

File Number **523**

2N6249, 2N6250, 2N6251

450-V, 30-A, 175-W Silicon N-P-N Switching Transistors

For Switching Applications in Industrial and Commercial Equipment

Features:

- **High voltage ratings:**
 $V_{CE0} = 450\text{ V (2N6251)}$
 375 V (2N6250)
 300 V (2N6249)
- **High dissipation rating:**
 $P_T = 175\text{ W}$
- **Low saturation voltages**
- **Maximum safe-area-of-operation curves**

RCA-2N6249, 2N6250 and 2N6251 are multiple epitaxial silicon n-p-n power transistors. Multiple-epitaxial construction maximizes the volt-ampere characteristic of the device and provides fast switching speeds.

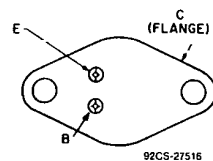
These devices use the popular JEDEC TO-204AA package; they differ mainly in voltage ratings, leakage-current limits, and $V_{CE(sat)}$ ratings.

The exceptional second-breakdown capabilities and high voltage-breakdown ratings make these transistors especially suitable for offline inverters, switching regulators motor controls, and deflection circuit applications.

The high gain and high $E_{s,b}$ energy-handling capability of the 2N6249 make it an excellent choice for motor-control applications in which large winding inductances are encountered and high surge currents are required to start the motor.

The high breakdown voltages, low saturation voltages, and fast-switching capability of the 2N6250 and 2N6251 make them especially suitable for inverter circuits operating directly off the rectified 115-V power line or a bridge configuration operating from the rectified 220-V line.

TERMINAL DESIGNATIONS



JEDEC TO-213AA

MAXIMUM RATINGS, Absolute-Maximum Values:

	2N6249	2N6250	2N6251	
* V_{CBO}	300	375	450	V
$V_{CE0(SUS)}$	200	275	350	V
* $V_{CEX(SUS)} (V_{BE} = 0\text{ V})$	225	300	375	V
$V_{CEX(SUS)} (R_{BE} \leq 50\ \Omega)$	225	300	375	V
* V_{EBO}	6	6	6	V
* I_C	10	10	10	A
I_{CM}	30	30	30	A
* I_B	10	10	10	A
* P_T At T_C up to 25°C and V_{CE} up to 30 V	175	175	175	W
At T_C up to 25°C and V_{CE} above 30 V	Derate Linearly at 1 _____			°C/W
* T_J, T_{stg}	-65 to +200			°C
* T_L At distances $\geq 1/32$ in. (0.8 mm) from case for 10 s max.	230			°C

* 2N-Series types in accordance with JEDEC registration data format (JS-6, RDF-1).

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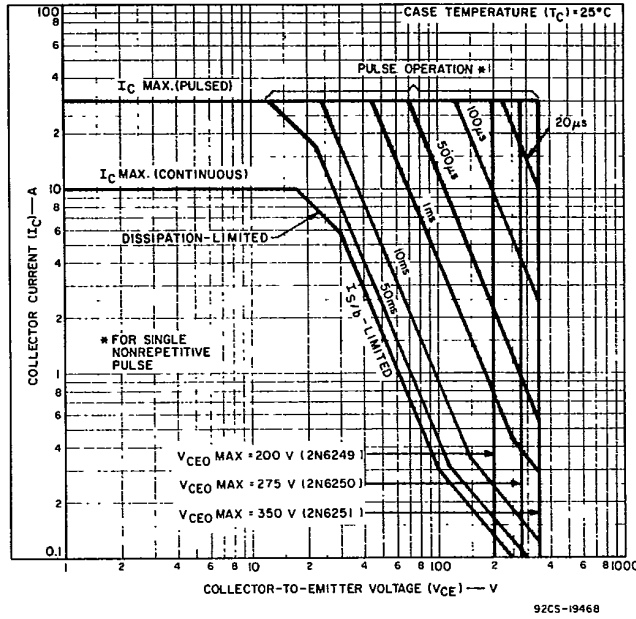


Fig. 1 - Maximum operating areas for all types at $T_c = 25^\circ C$.

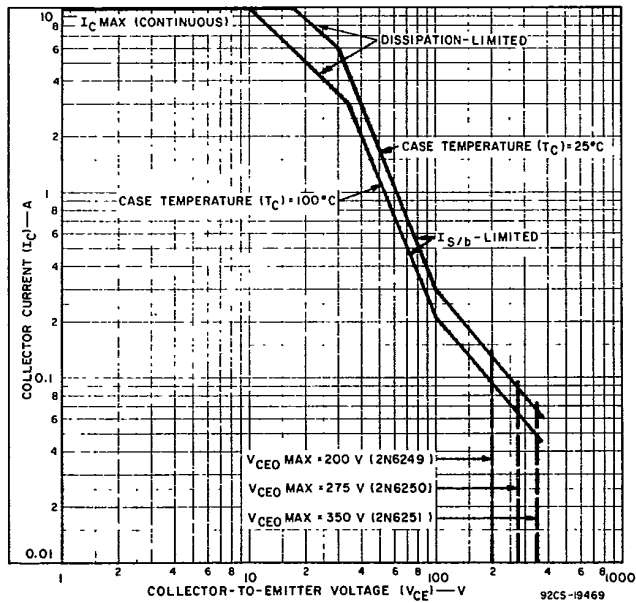


Fig. 2 - Maximum operating areas for all types at $T_c = 100^\circ C$.

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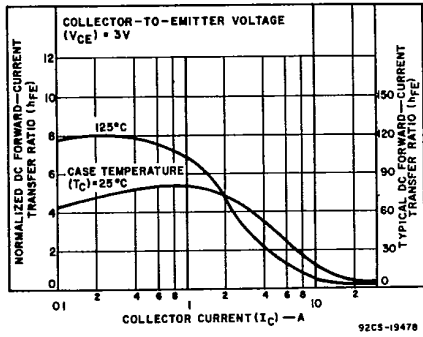


Fig. 3 - Typical normalized dc beta characteristics for all types.

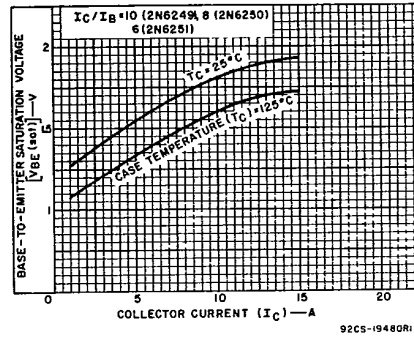


Fig. 4 - Typical base-to-emitter saturation voltage characteristics for all types.

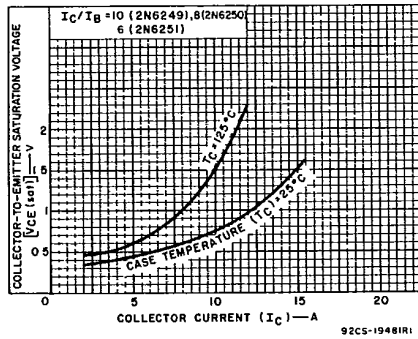


Fig. 5 - Typical collector-to-emitter saturation voltage characteristics for all types.

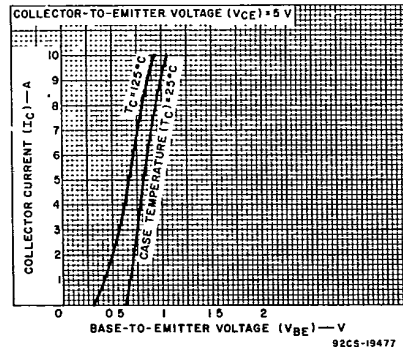


Fig. 6 - Typical transfer characteristics for all types.

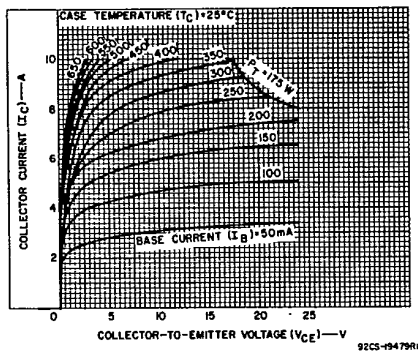


Fig. 7 - Typical output characteristics for all types.

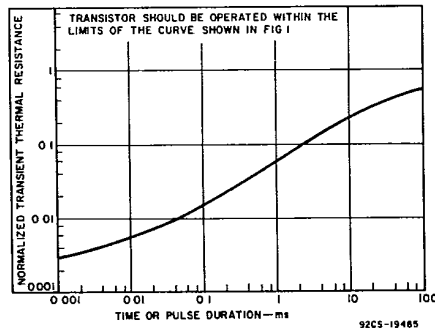


Fig. 8 - Typical thermal response characteristics for all types.

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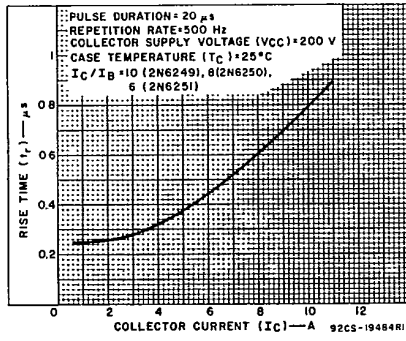


Fig. 9 - Typical rise-time characteristics for all types.

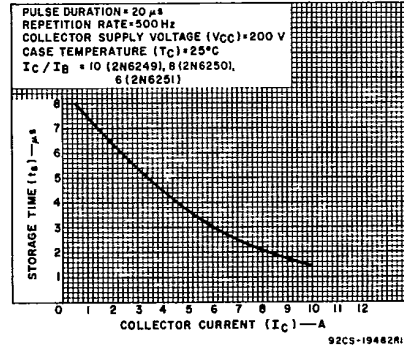


Fig. 10 - Typical storage-time characteristics for all types (with constant forced gain).

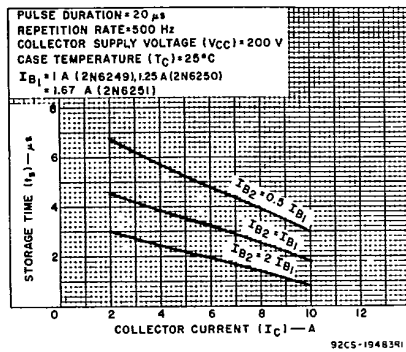


Fig. 11 - Typical storage-time characteristics for all types (with constant base drive).

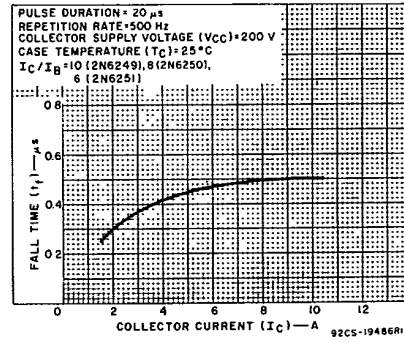


Fig. 12 - Typical fall-time characteristic for all types.

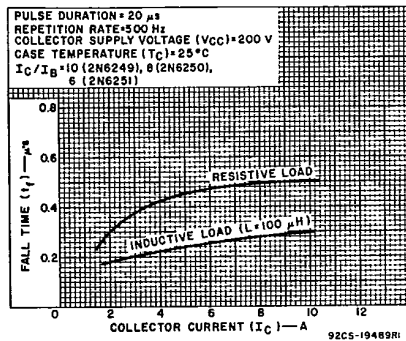


Fig. 13 - Typical inductive- and resistive-load fall-time characteristics for all types.

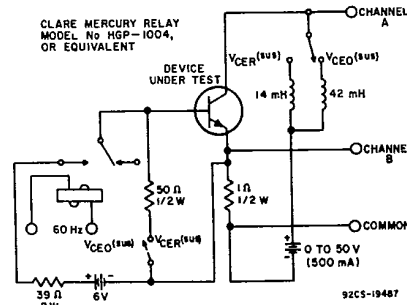
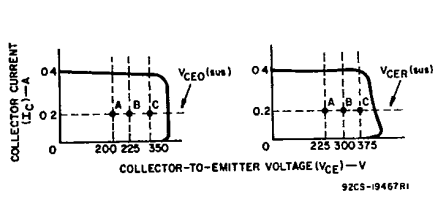


Fig. 14 - Circuit used to measure sustaining voltage $V_{CE0(sus)}$ and $V_{CEr(sus)}$ for all types.

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The sustaining voltages $V_{CE0(sus)}$ and $V_{CEr(sus)}$ are acceptable when the traces fall to the right of point "A" for type 2N6249, point "B" for type 2N6250, and point "C" for type 2N6251 ($I_C = 0.2$ A).

Fig. 15 - Oscilloscope display for measurement of sustaining voltages.

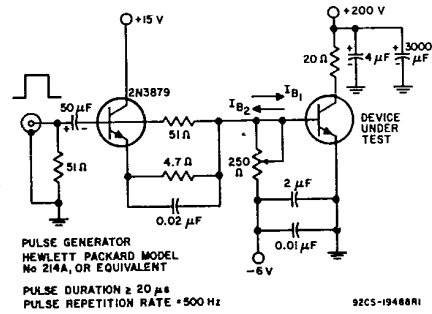


Fig. 16 - Circuit used to measure switching times for all types.

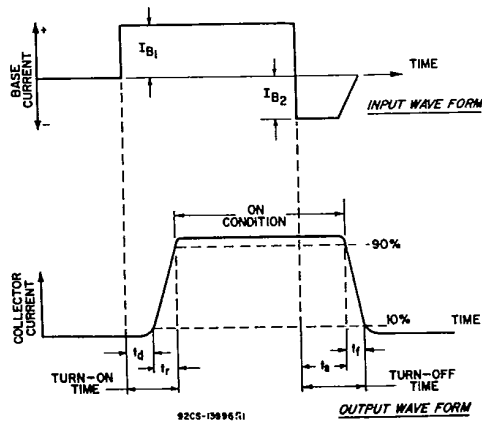


Fig. 17 - Phase relationship between input and output currents showing reference points for specifications of switching times.

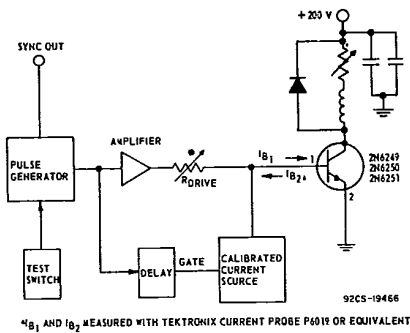


Fig. 18 - Circuit used to measure inductive-load switching times for all types.