MM6022Q5B

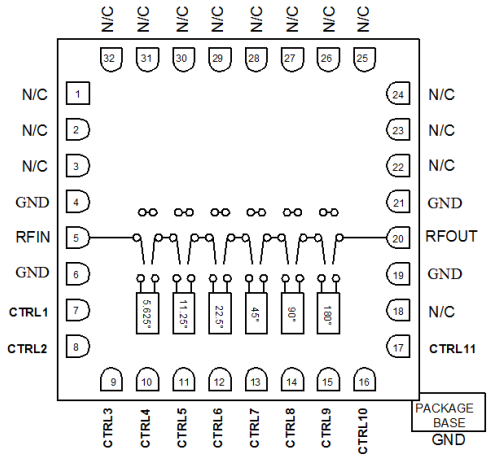
V1.0.0

GaAs Plastic QFN 5x5mm
6-Bit Digital Control Phase Shifter
19-21GHz

Features

- Frequency: 19-21GHz
- 6-Bit Digital Control Phase Shifter
- Phase Shift Range: 360°
- Minimum Phase Shift: 5.625°
- Phase Shift Accuracy RMS: 3.0°
- Insertion Loss: 9.5dB Typical
- Amplitude Variation: 1.6dB Typical
- Input/Output: 50Ω
- Package Size : 5x5x1.0mm

Functional Block Diagram



Typical Applications

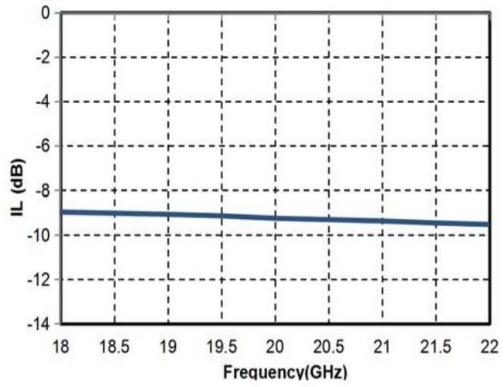
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

Electrical Specifications

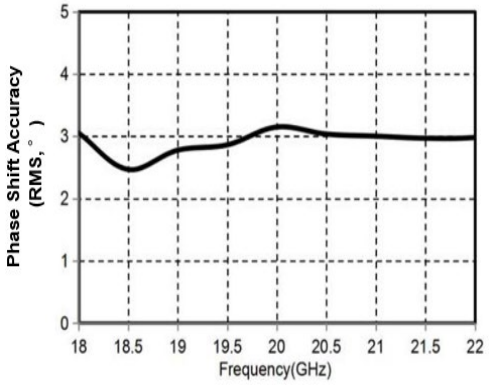
TA = +25°C, Vctl = 0/-5V

Parameters	Min.	Typ.	Max.	Units
Frequency	**19**		**21**	**GHz**
Insertion Loss		**9.5**	**10**	**dB**
Insertion Loss Variation		**1.6**		**dB**
Phase Shift Accuracy RMS		**3.0**		**°**
Phase-shifting Amplitude Modulation		**±1.0**		**dB**
Amplitude Variation		**1.6**		**dB**
Input Return Loss		**13**		**dB**
Output Return Loss		**15**		**dB**
P1dB - Input 1dB Compression		**21**		**dBm**
Switching Speed		**30**		**ns**

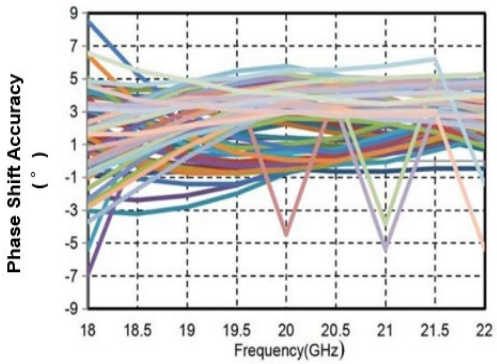
Insertion Loss vs. Frequency



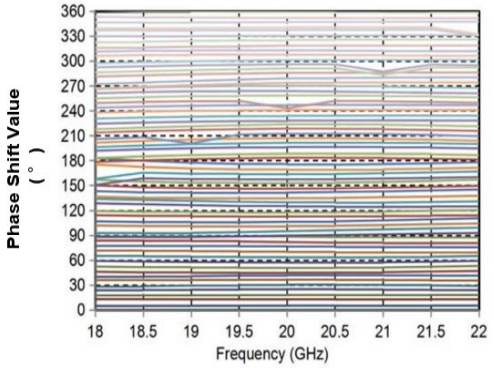
Phase Shift Accuracy (RMS) vs. Frequency



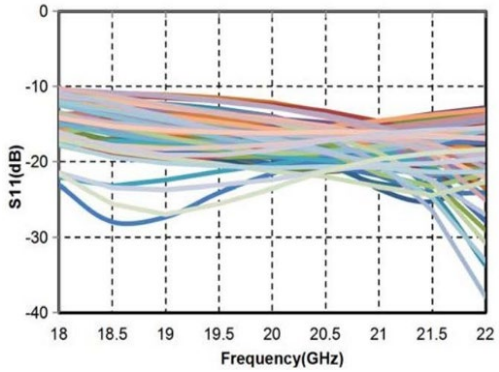
Phase Shift Accuracy vs. Frequency



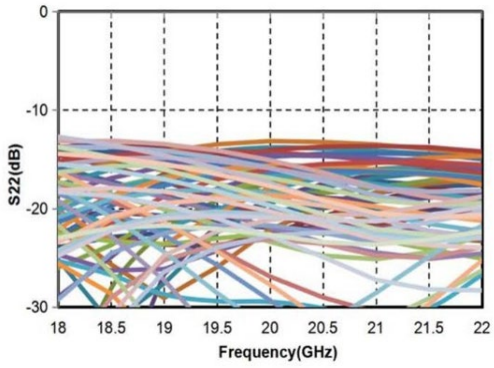
Phase Shift Value vs. Frequency



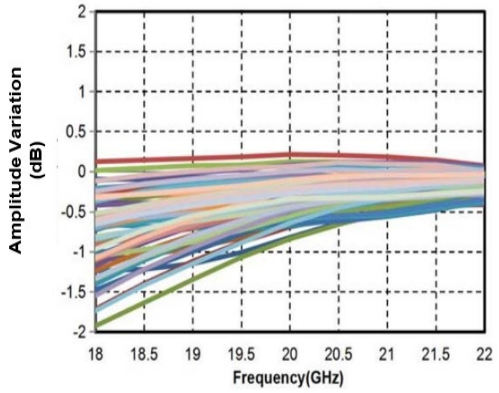
Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



Amplitude Variation



Absolute Maximum Ratings

Control Voltage, Vctl	-8V
RF Input Power	+23dBm
Operating Temperature	-55°C to +85 °C
Storage Temperature	-55°C to +150 °C

Recommended Op erating Conditions

Parameter	Min.	Typ.	Max.	Units
CTRL	-5		0	V

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Truth Table

Phase Shifter Setting	45°		5.625°	90°		11.25°		22.5°		180°	
	CTRL1	CTRL2	CTRL3	CTRL4	CTRL5	CTRL6	CTRL7	CTRL8	CTRL9	CTRL10	CTRL11
0°(Reference)	1	0	0	1	0	0	1	0	1	1	0
5.625°	1	0	1	1	0	0	1	0	1	1	0
11.25°	1	0	0	1	0	1	0	0	1	1	0
22.5°	1	0	0	1	0	0	1	1	0	1	0
45°	0	1	0	1	0	0	1	0	1	1	0
90°	1	0	0	0	1	0	1	0	1	1	0
180°	1	0	0	1	0	0	1	0	1	0	1
354.38°	0	0	1	0	1	1	0	1	0	0	1

Logic "0" = LOW(-5V), Logic "1" = High(0V)

V1.0.0

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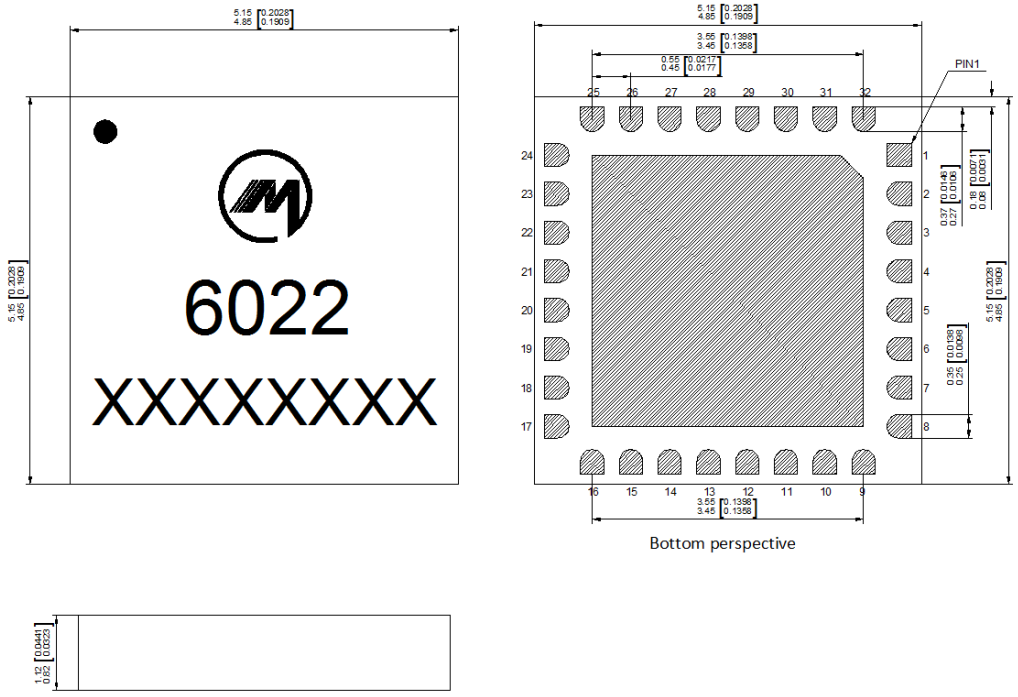
Outline Drawing:

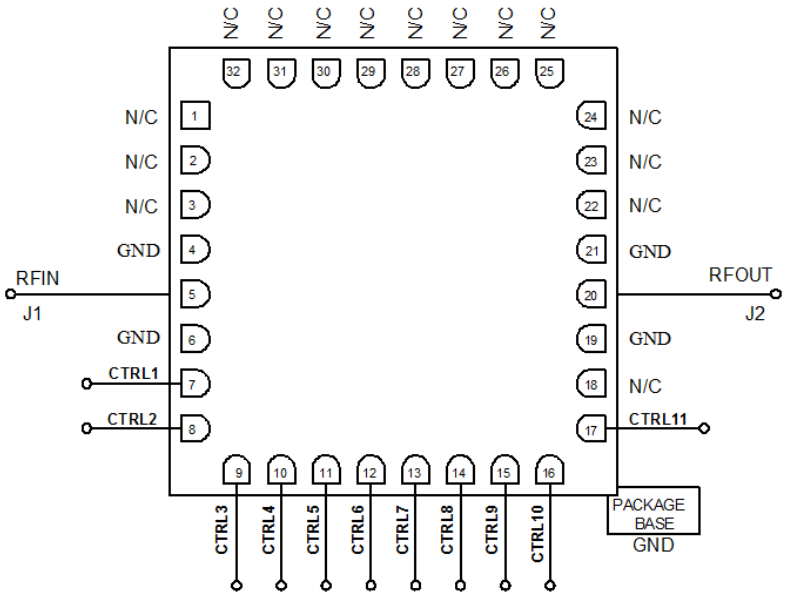
All Dimensions in mm[inches]



Notes:

1. Package body material : Alumina.
2. Lead and ground paddle plating: Gold flash over nickel.
3. Dimensions are in millimeters(inches).
4. Lead spacing tolerance is non-cumulative.

Assembly Drawing



Pin Descriptions

No	Function	Description
1,2,3,18,22,23,24,25,26 ,27,28,29,30,31,32	NC	No connection. These pins may be connected to RF ground. Performance will not be affected.
5	RF IN	RF Signal Input.
20	RF OUT	RF Signal Output.
7,8,9,10,11,12,13,14,15 ,16,17	CTRL	Control Ports
4,6,19,21	GND	These pins & exposed ground paddle must be connected to RF/DC ground
	GND	Package bottom must be connected to RF/DC ground