



Spectrum Devices Corporation

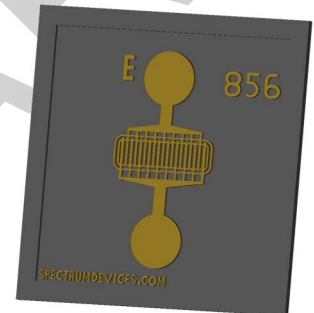
Semiconductor Engineering and Manufacturing

**RF & MICROWAVE TRANSISTOR DIE
LOW POWER APPLICATIONS TO 1 GHz**

SD856-10

FEATURES:

- 7 GHz f_T
- 10 Volt Operation
- Noise Figure, 1.1dB, typical
- Common Emitter
- Gold Metallization
- **Replacement for NEC NE85600**



DESCRIPTION:

The SD856-10 NPN silicon bipolar transistor is designed for low power applications requiring high dynamic range. This device exhibits an outstanding combination of high gain and low noise figure. The SD856-10 offers excellent performance and reliability using gold topside and backside metallization of the chip.

ABSOLUTE MAXIMUM RATINGS: ($T_{\text{SUBSTRATE}} = 25^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	30	V
V_{CEO}	Collector-Emitter Voltage	15	V
V_{EBO}	Emitter-Base Voltage	3.0	V
I_{C}	Device Current	100	mA
P_{DISS}	Total Dissipation	700	mW
T_{J}	Junction Temperature	+200	$^{\circ}\text{C}$
T_{STG}	Storage Temperature	-65 to +150	$^{\circ}\text{C}$

THERMAL DATA:

$R_{\text{TH(J-S)}}$	Thermal Resistance Junction-Substrate	250	$^{\circ}\text{C/W}$
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ELECTRICAL SPECIFICATIONS ($T_{\text{SUBSTRATE}} = 25^{\circ}\text{C}$)

DC CHARACTERISTICS

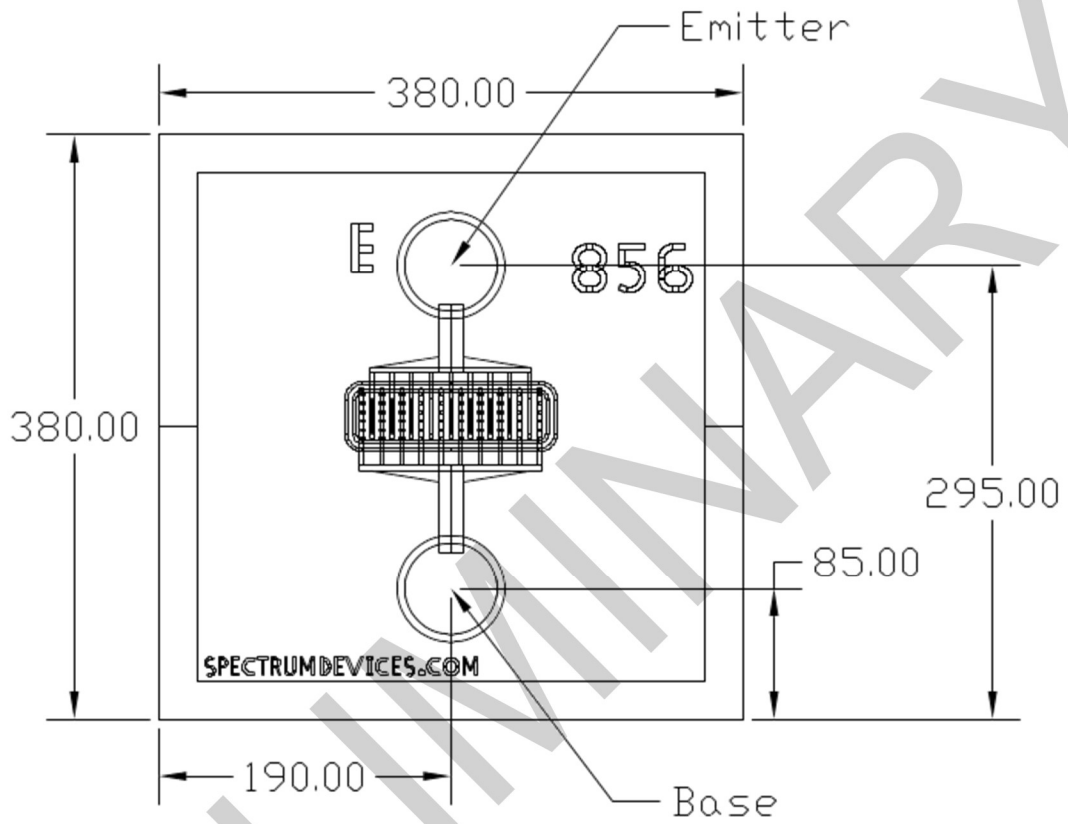
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 5 \text{ mA}$	$I_E = 0 \text{ mA}$	30	--	--	V
BV_{CEO}	$I_C = 5 \text{ mA}$	$I_B = 0 \text{ mA}$	15	--	--	V
BV_{EBO}	$I_E = 1 \text{ mA}$	$I_C = 0 \text{ mA}$	3.0	--	--	V
I_{CBO}	$V_{CE} = 15\text{V}$	$I_E = 0 \text{ mA}$	--	--	1	μA
h_{FE}	$V_{CE} = 5 \text{ V}$	$I_C = 20 \text{ mA}$	30	--	300	--

RF CHARACTERISTICS

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
f_T	$V_{CE} = 10 \text{ V}$	$I_C = 20 \text{ mA}$		--	7	--	GHz
NF_{MIN}	$V_{CE} = 10 \text{ V}$	$I_C = 7 \text{ mA}$	$f_{\text{meas}} = 1 \text{ GHz}$	--	1.1	--	dB
G_A	$V_{CE} = 10 \text{ V}$	$I_C = 7 \text{ mA}$	$f_{\text{meas}} = 1 \text{ GHz}$	--	13	--	dB
$ S_{21E} $	$V_{CE} = 10 \text{ V}$	$I_C = 20 \text{ mA}$	$f_{\text{meas}} = 1 \text{ GHz}$	--	13	--	dB
C_{OB}	$f = 1 \text{ MHz}$	$V_{CB} = 10 \text{ V}$		--	1	--	pF

OUTLINE DIMENSIONS

(Dimensions in Microns)



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