

Silicon NPN Transistor

2N1480

General Purpose Transistor

100V / 1,5A

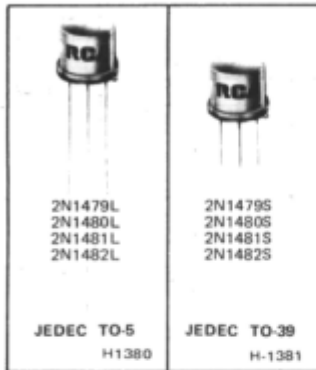
DATASHEET

OEM –RCA

Source: RCA Databook SCD108C

Power Transistors

2N1479 2N1480
2N1481 2N1482



Silicon N-P-N Power Transistors

General-Purpose Types for Medium-Power Applications

Features:

- High-temperature characterization
- High dc beta at 200 mA
- Full switching-time characterization at 200 mA

These devices are available with either 1/8-inch leads (TO-5 package) or 1/2-inch leads (TO-39 package). The longer-lead versions are specified by suffix "L" after the type number; the shorter-lead versions are specified by suffix "S" after the type number.

RCA-2N1479-2N1482 are diffused-junction silicon n-p-n power transistors. These transistors are intended for a wide variety of applications in industrial and military equipment. They are particularly useful in power-switching circuits such as in dc-to-dc converters, inverters, choppers, solenoid and relay controls; in oscillator, regulator, and pulse-amplifier

circuits; and as class A and class B push-pull audio and servo amplifiers.

These transistors feature high beta at high current, and excellent high-temperature performance. They employ the JEDEC TO-39 or TO-5 hermetic package.

Maximum Ratings, Absolute-Maximum Values:

| | 2N1479 | 2N1480 | |
|-------------------------------------|----------------|-------------|---------|
| | 2N1481 | 2N1482 | |
| *COLLECTOR-TO-BASE VOLTAGE | V_{CBO} | 60 | 100 V |
| *COLLECTOR-TO-EMITTER VOLTAGE: | | | |
| With base open, sustaining | $V_{CEO(sus)}$ | 40 | 55 V |
| With emitter-to-base reverse biased | | | |
| ($V_{EB} = 1.5$ volts) | V_{CEX} | 60 | 100 V |
| *EMITTER-TO-BASE VOLTAGE | V_{EB} | 12 | 12 V |
| *COLLECTOR CURRENT | I_C | 1.5 | 1.5 A |
| *EMITTER CURRENT | I_E | -1.75 | -1.75 A |
| *BASE CURRENT | I_B | 1 | 1 A |
| *TRANSISTOR DISSIPATION: | P_T | | |
| (See Rating Chart Fig. 1): | | | |
| At case temperature of 25° C | | 5 | 5 W |
| At case temperature of 100° C | | 2.86 | 2.86 W |
| TEMPERATURE RANGE: | | | |
| Operating and Storage | | -65 to +200 | °C |

*In accordance with JEDEC registration data

ELECTRICAL CHARACTERISTICS, At Case Temperature (T_C) = 25°C unless otherwise specified

| CHARACTERISTIC | SYMBOL | TEST CONDITIONS | | | | | | LIMITS | | | | | | | | UNITS |
|--|------------------|-----------------|----------|----------|------------------|-------|---------|----------|---------|----------|---------|----------|---------|----------|------|--------------|
| | | VOLTAGE V dc | | | CURRENT mA dc | | | 2N1479 | | 2N1480 | | 2N1481 | | 2N1482 | | |
| | | V_{CB} | V_{CE} | V_{EB} | I_C | I_B | I_E | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | |
| Collector Cutoff Current: $T_C = 150^\circ C$ | I_{CBO} | 30 | | | | | 0 | | 10 | | 10 | | 10 | | 10 | μA |
| Emitter Cutoff Current | I_{EBO} | | | 12 | 0 | | | | 10 | | 10 | | 10 | | 10 | μA |
| Collector-To-Emitter Voltage: With base-emitter junction reverse-biased | V_{CEX} | | | 1.5 | 0.25 | | 60 | | 100 | | 60 | | 100 | | | V |
| With base open, sustaining | $V_{CEO(sus)}$ | | | | 50 | 0 | 40 | | 55 | | 40 | | 55 | | | |
| Base-To-Emitter Voltage | V_{BE} | | 4 | | 200 | | | 3 | | 3 | | 3 | | 3 | | V |
| DC Current Transfer Ratio | h_{FE} | | 4 | | 200 | | 20 | 60 | 20 | 60 | 35 | 100 | 35 | 100 | | |
| Small-Signal Current Transfer Ratio | h_{fe} | | 4 | | 5 | | 50 Typ. | | 50 Typ. | | 50 Typ. | | 50 Typ. | | | |
| DC Collector-To-Emitter Saturation Resistance | $r_{CE(sat)}$ | | | | 200 | 20 | | 7 | | 7 | | | 7 | | 7 | Ω |
| Collector-To-Base Capacitance | C_{ob} | 40 | | | | | | 150 Typ. | | 150 Typ. | | 150 Typ. | | 150 Typ. | | pF |
| Thermal Time Constant | τ_1 | | | | | | | 10 Typ. | | 10 Typ. | | 10 Typ. | | 10 Typ. | | ms |
| Alpha-Cutoff Frequency | $f_{\alpha b}$ | 28 | | | 5 | | | 1.5 Typ. | | 1.5 Typ. | | 1.5 Typ. | | 1.5 Typ. | | MHz |
| Switching Time: | | | | | | | | | | | | | | | | |
| Delay Time | t_d^* | | | | | | | 0.2 Typ. | | 0.2 Typ. | | 0.2 Typ. | | 0.2 Typ. | | μs |
| Rise Time | t_r^* | | | | | | | 1 Typ. | | 1 Typ. | | 1 Typ. | | 1 Typ. | | |
| Storage Time | t_s^* | | | | | | | 0.6 Typ. | | 0.6 Typ. | | 0.6 Typ. | | 0.6 Typ. | | |
| Fall Time | t_f^* | | | | | | | 1 Typ. | | 1 Typ. | | 1 Typ. | | 1 Typ. | | |
| Thermal Resistance: | | | | | | | | | | | | | | | | |
| Junction-to-case | $R_{\theta JC}$ | | | | | | | 35 | | 35 | | 35 | | 35 | | $^\circ C/W$ |
| Junction-to-free air | $R_{\theta JFA}$ | | | | | | | 200 | | 200 | | 200 | | 200 | | |

* In accordance with JEDEC registration data
 $I_C = 200 \text{ mA}$, $I_{B1} = 20 \text{ mA}$, $I_{B2} = -8.5 \text{ mA}$; see Figs. 6 and 7.

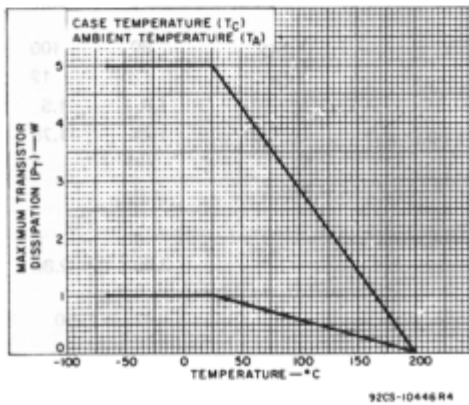


Fig. 1 - Derating chart for all types.

TERMINAL CONNECTIONS

- Lead 1 - Emitter
- Lead 2 - Base
- Case, Lead 3 - Collector

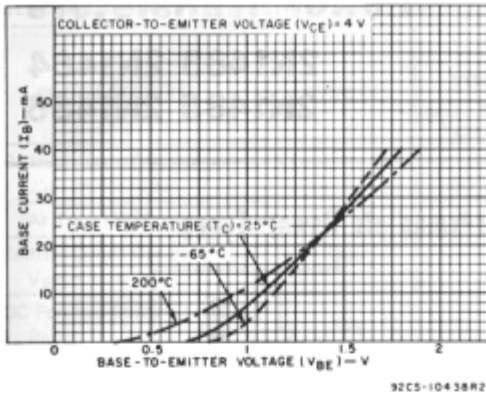


Fig. 2 - Typical input characteristics for all types.

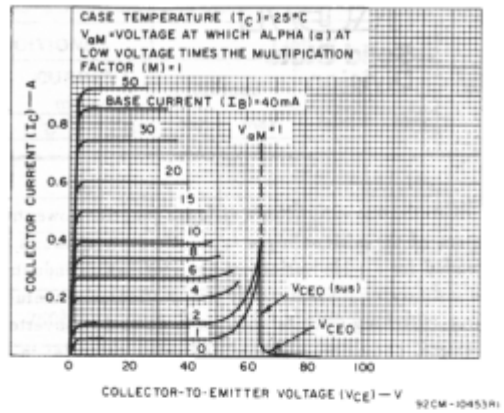


Fig. 3 - Typical output characteristics for all types.

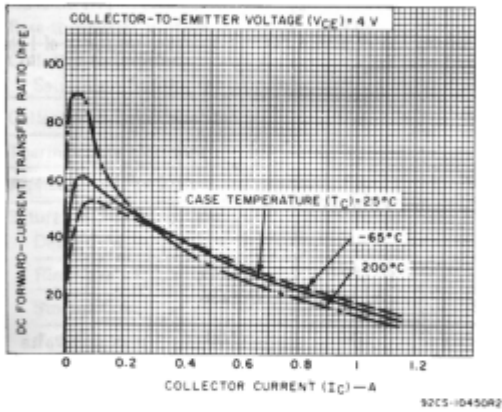


Fig. 4 - Typical dc beta characteristics for all types.

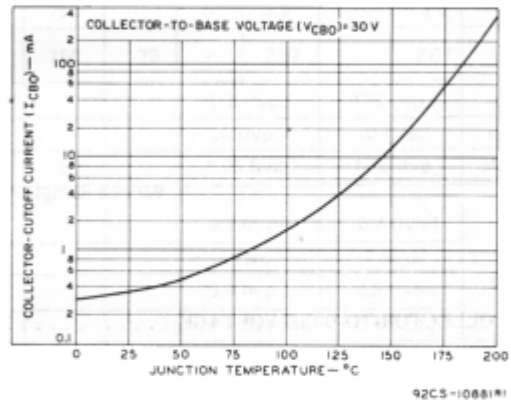


Fig. 5 - Typical leakage characteristics for all types.

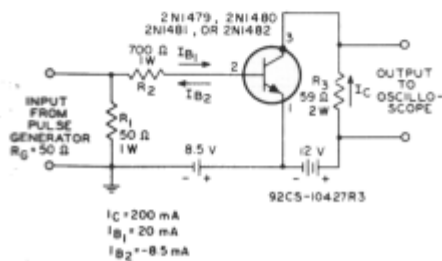


Fig. 6 - Test circuit for measurement of saturated switching times.

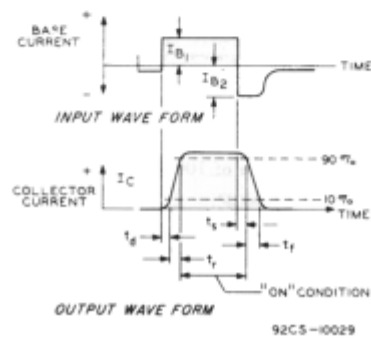


Fig. 7 - Oscilloscope display for measurement of switching times (test circuit in Fig. 6).