

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

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

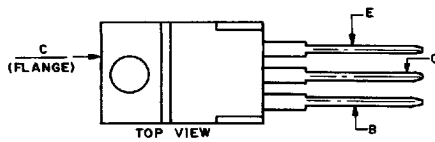
**Features:**

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

The 2N6106-2N6111, 2N6288-2N6293, and 2N6473-2N6476 are epitaxial-base silicon transistors supplied in a VERSAWATT package. The 2N6288-2N6293, 2N6473, and 2N6474\* are n-p-n complements of p-n-p types 2N6106-2N6111, 2N6475, and 2N6476\*, respectively. 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.

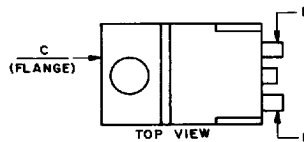
The 2N6289, 2N6291, and 2N6293 n-p-n types and 2N6106, 2N6108, and 2N6110 p-n-p devices fit into TO-213AA sockets. The remaining types are supplied in the JEDEC TO-220AB straight-lead version of the VERSAWATT package. All of these devices are also available on special order in a variety of lead-form configurations.

- \*Formerly RCA Dev. Nos. TA7784, TA8323, TA7783, TA8232, TA7782, TA8231, TA8444, and TA8723, respectively.
- †Formerly RCA Dev. Nos. TA8210, TA7741, TA8211, TA7742, TA8212, TA7743, TA8445, and TA8722, respectively.



92CS-39969

JEDEC TO-220AB



92CS-40186

JEDEC TO-220AA

Boca Semiconductor Corp.  
BSC

<http://www.bocasemi.com>

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

	N-P-N		P-N-P		V	
	2N6288 2N6289	2N6290 2N6291	2N6292 2N6293	2N6473 2N6474		
$V_{CE0}$ .....	40	60	80	110	130	V
$V_{CEX}(SUS)$ $R_{\theta\theta} = 100 \Omega, V_{\theta\theta} = 0 V$ .....	40	60	80	110	130	V
$V_{CE0}(SUS)$ .....	30	50	70	100	120	V
$V_{EBO}$ .....	5		5			V
$I_C (T_C \leq 106^\circ C)$ .....	7		4			A
$I_E (T_C \leq 130^\circ C)$ .....	3		2			A
$P_T$ .....	40		16			W
$T_C \leq 25^\circ C$ .....	40		16			W
$T_C > 25^\circ C \leq 100^\circ C$ .....	Derate linearly 0.32					W/°C
$T_C > 25^\circ C$ .....	1.8					W
$T_A \leq 25^\circ C$ .....	Derate linearly 0.0144					W/°C
$T_A > 25^\circ C$ .....	-65 to 150					°C
$T_{\theta\theta}, T_J$ .....	235					°C
$T_L$ .....						°C
At distances $\geq 1/8$ in. (3.17 mm) from case for 10 s max. ....						°C

\*In accordance with JEDEC registration data.

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

CHARACTERISTIC	VOLTAGE V dc		CURRENT A dc		2N6292 2N6293 2N6106♦ 2N6107♦		2N6290 2N6291 2N6108♦ 2N6109♦		2N6288 2N6289 2N6110♦ 2N6111♦		UNITS
	V <sub>CE</sub>	V <sub>BE</sub>	I <sub>C</sub>	I <sub>B</sub>	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
I <sub>CER</sub> (R <sub>BE</sub> = 100 Ω)	75				—	0.1	—	—	—	—	mA
	55				—	—	—	0.1	—	—	
	35				—	—	—	—	—	0.1	
(R <sub>BE</sub> = 100 Ω, T <sub>C</sub> = 150°C)	70				—	2	—	—	—	—	
	50				—	—	—	2	—	—	
	30				—	—	—	—	—	2	
* I <sub>CEX</sub> (R <sub>BE</sub> = 100 Ω)	75	-1.5			—	0.1	—	—	—	—	
	56	-1.5			—	—	—	0.1	—	—	
	37.5	-1.5			—	—	—	—	—	0.1	
(R <sub>BE</sub> = 100 Ω, T <sub>C</sub> = 150°C)	70	-1.5			—	2	—	—	—	—	
	50	-1.5			—	—	—	2	—	—	
	30	-1.5			—	—	—	—	—	2	
* I <sub>CEO</sub>	60			0	—	1	—	—	—	—	
	40			0	—	—	—	1	—	—	
	20			0	—	—	—	—	—	1	
* I <sub>EBO</sub>		-5	0		—	1	—	1	—	1	
* V <sub>CEO(sus)</sub> <sup>b</sup>			0.1 <sup>a</sup>	0	70	—	50	—	30	—	V
V <sub>CER(sus)</sub> <sup>b</sup> (R <sub>BE</sub> = 100 Ω)			0.1 <sup>a</sup>		80	—	60	—	40	—	
* h <sub>FE</sub>	4		2 <sup>a</sup>		30	150	—	—	—	—	
	4		2.5 <sup>a</sup>		—	—	30	150	—	—	
	4		3 <sup>a</sup>		—	—	—	—	30	150	
	4		7 <sup>a</sup>		2.3	—	2.3	—	2.3	—	
* V <sub>BE</sub>	4		2 <sup>a</sup>		—	1.5	—	—	—	—	V
	4		2.5 <sup>a</sup>		—	—	—	1.5	—	—	
	4		3 <sup>a</sup>		—	—	—	—	—	1.5	
	4		7 <sup>a</sup>		—	3	—	3	—	3	
* V <sub>CE(sat)</sub>			2 <sup>a</sup>	0.2	—	1	—	—	—	—	
			2.5 <sup>a</sup>	0.25	—	—	—	1	—	—	
			3 <sup>a</sup>	0.3	—	—	—	—	—	1	
			7 <sup>a</sup>	3	—	3.5	—	3.5	—	3.5	
*  h <sub>fe</sub>   (f = 1 MHz)	2N6288-93	4	0.5		4	—	4	—	4	—	
	2N6106-11	-4	-0.5		10	—	10	—	10	—	
* h <sub>fe</sub> (f = 50 kHz)	4		0.5		20	—	20	—	20	—	
* f <sub>T</sub>	2N6288-93	4	0.5		10	—	10	—	10	—	MHz
	2N6106-11	-4	-0.5		10	—	10	—	10	—	
* C <sub>obo</sub> (f = 1 MHz)	10 <sup>c</sup>		0		—	250	—	250	—	250	pF
R <sub>θJC</sub>					—	3.125	—	3.125	—	3.125	°C/W
R <sub>θJA</sub>					—	70	—	70	—	70	

<sup>a</sup> In accordance with JEDEC registration data.

<sup>b</sup> Pulsed: Pulse duration = 300 μs, duty factor = 0.018.

<sup>b</sup> **CAUTION:** The sustaining voltage V<sub>CEO(sus)</sub> and V<sub>CER(sus)</sub> **MUST NOT** be measured on a curve tracer.

<sup>c</sup> V<sub>CB</sub> value.

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

CHARACTERISTIC	VOLTAGE V dc		CURRENT A dc		2N6474 2N6476*		2N6473 2N6475*		UNITS	
	V <sub>CE</sub>	V <sub>BE</sub>	I <sub>C</sub>	I <sub>B</sub>	Min.	Max.	Min.	Max.		
	I <sub>CE</sub> R (R <sub>BE</sub> = 100 Ω)	120 100				–	0.1	–		–
(R <sub>BE</sub> = 100 Ω T <sub>C</sub> = 100°C)	120 100				–	2	–	–		
* I <sub>CEX</sub> (R <sub>BE</sub> = 100 Ω)	120 100	–1.5 –1.5			–	0.1	–	–		
(R <sub>BE</sub> = 100 Ω, T <sub>C</sub> = 100°C)	120 100	–1.5 –1.5			–	2	–	–		
* I <sub>CEO</sub>	60 50			0 0	–	1	–	–		
* I <sub>EBO</sub>		–5		0	–	1	–	1		
* V <sub>CEO(sus)</sub> <sup>b</sup>			0.1 <sup>a</sup>	0	120	–	100	–	V	
V <sub>CER(sus)</sub> <sup>b</sup> (R <sub>BE</sub> = 100 Ω)			0.1 <sup>a</sup>		130	–	110	–		
* h <sub>FE</sub>	4 2.5		1.5 <sup>a</sup> 4 <sup>a</sup>		15 2	150 –	15 2	150 –	V	
* V <sub>BE</sub>	4 2.5		1.5 <sup>a</sup> 4 <sup>a</sup>		– –	2 3.5	– –	2 3.5		
* V <sub>CE(sat)</sub>			1.5 <sup>a</sup> 4 <sup>a</sup>	0.15 2	– –	1.2 2.5	– –	1.2 2.5		
*  h <sub>fe</sub>   (f = 1 MHz)									MHz	
2N6473-74	4		0.5		4	–	4	–		
2N6475-76	–4		–0.5		5	–	5	–		
* h <sub>fe</sub> (f = 50 kHz)	4		0.5		20	–	20	–		
f <sub>T</sub>									pF	
2N6473-74	4		0.5		4	–	4	–		
2N6475-76	–4		–0.5		5	–	4	–		
* C <sub>obd</sub> (f = 1 MHz)	10 <sup>c</sup>		0		–	250	–	250	°C/W	
R <sub>θJC</sub>					–	3.125	–	3.125		
R <sub>θJA</sub>					–	70	–	70		

T-33-01

\* In accordance with JEDEC registration data

<sup>a</sup> Pulsed: Pulse duration = 300 μs, duty factor = 0.018.

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