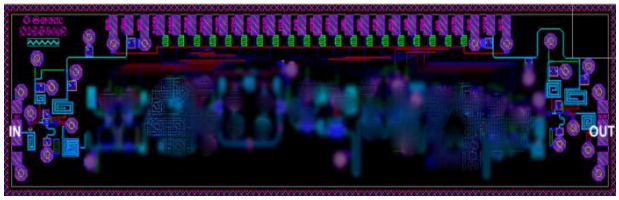
6-Bit, Ku-Band Core Chip
13.25 - 14.75 GHz

CGY2330UH/C1
Rev. V1

Features

- Gain: 5.5 dB
- Drain Voltage Supply: 3 V
- Drain Current: 16 mA
- 50 Ω Input & Output Matched
- Chip Size: 5.85 x 1.5 mm
- Tested, Inspected Known Good Die (KGD)
- Space and MIL-STD MMICs
- RoHS* Compliant



Applications

- Radar
- Telecommunication
- Instrumentation

Description

The CGY2330UH/C1 is a high-performance GaAs pHEMT MMIC 6-bit Core Chip designed to operate in the Ku-band.

The die is manufactured using a 180 nm gate length pHEMT technology (ED02AH). This technology has been evaluated for space applications and is on European preferred parts list of the European Space Agency (ESA).

The pad metallization is gold over titanium/platinum and compatible with ultrasonic wire bonding. The minimum gold thickness shall be 1.25 µm.

Ordering Information

Part Number	Package
CGY2330UH/C1	On wafer measured die

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

Electrical Specifications: Freq. = 13.25 - 14.75 GHz, T_A = +25°C

Parameter	Test Conditions	Units	Min.	Typ.	Max.
RF Input Power	—	dBm	-25	—	-12
Gain	—	dB	3.0	5.5	7.0
Noise Figure	—	dB	—	—	12
Input Return Loss	50 Ω	dB	—	-18	-15
Output Return Loss	50 Ω	dB	—	-18	-15
Input IP3	—	dBm	—	3	—
Input P1dB	—	dBm	-6	-3	—
Attenuation number of Bits 6	Bit 1 Bit 2 Bit 3 Bit 4 Bit 5 Bit 6	dB	—	0.5 1.0 2.0 4.0 8.0 16.0	—
Attenuation Range	—	dB	—	31.5	—
Phase number of Bits 6	Bit 1 Bit 2 Bit 3 Bit 4 Bit 5 Bit 6	°	—	5.625 11.25 22.5 45 90 180	—

Absolute Maximum Ratings[1,2]

Parameter	Absolute Maximum
Drain Voltage	5.0 V
Gate Voltage	-6.- V to +0.9 V
Input Power CW during 1 minute	10 dBm
Thermal Resistance	100 °C/W
Junction Temperature	+125°C
Mounting Temperature	+300°C, 60 seconds
Storage Temperature	-55°C to +150°C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. MACOM does not recommend sustained operation near these survivability limits.

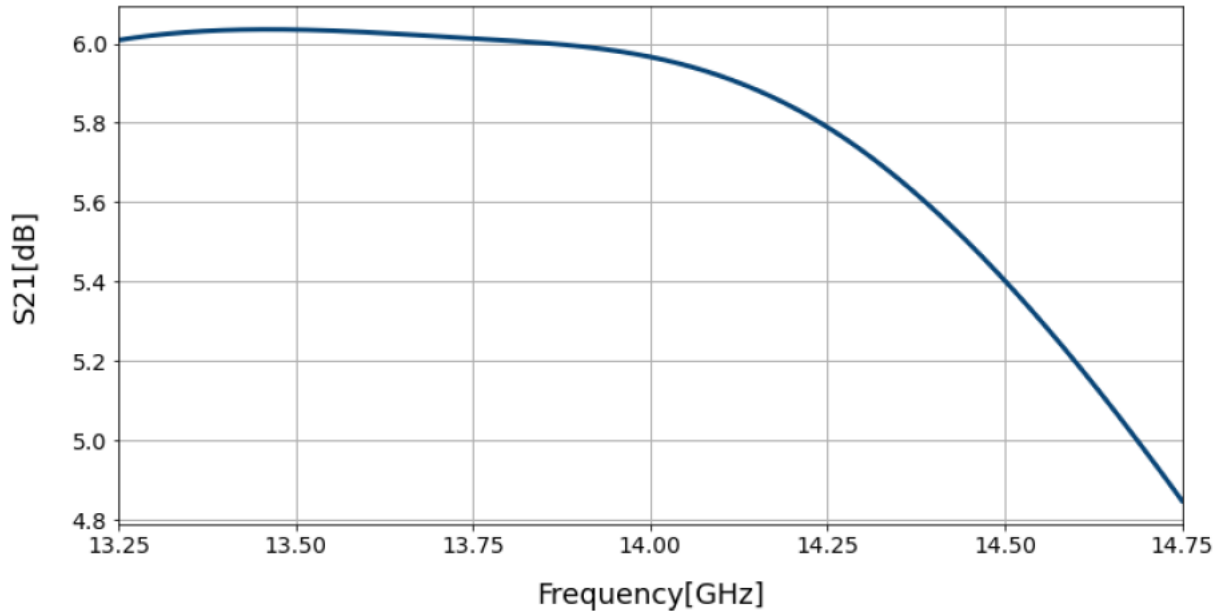
Handling Procedures

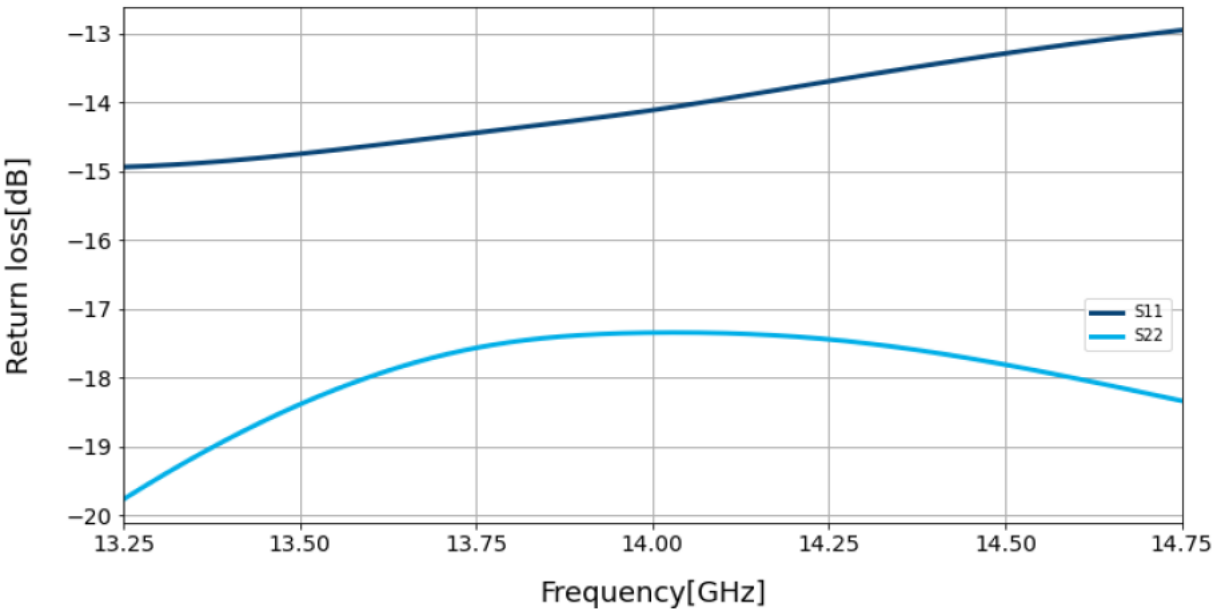
Please observe the following precautions to avoid damage:

Static Sensitivity

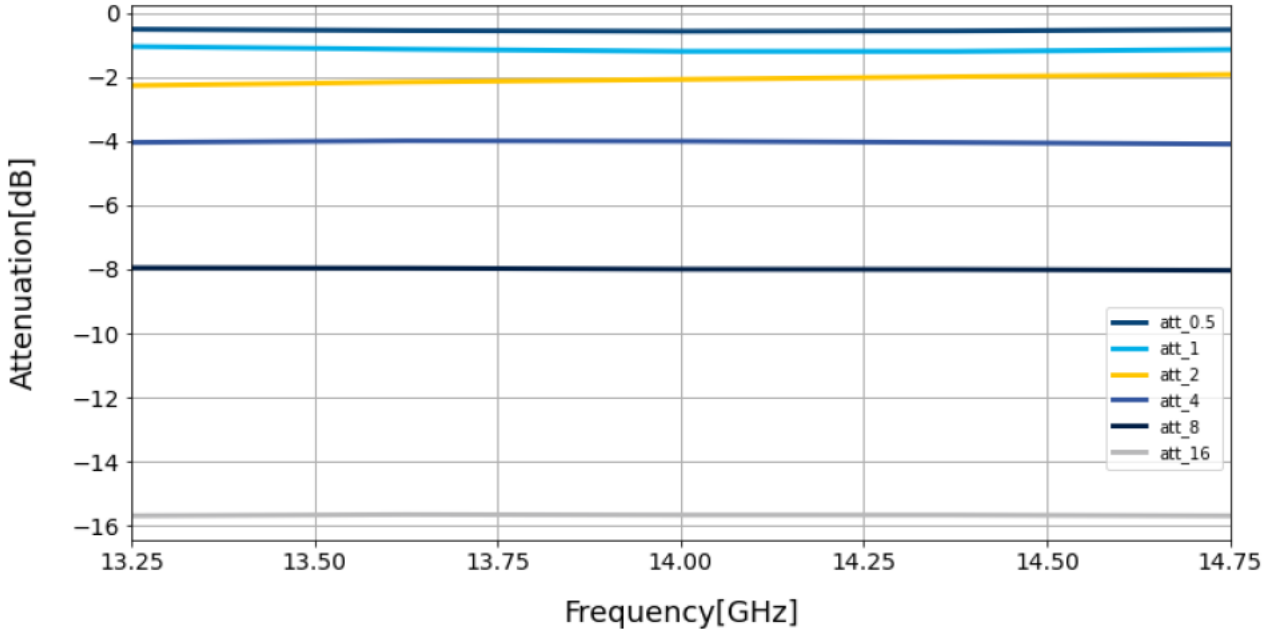
These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

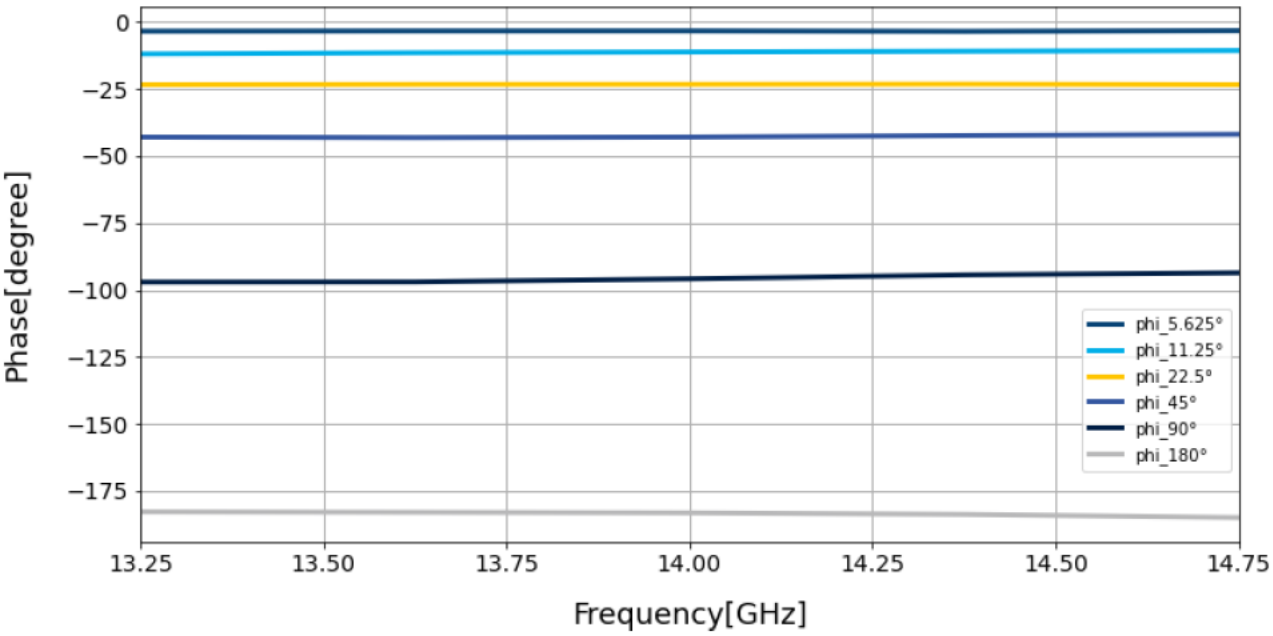
Typical Performance Curves: On Wafer Measurements



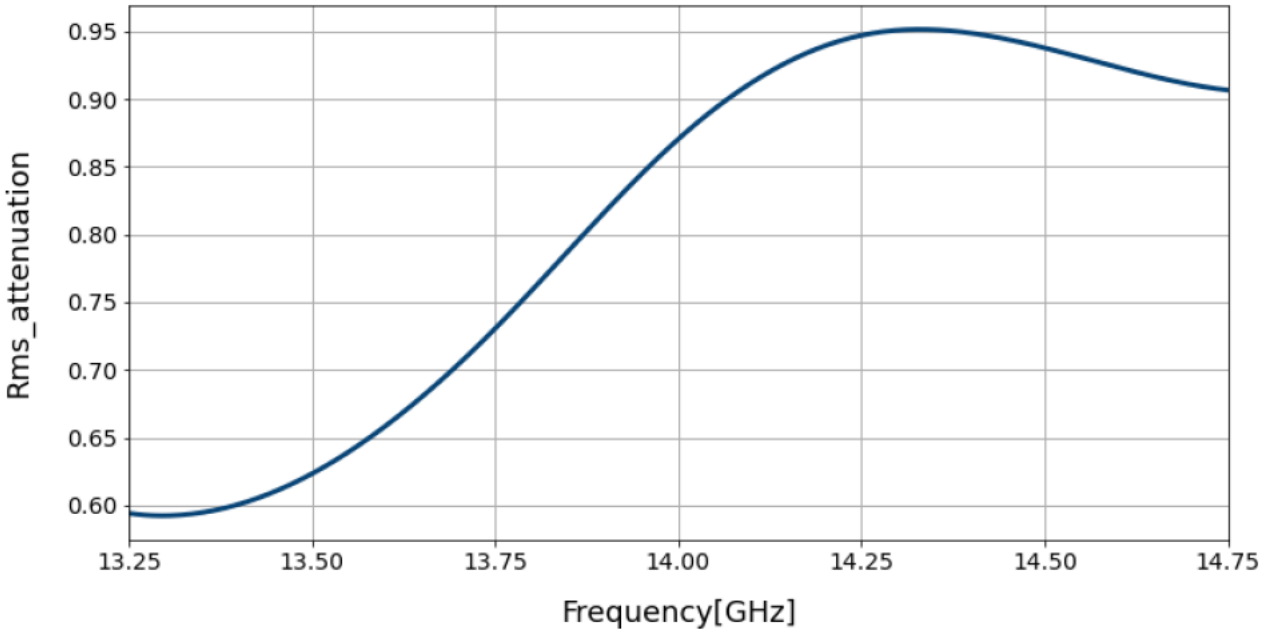


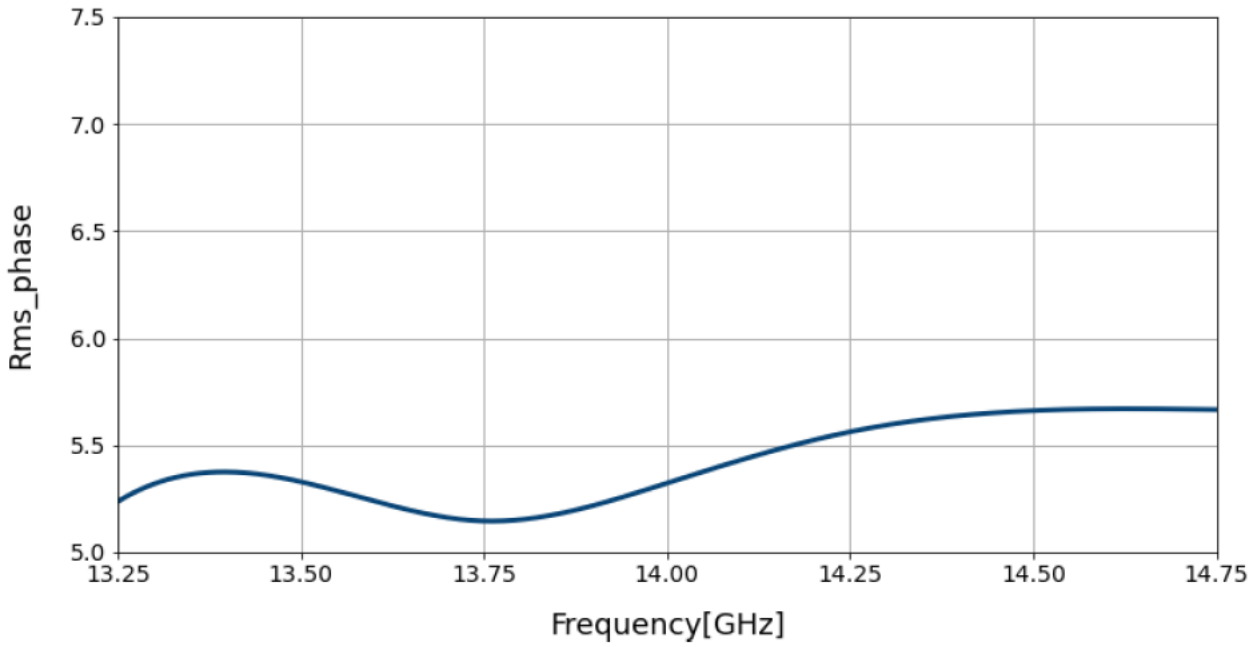
Typical Performance Curves: On Wafer Measurements





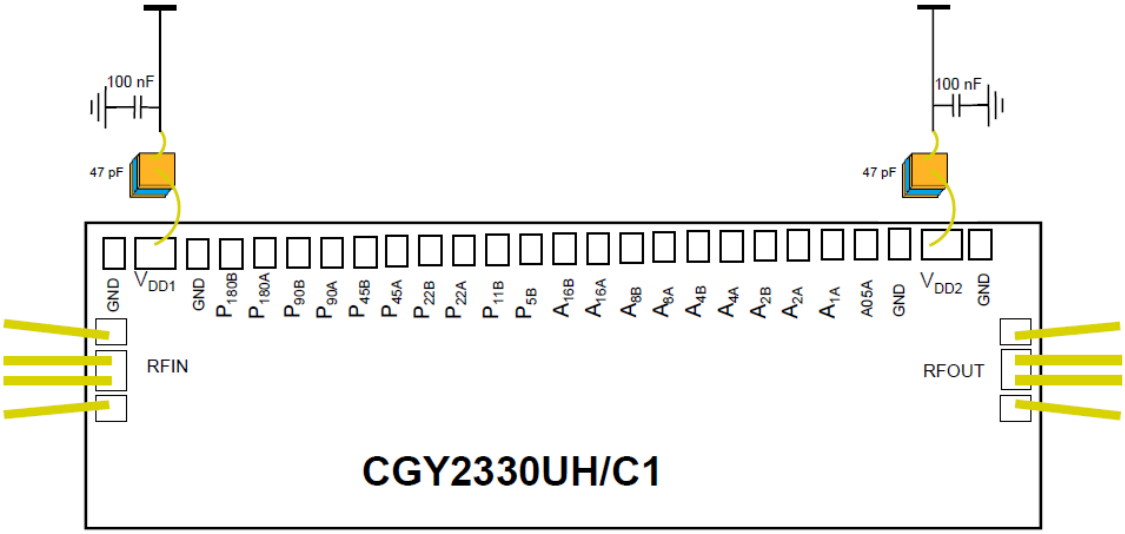
Typical Performance Curves: On Wafer Measurements





Application Schematic

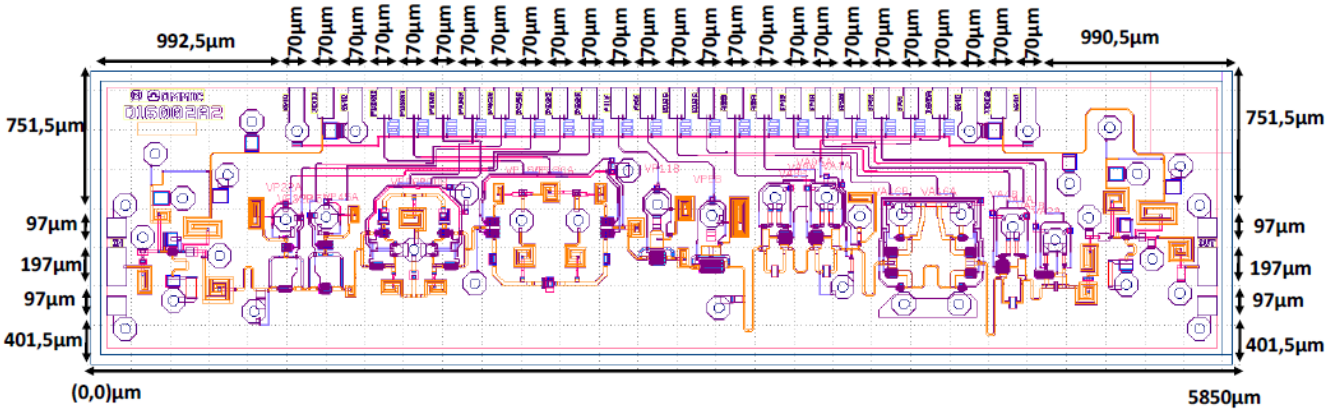
To prevent instability of the customer design it is highly recommended to place small chip capacitors as near as possible to the CGY2330UH/C1 on VDD1, VDD2, here 47pF is recommended.

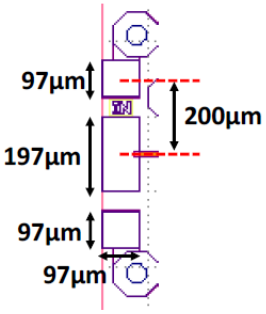


Pad Configuration

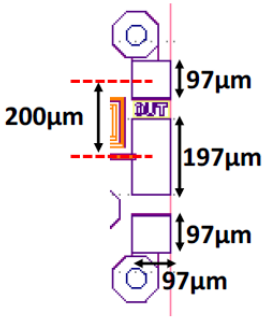
Pad	OFF State	On State
GND	—	—
VDD1	3 V	3 V
GND	—	—
P180B	0 V	-3.3 V
P180A	-3.3 V	0 V
P90B	0 V	-3.3 V
P90A	-3.3 V	0 V
P45B	0 V	-3.3 V
P45A	-3.3 V	0 V
P22B	0 V	-3.3 V
P22A	-3.3 V	0 V
P11B	0 V	-3.3 V
P5B	0 V	-3.3 V
A16B	0 V	-3.3 V
A16A	-3.3 V	0 V
A8B	0 V	-3.3 V
A8A	-3.3 V	0 V
A4B	0 V	-3.3 V
A4A	-3.3 V	0 V
A2B	0 V	-3.3 V
A2A	-3.3 V	0 V
A1A	-3.3 V	0 V
A05A	-3.3 V	0 V
GND	—	—
VDD2	3 V	3 V
GND	—	—

Pad Layout

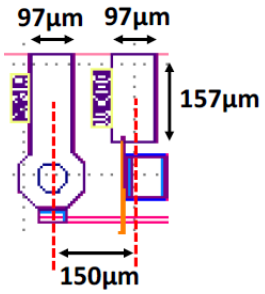




The same size is used of each RF pad RFIN of LNA.



The same size is used of each RF pad RFOUT of LNA.



The size is used DC Pad of LNA.

Bonding Pad Coordinates & Description

Pad	X Coordinate	Y Coordinate	Pad Size	Description
GND	81.5	251.5	97 x 97	Associated with RFIN pad
RFIN	81.5	401.5	97 x 197	RFIN pad
GND	81.5	651.5	97 x 97	Associated with RFIN pad
GND	1011.5	1261.5	97 x 157	Ground
VD1	1161.5	1261.5	97 x 157	First Positive supply voltage
GND	1311.5	1261.5	97 x 157	Ground
P180B	1461.5	1261.5	97 x 157	180° Phase Shifting supply ON
P180A	1611.5	1261.5	97 x 157	180° Phase Shifting supply OFF
P90B	1761.5	1261.5	97 x 157	90° Phase Shifting supply ON
P90A	1911.5	1261.5	97 x 157	90° Phase Shifting supply OFF
P45B	2061.5	1261.5	97 x 157	45° Phase Shifting supply ON
P45A	2211.5	1261.5	97 x 157	45° Phase Shifting supply OFF
P22B	2361.5	1261.5	97 x 157	22.5° Phase Shifting supply ON
P22A	2511.5	1261.5	97 x 157	22.5° Phase Shifting supply OFF
P11B	2661.5	1261.5	97 x 157	11.25° Phase Shifting supply ON
P5B	2811.5	1261.5	97 x 157	5.625° Phase Shifting supply ON
A16B	2961.5	1261.5	97 x 157	16 dB Attenuator supply ON
A16A	3111.5	1261.5	97 x 157	16 dB Attenuator supply OFF
A8B	3261.5	1261.5	97 x 157	8 dB Attenuator supply ON
A8A	3411.5	1261.5	97 x 157	8 dB Attenuator supply OFF
A4B	3561.5	1261.5	97 x 157	4 dB Attenuator supply ON
A4A	3711.5	1261.5	97 x 157	4 dB Attenuator supply OFF
A2B	3861.5	1261.5	97 x 157	2 dB Attenuator supply ON
A2A	4011.5	1261.5	97 x 157	2 dB Attenuator supply OFF
A1A	4161.5	1261.5	97 x 157	1 dB Attenuator supply OFF
A0.5A	4311.5	1261.5	97 x 157	0.5 dB Attenuator supply OFF
GND	4461.5	1261.5	97 x 157	Ground
VDD2	4611.5	1261.5	97 x 157	Second Positive Supply Voltage
GND	5671.5	251.5	97 x 97	Associated with RFOUT pad
RFOUT	5671.5	401.5	97 x 197	RFOUT Pad
GND	5671.5	651.5	97 x 97	Associated with RFOUT pad