

3875081 G E SOLID STATE  
High-Speed Power Transistors

2N3053, 2N3053A

File Number 960

**General-Purpose, Medium-Power  
Silicon N-P-N Planar Transistors**

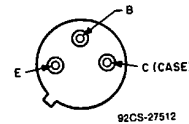
For Small-Signal Applications

**Features:**

- Maximum safe-area-of-operation curve
- High gain-bandwidth product  
 $f_T = 100 \text{ MHz}$
- Low leakage current

**Applications:**

- Audio amplifiers
- Controlled amplifiers
- Power supplies
- Power oscillators

**TERMINAL DESIGNATIONS**

JEDEC TO-205AD

The RCA-2N3053 and 2N3053A are silicon n-p-n planar transistors useful up to 20 MHz in small-signal, medium-power applications. These types are supplied in the JEDEC TO-205AD package.

**MAXIMUM RATINGS, Absolute-Maximum Values:**

	2N3053	2N3053A	
* $V_{CB0}$ .....	60	80	V
$V_{CE0}(SUS)$ .....	50	70	V
$R_{BE} = 10 \Omega$ .....	40	60	V
* $V_{CE0}(SUS)$ .....			
$V_{CE0}(SUS)$ .....	60	80	V
$V_{BE} = -1.5 \text{ V}$ .....	5	5	V
* $V_{EBO}$ .....	0.7	0.7	A
* $I_C$ .....			
* $P_T$ .....	5	5	W
$T_C \leq 25^\circ \text{C}$ .....	1	1	W
$T_A \leq 25^\circ \text{C}$ .....	Derate linearly 0.0286		W/°C
$T_C > 25^\circ \text{C}$ .....	-65 to +200		°C
* $T_{eq}, T_J$ .....			
* $T_L$ .....			
At distance $1/16 \pm 1/32 \text{ in. (1.58 mm } \pm 0.8 \text{ mm)}$	235		°C
from seating plane for 10 s max. ....			

\* In accordance with JEDEC registration data.

## 2N3053, 2N3053A

ELECTRICAL CHARACTERISTICS, at Case Temperature ( $T_c$ ) = 25°C

CHARACTERISTICS	TEST CONDITIONS					LIMITS				UNITS
	VOLTAGE V dc			CURRENT mA dc		2N3053		2N3053A		
	V <sub>CB</sub>	V <sub>CE</sub>	V <sub>BE</sub>	I <sub>C</sub>	I <sub>B</sub>	Min.	Max.	Min.	Max.	
I <sub>CEV</sub>	30 60	— —	-1.5 -1.5	— —	— —	— —	0.25 —	— —	— 0.25	μA
I <sub>BEV</sub>	—	60	-1.5	—	—	—	—	—	0.25	μA
I <sub>EBO</sub>	—	—	-4	0	—	—	0.25	—	0.25	μA
h <sub>FE</sub>	— —	2.5 10	— —	150 150	— —	25 50	— 250	25 50	— 250	
V <sub>IBRCBO</sub>	—	—	—	0.1	—	60	—	80	—	V
V <sub>IBREBO</sub> I <sub>E</sub> = 0.1 mA	—	—	—	0	—	5	—	5	—	V
V <sub>CEO(SUS)</sub>	—	—	—	0.1	0	40	—	60	—	V
V <sub>CER(SUS)</sub> R <sub>BE</sub> = 10 Ω	—	—	—	100	—	50	—	70	—	V
V <sub>BE(sat)</sub>	—	—	—	150	15	—	1.7	0.6	1	V
V <sub>CE(sat)</sub>	—	—	—	150	15	—	1.4	—	0.3	V
V <sub>BE</sub>	—	2.5	—	150	—	—	1.7	—	1	V
h <sub>fe</sub> f = 20 MHz	—	10	—	50	—	5	—	5	—	
C <sub>obo</sub> f = 140 kHz	10	—	—	—	—	—	15	—	15	pF
C <sub>ib</sub> f = 140 kHz	—	—	-0.5	0	—	—	80	—	80	pF
R <sub>θJC</sub>	—	—	—	—	—	—	35	—	35	°C/W
R <sub>θJA</sub>	—	—	—	—	—	—	175	—	175	°C/W

\* In accordance with JEDEC registration data.

\* Pulsed; pulse duration = 300  $\mu s$ , duty factory < 2%.

2N3053, 2N3053A

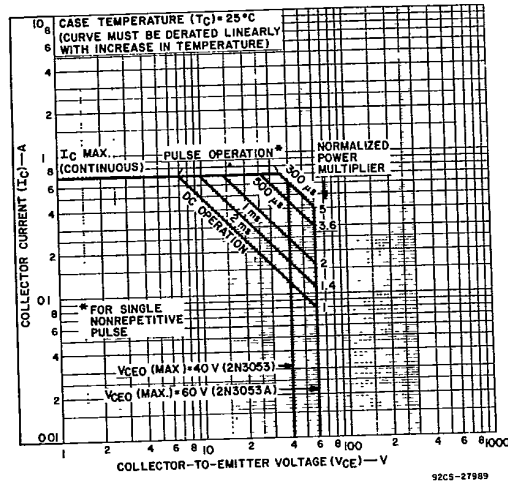


Fig. 1 - Maximum operating areas for 2N3053, 2N3053A.

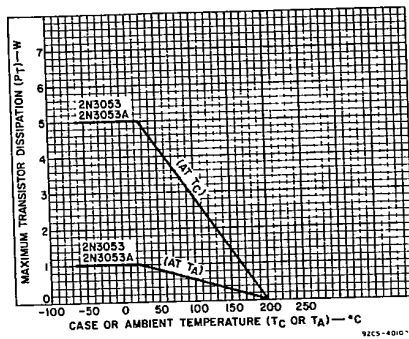


Fig. 2 - Dissipation derating curves for all types.

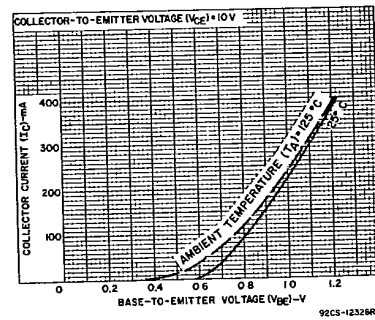


Fig. 3 - Typical transfer characteristics for all types.

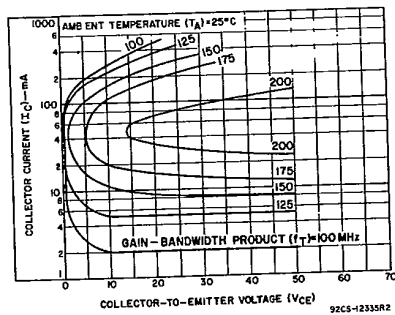


Fig. 4 - Typical dc beta characteristics for all types.

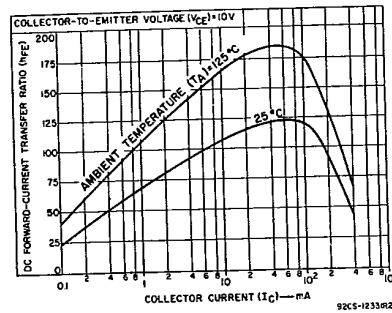


Fig. 5 - Typical variation of gain-bandwidth product with Ic and Vce for all types.

## 2N3053, 2N3053A

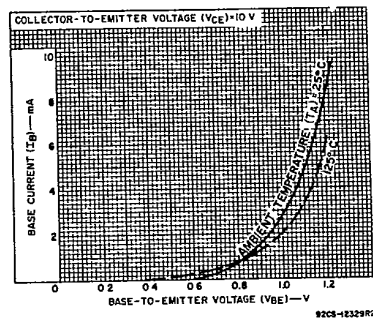


Fig. 6 - Typical input characteristics for all types.

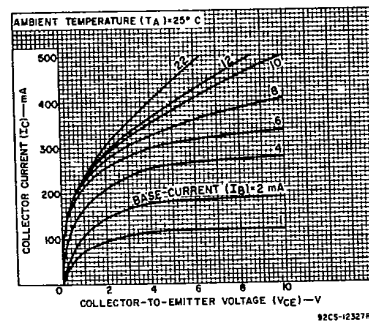


Fig. 7 - Typical output characteristics for all types.