



# A10200 20 GHz 30 dBm RF Signal Amplifier

User Manual

Rev. 1.0

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## WARRANTY STATEMENT

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## Document Revision History

Table Document Revision History

Revision	Date	Description	Author
1.0	10-Jan-21	• Original revision.	Jakob Apelblat

# Acronyms & Abbreviations

Table Acronyms &amp; Abbreviations

Acronym	Description
μs or us	Microseconds
ADC	Analog to Digital Converter
AM	Amplitude Modulation
ASIC	Application-Specific Integrated Circuit
ATE	Automatic Test Equipment
AWG	Arbitrary Waveform Generators
AWT	Arbitrary Waveform Transceiver
BNC	Bayonet Neill–Concelm (coax connector)
BW	Bandwidth
CW	Carrier Wave
DAC	Digital to Analog Converter
dBc	dB/carrier. The power ratio of a signal to a carrier signal, expressed in decibels
dBm	Decibel-Milliwatts. E.g., 0 dBm equals 1.0 mW.
DDC	Digital Down-Converter
DHCP	Dynamic Host Configuration Protocol
DSO	Digital Storage Oscilloscope
DUC	Digital Up-Converter
DUT	Device Under Test
ENoB	Effective Number of Bits
ESD	Electrostatic Discharge
EVM	Error Vector Magnitude
FPGA	Field-Programmable Gate Arrays
FW	Firmware
GHz	Gigahertz
GPIB	General Purpose Interface Bus
GS/s	Giga Samples per Second
GUI	Graphical User Interface

<b>Acronym</b>	<b>Description</b>
HP	Horizontal Pitch (PXIe module horizontal width, 1 HP = 5.08mm)
Hz	Hertz
IF	Intermediate Frequency
I/O	Input / Output
IP	Internet Protocol
IQ	In-phase Quadrature
IVI	Interchangeable Virtual Instrument
JSON	JavaScript Object Notation
KHz	Kilohertz
LCD	Liquid Crystal Display
LO	Local Oscillator
MAC	Media Access Control (address)
MDR	Mini D Ribbon (connector)
MHz	Megahertz
ms	Milliseconds
NCO	Numerically Controlled Oscillator
ns	Nanoseconds
PC	Personal Computer
PCAP	Projected Capacitive Touch Panel
PCB	Printed Circuit Board
PCI	Peripheral Component Interconnect
PXI	PCI eXtension for Instrumentation
PXIe	PCI Express eXtension for Instrumentation
QC	Quantum Computing
Qubits	Quantum bits
R&D	Research & Development
RF	Radio Frequency
RT-DSO	Real-Time Digital Oscilloscope
s	Seconds
SA	Spectrum Analyzer

<b>Acronym</b>	<b>Description</b>
SCPI	Standard Commands for Programmable Instruments
SFDR	Spurious Free Dynamic Range
SFP	Software Front Panel
SMA	Subminiature version A connector
SMP	Subminiature Push-on connector
SPI	Serial Peripheral Interface
SRAM	Static Random-Access Memory
TFT	Thin Film Transistor
T&M	Test and Measurement
TPS	Test Program Sets
UART	Universal Asynchronous Receiver-Transmitter
USB	Universal Serial Bus
VCP	Virtual COM Port
Vdc	Volts, Direct Current
V p-p	Volts, Peak-to-Peak
VSA	Vector Signal Analyzer
VSG	Vector Signal Generator
WDS	Wave Design Studio

# 1 General

Model A10200 is an ultra-small footprint amplifier designed for high frequency, and high power signal amplification. With an ultra-high bandwidth of almost 20GHz and up to +30dBm power into 50 ohms, the A10200 is the ideal complimentary amplifier to any signal source that needs an extended power boost for demanding applications.

## 1.1 A10200 Feature Highlights

- Ultra-wide bandwidth 100kHz to 20GHz
- Relatively Flat Gain 14 - 10dB over whole band
- Maximum output up to +30dBm
- High OIP3 38dBm
- Fully protected device Reverse Polarity, Over Voltage, Under Voltage, Over Current, and Open-Short Load
- Small dimensions, all metal case



Figure 1.1 Model A10200

## 1.2 Safety Considerations

The Model A10200 has been manufactured according to international safety standards. The instrument meets EN61010-1 standards for safety of commercial electronic measuring and test equipment for instruments with an exposed metal chassis that is directly connected to earth via the chassis power supply cable.

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**Caution!**

- Do not remove instrument covers when operating the instrument or when the power cord is connected to the mains.
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Any adjustment, maintenance and repair of an opened, powered-on instrument should be avoided as much as possible, but when necessary, should be carried out only by a skilled person who is aware of the hazard involved.

## 1.3 Long Term Storage or Repackaging for Shipment

If the A10200 is to be stored for a long period of time or shipped to a service center, proceed as directed below. If repacking procedures are not clear to you or, if you have questions, contact your nearest Tabor Electronics Representative, or the Tabor Electronics Customer Service Department.

1. Repack the instrument using the wrappings, packing material and accessories originally shipped with the unit. If the original container is not available, purchase replacement materials.
2. Be sure the carton is well sealed with strong tape or metal straps.
3. Mark the carton with the model and serial number. If it is to be shipped, show sending and return address on two sides of the box.

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**Note**

- If the instrument is to be shipped to Tabor Electronics for calibration or repair, attach a tag to the instrument identifying the owner. Note the problem, symptoms, and service or repair desired. Record the model and serial number of the instrument. Show the RMA (Returned Materials Authorization) order as well as the date and method of shipment. ALWAYS OBTAIN AN RMA NUMBER FROM THE FACTORY BEFORE SHIPPING THE UNIT TO TAVOR ELECTRONICS.
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## 2 Introduction

### 2.1 Unpacking and Initial Inspection

Unpacking and handling of the A10200 requires normal precautions and procedures applicable to handling of sensitive electronic equipment. The contents of all shipping containers should be checked for included accessories and certified against the packing slip to determine that the shipment is complete.

### 2.2 Connectors

The A10200 has one front panel 2.92mm(K) input connectors, which match the Tabor's Lucid series outputs locations. At the rear panel, the A10200 has one 2.92mm(K) output connector, which outputs the amplified signals and the power SDS-50J input connector, which is fed from a factory supplied power supply.



Figure 2.1 Model A10200 Output



Figure 2.2 Model A10200 Input

## 2.3 Power Supply

The A10200 comes with a factory supplied power supply, which accepts any voltage from 100 to 240Vac and there is no need to select the voltage range between different countries. To avoid potentially hazardous situations, always connect the center pin of the power supply plug to mains ground using the line cord that is supplied with the instrument.

## 2.4 Specifications

The specifications listed in this manual represent the performance standards or limits against which the A10200 is tested. Specifications apply under the following conditions: output terminated into 50 ohms impedance, after 30 minutes of warm up time, and within a temperature range of 20°C to 30°C. Specifications outside of the temperature range are degraded by 0.1% per °C.

## 2.5 Operating Environment

The A10200 is intended for indoor use only and should be operated in a clean, dry environment with an ambient temperature within the range of 0 °C to 40 °C.

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**Caution!**

- The A10200 must not be operated in explosive, dusty, or wet atmospheres. Avoid installation of the module close to strong magnetic fields.
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## 2.6 Performance Checks

The instrument has been inspected for mechanical and electrical performance before shipment from the factory. It is free of physical defects and in perfect electrical order. Check the instrument for damage in transit and perform the electrical procedures outlined in the section entitled Unpacking and Initial Inspection.

## 2.7 Supplied Accessories

The A10200 is supplied with a power supply, power cord, one SMA/M to SMA/M connector to tie the A10200 to the instrument.



Figure 2.3 A10200 Kit

## 2.8 Installation & Operating Instructions

Being a passive device, there are no controls, nor computer programming required to operate the A10200. The following procedure is recommended for proper installation of the A10200 with the Tabor Lucid series models, however, model A10200 can be used in conjunction with any signal source, simply by using cables to connect to the amplifier:

1. Connect the input terminals to your source, using the supplied SMA/M to SMA/M connectors, as shown in figure 2.
2. Connect the output terminal to your load.

3. Connect the power input terminal to the supplied power supply.

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**Caution!**

- There is no switch control to turn A10200 amplification on and off and therefore, the amplifier is active immediately after you power it up. Always make sure your load is protected from inadvertent power up conditions before you turn on your A10200.
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Figure 2.4 Connecting the A10200 to Tabor Lucid Unit

## 3 Specifications

### 3.1 RF Characteristics

Characteristics	Description		
RF Connector	2.92mm(K)		
Frequency Range	100kHz to 20GHz		
Gain	Min.	Typ.	Max.
100kHz to 100MHz	11	12	14
100MHz to 3GHz	12	12.5	13
3GHz to 9GHz	9	10	11
9GHz to 20GH	7	8	9.5
Input Return Loss:	14dB typ. (11dB Min.)		
Output Return Loss:	12dB typ. (8dB Min.)		
P1dB	+27dBm		
Psat	+30dBm		
Output IP3	+38dBm		
Noise Figure	9dB		
Reverse Isolation	50dB typ. (40dB Min.)		
Second Harmonic	-23dBc @ Pout +25 dBm		
RF Input Level (No Damage):	+27dBm Max.		
Protection	Reverse Polarity, Over Voltage, Under Voltage, Over Current, and Open-Short Load		



### 3.2 General

Characteristics	Description
Vcc	20-27V, 24V Nominal
Icc	450mA Typ.
Power Dissipation	11W Typ.
Dimensions	40 x 30 x 85 mm
Weight:	
Without Package	110 g
Shipping Weight	1.25 kg
Temperature	
Operating	0°C to +40°C
Storage	-40°C to +70°C
Warm up Time	15 minutes

Characteristics	Description
Humidity	85% RH, non-condensing
Safety	CE Marked, IEC61010-1:2010
EMC	IEC 61326-1:2013
Calibration	2 years
Warranty	1 year or 3 years warranty plans

### 3.2.1 Ordering Information

Model	Description
A10200	20GHz 30dBm RF signal amplifier