

NPN SILICON PLANAR RF TRANSISTOR

MPSH10P

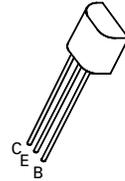
ISSUE 4 – FEB 94

FEATURES

- * High $f_T=650\text{MHz}$ min
- * Max. capacitance 0.7pF
- * Low noise <5dB at 500MHz

APPLICATIONS

- * Keyless entry systems
- * Wideband instrumentation amplifiers
- * Telemetry
- * Wireless lans



**E-Line
T092 Compatible**

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|----------------|-------------|------------------|
| Collector-Base Voltage | V_{CBO} | 30 | V |
| Collector-Emitter Voltage | V_{CEO} | 25 | V |
| Emitter-Base Voltage | V_{EBO} | 3 | V |
| Continuous Collector Current | I_C | 25 | mA |
| Power Dissipation at $T_{amb}=25^\circ\text{C}$ | P_{tot} | 500 | mW |
| Operating and Storage Temperature Range | $T_j; T_{stg}$ | -55 to +200 | $^\circ\text{C}$ |

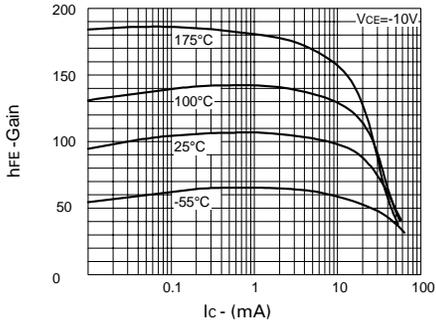
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ\text{C}$)

| PARAMETER | SYMBOL | MIN. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|---------------|------|------|------|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 30 | | V | $I_C=100\mu\text{A}, I_E=0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 25 | | V | $I_C=1\text{mA}, I_B=0^*$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 3 | | V | $I_E=10\mu\text{A}, I_C=0$ |
| Collector Cut-Off Current | I_{CBO} | | 100 | nA | $V_{CB}=25\text{V}, I_E=0$ |
| Emitter Cut-Off Current | I_{EBO} | | 100 | nA | $V_{EB}=2\text{V}, I_C=0$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | 0.5 | V | $I_C=4\text{mA}, I_B=0.4\text{mA}$ |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | 0.95 | V | $I_C=4\text{mA}, V_{CE}=10\text{V}$ |
| Static Forward Current Transfer Ratio | h_{FE} | 60 | | | $I_C=4\text{mA}, V_{CE}=10\text{V}^*$ |
| Transition Frequency | f_T | 650 | | MHz | $I_C=4\text{mA}, V_{CE}=10\text{V}, f=100\text{MHz}$ |
| Collector Base Capacitance | C_{cb} | | 0.7 | pF | $V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$ |
| Collector Base Time Constant | $r_b C_c$ | | 9 | ps | $V_{CB}=10\text{V}, I_C=4\text{mA}, f=31.8\text{MHz}$ |
| Common-Base Feedback capacitance | C_{rb} | | 0.65 | pF | $V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$ |
| Noise Figure | N_f | | 5 | dB | $I_C=2\text{mA}, V_{CE}=5\text{V}, R_S=50\Omega, f=500\text{MHz}$ |

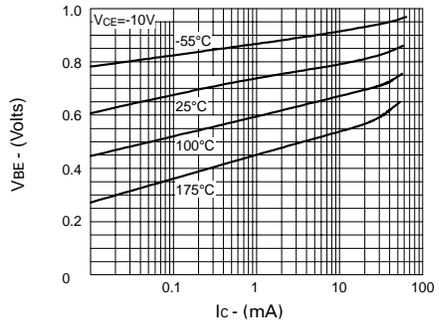
*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

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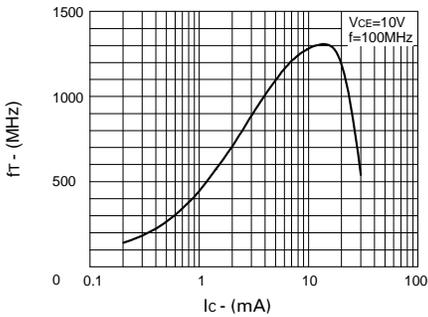
TYPICAL CHARACTERISTICS



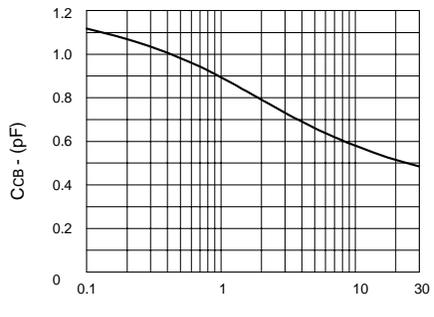
hFE v IC



VBE(on) v IC



ft v IC



CCB v VCB