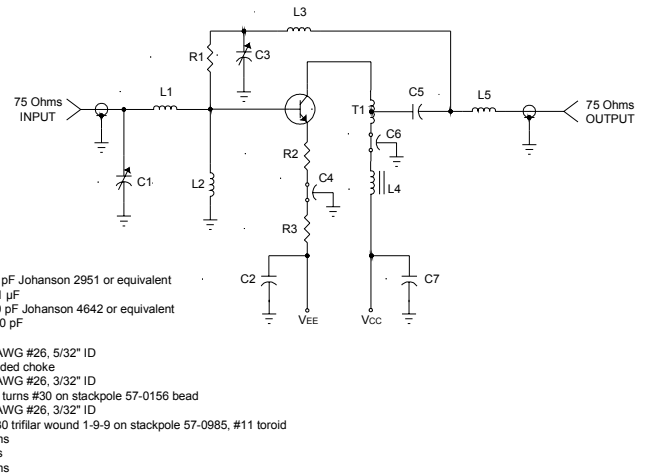
|                                               | SYMBOL                            |             | UNITS |
|-----------------------------------------------|-----------------------------------|-------------|-------|
| Collector-Base Voltage                        | V <sub>CB0</sub>                  | 40          | V     |
| Collector-Emitter Voltage                     | V <sub>CEO</sub>                  | 30          | V     |
| Emitter-Base Voltage                          | V <sub>EBO</sub>                  | 3.5         | V     |
| Collector Current                             | I <sub>C</sub>                    | 400         | mA    |
| Power Dissipation                             | P <sub>D</sub>                    | 1.0         | W     |
| Power Dissipation (T <sub>C</sub> =25°C)      | P <sub>D</sub>                    | 3.5         | W     |
| Operating and Storage<br>Junction Temperature | T <sub>J</sub> , T <sub>stg</sub> | -65 to +200 | °C    |
| Thermal Resistance                            | θ <sub>JA</sub>                   | 175         | °C/W  |
| Thermal Resistance                            | θ <sub>JC</sub>                   | 50          | °C/W  |

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

| SYMBOL               | TEST CONDITIONS                                                 | MIN  | TYP  | MAX  | UNITS |
|----------------------|-----------------------------------------------------------------|------|------|------|-------|
| I <sub>CB0</sub>     | V <sub>CB</sub> =15V                                            |      |      | 10   | μA    |
| I <sub>CEO</sub>     | V <sub>CE</sub> =20V                                            |      |      | 50   | μA    |
| BV <sub>CB0</sub>    | I <sub>C</sub> =100μA                                           | 40   |      |      | V     |
| BV <sub>CEO</sub>    | I <sub>C</sub> =5.0mA                                           | 30   |      |      | V     |
| BV <sub>EBO</sub>    | I <sub>E</sub> =100μA                                           | 3.5  |      |      | V     |
| V <sub>CE(SAT)</sub> | I <sub>C</sub> =100mA, I <sub>B</sub> =10mA                     |      |      | 0.2  | V     |
| V <sub>BE(SAT)</sub> | I <sub>C</sub> =100mA, I <sub>B</sub> =10mA                     |      |      | 1.0  | V     |
| h <sub>FE</sub>      | V <sub>CE</sub> =15V, I <sub>C</sub> =50mA                      | 25   |      | 300  |       |
| f <sub>T</sub>       | V <sub>CE</sub> =15V, I <sub>C</sub> =25mA, f=200MHz            | 1000 |      |      | MHz   |
| f <sub>T</sub>       | V <sub>CE</sub> =15V, I <sub>C</sub> =50mA, f=200MHz            | 1200 |      | 2400 | MHz   |
| f <sub>T</sub>       | V <sub>CE</sub> =15V, I <sub>C</sub> =100mA, f=200MHz           | 1000 |      |      | MHz   |
| C <sub>cb</sub>      | V <sub>CB</sub> =30V, I <sub>E</sub> =0, f=100kHz               | 1.0  |      | 2.5  | pF    |
| C <sub>eb</sub>      | V <sub>EB</sub> =0.5V, I <sub>C</sub> =0, f=100kHz              |      |      | 15   | pF    |
| h <sub>fe</sub>      | V <sub>CE</sub> =15V, I <sub>C</sub> =50mA, f=1.0kHz            | 25   |      | 350  |       |
| rb'C <sub>C</sub>    | V <sub>CB</sub> =15V, I <sub>E</sub> =50mA, f=31.8MHz           | 2.0  |      | 20   | ps    |
| NF                   | V <sub>CE</sub> =15V, I <sub>C</sub> =30mA, f=200MHz (Figure 1) |      | 3.4  |      | dB    |
| NF                   | V <sub>CE</sub> =15V, I <sub>C</sub> =35mA, f=200MHz (Figure 2) |      |      | 8.0  | dB    |
| G <sub>pe</sub>      | V <sub>CE</sub> =15V, I <sub>C</sub> =10mA, f=200MHz (Figure 1) |      | 11.4 |      | dB    |
| G <sub>pe</sub>      | V <sub>CE</sub> =15V, I <sub>C</sub> =50mA, f=250MHz (Figure 2) | 7.0  |      |      | dB    |

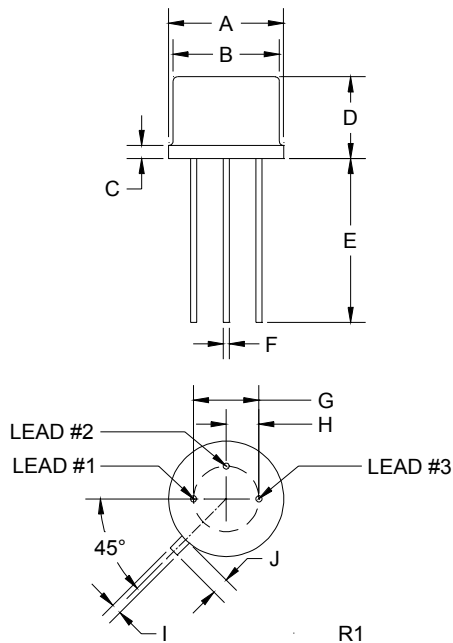


**Figure 1.**  
Narrow-Band Test Circuit



**Figure 2.**  
Broad-Band Test Circuit

## TO-39 PACKAGE - MECHANICAL OUTLINE



| SYMBOL  | DIMENSIONS |       |             |      |
|---------|------------|-------|-------------|------|
|         | INCHES     |       | MILLIMETERS |      |
|         | MIN        | MAX   | MIN         | MAX  |
| A (DIA) | 0.335      | 0.370 | 8.51        | 9.40 |
| B (DIA) | 0.315      | 0.335 | 8.00        | 8.51 |
| C       | -          | 0.040 | -           | 1.02 |
| D       | 0.240      | 0.260 | 6.10        | 6.60 |
| E       | 0.500      | -     | 12.70       | -    |
| F (DIA) | 0.016      | 0.021 | 0.41        | 0.53 |
| G (DIA) | 0.200      |       | 5.08        |      |
| H       | 0.100      |       | 2.54        |      |
| I       | 0.028      | 0.034 | 0.71        | 0.86 |
| J       | 0.029      | 0.045 | 0.74        | 1.14 |

TO-39 (REV: R1)

### LEAD CODE:

- 1) Emitter
- 2) Base
- 3) Collector

R0 (1- October 2001)

**Central**  
Semiconductor Corp.

145 Adams Ave., Hauppauge, NY 11788 USA  
 Phone (631) 435-1110 FAX (631) 435-1824

Manufacturers of World Class Discrete Semiconductors  
[www.centralsemi.com](http://www.centralsemi.com)