



**General  
Semiconductor  
Industries, Inc.**

**SQUARE D COMPANY**

**2N 2877  
2N 2878  
2N 2879  
2N 2880**

T-33-09

**NPN SILICON  
HIGH-POWER  
TRANSISTORS**

**DIFFUSED SILICON EPITAXIAL PASSIVATED TRANSISTOR**

These devices are designed for use in power amplifiers and switching applications. The latest technologies are used to offer the highest degree of reliability.

**FEATURES**

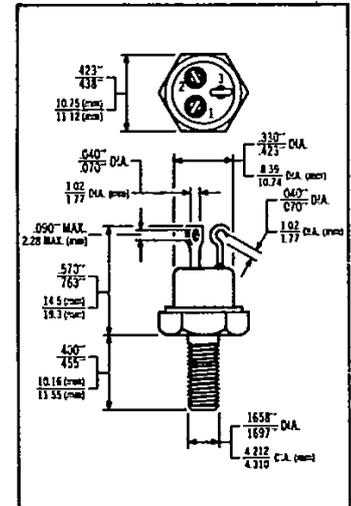
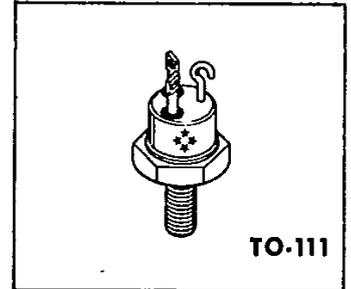
- Low Saturation Voltage
- High Frequency Response
- Fast Switching
- Low Leakage Current
- Low Drive Requirement

**APPLICATIONS**

- High Frequency Inverters
- Converters
- Linear Amplifiers
- High Speed Switching Regulated Power Supplies
- RF Power Amplifiers

**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures	
Storage Temperatures	-65°C to +200°C
Operating Junction Temperature	+200°C
Lead Temperature (soldering, 60 second time limit)	+300°C
Maximum Power Dissipation	
Total Dissipation at 100°C Case Temperature	30 Watts
(1) See Safe Operating Curves for derating	
Linear derating factor	.3W/°C
	<b>2N2877      2N2878</b>
	<b>2N2878      2N2880</b>
Maximum Voltages and Current	
V <sub>CEO</sub> Collector to Emitter Voltage	60 Volts      80 Volts
V <sub>CBO</sub> Collector to Base Voltage	80 Volts      100 Volts
V <sub>EBO</sub> Emitter to Base Voltage	8 Volts      8 Volts
I <sub>C</sub> Collector Current	5 Amps      5 Amps



**MECHANICAL CHARACTERISTICS**

Case: TO-111 Package  
 Weight: 6.5 grams (Maximum)  
 Leads: Tin Plated Kovar  
 1. Emitter 2. Base 3. Collector  
 Body marked with Logo \* and type number

**\*ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)**

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	2N2877		2N2878		2N2879		2N2880		UNITS
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
Collector to Base Breakdown Voltage	BV <sub>CBO</sub>	I <sub>C</sub> = 10μA, I <sub>E</sub> = 0	80		80		100		100		Volts
Collector to Emitter Sustaining Voltage	V <sub>CEO (sust)</sub>	I <sub>C</sub> = 100mA, I <sub>B</sub> = 0	60		60		70		70		Volts
Collector to Emitter Breakdown Voltage	BV <sub>CEO</sub>	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0	60		60		80		80		Volts
Emitter to Base Breakdown Voltage	BV <sub>EBO</sub>	I <sub>E</sub> = 10μA, I <sub>C</sub> = 0	8		8		8		8		Volts
† DC Pulse Current Gain	h <sub>FE</sub>	I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V	20	60	40	120	20	60	40	120	
† DC Pulse Current Gain	h <sub>FE</sub>	I <sub>C</sub> = 5A, V <sub>CE</sub> = 5V	10		15		10		15		
† DC Pulse Current Gain	h <sub>FE</sub>	I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V @ T <sub>C</sub> = -55°C	10		10		10		10		
† Pulsed Collector Saturation	V <sub>CE (sat)</sub>	I <sub>C</sub> = 1A, I <sub>B</sub> = 0.1A		0.25		0.25		0.25		0.25	Volts
		I <sub>C</sub> = 5A, I <sub>B</sub> = 0.5A		2.0		2.0		2.0		2.0	Volts
† Pulsed Base Emitter Voltage	V <sub>BE</sub>	I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V		1.2		1.2		1.2		1.2	Volts
† Pulsed Base Saturation Voltage	V <sub>BE (sat)</sub>	I <sub>C</sub> = 1A, I <sub>B</sub> = 0.1A		1.2		1.2		1.2		1.2	Volts
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> = 60V, I <sub>E</sub> = 0	0.1		0.1		0.1		0.1		μAmp
Collector Cutoff Current	I <sub>CEO</sub>	V <sub>CE</sub> = 50V, I <sub>B</sub> = 0	100		100		100		100		μAmp
Collector Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> = 5V, I <sub>C</sub> = 0	0.1		0.1		0.1		0.1		μAmp
Collector Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> = 8V, I <sub>C</sub> = 0	10		10		10		10		μAmp
Collector Cutoff Current	I <sub>CEX</sub>	V <sub>EB</sub> = 0.5V, V <sub>CE</sub> = 60V @ T <sub>C</sub> = 150°C	50		50		50		50		μAmp

\*JEDEC registered data. † Pulse Conditions: Width = 10μs; Duty Cycle ≤ 2% (measured using Kelvin connections).

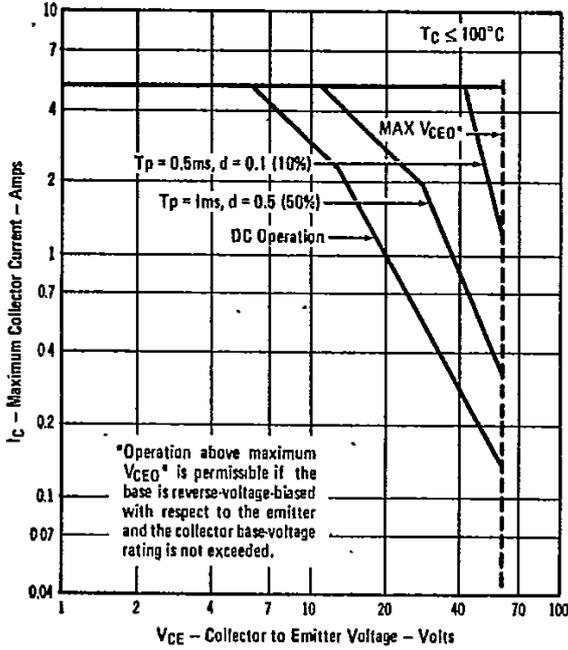
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\*DYNAMIC CHARACTERISTICS

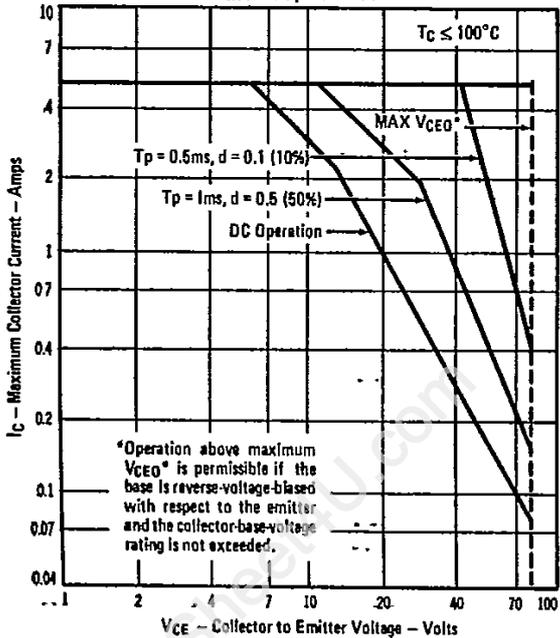
CHARACTERISTIC	SYMBOL	TEST CONDITIONS	2N2877 2N2879		2N2878 2N2880		UNITS
			MIN	MAX	MIN	MAX	
Pulse Rise Time	$t_r$	See Circuit #1		120		80	nsec
Pulse Storage Time	$t_s$	See Circuit #1		60		60	nsec
Pulse Fall Time	$t_f$	See Circuit #1		80		80	nsec
Collector Base Capacitance (f = 1.0 MHz)	$C_{OB}$	$V_{CB} = 10V, I_E = 0, f = 1 \text{ MHz}$		150		150	pF
High Frequency Current Gain (f = 10 MHz)	$ h_{fe} $	$V_{CE} = 10V, I_C = 1A, f = 10 \text{ MHz}$	3		5		
High Frequency Small Signal (f = 1kHz)	$ h_{fe} $	$V_{CE} = 5V, I_C = 50mA, f = 1 \text{ KHz}$	20	70	40	140	

\*JEDEC registered data.

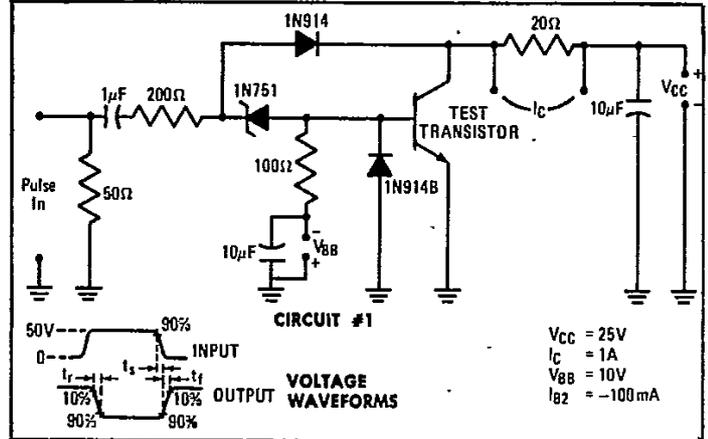
MAXIMUM SAFE OPERATION REGION  
2N2877, 2N2878



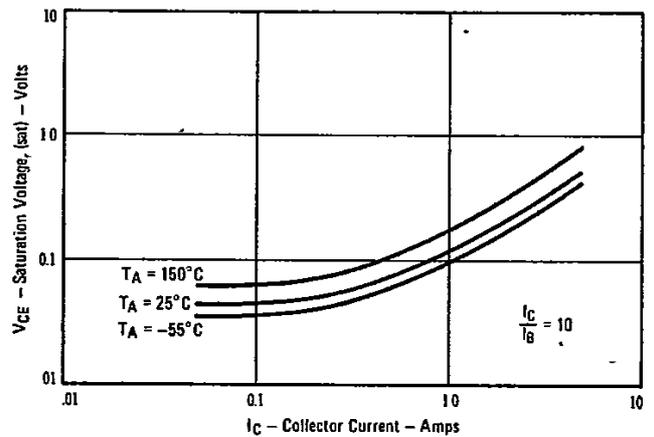
MAXIMUM SAFE OPERATION REGION  
2N2879, 2N2880



PULSE RESPONSE MEASUREMENT CIRCUIT



COLLECTOR TO EMITTER VOLTAGE VS. COLLECTOR CURRENT



NORMALIZED CURRENT GAIN VS. COLLECTOR CURRENT

