

Epitaxial-Base, Silicon N-P-N and P-N-P VERSAWATT Transistors

General-Purpose Medium-Power Types for Switching and Amplifier Applications

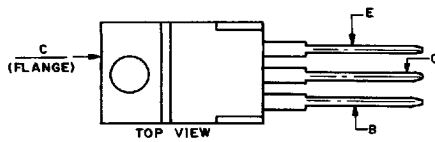
Features:

- Low saturation voltages
- Complementary n-p-n and p-n-p types
- Maximum safe-area-of-operation curves specified for dc operation

The 2N6106-2N6111, 2N6288-2N6293, and 2N6473-2N6476 are epitaxial-base silicon transistors supplied in a VERSAWATT package. The 2N6288-2N6293, 2N6473, and 2N6474* are n-p-n complements of p-n-p types 2N6106-2N6111, 2N6475, and 2N6476*, respectively. All these transistors are intended for a wide variety of medium-power switching and amplifier applications, such as series and shunt regulators and driver and output stages of high-fidelity amplifiers.

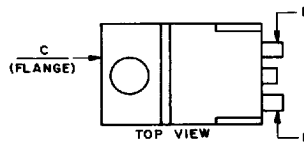
The 2N6289, 2N6291, and 2N6293 n-p-n types and 2N6106, 2N6108, and 2N6110 p-n-p devices fit into TO-213AA sockets. The remaining types are supplied in the JEDEC TO-220AB straight-lead version of the VERSAWATT package. All of these devices are also available on special order in a variety of lead-form configurations.

- *Formerly RCA Dev. Nos. TA7784, TA8323, TA7783, TA8232, TA7782, TA8231, TA8444, and TA8723, respectively.
- †Formerly RCA Dev. Nos. TA8210, TA7741, TA8211, TA7742, TA8212, TA7743, TA8445, and TA8722, respectively.



92CS-39969

JEDEC TO-220AB



92CS-40186

JEDEC TO-220AA

Boca Semiconductor Corp.
BSC

<http://www.bocasemi.com>

MAXIMUM RATINGS, Absolute-Maximum Values:

| | N-P-N | | P-N-P | | V | |
|---|------------------------|------------------|------------------|------------------|-----|------|
| | 2N6288 2N6289 | 2N6290 2N6291 | 2N6292 2N6293 | 2N6473 2N6474 | | |
| V_{CE0} | 40 | 60 | 80 | 110 | 130 | V |
| $V_{CEX(sus)}$ $R_{\theta\theta} = 100 \Omega, V_{BB} = 0 V$ | 40 | 60 | 80 | 110 | 130 | V |
| $V_{CE0(sus)}$ | 30 | 50 | 70 | 100 | 120 | V |
| V_{EBO} | 5 | | | | | V |
| $I_C (T_C \leq 106^\circ C)$ | 7 | | 4 | | | A |
| $I_E (T_C \leq 130^\circ C)$ | 3 | | 2 | | | A |
| P_T | | | | | | |
| $T_C \leq 25^\circ C$ | 40 | | | | | W |
| $T_C > 25^\circ C \leq 100^\circ C$ | 16 | | | | | W |
| $T_C > 25^\circ C$ | Derate linearly 0.32 | | | | | W/°C |
| $T_A \leq 25^\circ C$ | 1.8 | | | | | W |
| $T_A > 25^\circ C$ | Derate linearly 0.0144 | | | | | W/°C |
| T_{stg}, T_J | -65 to 150 | | | | | °C |
| T_L | 235 | | | | | °C |
| At distances $\geq 1/8$ in. (3.17 mm) from case for 10 s max. | | | | | | |

*In accordance with JEDEC registration data.

‡For p-n-p devices, voltage and current values are negative.

| CHARACTERISTIC | VOLTAGE V dc | | CURRENT A dc | | 2N6292 2N6293 2N6106♦ 2N6107♦ | | 2N6290 2N6291 2N6108♦ 2N6109♦ | | 2N6288 2N6289 2N6110♦ 2N6111♦ | | UNITS |
|---|-----------------|-----------------|------------------|----------------|--|-------|--|-------|--|-------|-------|
| | V _{CE} | V _{BE} | I _C | I _B | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | |
| I _{CER} (R _{BE} = 100 Ω) | 75 | | | | — | 0.1 | — | — | — | — | mA |
| | 55 | | | | — | — | — | 0.1 | — | — | |
| | 35 | | | | — | — | — | — | — | 0.1 | |
| (R _{BE} = 100 Ω, T _C = 150°C) | 70 | | | | — | 2 | — | — | — | — | |
| | 50 | | | | — | — | — | 2 | — | — | |
| | 30 | | | | — | — | — | — | — | 2 | |
| * I _{CEX} (R _{BE} = 100 Ω) | 75 | -1.5 | | | — | 0.1 | — | — | — | — | |
| | 56 | -1.5 | | | — | — | — | 0.1 | — | — | |
| | 37.5 | -1.5 | | | — | — | — | — | — | 0.1 | |
| (R _{BE} = 100 Ω, T _C = 150°C) | 70 | -1.5 | | | — | 2 | — | — | — | — | |
| | 50 | -1.5 | | | — | — | — | 2 | — | — | |
| | 30 | -1.5 | | | — | — | — | — | — | 2 | |
| * I _{CEO} | 60 | | | 0 | — | 1 | — | — | — | V | |
| 40 | | | 0 | — | — | — | 1 | — | — | | |
| 20 | | | 0 | — | — | — | — | — | 1 | | |
| * I _{EBO} | | -5 | 0 | | — | 1 | — | 1 | — | 1 | |
| * V _{CEO(sus)} ^b | | | 0.1 ^a | 0 | 70 | — | 50 | — | 30 | — | |
| * V _{CER(sus)} ^b (R _{BE} = 100 Ω) | | | 0.1 ^a | | 80 | — | 60 | — | 40 | — | |
| * h _{FE} | 4 | | 2 ^a | | 30 | 150 | — | — | — | — | |
| | 4 | | 2.5 ^a | | — | — | 30 | 150 | — | — | |
| | 4 | | 3 ^a | | — | — | — | — | 30 | 150 | |
| | 4 | | 7 ^a | | 2.3 | — | 2.3 | — | 2.3 | — | |
| * V _{BE} | 4 | | 2 ^a | | — | 1.5 | — | — | — | — | |
| | 4 | | 2.5 ^a | | — | — | — | 1.5 | — | — | |
| | 4 | | 3 ^a | | — | — | — | — | — | 1.5 | |
| | 4 | | 7 ^a | | — | 3 | — | 3 | — | 3 | |
| * V _{CE(sat)} | | | 2 ^a | 0.2 | — | 1 | — | — | — | — | |
| | | | 2.5 ^a | 0.25 | — | — | — | 1 | — | — | |
| | | | 3 ^a | 0.3 | — | — | — | — | — | 1 | |
| | | | 7 ^a | 3 | — | 3.5 | — | 3.5 | — | 3.5 | |
| * h _{fe} (f = 1 MHz) | 2N6288-93 | 4 | 0.5 | | 4 | — | 4 | — | 4 | — | |
| | 2N6106-11 | -4 | -0.5 | | 10 | — | 10 | — | 10 | — | |
| * h _{fe} (f = 50 kHz) | 4 | | 0.5 | | 20 | — | 20 | — | 20 | — | |
| * f _T | 2N6288-93 | 4 | 0.5 | | 10 | — | 10 | — | 10 | — | |
| | 2N6106-11 | -4 | -0.5 | | 10 | — | 10 | — | 10 | — | |
| * C _{obo} (f = 1 MHz) | 10 ^c | | 0 | | — | 250 | — | 250 | — | 250 | |
| R _{θJC} | | | | | — | 3.125 | — | 3.125 | — | 3.125 | |
| R _{θJA} | | | | | — | 70 | — | 70 | — | 70 | |

^a In accordance with JEDEC registration data.

^b Pulsed: Pulse duration = 300 μs, duty factor = 0.018.

^b CAUTION: The sustaining voltage V_{CEO(sus)} and V_{CER(sus)} MUST NOT be measured on a curve tracer.

^c V_{CB} value.

♦ For p-n-p devices, voltage and current values are negative.

| CHARACTERISTIC | VOLTAGE V dc | | CURRENT A dc | | 2N6474 2N6476* | | 2N6473 2N6475* | | UNITS | |
|---|--|-----------------|------------------------------------|----------------|-------------------|------------|-------------------|------------|-------|---|
| | V _{CE} | V _{BE} | I _C | I _B | Min. | Max. | Min. | Max. | | |
| | I _{CE} R (R _{BE} = 100 Ω) | 120 100 | | | | – | 0.1 | – | | – |
| (R _{BE} = 100 Ω T _C = 100°C) | 120 100 | | | | – | 2 | – | – | | |
| * I _{CEX} (R _{BE} = 100 Ω) | 120 100 | –1.5 –1.5 | | | – | 0.1 | – | – | | |
| (R _{BE} = 100 Ω, T _C = 100°C) | 120 100 | –1.5 –1.5 | | | – | 2 | – | – | | |
| * I _{CEO} | 60 50 | | | 0 0 | – | 1 | – | – | | |
| * I _{EBO} | | –5 | | 0 | – | 1 | – | 1 | | |
| * V _{CEO(sus)} ^b | | | 0.1 ^a | 0 | 120 | – | 100 | – | V | |
| V _{CER(sus)} ^b (R _{BE} = 100 Ω) | | | 0.1 ^a | | 130 | – | 110 | – | | |
| * h _{FE} | 4 2.5 | | 1.5 ^a 4 ^a | | 15 2 | 150 – | 15 2 | 150 – | V | |
| * V _{BE} | 4 2.5 | | 1.5 ^a 4 ^a | | – – | 2 3.5 | – – | 2 3.5 | | |
| * V _{CE(sat)} | | | 1.5 ^a 4 ^a | 0.15 2 | – – | 1.2 2.5 | – – | 1.2 2.5 | | |
| * h _{fe} (f = 1 MHz) | | | | | | | | | MHz | |
| 2N6473-74 | 4 | | 0.5 | | 4 | – | 4 | – | | |
| 2N6475-76 | –4 | | –0.5 | | 5 | – | 5 | – | | |
| * h _{fe} (f = 50 kHz) | 4 | | 0.5 | | 20 | – | 20 | – | | |
| f _T | | | | | | | | | pF | |
| 2N6473-74 | 4 | | 0.5 | | 4 | – | 4 | – | | |
| 2N6475-76 | –4 | | –0.5 | | 5 | – | 4 | – | | |
| * C _{obd} (f = 1 MHz) | 10 ^c | | 0 | | – | 250 | – | 250 | °C/W | |
| R _{θJC} | | | | | – | 3.125 | – | 3.125 | | |
| R _{θJA} | | | | | – | 70 | – | 70 | | |

T-33-01

* In accordance with JEDEC registration data

^a Pulsed: Pulse duration = 300 μs, duty factor = 0.018.

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