Spectrum Devices Corporation

Semiconductor Engineering and Manufacturing

RF & MICROWAVE TRANSISTORS
HF SSB APPLICATIONS

HF50-250

FEATURES:

- 30 MHz
- 50 Volts
- IMD –30 dB
- Common Emitter
- Gold Metallization
- P_{out}= 250 W PEP Min. with 14.5 dB Gain
- **Improved Collector-Base Breakdown Voltage: 175 Volts Min.**
- **Direct replacement for ST SD1728 (TH430)**

0.550" DIAMETER
SOE PACKAGE

DESCRIPTION:

The HF50-250 is a 50V epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes emitter ballasting to achieve extreme ruggedness and reliability. The HF50-series products utilize the unique Spectrum Devices' Bipolar process which offers a 60% improvement in collector-base breakdown voltage, enhancing reliability while maintaining RF performance

ABSOLUTE MAXIMUM RATINGS: (T_{CASE} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	175	V
V_{CEO}	Collector-Emitter Voltage	55	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_C	Device Current	40	A
P_{DISS}	Total Dissipation	330	W
T_J	Junction Temperature	+200	°C
T_{STG}	Storage Temperature	-65 to +150	°C

THERMAL DATA:

$R_{TH(J-C)}$	Thermal Resistance Junction-case	0.4	°C/W

ELECTRICAL SPECIFICATIONS (T_{CASE} = 25°C)

DC CHARACTERISTICS

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	I_C = 200 mA	V_{BE} = 0 V	175	--	--	V
BV_{CEO}	I_C = 200 mA	I_B = 0 mA	55	--	--	V
BV_{EBO}	I_E = 20 mA	I_C = 0 mA	4.0	--	--	V
I_{CEO}	V_{CE} = 30 V	I_E = 0 mA	--	--	10	mA
I_{CES}	V_{CE} = 60 V	I_E = 0 mA	--	--	10	mA
h_{FE}	V_{CE} = 6 V	I_C = 10 A	15	--	45	--

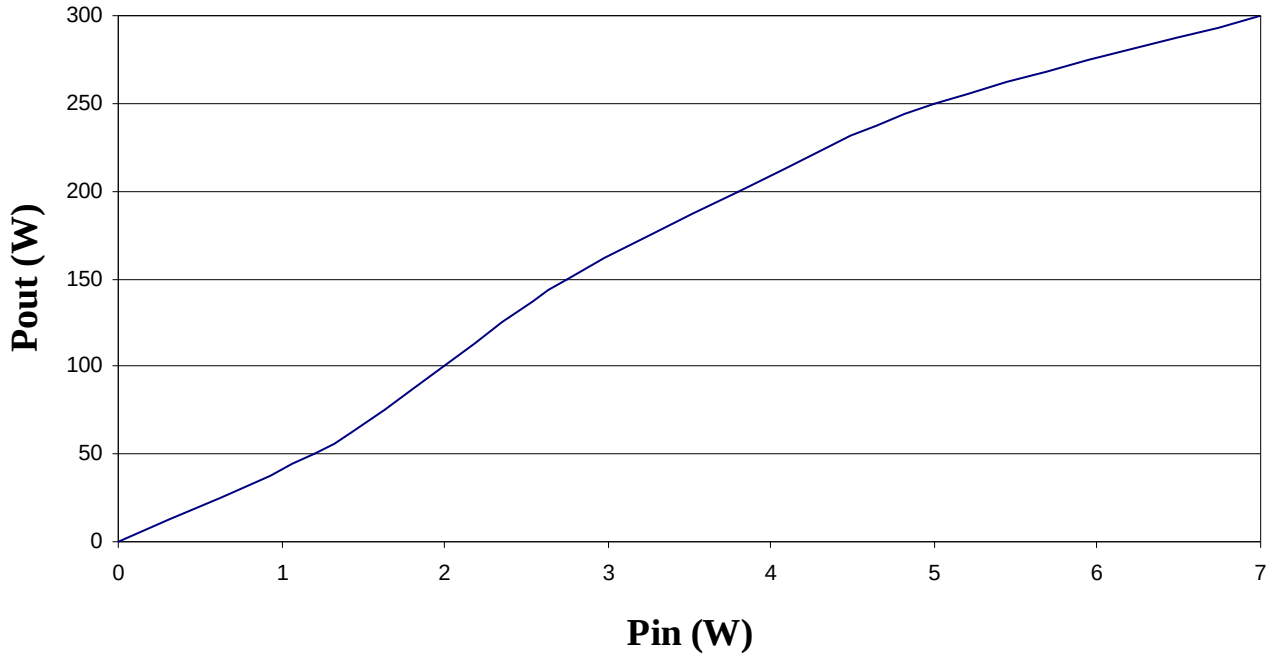
RF CHARACTERISTICS

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 30 MHz	V_{CC} = 50 V	I_{CQ} =150 mA	250	--	--	W PEP
G_P	P_{out} =250 W PEP	V_{CC} = 50 V	I_{CQ} =150 mA	14.5	--	--	dB
IMD*	P_{out} =250 W PEP	V_{CC} = 50 V	I_{CQ} =150 mA	--	--	-30	dBc
η_C	P_{out} =250 W PEP	V_{CC} = 50 V	I_{CQ} =150 mA	37	--	--	%
C_{OB}	f = 1 MHz	V_{CB} = 50 V		--	--	360	pF

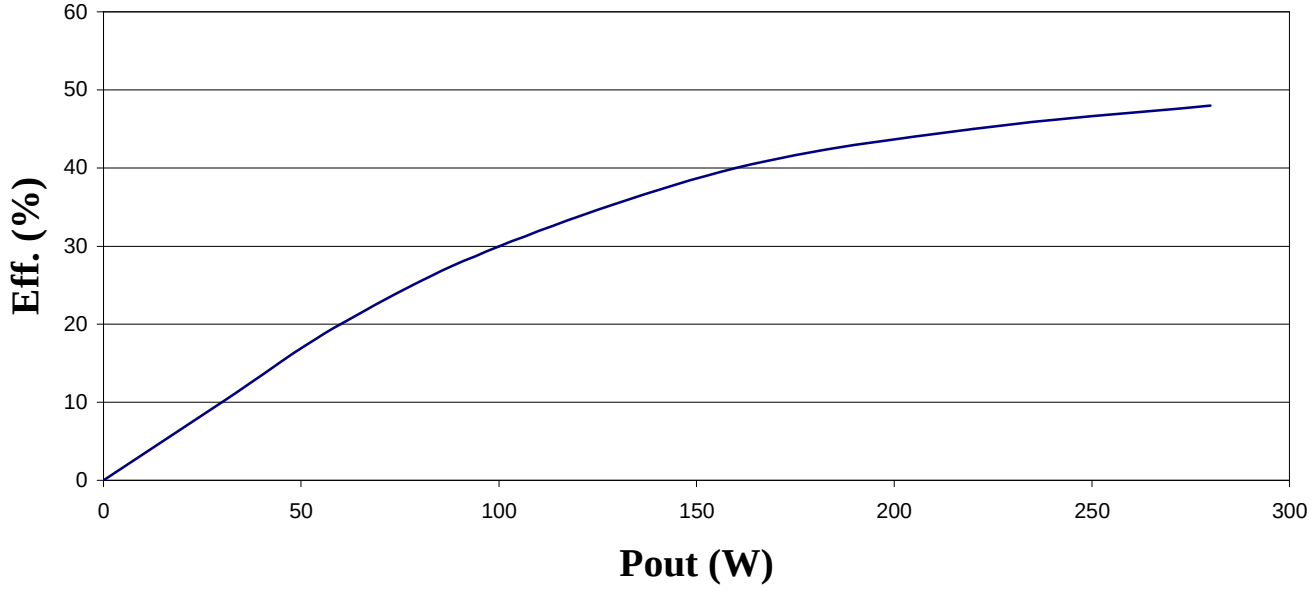
*Conditions f1 = 30.00MHz f2 = 30.001MHz

TYPICAL PERFORMANCE

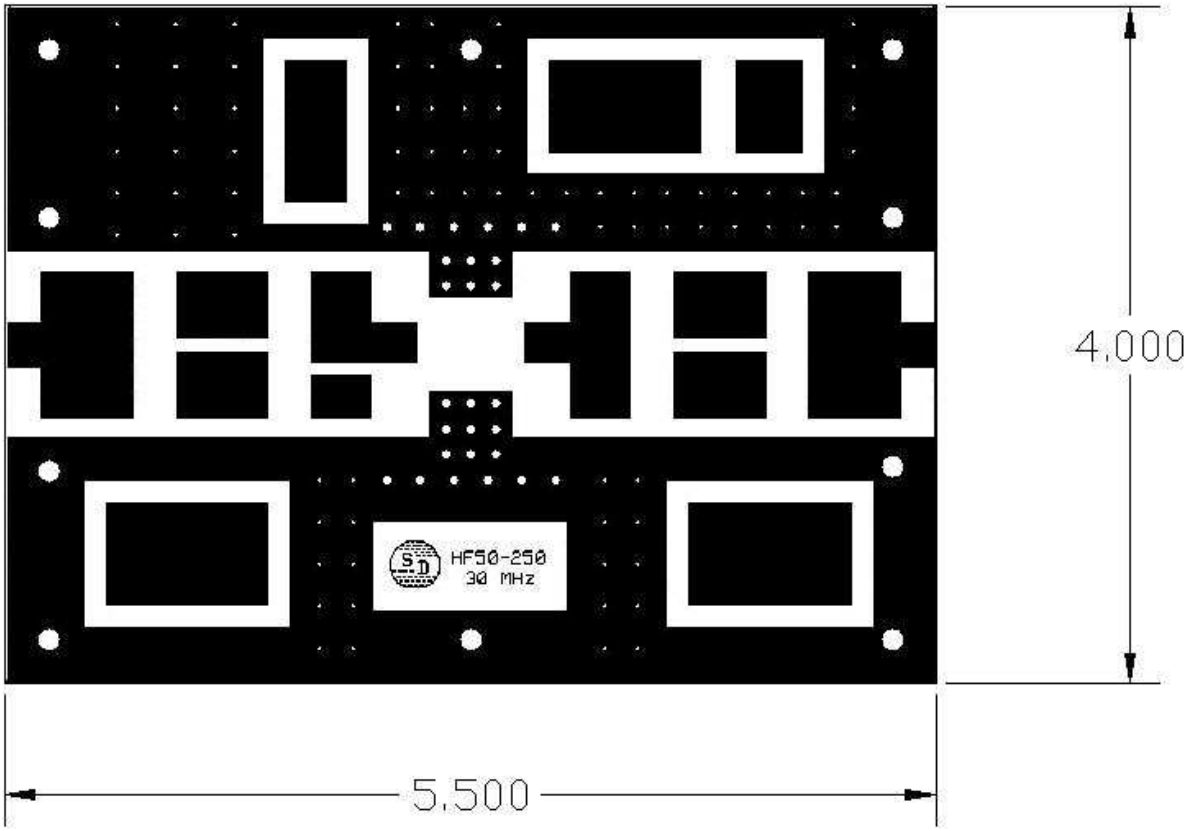
Power Output vs Power Input



Collector Efficiency vs. Power Out

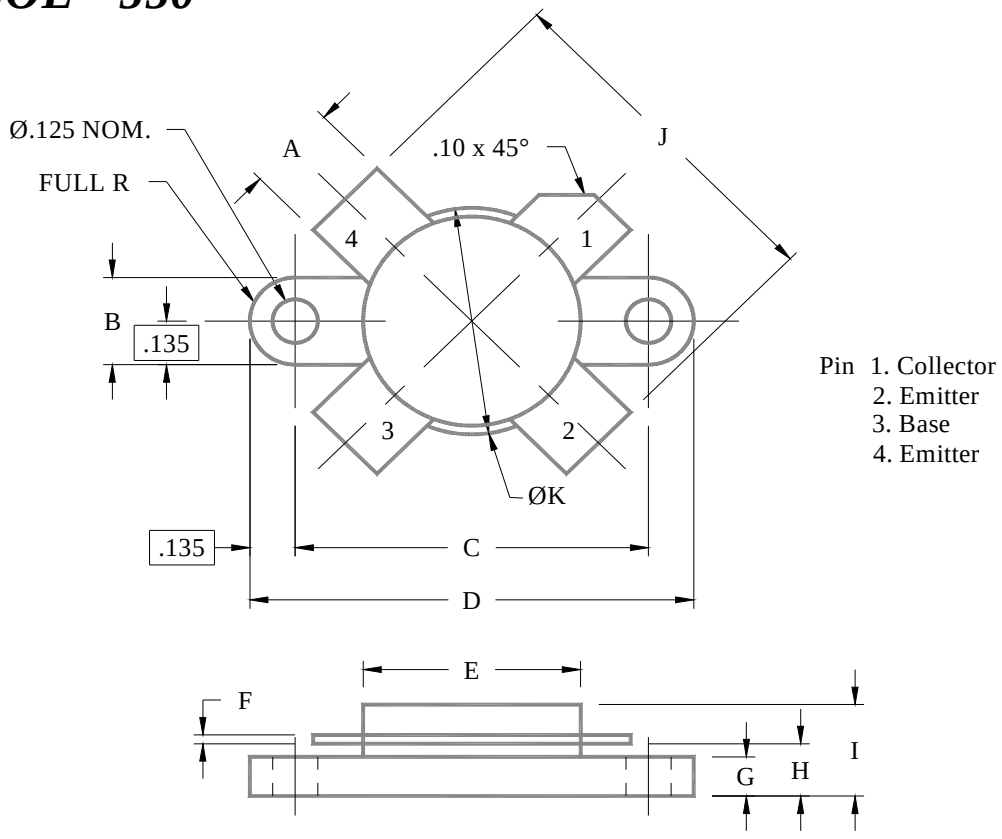


PCB LAYOUT



PACKAGE MECHANICAL DATA

SOE - 550



	Minimum Inches /MM	Maximum Inches/MM		Minimum Inches/MM	Maximum Inches/MM
A	.225/5.72	.235/5.97	G	.100/2.54	.118/3.00
B	.265/6.73	.275/6.96	H	.150/3.81	.170/4.32
C	.860/21.84	.870/22.10	I		.280/7.11
D	1.130/28.70	1.140/28.96	J	1.080/27.43	1.120/28.45
E	.545/13.84	.555/14.10	K	.625/15.88	.635/16.13
F	.003/0.08	.007/0.18			

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Visit our website at www.spectrumdevices.com or contact our facility directly at
Spectrum Devices Corp., 2880 Bergey Road, Suite C, Hatfield, PA 19440.
Phone 215-997-7870 or FAX 215-997-7828