

File Number **325**

2N5320, 2N5321, 2N5322, 2N5323

Complementary N-P-N & P-N-P Silicon Power Transistors

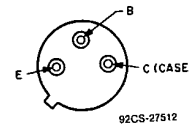
General-Purpose Types for Small-Signal, Medium-Power Applications

- Features:**
- 2N5322 } P-N-P Complements of: { 2N5320
 - 2N5323 } { 2N5321
 - Maximum safe-area-of-operation curves
 - Planar construction for low-noise and low leakage characteristics
 - Low saturation voltage
 - High beta at high collector current

The RCA-2N5320, 2N5321, 2N5322 and 2N5323 are doubled-diffused epitaxial-planar silicon power transistors intended for small-signal medium-power applications. The 2N5320 and 2N5321 n-p-n types are actually high-current, high-dissipation versions of the 2N2102 with all of the salient features of that device. The 2N5322 and 2N5323, p-n-p complements of the 2N5320 and 2N5321, are actually high-current, high-power versions of the 2N4036 with all of its additional outstanding features.

The 2N5320, 2N5321, 2N5322, and 2N5323 are supplied in the TO-205AD package.

TERMINAL DESIGNATIONS



JEDEC TO-205AD

MAXIMUM RATINGS, Absolute-Maximum Values:

	2N5321	2N5323	2N5320	2N5322	
*V _{CB0}	75	-75	100	-100	V
V _{CEV} V _{BE} = -1.5 V	75	-75	100	-100	V
V _{CER} R _{BE} = 100 Ω	65	-65	90	-90	V
*V _{CEO}	50	-50	75	-75	V
*V _{EBO}	5	-5	7	-7	V
*I _C	2	-2	2	-2	A
*I _B	1	-1	1	-1	A
*P _T T _C ≤ 25°C	10	10	10	10	W
T _C > 25°C	Derate linearly at 0.057 W/°C				°C
*T _{sig} , T _J	-65 to +200				°C
*T _L At distance > 1/16 in. (1.58 mm) from seating plane for 10 s max.	230				°C

* In accordance with JEDEC registration data format (JS-6-RDF-1).

2N5320, 2N5321, 2N5322, 2N5323

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

CHARACTERISTIC	TEST CONDITIONS				LIMITS								UNITS
	VOLTAGE V dc		CURRENT mA dc		2N5320		2N5321		2N5322		2N5323		
	V _{CE}	V _{BE}	I _C	I _B	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
I _{CBO}	80 [▲]				-	0.5	-	-	-	-	-	-	μA
	60 [▲]				-	-	5	-	-	-	-	-	
	-80 [▲]				-	-	-	-	-0.5	-	-	-	
	-60 [▲]				-	-	-	-	-	-	-5	-	
*I _{CEX}	100	-1.5			-	0.1	-	-	-	-	-	-	mA
	75	-1.5			-	-	-	0.1	-	-	-	-	
	-100	1.5			-	-	-	-	-0.1	-	-	-	
	-75	1.5			-	-	-	-	-	-	-0.1	-	
T _C = 150°C	70	-1.5			-	5	-	-	-	-	-	-	mA
	45	-1.5			-	-	-	5	-	-	-	-	
	-70	1.5			-	-	-	-	-5	-	-	-	
	-45	1.5			-	-	-	-	-	-	-5	-	
*I _{EBO}		-7	0		-	0.1	-	-	-	-	-	-	mA
		-5	0		-	-	-	0.1	-	-	-	-	
		7	0		-	-	-	-	-0.1	-	-	-	
		5	0		-	-	-	-	-	-	-0.1	-	
		-5	0		-	0.1	-	-	-	-	-	-	μA
		-4	0		-	-	-	0.5	-	-	-	-	
		5	0		-	-	-	-	-0.1	-	-	-	
		4	0		-	-	-	-	-	-	-0.5	-	
V _{(BR)CEV}		-1.5 1.5	0.1 -0.1		100 -	-	75 -	-	- -100	-	-75 -	-	V
V _{CE} (sus) ^a R _{BE} = 100Ω			100 ^b -100 ^b		90 -	-	65 -	-	- -90	-	-65 -	-	V
*V _{CEO} (sus) ^a			100 ^b -100 ^b	0 0	75 -	-	50 -	-	- -75	-	-50 -	-	V
*V _{CE} (sat)			500 ^b -500 ^b	50 -50	-	0.5 -	-	0.8 -	- -0.7	-	- -1.2	-	V
*V _{BE}	4 -4		500 ^b -500 ^b		-	1.1 -	-	1.4 -	- -1.1	-	- -1.4	-	V
*h _{FE}	4		500 ^b		30	130	40	250	-	-	-	-	
	-4		-500 ^b		-	-	-	-	30	130	40	250	
	2		1000 ^b		10	-	-	-	-	-	-	-	
	-2		-1000 ^b		-	-	-	-	10	-	-	-	
* h _{fe} l f = 10 MHz	4 -4		50 -50		5 -	-	5 -	-	- 5	-	- 5	-	
I _S /b ^d	50 -35				200 -	-	200 -	-	- -285	-	- -285	-	mA
*t _{ON}	30 -30		500 -500	50 -50	-	80 -	-	80 -	- 100	-	- 100	-	ns
*t _{OFF}	30 -30		500 -500	50 -50	-	800 -	-	800 -	- 1000	-	- 1000	-	ns
*R _{θJC}					-	17.5	-	17.5	-	17.5	-	17.5	°C/W
R _{θJA}					-	150	-	150	-	150	-	150	°C/W

▲ V_{CB}
 * In accordance with JEDEC registration data format (JS-6 RDF-1)
 a CAUTION: The sustaining voltages V_{CEO}(sus) and V_{CER}(sus) MUST NOT be measured on a curve tracer.
 b Pulsed; pulse duration < 300 μs, duty factor < 0.02.
 d Pulsed; 0.4 s non-repetitive pulse.

2N5320, 2N5321, 2N5322, 2N5323

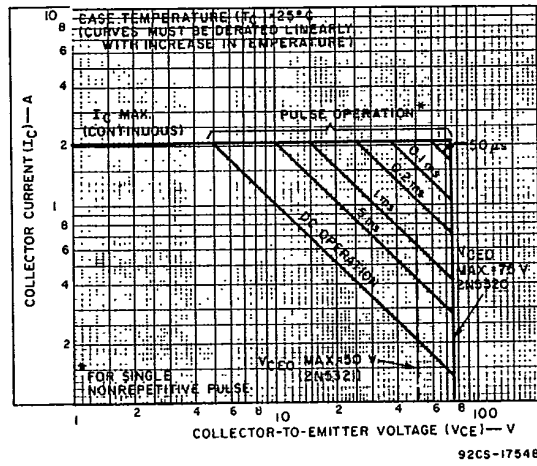


Fig.1 - Maximum operating areas for types 2N5320 and 2N5321.

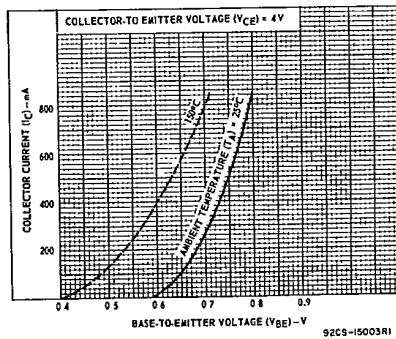


Fig.2 - Typical static beta characteristics for types 2N5320 and 2N5321.

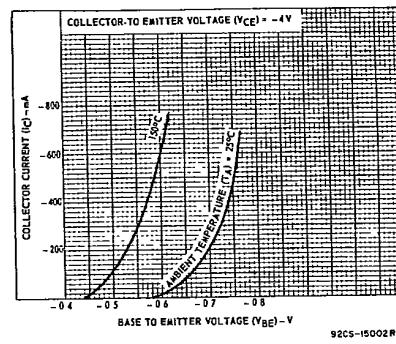


Fig.3 - Typical static beta characteristics for types 2N5322 and 2N5323.

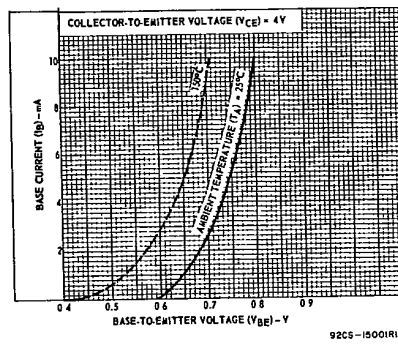


Fig.4 - Typical output characteristics for types 2N5320 and 2N5321.

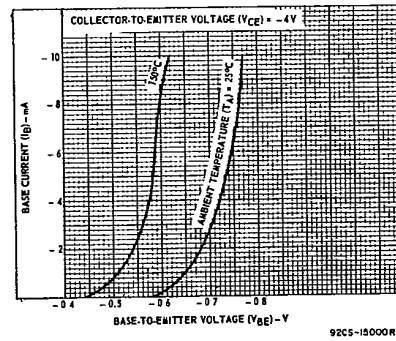


Fig.5 - Typical output characteristics for types 2N5322 and 2N5323.

2N5320, 2N5321, 2N5322, 2N5323

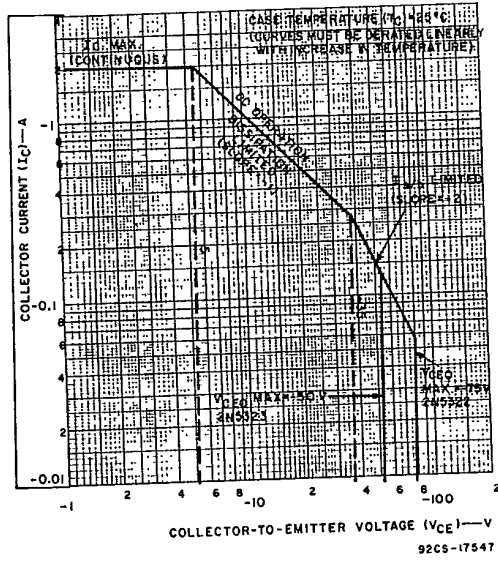


Fig.6 - Maximum operating areas for types 2N5322 and 2N5323.

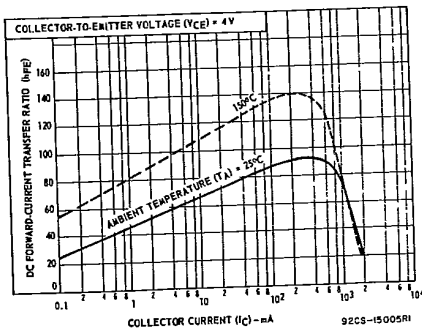


Fig.7 - Typical transfer characteristics for types 2N5320 and 2N5321.

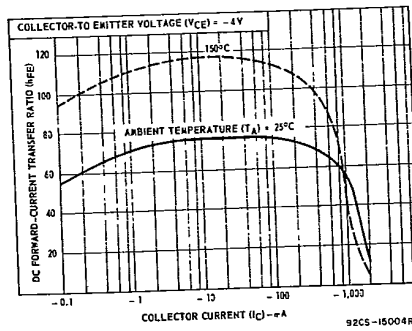


Fig.8 - Typical transfer characteristics for types 2N5322 and 2N5323.

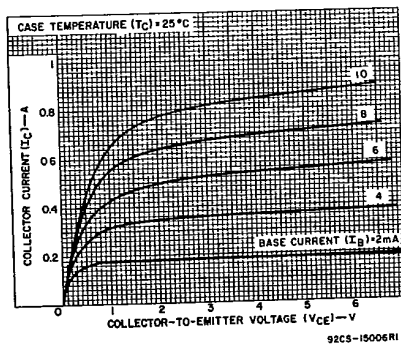


Fig.9 - Typical input characteristics for types 2N5320 and 2N5321.

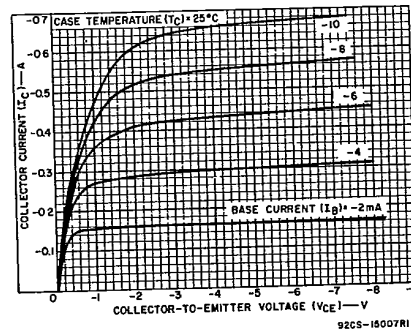
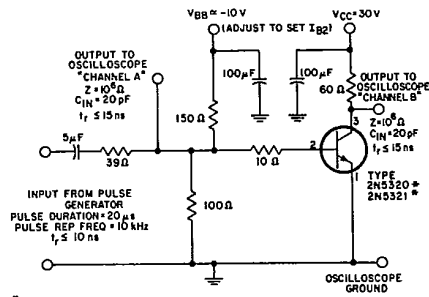


Fig.10 - Typical input characteristics for types 2N5322 and 2N5323.

2N5320, 2N5321, 2N5322, 2N5323



* * For 2N5322 or 2N5323, reverse direction of I_{B1} and I_{B2} and reverse polarity of V_{BB} and V_{CC} .

Fig. 11 - Circuit used to measure switching times for all types.