

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.

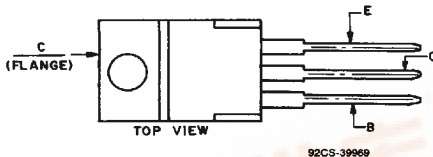
†Formerly RCA Dev. Nos. TA8210, TA7741, TA8211, TA7742, TA8212, TA7743, TA8445, and TA8722, respectively.

MAXIMUM RATINGS, Absolute-Maximum Values:

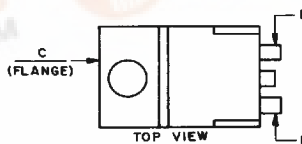
	2N6288		2N6290		2N6292		2N6473	2N6474
	N-P-N	2N6289	2N6291	2N6293	2N6293	2N6293		
	P-N-P	2N6110‡	2N6108‡	2N6106‡	2N6475‡	2N6476‡		
		2N6111‡	2N6109‡	2N6107‡				
• V _{CEO}		40	60	80	110	130		V
• V _{CEX} (SUS) R _{θJC} = 100 Ω, V _{BE} = 0 V		40	60	80	110	130		V
V _{CEO} (SUS)		30	50	70	100	120		V
• V _{ESD}				5				V
• I _C (T _C ≤ 106°C)			7		4			A
• I _E (T _C ≤ 130°C)			3		2			A
P _T				40				W
• T _C ≤ 25°C				16				W
T _C > 25°C ≤ 100°C				Derate linearly 0.32				W/°C
T _C > 25°C				1.8				W
T _A ≤ 25°C				Derate linearly 0.0144				W/°C
T _A > 25°C				-65 to 150				°C
• T _{θJC} , T _J				235				°C
• T _L At distances ≥ 1/8 in. (3.17 mm) from case for 10 s max.				235				°C

*In accordance with JEDEC registration data.

TERMINAL DESIGNATIONS



JEDEC TO-220AB



JEDEC TO-220AA

POWER
TRANSISTORS



ELECTRICAL CHARACTERISTICS At Case Temperature (T_C) = 25°C Unless Otherwise Specified

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 Ω)	75				-	0.1	-	-	-	-	mA
	55				-	-	-	0.1	-	-	
	35				-	-	-	-	-	0.1	
(R _{BE} = 100 Ω, T _C = 150°C)	70				-	2	-	-	-	-	mA
	50				-	-	-	2	-	-	
	30				-	-	-	-	-	2	
* I _{CEX} (R _{BE} = 100 Ω)	75	-1.5			-	0.1	-	-	-	-	mA
	56	-1.5			-	-	-	0.1	-	-	
	37.5	-1.5			-	-	-	-	-	0.1	
(R _{BE} = 100 Ω, T _C = 150°C)	70	-1.5			-	2	-	-	-	-	mA
	50	-1.5			-	-	-	2	-	-	
	30	-1.5			-	-	-	-	-	2	
* I _{CEO}	60			0	-	1	-	-	-	-	mA
	40			0	-	-	-	1	-	-	
	20			0	-	-	-	-	-	1	
* I _{EBO}		-5	0		-	1	-	1	-	1	V
* V _{CEO(sus)} ^b			0.1 ^a	0	70	-	50	-	30	-	
V _{CER(sus)} ^b (R _{BE} = 100 Ω)			0.1 ^a		80	-	60	-	40	-	
* h _{FE}	4		2 ^a		30	150	-	-	-	-	V
	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	-	-	-	-	V
	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	-	-	-	-	V
			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	-	MHz
	2N6106-11	-4	-0.5		10	-	10	-	10	-	
* h _{fe} (f = 50 kHz)	4		0.5		20	-	20	-	20	-	MHz
f _T	2N6288-93	4	0.5		10	-	10	-	10	-	
	2N6106-11	-4	-0.5		10	-	10	-	10	-	
* C _{obo} (f = 1 MHz)	10 ^c		0		-	250	-	250	-	250	pF
R _{θJC}					-	3.125	-	3.125	-	3.125	°C/W
R _{θJA}					-	70	-	70	-	70	°C/W

[†] 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.

HARRIS SEMICONDUCTOR 56 D 430227J 0040504 J50 HAS

2N6106-2N6111, 2N6288-2N6293, 2N6473-2N6476

ELECTRICAL CHARACTERISTICS At Case Temperature (T_C) = 25°C Unless Otherwise Specified

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	–	–	T-33-01
	100				–	–	–	0.1	
(R _{BE} = 100 Ω T _C = 100°C)	120				–	2	–	–	mA
	100				–	–	–	2	
* I _{CEX} (R _{BE} = 100 Ω)	120	–1.5			–	0.1	–	–	mA
	100	–1.5			–	–	–	0.1	
(R _{BE} = 100 Ω, T _C = 100°C)	120	–1.5			–	2	–	–	mA
	100	–1.5			–	–	–	2	
* I _{CEO}	60			0	–	1	–	–	mA
	50			0	–	–	–	1	
* I _{EBO}		–5		0	–	1	–	1	mA
* V _{CEO(sus)} ^b			0.1 ^a	0	120	–	100	–	V
V _{CER(sus)} ^b (R _{BE} = 100 Ω)			0.1 ^a		130	–	110	–	V
* h _{FE}	4		1.5 ^a		15	150	15	150	V
	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	V
			4 ^a	2	–	2.5	–	2.5	
* h _{fe} (f = 1 MHz)					4	–	4	–	MHz
	4		0.5		4	–	4	–	
2N6473-74					5	–	5	–	MHz
2N6475-76	–4		–0.5		5	–	5	–	
* h _{fe} (f = 50 kHz)	4		0.5		20	–	20	–	MHz
* f _T					4	–	4	–	MHz
	4		0.5		4	–	4	–	
2N6473-74					5	–	4	–	MHz
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	°C/W

* 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.

HARRIS SEMICONDUCTOR 56E D 430227J 0040505 097 HAS

POWER TRANSISTORS