

361-975

## POWER TRANSISTORS

### 2N3055H, 2N6253, 2N6254, 2N6371, 40251

#### Hometaxial-Base High-Power Silicon N-P-N Transistors

Rugged, Broadly Applicable Devices For Industrial and Commercial Use

These RCA types are silicon n-p-n transistors intended for a wide variety of high-power linear and switching applications. The hometaxial-base construction of these devices makes them highly resistant to second breakdown; for example, the 2N3055H can withstand an  $I_{S/B}$  current of

1.95 amperes (min.) at a  $V_{CE0}$  of up to 60 volts. For the 2N6254, the  $I_{S/B}$  rating is 1.87 amperes (min.) at  $V_{CE0}$  up to 80 volts.

All of these transistors are supplied in the JEDEC TO-3 hermetic steel package.

#### Features:

- 2N6254: premium type from 2N3055H family
- Maximum safe-area-of-operation curves
- Low saturation voltages
- High dissipation ratings
- Thermal-cycle rating curves

#### Applications:

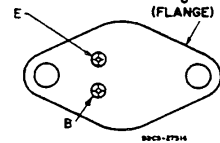
- Series and shunt regulators
- High-fidelity amplifiers
- Power-switching circuits
- Solenoid drivers
- Low-frequency inverters

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

	2N3055H	2N6253	2N6254	2N6371	40251	
* $V_{CBO}$ .....	100	55	100	50	50	V
* $V_{CER}(sus)$ RBE = 100 $\Omega$ .....	70	55	85	45	—	V
* $V_{CE0}(sus)$ .....	60	45	80	40	40	V
$V_{CEV}(sus)$ $V_{BE} = -1.5$ V.....	90	55	90	50	50	V
* $V_{EBO}$ .....	7	5	7	5	5	V
* $I_C$ .....	15	15	15	15	15	A
* $I_B$ .....	7	7	7	7	7	A
* $P_T$ : ≤ 25°C.....	115	115	150	117	117	W
> 25°C.....	Derate linearly to 200°C					
* $T_J, T_{stg}$ .....	—65 to +200					°C
* $T_L$ : During soldering, at distances 1/32 in. (0.8 mm) from seating plane for 10 s max.....	—235					°C

\*In accordance with JEDEC registration data formats JS-9 RDF-10: 2N3055H; JS-6 RDF-2: 2N6253, 2N6254, 2N6371.

#### TERMINAL DESIGNATIONS



JEDEC TO-3

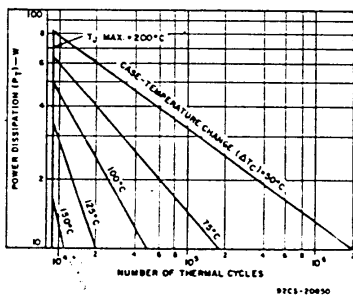


Fig. 1 - Thermal-cycling rating chart for 2N3055H, 2N6253, 2N6371.

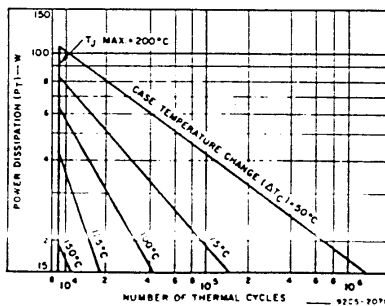


Fig. 2 - Thermal cycling rating chart for 2N6254.

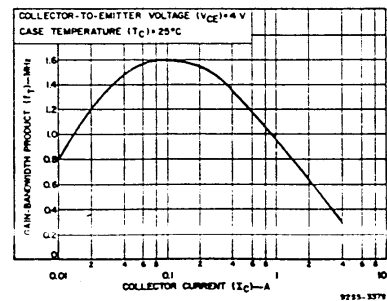


Fig. 3 - Typical gain-bandwidth product for all types.

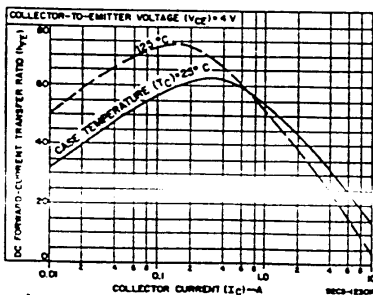


Fig. 4 - Typical dc beta characteristics for 2N3055H and 2N6371.

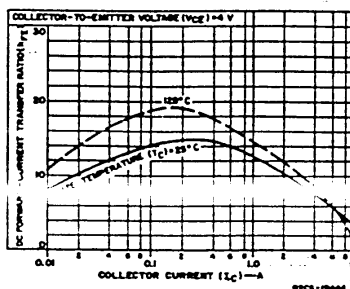


Fig. 5 - Typical dc beta characteristics for 2N6254.

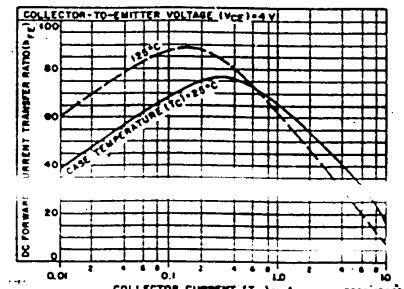


Fig. 6 - Typical dc beta characteristics for 2N6254.

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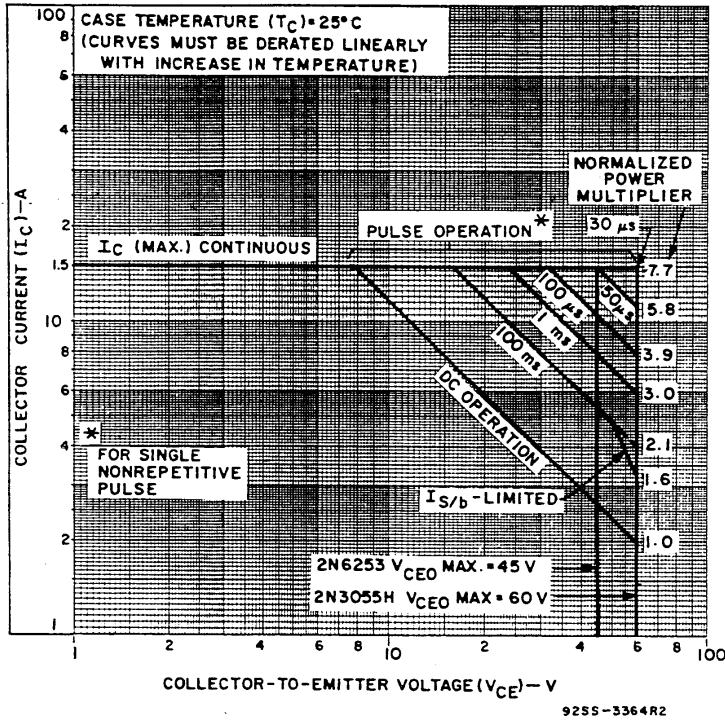


Fig. 7 - Maximum operating areas for types 2N6253 and 2N3055H.

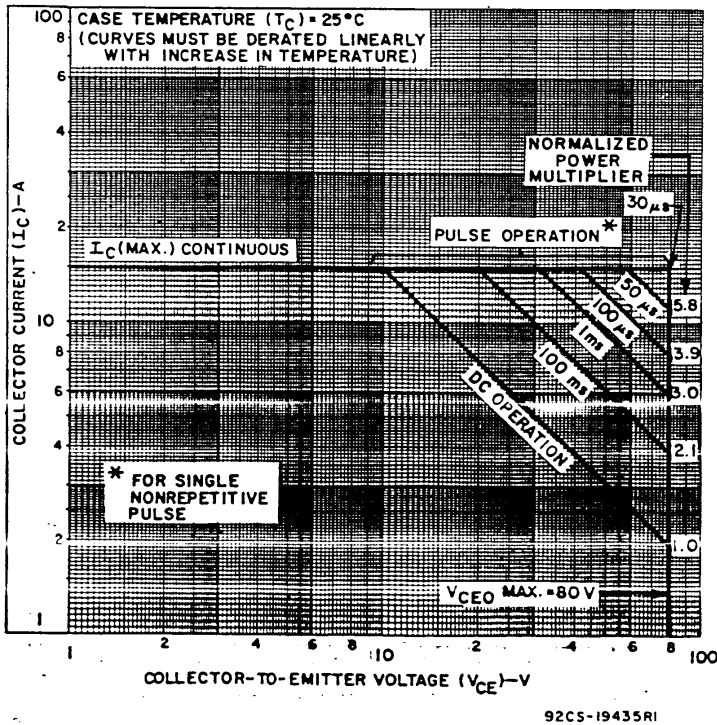


Fig. 10 - Maximum operating areas for 2N6254.

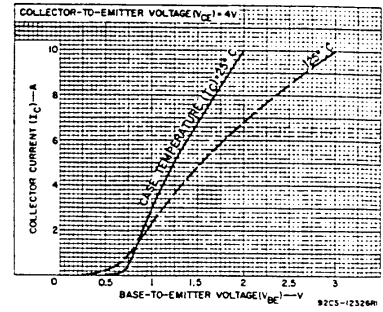


Fig. 8 - Typical transfer characteristics for 2N6254, 2N3055H, 2N6371, 40251.

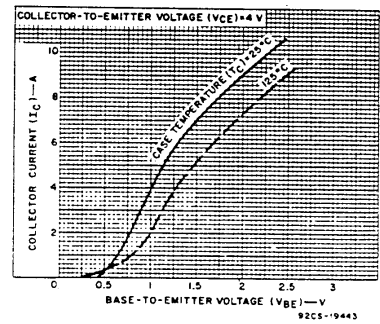


Fig. 9 - Typical transfer characteristics for 2N6253.

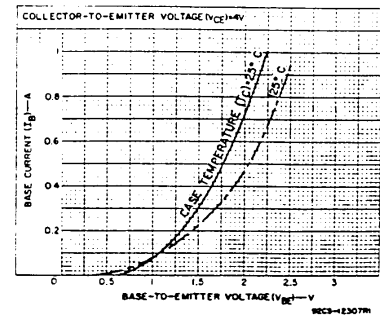


Fig. 11 - Typical input characteristics for 2N3055H, 2N6371, 40251.

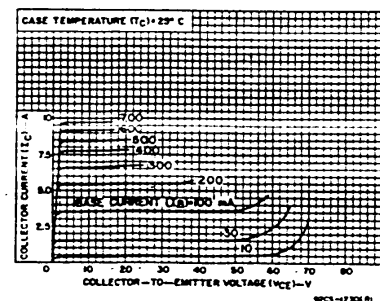


Fig. 12 - Typical output characteristics for 2N3055H, 2N6371.

## 2N3055H, 2N6253, 2N6254, 2N6371, 40251

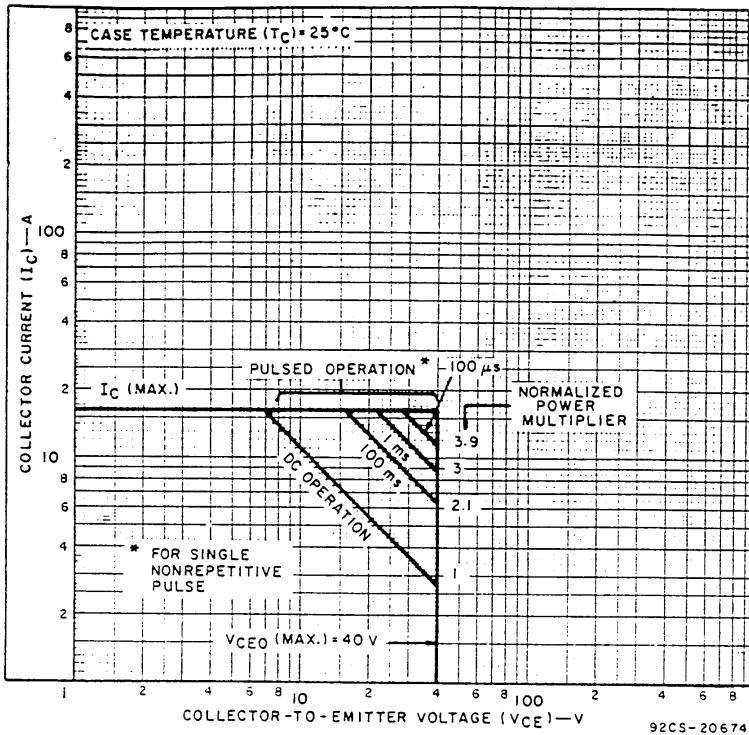


Fig. 13 - Maximum safe area of operation at case temperature of 25°C for 2N6371.

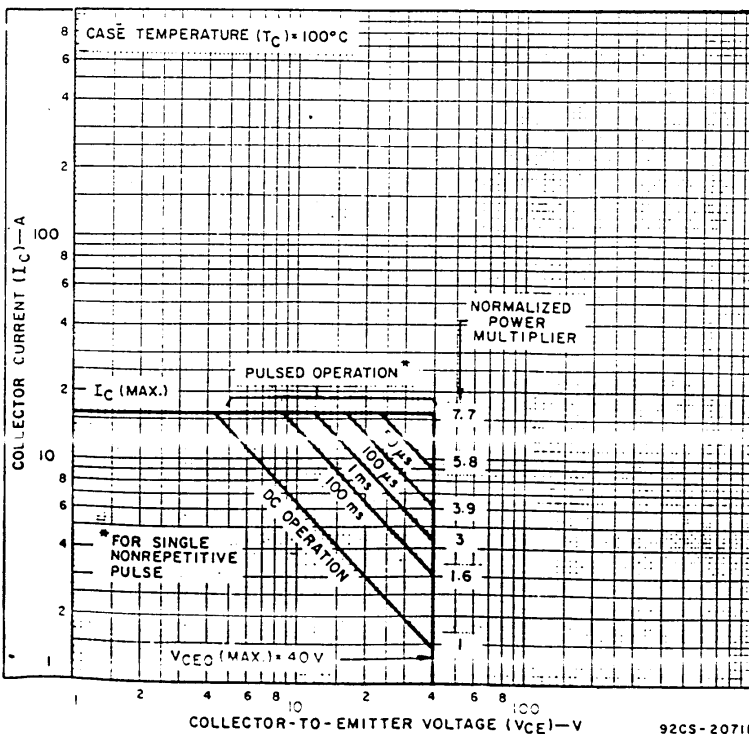


Fig. 16 - Maximum safe area of operation at case temperature of 100°C for 2N6371.

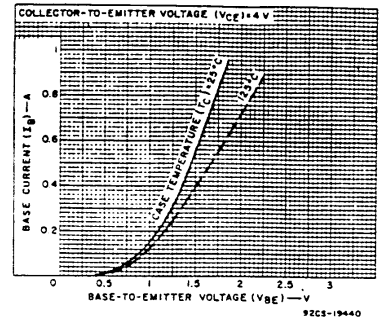


Fig. 14 - Typical input characteristics for 2N6253.

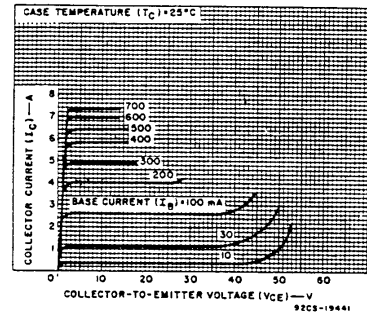


Fig. 15 - Typical output characteristics for 2N6253.

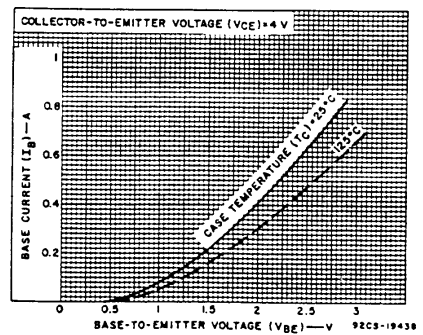


Fig. 17 - Typical input characteristics for 2N6254.

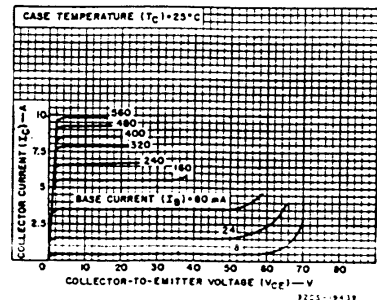


Fig. 18 - Typical output characteristics for 2N6254.

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ELECTRICAL CHARACTERISTICS,  $T_C = 25^\circ\text{C}$  Unless Otherwise Specified.

CHARACTERISTIC	TEST CONDITIONS				LIMITS								UNITS		
	VOLTAGE		CURRENT		2N3055H		2N6253		2N6254		2N6371			40251	
	V <sub>dc</sub>	V <sub>BE</sub>	I <sub>C</sub>	I <sub>B</sub>	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.		MIN.	MAX.
I <sub>CEO</sub>	25			0	-	-	-	1.5	-	-	-	1.5	-	-	
	30			0	-	0.7	-	-	-	-	-	-	-	-	
	60			0	-	-	-	-	1	-	-	-	-	-	
I <sub>CEX</sub>	40	-1.5			-	-	-	-	-	-	-	-	-	2	
	45	-1.5			-	-	-	-	-	-	2	-	-	-	
	55	-1.5			-	-	-	2	-	-	-	-	-	-	
	100	-1.5			-	5	-	-	0.5	-	-	-	-	-	
T <sub>C</sub> = 150°C	40	-1.5			-	-	-	-	-	-	10	-	10	-	
	50	-1.5			-	-	-	10	-	-	-	-	-	-	
	100	-1.5			-	30	-	-	5	-	-	-	-	-	
I <sub>EBO</sub>		-5			-	-	-	10	-	-	-	-	-	-	
		-7			-	5	-	-	0.5	-	-	-	-	-	
V <sub>(BR)CBO</sub>			0.1		-	-	-	-	-	-	-	50	-		
V <sub>(BR)ICEV</sub>		-1.5	0.1		-	-	-	-	-	-	-	50	-		
V <sub>(BR)IEBO</sub> I <sub>E</sub> = 0.01 mA			0		-	-	-	-	-	-	-	5	-		
V <sub>CEO(sus)</sub>			0.2 <sup>a</sup>	0	60	-	45	-	80	-	40	-	40	-	
V <sub>CER(sus)</sub> R <sub>BE</sub> = 100 Ω			0.2 <sup>a</sup>		70	-	55	-	85	-	45	-	-	-	
V <sub>CEV(sus)</sub>		-1.5	0.1 <sup>a</sup>		90	-	55	-	90	-	50	-	-	-	
h <sub>FE</sub>	4		3 <sup>a</sup>		-	-	20	70	-	-	-	-	-	-	
	4		4 <sup>a</sup>		20	70	-	-	-	-	-	-	-	-	
	2		5 <sup>a</sup>		-	-	-	-	20	70	-	-	-	-	
	4		8 <sup>a</sup>		-	-	-	-	-	-	15	60	15	60	
	4		10 <sup>a</sup>		5	-	-	-	-	-	-	-	-	-	
	4		15 <sup>a</sup>		-	-	3	-	5	-	-	-	-	-	
	4		16 <sup>a</sup>		-	-	-	-	-	-	4	-	-	-	
V <sub>BE</sub>	4		3 <sup>a</sup>		-	-	-	1.7	-	-	-	-	-	-	
	4		4 <sup>a</sup>		-	1.8	-	-	-	-	-	-	-	-	
	2		5 <sup>a</sup>		-	-	-	-	1.5	-	-	-	-	-	
	4		8 <sup>a</sup>		-	-	-	-	-	-	-	-	2.2	-	
	4		16 <sup>a</sup>		-	-	-	-	-	-	4	-	-	-	
V <sub>CE(sat)</sub>			3 <sup>a</sup>	0.3 <sup>a</sup>	-	-	-	1	-	-	-	-	-	-	
			4 <sup>a</sup>	0.4 <sup>a</sup>	-	1.1	-	-	-	-	-	-	-	-	
			5 <sup>a</sup>	0.5 <sup>a</sup>	-	-	-	-	0.5	-	-	-	-	-	
			8 <sup>a</sup>	0.8 <sup>a</sup>	-	-	-	-	-	-	1.5	-	1.5	-	
			10 <sup>a</sup>	3.3 <sup>a</sup>	-	8	-	-	-	-	-	-	-	-	
			15 <sup>a</sup>	3 <sup>a</sup>	-	-	-	-	4	-	-	-	-	-	
			16 <sup>a</sup>	4 <sup>a</sup>	-	-	-	-	-	-	4	-	-	-	
h <sub>FE</sub> f = 1 kHz	4		1		15	120	10	-	10	-	10	-	-	-	
f <sub>T</sub>			1		800	-	-	-	-	-	800	-	-	-	
h <sub>FE</sub>   f = 0.4 MHz	4		1		-	-	2	-	2	-	2	-	-	-	
f <sub>hFE</sub>	4		1		10	-	10	-	10	-	-	-	-	-	
S/b t <sub>p</sub> = 1 s nonrep.	39				-	-	-	-	-	-	-	-	3	-	
	40				2.9	-	-	-	-	-	2.9	-	-	-	
	45				-	-	2.55	-	-	-	-	-	-	-	
	60				1.95	-	-	-	-	-	-	-	-	-	
	80				-	-	-	-	1.87	-	-	-	-	-	
θ <sub>JJC</sub>					-	1.5	-	1.5	-	1.17	-	1.5	-	1.5	

\* In accordance with JEDEC registration data formats JS-9 RDF-10: 2N3055H; JS-6 RDF-2: 2N6253, 2N6254, 2N6371.

<sup>a</sup> pulse duration = 300 μs, duty factor = 1.0%.