# MPS-A13, MPS-A14

T-29-27

## Silicon Darlington Transistors

TO-92

The GE/RCA MPS-A13 and A14 are planar epitaxial passivated NPN silicon Darlington transistors designed for preamplifier input applications where high impedance is a requirement. These types are supplied in JEDEC TO-92 package.

**MAXIMUM RATINGS,** *Absolute-Maximum Values:*

COLLECTOR TO EMITTER VOLTAGE ($V_{CEO}$) ..... 30 V
COLLECTOR TO BASE VOLTAGE ($V_{CBO}$) ..... 30 V
EMITTER TO BASE VOLTAGE ($V_{EBO}$) ..... 10 V
CONTINUOUS COLLECTOR CURRENT ($I_C$) ..... 500 mA
TOTAL POWER DISSIPATION ($T_A \leq 25°C$) ($P_T$) ..... 625 mW
TOTAL POWER DISSIPATION ($T_C \leq 25°C$) ($P_T$) ..... 1.5 W
DERATE FACTOR ($T_A \leq 25°C$) ($P_T$) ..... 5 mW/°C
DERATE FACTOR ($T_C \leq 25°C$) ($P_T$) ..... 12 mW/°C
OPERATING TEMPERATURE ($T_J$) ..... −55° to +150°C
STORAGE TEMPERATURE ($T_{STG}$) ..... −55° to +150°C
LEAD TEMPERATURE, 1/16" ± 1/32" (1.58mm ± 0.8mm) from case for 10s max. ($T_L$) ..... +230°C

**ELECTRICAL CHARACTERISTICS, At Ambient Temperature ($T_A$) = 25°C Unless Otherwise Specified**

| CHARACTERISTICS | SYMBOL | LIMITS | | | UNITS |
|---|---|---|---|---|---|
| | | MIN. | TYP. | MAX. | |
| Collector-Emitter Breakdown Voltage ($I_C$ = 100μA, $I_B$ = 0) | $BV_{CES}$ | 30 | – | – | V |
| Collector Cutoff Current ($V_{CB}$ = 30V, $I_E$ = 0) | $I_{CBO}$ | – | – | 100 | nA |
| Emitter Cutoff Current ($V_{BE}$ = 10V, $I_C$ = 0) | $I_{EBO}$ | – | – | 100 | nA |
| DC Forward Current Transfer Ratio ($I_C$ = 10 mA, $V_{CE}$ = 5V)* MPS-A13 | $h_{FE}$ | 5,000 | – | – | |
| MPS-A14 | | 10,000 | – | – | |
| DC Forward Current Transfer Ratio ($I_C$ = 100 mA, $V_{CE}$ = 5V)* MPS-A13 | $h_{FE}$ | 10,000 | – | – | |
| MPS-A14 | | 20,000 | – | – | |
| Collector-Emitter Saturation Voltage ($I_C$ = 100 mA, $I_B$ = 0.1 mA)* | $V_{CE(sat)}$ | – | 0.75 | 1.5 | V |
| Base-Emitter On-Voltage ($I_C$ = 100 mA, $V_{CE}$ = 5 V) | $V_{BE(ON)}$ | – | 1.29 | 2 | V |
| Small-Signal Current Gain ($I_C$ = 30 mA, $V_{CE}$ = 10V, f = 20 MHz) | $h_{fe}$ | 4 | – | – | MHz |
| Output Capacitance ($V_{CB}$ = 10 V, $I_E$ = 0, f = 100kHz) | $C_{cb}$ | – | 5.4 | 8 | pF |
| Noise Figure ($I_C$ = 10 mA, $V_{CE}$ = 5 V, $R_S$ = 100 kΩ, f = 1 kHz) | NF | – | 2 | – | dB |

*Pulse conditions: ≤ 300μs pulse width, ≤ 2 % duty cycle

**TERMINAL CONNECTIONS**

**Lead 1 - Emitter**
**Lead 2 - Base**
**Lead 3 - Collector**

File Number **2074**