

File Number 680

2N6477, 2N6478

Medium-Power Silicon N-P-N Transistors

For Intermediate Power Applications
in Industrial and Commercial Equipment

Features:

- Maximum safe-area-of-operation curves for dc and pulse operation
- High voltage ratings
- Low saturation voltages

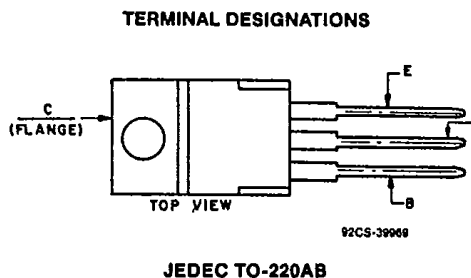
Applications:

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

RCA 2N6477 and 2N6478^Δ are silicon n-p-n transistors intended for a wide variety of medium-to-high power, high-voltage applications. These devices, which are voltage extensions of the 2N5298 family, are especially useful in vertical output stages in color and black-and-white TV. The units differ in voltage ratings and in the currents at which parameters are controlled.

The 2N6477 and 2N6478 are supplied in the JEDEC TO-220AB plastic package.

^ΔFormerly RCA Dev. Nos. TA8405 and TA8343.



MAXIMUM RATINGS, Absolute-Maximum Values:

	2N6477	2N6478		
*COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	140	160	V
COLLECTOR-TO-EMITTER SUSTAINING VOLTAGE:				
With base open	$V_{CEO(sus)}$	120	140	V
With external base-to-emitter resistance (R_{BE}) = 100 Ω	$V_{CER(sus)}$	130	150	V
* With base reverse-biased ($V_{BE} = -1.5$ V)	$V_{CEV(sus)}$	140	160	V
*EMITTER-TO-BASE VOLTAGE	V_{EBO}	5	5	V
*CONTINUOUS COLLECTOR CURRENT	I_C	2.5	2.5	A
PEAK COLLECTOR CURRENT		4	4	A
*CONTINUOUS BASE CURRENT	I_B	1	1	A
TRANSISTOR DISSIPATION:	P_T			
* At case temperature up to 25°C		50	50	W
* At case temperatures above 25°C		See Fig. 2		
At ambient temperatures up to 25°C		1.8	1.8	W
At ambient temperatures above 25°C		Derate linearly at 0.0144		W/°C
*TEMPERATURE RANGE:				
Storage and Operating (Junction)		-65 to 150		°C
*PIN TEMPERATURE (During Soldering):				
At distances \geq 1/32 in. (0.8 mm) from seating plane for 10 s max.		235		°C

* In accordance with JEDEC registration data format JS-6 RDF-2.

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ELECTRICAL CHARACTERISTICS, At Case Temperature (T_C) = 25°C unless otherwise specified

CHARACTERISTIC	SYMBOL	TEST CONDITIONS					LIMITS				UNITS			
		VOLTAGE V dc			CURRENT A dc		2N6477		2N6478					
		V _{CE}	V _{EB}	V _{BE}	I _C	I _B	MIN.	MAX.	MIN.	MAX.				
* Collector-Cutoff Current: With base open	I _{CEO}	80 100				0 0	- -	2 -	- -	- 2	mA			
With base-emitter junction reverse-biased	I _{CEV}	130 150		-1.5 -1.5			- -	2 -	- 2	- -				
At T _C = 150°C	I _{CEV}	120 140		-1.5 -1.5			- -	10 -	- 10	- -				
* Emitter-Cutoff Current	I _{EBO}		5			0	-	2	-	2	mA			
* Collector-to-Emitter Sustaining Voltage: With base open	V _{CEO(sus)}					0.1 [#]	0	120	-	140	-	V		
With external base-to-emitter resistance (R _{BE}) = 100 Ω	V _{CER(sus)}					0.1 [#]		130	-	150	-			
With base-emitter junction reverse-biased	V _{CEV(sus)}			-1.5		0.1 [#]		140	-	160	-			
* DC Forward-Current Transfer Ratio	h _{FE}	4 4				1 [#] 2.5 [#]		25 5	150 -	25 5	150 -			
* Collector-to-Emitter Saturation Voltage	V _{CE(sat)}					1 [#] 2.5 [#]	0.1 0.5	- -	1 2	- -	1 2	V		
* Base-to-Emitter Voltage	V _{BE}	4 4				1 [#] 2.5 [#]		- -	1.8 3	- -	1.8 3	V		
* Magnitude of Common-Emitter, Small-Signal, Short-Circuit Forward-Current Transfer Ratio (f = 40 kHz)	h _{fe}	4						0.5		5	-	5	-	
* Gain-Bandwidth Product	f _T	4						0.5		200	-	200	-	kHz
* Common-Emitter, Small-Signal, Short-Circuit Forward-Current Transfer Ratio (f = 1 kHz)	h _{fe}	4						0.1		25	-	25	-	
Thermal Resistance: Junction-to-Case	R _{θJC}									-	2.5	-	2.5	°C/W
Junction-to-Ambient	R _{θJA}									-	70	-	70	

* In accordance with JEDEC registration data format (JS-6 RDF-2).

[#] Pulsed: Pulse duration = 300 μs, duty factor = 1.8%.

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

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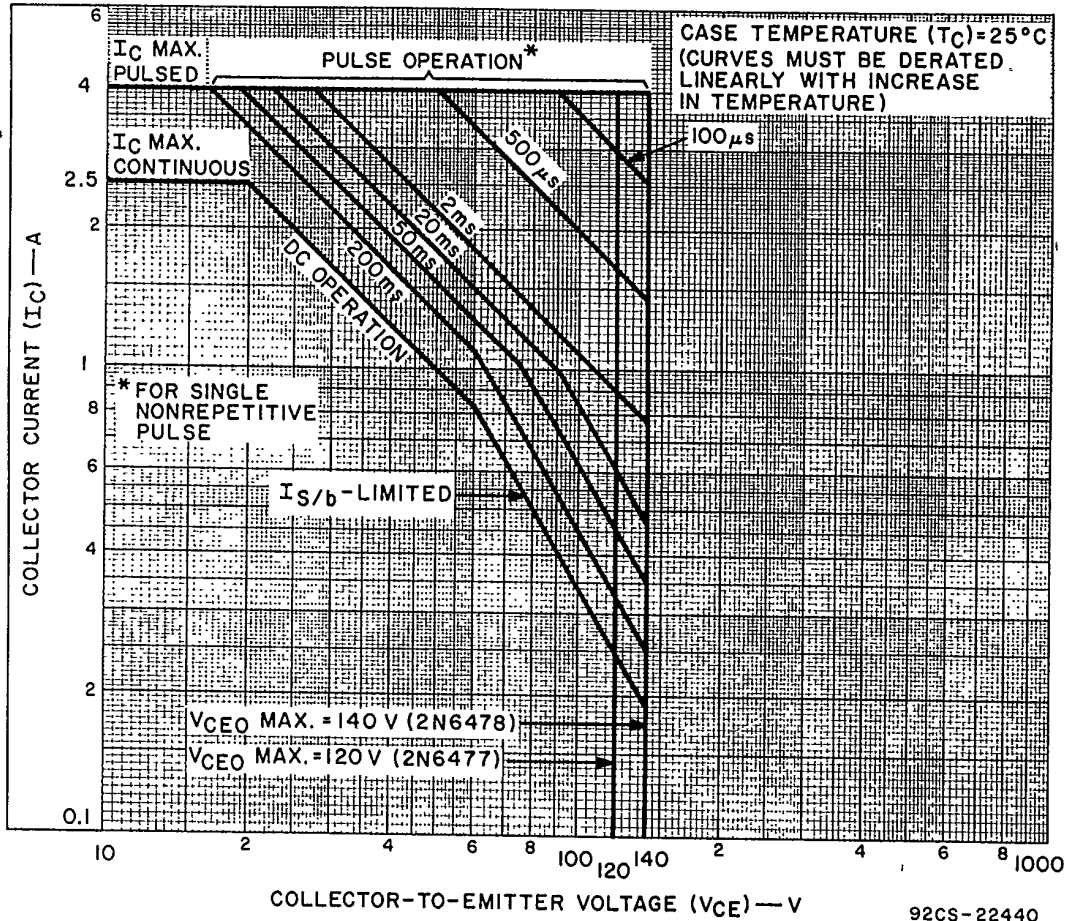


Fig. 1 — Maximum operating areas for both types.

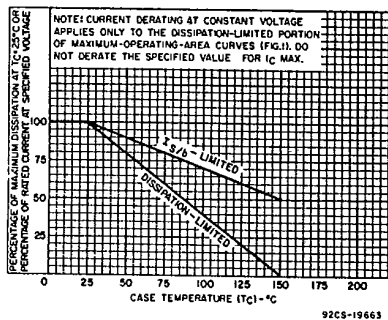


Fig. 2 — Current derating curve for both types.

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General-Purpose Power Transistors

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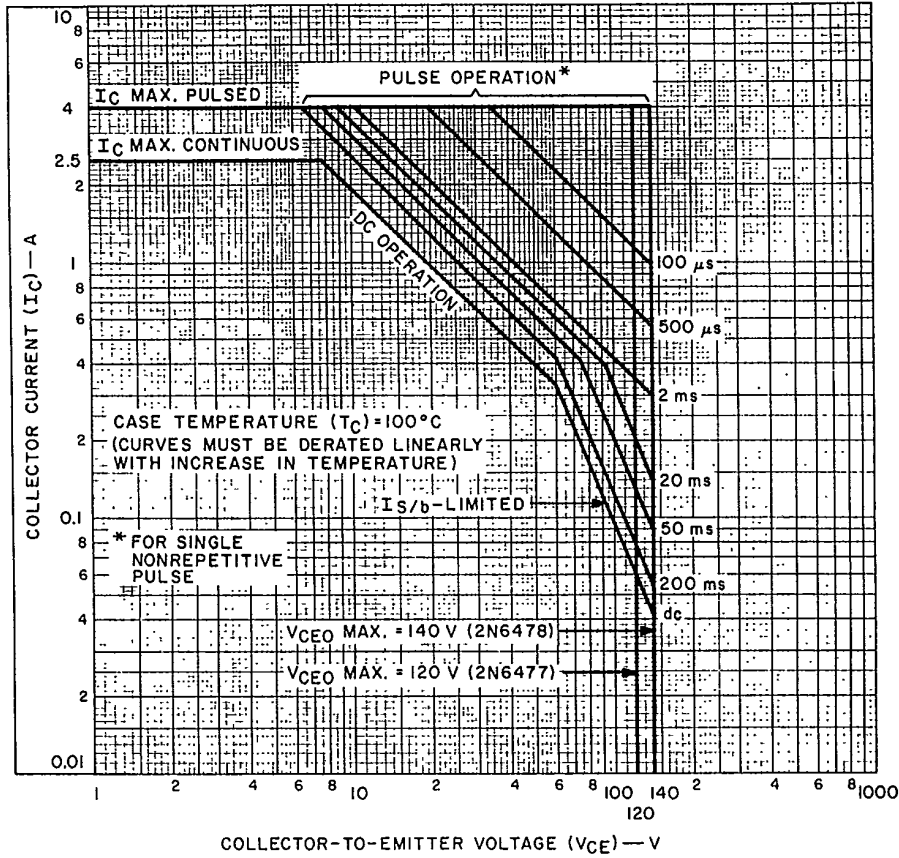


Fig. 3 — Maximum operating areas for both types.

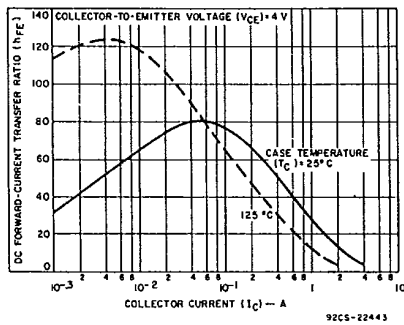


Fig. 4 — Typical dc beta characteristics for 2N6477.

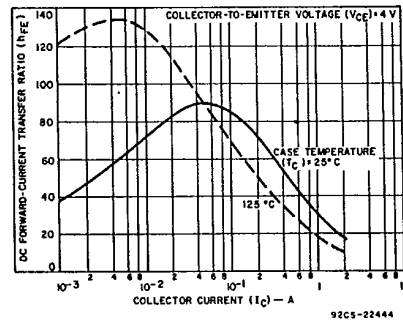


Fig. 5 — Typical dc beta characteristics for 2N6478.

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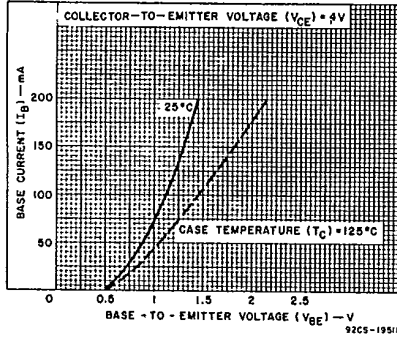


Fig. 6 — Typical input characteristics for 2N6477.

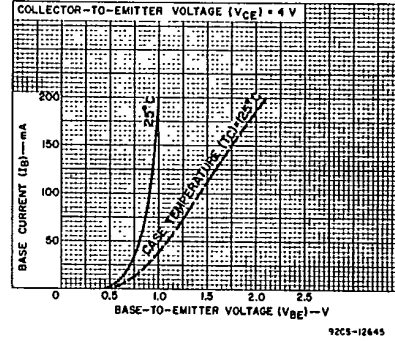


Fig. 7 — Typical input characteristics for 2N6478.

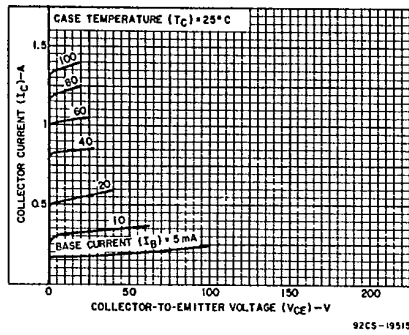


Fig. 8 — Typical output characteristics for 2N6477.

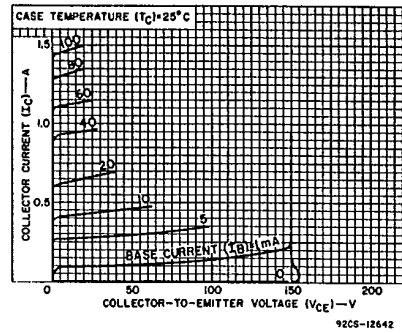


Fig. 9 — Typical output characteristics for 2N6478.

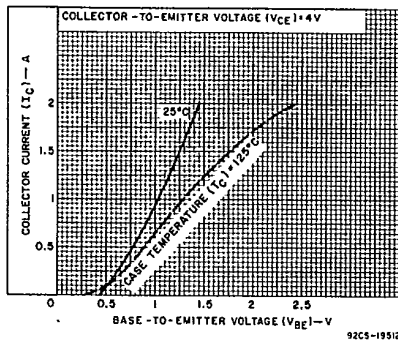


Fig. 10 — Typical transfer characteristics for 2N6477.

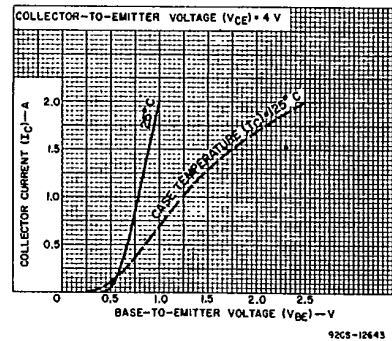


Fig. 11 — Typical transfer characteristics for 2N6478.