

## MS1251

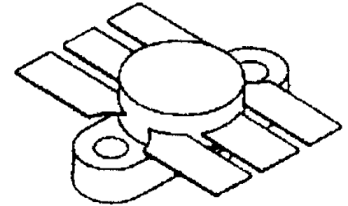
### RF & MICROWAVE TRANSISTORS VHF MOBILE APPLICATIONS

#### Features

- 175 MHz
- 12.5 VOLTS
- $P_{OUT} = 45$  WATTS
- $G_P = 6.5$  dB MINIMUM
- INPUT MATCHED
- COMMON EMITTER CONFIGURATION
- VSWR = 20:1

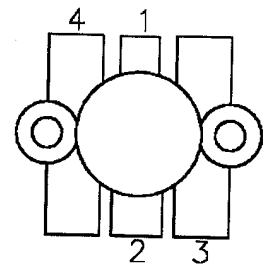
#### DESCRIPTION:

The MS1251 is an epitaxial silicon NPN planar transistor designed primarily for 12.5 V, Class C VHF communications. This device utilizes diffused emitter resistors to achieve 20:1 VSWR capability at rated operating conditions.



.500 6L flanged (M111)  
epoxy sealed

#### PIN CONNECTION



- |              |            |
|--------------|------------|
| 1. Collector | 3. Base    |
| 2. Emitter   | 4. Emitter |

#### ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector - Base Voltage	36	V
V <sub>CEO</sub>	Collector - Emitter Voltage	18	V
V <sub>CES</sub>	Collector - Emitter Voltage	36	V
V <sub>EBO</sub>	Emitter - Base Voltage	4.0	V
I <sub>C</sub>	Device Current	6.0	A
P <sub>DISS</sub>	Power Dissipation	145	W
T <sub>J</sub>	Junction Temperature	+200	°C
T <sub>STG</sub>	Storage Temperature	-65 to +150	°C

#### Thermal Data

R <sub>TH(J-C)</sub>	Junction-Case Thermal Resistance	1.2	°C/W
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## ELECTRICAL SPECIFICATIONS (T<sub>case</sub> = 25°C)

### STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
<b>BV<sub>CBO</sub></b>	<b>I<sub>C</sub> = 50 mA</b>	<b>I<sub>E</sub> = 0 mA</b>	<b>36</b>	---	---	<b>V</b>
<b>BV<sub>CES</sub></b>	<b>I<sub>C</sub> = 50 mA</b>	<b>V<sub>BE</sub> = 0 V</b>	<b>36</b>	---	---	<b>V</b>
<b>BV<sub>CEO</sub></b>	<b>I<sub>C</sub> = 50 mA</b>	<b>I<sub>B</sub> = 0 mA</b>	<b>18</b>	---	---	<b>V</b>
<b>BV<sub>EBO</sub></b>	<b>I<sub>E</sub> = 10 mA</b>	<b>I<sub>C</sub> = 0 mA</b>	<b>4.0</b>	---	---	<b>V</b>
<b>I<sub>CES</sub></b>	<b>V<sub>CE</sub> = 15 V</b>	<b>I<sub>E</sub> = 0 mA</b>	---	---	<b>5</b>	<b>mA</b>
<b>H<sub>FE</sub></b>	<b>V<sub>CE</sub> = 5 V</b>	<b>I<sub>C</sub> = 5 A</b>	<b>20</b>	---	<b>200</b>	---

### DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
<b>P<sub>OUT</sub></b>	<b>f = 138 - 175 MHz</b>	<b>P<sub>IN</sub> = 10 W</b>	<b>V<sub>CE</sub> = 12.5 V</b>	<b>45</b>	---	---	<b>W</b>
<b>G<sub>P</sub></b>	<b>f = 138 - 175 MHz</b>	<b>P<sub>IN</sub> = 10 W</b>	<b>V<sub>CE</sub> = 12.5 V</b>	<b>6.5</b>	---	---	<b>dB</b>
<b>η<sub>C</sub></b>	<b>f = 138 - 175 MHz</b>	<b>P<sub>IN</sub> = 10 W</b>	<b>V<sub>CE</sub> = 12.5 V</b>	<b>50</b>	---	---	<b>%</b>
<b>C<sub>OB</sub></b>	<b>f = 1 MHz</b>	<b>V<sub>CB</sub> = 12.5 V</b>		---	---	<b>135</b>	<b>pF</b>

### IMPEDANCE DATA

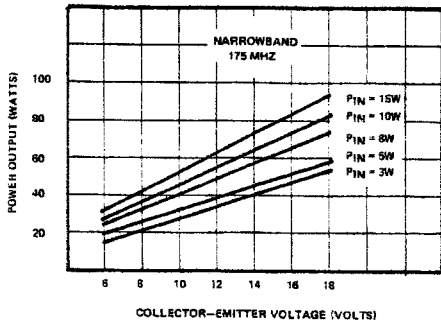
FREQ	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
175 MHz	1.38 + j0.44	1.70 + j0.48

**P<sub>IN</sub> = 10 W**  
**V<sub>CE</sub> = 12.5 V**

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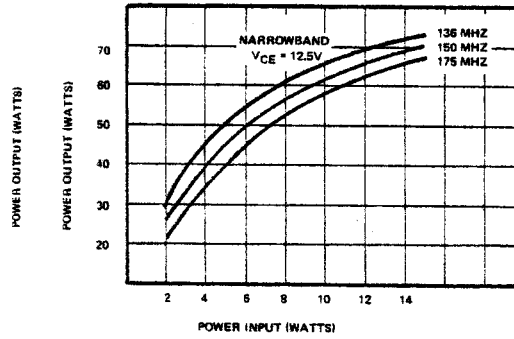
## TYPICAL PERFORMANCE

POWER OUTPUT VS. V<sub>CE</sub>



S88SD1428-02

POWER OUTPUT VS. POWER INPUT

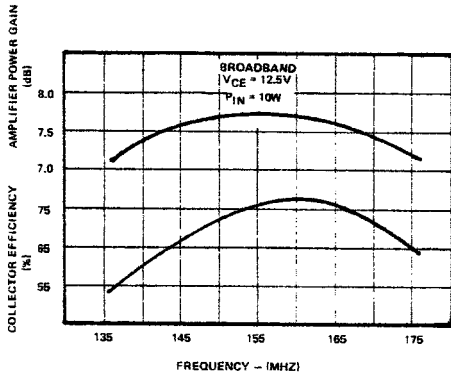


S88S1428-03

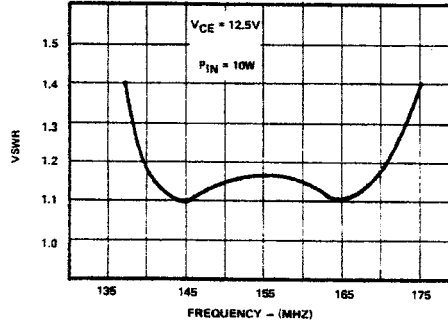
**MS1251**

**TYPICAL PERFORMANCE (CONTINUED)**

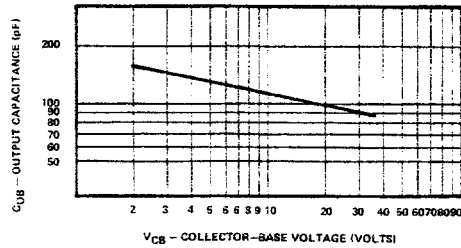
**POWER GAIN & COLLECTOR EFFICIENCY vs FREQUENCY**



**INPUT VSWR vs FREQUENCY**

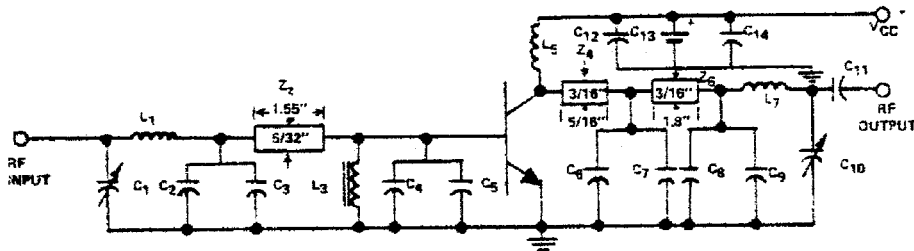
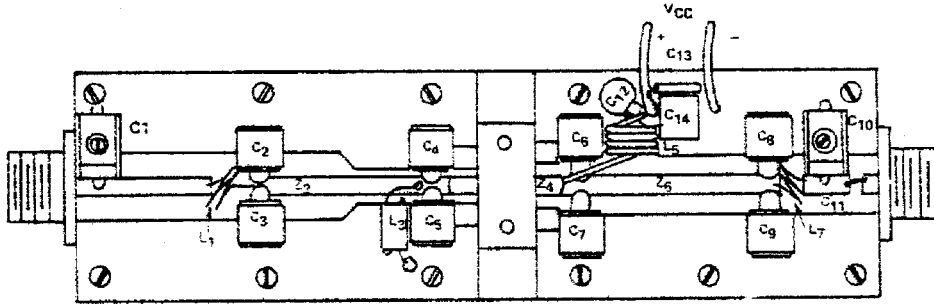


**COLLECTOR CAPACITANCE vs VOLTAGE**



**MS1251**

**TEST CIRCUIT**



- |                             |  |
|-----------------------------|--|
| C1, C10 : 4 - 40pF ARCO 403 | C14 : 1000pF Unelco  |
| C2 : 39pF Unelco            | L1 : 2 Turns, #18 AWG, 1/4" I.D., Wire Spacing, Enameled   |
| C3 : 56pF Unelco            | L3 : vk200 Ferroxcube                                      |
| C4 : 82pF Unelco            | L5 : 4 Turns, #16 AWG, 1/4" I.D., Close Wound, Enameled    |
| C5 : 100pF Unelco           | L7 : 2 Turns, #16 AWG, 17/64" I.D., Wire Spacing, Enameled |
| C6, C7 : 200pF Unelco       | Z2 : Approx. 8.1mH   |
| C8, C9 : 62pF Unelco        | Z4 : Approx. 2.3mH   |
| C11 : .015f Erie Red Cap    | Z6 : Approx. 10.1mH  |
| C12 : .01f Erie Disk        |  |
| C13 : 4.7f Electrolytic     |  |

**PACKAGE MECHANICAL DATA**

