



ACTiV 3.0

WiFi-7 320MHz bandwidth support

Data Sheet

Version 1.2, Jun 2025



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1 Overview



The ALifecom ACTiV 3.0 is an advanced, all-in-one testing solution designed to address the comprehensive evaluation needs of modern wireless communication devices. With its broad range of capabilities, the ACTiV 3.0 supports the latest wireless standards, making it an ideal choice for manufacturers aiming to ensure the quality, performance, and reliability of their products. This state-of-the-art system is engineered to deliver precise measurements, high throughput, and intuitive operation, making it an invaluable asset for high-volume production environments.

The ACTiV 3.0 stands out with its wide frequency coverage, cutting-edge Vector Signal Analyzer (VSA) and Vector Signal Generator (VSG), and extensive measurement capabilities that support various wireless technologies, including Wi-Fi, Bluetooth, Zigbee, SUN-OFDM, LoRa, and FSK. Its robust design is built to handle demanding test scenarios, providing accurate and reliable results that are essential for modern wireless technology development.

Additionally, the ACTiV 3.0's ability to perform multi-DUT (device under test) test configurations and its comprehensive connectivity options make it a versatile and efficient tool, capable of seamlessly integrating into various test setups.

By offering detailed reporting and advanced analysis tools, the ACTiV 3.0 not only facilitates thorough testing but also helps in gaining deep insights into the performance and quality of wireless devices. The ALifecom ACTiV 3.0 is equipped to meet the stringent demands of wireless communication testing, providing the accuracy, efficiency, and flexibility needed to stay ahead in the fast-paced world of wireless technology.

Key Features:

Wide Frequency Range: The ACTiV 3.0 supports frequencies from 800 MHz to 7.3 GHz, enabling testing across a broad spectrum of wireless communication standards. This wide frequency range makes it ideal for testing various technologies such as Wi-Fi (up to the latest Wi-Fi 7), Bluetooth, Zigbee, SUN-OFDM, LoRa, and FSK, ensuring compatibility with a wide array of devices and applications.

High-Precision VSA and VSG: Equipped with state-of-the-art VSA and VSG, the ACTiV 3.0 delivers high accuracy and performance metrics essential for detailed signal analysis and generation. The VSA and VSG capabilities ensure that measurements are precise, reliable, and repeatable, providing confidence in the testing results and supporting high-quality product development.

Extensive Measurement Capabilities: The ACTiV 3.0 supports a wide array of wireless standards, including 802.11a/b/g/n/ac/ax/be, Bluetooth BDR/EDR/BLE, Zigbee, SUN-OFDM, LoRa, and FSK, making it a comprehensive solution for modern wireless communication testing. With the capability to handle the latest standards such as Wi-Fi 7 with 4096QAM in 320MHz bandwidth, it ensures that the device is future-proof and can be used for testing emerging technologies as well.

Multi-DUT Test: The ACTiV 3.0 supports multi-DUT configurations, allowing up to 8 ports (2 VSA/VSG) to be tested in parallel. This significantly increases testing throughput and efficiency, making it ideal for high-volume production environments.

2 Specifications

2.1 General Hardware

2.1.1 Vector Signal Analyzer (VSA)

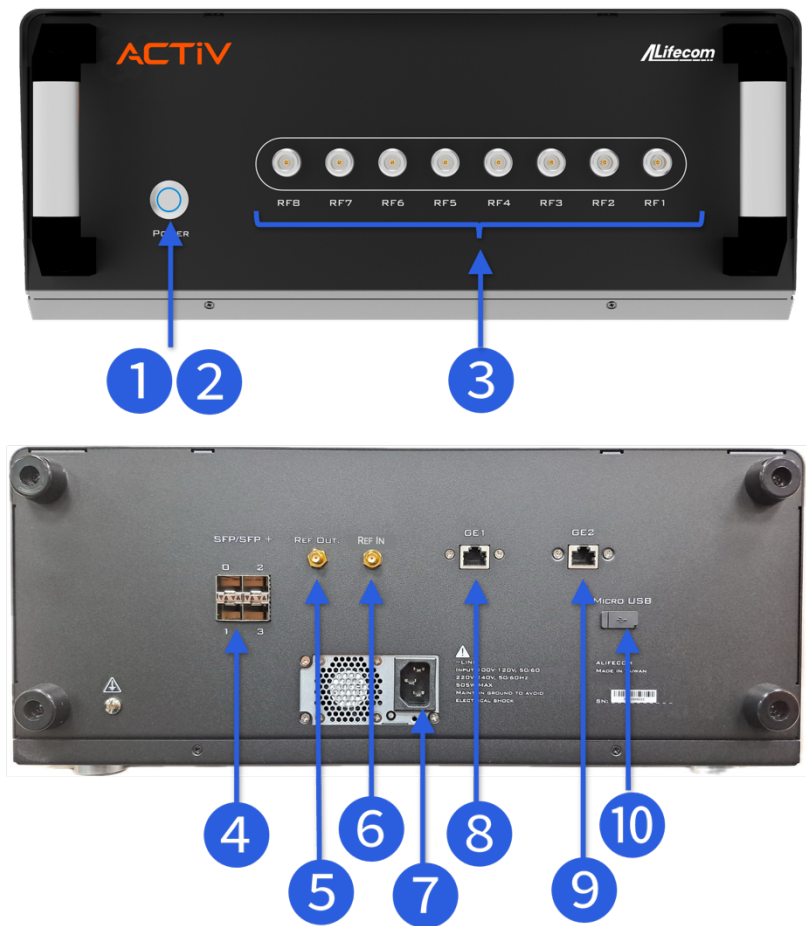
Parameters	Ports	Specifications
Frequency Range	RF1 to RF8	800 MHz ~ 7.3 GHz
IF Bandwidth	RF1 to RF8	320 MHz
Input Power	RF1 to RF8	-50 ~ 20 dBm
Input Power Accuracy	RF1 to RF8	± 1 dB
Input Return Loss	RF1 to RF8	≥ 10 dB
Spectral Flatness	RF1 to RF8	± 1.5 dB (± 100 MHz)
Noise Figure	RF1 to RF8	≤ 20 dB
Sample Data Rates	RF1 to RF8	480Msps
Waveform Capture Duration	RF1 to RF8	100ms

2.1.2 Vector Signal Generator (VSG)

Parameters	Ports	Specifications
Frequency Range	RF1 to RF8	800 MHz ~ 7.3 GHz
IF Bandwidth	RF1 to RF8	320 MHz
Outpower Power Range (CW)	RF1 to RF8	-110 ~ -3 dBm
Output Power Accuracy	RF1 to RF8	± 1 dB
Output Return Loss	RF1 to RF8	≥ 10 dB
Spectral Flatness	RF1 to RF8	± 1.5 dB
Sample Data Rates	RF1 to RF8	400Msps

Waveform Playback Duration	RF1 to RF8	100ms
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2.1.3 Front/Rear Panel Details



Front Panel interface		
I/O	Function	Type
1. Power Switch	Power on/off	Push button
2. Power Indicator	LED green – powered up, running	LED indicator
3. RF1 to RF8	RF input/output	N female
Rear Panel interface		

I/O	Function	Type
4. SFP + 0/1/2/3	Reserved	
5. Ref Out.	10MHz Reference clock out	3.5 mm SMA-F
6. Ref In	10MHz Reference clock in	3.5 mm SMA-F
7. AC in	AC Power Input	AC 110 ~ 240 V (automatically switched)
8. GE 1	1000 Base-T LAN	RJ45
9. GE 2	1000 Base-T LAN	RJ45
10. Micro USB	USB 2.0	Micro USB Type-B

2.1.4 Port Isolation

Measurement	Value
Port to Port Isolation	VSA to VSA: 100 dB, < 2500MHz; 90 dB, >2500MHz VSG to VSG: 100 dB, < 2500MHz; 90 dB, >2500MHz VSG to VSA: 100 dB, < 2500MHz; 90 dB, >2500MHz

2.1.5 Time base

Parameters	Value
Oscillator Type	DCTCXO
Frequency	100 MHz
Initial Accuracy (25°C, after 30-minute warm-up)	< ± 0.3 ppm
Maximum Aging (25°C)	< ± 0.1 ppm per year
Temperature Stability	< ± 0.09 ppm over 0° to 50° range, reference to 25°C
Warm-up Time (to within ± 0.1ppm at 25°C)	30 mins

2.1.6 Frequency Reference Output

Parameters	Value
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Frequency	10 MHz
Output Voltage	1.8 V
Impedance	50 Ω

2.2 Wireless LAN 802.11a/b/g/n/ac/ax/be Measurements

Controls	Description	Performance
EVM	Residual lookback EVM averaged over payload based on standard requirements, full packet channel estimation	$\leq -54 \text{ dB} \pm 1 \text{ dB}$ 2.4 GHz Frequency band (MCS 13), 802.11be waveform, 20MHz $\leq -50 \text{ dB} \pm 1 \text{ dB}$ 5G and 6GHz Frequency band (MCS13), 802.11be waveform, 160MHz
Peak Power	Peak power over all symbols (dBm)	VSA power accuracy: $\pm 1 \text{ dB}$
RMS Power	All average power of complete data capture (dBm)	VSA power accuracy: $\pm 1 \text{ dB}$ (800MHz – 7.3GHz)
Max. Avg. Power	Peak value of the amplitude as a moving average over 40 samples (dBm)	VSA power accuracy: $\pm 1 \text{ dB}$ (800MHz – 7.3GHz)
Frequency Error	Carrier frequency error (kHz)	VSA measurement error $\leq \pm 0.2 \text{ ppm}$ calibrated
Spectrum Mask	Transmit spectrum mask	
Spectral Flatness	Reflects variation of signal energy as a function of OFDM subcarrier number	$\pm 1.5 \text{ dB}$
Receive Sensitivity	Receive sensitivity test using ACTiV 3.0 or used generated waveform	

2.3 Bluetooth® BDR/EDR Measurements

Controls	Description
TX output power	Transmit DUT output power (dBm)
In-band emissions (adjacent channel)	Spurious emission at ± 5 MHz of DUT Tx frequency only
Modulation characteristics	Average and peak frequency deviation (Hz)
Carrier frequency tolerance	Carrier frequency offset (Hz)
Carrier frequency drift	Carrier frequency change over the Bluetooth burst (Hz)
Relative transmit power (EDR)	Average power of complete data capture (dBm)
Carrier frequency stability (EDR)	Frequency drift over the Bluetooth EDR burst duration (Hz)
Receive sensitivity	Receive sensitivity test using ACTiV 3.0 or used generated waveform
Maximum input signal level	Assuming single-ended BER measurement
RMS EVM (EDR)	RMS EVM for Bluetooth EDR
Peak EVM (EDR)	Peak EVM for Bluetooth EDR

2.4 Bluetooth® BLE Measurements

Controls	Description
Output power at NOC	Transmit DUT output power (dBm)
Output power at EOC	Transmit DUT output power (dBm)
In-band emissions at NOC	Spurious emission at ± 5 MHz of DUT Tx frequency only
In-band emissions at EOC	Spurious emission at ± 5 MHz of DUT Tx frequency only
Modulation characteristics	Average and peak frequency deviation (Hz)
Carrier frequency offset and drift at NOC	Carrier frequency offset (Hz) and change over the Bluetooth burst (Hz)

Carrier frequency offset and drift at EOC	Carrier frequency offset (Hz) and change over the Bluetooth burst (Hz)
Receiver sensitivity at NOC	Receive sensitivity test using ACTiV 3.0 or used generated waveform
Receiver sensitivity at EOC	Receive sensitivity test using ACTiV 3.0 or used generated waveform
Maximum input signal level	Assuming single-ended BER measurement

2.5 Zigbee (802.15.4) Measurements

Controls	Description
Output power	Transmit DUT output power (dBm)
Power spectral density	Transmit DUT power spectral density
Carrier frequency tolerance	Tx center frequency tolerance
EVM	Offset: compensate the I and Q offset in OQPSK
Receive sensitivity	Receive sensitivity test using ACTiV 3.0 or used generated waveform

2.6 SUN-OFDM Measurements

Controls	Description
Output power	Transmit DUT output power (dBm)
Power spectral density	Transmit DUT power spectral density
Carrier frequency tolerance	Tx center frequency tolerance
EVM	EVM averaged over payload based on standard requirement
Receive sensitivity	Receive sensitivity test using ACTiV 3.0 or used generated waveform

2.7 LoRa Measurements

Controls	Description
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Output power	Transmit DUT output power (dBm)
Carrier frequency tolerance	Tx center frequency tolerance
Receive sensitivity	Receive sensitivity test using ACTiV 3.0 or used generated waveform

2.8 FSK Measurements

Controls	Description
Output power	Transmit DUT output power (dBm)
Carrier frequency tolerance	Tx center frequency tolerance
Receive sensitivity	Receive sensitivity test using ACTiV 3.0 or used generated waveform

2.9 General and Environmental Info

Parameters	Description	
Dimensions (D x W x H)	With handle	635mm*440mm*185mm
	Without handle	604mm*440mm*185mm
Weight	25kg	
Power consumption (maximum)	150 W	
Power consumption (average)	110 W	
Power requirements	AC 110 ~ 240 V	
Operating temperature	+10°C to +50°C	
Storage temperature	-20°C to +70°C	
Specification validity	20°C to 35°C 30 minutes warm-up time at ambient temperature	
Operating humidity	15% to 95% relative humidity, non-condensing	
Recommended calibration cycle	12 months	

Warranty	12 months hardware, 12 months software updates
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Contact Info

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