



RF-6G

RF FRONT-END FOR SYSTEM INTEGRATORS

Operating instructions

AOR, LTD.

Table of contents

1. INTRODUCTION.....	2
2. MAIN FEATURES.....	3
3. TAKE CARE OF YOUR UNIT.....	4
4. INCLUDED IN THIS PACKAGE.....	5
5. FRONT PANEL CONNECTIONS.....	6
6. CONTROL INTERFACES.....	7
6.1 Asynchronous (DB-9) @ 115.25kbps.....	7
6.2 SPI (IDC-10P) @ 10Mbps.....	8
7. SPECIFICATIONS.....	10
8. CHASSIS.....	11
9. BLOCK DIAGRAM.....	12

1. INTRODUCTION

Thank you for purchasing the RF-6G RF Front-End, a super wide-band 500kHz-6GHz RF tuner for your high-end signal interception system.

RF-6G is designed using the latest technology to ensure the highest level of performance and reliability.

To obtain the best possible results from your RF-6G, we strongly recommend that you read these operating instructions and familiarize yourself with the unit.

Every effort has been made to make these instructions correct and up to date. Due to continuous developments of the unit, we acknowledge that there may be some errors or omission anomalies.

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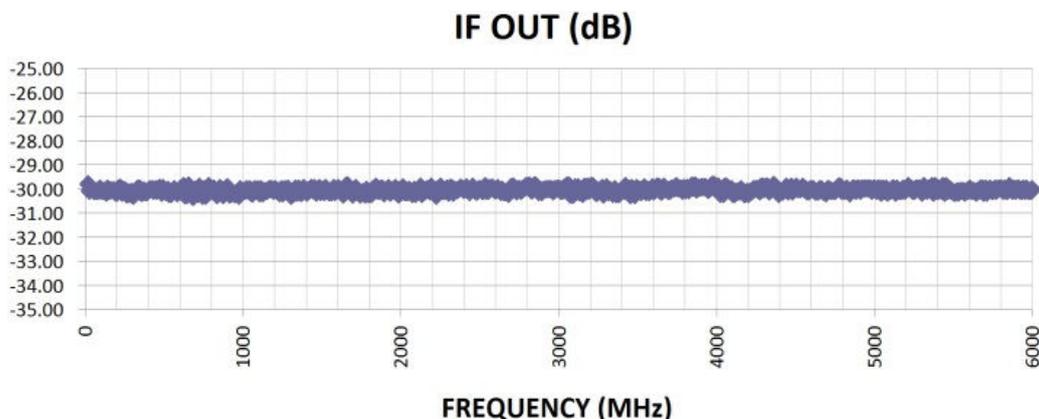
2. MAIN FEATURES

- 500kHz-6GHz super wide-band coverage
- Ultra-fast 1ms switching synthesizer
- +/-0.1ppm frequency stability
- RF to IF gain +30dB (+/-2dB)
- 20MHz wide high-linearity IF bandwidth
- Excellent phase noise performance
- Two control interfaces: High-speed SPI 10Mbps or Asynchronous 115.25kbps

On all frequencies, RF-6G provides excellent tuning characteristics needed for professional signal analysis and signal strength measurement. Typical applications for RF-6G are the integration into high-end monitoring systems dedicated to wide-band radio monitoring, interference detection and investigation, field-strength measurements, frequency analysis, radio propagation research, and close-range detection of illegal eavesdropping devices.

SUPERB IF-OUT ACCURACY

The 71.95 MHz IF analog output offers 20MHz (+/-10MHz) of bandwidth for external peripherals. Precise factory calibration ensures that the IF output is correlated to the antenna input within only +/-2dB, and this on the entire 500kHz – 6Ghz receive range!



LOW NOISE DOWN CONVERTER

The 3GHz to 6GHz portion is realized by cleverly designed, internal down conversion circuitry, offering ultra-low noise figures comparable to high-end microwave-only receivers.

DDS LOCAL OSCILLATOR

An AD9912 1GSPS direct digital synthesizer, which features an integrated 14-bit digital-to-analog converter, is used at the 1st local oscillator stage to ensure ultra-fast 1ms frequency switching.

3. TAKE CARE OF YOUR UNIT

There are no internal operator adjustments needed. In the unlikely event of service being required, please contact us for technical assistance.

Do not use or leave the unit in direct sunlight. It is best to avoid locations where excessive heat, humidity, dust and vibrations are present. Always keep the RF-6G free from dust and moisture. Use a soft, dry cloth to gently wipe the external surfaces clean; never use abrasive cleaners or organic solvents which may damage certain parts.

Treat the RF-6G with care; avoid spilling or leaking liquids into the unit. Special care should be taken to avoid liquids from entering the connection jacks.

The RF-6G is designed to operate from a good quality regulated DC power supply of 10.7 to 16.0 V, which should be capable of supplying 2A. Never connect the RF-6G directly to an AC power outlet. The chassis of the unit is at negative ground.

RF-6G has no user adjustable internal parts.

The RF-6G has two antenna connectors. These are intended for connection to a 50 Ω (unbalanced) coaxial fed antenna such as a disccone, dipole, Yagi, etc.

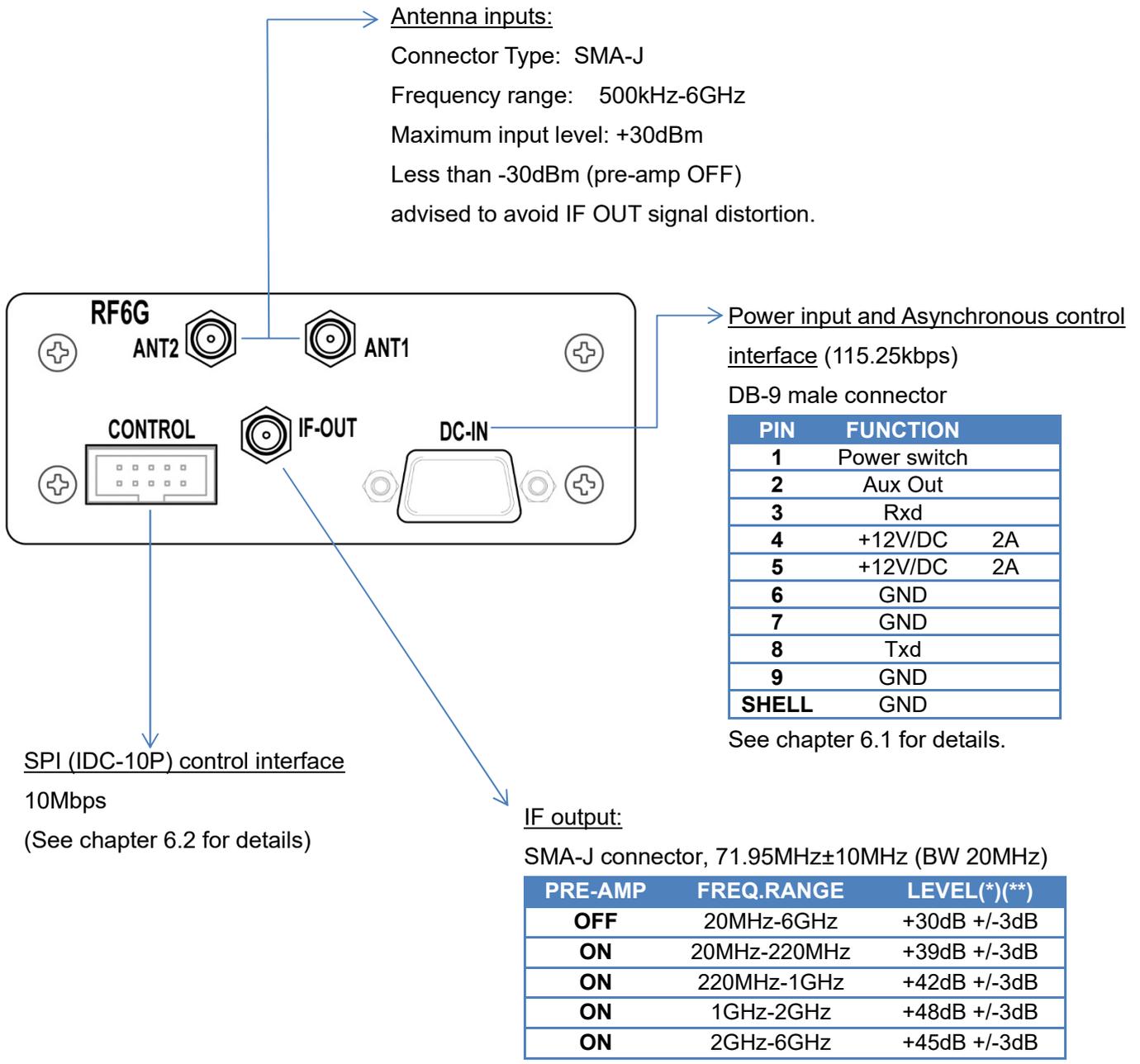
When installing an antenna, avoid power cables. Ensure that you do not confuse the antenna and the IF output connector as they are located close to each other.

4. INCLUDED IN THIS PACKAGE

The following items are provided in this package:

RF-6G RF Front-End unit	x 1
IDC-10P (27cm) ribbon cable	x 1
DB-9 female connector with shell	x 1
Operating instructions (this booklet)	

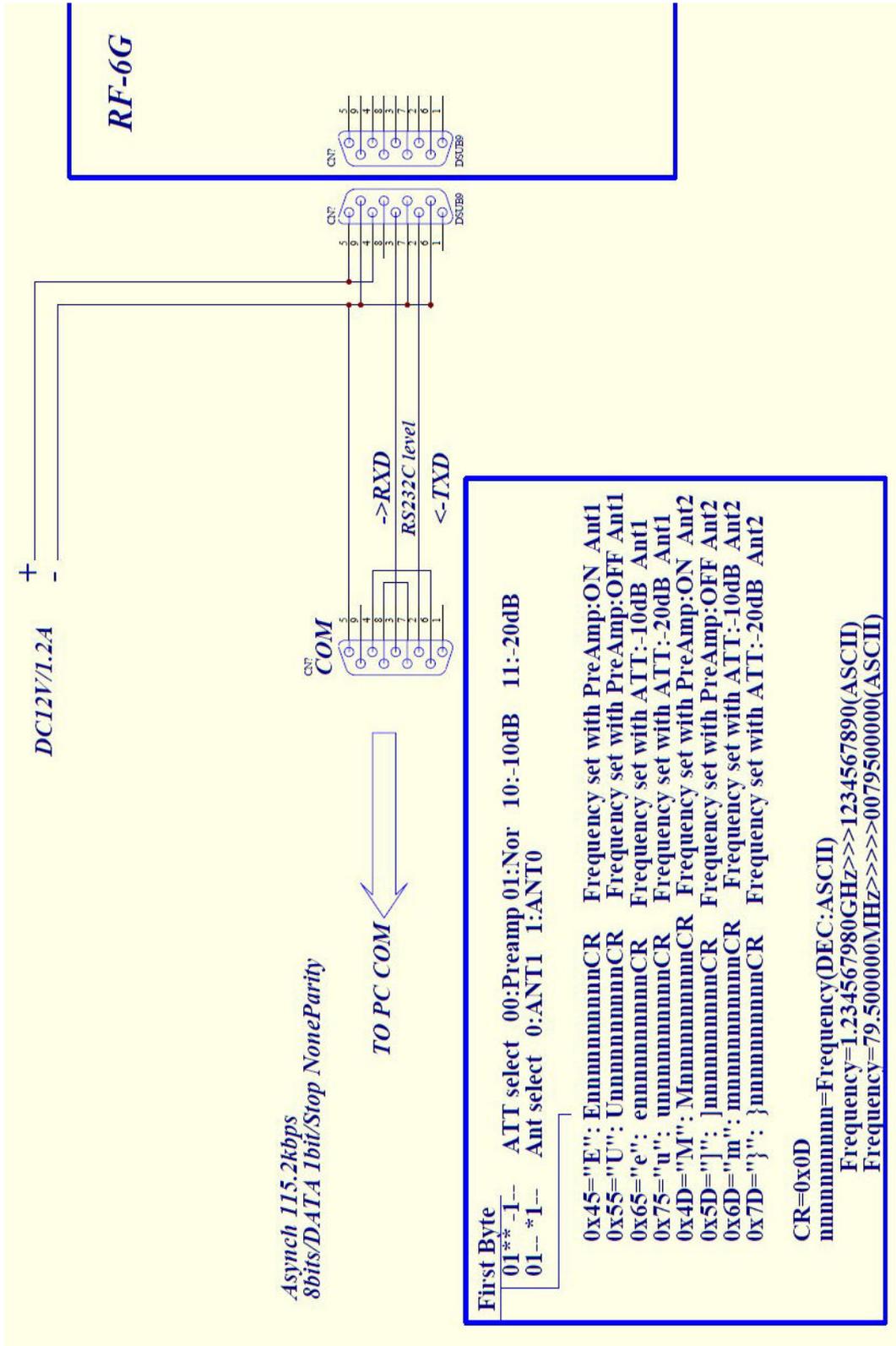
5. FRONT PANEL CONNECTIONS



(*) < +/-3dB for 71.95MHz (center frequency)
 (**) < +/-6dB for 555.05MHz and 35.05MHz (band edges).

6. CONTROL INTERFACES

6.1 Asynchronous (DB-9) @ 115.25kbps



6.2 SPI (IDC-10P) @ 10Mbps

Connector Type: IDC-10P

PIN	FUNCTION	
1	NC	
2	GND	
3	PCK	Load enable Input
4	GND	
5	CLK	Clock 10MHz input
6	GND	
7	SDI	Serial data input
8	GND	
9	SDO	Serial data output not provided
10	GND	

Frequency: 33bits, 1Hz step

Pre-amp and ATT: 2bits

00: Pre-amp ON

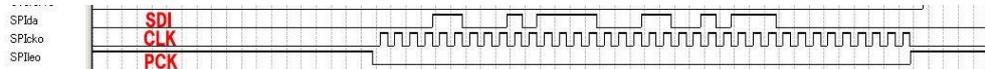
01: Pre-amp OFF

10: -10dBATT

11: -20dBATT

Total length: 36bits

- **SPI interface wave form**



- **Data**

D32-D0 = Receiving Frequency 20MHz – 6GHz (Hz)

For example:

25MHz = 0x0017D7840

6GHz = x165A0BC00

D34-D33 = ATT (PreAmp)

00: Pre Amp on

01: Normal Operation

10: 10 dB ATT on

11: 20 dB ATT on

D35: 0 = Reserved bit

- **Signal Level**

Hi-level: 3.5V – 2.5V

Low-level: 1.0V - 0V

- **Timing**

SERIAL PORT TIMING SPECIFICATIONS		
CLK Clock Rate (1/t _{CLK})	10MHz +- 2%	MHz
CLK Pulse Width High, t _{HIGH}	30 < t_{HIGH} < 50	ns
CLK Pulse Width Low, t _{LOW}	30 < t_{LOW} < 50	ns
SDI to CLK Setup Time, t _{DS}	> 12	ns
SDI to CLK Hold Time, t _{DH}	> 12	ns
CLK Falling Edge to Valid Data on SDI /SDO, t _{DV}	< 10	ns

7. SPECIFICATIONS

Input freq. range	500kHz – 6GHz
Tuning resolution	1Hz
Frequency stability	+/-0.1ppm (after 5 minutes warm-up time)
Frequency switching	1ms
Output frequency	71.95MHz
Output bandwidth	20MHz (*)
Reference input (**)	10MHz +2dBm (+/-2dB)
Gain	30dB
Gain flatness	+/-2dB
Noise figure	12dB typ. @ < 1GHz
Max. input level	+15dBm
Attenuation control	0, -10, -20dB @ <1GHz
IP3	>3dBm @ <3GHz
Antenna input	2 x SMA (selectable)
Attenuator	0dB, -10dB, -20dB up to 1GHz
Input impedance	50Ω
Output impedance	50Ω (SMA)
Control interfaces	SPI (IDC-10P) 10Mbps or Asynchronous (DB-9) 115.25kbps
Operating voltage	DC 10.7V-16V (DB-9)
Power consumption	Approx. 1.2A @ 12V
Dimensions	250 x 100 x 40mm
Weight	720g
Operating temperature	-10°C to +50°C

(*) Full 20MHz bandwidth available for receive center frequency of at least 10.5MHz.

(**) To facilitate system integration, this SMA socket is not pre-fitted, but supplied in the box for you to solder it, if required by your project.

“Last-one” memory function not provided. The unit does not retain frequency, pre-amp and attenuator settings after power has been switched off.

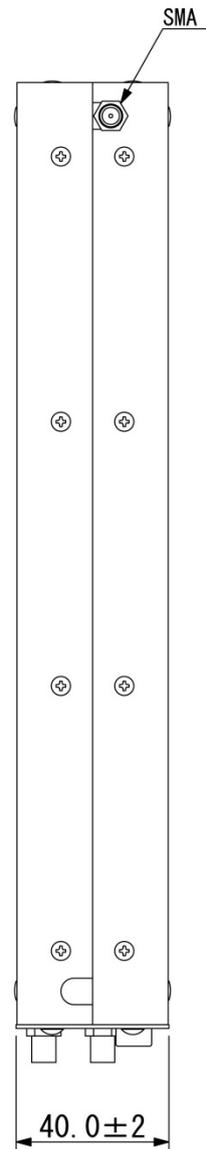
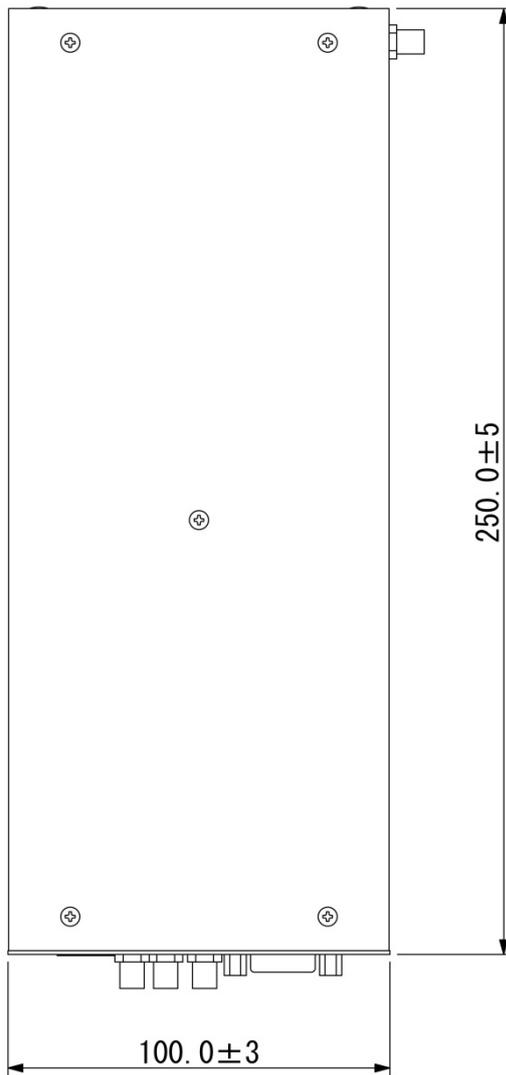
Design, features and performance subject to change without notice nor obligation.

8. CHASSIS

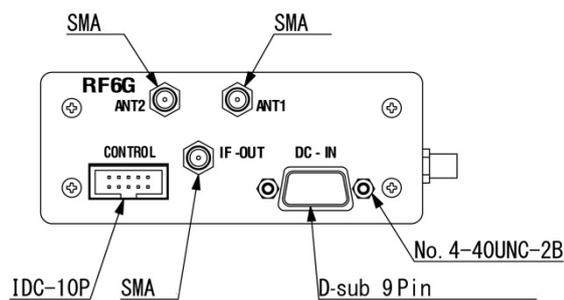
Made of aluminum.

Dimensions: 40mm+/-2mm(D) x 100mm+/-3mm(W) x 250mm+/-5mm(H)

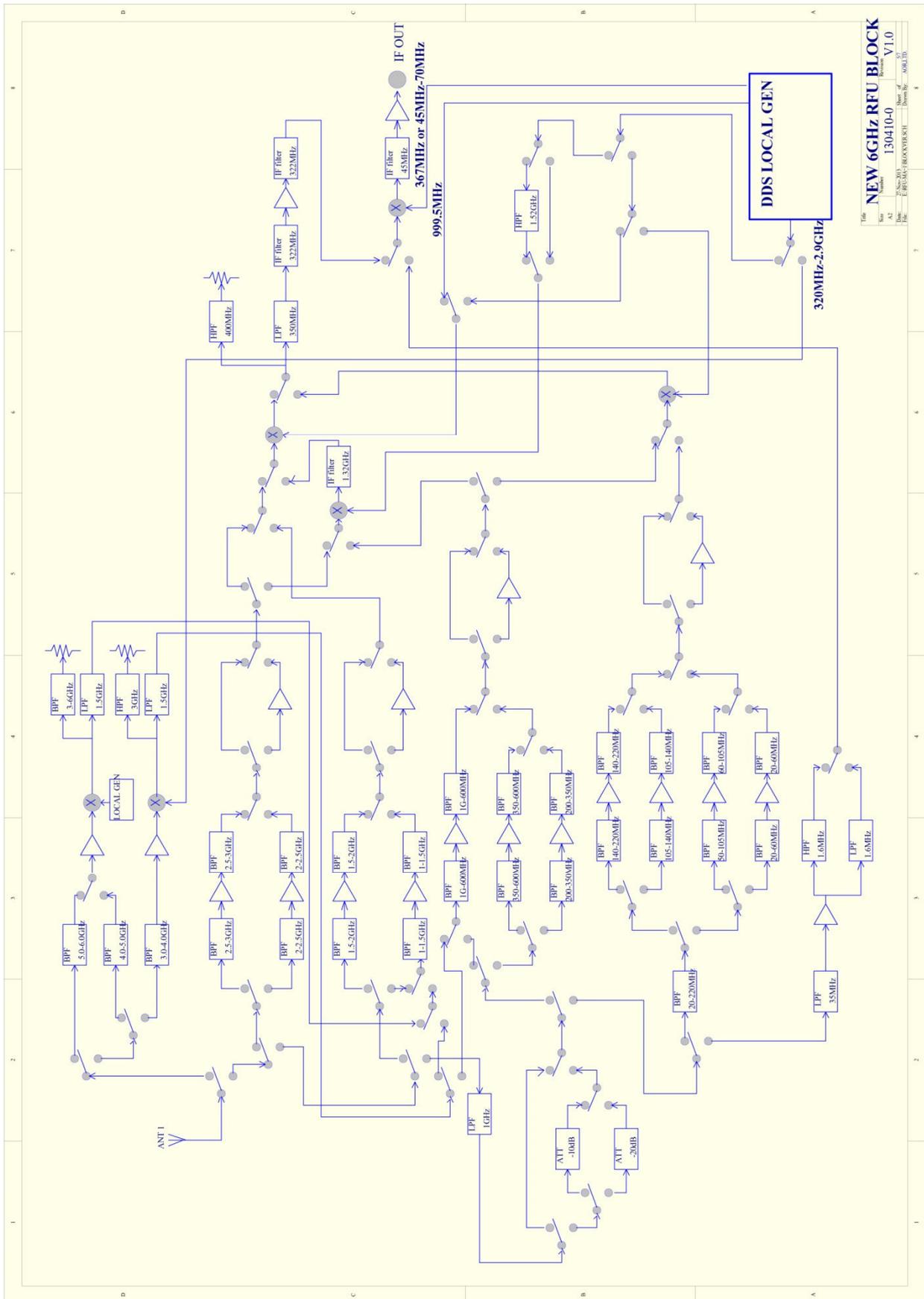
All interface connectors except Reference Input are located on the top of the chassis.



To facilitate system integration, this SMA socket is not pre-fitted, but supplied in the box for you to solder it, if required by your project.



9. BLOCK DIAGRAM



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