



# Power Transistors

## 41505



"Plastic TO-5"

H-1642

## High-Voltage, Medium-Power Silicon N-P-N Transistor

For High-Speed Switching and Linear-Amplifier Applications

### Features

- Thermal fatigue ratings
- High frequency response:  $f_T = 20$  MHz
- Maximum area-of-operation curves for dc and pulse operation
- Designed to assure freedom from second breakdown in class A, B, and C operation at maximum ratings

RCA-41505 is an epitaxial-collector, diffused-base silicon n-p-n transistor with high breakdown voltage, high frequency response, and high switching speed.

Typical applications for this device include TV video output, RGB output, chroma output, TV blanking, solenoid drivers, off-line inverters, regulators, audio output, and electrostatic deflection in display circuits.

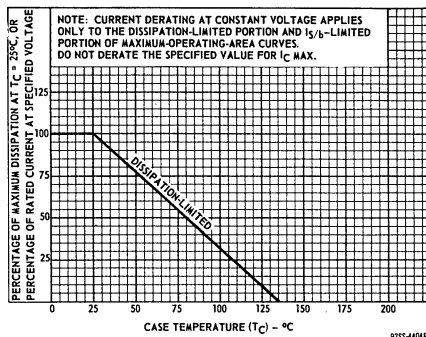


Fig. 1 — Dissipation derating curve.

### MAXIMUM RATINGS, Absolute-Maximum Values:

|                                                                       |                |                   |                  |
|-----------------------------------------------------------------------|----------------|-------------------|------------------|
| COLLECTOR-TO-EMITTER-SUSTAINING VOLTAGE . . . . .                     | $V_{CEO(sus)}$ | 200               | V                |
| EMITTER-TO-BASE VOLTAGE . . . . .                                     | $V_{EBO}$      | 7                 | V                |
| COLLECTOR CURRENT . . . . .                                           | $I_C$          | 1.0               | A                |
| BASE CURRENT . . . . .                                                | $I_B$          | 0.5               | A                |
| TRANSISTOR DISSIPATION:                                               | $P_T$          |                   |                  |
| At case temperatures up to $25^\circ\text{C}$ . . . . .               |                | 20                | W                |
| At case temperatures above $25^\circ\text{C}$ . . . . .               |                | See Figs. 1 and 4 |                  |
| For pulse operation . . . . .                                         |                | See Fig. 4        |                  |
| TEMPERATURE RANGE:                                                    |                |                   |                  |
| Storage and Operating (Junction) . . . . .                            |                | -65 to 135        | $^\circ\text{C}$ |
| LEAD TEMPERATURE (During soldering):                                  |                |                   |                  |
| At distance $\geq 1/16$ in. (1.59 mm) from case for 10 s max. . . . . |                | 230               | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS, At Case Temperature ( $T_C$ ) = 25°C:

| CHARACTERISTIC                                                                                      | SYMBOL                | TEST CONDITIONS |                 |                 |                 |                  |                |                | LIMITS           |        | UNITS |
|-----------------------------------------------------------------------------------------------------|-----------------------|-----------------|-----------------|-----------------|-----------------|------------------|----------------|----------------|------------------|--------|-------|
|                                                                                                     |                       | VOLTAGE<br>V dc |                 |                 |                 | CURRENT<br>mA dc |                |                | 41505            |        |       |
|                                                                                                     |                       | V <sub>CB</sub> | V <sub>CE</sub> | V <sub>EB</sub> | V <sub>BE</sub> | I <sub>C</sub>   | I <sub>E</sub> | I <sub>B</sub> | MIN.             | MAX.   |       |
| Collector-Cutoff Current:<br>With external base-to-emitter<br>resistance (R <sub>BE</sub> ) = 100 Ω | I <sub>CER</sub>      |                 | 150             |                 |                 |                  |                |                | —                | 50     | μA    |
| DC Forward-Current Transfer<br>Ratio                                                                | h <sub>FE</sub>       |                 | 10<br>10        |                 |                 | 50<br>5          |                |                | 20<br>10         | —<br>— |       |
| Collector-to-Emitter<br>Sustaining Voltage:<br>With base open                                       | V <sub>CEO(sus)</sub> |                 |                 |                 |                 | 10               |                | 0              | 200 <sup>a</sup> | —      | V     |
| Collector-to-Emitter<br>Saturation Voltage                                                          | V <sub>CE(sat)</sub>  |                 |                 |                 |                 | 50               |                | 5              | —                | 2      | V     |
| Emitter-to-Base<br>Breakdown Voltage                                                                | V <sub>(BR)EBO</sub>  |                 |                 |                 |                 | 0                | 1              |                | 7                | —      | V     |
| Output Capacitance (at 1 MHz)                                                                       | C <sub>ob</sub>       | 20              |                 |                 |                 |                  | 0              |                | —                | 8      | pF    |
| Thermal Resistance:<br>Junction-to-Case                                                             | R <sub>θJC</sub>      |                 |                 |                 |                 |                  |                |                | —                | 5.5    | °C/W  |
| Junction-to-Ambient                                                                                 | R <sub>θJA</sub>      |                 |                 |                 |                 |                  |                |                | —                | 138    |       |

<sup>a</sup> CAUTION: The sustaining voltage V<sub>CEO(sus)</sub> MUST NOT be measured on a curve tracer.

TERMINAL CONNECTIONS

- Lead 1 — Emitter
- Lead 2 — Base
- Lead 3 — Collector
- Rectangular Metal Slug — Collector

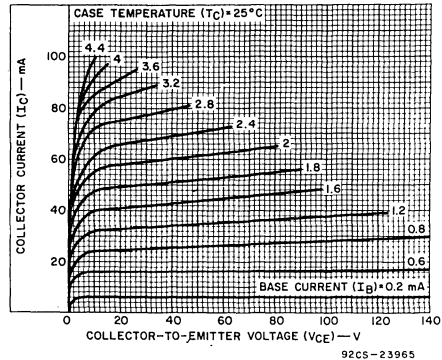


Fig.2 — Typical output characteristics.

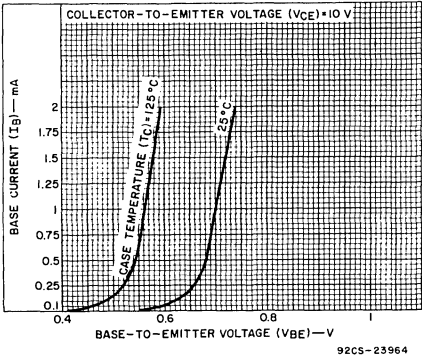


Fig.3 Typical input characteristics.

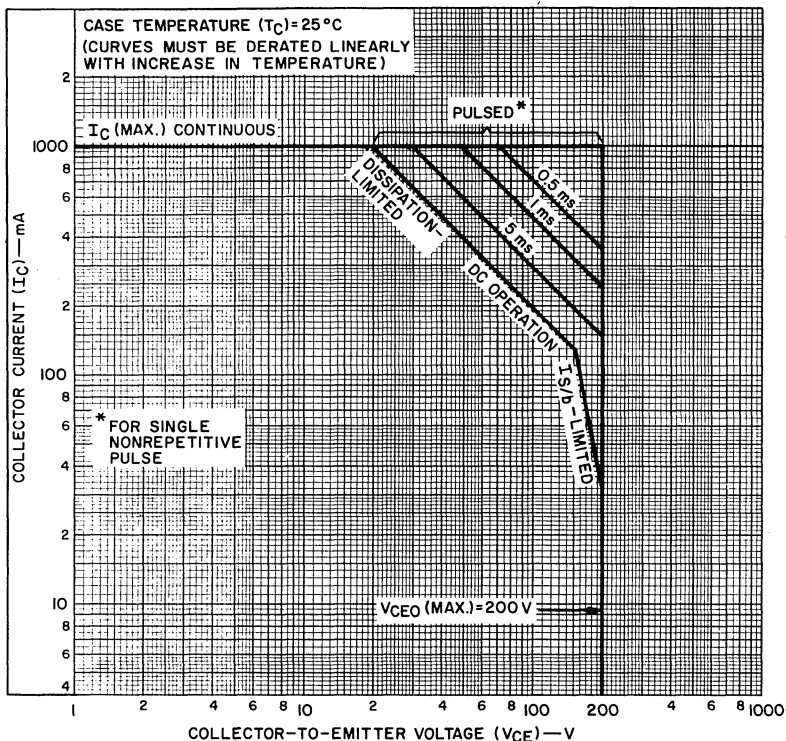


Fig. 4 — Maximum operating areas.

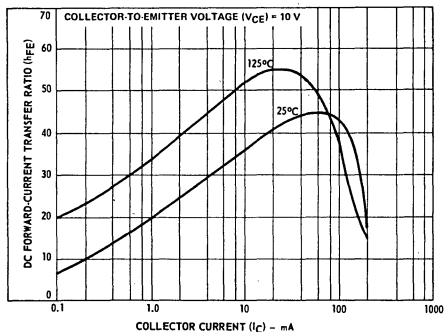


Fig. 5 — Typical dc beta characteristics.

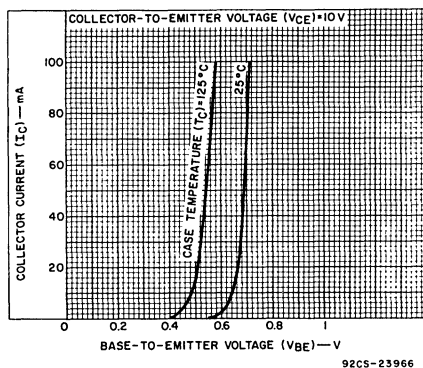


Fig. 6 — Typical transfer characteristics.