

8-Ampere N-P-N Darlington Power Transistors

60-, 80-, 100-Volts, 75 Watts
 Gain of 1000 at 4 A (2N6043, 2N6044)
 Gain of 1000 at 3 A (2N6045)

Features:

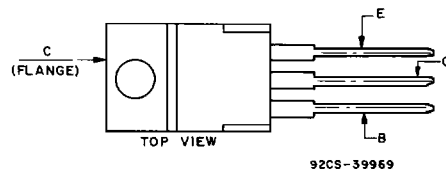
- Operates from IC without predriver

Applications:

- Power switching
- Hammer drivers
- Audio amplifiers
- Series and shunt regulators

The 2N6043, 2N6044, and 2N6045 are monolithic silicon n-p-n Darlington transistors designed for low- and medium-frequency power applications. The high gain of these devices makes it possible for them to be driven directly from integrated circuits. These devices are supplied in the JEDEC TO-220AB (VERSAWATT) plastic package.

TERMINAL DESIGNATIONS



JEDEC TO-220AB

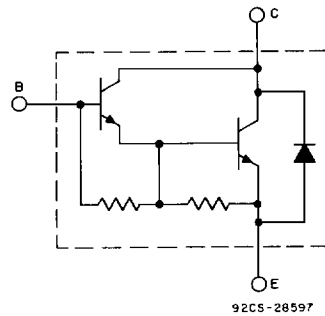


Fig. 1 — Schematic diagram for all types.

2
POWER TRANSISTORS

MAXIMUM RATINGS, Absolute-Maximum Values:

| | 2N6043 | 2N6044 | 2N6045 | |
|---|--------|------------|--------|----|
| *V _{CB0} | 60 | 80 | 100 | V |
| V _{CEO(sus)} | 60 | 80 | 100 | V |
| *V _{EBO} | _____ | 5 | _____ | V |
| *I _C | _____ | 8 | _____ | A |
| I _{CM} | _____ | 16 | _____ | A |
| *I _B | _____ | 0.12 | _____ | A |
| *P _T | _____ | _____ | _____ | W |
| T _C ≥ 25°C | _____ | 75 | _____ | W |
| T _C > 25°C | _____ | See Fig. 2 | _____ | W |
| *T _{stg} , T _J | _____ | -65 to 150 | _____ | °C |
| *T _L | _____ | _____ | _____ | °C |
| At distances ≥ 1/8 in. (3.17 mm) from case for 10 s max. | _____ | 235 | _____ | °C |

*In accordance with JEDEC registration data.

2N6043, 2N6044, 2N6045

ELECTRICAL CHARACTERISTICS, At Case Temperature (T_C) = 25°C Unless Otherwise Specified

| CHARACTERISTIC SYMBOL | TEST CONDITIONS | | | | LIMITS | | | | | | UNITS |
|------------------------------------|--|----------------------|------------------|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------|
| | VOLTAGE V dc | | CURRENT A dc | | 2N6043 | | 2N6044 | | 2N6045 | | |
| | V _{CE} | V _{BE} | I _C | I _B | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | |
| * I _{CEO} | 100 80 60 | | | 0 0 0 | — — — | — — 20 | — — — | — 20 — | — — — | 20 — — | μA |
| * I _{CEV} | 100 80 60 | -1.5 -1.5 -1.5 | | | — — — | — — 20 | — — — | — 20 — | — — — | 20 — — | |
| T _C =125°C | 100 80 60 | -1.5 -1.5 -1.5 | | | — — — | — — 200 | — — — | — 200 — | — — — | 200 — — | |
| * I _{EBO} | | 5 | | 0 | — | 2 | — | 2 | — | 2 | mA |
| * V _{CEO(sus)} | | | 0.1 ^a | 0 | 60 | — | 80 | — | 100 | — | V |
| I _{CBO} | 100 ^b 80 ^b 60 ^b | | | | — — — | — — 20 | — — — | — 20 — | — — — | 20 — — | μA |
| * h _{FE} | 4 4 4 | | 4 3 8 | | 1000 — 100 | 20,000 — — | 1000 — 100 | 20,000 — — | — 1000 100 | — 20,000 — | |
| * V _{BE} | 4 4 | | 4 3 | | — — | 2.8 — | — — | 2.8 — | — — | — 2.8 | V |
| * V _{BE(sat)} | | | 8 | 0.08 | — | 4.5 | — | 4.5 | — | 4.5 | |
| * V _{CE(sat)} | | | 4 3 8 | 0.016 0.012 0.08 | — — — | 2 — 4 | — — — | 2 — 4 | — — — | — 2 4 | V |
| V _F | | | -8 ^a | | — | 4 | — | 4 | — | 4 | V |
| * h _{fe} f=1 kHz | 4 | | 3 | | 300 | — | 300 | — | 300 | — | |
| * h _{fe} f=1 MHz | 4 | | 3 | | 4 | — | 4 | — | 4 | — | |
| * C _{obo} f=1 MHz | 10 ^b | | | | — | 200 | — | 200 | — | 200 | pF |
| I _{S/b} t=1 s, nonrep. | 30 | | | | 2.5 | — | 2.5 | — | 2.5 | — | A |
| R _{θJC} | | | | | — | 1.67 | — | 1.67 | — | 1.67 | °C/W |

* In accordance with JEDEC registration data.

^a Pulsed: Pulse duration = 300 μs, duty factor = 1.8%.

^b V_{CB} value.

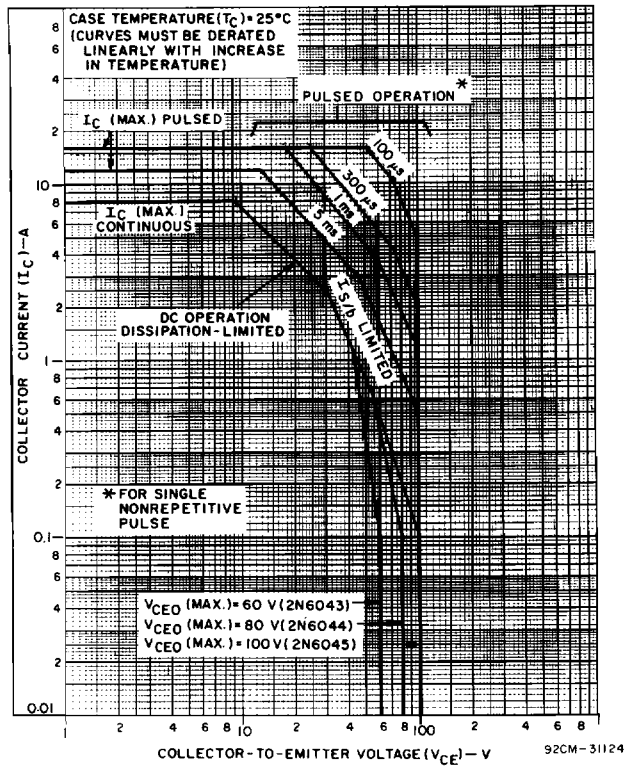


Fig. 2 - Maximum operating areas for all types ($T_C = 25^\circ C$).

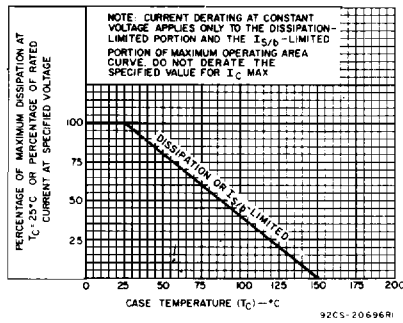


Fig. 3 - Derating curve for all types.

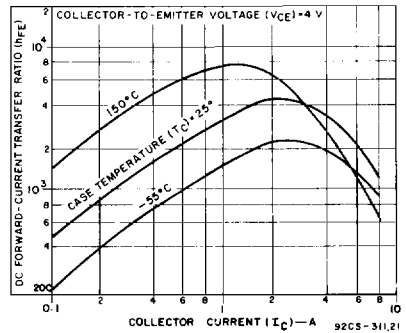


Fig. 4 - Typical dc beta characteristics for all types.

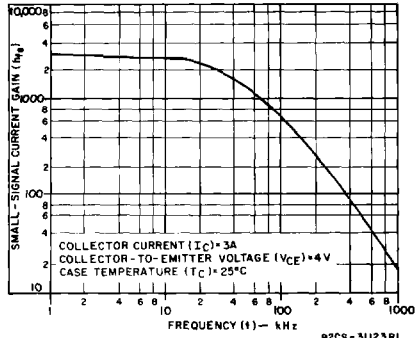


Fig. 5 — Typical small-signal gain for all types.

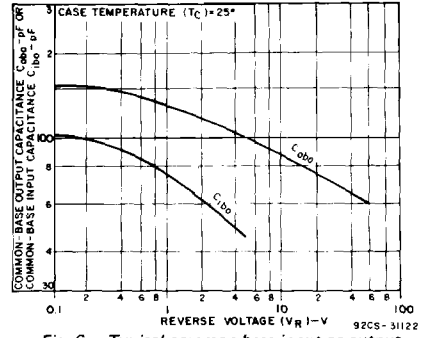


Fig. 6 — Typical common-base input or output capacitance characteristics as a function of reverse voltage for all types.