

# **IQMASTER**

**IQ6400 – Vector Signal Generator and Analyzer**

**75MHz-6000MHz**

**400MHz BW**



# **AMCAD**

## Main features

- 75MHz-6GHz Vector Signal Transceiver (VST) based on Radio Unit SoC Technologies
- Turnkey solution for IQSTAR measurement software
- Dedicated firmware to run the VST like a benchtop instrument grade solution
- Measurement of RF Power Amplifier in base station-like conditions
  - LTE/5G PA Tests with signal generation and analysis bandwidth up to 400MHz
  - 1-tone measurements: CW and pulsed CW characterization with configurable rise/fall time
  - 2-tone measurements for video bandwidth analysis
  - IQ signal generation and analysis with Digital Predistortion capabilities - Acquisition averaging up to 8192 in IQ modulation mode for high dynamic range characterization
- Trigger and 10 MHz IN/OUT available to connect power meters, multimeter or spectrum analyzer
- High data transfer rate (Gigabit LAN interface)



# Specifications

General Specifications.		
Frequency range		75MHz to 6GHz
Harmonics		Rejected by external low pass filter
Frequency accuracy		$\pm (\text{Output frequency} \times 61.5\text{ppm} + 1.832)$
RF OUTPUT PORT		
RF output port connector		SMA female, 50 $\Omega$ nominal
RF Output port max. reverse input power level		+15dBm
RF Output port max. DC voltage input level		TBD
RF Output port setting level range		130dB relative to max power
RF Output port level accuracy		
	Power Level = max power - 6dB	< $\pm 0.15\text{dB}$
	Overall power range	< $\pm 1\text{dB}$
RF Output port setting resolution		0.01 dB
RF INPUT PORT		
RF Input port (ORx1)		
	Connector	SMA female, 50 $\Omega$ nominal
	Max. safe input power level	+17 dBm
	Damage input power level	+23 dBm (peak)
	Max. DC voltage input level	+30V
RF Input port level accuracy		NA (uncalibrated)
INPUTS AND OUTPUTS		
REF OUT		BNC female, 50 $\Omega$ nominal Output level: +5dBm $\pm$ 1dB (square waveform) Frequency: 10MHz $\pm$ 61.5 ppm
REF IN		BNC female, 50 $\Omega$ nominal Input level range: -15 to +13dBm (sine or square waveform) Frequency: 10MHz Lock range: $\pm$ 30 ppm
TRIG IN		BNC female, >100 k $\Omega$ nominal Accepts +3.3V TTL Vhigh min: +2.0V Min. pulse width: 20 ns
TRIG OUT 1, TRIG OUT 2, TRIG OUT 3		BNC female, 30 $\Omega$ nominal +3.3Vpp into >100 k $\Omega$ +2.0Vpp into 50 $\Omega$
DIMENSIONS AND WEIGHT		
Dimensions		85 mm (H) x 460 mm (L) x 300 mm (W)
Weight		5.54 kg
Environmental conditions		
Altitude up to 2000m, Temperatures : 5 to 40°C , Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.		

# Specifications

Vector Signal Generator and Vector Signal Analyzer - IQ waveform mode		
Sampling rate	122.88MSa/s, 245.76MSa/s, 491.52MSa/s	
Capture depth	64MSa, 136ms @ 491.52MSa/s	
Maximum signal generation and analysis bandwidth		
	Center frequency	
	75 MHz – 526 MHz	100 MHz
	526 MHz – 5835 MHz	400 MHz
	5836 MHz – 5948 MHz	200 MHz
	5948 MHz – 6000 MHz	100 MHz
Waveform transfer rate	Read	87.5MB/s
	Write	62.5MB/s
Triggering	Internal, External, Free Run	

1-tone CW and pulsed modes		
Sampling rate (only applicable with 1-tone pulsed mode)	122.88MSa/s, 245.76MSa/s, 491.52MSa/s	
ON/OFF ratio	> 80dB	
Pulse period <sup>1</sup>		
	Min.	1.83 μs
	Max.	17.47 s
Pulse width <sup>1</sup>		
	Min.	32.55 ns
	Max.	17.47 s
Pulse delay <sup>1</sup>		
	Min.	0 ns
	Max.	8.74 s
Rise/fall time <sup>1</sup>		
	Min.	8.14 ns
	Max.	66 μs
Resolution <sup>1</sup> (applicable to period, width, delay, rise/fall time)	4.07 ns	

2-tones mode		
Frequency spacing		
	Center frequency	
	75 MHz – 526 MHz	100 kHz to 100 MHz
	526 MHz – 5835 MHz	100 kHz to 400 MHz
	5836 MHz – 5948 MHz	100 kHz to 200 MHz
	5948 MHz – 6000 MHz	100 kHz to 100 MHz
Frequency resolution between tones	57 mHz	
Tone power range	95dB below average output power	

<sup>1</sup> Data specified with 491.52MSa/s sampling rate, other values can be reach with different sampling rates.

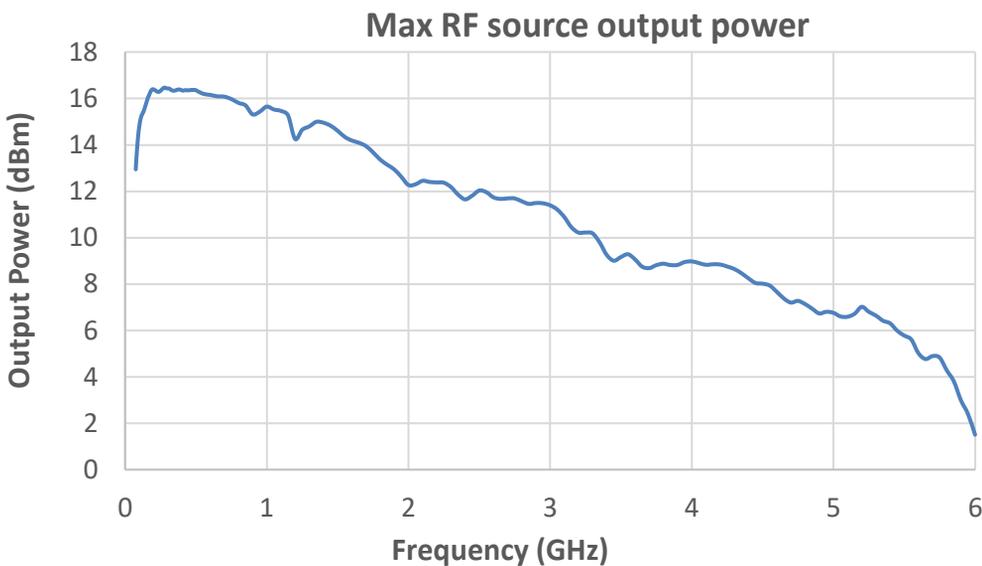
# Mechanical Dimensions

Dimensions: 85 mm (H) x 460 mm (L) x 300 mm (W)



# Typical Performances

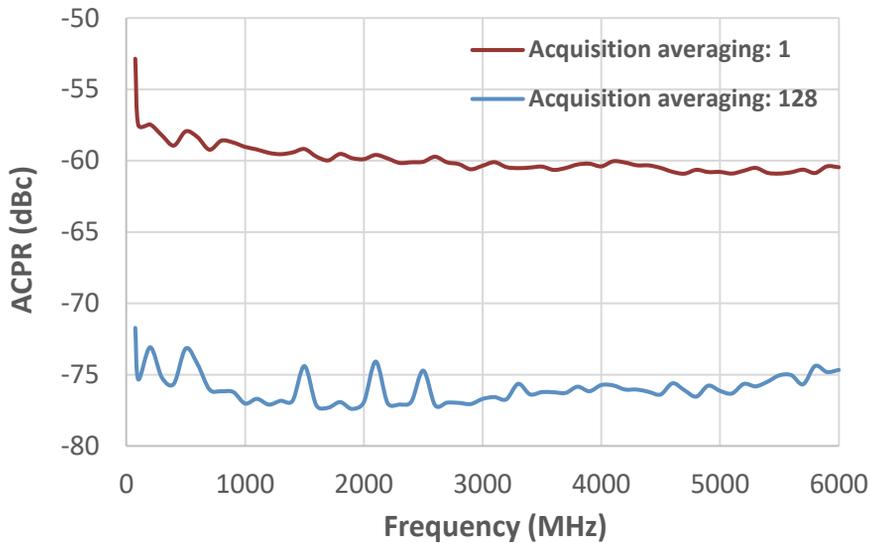
Maximum CW source output power:



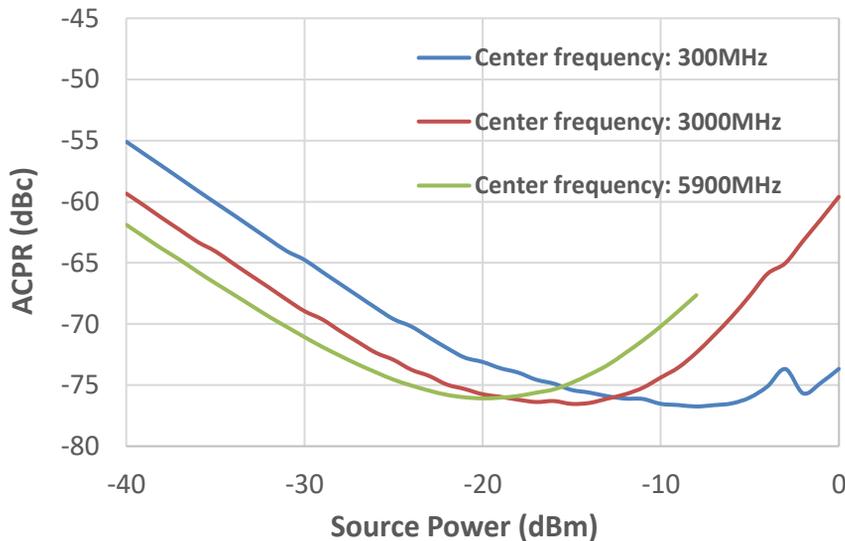
Maximum CW RF source output power vs frequency

## Typical Performances

### General performances: 75MHz – 6GHz



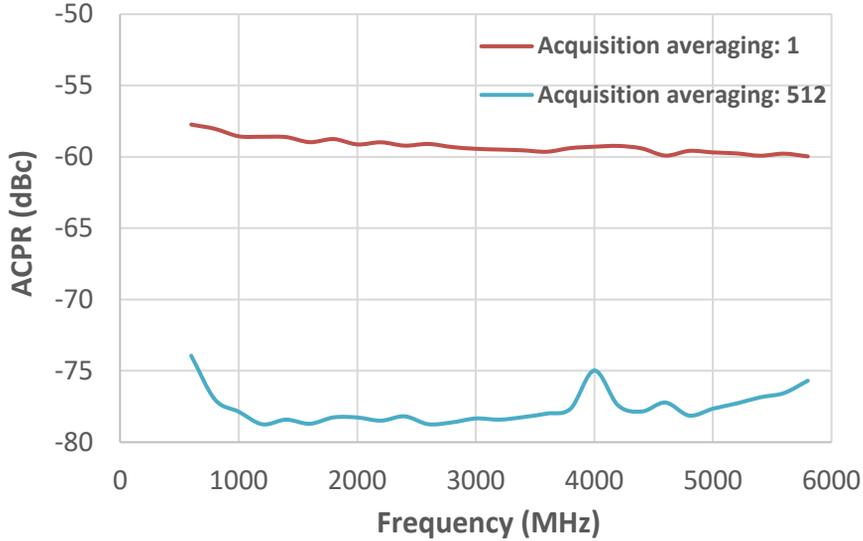
General performances vs. frequency with 20MHz bandwidth 10dB PAPR  
Source power -15dBm  
@122.88MSa/s



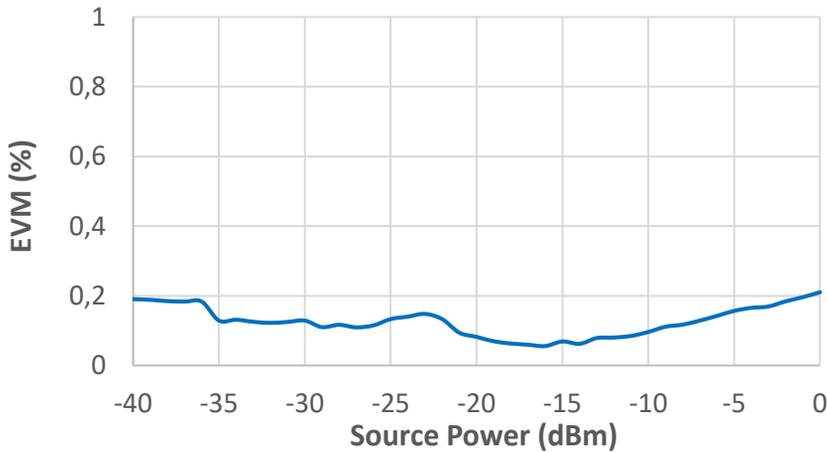
General performances vs. source power at 300MHz, 3GHz and 5.9GHz with 20MHz bandwidth 10dB PAPR  
@122.88MSa/s

Note: RF output loopback to RF input .  
Acquisition averaging set to 128.

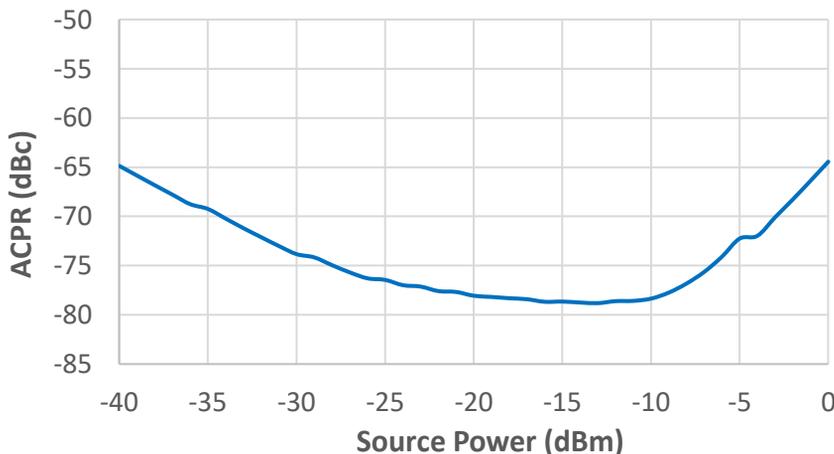
## LTE Typical Performances



*LTE performances vs. frequency  
with 20MHz bandwidth 10dB PAPR  
Source power -15dBm  
@491.52MSa/s*

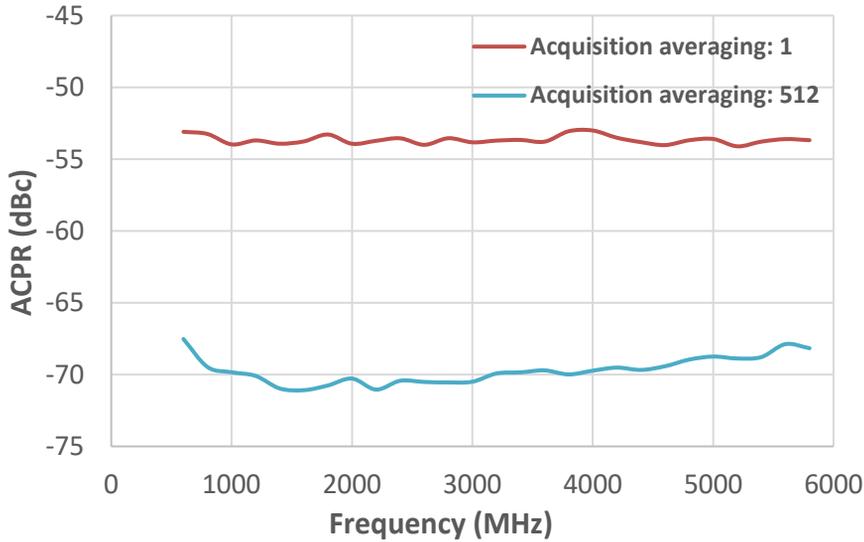


*LTE performances vs. source power  
at 2.6GHz with 20MHz bandwidth  
10dB PAPR  
@491.52MSa/s*

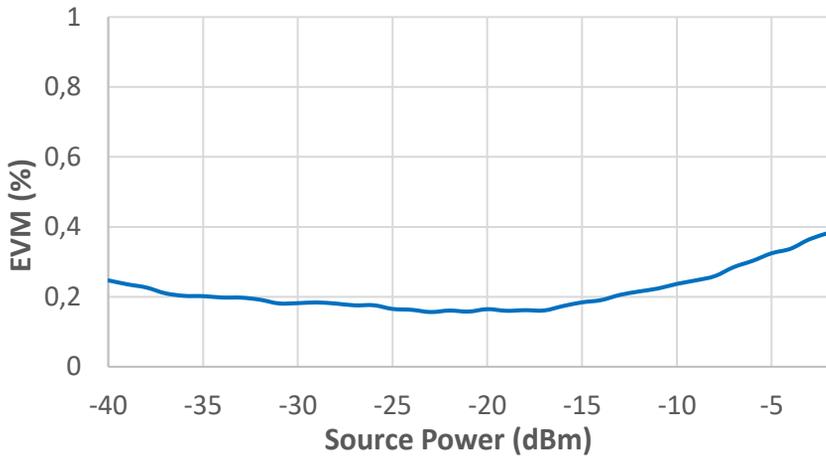


*Note: RF output loopback to RF input.  
Acquisition averaging set to 512.*

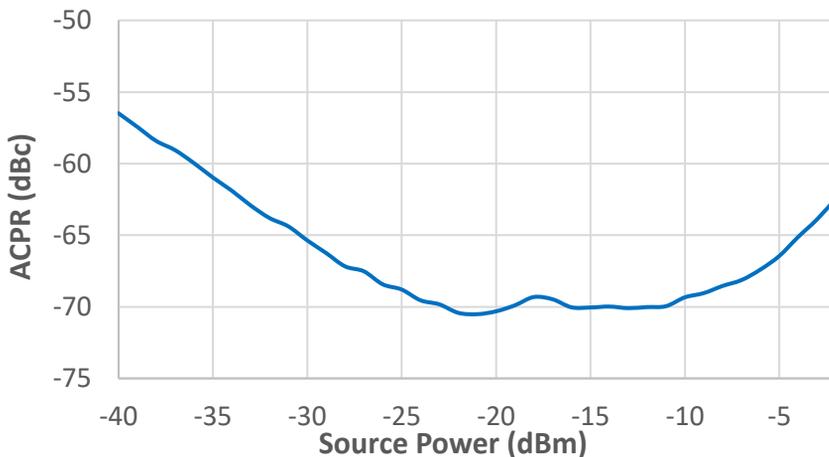
## 5G Typical Performances



5G performances vs. frequency with  
100MHz bandwidth 10dB PAPR  
Source power -15dBm  
@491.52MSa/s



5G performances vs. source power  
at 3.6GHz with 100MHz bandwidth  
10dB PAPR  
@491.52MSa/s



Note: RF output loopback to RF input.  
Acquisition averaging set to 512.

### **Warranty**

Any AMCAD product comes with a two-year parts and labour warranty, when returned to our workshops. A phone support service is also available for the same period.

At the end of the initial two-year period, a further contract can be subscribed, including:

- a preventive functional check and calibration of the modules (on site or in our workshop)
- a further two-year warranty period

### **Quality Regulations & Environment**

AMCAD Systems and all modules are compliant to the applicable European directive and hold the CE mark.

- Products are designed and manufactured in France.
- Serial number-based life cycle management
- All products are 100% tested (test reports on demand)
- To ensure a correct operation, the fans must not be obstructed
- Maintenance will only be performed by the manufacturer AMCAD. Do not allow anyone to perform electrical maintenance on the VST.
- AMCAD only uses RoHS compliant components and does not use substances banned by the COSHH regulation.
- AMCAD complies with the relevant national regulations related to the safety and health of its employees against hazardous substances.
- As we are always seeking to improve our products, the information in this document gives only a general indication of the product capacity, performance and suitability, none of which shall form part of any contract. We reserve the right to make design changes without notice.

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