

File Number 677

2N6246, 2N6247, 2N6248, 2N6469

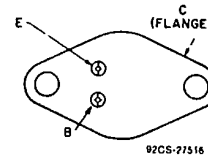
Silicon P-N-P Epitaxial-Base, High-Power Transistors

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	-50	-70	-90	-110	V
COLLECTOR-TO-EMITTER VOLTAGE:					
* With external base-to-emitter resistance (R _{BE}) = 100 Ω	-50	-70	-90	-110	V
With base open	-40	-60	-80	-100	V
*EMITTER-TO-BASE VOLTAGE	-5	-5	-5	-5	V
*CONTINUOUS COLLECTOR CURRENT	-15	-15	-15	-10	A
*CONTINUOUS BASE CURRENT	-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).

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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		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		-45 -55	1.5 1.5			- -	-5 -	- -	- -5	mA
With base open	I _{CEO}	-20 -30		0 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	-	V
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	h _{fe}	-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 _{θJC}					-	1.4	-	1.4	°C/W

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

^b Pulsed: pulse duration = 300 μs, duty factor = 1.8%.

^c CAUTION: CAUTION: Sustaining voltages V_{CEO(sus)} and V_{CER(sus)} MUST NOT be measured on a curve tracer.

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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		-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	-	V
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	h _{fe}	-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 _{θJC}					-	1.4	-	1.4	°C/W

^a 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.

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General-Purpose Power Transistors

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2N6246, 2N6247, 2N6248, 2N6469

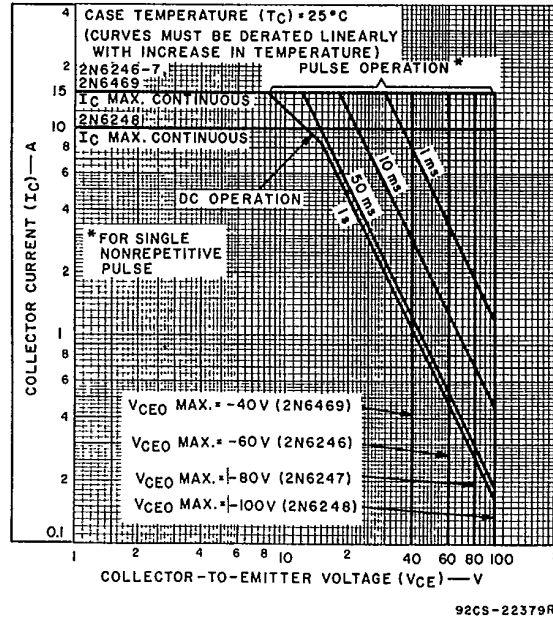


Fig. 1 — Maximum operating areas for all types.

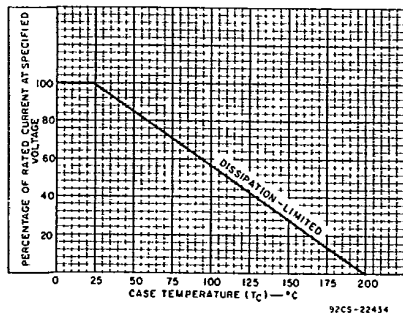


Fig. 2 — Current derating for all types.

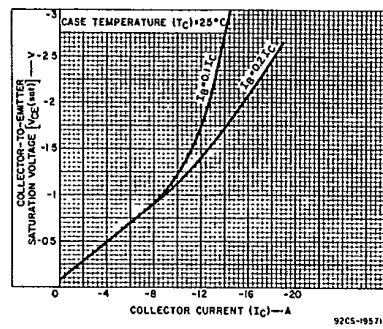
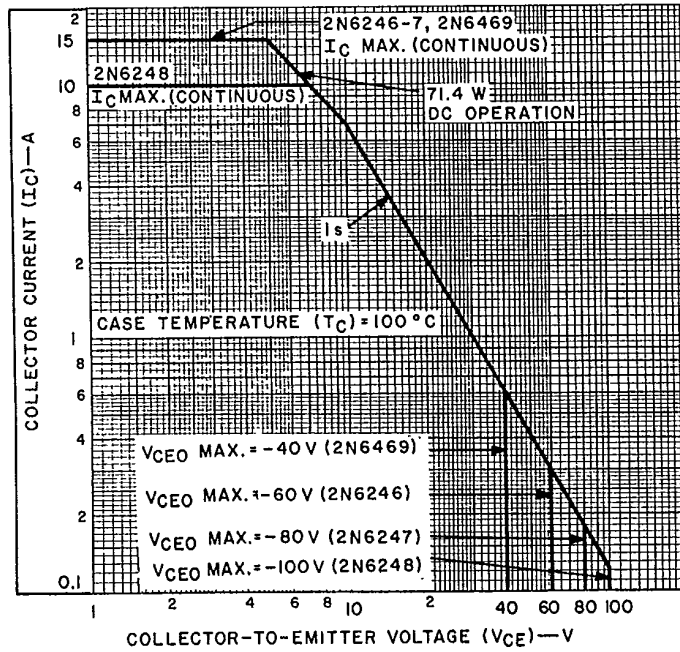


Fig. 3 — Typical collector-to-emitter saturation-voltage characteristics for 2N6246, 2N6247, 2N6248, and 2N6469.

2N6246, 2N6247, 2N6248, 2N6469



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Fig. 4 — Maximum operating areas for all types.

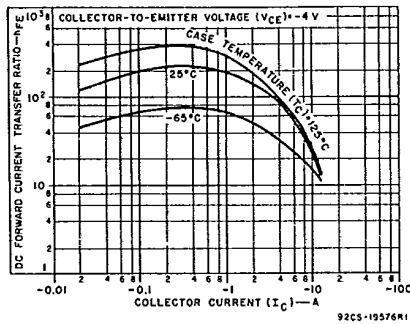


Fig. 5 — Typical dc beta characteristics for 2N6246, 2N6247, and 2N6469.

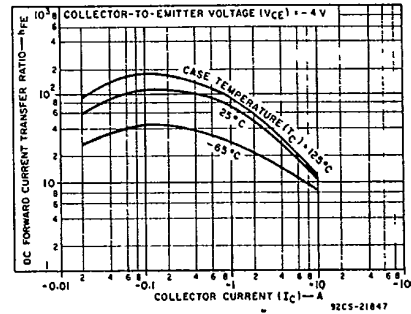


Fig. 6 — Typical dc beta characteristics for 2N6248.

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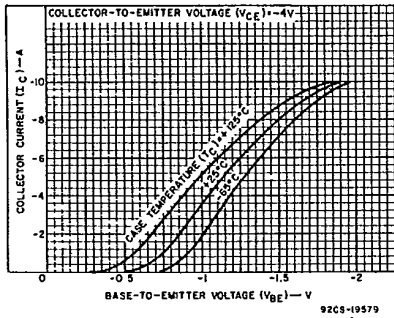


Fig. 7 — Typical transfer characteristics for 2N6246, 2N6247, 2N6248, and 2N6469.

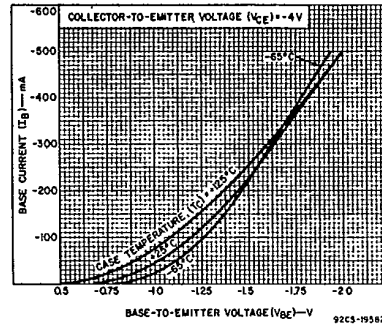


Fig. 8 — Typical input characteristics for 2N6246, 2N6247, and 2N6469.

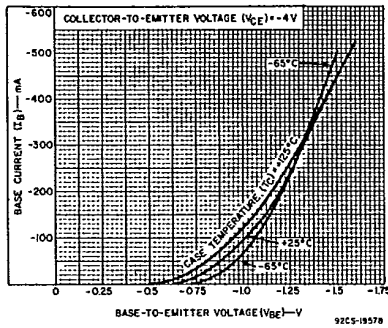


Fig. 9 — Typical input characteristics for 2N6248.

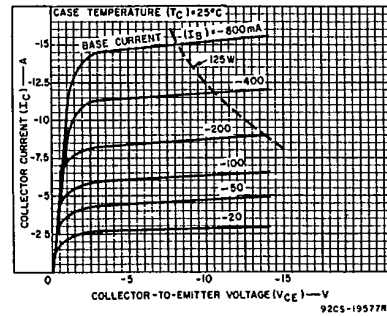


Fig. 10 — Typical output characteristics for 2N6246, 2N6247, and 2N6469.

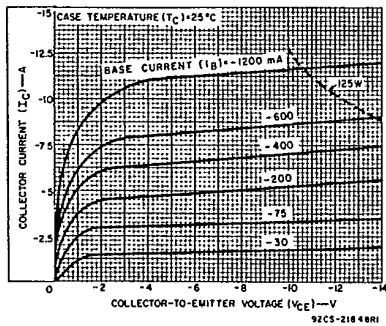


Fig. 11 — Typical output characteristics for 2N6248.

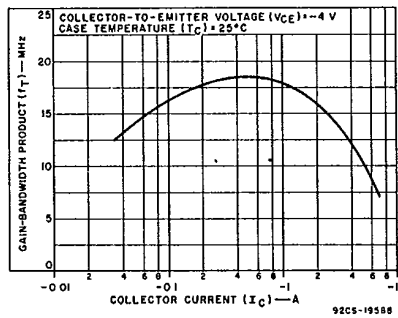


Fig. 12 — Typical gain-bandwidth product vs. collector current for 2N6246, 2N6247, 2N6248, and 2N6469.

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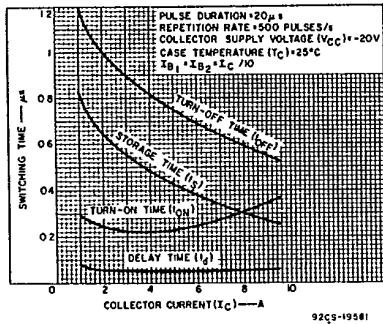


Fig. 13 — Typical saturated switching characteristics for 2N6246, 2N6247, 2N6248, and 2N6469.

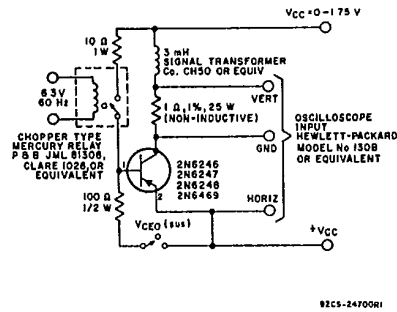
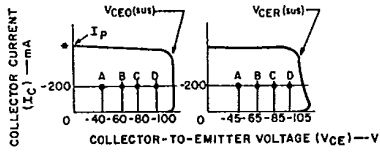


Fig. 14 — Circuit used to measure sustaining voltages $V_{CE(sus)}$ and $V_{CE(sus)}$ for all types.

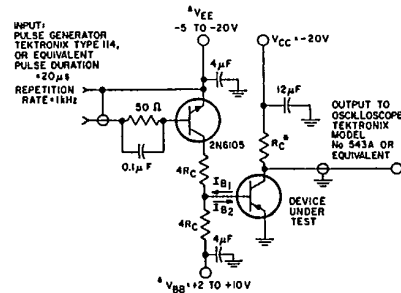


* PULSE CURRENT (I_P) RANGE = 0.6 - 0.8 A

THE SUSTAINING VOLTAGES $V_{CE(sus)}$ AND $V_{CE(sus)}$ ARE ACCEPTABLE WHEN THE TRACES FALL TO THE RIGHT AND ABOVE POINT "A" FOR TYPE 2N6246; POINT "B" FOR 2N6246; POINT "C" FOR 2N6247; AND POINT "D" FOR 2N6248.

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



* R_C IS CHOSEN FOR I_C
 * V_{EE} AND V_{BB} ARE MEASURED FOR I_{B1} AND I_{B2}
 I_{B1} AND I_{B2} ARE MEASURED WITH TEKTRONIX CURRENT PROBE P-6019
 AND TYPE 134 AMPLIFIER, OR EQUIVALENT

92CS-19588R3

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

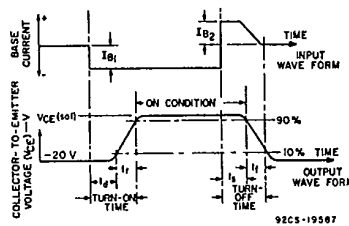


Fig. 17 — Oscilloscope display for measurement of switching times.

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