

**2N5086****2N5087****2N5088****2N5089**

PNP . NPN SILICON AF LOW NOISE SMALL SIGNAL TRANSISTORS

THE 2N5086, 2N5087 (PNP) AND 2N5088, 2N5089 (NPN) ARE SILICON PLANAR EPITAXIAL TRANSISTORS FOR USE IN AF LOW NOISE PREAMPLIFIER CIRCUITS.

CASE TO-92A



EBC

**ABSOLUTE MAXIMUM RATINGS** For p-n-p devices, voltage and current values are negative.

|                                                 |                                   | (PNP)<br>2N5086            | (PNP)<br>2N5087 | (NPN)<br>2N5088 | (NPN)<br>2N5089 |
|-------------------------------------------------|-----------------------------------|----------------------------|-----------------|-----------------|-----------------|
| Collector-Base Voltage                          | V <sub>CB0</sub>                  | 50V                        | 50V             | 35V             | 30V             |
| Collector-Emitter Voltage                       | V <sub>CEO</sub>                  | 50V                        | 50V             | 30V             | 25V             |
| Emitter-Base Voltage                            | V <sub>EB0</sub>                  | 3V                         | 3V              | 4.5V            | 4.5V            |
| Collector Current                               | I <sub>C</sub>                    | 50mA                       |                 |                 |                 |
| Total Power Dissipation (T <sub>A</sub> ≤ 25°C) | P <sub>tot</sub>                  | 350mW                      |                 |                 |                 |
|                                                 |                                   | derate 2.8mW/°C above 25°C |                 |                 |                 |
| Operating Junction & Storage Temperature        | T <sub>j</sub> , T <sub>stg</sub> | -55 to 150°C               |                 |                 |                 |

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

| PARAMETER                            | SYMBOL               | MIN  | TYP | MAX | UNIT | TEST CONDITIONS                                     |
|--------------------------------------|----------------------|------|-----|-----|------|-----------------------------------------------------|
| Collector-Base Breakdown Voltage     | BV <sub>CB0</sub>    |      |     |     |      | I <sub>C</sub> = 0.1mA I <sub>E</sub> = 0           |
| 2N5086,7                             |                      | 50   |     |     | V    |                                                     |
| 2N5088                               |                      | 35   |     |     | V    |                                                     |
| 2N5089                               |                      | 30   |     |     | V    |                                                     |
| Collector-Emitter Breakdown Voltage  | LV <sub>CEO</sub>    |      |     |     |      | I <sub>C</sub> = 1mA (Pulsed)<br>I <sub>B</sub> = 0 |
| 2N5086,7                             |                      | 50   |     |     | V    |                                                     |
| 2N5088                               |                      | 30   |     |     | V    |                                                     |
| 2N5089                               |                      | 25   |     |     | V    |                                                     |
| Collector Cutoff Current             | I <sub>CB0</sub>     |      |     |     |      | V <sub>CB</sub> = 10V I <sub>E</sub> = 0            |
| 2N5086,7                             |                      |      |     | 10  | nA   | V <sub>CB</sub> = 15V I <sub>E</sub> = 0            |
| 2N5089                               |                      |      |     | 50  | nA   | V <sub>CB</sub> = 20V I <sub>E</sub> = 0            |
| 2N5088                               |                      |      |     | 50  | nA   | V <sub>CB</sub> = 35V I <sub>E</sub> = 0            |
| 2N5086,7                             |                      |      |     | 50  | nA   |                                                     |
| Emitter Cutoff Current               | I <sub>EB0</sub>     |      |     |     |      | V <sub>EB</sub> = 3V I <sub>C</sub> = 0             |
| All types                            |                      |      |     | 50  | nA   | V <sub>EB</sub> = 4.5V I <sub>C</sub> = 0           |
| 2N5088,9 only                        |                      |      |     | 100 | nA   |                                                     |
| Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> |      |     |     |      | I <sub>C</sub> = 10mA I <sub>B</sub> = 1mA          |
| 2N5086,7                             |                      | 0.08 | 0.3 |     | V    |                                                     |
| 2N5088,9                             |                      | 0.08 | 0.5 |     | V    |                                                     |

**MICRO ELECTRONICS LTD.**

38 HUNG TO ROAD, KWUN TONG, HONG KONG. TELEX 43510  
 KWUN TONG P. O. BOX 69477 CABLE ADDRESS "MICROTRON"  
 TELEPHONE:- 3-430181-6 9-893363, 9-892429

FAX: 3-410321

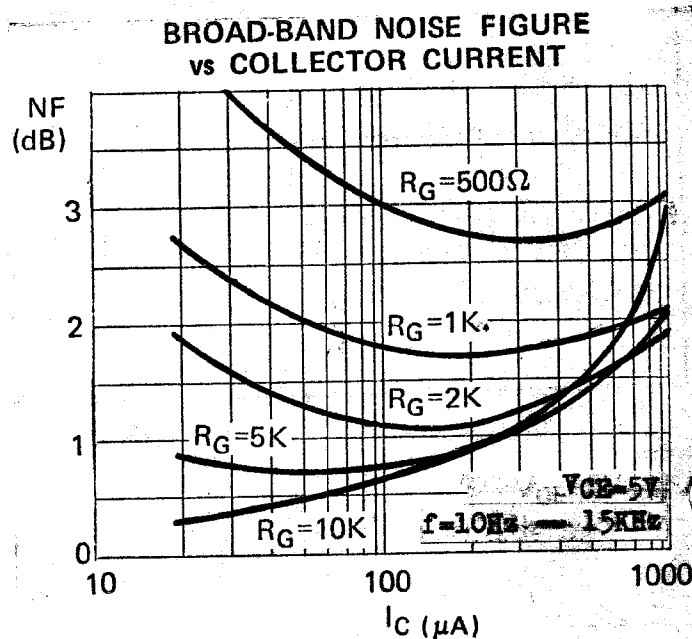
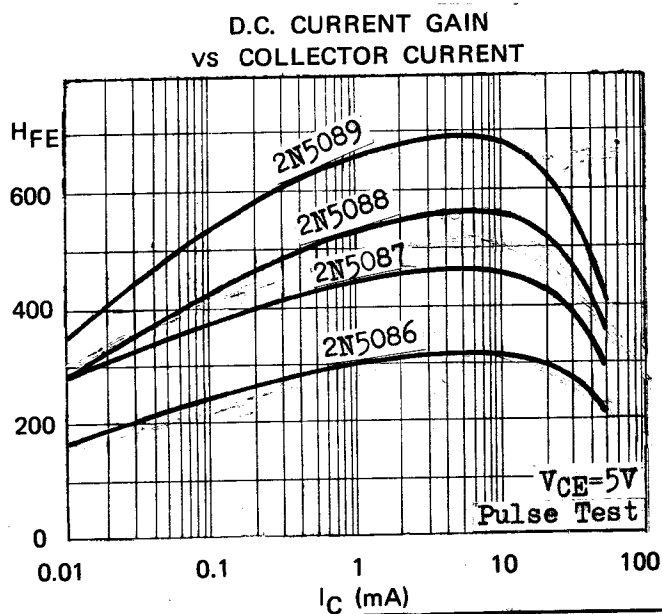
- - - Continued - - -

| PARAMETER                                                                                              | SYMBOL   | MIN      | TYP         | MAX                        | UNIT                             | TEST CONDITIONS                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------|----------|----------|-------------|----------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Base-Emitter Voltage<br>2N5086,7<br>2N5088,9                                                           | $V_{BE}$ |          | 0.63<br>0.7 | 0.85<br>0.8                | V<br>V                           | $I_C=1mA$ $V_{CE}=5V$<br>$I_C=10mA$ $V_{CE}=5V$                                                                                                                                      |
| Current Gain-Bandwidth Product<br>2N5086,7<br>2N5088,9                                                 | $f_T$    | 40<br>50 | 80<br>100   |                            | MHz<br>MHz                       | $I_C=0.5mA$ $V_{CE}=5V$<br>$I_C=0.5mA$ $V_{CE}=5V$                                                                                                                                   |
| Collector-Base Capacitance<br>All types                                                                | $C_{ob}$ |          | 3           | 4                          | pF                               | $V_{CB}=5V$ $I_E=0$<br>$f=100KHz$                                                                                                                                                    |
| Emitter-Base Capacitance<br>2N5088,9 only                                                              | $C_{ib}$ |          | 7           | 10                         | pF                               | $V_{EB}=0.5V$ $I_C=0$<br>$f=100KHz$                                                                                                                                                  |
| Noise Figure<br>2N5086 only<br>2N5087 only<br>2N5086 only<br>2N5087 only<br>2N5088 only<br>2N5089 only | NF       |          |             | 3<br>2<br>3<br>2<br>3<br>2 | dB<br>dB<br>dB<br>dB<br>dB<br>dB | $I_C=20\mu A$ $V_{CE}=5V$<br>$R_G=10K\Omega$ $f=10Hz-15KHz$<br>$I_C=100\mu A$ $V_{CE}=5V$<br>$R_G=3K\Omega$ $f=1KHz$<br>$I_C=100\mu A$ $V_{CE}=5V$<br>$R_G=10K\Omega$ $f=10Hz-15KHz$ |

D.C. AND SMALL SIGNAL CURRENT GAIN ( $H_{FE}$ ,  $h_{fe}$ ) AT  $V_{CE}=5V$   $T_A=25^\circ C$

| TYPE   | $H_{FE}$ @ $I_C=0.1mA$ |      | $H_{FE}$ @ $I_C=1mA$ |     | $H_{FE}$ @ $I_C=10mA$ |     | $h_{fe}$ @ $I_C=1mA$ $f=1kHz$ |      |
|--------|------------------------|------|----------------------|-----|-----------------------|-----|-------------------------------|------|
|        | MIN                    | MAX  | MIN                  | MAX | MIN                   | MAX | MIN                           | MAX  |
| 2N5086 | 150                    | 500  | 150                  |     | 150                   |     | 150                           | 600  |
| 2N5087 | 250                    | 800  | 250                  |     | 250                   |     | 250                           | 900  |
| 2N5088 | 300                    | 900  | 350                  |     | 300                   |     | 350                           | 1400 |
| 2N5089 | 400                    | 1200 | 450                  |     | 400                   |     | 450                           | 1800 |

TYPICAL CHARACTERISTICS AT  $T_A=25^\circ C$



This datasheet has been download from:

[www.datasheetcatalog.com](http://www.datasheetcatalog.com)

Datasheets for electronics components.