



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 METALLIZATION**
- **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

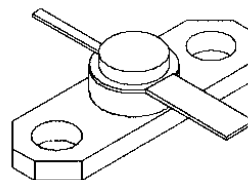
Collector Current (I_C) 0.2 A

Temperatures

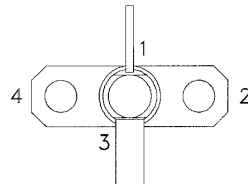
Storage Temperature -65 to +150 °C

Operating Junction Temperature +200 °C

CASE OUTLINE .250 2LFL M210 (Common Base)



PIN CONNECTION



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

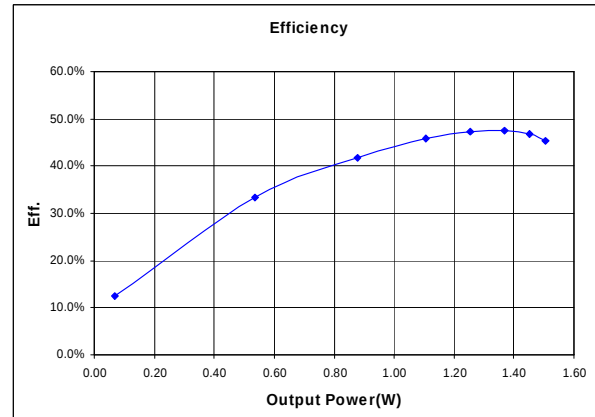
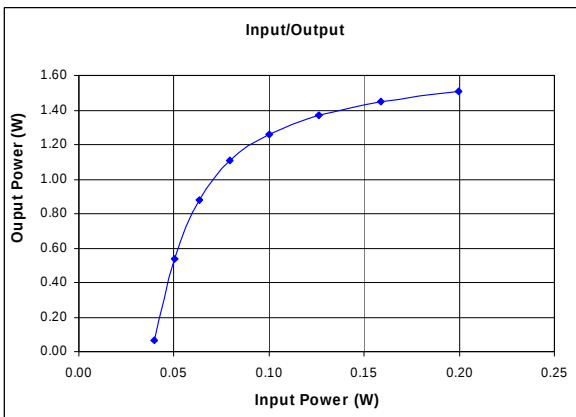
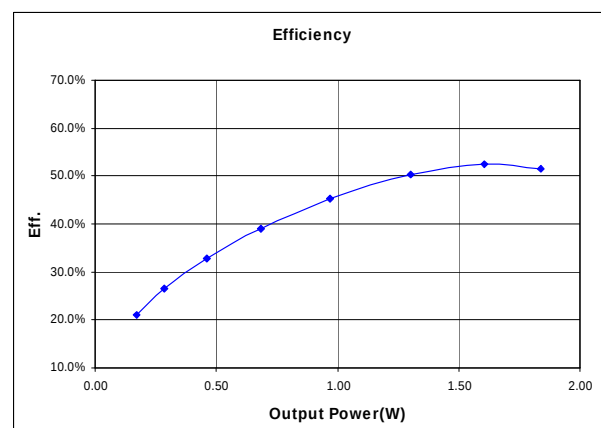
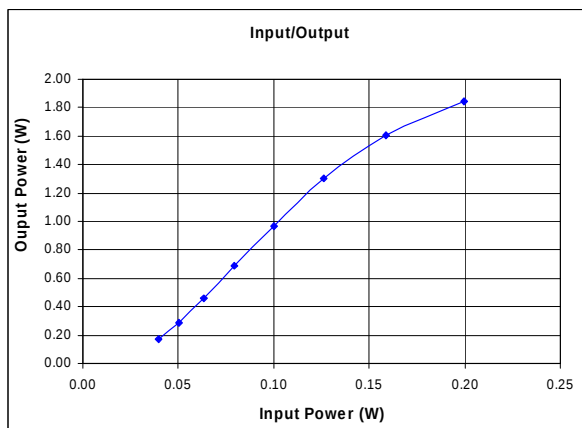
ELECTRICAL CHARACTERISTICS @ 25°C

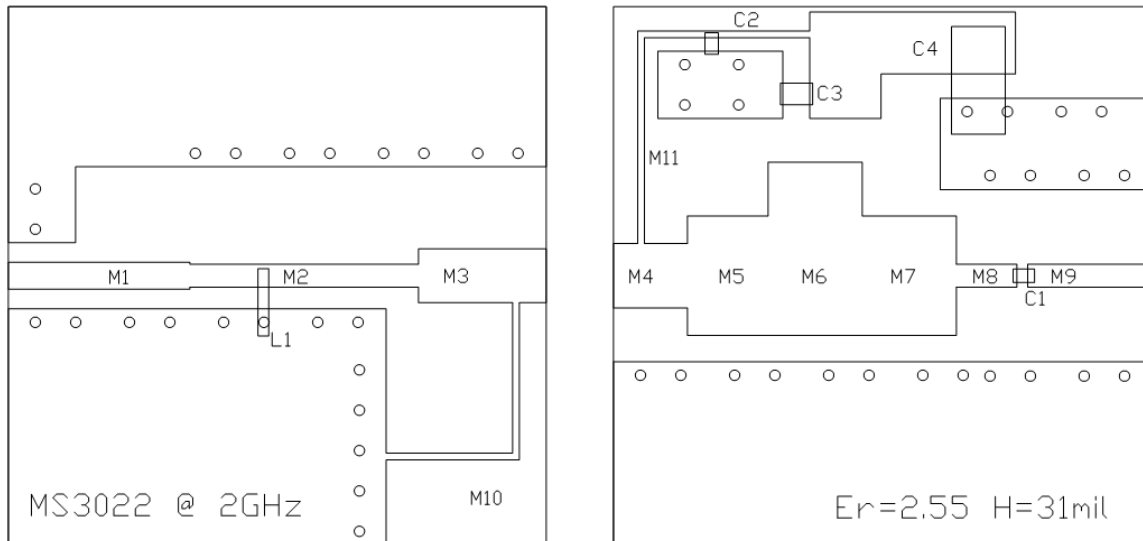
SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
BV _{CEO}	Collector to Emitter Breakdown	I _C = 5 mA, R _{BE} = 50 Ω	45			V
BV _{CBO}	Collector to Base Breakdown	I _C = 1 mA, I _B = 0 mA	45			V
BV _{EBO}	Emitter to Base Breakdown	I _E = 1 mA, I _C = 0 mA	3.5			V
I _{CBO}	Collector to Base Leakage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

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

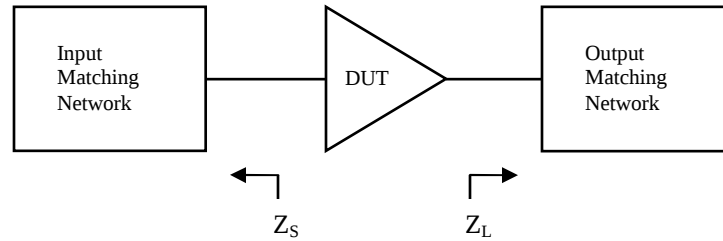
FUNCTIONAL CHARACTERISTICS @ 25°C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
P_{OUT}	Power Out	F = 2.0GHz $V_{CB} = 28V$ $P_{in} = 0.2W$ CW	1.0			W
P_{IN}	Power Input				0.2	W
G_p	Power Gain		7.0			dB
η_C	Collector Efficiency		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)


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

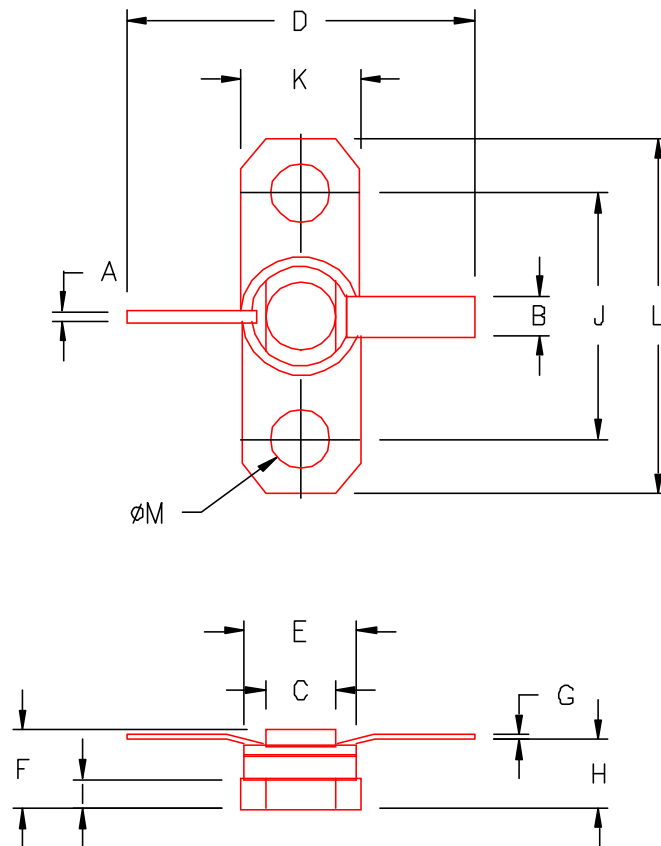
Typical Impedance Values

Frequency	$Z_S (\Omega)$	$Z_L (\Omega)$
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

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			