File Number **677**

2N6246, 2N6247, 2N6248, 2N6469

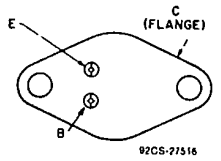
Silicon P-N-P Epitaxial-Base, High-Power Transistors

General-Purpose Types of Switching and Linear-Amplifier Applications

Features:

- *High dissipation capability: 125 W at 25°C*
- *Low saturation voltages*
- *Maximum safe-area-of-operation curves*
- *High gain at high current*

TERMINAL DESIGNATIONS



JEDEC TO-204AA

RCA-2N6246, 2N6247, 2N6248, and 2N6469 are epitaxial-base silicon p-n-p transistors featuring high gain at high current. All of these devices have a dissipation capability of 125 watts at case temperatures up to 25°C. They differ in voltage ratings and in the currents at which the parameters are controlled. All are supplied in the JEDEC TO-204AA package.

▲Formerly RCA Dev. Nos. TA7281, TA7280, TA7279, and TA8724, respectively.

Maximum Ratings, *Absolute-Maximum Values:*

		2N6469	2N6246	2N6247	2N6248	
*COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	-50	-70	-90	-110	V
COLLECTOR-TO-EMITTER VOLTAGE:						
* With external base-to-emitter resistance (R_{BE}) = 100 Ω	V_{CER}	-50	-70	-90	-110	V
With base open	V_{CEO}	-40	-60	-80	-100	V
*EMITTER-TO-BASE VOLTAGE	V_{EBO}	-5	-5	-5	-5	V
*CONTINUOUS COLLECTOR CURRENT	I_C	-15	-15	-15	-10	A
*CONTINUOUS BASE CURRENT	I_B	-5	-5	-5	-5	A
*TRANSISTOR DISSIPATION:	P_T					
At case temperatures up to 25°C		125	125	125	125	W
At case temperatures above 25°C		← See Fig. 2 →				
*TEMPERATURE RANGE:						
Storage & Operating (Junction)		← −65 to +200 →				°C
*PIN TEMPERATURE (During Soldering):						
At distances ≥ 1/32" (0.8 mm) from seating plane for 10 s max.		← +235 →				°C

* In accordance with JEDEC registration data format (JS-6 RDF-2).

2N6246, 2N6247, 2N6248, 2N6469

ELECTRICAL CHARACTERISTICS FOR P-N-P TYPES, *At case temperature (T_C) = 25°C unless otherwise specified*

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS				UNITS
		VOLTAGE V dc		CURRENT A dc		2N6469		2N6246		
		V_{CE}	V_{BE}	I_C	I_B	Min.	Max.	Min.	Max.	
Collector-Cutoff Current: With external base-emitter resistance (R_{BE}) = 100 Ω	I_{CER}	−35 −55				– –	−200 –	– –	– −200	μA
* With base-emitter junction reverse-biased	I_{CEX}	−45 −65	1.5 1.5			– –	−200 –	– –	– −200	μA
* With reverse bias and T_C = 150°C	I_{CEX}	−45 −55	1.5 1.5			– –	−5 –	– –	– −5	mA
* With base open	I_{CEO}	−20 −30			0 0	– –	−1 –	– –	– −1	mA
* Emitter-Cutoff Current	I_{EBO}		5		0	–	−5	–	−5	mA
* DC Forward-Current Transfer Ratio	h_{FE}	−4 −4 −4		−5[a] −7[a] −15[a]		20 – 5	150 – –	– 20 5	– 100 –	
Collector-to-Emitter Sustaining Voltage: * With base open	$V_{CEO(sus)}$			−0.2	0	−40[b]	–	−60[b]	–	V
With external base-emitter resistance (R_{BE}) = 100 Ω	$V_{CER(sus)}$			−0.2		−45[b]	–	−65[b]	–	
* Base-to-Emitter Voltage	V_{BE}	−4 −4		−15[a] −7[a]		– –	−3.5 –	– –	– −2	V
* Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$			−5[a] −7[a] −15[a] −15[a]	−0.5 −0.7 −5 −3	– – – –	−1.3 – −3.5 –	– – – –	– −1.3 – −2.5	V
* Magnitude of Common-Emitter Small-Signal Short-Circuit Forward-Current Transfer Ratio: f = 2 MHz	$\lvert h_{fe} \rvert$	−4		−1		5	–	5	–	
* Common-Emitter, Small-Signal Short-Circuit, Forward-Current Transfer Ratio: f = 1 kHz	h_{fe}	−4		−1		25	–	25	–	
Thermal Resistance: Junction-to-case	$R_{\theta JC}$					–	1.4	–	1.4	°C/W

* In accordance with JEDEC registration data format (JS-6 RDF-2).

[a] Pulsed; pulse duration = 300 μs, duty factor = 1.8%.

[b] *CAUTION: CAUTION: Sustaining voltages $V_{CEO(sus)}$ and $V_{CER(sus)}$ MUST NOT be measured on a curve tracer.*

General-Purpose Power Transistors

2N6246, 2N6247, 2N6248, 2N6469

ELECTRICAL CHARACTERISTICS FOR P-N-P TYPES, *At case temperature (T_C) = 25°C unless otherwise specified*

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS				UNITS
		VOLTAGE V dc		CURRENT A dc		2N6247		2N6248		
		V_{CE}	V_{BE}	I_C	I_B	Min.	Max.	Min.	Max.	
Collector-Cutoff Current: With external base-emitter resistance (R_{BE}) = 100 Ω	I_{CER}	−75 −95				– –	−200 –	– –	– −200	μA
With base-emitter junction reverse-biased	I_{CEX}	−85 −100	1.5 1.5			– –	−200 –	– –	– −200	μA
With reverse bias, at T_C = 150°C	I_{CEX}	−70 −90	1.5 1.5			– –	−5 –	– –	– −5	mA
With base open	I_{CEO}	−40 −50			0 0	– –	−1 –	– –	– −1	mA
Emitter-Cutoff Current	I_{EBO}		5		0	–	−1	–	−1	mA
DC Forward-Current Transfer Ratio	h_{FE}	−4 −4 −4 −4		−5[a] −6[a] −10[a] −15[a]		– 20 – 5	– 100 – –	20 – 5 –	100 – – –	
Collector-to-Emitter Sustaining Voltage: With base open	$V_{CEO(sus)}$			−0.2	0	−80[b]	–	−100[b]	–	V
With external base-emitter resistance (R_{BE}) = 100 Ω	$V_{CER(sus)}$			−0.2		−85[b]	–	−105[b]	–	
Base-to-Emitter Voltage	V_{BE}	−4 −4		−6[a] −5[a]		– –	−1.8 –	– –	– −1.8	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$			−5[a] −6[a] −15[a] −10[a]	−0.5 −0.6 −4 −2	– – – –	– −1.3 −3.5 –	– – – –	−1.3 – – −3.5	V
Magnitude of Common-Emitter Small-Signal Short-Circuit Forward-Current Transfer Ratio: f = 2 MHz	$\lvert h_{fe} \rvert$	−4		−1		5	–	5	–	
Common-Emitter, Small-Signal, Short-Circuit, Forward-Current Transfer Ratio: f = 1 kHz	h_{fe}	−4		−1		25	–	25	–	
Thermal Resistance: Junction-to-case	$R_{\theta JC}$					–	1.4	–	1.4	°C/W

* In accordance with JEDEC registration data format (JS-6 RDF-2).

[a] Pulsed; pulse duration = 300 μs, duty factor = 1.8%.

[b] *CAUTION: Sustaining voltages $V_{CEO(sus)}$ and $V_{CER(sus)}$ MUST NOT be measured on a curve tracer.*

2N6246, 2N6247, 2N6248, 2N6469

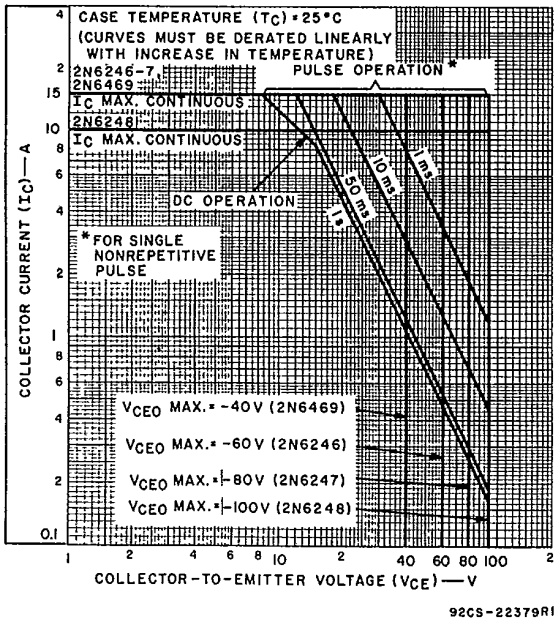


Fig. 1 — Maximum operating areas for all types.

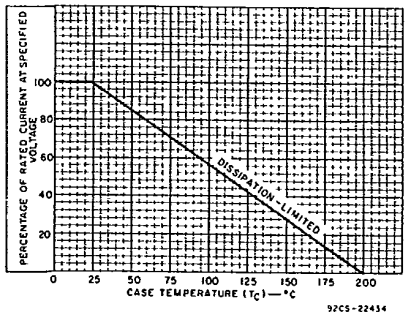


Fig. 2 — Current derating for all types.

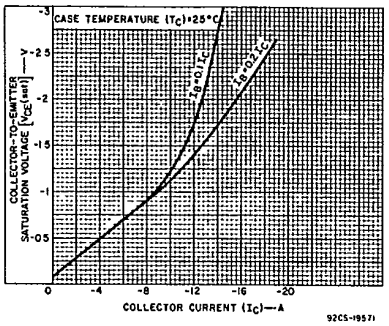


Fig. 3 — Typical collector-to-emitter saturation-voltage characteristics for 2N6246, 2N6247, 2N6248, and 2N6469.

2N6246, 2N6247, 2N6248, 2N6469

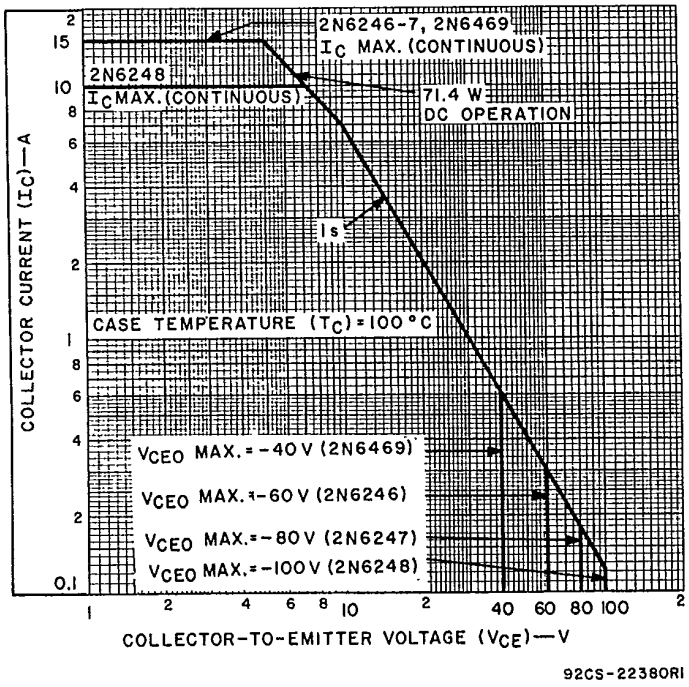


Fig. 4 — Maximum operating areas for all types.

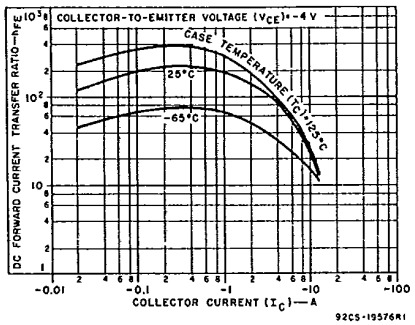


Fig. 5 — Typical dc beta characteristics for 2N6246, 2N6247, and 2N6469.

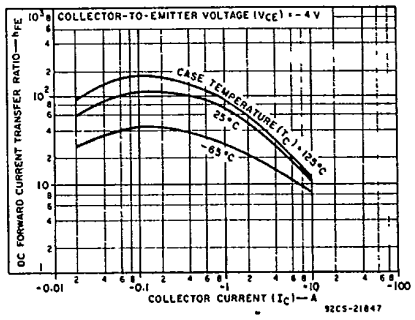


Fig. 6 — Typical dc beta characteristics for 2N6248.

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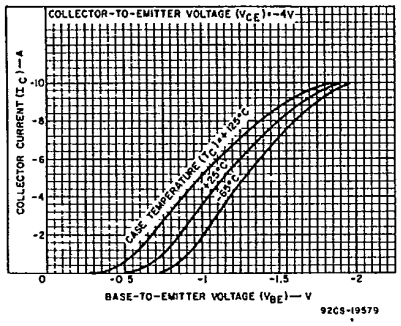

Fig. 7 — Typical transfer characteristics for 2N6246, 2N6247, 2N6248, and 2N6469.

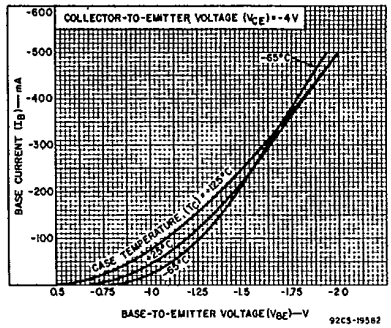

Fig. 8 — Typical input characteristics for 2N6246, 2N6247, and 2N6469.

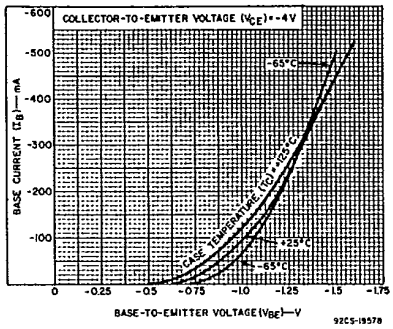

Fig. 9 — Typical input characteristics for 2N6248.

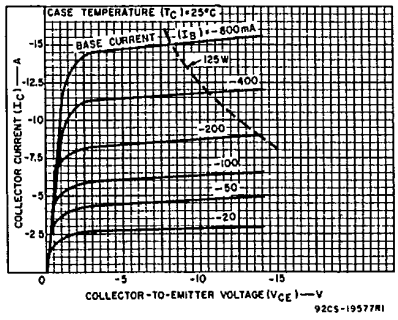

Fig. 10 — Typical output characteristics for 2N6246, 2N6247, and 2N6469.

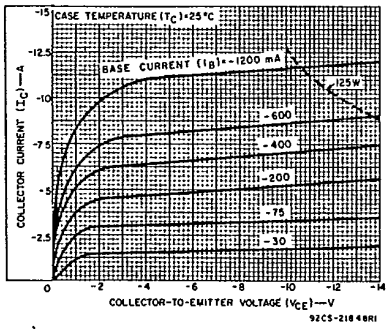

Fig. 11 — Typical output characteristics for 2N6248.

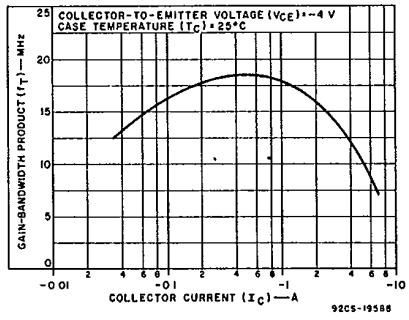

Fig. 12 — Typical gain-bandwidth product vs. collector current for 2N6246, 2N6247, 2N6248, and 2N6469.

2N6246, 2N6247, 2N6248, 2N6469

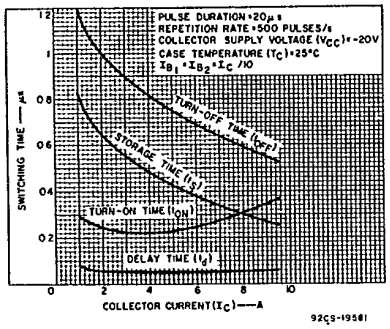

Fig. 13 — Typical saturated switching characteristics for 2N6246, 2N6247, 2N6248, and 2N6469.

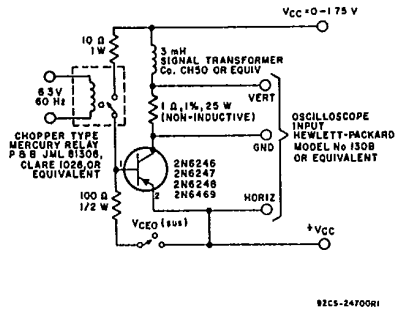

Fig. 14 — Circuit used to measure sustaining voltages V_{CEO}(sus) and V_{CER}(sus) for all types.

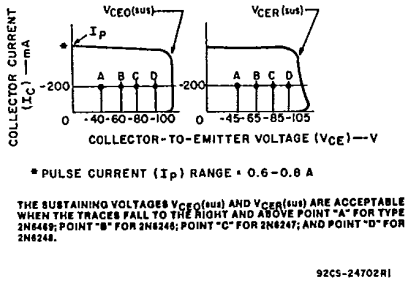

Fig. 15 — Oscilloscope display for measurement of sustaining voltages (test circuit shown in Fig. 14).

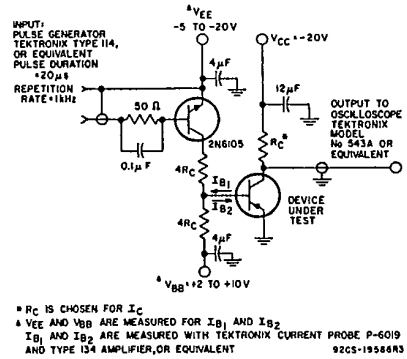

Fig. 16 — Circuit used to measure switching times for 2N6246, 2N6247, 2N6248, and 2N6469.

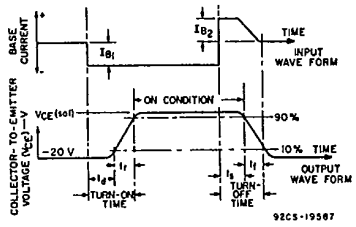

Fig. 17 — Oscilloscope display for measurement of switching times.