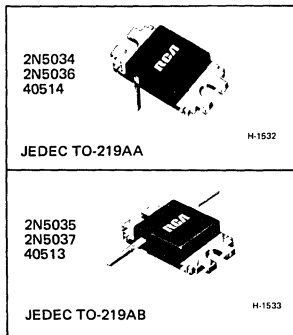




Power Transistors

2N5034 2N5035
 2N5036 2N5037
 40514 40513



Molded Silicone-Plastic Hometaxial-Base Transistors

Silicon N-P-N Types for Industrial and Commercial Applications

Features:

- Low thermal resistance: $\theta_{J-C} = 1.5^{\circ}\text{C/W max.}$
- Low saturation voltage
- High second breakdown ratings for both forward- and reverse-bias operation
- High peak collector current ratings
- Maximum-area-of-operation curves for DC and pulse operation

RCA-2N5034, 2N5035, 2N5036, 2N5037*, 40513, and 40514 are hometaxial**-base silicon n-p-n power transistors employing two versions of a unique plastic package. This new plastic package is available with two different lead configurations: a "vertical-lead" version which will fit a TO-3 socket; a "horizontal-lead" type for mounting on a printed-circuit board.

Types 2N5034, 2N5036, and 40514 are the "TO-3" versions. The 2N5034, 2N5036, and 40514 differ in breakdown-voltage, collector-current ratings, and leakage-current limits. These devices may be plugged into a TO-3 socket and secured by means of an over-clamp whose mounting holes are identical to those in a TO-3 socket.

Types 2N5035, 2N5037, and 40513 are electrically identical to the 2N5034, 2N5036, and 40514, respectively, but employ the horizontal-lead package.

These plastic transistors are intended for a wide variety of high-power switching and amplifier applications such as series and shunt regulator driver and output stages and for high-fidelity amplifiers.

*Formerly Dev. Type Nos. TA7201, TA7202, TA7199, and TA7200 respectively.

**"Hometaxial" was coined by RCA from "homogeneous" and "axial" to describe a single-diffused transistor with a base region of homogeneous-resistivity silicon in the axial direction (emitter-to-collector).

MAXIMUM RATINGS, Absolute-Maximum Values:	40514 40513	2N5034 2N5035	2N5036 2N5037	
* COLLECTOR-TO-BASE VOLTAGE	-	55	70	V
COLLECTOR-TO-EMITTER SUSTAINING VOLTAGE:				
With -1.5 volts (V_{BE}) of reverse bias	-	55	70	V
* With external base-to-emitter resistance (R_{BE}) = 100 Ω	45	45	60	V
With base open	-	40	50	V
* EMITTER-TO-BASE VOLTAGE	5	5	5	V
* CONTINUOUS COLLECTOR CURRENT	6	6	8	A
* PEAK COLLECTOR CURRENT	12	12	12	A
* CONTINUOUS BASE CURRENT	6	6	6	A
* TRANSISTOR DISSIPATION:				P _T
At case temperatures up to 25°C	83	83	83	W
At temperatures above 25°C		See Fig. 1		
* TEMPERATURE RANGE:				
Storage & Operating (Junction)		-65 to 150		°C
* LEAD TEMPERATURE (During Soldering)				
2N5034, 2N5036, & 40514: At distance \geq 1/16 in. (1.58mm) from seating plane for 10s max.		235		°C
2N5035, 2N5037, & 40513: At distances \geq 1/8 in. (3.18mm) from case for 10s max.		235		°C

* Types 2N5034-2N5037, inclusive, in accordance with JEDEC registration data format JS-6 RDF-2.

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

Characteristic	Symbol	TEST CONDITIONS						LIMITS						Units
		DC Collector Voltage (V)		DC Emitter or Base Voltage (V)		DC Current (A)		Types 40514 40513		Types 2N5034 2N5035		Types 2N5036 2N5037		
		VCE	VEB	VBE	IC	IB	Min.	Max.	Min.	Max.	Min.	Max.		
Collector-Cutoff Current With external base-to-emitter resistance (R_{BE}) = 100 Ω	I_{CER}	20					–	2.5	–	–	–	–	–	mA
		35					–	–	–	1.0	–	–		
		50					–	–	–	–	–	1.0		
* With base-emitter junction reverse biased	I_{CEV} ($T_C = 150^\circ C$)	20					–	5.0	–	–	–	–	mA	
		35					–	–	–	5.0	–	–		
		50					–	–	–	–	–	5.0		
* With base open	I_{CEO}	30				0	–	–	–	2	–	–	mA	
		40				0	–	–	–	–	–	2		
* Emitter-Cutoff Current	I_{EBO}		5		0		–	5.0	–	5.0	–	5.0	mA	
* DC Forward-Current Transfer Ratio	h_{FE}	4			3 ^a		25	100	–	–	–	–		
		4			4 ^a		–	–	20	80	–	–		
		4			5 ^a		–	–	–	–	20	80		
		4			6 ^a		–	–	5	–	–	–		
		4			8 ^a		–	–	–	–	5	–		
Collector-to-Emitter Sustaining Voltage With base open	$V_{CEO(sus)}$				0.2 ^a	0	–	–	40	–	50	–	V	
With base-emitter junction reverse biased	$V_{CEV(sus)}$			–1.5	0.1 ^a		–	–	55	–	70	–	V	
With external base-to-emitter resistance (R_{BE}) = 100 Ω	$V_{CER(sus)}$				0.2 ^a		45	–	45	–	60	–	V	
* Base-to-Emitter Voltage	V_{BE}	4			3 ^a		–	1.7	–	–	–	–	V	
		4			4 ^a		–	–	–	1.7	–	–		
		4			5 ^a		–	–	–	–	–	1.7		
* Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$				3 ^a	0.3	–	1.0	–	–	–	–	V	
					4 ^a	0.4	–	–	–	1.0	–	–		
					5 ^a	0.5	–	–	–	–	–	1.0		
* Common-Emitter, Small-Signal, Short-Circuit Forward-Current Transfer Ratio (f = 1 kHz)	h_{fe}	4			0.5		15	–	15	–	15	–		
* Magnitude of Common-Emitter, Small-Signal, Short-Circuit, Forward-Current Transfer Ratio (f = 100 kHz)	$ h_{fe} $	4			0.5		8	28	8	28	8	28		
Thermal Resistance (Junction-to-Case)	θ_{J-C}						–	1.5	–	1.5	–	1.5	°C/W	

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

* Types 2N5034-2N5037, inclusive, in accordance with JEDEC registration data format JS-6 RDF-2.

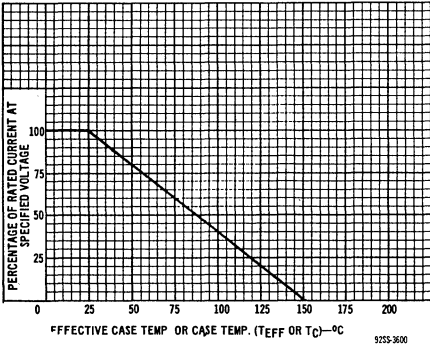


Fig. 1—Dissipation derating curve for all types.

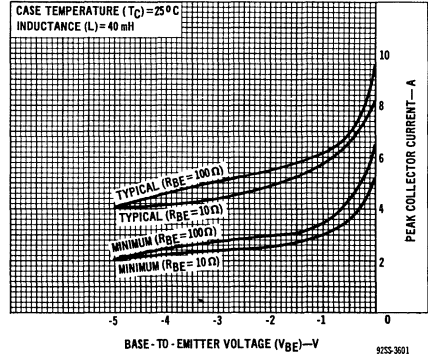


Fig. 2—Reverse-bias, second breakdown characteristics for all types.

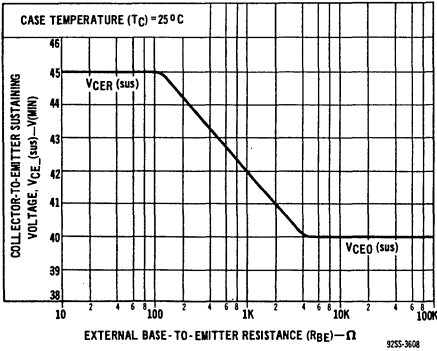


Fig. 3—Sustaining voltage vs. base-to-emitter resistance for types 2N5034 & 2N5035.

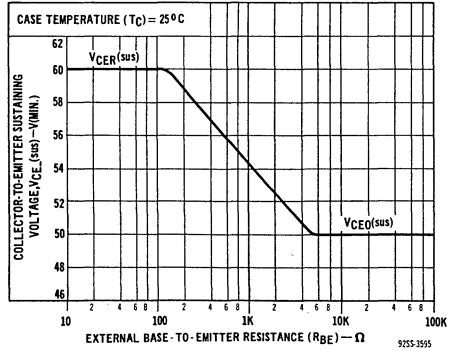


Fig. 4—Sustaining voltage vs. base-to-emitter resistance for types 2N5036 & 2N5037.

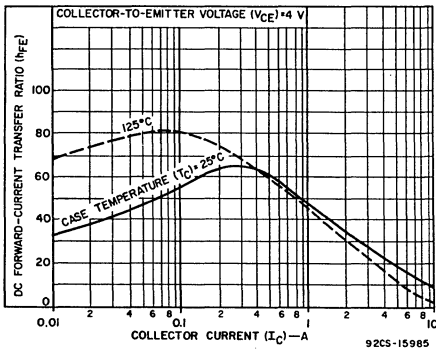


Fig. 5—Typical dc beta characteristics for types 2N5034, 2N5035, 40513, & 40514.

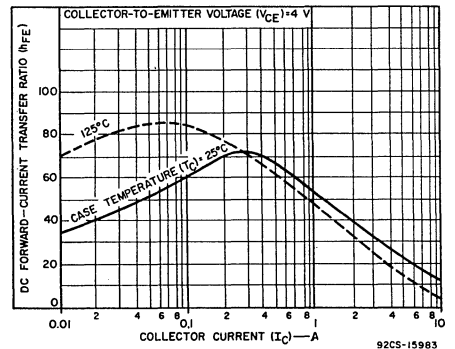


Fig. 6—Typical dc beta characteristics for types 2N5036 & 2N5037.

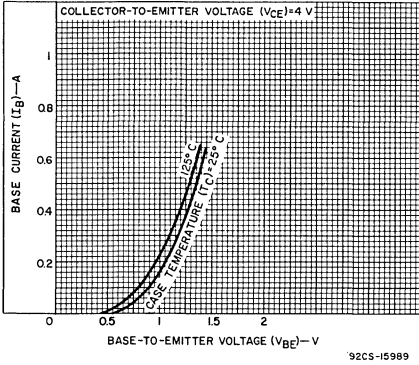


Fig. 7—Typical input characteristics for types 2N5034, 2N5035, 40513, & 40514.

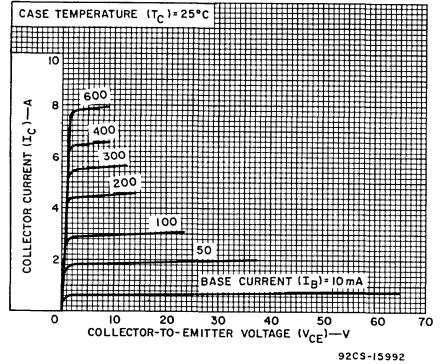


Fig. 8—Typical output characteristics for types 2N5034, 2N5035, 40513, & 40514.

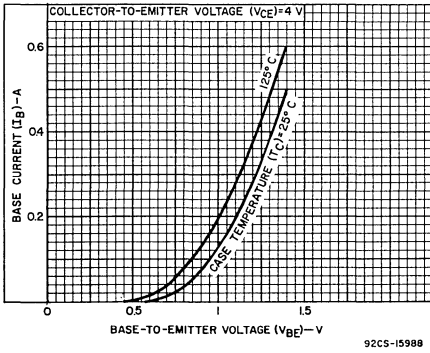


Fig. 9—Typical input characteristics for types 2N5036 & 2N5037.

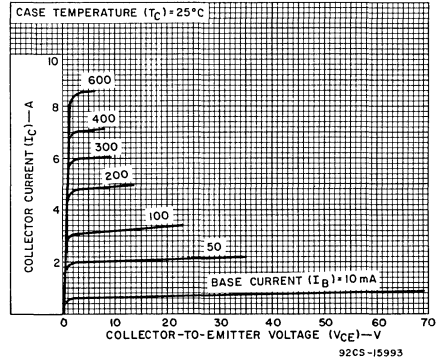


Fig. 10—Typical output characteristics for types 2N5036 & 2N5037.

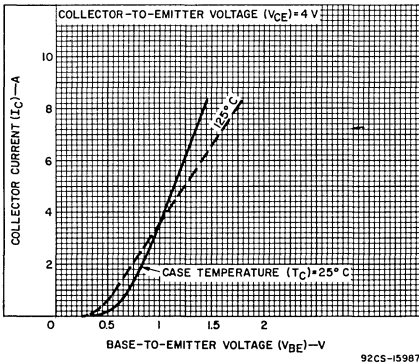


Fig. 11—Typical transfer characteristics for all types.

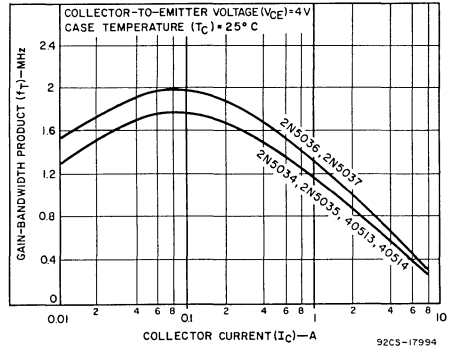


Fig. 12—Typical gain-bandwidth product for all types.

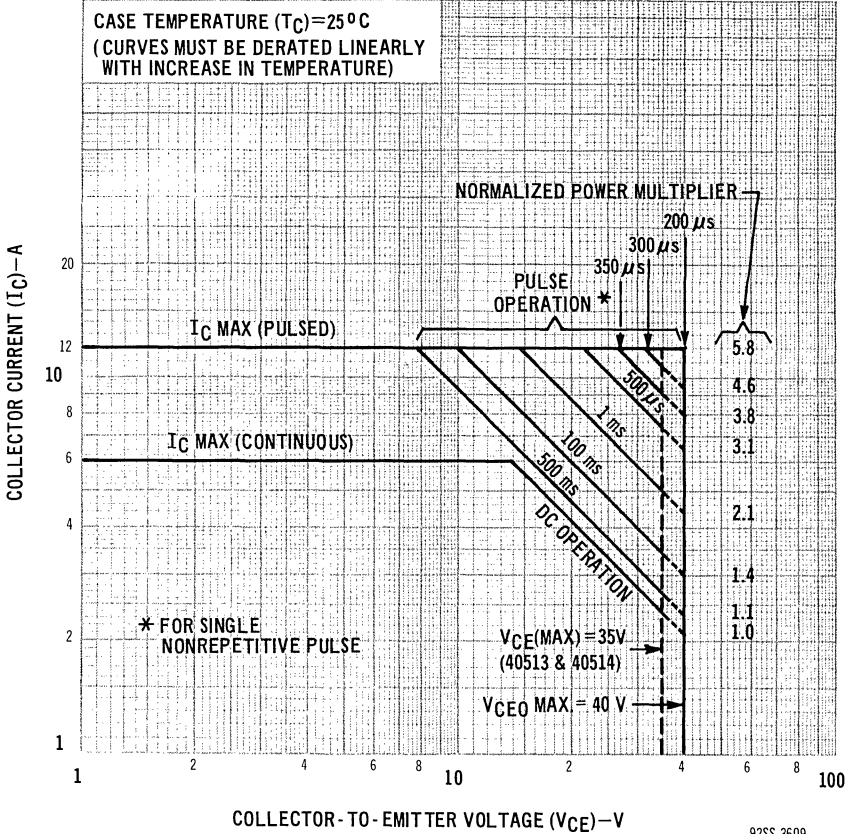


Fig. 13—Maximum operating areas for types 2N5034, 2N5035, 40513, & 40514.

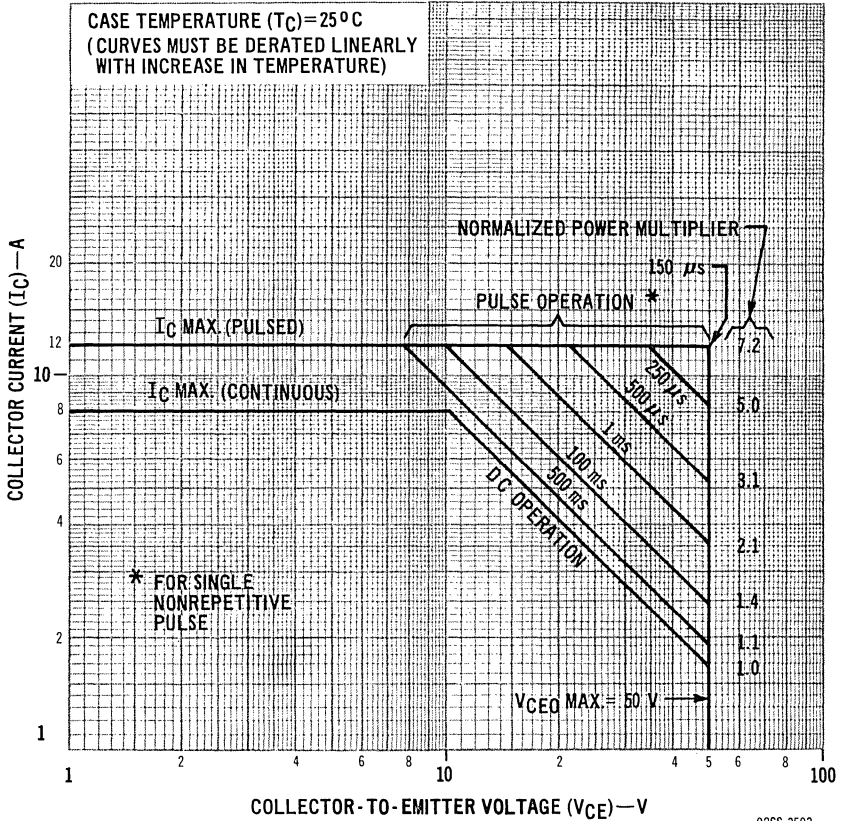


Fig. 14—Maximum operating areas for types 2N5036 & 2N5037.

TERMINAL CONNECTIONS FOR ALL TYPES

- Lead No. 1 — Base
- Lead No. 2 — Emitter
- Mounting Flange — Collector