

## NTE486 Silicon NPN Transistor RF High Frequency Amplifier

### **Description:**

The NTE486 is a silicon NPN high frequency RF transistor in a TO39 type package designed for use in 12.5V UHF large-signal applications required in industrial equipment.

### **Features:**

- Specified 12.5V, 470MHz Characteristics:  
Output Power = 0.75W  
Minimum Gain = 8dB  
Efficiency = 50%
- S Parameter Data from 100MHz to 1GHz

### **Absolute Maximum Ratings:**

|   |                                     |
|---|-------------------------------------|
| Collector-Emitter Voltage, $V_{CEO}$                          | 20V                                 |
| Collector-Base Voltage, $V_{CBO}$                             | 35V                                 |
| Emitter-Base Voltage, $V_{EBO}$                               | 4V                                  |
| Continuous Collector Current, $I_C$                           | 150mA                               |
| Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ | 2.5W                                |
| Derate Above $25^\circ\text{C}$                               | 14.3mW/ $^\circ\text{C}$            |
| Storage Temperature Range, $T_{stg}$                          | $-65^\circ$ to $+200^\circ\text{C}$ |

### **Electrical Characteristics:** ( $T_C = +25^\circ\text{C}$ unless otherwise specified)

| Parameter                            | Symbol        | Test Conditions                             | Min | Typ | Max | Unit          |
|--------------------------------------|---------------|---|-----|-----|-----|---------------|
| <b>OFF Characteristics</b>           |               |   |     |     |     |               |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C = 5\text{mA}$ , $I_B = 0$              | 20  | —   | —   | V             |
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C = 100\mu\text{A}$ , $I_E = 0$          | 35  | —   | —   | V             |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E = 100\mu\text{A}$ , $I_C = 0$          | 4   | —   | —   | V             |
| Collector Cutoff Current             | $I_{CEO}$     | $V_{CE} = 15\text{V}$ , $I_B = 0$           | —   | —   | 10  | $\mu\text{A}$ |
| <b>ON Characteristics</b>            |               |   |     |     |     |               |
| DC Current Gain                      | $h_{FE}$      | $V_{CE} = 10\text{V}$ , $I_C = 50\text{mA}$ | 20  | 60  | 150 |               |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 50\text{mA}$ , $I_B = 5\text{mA}$    | —   | —   | 0.5 | V             |

**Electrical Characteristics (Cont'd):** ( $T_C = +25^\circ\text{C}$  unless otherwise specified)

| Parameter                           | Symbol    | Test Conditions  | Min  | Typ       | Max | Unit     |
|-------------------------------------|-----------|--|------|-----------|-----|----------|
| <b>Dynamic Characteristics</b>      |           |  |      |           |     |          |
| Current Gain–Bandwidth Product      | $f_T$     | $V_{CE} = 10\text{V}, I_C = 100\text{mA}, f = 200\text{MHz}$   | 1800 | 2000      | –   | MHz      |
| Output Capacitance                  | $C_{ob}$  | $V_{CB} = 12.5\text{V}, I_E = 0, f = 1\text{MHz}$              | –    | 3.5       | 4.0 | pF       |
| <b>Functional Tests</b>             |           |  |      |           |     |          |
| Common–Emitter Amplifier Power Gain | $G_{PE}$  | $V_{CC} = 12.5\text{V}, P_O = 0.75\text{W}, f = 470\text{MHz}$ | 8.0  | 8.5       | –   | dB       |
| Collector Efficiency                | $\eta$    |  | 50   | 70        | –   | %        |
| Series Equivalent Input Impedance   | $Z_{in}$  |  | –    | $14+j4.0$ | –   | $\Omega$ |
| Series Equivalent Output Impedance  | $Z_{out}$ |  | –    | $28-j38$  | –   | $\Omega$ |

