MS3022

1 Watts, 28 Volts
Class-C, CW 1.0 to 2.0 GHz

GENERAL DESCRIPTION

The **MS3022** 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 **MS3022** is particularly suited for microwave communication links in the 1.0 to 2.0 GHz frequency ranges.

Features

- **GOLD METALLIZATIOM**
- **P_{OUT} = 1.0 W MINIMUM**
- **G_P = 7.0 dB**
- **COMMON BASE**

ABSOLUTE MAXIMUM RATINGS

Power Dissipation

Device Dissipation @25°C (P_d)	7	W (At rated pulse condition)

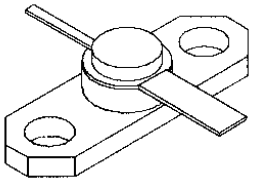
Voltage and Current

Collector to Base Voltage (BV_{CES})	45	V
Emitter to Base Voltage (BV_{EBO})	3.5	V
Collector Current (I_C)	0.2	A

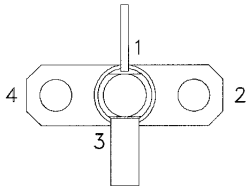
Temperatures

Storage Temperature	-65 to +150	°C
Operating Junction Temperature	+200	°C

CASE OUTLINE
.250 2LFL M210
(Common Base)



PIN CONNECTION



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

ELECTRICAL CHARACTERISTICS @ 25°C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
BV_{CEO}	Collector to Emitter Breakdown	I_C = 5 mA, R_{BE} = 50 Ω	45			V
BV_{CBO}	Collector to Base Breakdown	I_C = 1 mA, I_B = 0 mA	45			V
BV_{EBO}	Emitter to Base Breakdown	I_E = 1 mA, I_C = 0 mA	3.5			V
I_{CBO}	Collector to Base Leakage	V_{CB} = 28.0 V			0.5	mA
H_{FE}	DC – Current Gain	I_C = 0.1A, V_{CE} = 5V	15		120	-
θjc[1]	Thermal Resistance				25	°C/W

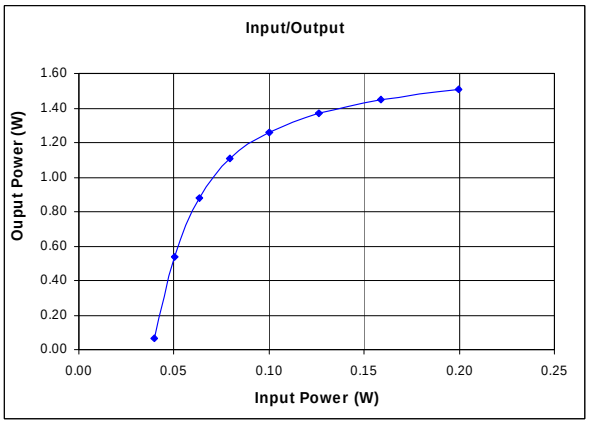
NOTES: 1. At rated output power, pulse conditions and MSC fixture
Rev. A : Oct. 2009

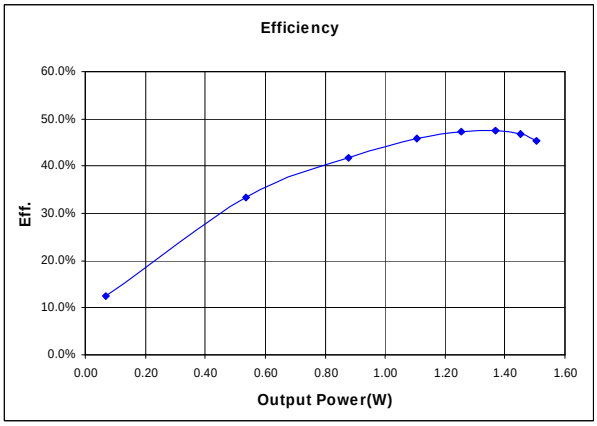
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FUNCTIONAL CHARACTERISTICS @ 25°C

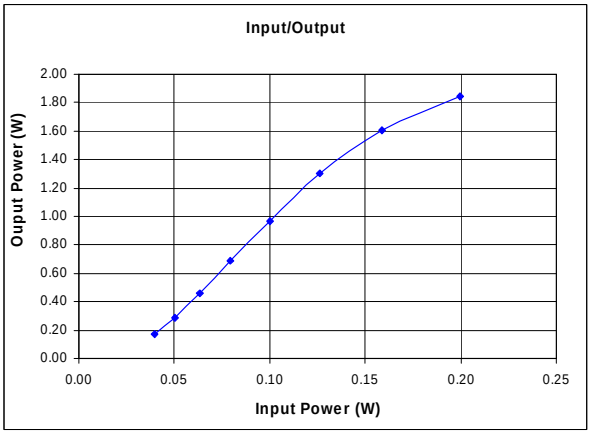
SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
P_{OUT}	Power Out	F = 2.0GHz	1.0			W
P_{IN}	Power Input	V_{CB} = 28V			0.2	W
G_P	Power Gain	P_{in} = 0.2W	7.0			dB
η_C	Collector Efficiency	CW	35			%
C_{OB}	Collector Base Capacitance	F = 1 MHz, V_{CB} = 28V			3.2	pF

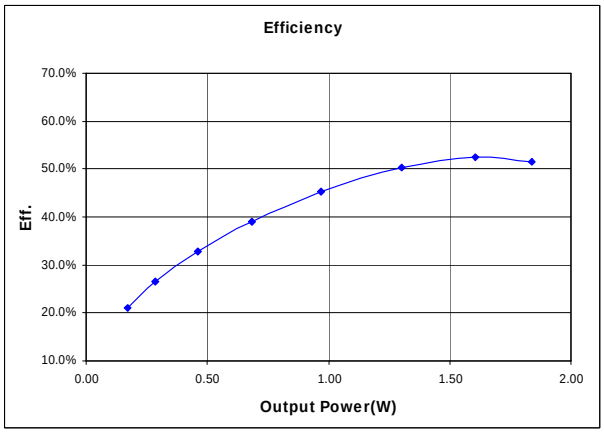
Typical Performance (2.0 GHz)





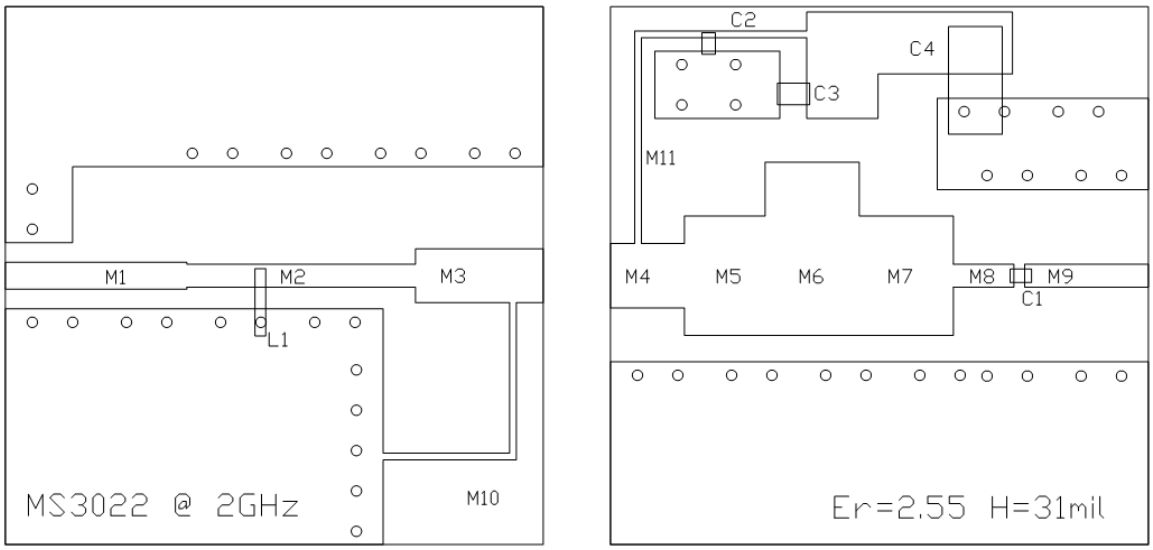
Typical Performance (1.0 GHz)





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MS3022 Test Circuit Layout (@ 2GHz)

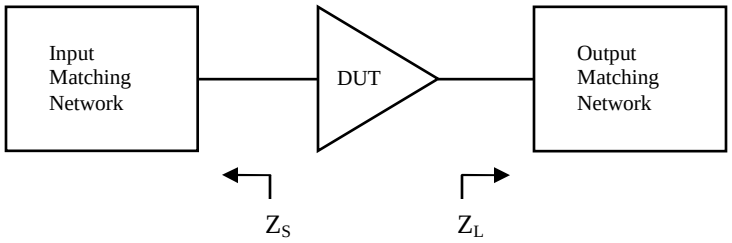


MS3022 Test Circuit Component Designations and Values

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, ε_r=2.55, 31mils, 1oz

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Typical Impedance Values

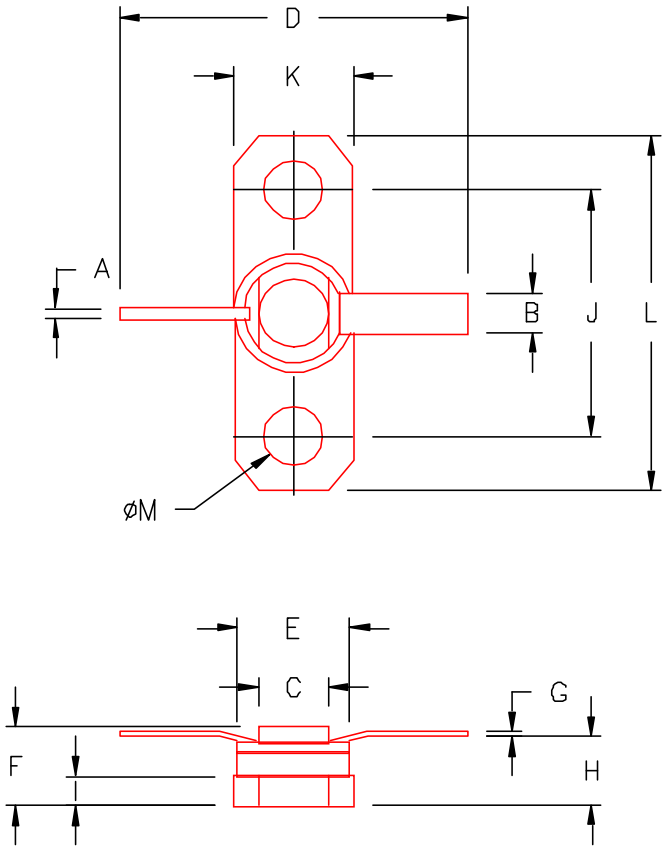


Frequency	Z_S (Ω)	Z_L (Ω)
1.0 GHz	**8.3 – j7.0**	**18.0 + j38.0**
1.5 GHz	**12.0 – j16.0**	**9.6 + j30.0**
1.7 GHz	**15.0 – j14.0**	**7.0 + j22.0**
2.0 GHz	**21.5 – j22.5**	**5.0 + j12.0**

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

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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			

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