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

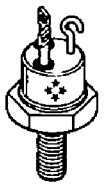
These devices are designed for use in power amplifiers and switching applications. The latest technologies are used to offer the highest degree of reliability.

FEATURES

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

APPLICATIONS

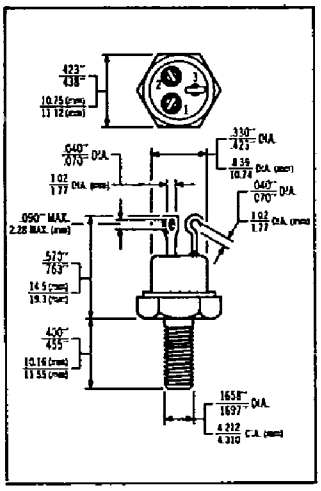
- **High Frequency Inverters**
- **Converters**
- **Linear Amplifiers**
- **High Speed Switching Regulated Power Supplies**
- **RF Power Amplifiers**



TO-111

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	
		2N2877 2N2878	2N2879 2N2880
Maximum Voltages and Current			
V_{CEO}	Collector to Emitter Voltage	60 Volts	80 Volts
V_{CBO}	Collector to Base Voltage	80 Volts	100 Volts
V_{EBO}	Emitter to Base Voltage	8 Volts	8 Volts
I_C	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 (Tc = 25°C unless otherwise noted)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	2N2877 MIN	2N2877 MAX	2N2878 MIN	2N2878 MAX	2N2879 MIN	2N2879 MAX	2N2880 MIN	2N2880 MAX	UNITS
Collector to Base Breakdown Voltage	BV_{CBO}	I_C = 10μA, I_E = 0	80		80		100		100		Volts
Collector to Emitter Sustaining Voltage	$V_{CEO(sust)}$	I_C = 100mA, I_B = 0	60		60		70		70		Volts
Collector to Emitter Breakdown Voltage	BV_{CEO}	I_C = 10mA, I_B = 0	60		60		80		80		Volts
Emitter to Base Breakdown Voltage	BV_{EBO}	I_E = 10μA, I_C = 0	8		8		8		8		Volts
†DC Pulse Current Gain	h_{FE}	I_C = 1A, V_{CE} = 2V	20	60	40	120	20	60	40	120	
†DC Pulse Current Gain	h_{FE}	I_C = 5A, V_{CE} = 5V	10		15		10		15		
†DC Pulse Current Gain	h_{FE}	I_C = 1A, V_{CE} = 2V @ T_C −55°C	10		10		10		10		
†Pulsed Collector Saturation	$V_{CE(sat)}$	I_C = 1A, I_B = 0.1A		0.25		0.25		0.25		0.25	Volts
		I_C = 5A, I_B = 0.5A		2.0		2.0		2.0		2.0	Volts
†Pulsed Base Emitter Voltage	V_{BE}	I_C = 1A, V_{CE} = 2V		1.2		1.2		1.2		1.2	Volts
†Pulsed Base Saturation Voltage	$V_{BE(sat)}$	I_C = 1A, I_B = 0.1A		1.2		1.2		1.2		1.2	Volts
Collector Cutoff Current	I_{CBO}	V_{CB} = 60V, I_E = 0		0.1		0.1		0.1		0.1	μAmp
Collector Cutoff Current	I_{CEO}	V_{CE} = 50V, I_B = 0		100		100		100		100	μAmp
Collector Cutoff Current	I_{EBO}	V_{EB} = 5V, I_C = 0		0.1		0.1		0.1		0.1	μAmp
Collector Cutoff Current	I_{EBO}	V_{EB} = 8V, I_C = 0		10		10		10		10	μAmp
Collector Cutoff Current	I_{CEX}	V_{EB} = 0.5V, V_{CE} = 60V @ T_C 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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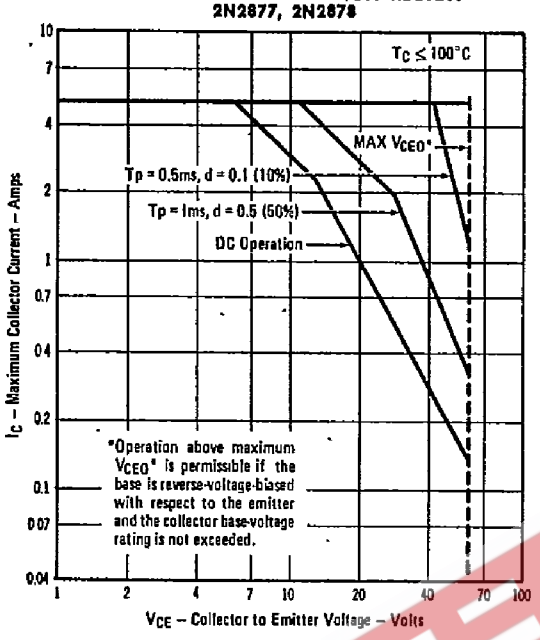
*DYNAMIC CHARACTERISTICS

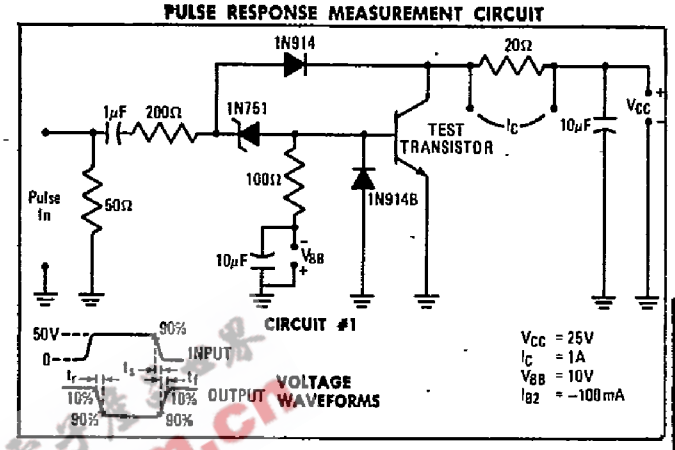
CHARACTERISTIC	SYMBOL	TEST CONDITIONS	2N2877 2N2879 MIN	2N2877 2N2879 MAX	2N2878 2N2880 MIN	2N2878 2N2880 MAX	UNITS
Pulse Rise Time	t_r	See Circuit #1		120		80	nsec
Pulse Storage Time	t_s	See Circuit #1		60		60	nsec
Pulse Fall Time	t_f	See Circuit #1		80		80	nsec
Collector Base Capacitance (f = 1.0 MHz)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

*JEDEC registered data.

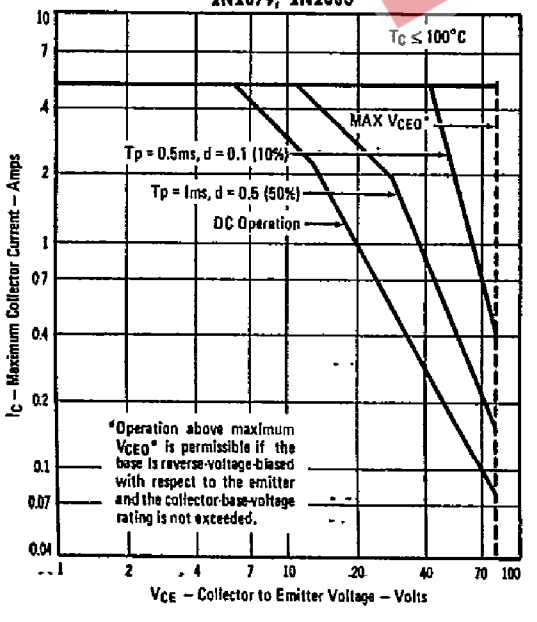
MAXIMUM SAFE OPERATION REGION
2N2877, 2N2878



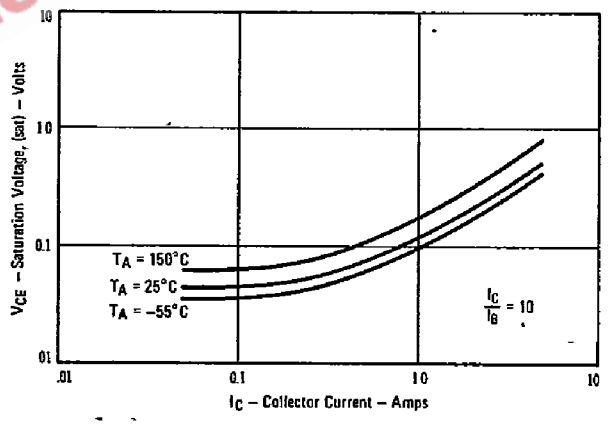
PULSE RESPONSE MEASUREMENT CIRCUIT



MAXIMUM SAFE OPERATION REGION
2N2879, 2N2880



COLLECTOR TO EMITTER VOLTAGE VS. COLLECTOR CURRENT



NORMALIZED CURRENT GAIN VS. COLLECTOR CURRENT