



# THE DATASHEET OF SD1488





# SD1488

## RF POWER BIPOLAR TRANSISTORS UHF MOBILE APPLICATIONS

### FEATURES SUMMARY

- 470 MHz
- 12.5 VOLTS
- EFFICIENCY 50%
- COMMON EMITTER
- $P_{OUT} = 38 \text{ W MIN. WITH } 5.8 \text{ dB GAIN}$

### DESCRIPTION

The SD1488 is a 12.5 V Class C epitaxial silicon NPN planar transistor designed primarily for broadband applications in the 450 - 512 MHz land mobile radio band. This device utilizes diffused emitter resistors to withstand infinite VSWR at rated operating conditions.

Figure 1. Package

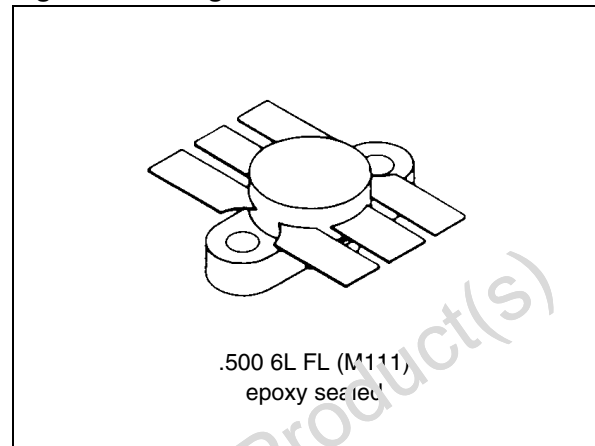


Figure 2. Pin Connection

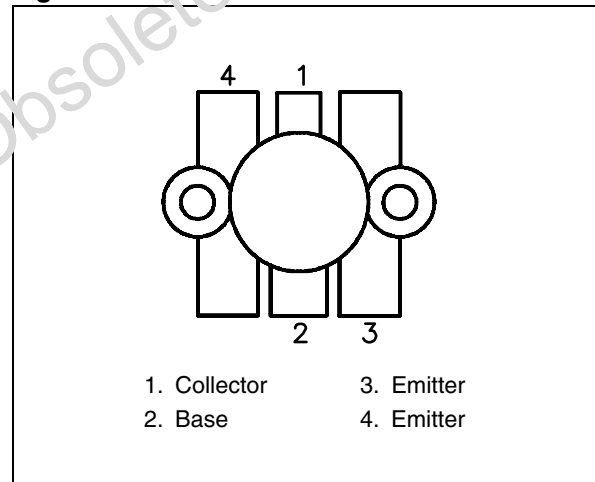


Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1488	SD1488	M111	PLASTIC TRAYS

**Table 2. Absolute Maximum Ratings ( $T_{\text{case}} = 25^{\circ}\text{C}$ )**

Symbol	Parameter	Value	Unit
$V_{\text{CBO}}$	Collector-Base Voltage	36	V
$V_{\text{CEO}}$	Collector-Emitter Voltage	16	V
$V_{\text{EBO}}$	Emitter-Base Voltage	4.0	V
$I_{\text{C}}$	Device Current	8.0	A
$P_{\text{DISS}}$	Power Dissipation	117	W
$T_{\text{J}}$	Junction Temperature	+200	$^{\circ}\text{C}$
$T_{\text{STG}}$	Storage Temperature	- 65 to +150	$^{\circ}\text{C}$

**Table 3. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{\text{TH(j-c)}}$	Junction-Case Thermal Resistance	1.5	$^{\circ}\text{C/W}$

**ELECTRICAL SPECIFICATIONS ( $T_{\text{case}} = 25^{\circ}\text{C}$ )****Table 4. Static**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{\text{CES}}$	$I_{\text{C}} = 15 \text{ mA}; V_{\text{BE}} = 0 \text{ V}$	36	—	—	V
$BV_{\text{CEO}}$	$I_{\text{C}} = 50 \text{ mA}; I_{\text{B}} = 0 \text{ mA}$	16	—	—	V
$BV_{\text{EBO}}$	$I_{\text{E}} = 5 \text{ mA}; I_{\text{C}} = 0 \text{ mA}$	4.0	—	—	V
$I_{\text{CES}}$	$V_{\text{CE}} = 12.5 \text{ V}; I_{\text{E}} = 0 \text{ mA}$	—	—	5	mA
$h_{\text{FE}}$	$V_{\text{CE}} = 5 \text{ V}; I_{\text{C}} = 1 \text{ A}$	20	—	300	—

**Table 5. Dynamic**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$P_{\text{OUT}}$	$f = 470 \text{ MHz}; P_{\text{IN}} = 10.0 \text{ W}; V_{\text{CC}} = 12.5 \text{ V}$	38	—	—	W
$G_{\text{P}}$	$f = 470 \text{ MHz}; P_{\text{IN}} = 10.0 \text{ W}; V_{\text{CC}} = 12.5 \text{ V}$	5.8	—	—	dB
$\eta_{\text{C}}$	$f = 470 \text{ MHz}; P_{\text{OUT}} = 38 \text{ W}; V_{\text{CC}} = 12.5 \text{ V}$	50	—	—	%
$C_{\text{OB}}$	$f = 1 \text{ MHz}; V_{\text{CB}} = 12.5 \text{ V}$	—	95	—	pF

## TYPICAL PERFORMANCE

Figure 3. Power Output vs Power Input

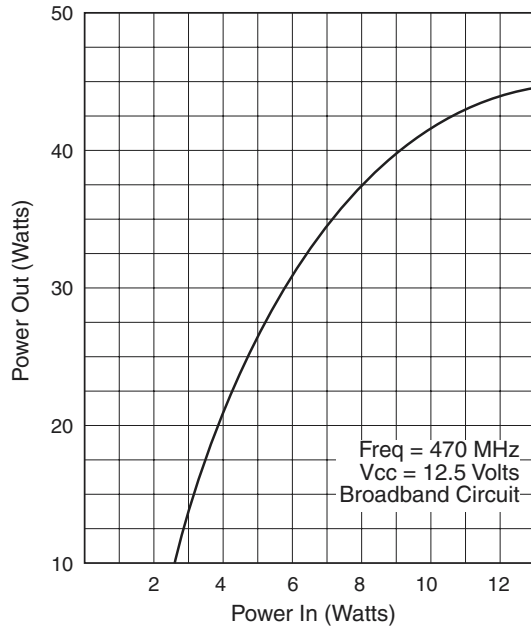


Figure 4. Power Output &amp; Collector Efficiency vs Frequency

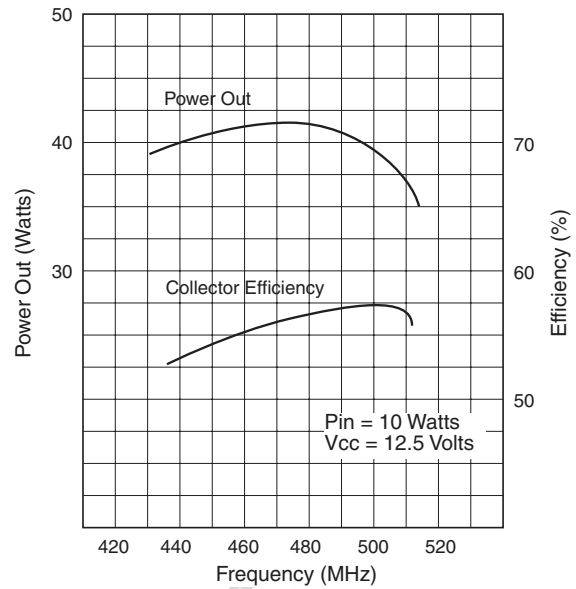


Figure 5. Power Output vs Frequency

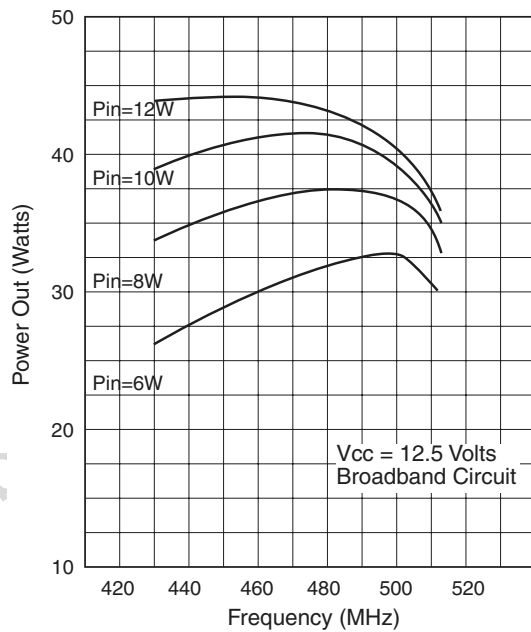
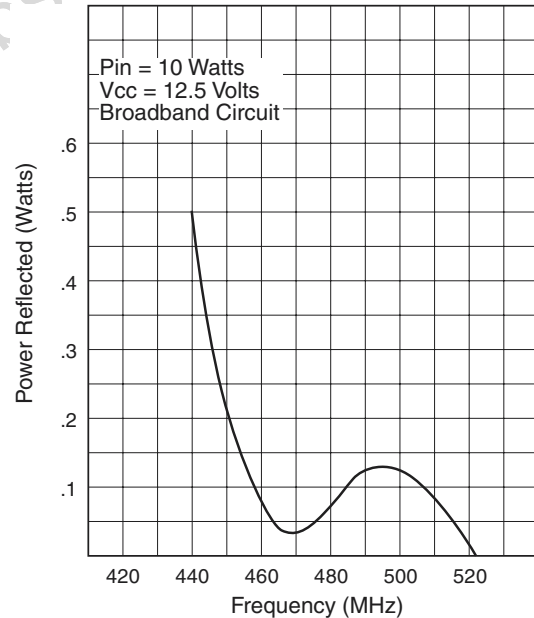
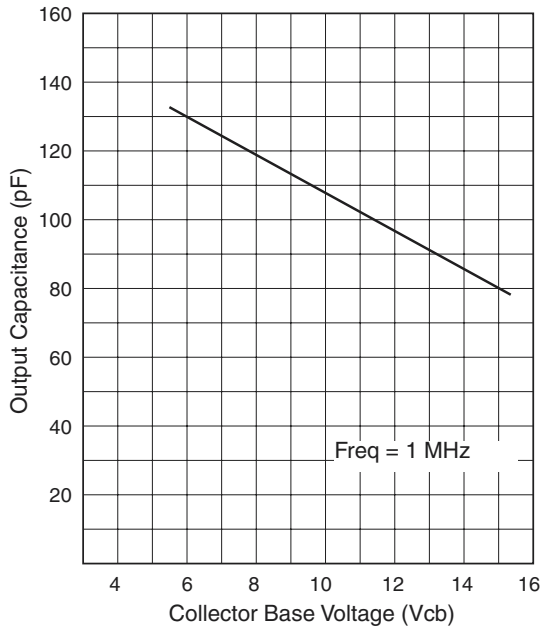


Figure 6. Power Reflected vs Frequency

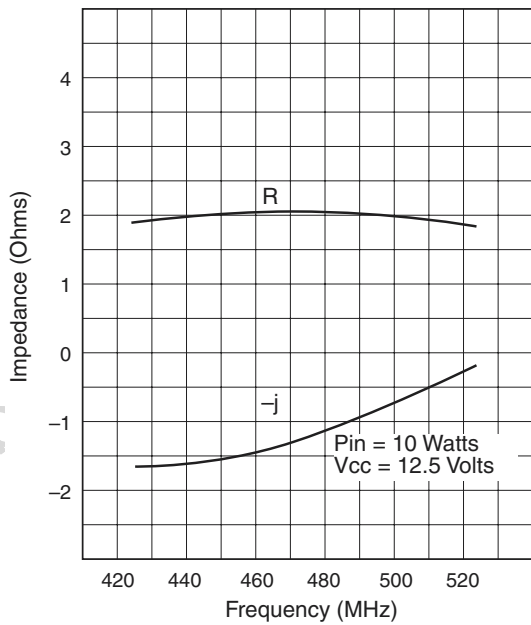


**Figure 7. Output Capacitance vs Collector Base Voltage**

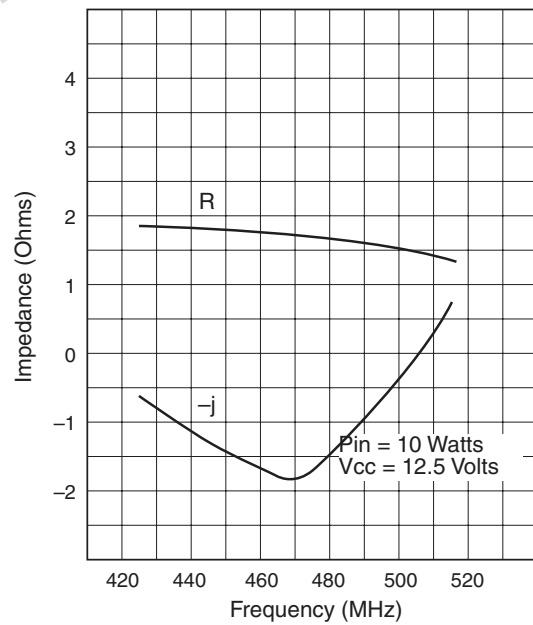


**IMPEDANCE DATA**

**Figure 8. Typical Input Impedance**



**Figure 9. Typical Collector Load Impedance**

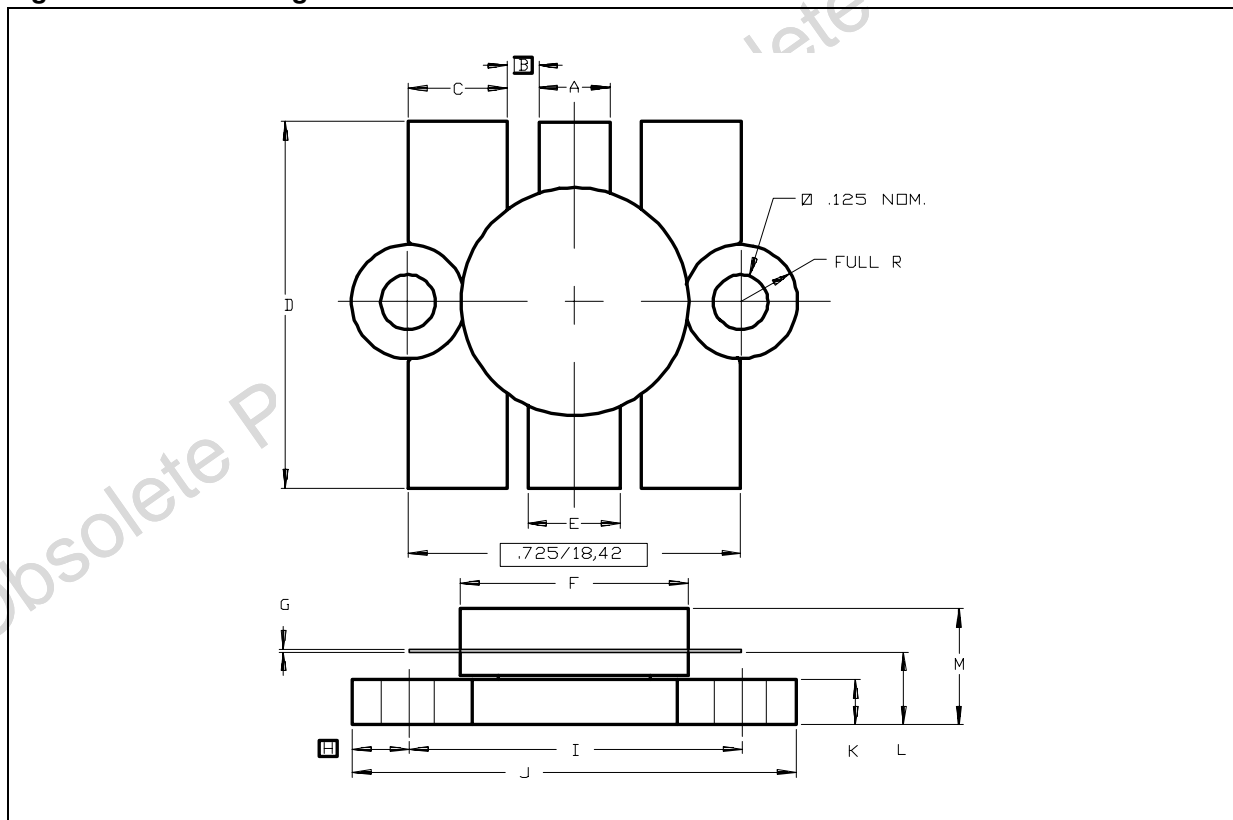


## PACKAGE MECHANICAL

Table 6. M111 Mechanical Data

Symbol	millimeters			inches		
	Min	Typ	Max	Min	Typ	Max
A	3.43		4.06	0.150		0.160
B		1.14			0.045	
C	5.33		5.59	0.210		0.220
D	21.21		21.97	0.835		0.865
E	5.08		5.33	0.200		0.210
F	12.45		12.95	0.490		0.510
G	0.08		0.18	0.003		0.007
H		3.18			0.125	
I	18.29		18.54	0.720		0.730
J	24.64		24.89	0.970		0.980
K	2.41		2.67	0.095		0.105
L	3.81		4.32	0.150		0.170
M			7.11			0.280

Figure 10. M111 Package Dimensions



**REVISION HISTORY**

**Table 7. Revision History**

Date	Revision	Description of Changes
July-1993	1	First Issue
10-June-2004	2	Stylesheet update. No content change.

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