

2N5415, 2N5416

File Number 336

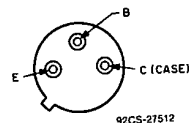
Silicon P-N-P High-Voltage
Planar Transistors

For High-Speed Switching and Linear-Amplifier
Applications in Military, Industrial and
Commercial Equipment

Features:

- 2N5415: p-n-p complement of 2N3440*
- 2N5416: p-n-p complement of 2N3439*
- Maximum safe-area-of-operation curves
- High voltage ratings:
 $V_{CBO} = -350$ V max. (2N5416)
 $V_{CEO} = -300$ V max. (2N5416)
 -200 V max. (2N5415)

TERMINAL DESIGNATIONS



JEDEC TO-205AD

The RCA-2N5415 and 2N5416[■] are silicon p-n-p transistors with high breakdown voltages, high frequency response, and fast switching speeds.

These transistors differ primarily in their voltage ratings. Typical applications include high-voltage differential and operational amplifiers; high-voltage inverters; and high-voltage, low-current switching and series regulators.

The 2N5415 and 2N5416 are supplied in the JEDEC TO-205AD package.

[■]Formerly RCA Dev. Types TA2819 and TA2819A.

*Data on types 2N3439 and 2N3440 are given in RCA data bulletin File No. 64.

MAXIMUM RATINGS, Absolute-Maximum Values:

	2N5415	2N5416	
* V_{CBO}	-200	-350	V
V_{CER}			
$R_{BE} = 50 \Omega$	—	-350	V
* V_{CEO}	-200	-300	V
* V_{EBO}	-4	-6	V
* I_C	-1	-1	A
* I_B	-0.5	-0.5	A
* P_T			
$T_C \leq 25^\circ\text{C}$	10	10	W
$T_C > 25^\circ\text{C}$	See Figs. 1 & 2		
$T_C \leq 50^\circ\text{C}$	1	1	W
$T_C > 50^\circ\text{C}$	6.7	6.7	mW/°C
* T_{stg}, T_J	-65 to +200		°C
* T_L			
At distance $\geq 1/32$ in. (0.8 mm) from seating plane for 10 s max.	255		°C

*In accordance with JEDEC registration data format (JS-9 RDF-8).

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ELECTRICAL CHARACTERISTICS, Case Temperature (T_C) = 25°C

CHARACTERISTIC	TEST CONDITIONS					LIMITS				UNITS
	VOLTAGE V dc			CURRENT mA dc		2N5415		2N5416		
	V _{CB}	V _{CE}	V _{BE}	I _C	I _B	MIN.	MAX.	MIN.	MAX.	
I _{CEO}		-250 -150			0 0	- -	- -50	- -	-50 -	μA
* I _{CBO} I _E = 0	-280 -175					- -	- -50	- -	-50 -	μA
I _{CEV}		-300 -200	1.5 1.5			- -	- -50	- -	-50 -	μA
* I _{EBO}			6 4	0 0		- -	- -20	- -	-20 -	μA
* h _{FE}		-10 -10		-50 ^b -50 ^b		- 30	- 150	30 -	120 -	
V _{CEO(sus)}				-50	0	-200 ^a	-	-300 ^a	-	V
V _{CER(sus)} R _{BE} = 50 Ω				-50		-	-	-350 ^a	-	V
V _{BE}		-10		-50 ^b		-	-1.5	-	-1.5	V
V _{CE(sat)}				-50 ^b	-5	-	-2.5	-	-2	V
* h _{fe} f = 1 kHz		-10		-5		25	-	25	-	
* h _{fe} f = 5 MHz		-10		-10		3	-	3	-	
* Re(h _{ie}) f = 1 MHz		-10		-5		-	300	-	300	Ω
* C _{ib} f = 1 MHz			5	0		-	75	-	75	pF
* C _{ob} f = 1 MHz	-10					-	15	-	15	pF
I _{S/b} t _p = 0.4 s nonrep.		-100				-100	-	-100	-	mA
R _{θJC}						-	17.5	-	17.5	°C/W

* In accordance with JEDEC registration data format (JS-9 RDF-8).

^a CAUTION: The sustaining voltages $V_{CEO(sus)}$ and $V_{CER(sus)}$ MUST NOT be measured on a curve tracer.^b Pulsed: Pulse = 300 μs ; duty factor $\leq 2\%$.

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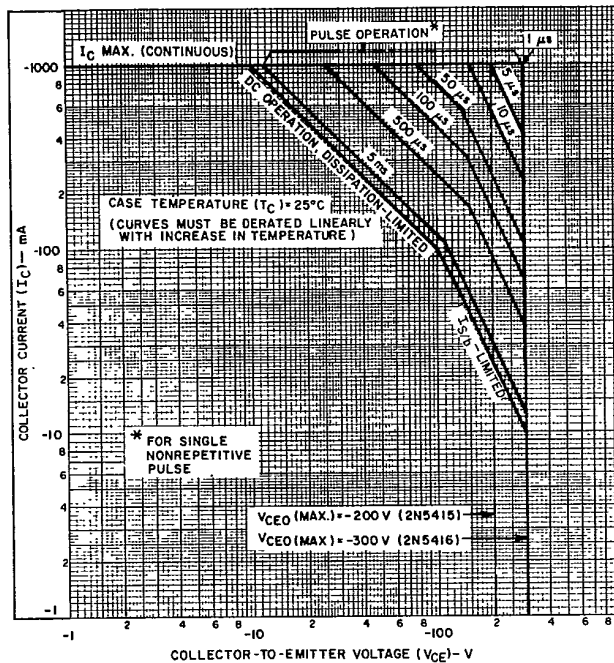


Fig. 1 — Maximum safe operating areas.

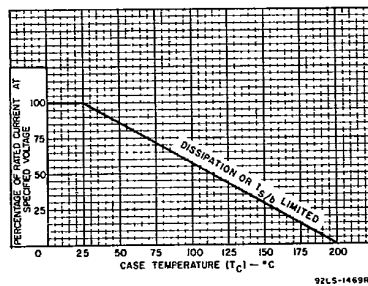


Fig. 2 — Dissipation derating curve.

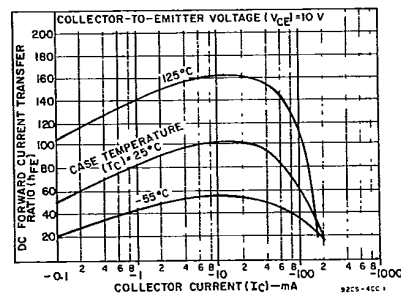


Fig. 3 — Typical dc beta characteristics for both types.

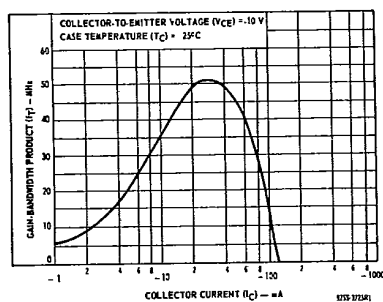


Fig. 4 — Typical gain-bandwidth product for both types.

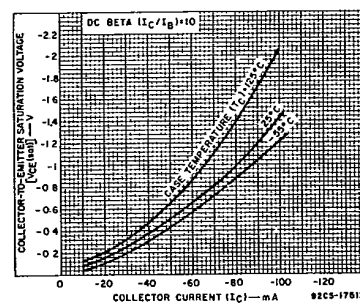


Fig. 5 — Typical collector-to-emitter saturation voltage for both types.

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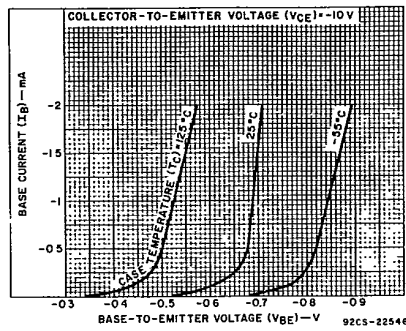


Fig. 6 - Typical input characteristics for both types.

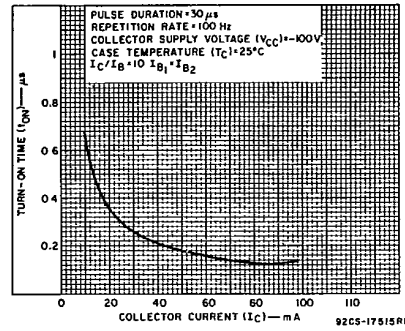


Fig. 7 - Typical turn-on time characteristic for both types.

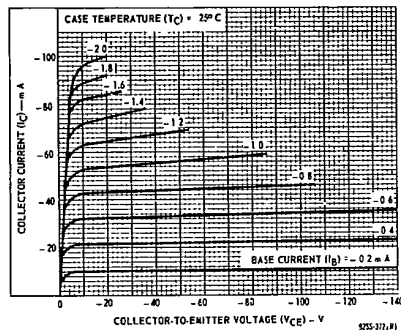


Fig. 8 - Typical output characteristics for both types.

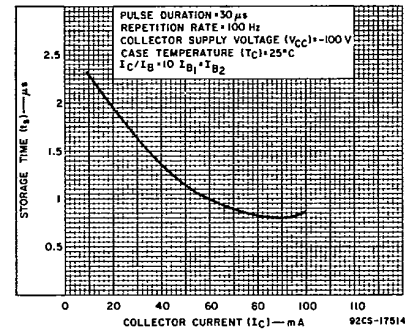


Fig. 9 - Typical storage-time characteristic for both types.

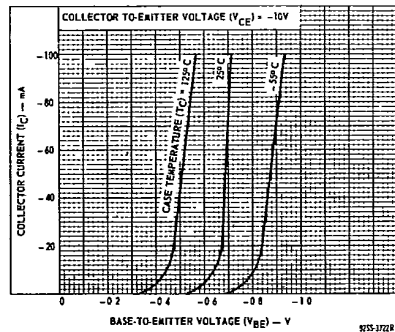


Fig. 10 - Typical transfer characteristics for both types.

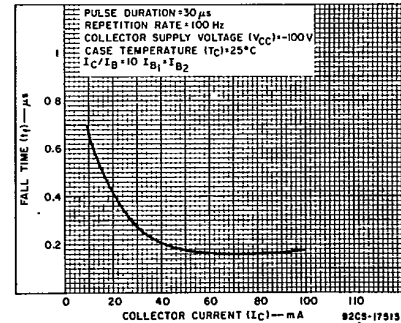


Fig. 11 - Typical fall-time characteristic for both types.