

Agenda Item: 8.7
Source: Ericsson
Title: Acceptable uncertainty of measurement equipment for 25.141
Document for: Approval

1. Introduction

Chapter 4.1 in TS 25.141 [1] gives a definition of acceptable uncertainty of measurement equipment, but does not yet define the acceptable uncertainties. Also some information is duplicated and some other needs to be added. This contribution proposes acceptable uncertainties and changes of the present text.

2. Comments on the “Acceptable uncertainty of measurement equipment”

a.

The sentence “Compliance with the requirement is determined by comparing the measured value (or derived value from the measured one) with the specified limit, without making allowance for measurement uncertainty” describe the interpretation of the measurement result. The first paragraph in chapter 4.2 “Interpretation of the measurement results” has the same meaning and therefore this sentence is proposed to be deleted.

b.

In the sentence “. The measurement equipment shall enable the stimulus signals in the test case to be adjusted to within the specified tolerance” information about the measurement uncertainty is missing. See proposed change in the next chapter.

c.

In order to avoid miss understanding it is good to define the confidence level of the maximum uncertainties.

d.

Acceptable uncertainties are not yet defined in [1]. See proposed maximum uncertainties in the next chapter.

3. Text proposal

4.1 Acceptable uncertainty of measurement equipment

The maximum acceptable uncertainty of measurement equipment is specified separately for each test, where appropriate. The measurement equipment shall enable the stimulus signals in the test case to be adjusted to within the specified tolerance, and the conformance requirement to be measured with an uncertainty not exceeding the specified values. ~~Compliance with the requirement is determined by comparing the measured value (or derived value from the measured one) with the specified limit, without making allowance for measurement uncertainty.~~ All tolerances and uncertainties are absolute values, and are valid for a confidence level of 95 %, unless otherwise stated.

Subclause x.x, Test environments:

Pressure	± 5 kPa
Temperature	± 2 degrees
Relative Humidity	± 5 %
DC Voltage	± 1.0 %
AC Voltage	± 1.5 %
Vibration	10 %
Vibration frequency	0.1 Hz

Transmitter

Subclause x.x, Base station output power:

Base station maximum output power	$\pm[0.5]$ dB
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Subclause x.x, Frequency stability:

Carrier frequency	$\pm[10]$ Hz
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Subclause x.x, Inner loop power control in the downlink:

Transmitter power control step (relative 1 dB step)	$\pm[0.3]$ dB
Transmitter average power control step (relative 10 * 1 dB steps)	$\pm[0.5]$ dB

NOTE: Code domain power

Subclause x.x, Power control dynamic range:

Maximum and minimum power	$\pm[0.8]$ dB
Power control dynamic range (at 25 dB relative power)	$\pm[0.5]$ dB

NOTE: Code domain power

Subclause x.x, Total power dynamic range:

Total power	$\pm[0.5]$ dB
Total power dynamic range (at 18 dB relative power)	$\pm[0.3]$ dB

Subclause x.x, Primary CPICH power:

CPICH power $\pm[0.8]$ dB

NOTE: Code domain power

Subclause x.x, Occupied bandwidth:

Occupied channel bandwidth $\pm[]$ kHz

Subclause x.x, Spectrum emission mask:

Emission power:

Frequency offset Δf	Conformance requirement power level	Uncertainty
$2.5 \leq \Delta f < 2.7$ MHz	≥ -22 dBm	$\pm[1.5]$ dB
$2.7 \leq \Delta f < 3.5$ MHz	≥ -34 dBm	$\pm[1.5]$ dB
$3.5 \leq \Delta f < 7.5$ MHz	≥ -36 dBm	$\pm[1.5]$ dB
$7.5 \leq \Delta f \leq \Delta f_{\max}$ MHz	≥ -40 dBm	$\pm[1.5]$ dB

Subclause x.x, Adjacent Channel Leakage power Ratio (ACLR):

ACLR ± 5 MHz (Relative carrier power) $\pm[0.8]$ dB

ACLR ± 10 MHz (Relative carrier power) $\pm[0.8]$ dB

Subclause x.x, Protection outside a licensee's frequency block:

Emission power $\pm[1.5]$ dB

Subclause x.x, Spurious emissions

Conformance requirement in BS and coexistence receive bands:

Emission power $\pm[2.0]$ dB

Conformance requirements outside BS and coexistence receive bands:

Emission power:

$f \leq 2.2$ GHz ± 1.5 dB

2.2 GHz $< f \leq 4$ GHz ± 2.0 dB

$f > 4$ GHz ± 4.0 dB

Subclause x.x, Transmit intermodulation:

Interference signal power relative the carrier power $\pm [1.0]$ dB

Intermodulation power $\pm [1.5]$ dB

Subclause x.x, Modulation Accuracy:

Modulation accuracy (EVM) $\pm [2.5]$ % RMS

Subclause x.x, Peak code Domain error:

Peak code domain error \pm [] dB

Receiver

Subclause x.x, Reference sensitivity level:

Test signal power \pm [0.8] dB

Subclause x.x, Dynamic range:

Test signal power \pm [0.8] dB
AWGN signal power \pm [1.0] dB

Subclause x.x, Adjacent Channel Selectivity (ACS):

Test signal power \pm [0.8] dB
Interfering signal power (Relative to the test signal) \pm [0.8] dB

Subclause x.x, Blocking characteristics:

Test signal power \pm [0.8] dB
Interfering signal power:
 $f \leq 2.2$ GHz \pm 0.7 dB
 2.2 GHz $< f \leq 4$ GHz \pm 1.5 dB
 $f > 4$ GHz \pm 3.0 dB

Subclause x.x, Intermodulation characteristics:

Test signal power \pm [0.8] dB
Interfering signals power \pm [0.7] dB

Subclause x.x, Spurious emissions:

Emission power:
 $f \leq 2.2$ GHz \pm 1.5 dB
 2.2 GHz $< f \leq 4$ GHz \pm 2.0 dB
 $f > 4$ GHz \pm 4.0 dB

Performance requirement

Subclause x.x, Performance in AWGN channel

Test signal power \pm [] dB
Eb/I0 (relative) \pm [] dB

Subclause x.x, Performance in multipath fading channels

Test signal power \pm [] dB
Eb/I0 (relative) \pm [] dB

4. References

- [1] Base station conformance testing (FDD), TS 25.141, v2.0.2