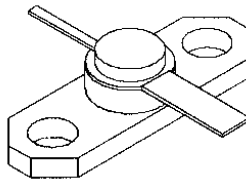
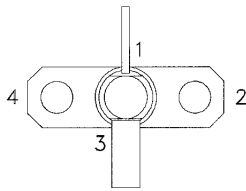




# MS3022

1 Watts, 28 Volts

Class-C, CW 1.0 to 2.0 GHz

<p><b>GENERAL DESCRIPTION</b></p> <p>The <b>MS3022</b> is a common base silicon NPN transistor designed for Class-C general purpose microwave applications. The device is capable of withstanding an infinite load VSWR under rated conditions. The <b>MS3022</b> is particularly suited for microwave communication links in the 1.0 to 2.0 GHz frequency ranges.</p>	<p><b>CASE OUTLINE</b> <b>.250 2LFL M210</b> <b>(Common Base)</b></p>  <p><b>PIN CONNECTION</b></p>  <p>1. Collector 2. Base 3. Emitter 4. Base</p>
<p><b>Features</b></p> <ul style="list-style-type: none"> <li>• <b>GOLD METALLIZATION</b></li> <li>• <b>P<sub>OUT</sub> = 1.0 W MINIMUM</b></li> <li>• <b>G<sub>P</sub> = 7.0 dB</b></li> <li>• <b>COMMON BASE</b></li> </ul>	
<p><b>ABSOLUTE MAXIMUM RATINGS</b></p> <p><b>Power Dissipation</b> Device Dissipation @25°C (P<sub>d</sub>)                      7 W (At rated pulse condition)</p> <p><b>Voltage and Current</b> Collector to Base Voltage (BV<sub>CES</sub>)                      45 V Emitter to Base Voltage (BV<sub>EBO</sub>)                      3.5 V Collector Current (I<sub>C</sub>)                                      0.2 A</p> <p><b>Temperatures</b> Storage Temperature                                      -65 to +150 °C Operating Junction Temperature                      +200 °C</p>	

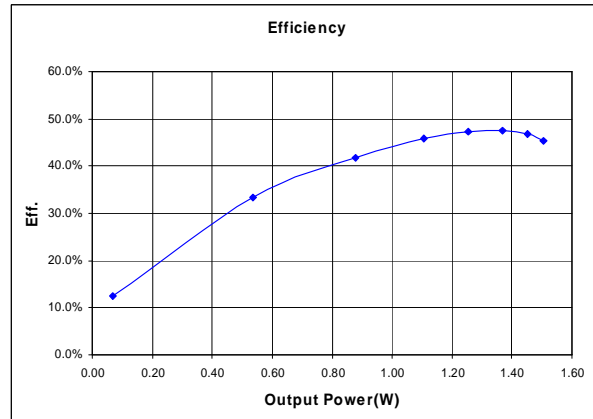
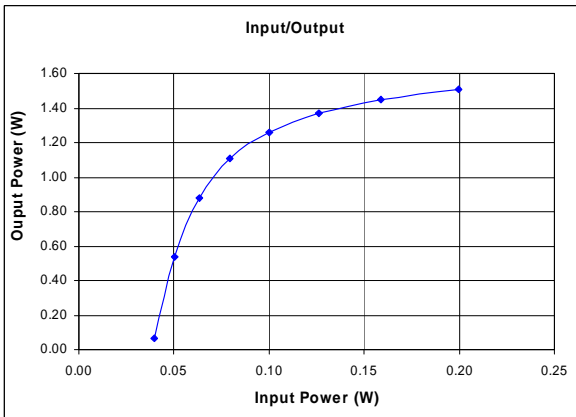
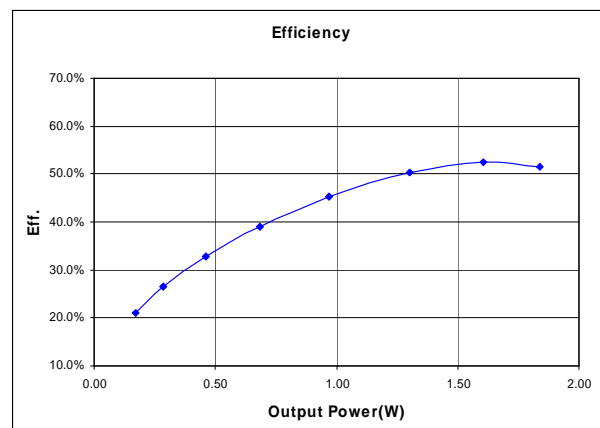
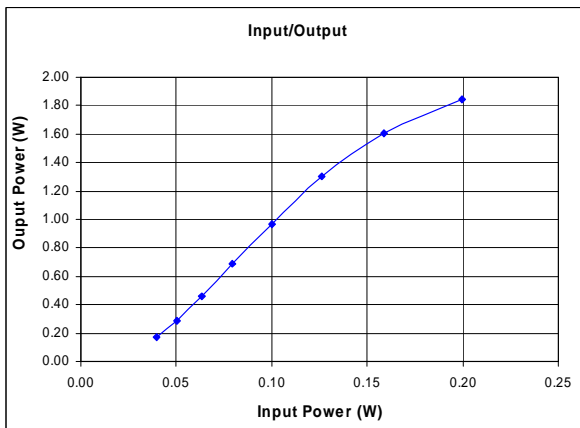
## ELECTRICAL CHARACTERISTICS @ 25°C

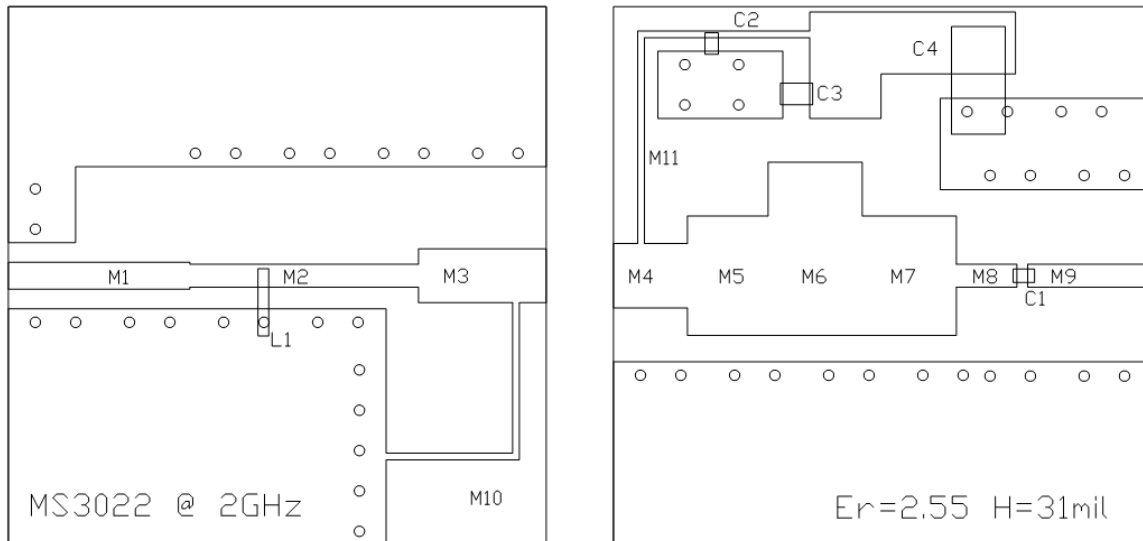
SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
BV <sub>CEO</sub>	Collector to Emitter Breakdown	I <sub>C</sub> = 5 mA, R <sub>BE</sub> = 50 Ω	45			V
BV <sub>CBO</sub>	Collector to Base Breakdown	I <sub>C</sub> = 1 mA, I <sub>B</sub> = 0 mA	45			V
BV <sub>EBO</sub>	Emitter to Base Breakdown	I <sub>E</sub> = 1 mA, I <sub>C</sub> = 0 mA	3.5			V
I <sub>CBO</sub>	Collector to Base Leakage	V <sub>CB</sub> = 28.0 V			0.5	mA
H <sub>FE</sub>	DC – Current Gain	I <sub>C</sub> = 0.1A, V <sub>CE</sub> = 5V	15		120	-
θ <sub>jc</sub> <sup>1</sup>	Thermal Resistance				25	°C/W

NOTES: 1. At rated output power, pulse conditions and MSC fixture  
Rev. A : Oct. 2009

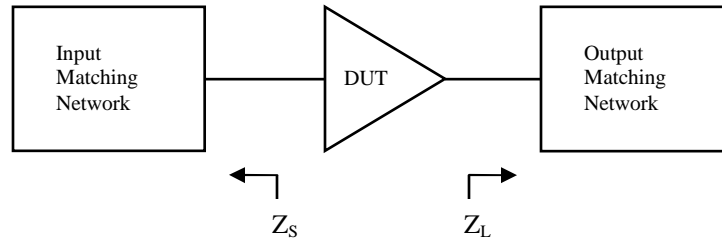
**FUNCTIONAL CHARACTERISTICS @ 25°C**

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
$P_{OUT}$	Power Out	$F = 2.0\text{GHz}$ $V_{CB} = 28\text{V}$ $P_{in} = 0.2\text{W}$ $CW$	1.0			W
$P_{IN}$	Power Input				0.2	W
$G_P$	Power Gain		7.0			dB
$\eta_C$	Collector Efficiency		35			%
$C_{OB}$	Collector Base Capacitance	$F = 1\text{ MHz}, V_{CB} = 28\text{V}$			3.2	pF

**Typical Performance (2.0 GHz)**

**Typical Performance (1.0 GHz)**


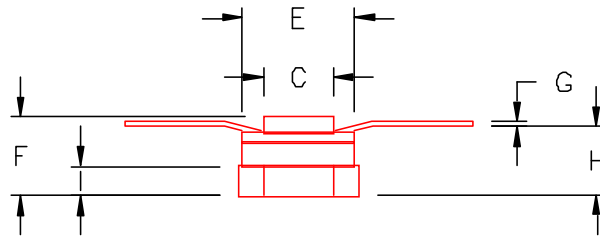
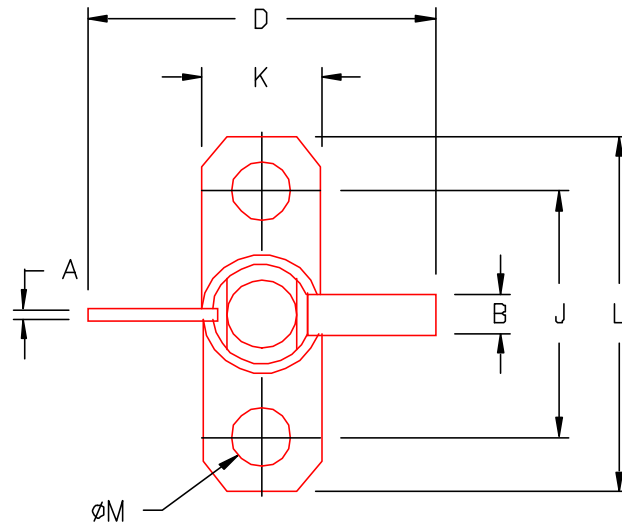
**MS3022 Test Circuit Layout (@ 2GHz)**

**MS3022 Test Circuit Component Designations and Values**

Part	Description	Part	Description
C1, C2	39pF Chip Capacitor (ATC 200A)	C3	100pF Chip Capacitor (ATC 200B)
C4	47uF 63V Electrolytic Capacitor	L1	Length: 0.32", AWG20
M1	100 x 675 mils (W x L)	M2	86 x 850 mils (W x L)
M3	200 x 475 mils (W x L)	M4	240 x 275 mils (W x L)
M5	445 x 300 mils (W x L)	M6	645 x 350 mils (W x L)
M7	445 x 350 mils (W x L)	M8	86 x 225 mils (W x L)
M9	86 x 460 mils (W x L)	M10	25 x 1055 mils (W x L)
M11	25 x 1040 mils (W x L)	PCB	Arlon, $\epsilon_r=2.55$ , 31mils, 1oz

**Typical Impedance Values**


Frequency	$Z_S$ ( $\Omega$ )	$Z_L$ ( $\Omega$ )
<b>1.0 GHz</b>	<b>8.3 - j7.0</b>	<b>18.0 + j38.0</b>
<b>1.5 GHz</b>	<b>12.0 - j16.0</b>	<b>9.6 + j30.0</b>
<b>1.7 GHz</b>	<b>15.0 - j14.0</b>	<b>7.0 + j22.0</b>
<b>2.0 GHz</b>	<b>21.5 - j22.5</b>	<b>5.0 + j12.0</b>

\*  $V_{CB} = 28V$ ,  $P_{IN} = 0.2W$   $P_{OUT} > 1W$   
 \* CW

**PACKAGE STYLE M210**


	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.028/0,71	.032/0,81	J	.115/2,92	.145/3,68
B	.110/2,80	.117/2,97	K	.245/6,22	.255/6,48
C	.165/4,19	.185/4,70	L	.790/20,07	.810/20,57
D	.740/18,80		M	.128/3,25	.132/3,35
E	.225/5,72	.235/5,97			
F	.149/2,30	.187/4,75			
G	.003/0,08	.007/0,18			
H	.117/2,97	.133/3,38			
I	.416/10,57	.465/11,81			