File Number **1205**

**RCA6340, RCA6341**

# 25-A Silicon N-P-N Power Transistors

N-P-N Types for Power Supplies and Other High Voltage Switching Applications

**Features:**

- *Fast switching speed*
- *Low $V_{CE}(sat)$*
- *Steel hermetic TO-204AA package*



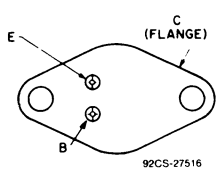
RCA6340 and RCA6341 silicon n-p-n power transistors which feature fast switching speeds, low saturation voltage, and high safe-operating-area (SOA) ratings. They are specially designed for converters, inverters, pusle-width-modulated regulators and a variety of power switching circuits.

These high-current, high-speed transistors are 100-percent tested for parameters that are essential to the design of high-power switching circuits.

The RCA6340 and RCA6341 transistors are supplied in steel JEDEC TO-204AA hermetic packages.

These types are similar to the 2N6340 and 2N6341 except for the $C_{obo}$, $h_{FE}$ measured at $I_C$ of 0.5A, and $I_{B1}$, $I_{B2}$ conditions for switching times.

**TERMINAL DESIGNATIONS**




**JEDEC TO-204AA**

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

| | RCA6340 | RCA6341 | |
|---|---|---|---|
| $V_{CBO}$ | 160 | 180 | V |
| $V_{CEO}$ | 140 | 150 | V |
| $V_{EBO}$ | 3 | | V |
| $I_C$ | 25 | | A |
| $I_{CM}$ | 50 | | A |
| $I_B$ | 10 | | A |
| $P_T$ | | | |
| $T_C$ up to 25°C | 200 | | W |
| $T_C$ above 25°C, derate linearly | 1.143 | | W/°C |
| $T_{stg}$, $T_J$ | -65 to 200 | | °C |
| $T_L$ | | | |
| At distance ≥ 1/16 in. (1.58 mm) from seating plane for 10 s max. | 235 | | °C |

# RCA6340, RCA6341

**ELECTRICAL CHARACTERISTICS, at Case Temperature $T_C$ = 25°C Unless Otherwise Specified**

| CHARACTERISTIC | TEST CONDITIONS | | | | LIMITS | | | | UNITS |
|---|---|---|---|---|---|---|---|---|---|
| | VOLTAGE V dc | | CURRENT A dc | | RCA6340 | | RCA6341 | | |
| | $V_{CE}$ | $V_{BE}$ | $I_C$ | $I_B$ | Min. | Max. | Min. | Max. | |
| $I_{CEV}$ | 150 | -1.5 | — | — | — | 10 | — | — | μA |
| | 150 | -1.5 | — | — | — | — | — | 10 | |
| $T_C$ = 150°C | 140 | -1.5 | — | — | — | 1 | — | — | mA |
| | 150 | -1.5 | — | — | — | — | — | 1 | |
| $I_{CBO}$ | 160[c] | — | — | — | — | 10 | — | — | μA |
| | 180[c] | — | — | — | — | — | — | 10 | |
| $I_{EBO}$ | — | -6 | 0 | — | — | 100 | — | 100 | |
| $V_{CEO}$(sus)[b] | — | — | 0.05[a] | 0 | 140 | — | 150 | — | V |
| $h_{FE}$ | 2 | — | 0.5[a] | — | 30 | — | 30 | — | |
| | 2 | — | 10[a] | — | 30 | 120 | 30 | 120 | |
| | 2 | — | 25[a] | — | 12 | — | 12 | — | |
| $V_{BE}$ | 2 | — | 10[a] | — | — | 1.8 | — | 1.8 | V |
| $V_{BE}$(sat) | — | — | 10[a] | 1 | — | 1.8 | — | 1.8 | |
| | — | — | 25[a] | 2.5 | — | 2.5 | — | 2.5 | |
| $V_{CE}$(sat) | — | — | 10[a] | 1 | — | 1 | — | 1 | |
| | — | — | 25[a] | 2.5 | — | 1.8 | — | 1.8 | |
| $I_{s/b}$ | 18 | — | 11.1 | — | 1 | — | 1 | — | s |
| $h_{fe}$ f = 5 MHz | 10 | — | 1 | — | 8 | — | 8 | — | |
| $f_T$ | 10 | — | 1 | — | 40 | — | 40 | — | MHz |
| $C_{obo}$ f = 0.1 MHz | 10[c] | — | — | — | — | 600 | — | 600 | pF |
| $t_r$[d] | — | -6 | 10 | 0.5 | — | 0.3 | — | 0.3 | μs |
| $t_s$[d] | — | -6 | 10 | 0.5[e] | — | 2.0 | — | 2.0 | |
| $t_f$[d] | — | -6 | 10 | 0.5[e] | — | 0.25 | — | 0.25 | |
| $R_{\theta JC}$ | 10 | — | 5 | — | — | 0.875 | — | 0.875 | °C/W |

[a] Pulsed; pulse duration = 300 μs, duty factory ≤ 2%.

[b] **CAUTION:** The sustaining voltage $V_{CEO}$(sus) MUST NOT be measured on a curve tracer.

[c] $V_{CB}$ value.

[d] $V_{CC}$ = 80 V, $t_p$ = 10 μs.

[e] $I_{B1} = -I_{B2}$.

# RCA6340, RCA6341

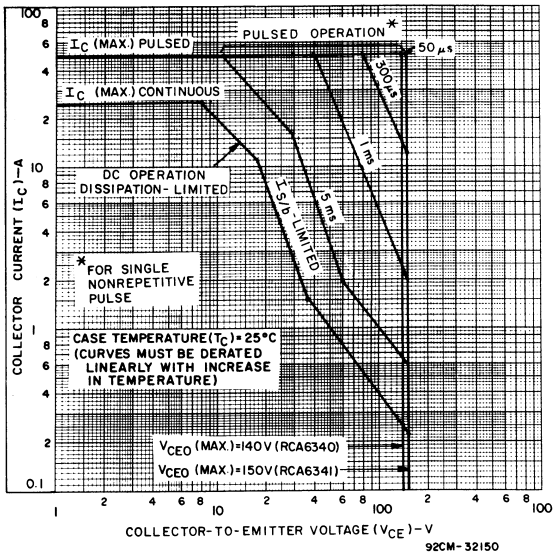



*Fig. 1 - Maximum operating areas for both types.*

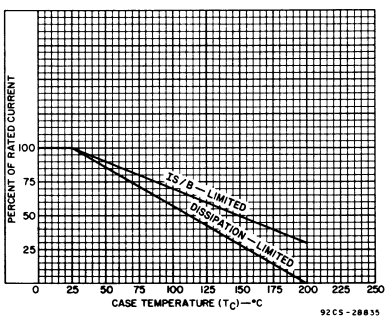



*Fig. 2 - Dissipation and $I_{S/b}$ derating curves for both types.*

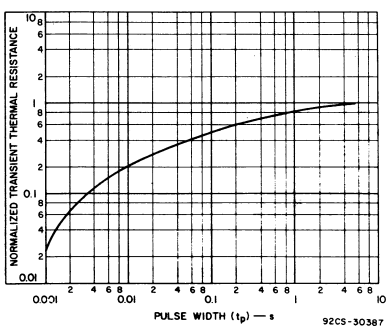



*Fig. 3 - Typical thermal-response characteristic for both types.*

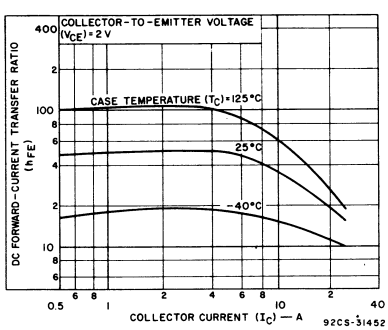



*Fig. 4 - Typical dc beta characteristics for both types.*

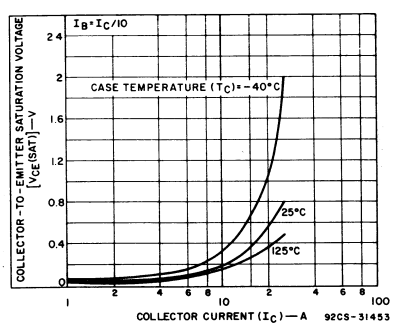



*Fig. 5 - Typical collector-to-emitter saturation voltage characteristics for both types.*

# RCA6340, RCA6341

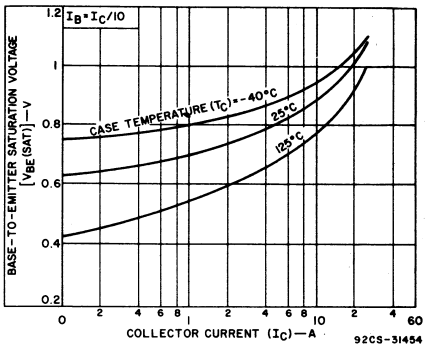



*Fig. 6 - Typical base-to-emitter saturation voltage characteristic for both types.*

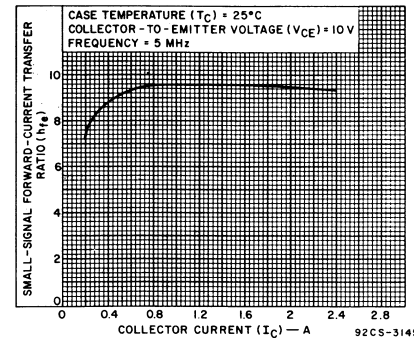



*Fig. 7 - Typical small-signal forward-current transfer ratio characteristic for both types (f = 5 MHz).*

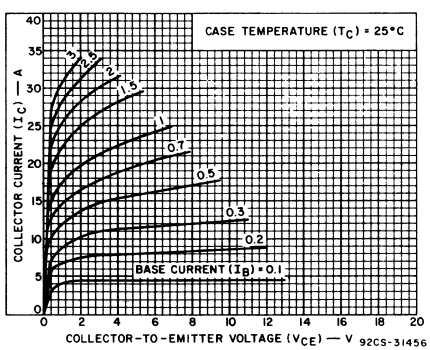



*Fig. 8 - Typical output characteristics for both types.*

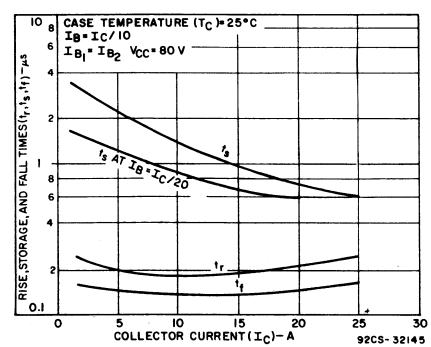



*Fig. 9 - Typical saturated-switching-time characteristics as a function of collector current for both types.*

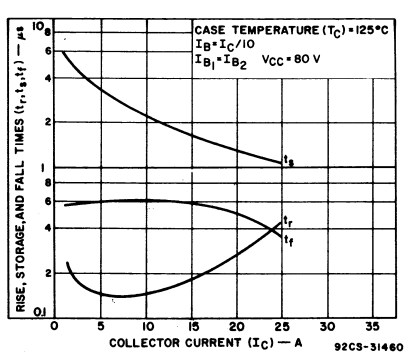



*Fig. 10 - Typical saturated-switching-time characteristics at $T_C$ = 125° C as a function of collector current for both types.*

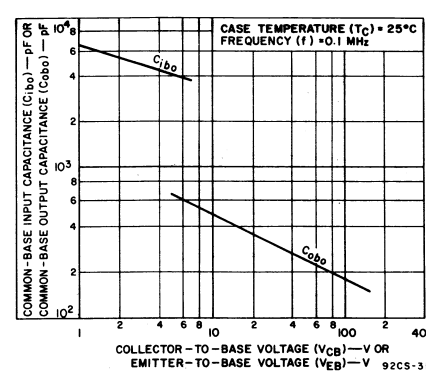



*Fig. 11 - Typical common-base input ($C_{ibo}$) or output ($C_{obo}$) capacitance characteristic for both types.*

# RCA6340, RCA6341

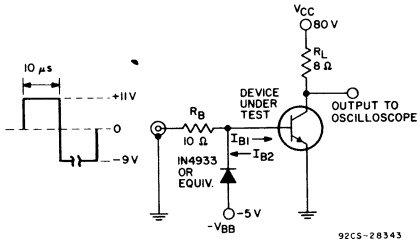



*Fig. 12 - Switching-time test circuit.*

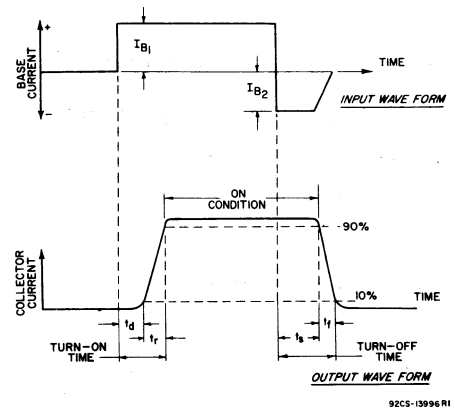



*Fig. 13 - Phase relationship between input current and output current showing reference points for specification of switching times.*

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