

**NTE367**  
**Silicon NPN Transistor**  
**RF Power Amplifier**  
 **$P_O = 45W @ 512MHz$**

**Description:**

The NTE367 is a silicon NPN RF power transistor in a W65 type package designed for 12.5V UHF large-signal amplifier applications in industrial and commercial FM equipment operating to 512MHz.

**Features:**

- Specified 12.5V, 470MHz Characteristics:  
    Output Power: 45W  
    Minimum Gain: 4.8dB  
    Efficiency: 55%
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- Built-In Matching Network for Broadband Operation
- Tested for Load Mismatch Stress at all Phase Angles with 20:1 VSWR @ 16V High Line and 50% Overdrive

**Absolute Maximum Ratings:**

|   |                               |
|---|-------------------------------|
| Collector-Emitter Voltage, $V_{CEO}$                    | 16V                           |
| Collector-Base Voltage, $V_{CBO}$                       | 36V                           |
| Emitter-Base Voltage, $V_{EBO}$                         | 4V                            |
| Continuous Collector Current, $I_C$                     | 9A                            |
| Total Device Dissipation ( $T_C = +25^\circ C$ ), $P_D$ | 117W                          |
| Derate Above $25^\circ C$                               | 670mW/ $^\circ C$             |
| Storage Temperature Range, $T_{stg}$                    | $-65^\circ$ to $+150^\circ C$ |
| Thermal Resistance, Junction to Case, $R_{\theta JC}$   | 1.5 $^\circ C/W$              |

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

| Parameter                           | Symbol        | Test Conditions                               | Min | Typ | Max | Unit |
|-------------------------------------|---------------|---|-----|-----|-----|------|
| <b>OFF Characteristics</b>          |               |   |     |     |     |      |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 20mA, I_B = 0$                         | 16  | —   | —   | V    |
|                                     | $V_{(BR)CES}$ | $I_C = 20mA, V_{BE} = 0$                      | 36  | —   | —   | V    |
| Emitter-Base Breakdown Voltage      | $V_{(BR)EBO}$ | $I_E = 5mA, I_C = 0$                          | 4   | —   | —   | V    |
| Collector Cutoff Current            | $I_{CES}$     | $V_{CE} = 15V, V_{BE} = 0, T_C = +25^\circ C$ | —   | —   | 10  | mA   |

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

| Parameter                           | Symbol   | Test Conditions   | Min                               | Typ        | Max | Unit     |
|-------------------------------------|----------|---|-----------------------------------|------------|-----|----------|
| <b>ON Characteristics</b>           |          |   |                                   |            |     |          |
| DC Current Gain                     | $h_{FE}$ | $I_C = 4\text{A}$ , $V_{CE} = 5\text{V}$  | 20                                | 70         | 150 |          |
| <b>Dynamic Characteristics</b>      |          |   |                                   |            |     |          |
| Output Capacitance                  | $C_{ob}$ | $V_{CB} = 12.5\text{V}$ , $I_E = 0$ , $f = 1\text{MHz}$   | –                                 | 90         | 125 | pF       |
| <b>Functional Tests</b>             |          |   |                                   |            |     |          |
| Common-Emitter Amplifier Power Gain | $G_{pe}$ | $V_{CC} = 12.5\text{V}$ , $P_O = 45\text{W}$ ,<br>$I_C(\text{Max}) = 5.8\text{A}$ , $f = 470\text{MHz}$ | 4.8                               | 5.4        | –   | dB       |
| Collector Efficiency                | $\eta$   |   | 55                                | 60         | –   | %        |
| Input Power                         | $P_{in}$ | $V_{CC} = 12.5\text{V}$ , $P_O = 45\text{W}$ ,<br>$f = 470\text{MHz}$                                   | –                                 | 13         | 15  | W        |
| Load Mismatch Stress                | $\psi$   | $V_{CC} = 16\text{V}$ , $f = 470\text{MHz}$ ,<br>$VSWR = 20:1$ , All Phase Angles,<br>Note 1, Note 2    | No Degradation in<br>Output Power |            |     |          |
| Series Equivalent Input Impedance   | $Z_{in}$ | $V_{CC} = 12.5\text{V}$ , $P_O = 45\text{W}$ ,<br>$f = 470\text{MHz}$                                   | –                                 | $1.4+j4.0$ | –   | $\Omega$ |
| Series Equivalent Output Impedance  | $Z_{OL}$ |   | –                                 | $1.2+j2.8$ | –   | $\Omega$ |

Note 1.  $P_{in} = 150\%$  of Drive Requirement for 45W output @ 12.5V.

Note 2.  $\psi$  = Mismatch stress factor – the electrical criterion established to verify the device resistance to load mismatch failure. The mismatch stress test is accomplished in a standard test fixture terminated in a 20:1 minimum load mismatch at all phase angles.

