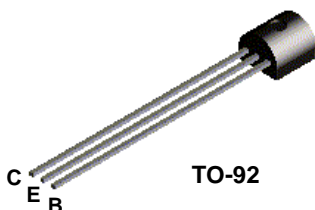


MPS6543



NPN RF Transistor

This device is designed for use as RF amplifiers, oscillators and multipliers with collector currents in the 100 μ A to 10 mA range. Sourced from Process 47. See MPSH11 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|-----------------------------------|--|-------------|-------|
| V _{CEO} | Collector-Emitter Voltage | 25 | V |
| V _{CBO} | Collector-Base Voltage | 35 | V |
| V _{EBO} | Emitter-Base Voltage | 3.0 | V |
| I _C | Collector Current - Continuous | 50 | mA |
| T _J , T _{stg} | Operating and Storage Junction Temperature Range | -55 to +150 | °C |

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

TA = 25°C unless otherwise noted

| Symbol | Characteristic | Max | Units |
|------------------|---|---------|-------|
| | | MPS6543 | |
| P _D | Total Device Dissipation Derate above 25°C | 350 | mW |
| | | 2.8 | mW/°C |
| R _{θJC} | Thermal Resistance, Junction to Case | 125 | °C/W |
| R _{θJA} | Thermal Resistance, Junction to Ambient | 357 | °C/W |

NPN RF Transistor

(continued)

MPS6543

Electrical Characteristics

TA = 25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Max | Units |
|--------|-----------|-----------------|-----|-----|-------|
|--------|-----------|-----------------|-----|-----|-------|

OFF CHARACTERISTICS

| | | | | | |
|---------------|--------------------------------------|---|-----|-----|---------------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage* | $I_C = 1.0 \text{ mA}, I_B = 0$ | 25 | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C = 100 \text{ } \mu\text{A}, I_E = 0$ | 35 | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E = 100 \text{ } \mu\text{A}, I_C = 0$ | 3.0 | | V |
| I_{CBO} | Collector Cutoff Current | $V_{CB} = 25 \text{ V}, I_E = 0$ | | 0.1 | μA |
| I_{EBO} | Emitter Cutoff Current | $V_{EB} = 2.0 \text{ V}, I_C = 0$ | | 1.0 | μA |

ON CHARACTERISTICS*

| | | | | | |
|---------------|--------------------------------------|---|----|------|---|
| h_{FE} | DC Current Gain | $V_{CE} = 10 \text{ V}, I_C = 4.0 \text{ mA}$ | 25 | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ | | 0.35 | V |
| $V_{BE(on)}$ | Base-Emitter On Voltage | $I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ | | 0.95 | V |

SMALL SIGNAL CHARACTERISTICS

| | | | | | |
|------------|----------------------------------|--|-----|-----|-----|
| f_T | Current Gain - Bandwidth Product | $I_C = 4.0 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 100 \text{ MHz}$ | 750 | | MHz |
| C_{ob} | Output Capacitance | $V_{CB} = 10 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$ | | 1.0 | pF |
| $r_b' C_C$ | Collector-Base Time Constant | $I_E = 4.0 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 31.8 \text{ MHz}$ | | 9.5 | pS |

*Pulse Test: Pulse Width $\leq 300 \text{ } \mu\text{s}$, Duty Cycle $\leq 2.0\%$