

T-33-C

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

TERMINAL DESIGNATIONS

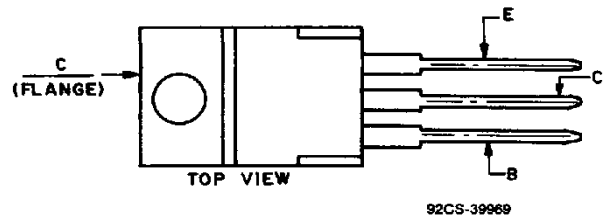
General-Purpose Medium-Power Types for
Switching and Amplifier Applications

Features:

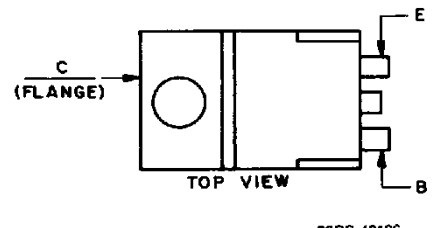
- Low saturation voltages
- Complementary n-p-n and p-n-p types
- Maximum safe-area-of-operation curves specified for dc operation

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.



JEDEC TO-220AB



JEDEC TO-220AA

*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.

MAXIMUM RATINGS, Absolute-Maximum Values:

	N-P-N		P-N-P			
	2N6288 2N6289	2N6290 2N6291	2N6110‡ 2N6111‡	2N6108‡ 2N6109‡		
* V_{CE0}	40	60	80	110	130	V
* $V_{CEX}(SUS)$ $R_{\theta\theta} = 100 \Omega, V_{BB} = 0 V$	40	60	80	110	130	V
$V_{CE0}(SUS)$	30	50	70	100	120	V
* V_{EBO}	5					V
* $I_C (T_C \leq 106^\circ C)$	7				4	A
* $I_B (T_C \leq 130^\circ C)$	3				2	A
* P_T						
* $T_C \leq 25^\circ C$	40					W
$T_C > 25^\circ C \leq 100^\circ C$	16					W
$T_C > 25^\circ C$	Derate linearly 0.32					W/°C
$T_A \leq 25^\circ C$	1.8					W
$T_A > 25^\circ C$	Derate linearly 0.0144					W/°C
* $T_{\theta\theta}, T_J$	-65 to 150					°C
* T_L At distances $\geq 1/8$ 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.

CHARACTERISTIC	TEST CONDITIONS [♦]				LIMITS						UNITS
	VOLTAGE V dc		CURRENT A dc		2N6292 2N6293 2N6106 [♦] 2N6107 [♦]		2N6290 2N6291 2N6108 [♦] 2N6109 [♦]		2N6288 2N6289 2N6110 [♦] 2N6111 [♦]		
	V_{CE}	V_{BE}	I_C	I_B	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
I_{CER} ($R_{BE} = 100 \Omega$)	75				—	0.1	—	—	—	—	mA
	55				—	—	—	0.1	—	—	
	35				—	—	—	—	—	0.1	
($R_{BE} = 100 \Omega$, $T_C = 150^\circ C$)	70				—	2	—	—	—	—	
	50				—	—	—	2	—	—	
	30				—	—	—	—	—	2	
* I_{CEX} ($R_{BE} = 100 \Omega$)	75	-1.5			—	0.1	—	—	—	—	
	56	-1.5			—	—	—	0.1	—	—	
	37.5	-1.5			—	—	—	—	—	0.1	
($R_{BE} = 100 \Omega$, $T_C = 150^\circ C$)	70	-1.5			—	2	—	—	—	—	
	50	-1.5			—	—	—	2	—	—	
	30	-1.5			—	—	—	—	—	2	
* I_{CEO}	60			0	—	1	—	—	—	—	
	40			0	—	—	—	1	—	—	
	20			0	—	—	—	—	—	1	
* I_{EBO}		-5	0		—	1	—	1	—	1	
* $V_{CEO(sus)}^b$			0.1 ^a	0	70	—	50	—	30	—	V
$V_{CER(sus)}^b$ ($R_{BE} = 100 \Omega$)			0.1 ^a		80	—	60	—	40	—	
* h_{FE}	4		2 ^a		30	150	—	—	—	—	
	4		2.5 ^a		—	—	30	150	—	—	
	4		3 ^a		—	—	—	—	30	150	
	4		7 ^a		2.3	—	2.3	—	2.3	—	
* V_{BE}	4		2 ^a		—	1.5	—	—	—	—	
	4		2.5 ^a		—	—	—	1.5	—	—	
	4		3 ^a		—	—	—	—	—	1.5	
	4		7 ^a		—	3	—	3	—	3	
* $V_{CE(sat)}$			2 ^a	0.2	—	1	—	—	—	—	
			2.5 ^a	0.25	—	—	—	1	—	—	
			3 ^a	0.3	—	—	—	—	—	1	
			7 ^a	3	—	3.5	—	3.5	—	3.5	
* $ h_{fe} $ ($f = 1$ MHz) 2N6288-93	4		0.5		4	—	4	—	4	—	
2N6106-11	-4		-0.5		10	—	10	—	10	—	
* h_{fe} ($f = 50$ kHz)	4		0.5		20	—	20	—	20	—	
f_T 2N6288-93	4		0.5		10	—	10	—	10	—	MHz
2N6106-11	-4		-0.5		10	—	10	—	10	—	
* C_{obo} ($f = 1$ MHz)	10 ^c		0		—	250	—	250	—	250	pF
$R_{\theta JC}$					—	3.125	—	3.125	—	3.125	°C/W
$R_{\theta JA}$					—	70	—	70	—	70	

* In accordance with JEDEC registration data.

^a Pulsed: Pulse duration = 300 μs , duty factor = 0.018.

^b CAUTION: The sustaining voltage $V_{CEO(sus)}$ and $V_{CER(sus)}$ MUST NOT be measured on a curve tracer.

^c V_{CB} value.

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

CHARACTERISTIC	TEST CONDITIONS				LIMITS				UNITS
	VOLTAGE V dc		CURRENT A dc		2N6474 2N6476 [♦]		2N6473 2N6475 [♦]		
	V _{CE}	V _{BE}	I _C	I _B	Min.	Max.	Min.	Max.	
I _{CER} (R _{BE} = 100 Ω)	120				—	0.1	—	—	mA
	100				—	—	—	0.1	
(R _{BE} = 100 Ω T _C = 100°C)	120				—	2	—	—	
	100				—	—	—	2	
* I _{CEX} (R _{BE} = 100 Ω)	120	-1.5			—	0.1	—	—	
	100	-1.5			—	—	—	0.1	
* (R _{BE} = 100 Ω, T _C = 100°C)	120	-1.5			—	2	—	—	
	100	-1.5			—	—	—	2	
* I _{CEO}	60			0	—	1	—	—	
	50			0	—	—	—	1	
* I _{EBO}		-5		0	—	1	—	1	
* V _{CEO(sus)} ^b			0.1 ^a	0	120	—	100	—	V
V _{CER(sus)} ^b (R _{BE} = 100 Ω)			0.1 ^a		130	—	110	—	
* h _{FE}	4		1.5 ^a		15	150	15	150	
	2.5		4 ^a		2	—	2	—	
* V _{BE}	4		1.5 ^a		—	2	—	2	V
	2.5		4 ^a		—	3.5	—	3.5	
* V _{CE(sat)}			1.5 ^a	0.15	—	1.2	—	1.2	
			4 ^a	2	—	2.5	—	2.5	
* h _{fe} (f = 1 MHz)									
	4		0.5		4	—	4	—	
2N6473-74									
2N6475-76	-4		-0.5		5	—	5	—	
* h _{fe} (f = 50 kHz)	4		0.5		20	—	20	—	
f _T									MHz
	4		0.5		4	—	4	—	
2N6473-74									
2N6475-76	-4		-0.5		5	—	4	—	
* C _{obo} (f = 1 MHz)	10 ^c		0		—	250	—	250	pF
R _{θJC}					—	3.125	—	3.125	°C/W
R _{θJA}					—	70	—	70	

T-33-01

* In accordance with JEDEC registration data

^a Pulsed: Pulse duration = 300 μs, duty factor = 0.018.

^b CAUTION: The sustaining voltage V_{CEO(sus)} are V_{CER(sus)} MUST NOT be measured on a curve tracer.

^c V_{CB} value.

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