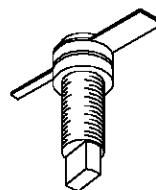


RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

- EMITTER BALLASTED
- VSWR CAPABILITY $\infty:1$ @ RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- $P_{OUT} = 2.0$ W MIN. WITH 10 dB GAIN @ 1 GHz



.230 2L STUD (S016)

hermetically sealed

ORDER CODE

MSC81002

BRANDING

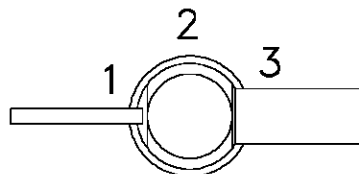
81002

DESCRIPTION

The MSC81002 is a common base hermetically sealed silicon NPN microwave transistor utilizing a fishbone, emitter ballasted geometry with a refractory/gold metallization system. This device is capable of withstanding an infinite load VSWR at any phase angle under rated conditions.

The MSC81002 was designed for Class C amplifier applications in the 0.4 - 1.2 GHz frequency range.

PIN CONNECTION



1. Collector

2. Base

3. Emitter

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation* ($T_C \leq 75^{\circ}\text{C}$)	6.25	W
I_C	Device Current*	200	mA
V_{CC}	Collector-Supply Voltage*	35	V
T_J	Junction Temperature	200	$^{\circ}\text{C}$
T_{STG}	Storage Temperature	- 65 to +200	$^{\circ}\text{C}$

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	20	$^{\circ}\text{C/W}$
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*Applies only to rated RF amplifier operation

MSC81002

ELECTRICAL SPECIFICATIONS ($T_{\text{case}} = 25^{\circ}\text{C}$)

STATIC

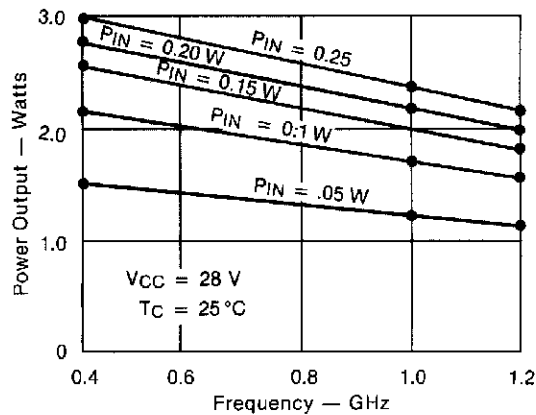
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 1\text{mA}$ $I_{\text{E}} = 0\text{mA}$	45	—	—	V
BV_{EBO}	$I_{\text{E}} = 1\text{mA}$ $I_{\text{C}} = 0\text{mA}$	3.5	—	—	V
BV_{CER}	$I_{\text{C}} = 5\text{mA}$ $R_{\text{BE}} = 10\Omega$	45	—	—	V
I_{CBO}	$V_{\text{CB}} = 28\text{V}$	—	—	0.5	mA
h_{FE}	$V_{\text{CE}} = 5\text{V}$ $I_{\text{C}} = 100\text{mA}$	15	—	120	—

DYNAMIC

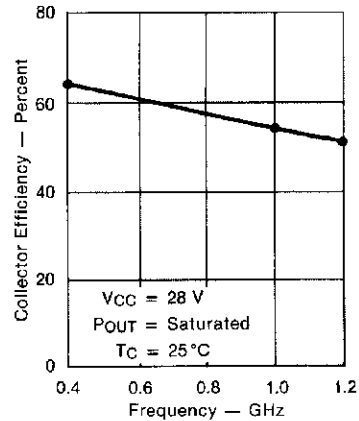
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 1.0\text{ GHz}$ $P_{\text{IN}} = 0.2\text{ W}$ $V_{\text{CC}} = 28\text{ V}$	2.0	2.2	—	W
η_{C}	$f = 1.0\text{ GHz}$ $P_{\text{IN}} = 0.2\text{ W}$ $V_{\text{CC}} = 28\text{ V}$	50	55	—	%
G_{P}	$f = 1.0\text{ GHz}$ $P_{\text{IN}} = 0.2\text{ W}$ $V_{\text{CC}} = 28\text{ V}$	10	10.4	—	dB
C_{OB}	$f = 1\text{ MHz}$ $V_{\text{CB}} = 28\text{ V}$	—	—	3.2	pF

TYPICAL PERFORMANCE

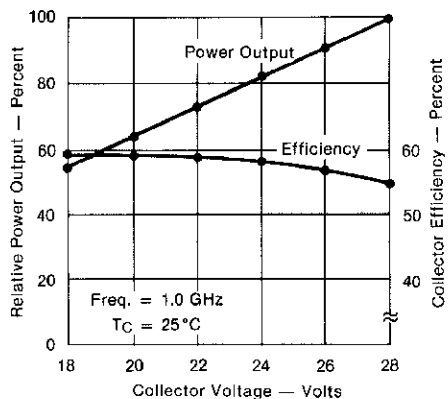
POWER OUTPUT vs FREQUENCY



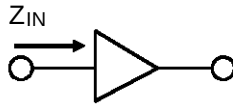
COLLECTOR EFFICIENCY vs FREQUENCY



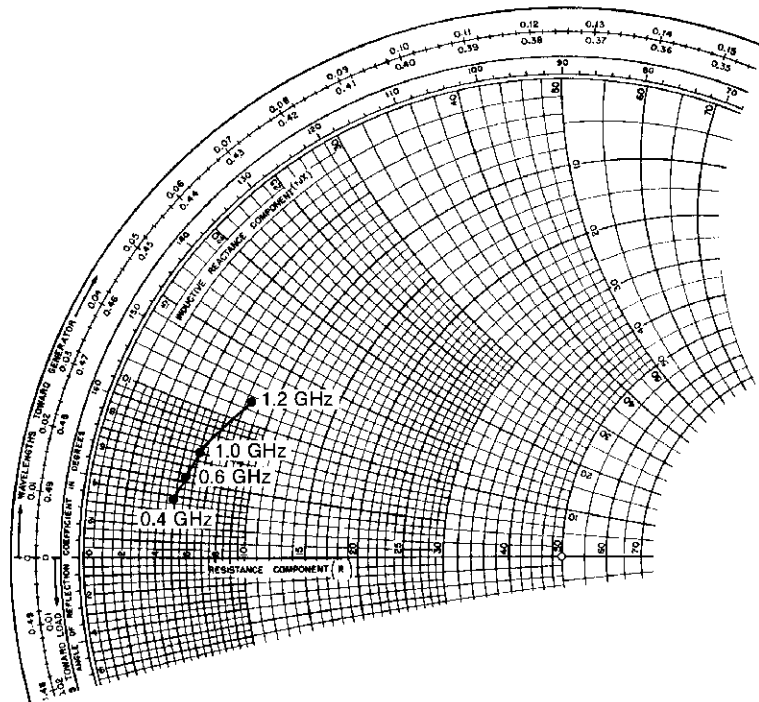
RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE



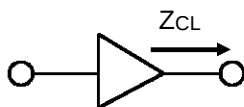
IMPEDANCE DATA

TYPICAL INPUT
IMPEDANCE

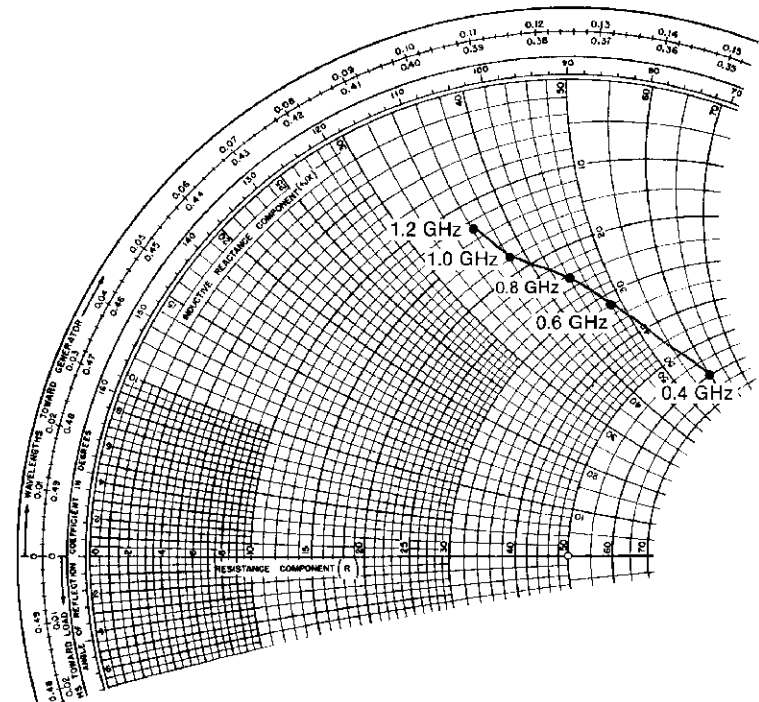
$P_{IN} = 0.2 \text{ W}$
 $V_{CC} = 28 \text{ V}$
 Normalized to 50 ohms



FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
0.4 GHz	$4.8 + j 3.7$	$60.0 + j 60.0$
0.6 GHz	$5.4 + j 5.3$	$32.0 + j 48.0$
1.0 GHz	$6.0 + j 7.0$	$18.0 + j 38.0$
1.2 GHz	$8.2 + j 11.6$	$12.8 + j 36.0$

TYPICAL COLLECTOR
LOAD IMPEDANCE

$P_{OUT} = \text{Saturated}$
 $V_{CC} = 28 \text{ V}$
 Normalized to 50 ohms



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