NI LTE Toolkit Specifications

Version 2.0

This document lists specifications for the NI LTE Toolkit.

Maximum specifications are derived under the following conditions:

- Switched off for at least 2 hours before switching on
- 30 minutes warm-up time
- Synchronize the analyzer clock to the generator clock
- Calibration cycle maintained
- Chassis fan speed set to High
- Slot blockers on all unused slots
- NI-RFSA version 2.4 or later used
- NI-RFSA instrument driver self-calibration performed after instrument temperature is stable
- NI 5601 module revision G or later

Maximum specifications describe the warranted, traceable product performance over ambient temperature ranges of 0 °C to 55 °C, unless otherwise noted.

Typical values describe useful product performance beyond specifications that are not covered by warranty and do not include guard bands for measurement uncertainty or drift. Typical values may not be verified on all units shipped from the factory. Unless otherwise noted, typical values cover the expected performance of units over ambient temperature ranges of 23 °C ±5 °C with a 90% confidence level, based on measurements taken during development or production.

All the specifications listed in this document indicate maximum specifications.

These specifications are representative and cannot be guaranteed for different frame configurations. In addition, these specifications cannot be guaranteed on all units shipped from the factory.

Specifications are subject to change without notice. For the most recent toolkit specifications, visit `ni.com/manuals`.

NATIONAL INSTRUMENTS

Generation

Frequency range (NI PXIe-5673E).....85 MHz to 6.6 GHz

Absolute amplitude accuracy.....Refer to the *NI PXIe-5673E Specifications*

Amplitude resolution .....Refer to the *NI PXIe-5673E Specifications*

The generation specifications for the uplink signal were derived using the following configuration:

- Carrier frequency: 1.9 GHz, 2.3 GHz, 3.5 GHz
- Duplex mode: UL Only (TDD)
- Signal configuration: Fully Filled PUSCH
- Signal bandwidth: 5 MHz, 10 MHz, 20 MHz
- Modulation scheme: 64-QAM
- Cyclic prefix: Normal
- Auto headroom enabled: TRUE
- Oversampling factor: 1
- Payload data type: PN Sequence
- Payload PN order: 31

Residual RMS EVM

When auto headroom is enabled, the residual RMS EVM specifications for the NI PXIe-5673 are as follows:

Bandwidth (MHz)	Power Level (dBm)	Residual RMS EVM (Typical)		Residual RMS EVM (Maximum)	
		%	dB	%	dB
5	–10	0.45	–47.0	0.56	–45.0
	–20	0.49	–46.3	0.66	–43.6
10	–10	0.45	–46.8	0.62	–44.1
	–20	0.52	–45.6	0.61	–44.3
20	–10	0.50	–46.1	0.61	–44.4
	–20	0.61	–44.3	0.68	–43.4

Analysis

Frequency range
NI PXIe-5663/5663E ..... 10 MHz to 6.6 GHz

ISM band ..... Supported by
NI PXIe-5663/5663E

Maximum IF bandwidth
NI PXIe-5663/5663E ..... 50 MHz

Frequency measurement accuracy ..... Refer to the
NI PXIe-5663 Specifications
or *NI PXIe-5663E Specifications*

Power measurement accuracy ..... Refer to the
NI PXIe-5663 Specifications
or *NI PXIe-5663E Specifications*

The analysis specifications for the uplink signal were derived using the following configuration:

- Carrier frequency: 1.9 GHz, 2.3 GHz, 3.5 GHZ
- Duplex mode: UL Only (TDD)
- Signal configuration: Fully Filled PUSCH
- Signal bandwidth: 5 MHz, 10 MHz, 20 MHz
- Modulation scheme: 64-QAM
- Cyclic prefix: Normal
- Auto headroom enabled: TRUE
- Oversampling factor: 1
- Payload data type: PN Sequence
- Payload PN order: 31

ACLR

The adjacent channel leakage ratio (ACLR) dynamic range is derived by varying both the average signal power and reference level to minimize the E-UTRA ACLR[1]. The auto level mode was disabled, and the reference level was varied in steps of 1 dB from the peak power of the input signal to 10 dB below the peak power of the input signal.

[1] The measurement procedure for E-UTRA ACLR is specified in section 6.6.2.3 of the *3GPP TS 36.521 v8.5.0* specifications.

The ACLR specifications for the NI PXIe-5663 are as follows:

Note The ACLR dynamic range specified includes noise floor of the NI PXIe-5663. The ACLR dynamic range value specified in the table is the ACLR of the first offset branch.

Bandwidth (MHz)	Power Level (dBm)	RFSA Reference Level (dBm)	ACLR Dynamic Range (dB)
5	–7	–5	–56.5
10	–7	–5	–51.3
20	–7	–5	–51.5

Residual RMS EVM

When auto headroom is enabled, the residual RMS EVM specifications for the NI PXIe-5663E are as follows:

Bandwidth (MHz)	Power Level (dBm)	Residual RMS EVM (Typical)		Residual RMS EVM (Maximum)	
		%	dB	%	dB
5	–10	0.45	–47.0	0.56	–45.0
	–20	0.49	–46.3	0.66	–43.6
10	–10	0.45	–46.8	0.62	–44.1
	–20	0.52	–45.6	0.61	–44.3
20	–10	0.50	–46.1	0.61	–44.4
	–20	0.61	–44.3	0.68	–43.4