



# Spectrum Devices Corporation

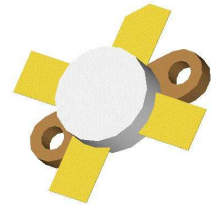
Semiconductor Engineering and Manufacturing

## RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

### HF50-75

### FEATURES:

- 30 MHz
- 50 Volts
- IMD -30 dB
- Common Emitter
- Gold Metallization
- $P_{out}$  = 75W Min. with 15 dB Gain
- **Improved Collector-Base Breakdown Voltage: 175 Volts Min.**



**0.500" DIAMETER  
SOE PACKAGE**

### DESCRIPTION:

The HF50-75 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            | 4.0         | A           |
| $P_{DISS}$ | Total Dissipation         | 140         | 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 | 1.05 | $^{\circ}C/W$ |
|---------------|----------------------------------|------|---------------|

## 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    |
| $I_{CES}$  | $V_{CE} = 50\text{ V}$ $I_E = 0\text{ mA}$  | --    | --   | 10   | mA   |
| $h_{FE}$   | $V_{CE} = 6\text{ V}$ $I_C = 1.4\text{ A}$  | 19    | --   | 50   | --   |

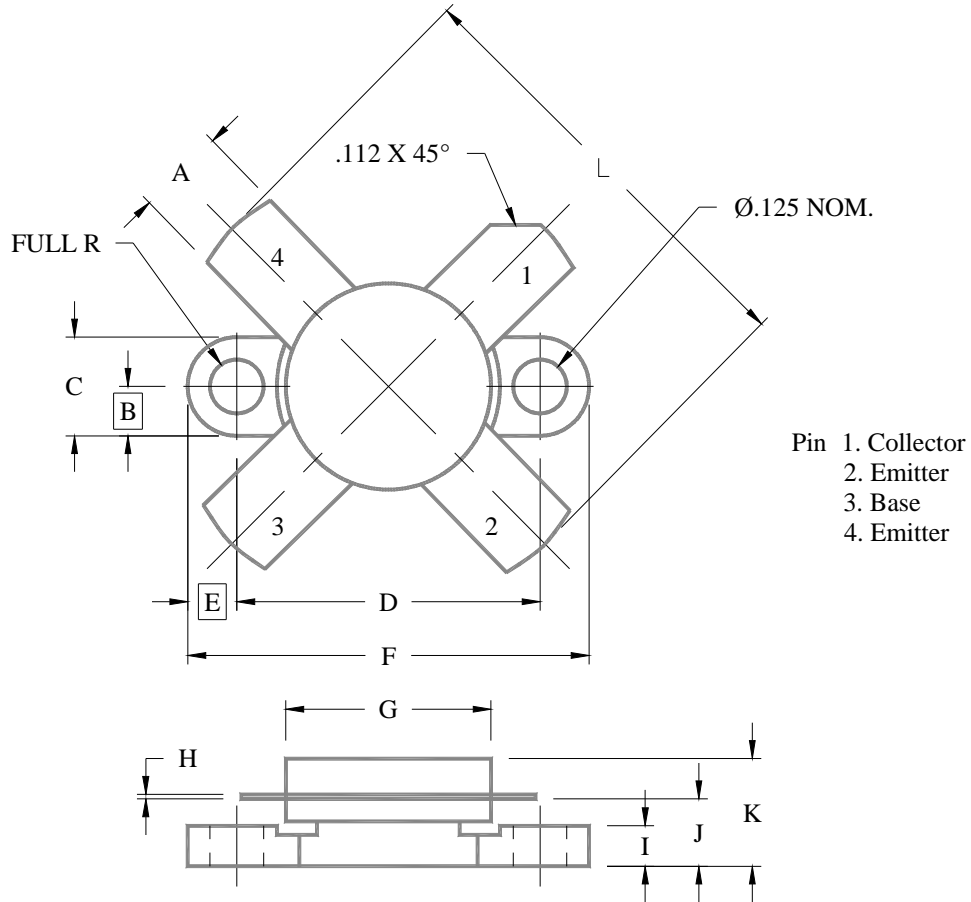
### RF CHARACTERISTICS

| Symbol    | Test Conditions                                    | Value |      |      | Unit |
|-----------|--|-------|------|------|------|
|           |  | Min.  | Typ. | Max. |      |
| $P_{OUT}$ | $f = 30\text{ MHz}$ $V_{CC} = 50\text{ V}$         | 75    | --   | --   | W    |
| $G_P$     | $P_{out} = 75\text{ W}$ $V_{CC} = 50\text{ V}$     | 16    | --   | --   | dB   |
| $\eta$    | $P_{out} = 75\text{ W}$ $V_{CC} = 50\text{ V}$     | 37    | --   | --   | %    |
| IMD*      | $P_{out} = 75\text{ W PEP}$ $V_{CC} = 50\text{ V}$ | --    | --   | -30  | dBc  |
| $C_{OB}$  | $f = 1\text{ MHz}$ $V_{CB} = 50\text{ V}$          | --    | 100  | --   | pF   |

\*Conditions     $f1 = 30.00\text{MHz}$      $f2 = 30.001\text{MHz}$

# PACKAGE MECHANICAL DATA

## SOE - 500



|   | Minimum<br>Inches/MM | Maximum<br>Inches/MM |   | Minimum<br>Inches/MM | Maximum<br>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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Visit our website at [www.spectrumdevices.com](http://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