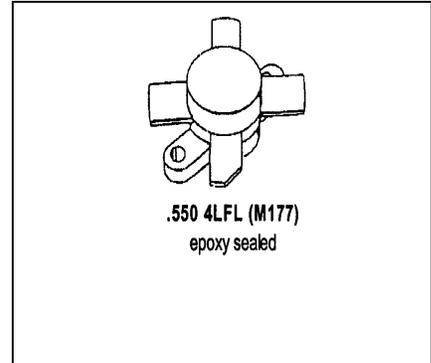


MS1004

**RF & MICROWAVE TRANSISTORS**  
**HF SSB APPLICATIONS**

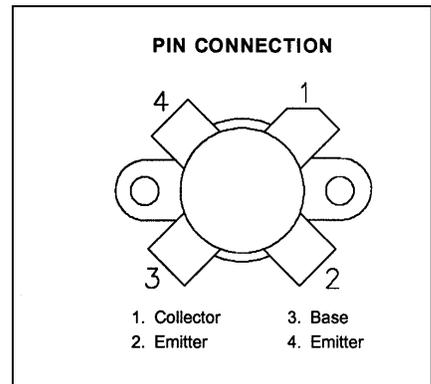
**Features**

- 30 MHz
- 50 VOLTS
- P<sub>OUT</sub> = 250 WATTS
- G<sub>P</sub> = 14.5 dB MINIMUM
- IMD = -30 dB
- GOLD METALIZATION
- COMMON EMITTER CONFIGURATION



**DESCRIPTION:**

The MS1004 is a 50V epitaxial silicon NPN planar transistor designed primarily for SSB and VHF communications. This device utilizes emitter ballasting for improved ruggedness and reliability.



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

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-Base Voltage	110	V
V <sub>CEO</sub>	Collector-Emitter Voltage	55	V
V <sub>EBO</sub>	Emitter-Base Voltage	4.0	V
I <sub>C</sub>	Device Current	40	A
P <sub>DISS</sub>	Total Dissipation	330	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>	Thermal Resistance Junction-case	0.4	°C/W
----------------------	----------------------------------	-----	------

**ELECTRICAL SPECIFICATIONS (T<sub>case</sub> = 25°C)**
**STATIC**

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
<b>BV<sub>CES</sub></b>	<b>I<sub>C</sub> = 200 mA</b>	<b>V<sub>BE</sub> = 0 V</b>	<b>110</b>	---	---	<b>V</b>
<b>BV<sub>CEO</sub></b>	<b>I<sub>C</sub> = 200 mA</b>	<b>I<sub>B</sub> = 0 mA</b>	<b>55</b>	---	---	<b>V</b>
<b>BV<sub>EBO</sub></b>	<b>I<sub>E</sub> = 20 mA</b>	<b>I<sub>C</sub> = 0 mA</b>	<b>4.0</b>	---	---	<b>V</b>
<b>I<sub>CEO</sub></b>	<b>V<sub>CE</sub> = 30 V</b>	<b>I<sub>E</sub> = 0 mA</b>	---	---	<b>10</b>	<b>mA</b>
<b>I<sub>CES</sub></b>	<b>V<sub>CE</sub> = 60 V</b>	<b>I<sub>E</sub> = 0 mA</b>	---	---	<b>10</b>	<b>mA</b>
<b>h<sub>F</sub>E</b>	<b>V<sub>CE</sub> = 6 V</b>	<b>I<sub>C</sub> = 10 A</b>	<b>15</b>	---	<b>45</b>	---

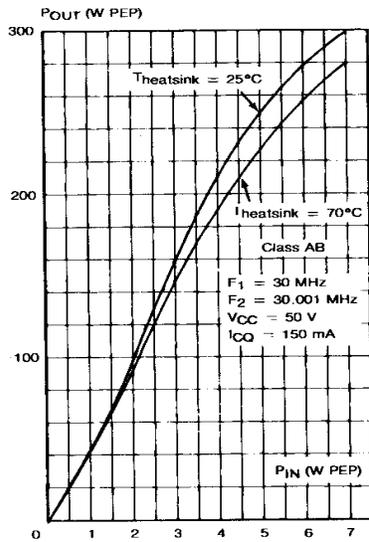
**DYNAMIC**

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
<b>P<sub>OUT</sub></b>	<b>f = 30MHz</b>	<b>V<sub>CC</sub> = 50 V</b>	<b>I<sub>CQ</sub> = 150 mA</b>	<b>250</b>	---	---	<b>WPEP</b>
<b>G<sub>P</sub></b>	<b>f = 30MHz</b>	<b>V<sub>CC</sub> = 50 V</b>	<b>I<sub>CQ</sub> = 150 mA</b>	<b>14.5</b>	---	---	<b>dB</b>
<b>IMD*</b>	<b>f = 30MHz</b>	<b>V<sub>CC</sub> = 50 V</b>	<b>I<sub>CQ</sub> = 150 mA</b>	--	---	<b>-30</b>	<b>dBc</b>
<b>η<sub>C</sub></b>	<b>f = 30MHz</b>	<b>V<sub>CC</sub> = 50 V</b>	<b>I<sub>CQ</sub> = 150 mA</b>	<b>37</b>	---	---	<b>%</b>
<b>C<sub>OB</sub></b>	<b>f = 1 MHz</b>	<b>V<sub>CB</sub> = 50 V</b>		---	---	<b>360</b>	<b>pf</b>
<b>Condition</b>	<b>f1 = 30.000 MHz</b>	<b>f2 = 30.001 MHz</b>					

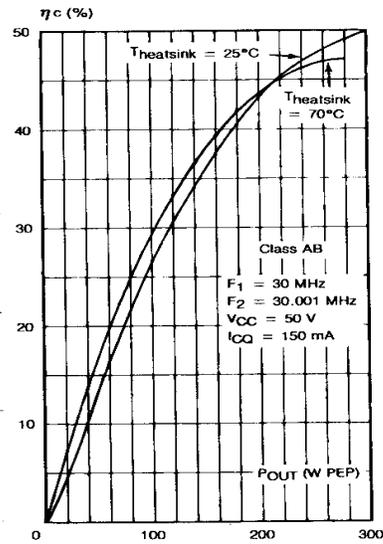
**TYPICAL PERFORMANCE**

**CLASS AB**

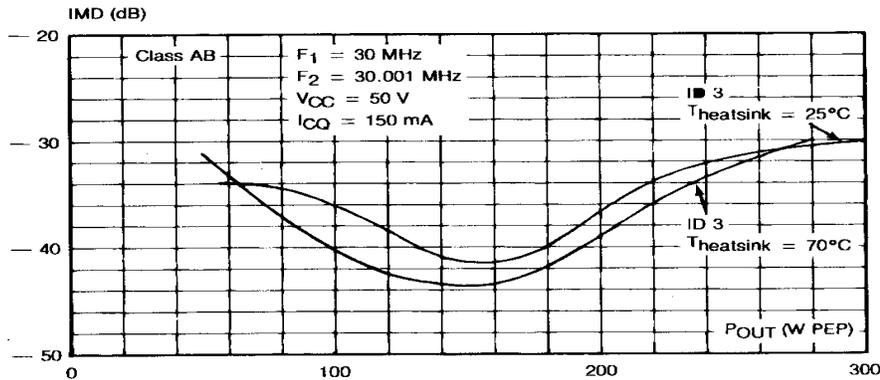
**POWER OUTPUT PEP vs POWER INPUT**



**COLLECTOR EFFICIENCY vs POWER OUTPUT PEP**



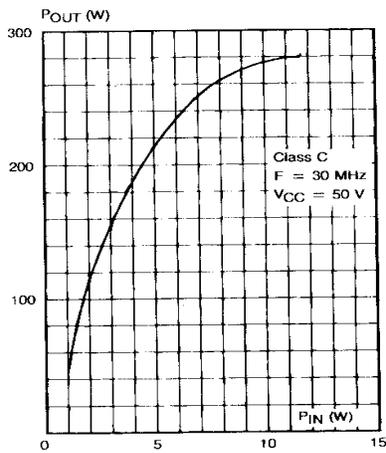
**INTERMODULATION DISTORTION vs POWER OUTPUT PEP**



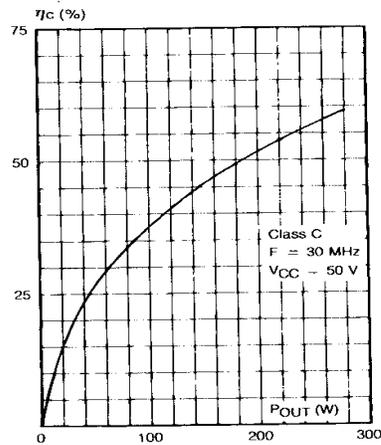
**TYPICAL PERFORMANCE**

**CLASS C F = 30 MHz**

**POWER OUTPUT vs POWER INPUT**

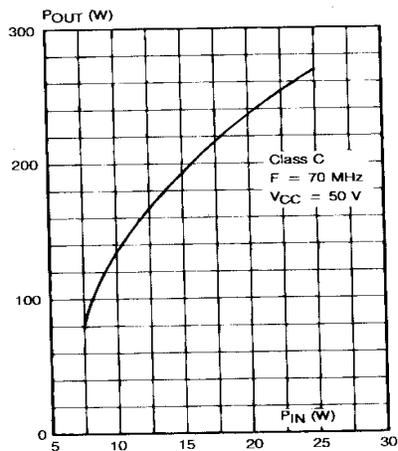


**COLLECTOR EFFICIENCY vs POWER OUTPUT**

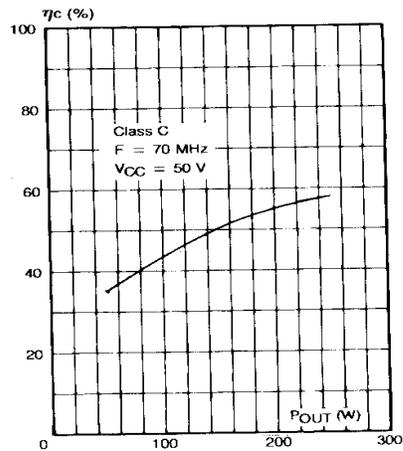


**CLASS C F = 70 MHz**

**POWER OUTPUT vs POWER INPUT**



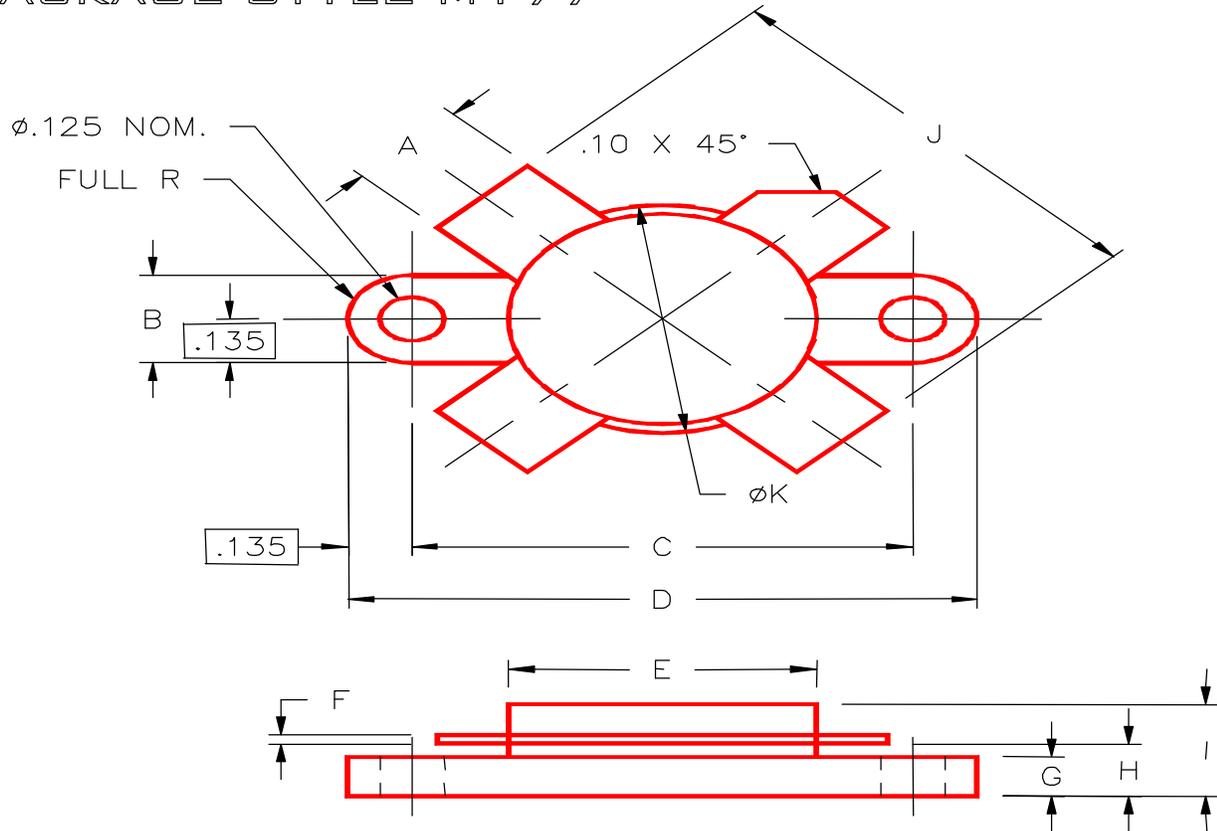
**COLLECTOR EFFICIENCY vs POWER OUTPUT**



**MS1004**

**PACKAGE MECHANICAL DATA**

PACKAGE STYLE M177



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.225/5,72	.235/5,97	I		.280/7,11
B	.265/6,73	.275/6,96	J	1.080/27,43	1.120/28,45
C	.860/21,84	.870/22,10	K	.625/15,88	.635/16,13
D	1.130/28,70	1.140/28,96			
E	.545/13,84	.555/14,10			
F	.003/0,08	.007/0,18			
G	.100/2,54	.118/3,00			
H	.150/3,81	.170/4,32			