

Measurement tree and result diagram for VZW VoLTE in communication analysis system ACQUA

## DESCRIPTION

The tests implemented in the VZW VoLTE test suite cover all electro-acoustic performance aspects of VoLTE mobile terminals as defined and required by Verizon Wireless in the document "Codec and Voice quality test plan" from May 2014.

These tests cover requirements for handset and handheld hands-free configurations as well as codec functionality tests via the electrical headset interface.

The measurements in the test suite implemented by HEAD acoustics may be changed, adapted or modified if needed in order to conduct additional tests. The tests can be combined in any way to create individual test sequences.

Combined with the advanced communication quality analysis system ACQUA and the calibrated measurement front end MFE VI.1, the VZW VoLTE test suite with its predefined measurement descriptors and automated measurement sequences allows the fast and easy acquisition, analysis and documentation of measurement data.

## APPLICATIONS

- **Conformance testing** of VoLTE mobile terminals according to "Codec and Voice quality test plan" by Verizon Wireless
- **Automated quality analysis** of VoLTE mobile terminals
- **Experimental development and optimization** of VoLTE mobile terminals with objective evaluation of speech quality

## SYSTEM REQUIREMENTS

**VZW VoLTE (Code 60023)** requires the following system components:

- **ACQUA**, Advanced Communication Quality Analysis System, Version 3.2.100 or later
  - **Standard (Code 6462)** or
  - **Compact (Code 6860.xx)***Note: existing customers need a valid software maintenance agreement (SMA)*
- **MFE VI.1 (Code 6462)**, analog USB front end with level adjustment and integrated power amplifier, with option **MFEVI-BEQ (Code 6461)** for handheld hands-free use case
- **MFE VIII.1 (Code 6484)**, VoIP reference gateway with Ethernet interface and SIP-VoIP client, with option **Cod-Opt (Code 6485)**
- **HMS II.3-33 (Code 1230.1)**, artificial HEAD Measurement System with pinna type 3.3.
 *Note: additional left ear simulator **HIS L (Code 1231)** required for handheld hands-free use case*
- **HHP III.1 (Code 1403)**, Handset Positioner for HMS II.3/4/5
- **HAE-BGN** Background Noise Simulation, cf. separate data sheet for Code 6971
- **Headset Interface Box**, for connecting mobile terminal electrical headset interface to MFE VI.1
- **ACOPT 21 (Code 6844)**, Option 3QUEST

## DATA SHEET

### VZW VoLTE (Code 60023)

Electro-acoustic Measurements of VoLTE Mobile Terminals according to Verizon Wireless "Codec and Voice quality test plan"

## OVERVIEW

VZW VoLTE contains measurements from "Codec and Voice quality test plan" by Verizon Wireless which specifies test methods to assess minimum performance requirements for VoLTE mobile terminals in Verizon mobile networks.

HEAD acoustics has implemented these test methods into the automated test suite VZW VoLTE for the communication quality analysis system ACQUA. It provides **comprehensive tests** for the analysis of

- **Delay,**
- **Speech transmission quality,**
- **Echo,**
- **Quality of background noise transmission,**
- **Codec functionality.**

Manufacturers can use VZW VoLTE to be able to prove conformance of their mobile devices with the requirements of the latest Verizon Wireless "Codec and Voice quality test plan".

- **ACOPT 30 (Code 6857)**, Option POLQA
- **LTE Radio Communication Tester**, e.g. Anritsu MD8475A or R&S CMW500 (not delivered by HEAD acoustics)

## OPTIONS

- **UG VZW VoLTE (Code 60024)**, upgrade from TS 26131-32 (Code 6777) to VZW VoLTE

## DELIVERY ITEMS

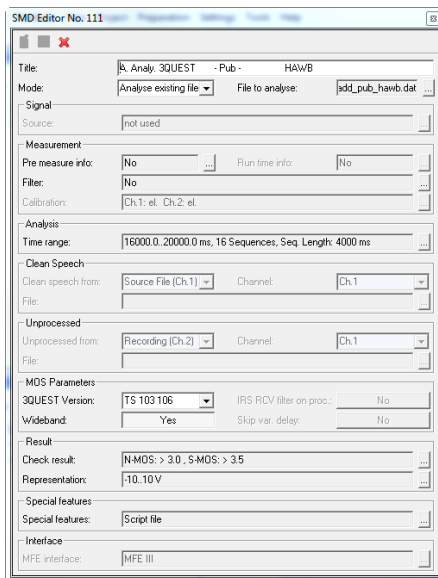
- **VZW VoLTE (Code 60023)**, as ACQUA database
- **V2C File** (for ACQUA, Version 3.2.100 or later)
- **Documentation** as PDF

## MEASUREMENTS

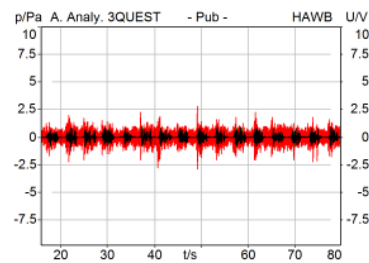
The following list gives an overview of the measurements included in VZW VoLTE test suite (numbering according to standard):

	Handset	Handheld	Hands-Free	Electrical Interface
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SMD Title					SMD Type
TC_01 Basic Codec Functionality				•	POLQA
TC_02 Additional Codec Functionality				•	POLQA
TC_03 / TC_13 Frequency Response SND	•	•			Frequency response
TC_04 / TC_14 Frequency Response RCV	•	•			Frequency response
TC_05 / TC_15A Loudness Rating SND	•	•			Loudness rating
TC_06 / TC_15B Loudness Rating RCV	•	•			Loudness rating
TC_07 / TC_16 Acoustic Echo Control	•	•			Echo loss
TC_08 Distortion SND	•				Distortion (sinusoidal)
TC_09 Distortion RCV	•				Distortion (sinusoidal)
TC_10 Idle Channel Noise SND	•				Noise
TC_11 Idle Channel Noise RCV	•				Noise
TC_12 / TC_17 Noise Reduction	•	•			3QUEST

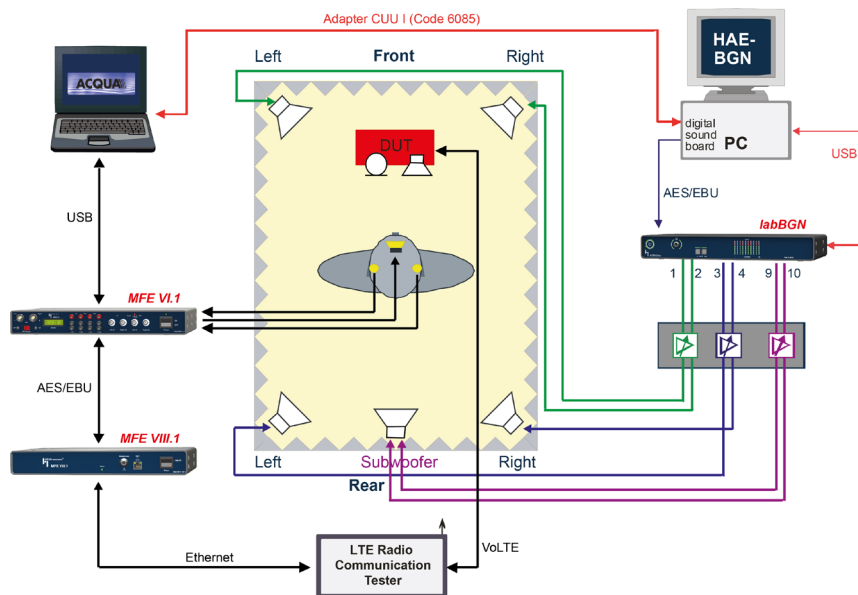


A. Analy. 3QUEST - Pub - HAWB



Time range: 16,0 .. 20,0 s	
G-MOS (TS 103 106)	3,6
N-MOS (TS 103 106)	4,8
S-MOS (TS 103 106)	3,4
SNR Unprocessed	1,82 dB
SNR Processed	49,65 dB
Delta SNR	47,83 dB
Delay Processed vs. Unprocessed	302,7 ms
Delay Processed vs. Clean	305,0 ms

Example of VZW VoLTE SMD (3QUEST) in communication analysis system ACQUA (left screenshot) and an excerpt from measurement report



Measurement test setup with ACQUA, MFE VI.1, MFE VIII.1, HAE-BGN, labBGN and LTE Radio Communication Tester.

**Note:** Due to legal restrictions the standard is only available after prior consultation with HEAD acoustics. For further information please contact the HEAD acoustics Telecom Sales Team.

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