



# Spectrum Devices Corporation

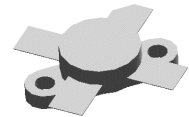
Semiconductor Engineering and Manufacturing

## RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

# HF50-150

### FEATURES:

- 30 MHz
- 50 Volts
- IMD -30 dB
- Common Emitter
- Gold Metallization
- $P_{out}$  = 150W PEP Min. with 14 dB Gain
- **Improved Collector-Base Breakdown Voltage: 175 Volts Min.**
- **Direct replacement for ST SD1726 (THA15)**



**0.500" DIAMETER  
SOE PACKAGE**

### DESCRIPTION:

The HF50-150 is a 50V epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes emitter ballasting to achieve extreme ruggedness under severe operating conditions. 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: ( $T_{CASE} = 25^{\circ}C$ )

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	10	A
$P_{DISS}$	Total Dissipation	233	W
$T_J$	Junction Temperature	+200	$^{\circ}C$
$T_{STG}$	Storage Temperature	-65 to +150	$^{\circ}C$

### THERMAL DATA:

$R_{TH(J-C)}$	Thermal Resistance Junction-case	0.75	$^{\circ}C/W$
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## ELECTRICAL SPECIFICATIONS ( $T_{CASE} = 25^{\circ}C$ )

### DC CHARACTERISTICS

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 100\text{ mA}$ $I_E = 0\text{ mA}$	175	--	--	V
$BV_{CES}$	$I_C = 100\text{ mA}$ $V_{BE} = 0\text{ V}$	175	--	--	V
$BV_{CEO}$	$I_C = 100\text{ mA}$ $I_B = 0\text{ mA}$	55	--	--	V
$BV_{EBO}$	$I_E = 10\text{ mA}$ $I_C = 0\text{ mA}$	4.0	--	--	V
$I_{CEO}$	$V_{CE} = 30\text{ V}$ $I_E = 0\text{ mA}$	--	--	5	mA
$I_{CES}$	$V_{CE} = 60\text{ V}$ $I_E = 0\text{ mA}$	--	--	5	mA
$h_{FE}$	$V_{CE} = 6\text{ V}$ $I_C = 1.4\text{ A}$	18	--	43.5	--

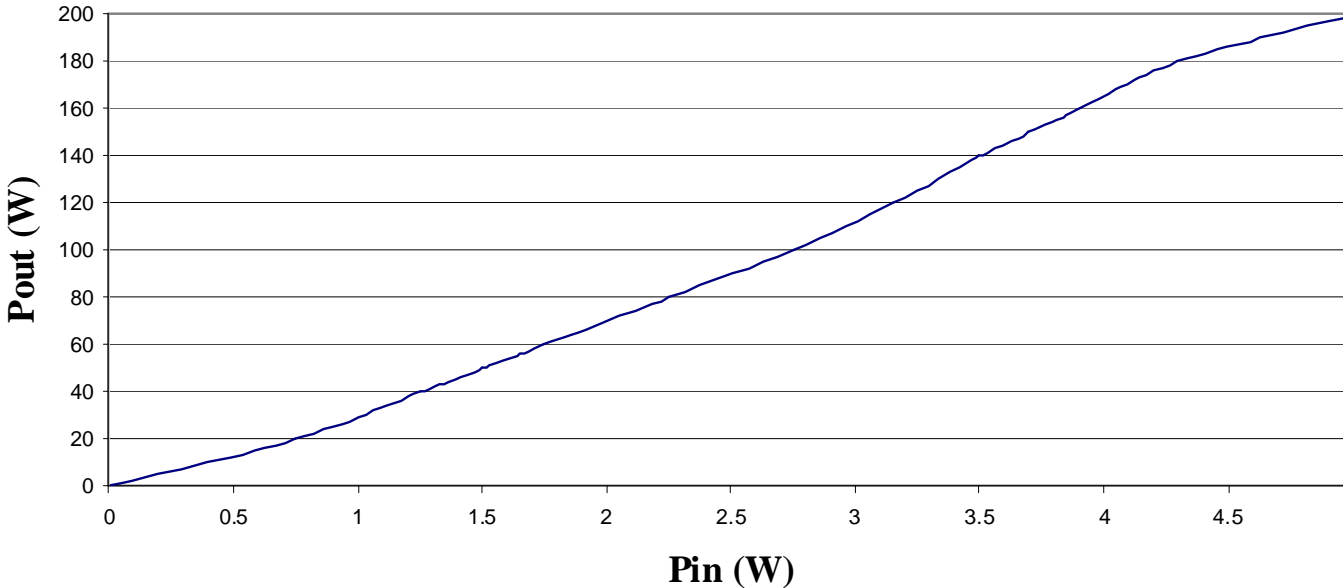
### RF CHARACTERISTICS

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$P_{OUT}$	$f = 30\text{ MHz}$ $V_{CC} = 50\text{ V}$ $I_{CQ} = 100\text{ mA}$	150	--	--	W PEP
$G_P$	$P_{out} = 150\text{ W PEP}$ $V_{CC} = 50\text{ V}$ $I_{CQ} = 100\text{ mA}$	14	--	--	dB
IMD*	$P_{out} = 150\text{ W PEP}$ $V_{CC} = 50\text{ V}$ $I_{CQ} = 100\text{ mA}$	--	--	-30	dBc
$\eta_C$	$P_{out} = 150\text{ W PEP}$ $V_{CC} = 50\text{ V}$ $I_{CQ} = 100\text{ mA}$	40	--	--	%
$C_{OB}$	$f = 1\text{ MHz}$ $V_{CB} = 50\text{ V}$	--	--	220	pF

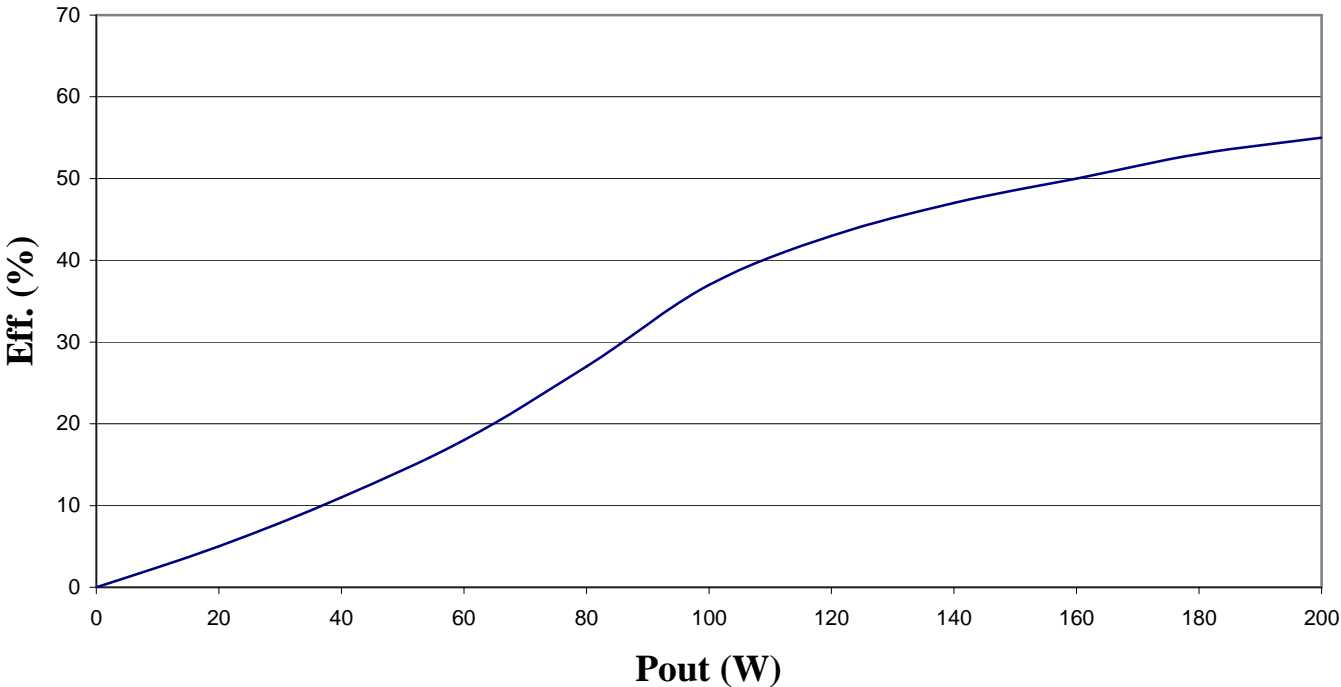
\*Conditions     $f_1 = 30.00\text{MHz}$      $f_2 = 30.001\text{MHz}$

# TYPICAL PERFORMANCE

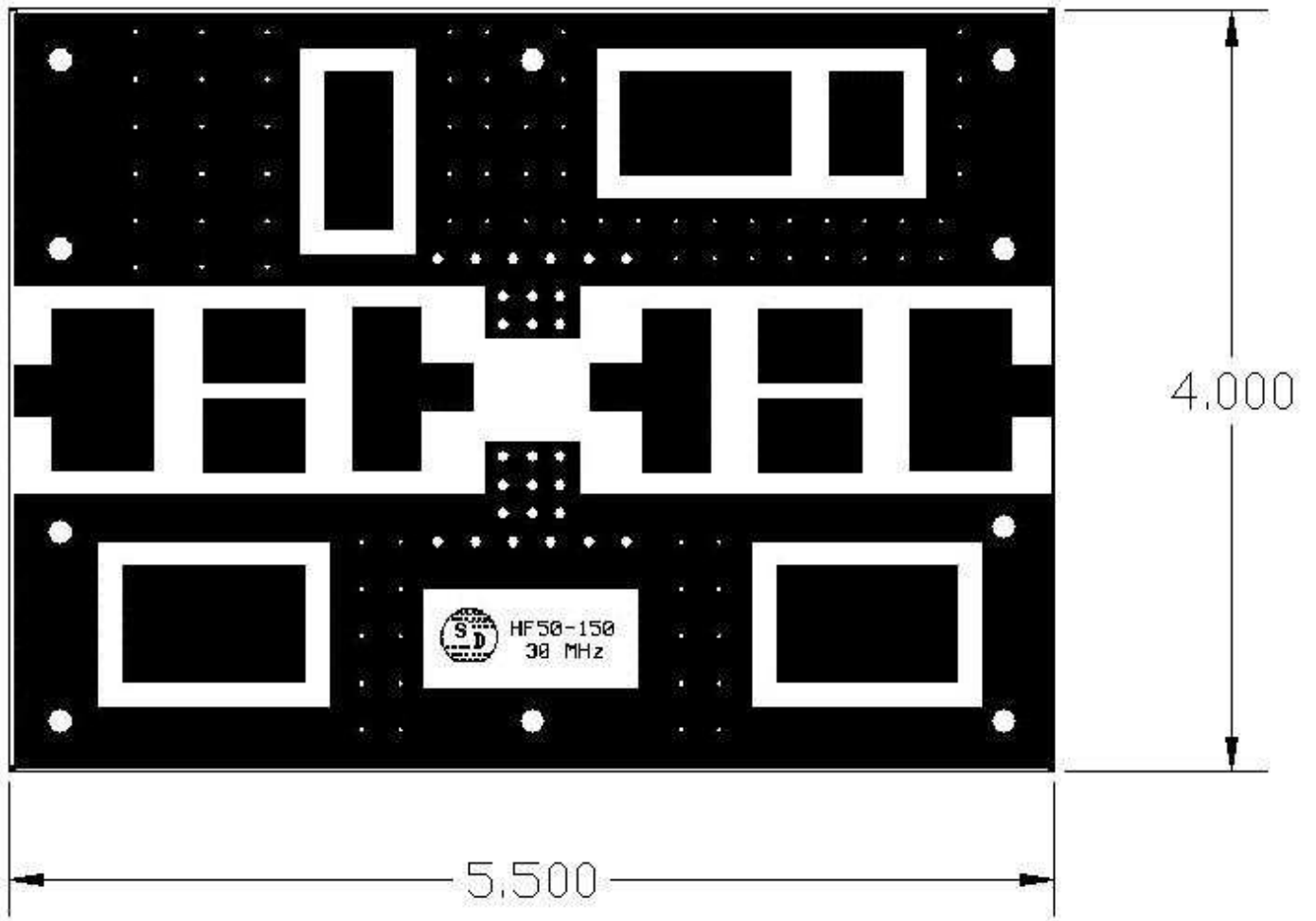
## Power Output vs. Power Input



## Collector Efficiency vs. Power Output

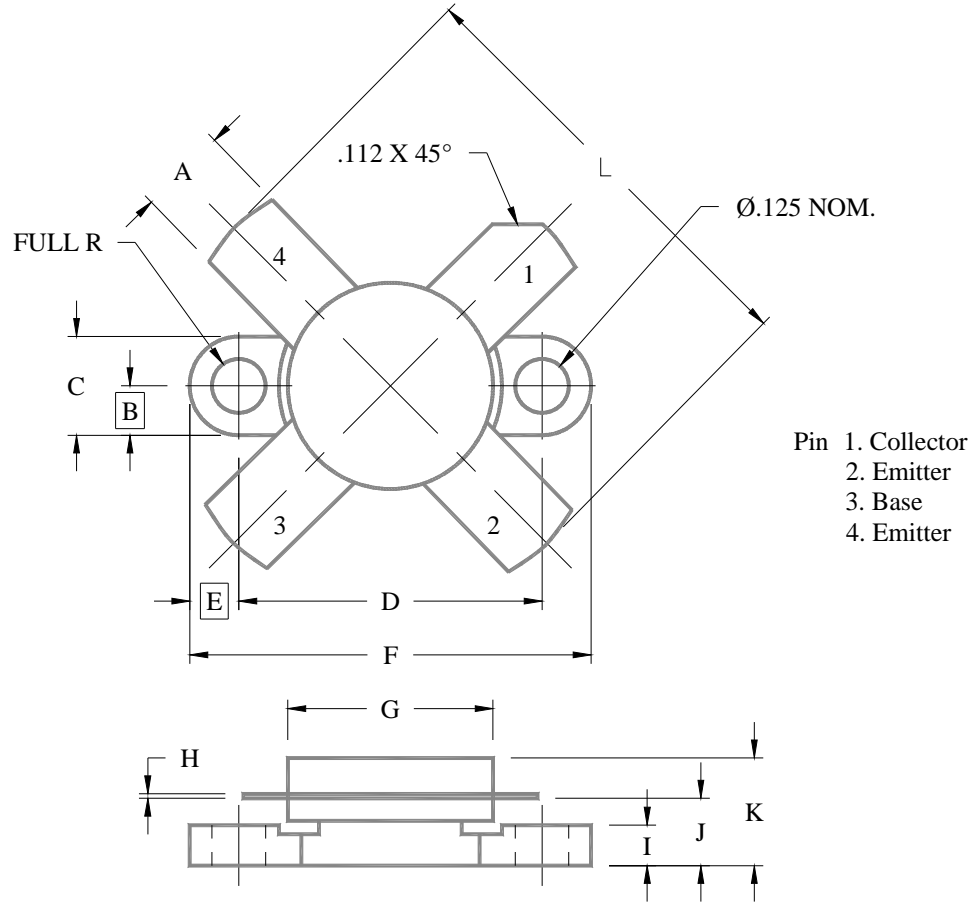


# PCB BOARD LAYOUT



# PACKAGE MECHANICAL DATA

## SOE - 500



	Minimum Inches/MM	Maximum Inches/MM		Minimum Inches/MM	Maximum Inches/MM
A	.220/5.59	.230/5.84	G	.495/12.57	.505/12.83
B	.125/3.18		H	.003/0.08	.007/0.18
C	.245/6.22	.255/6.48	I	.090/2.29	.110/2.79
D	.720/18.28	.730/18.54	J	.160/4.06	.175/4.45
E	.125/3.18		K		.280/7.11
F	.970/24.64	.980/24.89	L		1.050/26.67

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### **Life Support Applications**

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