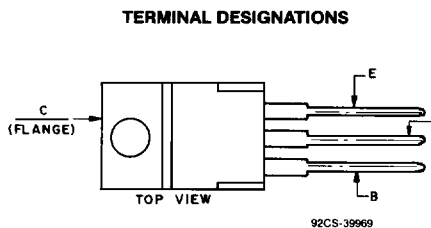


# Epitaxial-Base, Silicon N-P-N and P-N-P VERSAWATT Transistors

General-Purpose Medium-Power Types for  
Switching and Amplifier Applications

**Features:**

- Low saturation voltages
- Complementary n-p-n and p-n-p types
- Maximum safe-area-of-operation curves specified for dc operation



JEDEC TO-220AB

The 2N6121, 2N6122, and 2N6123 are epitaxial-base n-p-n transistors. The 2N6124, 2N6125, and 2N6126 are epitaxial-base p-n-p transistors. They are complements to 2N6121, 2N6122, and 2N6123, respectively.

All types utilize the JEDEC TO-220AB (VERSAWATT) plastic package.

All these transistors are intended for a wide variety of medium-power switching and amplifier applications, such as series and shunt regulators and driver and output stages of high-fidelity amplifiers.

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

	N-P-N P-N-P	2N6121 2N6124	2N6122 2N6125	2N6123 2N6126	
*V <sub>CBO</sub> .....		45	60	80	V
*V <sub>CEO(SUS)</sub> .....		45	60	80	V
*V <sub>EBO</sub> .....			5		V
*I <sub>C</sub> .....			4		A
*I <sub>B</sub> .....			1		A
P <sub>T</sub> .....					
*T <sub>C</sub> ≥ 25°C .....			40		W
T <sub>C</sub> > 25°C ≤ 100°C .....			16		W
T <sub>C</sub> > 25°C .....			Derate linearly 0.32		W/°C
T <sub>A</sub> ≤ 25°C .....			1.8		W
T <sub>A</sub> > 25°C .....			Derate linearly 0.0144		W/°C
*T <sub>stg</sub> , T <sub>J</sub> .....			-65 to 150		°C
T <sub>L</sub> .....					
At distances ≥ 1/8 in. (3.17 mm) from case for 10 s max. ....			235		°C

\*In accordance with JEDEC registration data.

For p-n-p devices, voltage and current values are negative.

ELECTRICAL CHARACTERISTICS At Case Temperature ( $T_C$ ) = 25°C

Unless Otherwise Specified

CHARACTERISTIC	TEST CONDITIONS <sup>♦</sup>				LIMITS					UNITS		
	VOLTAGE V dc		CURRENT A dc		2N6121 2N6124 <sup>♦</sup>		2N6122 2N6125 <sup>♦</sup>		2N6123 2N6126 <sup>♦</sup>			
	V <sub>CE</sub>	V <sub>BE</sub>	I <sub>C</sub>	I <sub>B</sub>	MIN.	MAX.	MIN.	MAX.	MIN.		MAX.	
I <sub>CBO</sub>	45 <sup>a</sup> 60 <sup>a</sup> 80 <sup>a</sup>				—	0.1	—	—	—	—	mA	
* I <sub>CEX</sub>	45 60 80	-1.5 -1.5 -1.5			—	0.1	—	—	—	—		
T <sub>C</sub> = 125°C	45 60 80	-1.5 -1.5 -1.5			—	2	—	2	—	—		
* I <sub>CEO</sub>	45 60 80			0 0 0	— — —	1	— — —	— 1 —	— — —	— — 1		
* I <sub>EBO</sub>		-5	0		—	1	—	1	—	1		
* V <sub>CEO</sub> (sus) <sup>b</sup>			0.1 <sup>c</sup>	0	45	—	60	—	80	—		V
* h <sub>FE</sub>	2 2		1.5 <sup>c</sup> 4 <sup>c</sup>		25 10	100 —	25 10	100 —	20 7	80 —		V
* V <sub>BE</sub>	2		1.5 <sup>c</sup>		—	1.2	—	1.2	—	1.2		
V <sub>CE</sub> (sat)			1.5 <sup>c</sup> 4 <sup>c</sup>	0.15 1	— —	0.6 1.4	— —	0.6 1.4	— —	0.6 1.4		
*  h <sub>fe</sub>   (f=1 MHz)	4		1		2.5	—	2.5	—	2.5	—		
* h <sub>fe</sub> (f=1 kHz)	2		0.1		25	—	25	—	25	—		
R <sub>θJC</sub>					—	3.125	—	3.125	—	3.125	°C/W	

\* In accordance with JEDEC registration data.  
<sup>b</sup> CAUTION: The sustaining voltage V<sub>CEO</sub>(sus) MUST NOT be measured on a curve tracer.

<sup>a</sup> V<sub>CB</sub> value.  
<sup>c</sup> Pulsed: Pulse duration = 300 μs, duty factor = 0.018.  
<sup>♦</sup> For p-n-p devices, voltage and current values are negative.

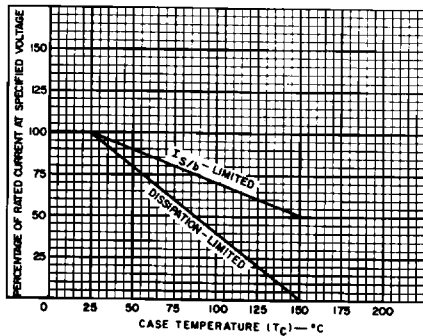


Fig. 1 - Current derating curves for all types.

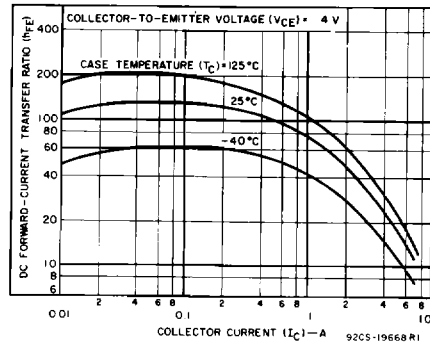


Fig. 2 - Typical dc beta characteristics for all types.

2  
POWER TRANSISTORS

# 2N6121-2N6123, 2N6124-2N6126

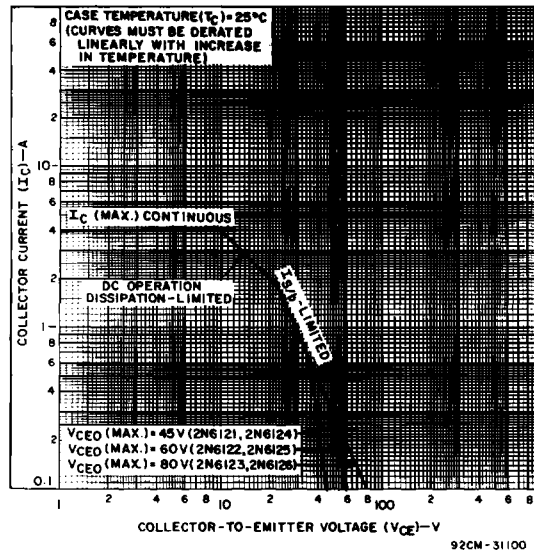


Fig. 3 - Maximum operating areas for all types.

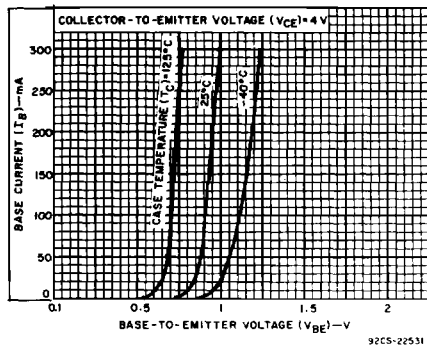


Fig. 4 - Typical input characteristics for all types.

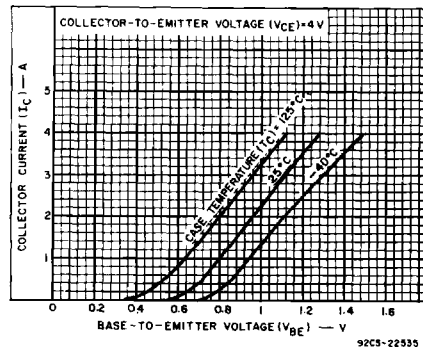


Fig. 5 - Typical transfer characteristics for all types.

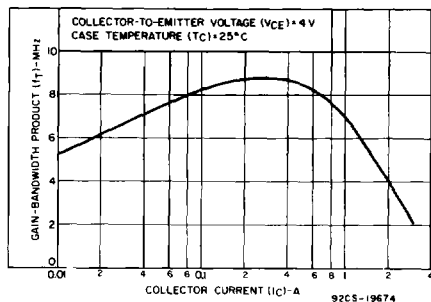
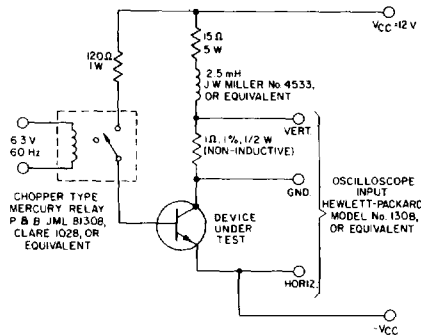


Fig. 6 - Typical gain-bandwidth product.



NOTE: FOR p-n-p TYPES, REVERSE POLARITY OF  $V_{CC}$ .

Fig. 7 - Circuit used to measure sustaining voltage  $V_{CE0}(sus)$  for all types.