

EMC TEST REPORT

Product Name : LTE Module

Model No. : EC25-E, EC25-E MINIPCIE

Prepared for:

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Report Number : UL32220170517RED011-3
Date of Report : 05-19-2017
Date of Test : 05-17-2017~05-18-2017

Notes:

The test results only relate to these samples which have been tested.
Partly using this report will not be admitted unless been allowed by Unilab.
Unilab is only responsible for the complete report with the reported stamp of Unilab.

Applicant: Quectel Wireless Solutions Co. Ltd .
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Manufacturer: Quectel Wireless Solutions Co. Ltd .
Room 501, Building 13, No.99 Tianzhou Road, Xuhui District,
Shanghai,China

Product Name: LTE Module

Brand Name: Quectel

Model Name: EC25-E, EC25-E MINIPCIE

EUT Voltage: Extreme Low: 3.3V
Nominal: 4.0V
Extreme High: 4.6V

Date of Receipt: 05-17-2017

Date of Test: 05-17-2017~05-18-2017

Test Standard: Draft ETSI EN301489-1 V2.2.0
Draft ETSI EN301489-52 V1.1.0

Test Result: PASS

Performed : Unilab (Shanghai) Co., Ltd.
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1. GENERAL INFORMATION

1.1 EUT DESCRIPTION

Product Name:	LTE Module
Model Name:	EC25-E, EC25-E MINIPCIE
Hardware Version:	R2.0
Software Version:	EC25EFAR02A04M4G
RF Exposure Environment:	Uncontrolled
GSM	
Support Band:	GSM 900/ DCS 1800
GPRS Class:	12
Tx Frequency Range:	GSM 900:880~915MHz DCS 1800:1710~1785MHz
Rx Frequency Range:	GSM 900:925~960MHz DCS 1800:1805 ~1880MHz
Type of modulation:	GMSK for GSM/GPRS 8PSK for EGPRS
Antenna Peak Gain:	4dBi
Antenna Type:	Connector
WCDMA	
Support Band:	WCDMA Band I / VIII
Tx Frequency Range:	WCDMA Band I:1920~1980MHz WCDMA Band VIII:880~915MHz
Rx Frequency Range:	WCDMA Band I:2110~2170MHz WCDMA Band VIII:925~960MHz
Type of modulation:	WCDMA: QPSK&16QAM&64QAM
Antenna Type:	Connector
Antenna Peak Gain:	4dBi
Operating Band	Power Class 3
LTE	
Support Band:	LTE Band 1/3/7/8/20/38/40
Tx Frequency Range:	LTE Band 1: 1920-1980MHz LTE Band 3: 1710-1785MHz LTE Band 7: 2500-2570MHz LTE Band 8: 880-915MHz LTE Band 20: 832-862MHz LTE Band 38: 2570-2620MHz LTE Band 40: 2300-2400MHz
Rx Frequency Range:	LTE Band 1: 2110-2170MHz LTE Band 3: 1805-1880MHz LTE Band 7: 2620-2690MHz LTE Band 8: 925-960MHz

	LTE Band 20: 791-821MHz LTE Band 38: 2570-2620MHz LTE Band 40: 2300-2400MHz
Type of modulation:	QPSK & 16QAM&64QAM
Antenna Type:	Connector
Antenna Peak Gain:	3.5dBi
Operating Band	Power Class 3

1.2 TEST MODE DESCRIPTION

UNILAB has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report is the worst test mode. All pre-test mode see below:

Pre-Test Mode:

Mode 1: GSM 900

The lithium battery and the charger were installed, and the MS were in charging state. A communication link was established between the MS and a System Simulator (SS). The MS operated at GSM 900MHz mid ARFCN (62) and maximum output power (level 5). The EUT configuration of the emission test was MS + Adapter.

Mode 2: DCS 1800

The lithium battery and the charger were installed, and the MS were in charging state. A communication link was established between the MS and a System Simulator (SS). The MS operated at GSM 1800MHz mid ARFCN (699) and maximum output power(level 0). The EUT configuration of the emission test was MS + Adapter.

Mode 3: GPRS 900

A communication link was established between the MS and a System Simulator (SS). During the test, the MS was operating at GPRS mode and made the data transmission function continuously. The MS operated at GSM 900MHz Mid Channel and maximum output power (level 5).

Mode 4: GPRS 1800

A communication link was established between the MS and a System Simulator (SS). During the test, the MS was operating at GPRS mode and made the data transmission function continuously. The MS operated at GSM 1800MHz Mid Channel and maximum output power(level 0).

Mode 5: EGPRS 900

During the measurement, A communication link was established between the MS and a System Simulator (SS). The MS operated at EGPRS 900MHz Mid Channel and maximum output power (level 5).

Mode6: EGPRS 1800

During the measurement, A communication link was established between the MS and a System Simulator (SS). The MS operated at EGPRS 1800MHz Mid Channel and maximum output power(level 0).

Mode 7: WCDMA Band I

During the measurement, the lithium battery and the charger were installed, and the MS were in charging state. A communication link was established between the MS and a

System Simulator (SS).
The MS operated at UMTS 2100MHz Mid Channel and maximum output power.

Mode 8: WCDMA Band VIII

During the measurement, the lithium battery and the charger were installed, and the MS were in charging state. A communication link was established between the MS and a System Simulator (SS).
The MS operated at UMTS 900MHz Mid Channel and maximum output power.

Mode 9: HSDPA Band I

A communication link was established between the MS and a System Simulator (SS) During the test, A communication link was established between the MS and a System Simulator (SS).
The MS operated at HSDPA 2100MHz Mid Channel and maximum output power.

Mode 10: HSDPA Band VIII

A communication link was established between the MS and a System Simulator (SS) During the test, A communication link was established between the MS and a System Simulator (SS).
The MS operated at HSDPA 900MHz Mid Channel and maximum output power.

Mode 11: HSUPA Band I

A communication link was established between the MS and a System Simulator (SS) During the test, A communication link was established between the MS and a System Simulator (SS).
The MS operated at HSUPA 2100MHz Mid Channel and maximum output power.

Mode 12: HSUPA Band VIII

A communication link was established between the MS and a System Simulator (SS) During the test, A communication link was established between the MS and a System Simulator (SS).
The MS operated at HSUPA 900MHz Mid Channel and maximum output power.

Mode 13: LTE Band 1

During the measurement, A communication link was established between the MS and a System Simulator (SS).
The MS operated at LTE Band 1 Mid Channel and maximum output power.

Mode 14: LTE Band 3

During the measurement, A communication link was established between the MS and a System Simulator (SS).
The MS operated at LTE Band 3 Mid Channel and maximum output power.

Mode 15: LTE Band 7

During the measurement, A communication link was established between the MS and a System Simulator (SS).
The MS operated at LTE Band 7 Mid Channel and maximum output power.

Mode 16: LTE Band 8

During the measurement, A communication link was established between the MS and a System Simulator (SS).
The MS operated at LTE Band 8 Mid Channel and maximum output power.

Mode 17: LTE Band 20

During the measurement, A communication link was established between the MS and a System Simulator (SS).
The MS operated at LTE Band 20 Mid Channel and maximum output power.

Mode 18: LTE Band 38

During the measurement, A communication link was established between the MS and a System Simulator (SS).
The MS operated at LTE Band 38 Mid Channel and maximum output power.

Mode 19: LTE Band 40

During the measurement, A communication link was established between the MS and a System Simulator (SS).
The MS operated at LTE Band 40 Mid Channel and maximum output power.

Mode 20: idle

The MS was registered to the base station simulator but no call was set up.

Final Test Mode	
EMI	Mode 1: GSM900
	Mode 2: DCS1800
	Mode 7: WCDMA Band I
	Mode 8: WCDMA Band VIII
	Mode 13: LTE Band 1
	Mode 14: LTE Band 3
	Mode 15: LTE Band 7
	Mode 16: LTE Band 8
	Mode 17: LTE Band 20
	Mode 18: LTE Band 38
	Mode 19: LTE Band 40
	Mode 20: Idle Mode
EMS	Mode 1: GSM900
	Mode 2: DCS1800
	Mode 7: WCDMA Band I
	Mode 8: WCDMA Band VIII
	Mode 13: LTE Band 1
	Mode 14: LTE Band 3
	Mode 15: LTE Band 7
	Mode 16: LTE Band 8
	Mode 17: LTE Band 20
	Mode 18: LTE Band 38
	Mode 19: LTE Band 40
	Mode 20: Idle Mode

2. TECHNIACL SUMMARY

2.1 SUMMARY OF STANDARDS AND TEST RESULTS

Test items are been completed as follows(ETSI EN 301489-1):

Phenomenon	Application	Equipment test requirement		
		fixed use	vehicular use	portable use
Radiated emission	enclosure of ancillary equipment	applicable for stand alone testing	applicable for stand alone testing	applicable for stand alone testing
Conducted emission	DC power input/output port	applicable	applicable	not applicable
	AC mains input/output port	applicable	not applicable	not applicable
	Telecommunication port	applicable	not applicable	not applicable
harmonic current emissions	AC mains input port	applicable	not applicable	not applicable
Voltage fluctuations and flicker	AC mains input port	applicable	not applicable	not applicable
RF electromagnetic Field (80-6000 MHz)	enclosure	applicable	applicable	applicable
Electrostatic discharge	enclosure	applicable	not applicable	applicable
fast transients common mode	signal, Telecommunication and control ports,	applicable	not applicable	not applicable
	DC and AC power ports	applicable	not applicable	not applicable
RF common mode 0,15 MHz to 80 MHz	Signal telecommunication and control ports	applicable	applicable	not applicable
	DC and AC power ports	applicable	applicable	not applicable
transients and surges	DC power input ports	not applicable	applicable	not applicable
voltage dips and interruptions	AC mains power input ports	applicable	not applicable	not applicable
surges, line to line and line to ground	AC mains power input ports, telecommunication ports	applicable	not applicable	not applicable

The EUT have been tested according to the applicable standards as referenced below:

EMISSION (ETSI EN 301489-1)		
Test Item	Standard	Result
Radiated disturbance	ETSI EN 301489-1 & EN 55032	N/A ^{1&2}
Conducted disturbance	ETSI EN 301489-1 & EN 55032	N/A ³
Harmonic current emission	ETSI EN 301489-1 & EN 61000-3-2	N/A ³
Voltage fluctuations and flicker	ETSI EN 301489-1 & EN 61000-3-3	N/A ³

IMMUNITY (ETSI EN 301489-1 & ETSI EN 301489-52)		
Test Item	Standard	Result
Radio-frequency electromagnetic field Immunity	ETSI EN 301489-1 & ETSI EN 301489-52 & EN 61000-4-3	P ⁴
Electrostatic discharge (ESD)	ETSI EN 301489-1 & ETSI EN 301489-52 & EN 61000-4-2	P
Electrical fast transients (EFT)	ETSI EN 301489-1 & ETSI EN 301489-52 & EN 61000-4-4	N/A ³
Radio-frequency common mode	ETSI EN 301489-1 & ETSI EN 301489-52 & EN 61000-4-6	N/A ³
Transients and surges	ETSI EN 301489-1 & ETSI EN 301489-52 & ISO 7637-2	N/A ⁵
Voltage dips and interruptions	ETSI EN 301489-1 & ETSI EN 301489-52 & EN 61000-4-11	N/A ³
Surges	ETSI EN 301489-1 & ETSI EN 301489-52 & EN 61000-4-5	N/A ³

Note 1: P means pass, F means failure, N/A means not applicable.

Note 2: This EUT is a radio host dependent module which is not stand alone ancillary. The test is not applicable for this equipment.

Note 3: This EUT is just a radio dependent module without any AC port, DC port and network port or Tele communication port, So these tests are not applicable for this EUT.

Note 4: EUT does not support audio/speech function, so Unilab monitor the "BER" when test data transfer mode.

Note 5: This EUT is just a radio dependent module which is not used in a vehicular environment. So this test is not applicable for this EUT.

2.2 TEST UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted disturbance	3.4
Radiated disturbance	4.2

2.3 TEST EQUIPMENT LIST

Shielding Room No. 2 - ESD Test (IEC 61000-4-2)				
Equipment	Manufacturer	Model	Serial No.	Due Date
ESD Simulator	SANKI	SKS-0230GV	020615003J321	06/24/2017

3M Full-anechoic Chamber - RF electromagnetic field Immunity Test (IEC 61000-4-3)				
Equipment	Manufacturer	Model	Serial No.	Due Date
Power Meter	R&S	NRVD	101457	11/02/2017
Signal generators	R&S	SMR20	101440	11/02/2017
Power Amplifier	B&K	BLWA	056186-01	07/17/2017
VHF/UHF EMS Antenna	SCHWARZBECK	HL046E	100008	10/12/2017
Universal Radio Communication Tester	R&S	CMU200	122449	10/29/2017
Broadband High Gain Horn Antenna	SCHWARZBECK	BBHA9120J	00008	09/08/2017
Power Amplifier	R&S	BBA 150 D400E200	101622	11/26/2017

NOTE: The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and has been calibrated by accredited calibration laboratories.

2.4 SUPPORT EQUIPMENT

Equipment	Manufacturer	Model	Serial No.	Due Date
Radio Communication Tester	R&S	CMW500	GB46581718	11/07/2017
Horn Antenna	SCHWARZBECK	BBHA9120D	943	09/08/2018

2.5 TEST FACILITY

The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards. The laboratory is compliance with the requirements of the ISO/IEC/EN 17025.

2.6 IMMUNITY PERFORMANCE CRITERIA

General Requirements (ETSI EN 301489-1):

The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests. For the purpose of the present document four categories of performance criteria apply:

- performance criteria for continuous phenomena applied to transmitters;
- performance criteria for transient phenomena applied to transmitters;
- performance criteria for continuous phenomena applied to receivers;
- performance criteria for transient phenomena applied to receivers.

Normally, the performance criteria depend on the type of radio equipment. Thus, the present document only contains general performance criteria commonly used for the assessment of radio equipment. More specific and product-related performance criteria for a dedicated type of radio equipment may be found in the part of EN 301 489 series [i.13] dealing with the particular type of radio equipment.

(1) Performance criteria for continuous phenomena applied to transmitters and receivers

If no further details are given in the relevant part of EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for continuous phenomena shall apply. During and after the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. During the test the EUT shall not unintentionally transmit or change its actual operating state and stored data. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

(2) Performance criteria for transient phenomena applied to transmitters and receivers

If no further details are given in the relevant part of EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for transient phenomena shall apply. After the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. During the EMC exposure to an electromagnetic phenomenon, a degradation of performance is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

(3) Performance criteria for equipment which does not provide a continuous communication link

For radio equipment which does not provide a continuous communication link, the performance criteria described in clauses 6.1 and 6.2 are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation. The related specifications set out in clause 5.3 have also to be taken into account. The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in clauses 6.1 and 6.2.

(4) Performance criteria for ancillary equipment tested on a stand alone basis

If ancillary equipment is intended to be tested on a stand alone basis, the performance criteria described in clauses 6.1 and 6.2 are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation. The related specifications set out in clause 5.3 have also to be taken into account. The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in clauses 6.1 and 6.2.

General Requirements (ETSI EN 301489-52):

The maintenance of a communications link shall be assessed by using an indicator, which may be part of the test system or the equipment under test.

If an equipment is of a specialized nature, that the performance criteria described in the following clauses are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after testing, as required by the present document.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in the following clauses.

In addition, the test shall also be performed in idle mode to ensure the transmitter does not unintentionally operate.

The requirements apply to all types of UTRA and E-UTRA (FDD or TDD) for the UE.

(1) Performance criteria for continuous phenomena

A communication link shall be established at the start of the test, and maintained during the test, clauses 4.1 and 4.2.

In the speech mode, the performance criteria shall be that the Up Link and Down Link speech output levels shall be at least 35 dB less than the recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (annex B).

NOTE: When there is a high level of background audio noise present, the filter bandwidth can be reduced down to a minimum of 40 Hz.

At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained.

In addition to confirming the above performance in traffic mode, the test shall be performed in idle mode, and the transmitter shall not unintentionally operate.

(1.1) UTRA

In the data transfer mode, the performance criteria can be one of the following:

- if the BER (as referred in TS 134 109 [8]) is used, it shall not exceed 0,001 during the test sequence;
- if the BLER (as referred in TS 134 109 [8]) is used, it shall not exceed 0,01 during the test sequence.

The BLER calculation shall be based on evaluating the CRC on each transport block.

(1.2) E-UTRA

In the data transfer mode, the performance criteria shall be that the throughput shall be ≥ 95 % of the maximum throughput of the reference measurement channel as specified in annex C in TS 136 101 [13] with parameters specified in tables 7.3.1-1 and 7.3.1-2 in TS 136 101 [13] during the test sequence.

(2) Performance criteria for Transient phenomena

A communications link shall be established at the start of the test, clauses 4.1 and 4.2.

At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.

At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

In addition to confirming the above performance in traffic mode, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

Special conditions for EMC immunity tests

Reference to clauses in EN 301 489-1 [1]	Special product-related conditions, additional to or modifying the test conditions in EN 301 489-1 [1], clause 9
9.2 Radio frequency electromagnetic field 9.2.2 Test method;	When using the max hold detector method (see annex B) at each test frequency step initially an unmodulated test signal shall be applied. Then the test modulation shall be applied.
9.5 Radio frequency, common mode 9.5.2 Test method	There is no exclusion band for the equipment in the scope of the present document. when using the max hold detector method (see annex B) at each test frequency step initially an unmodulated test signal shall be applied. Then the test modulation shall be applied. The procedure used for identifying narrowband responses does not apply to conducted immunity tests in the frequency range 150 kHz to 80 MHz (see clause 4.4).
9.6.3 Performance criteria	During tests with pulses 3a and 3b, the performance criteria TT shall apply, see clause 6.2.

2.7 TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

Notes:

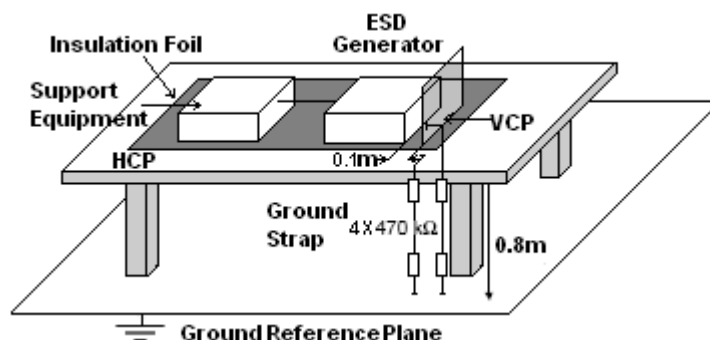
1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. ELECTROSTATIC DISCHARGE (ESD)

3.1 TEST SPECIFICATION

Basic Standard	: EN 61000-4-2
Test Port	: Enclosure port
Discharge Impedance	: 330 ohm / 150 pF
Discharge Mode	: Single Discharge
Discharge Period	: one second between each discharge

3.2 TEST SETUP



3.3 TEST PROCEDURE

The test applied a non-conductive surface and a horizontal coupling plane on a wooden table, 0.8 m high, standing on the reference ground plane, which is a 3 m x 4 m metallic sheet with 1.5 mm thickness. This reference ground plane projected beyond the EUT by at least 0.5 m on all sides and the minimum distance between the EUT and all other conductive structure, except the ground plane beneath the EUT, was more than 1.0 m.

ESD shall be applied only to those points and surfaces of the EUT which are expected to be touched during usual operation, including user access, as specified in the user manual.

The discharges shall be applied in the following:

A. Contact discharge (Tests shall be performed at a maximum repetition rate of one discharge per second.):

a. Direct discharge:

The tip of the discharge electrode should touch the EUT, before the discharge switch was operated. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points (a minimum of 50 discharges at each point). One of the test points shall be subjected to at least 50 indirect discharges (contact) to the center of the front edge of the horizontal coupling plane. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode (use of the Vertical Coupling Plane)

b. Indirect discharge:

b1. Horizontal Coupling Plane (HCP): More than 50 single discharges were applied at the front edge of each HCP opposite the center point of the EUT and 0.1m from vertically the front of the EUT. Discharge to the HCP was made horizontal to the edge of the HCP.

b2. Vertical Coupling Plane (VCP): More than 50 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5 m x 0.5 m, was placed parallel to, and positioned at a distance of 0. m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that all sides of the EUT were completely illuminated.

B. Air discharge at slots and apertures, and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the ESD simulator (discharge electrode) was removed from the EUT. The simulator was then re-triggered for a new single discharge and applies more than 10 times on each reselected point. This procedure was repeated until the air discharge completed.

3.4 RESULTS & PERFORMANCE

Discharge point:



EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 1&2&7&8&13&14&15&16&17&18&19&20	Humidity	: 52%

Contact discharge					
Test location	Test level (±kV)	Minimum number of discharge per polarity (each location)	Required Criterion	Performance Criterion	Result
1	2,4	10	TT/TR	TT/TR	Pass

Contact discharge (HCP)					
Test location	Test level (±kV)	Minimum number of discharge per polarity (each location)	Required Criterion	Performance Criterion	Result
Front	2,4	25	TT/TR	TT/TR	Pass
Rear	2,4	25	TT/TR	TT/TR	Pass
Left	2,4	25	TT/TR	TT/TR	Pass
Right	2,4	25	TT/TR	TT/TR	Pass

Contact discharge (VCP)					
Test location	Test level (±kV)	Minimum number of discharge per polarity (each location)	Required Level	Performance Criterion	Result
Front	2,4	25	TT/TR	TT/TR	Pass
Rear	2,4	25	TT/TR	TT/TR	Pass
Left	2,4	25	TT/TR	TT/TR	Pass
Right	2,4	25	TT/TR	TT/TR	Pass

3.5 ADDITIONAL RESULT INFORMATION

No observable change for EUT during the test and after test, and the following Performance criteria be conformed:

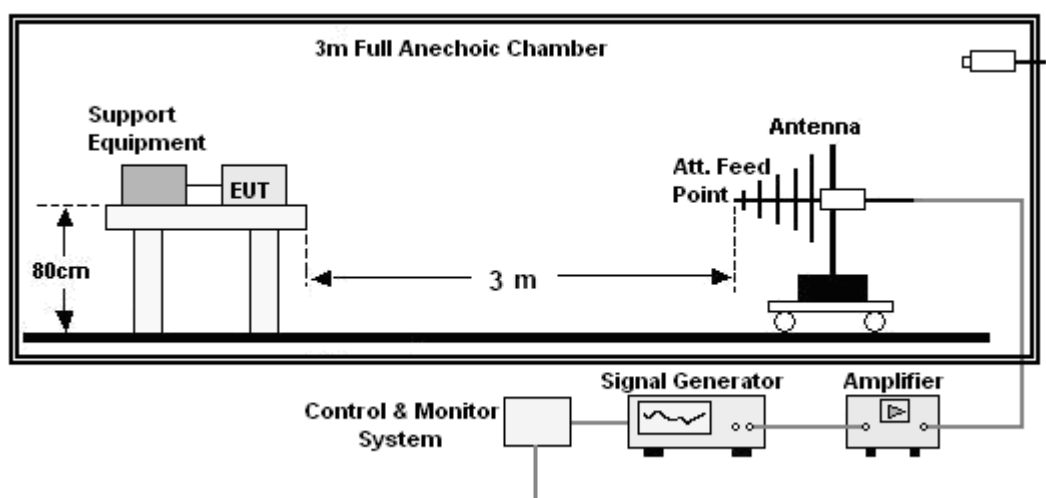
- The EUT operate with no user noticeable loss of the communication link each exposure.
- The total test comprising the series of individual exposures, and operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link have been maintained
- The transmitter did not unintentionally operate at the idle mode.

4. RF ELECTROMAGNETIC FIELD IMMUNITY

4.1 TEST SPECIFICATION

Basic Standard	: EN 61000-4-3
Test Port	: Enclosure port
Step Size	: 1%
Modulation	: 1kHz, 80% AM
Dwell Time	: 1 second
Polarization	: Horizontal & Vertical

4.2 TEST SETUP



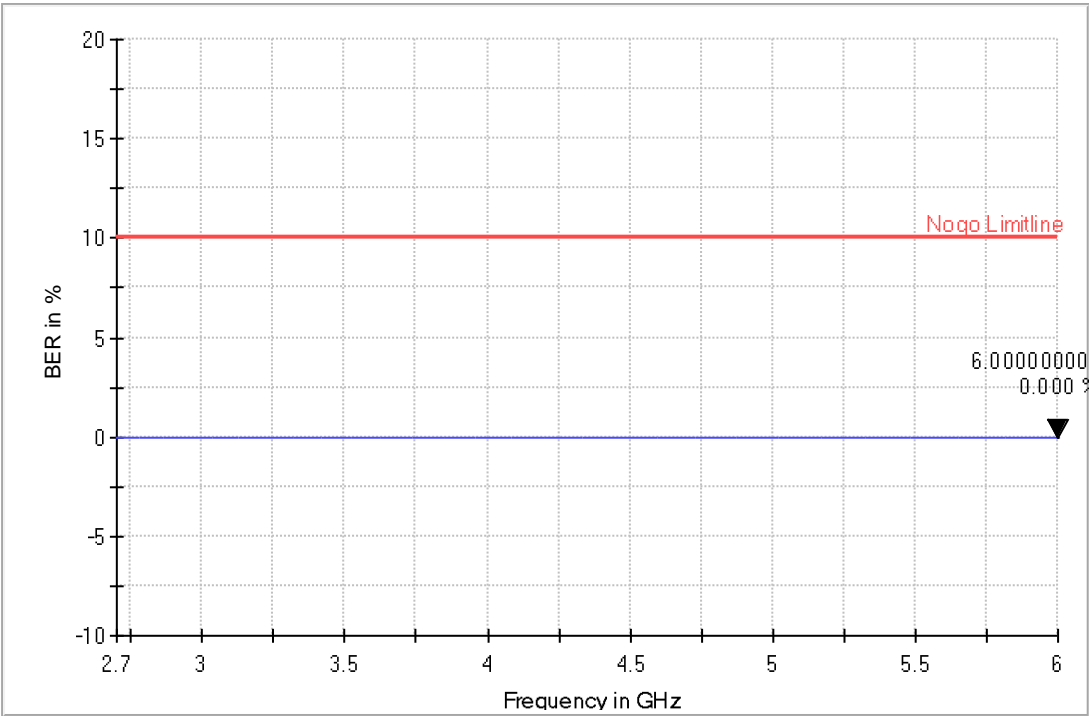
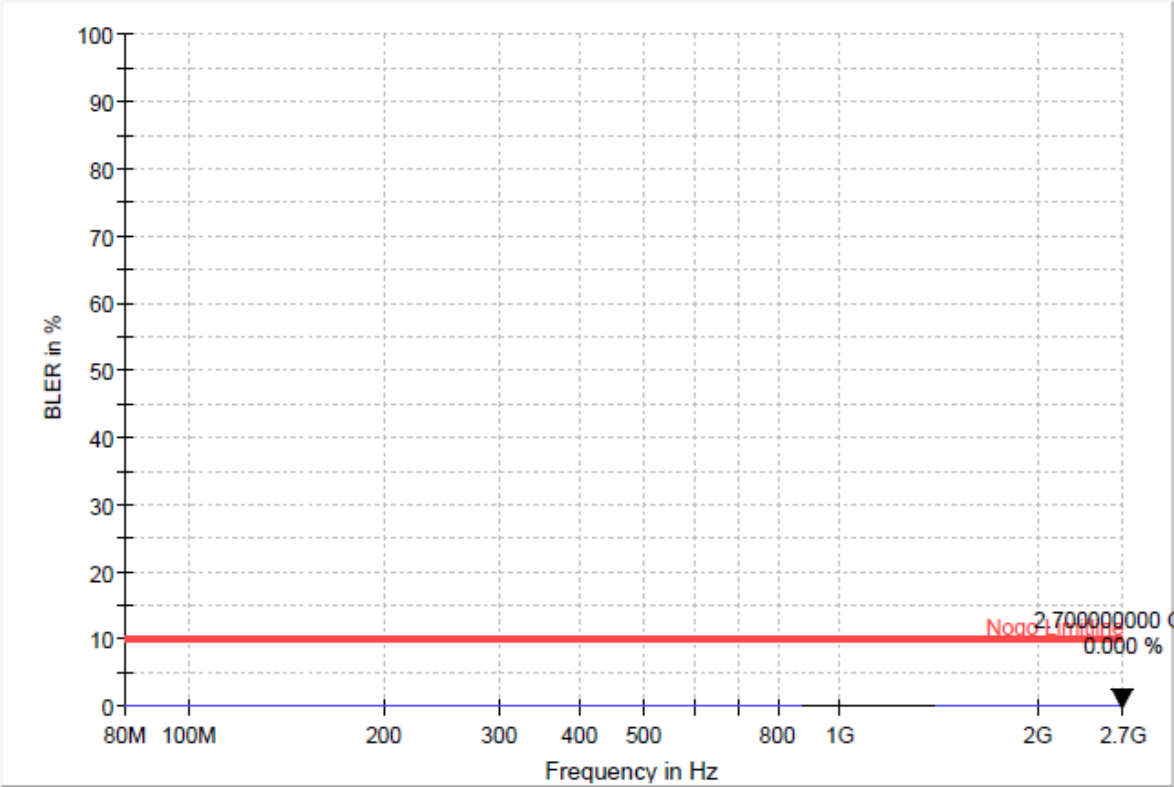
4.3 TEST PROCEDURE

- The EUT and support equipment were placed on the non-conductive table 0.8m above the ground plane at a fully-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT and support equipment.
- The frequency range is swept from 80MHz to 6000MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1%. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each side. A CCD camera was put inside the chamber and through its display to monitor the operational situation of the EUT to judge the EUT performance criterion during test.

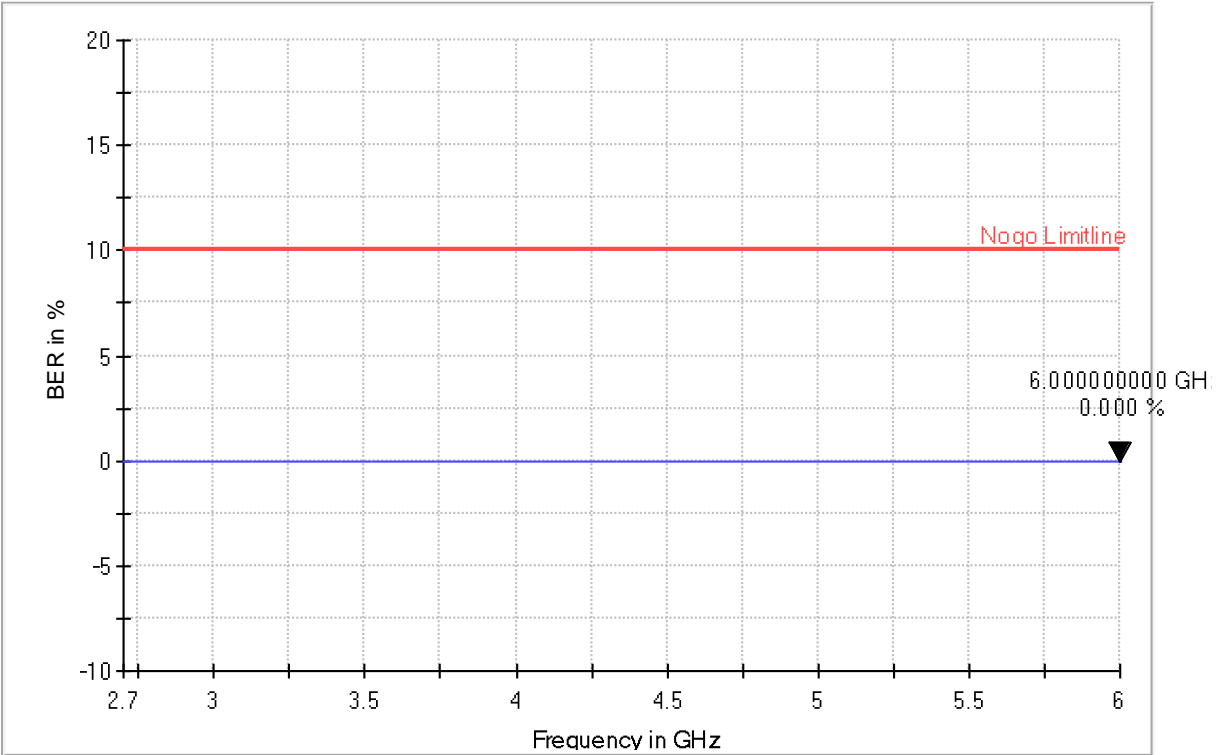
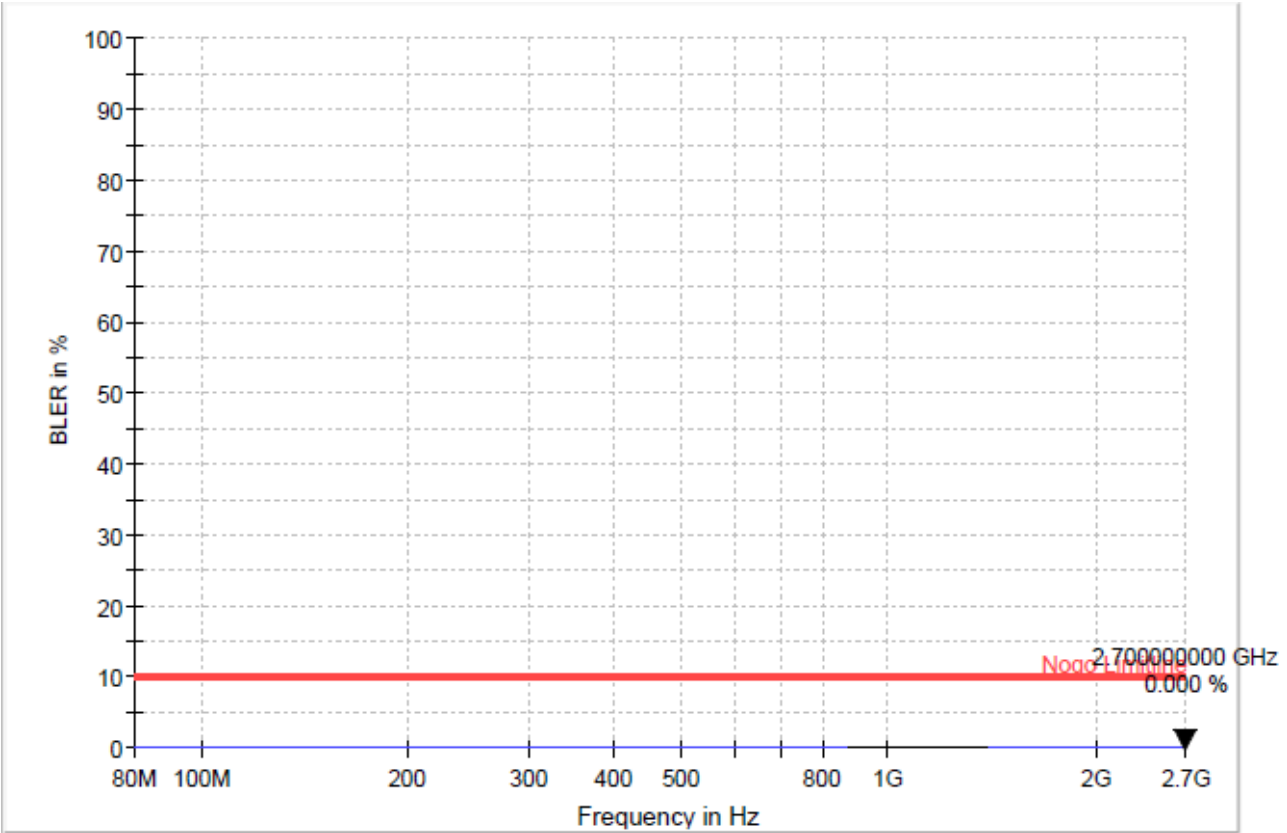
4.4 RESULTS & PERFORMANCE

EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 1	Humidity	: 52%

Horizontal

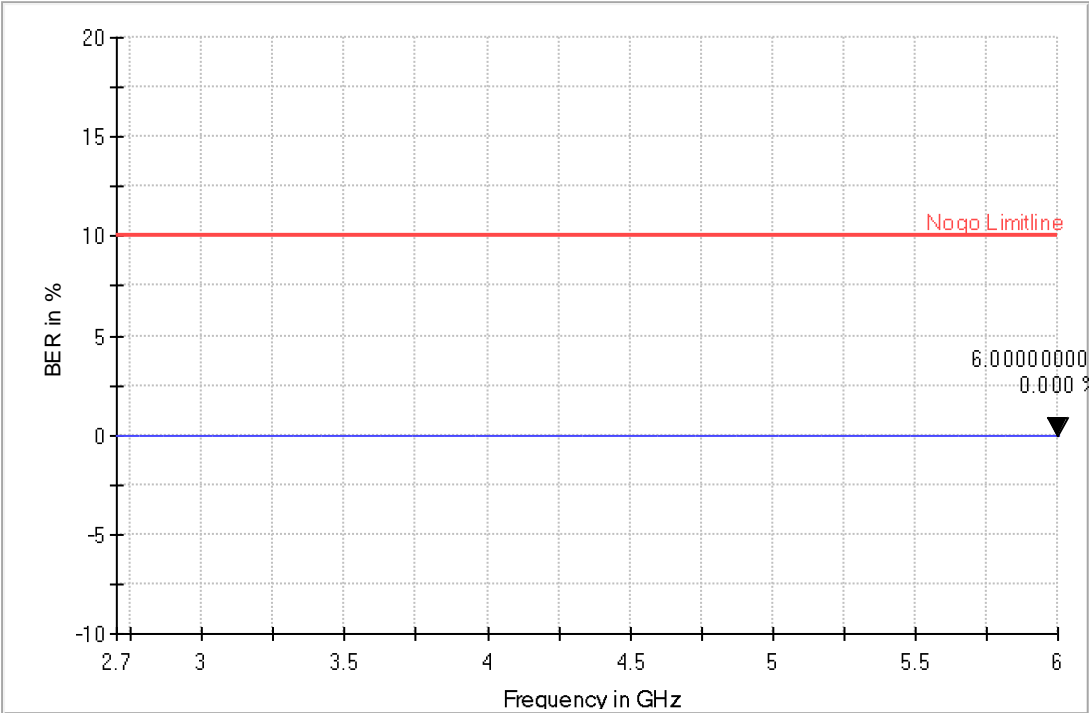
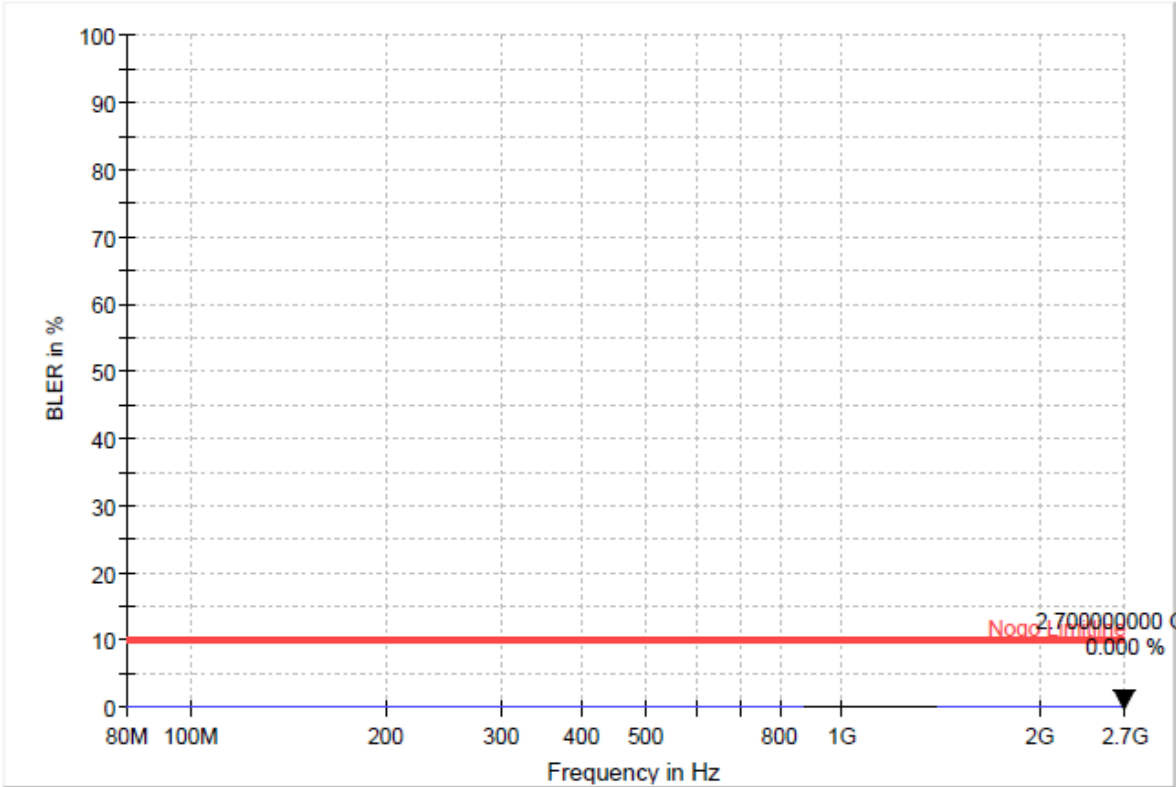


Vertical

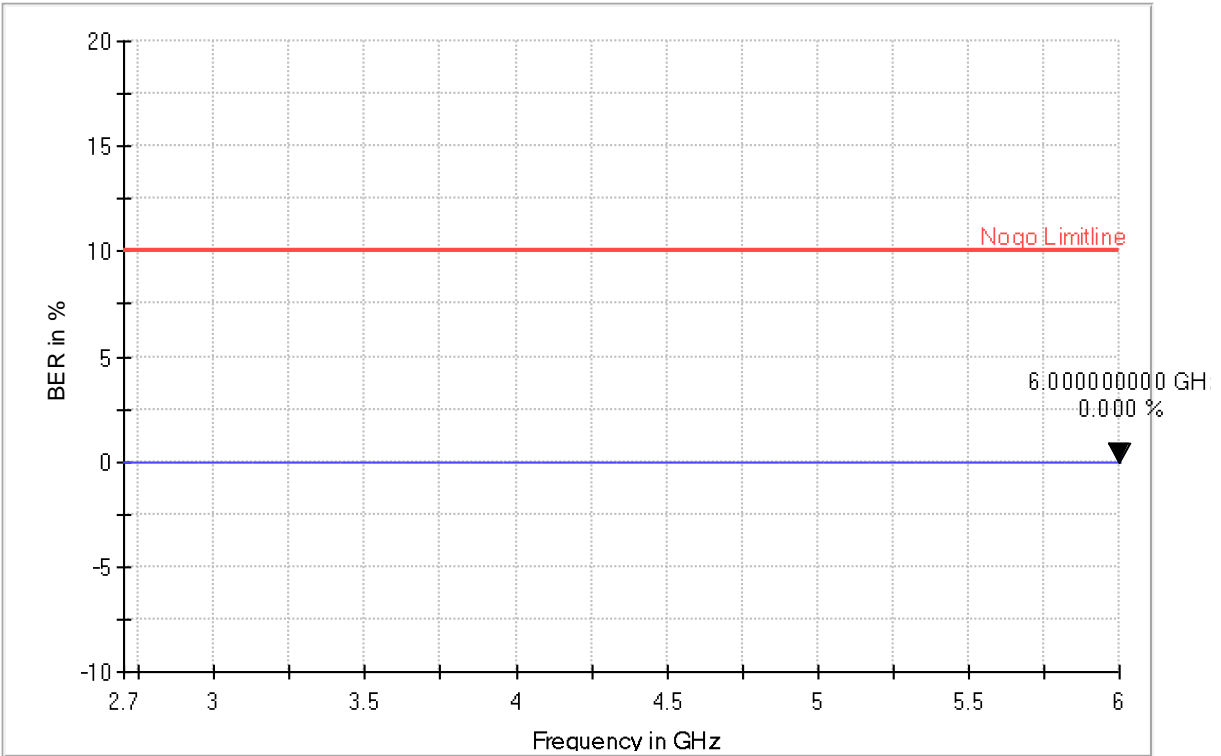
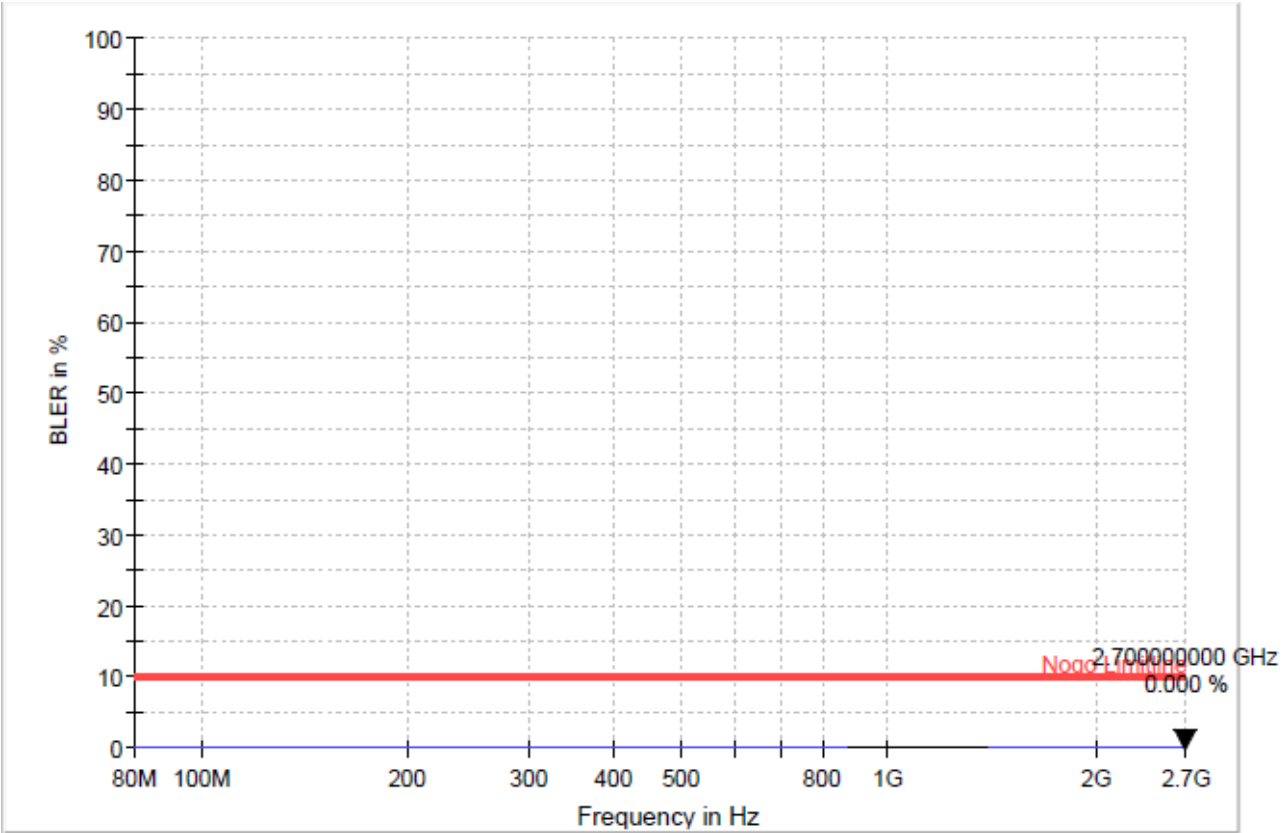


EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 2	Humidity	: 52%

Horizontal

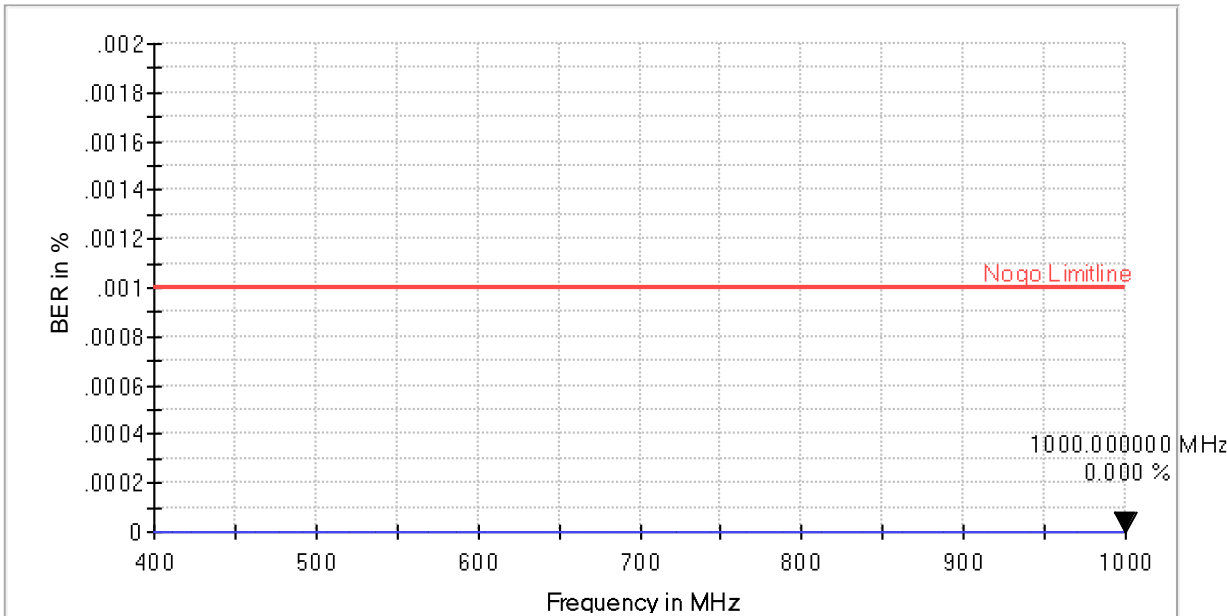
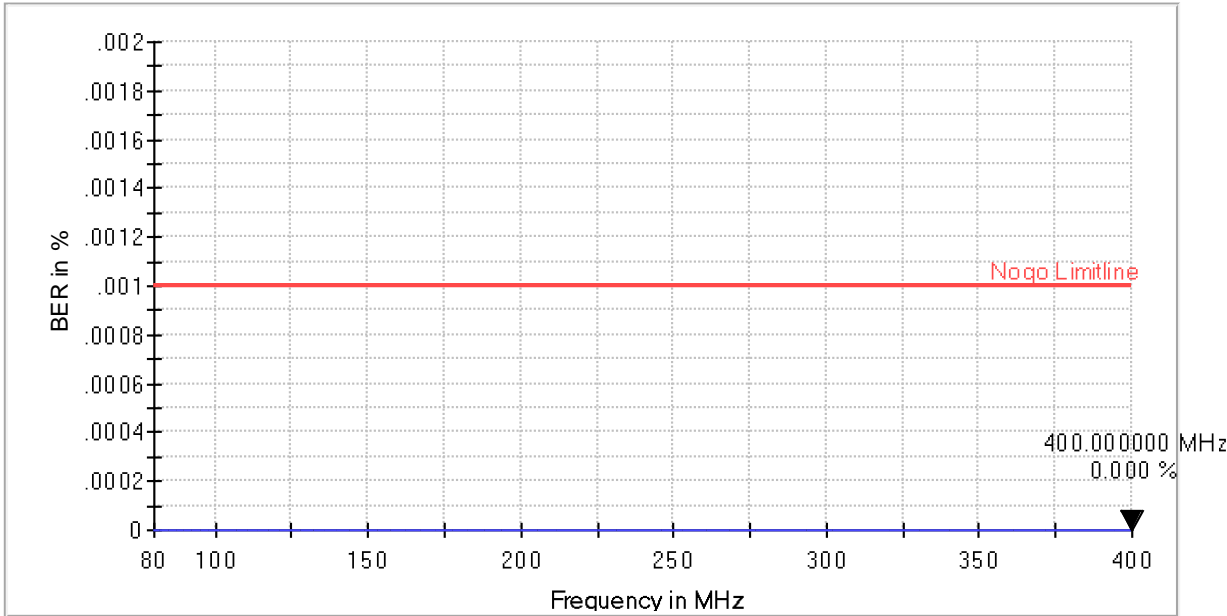


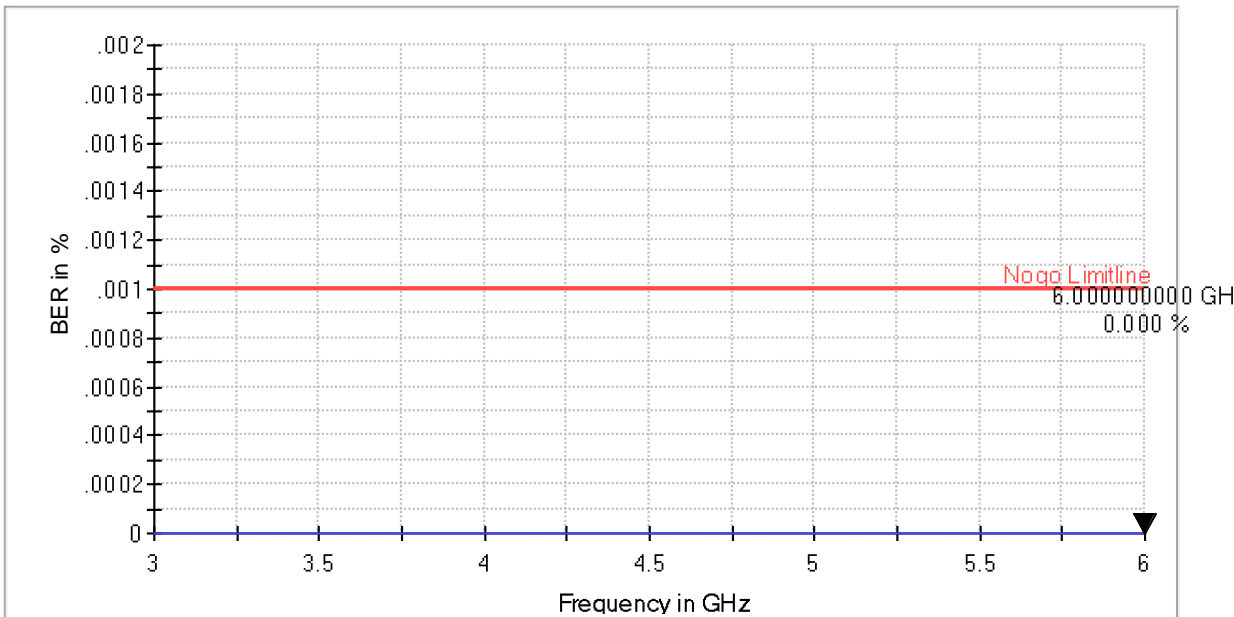
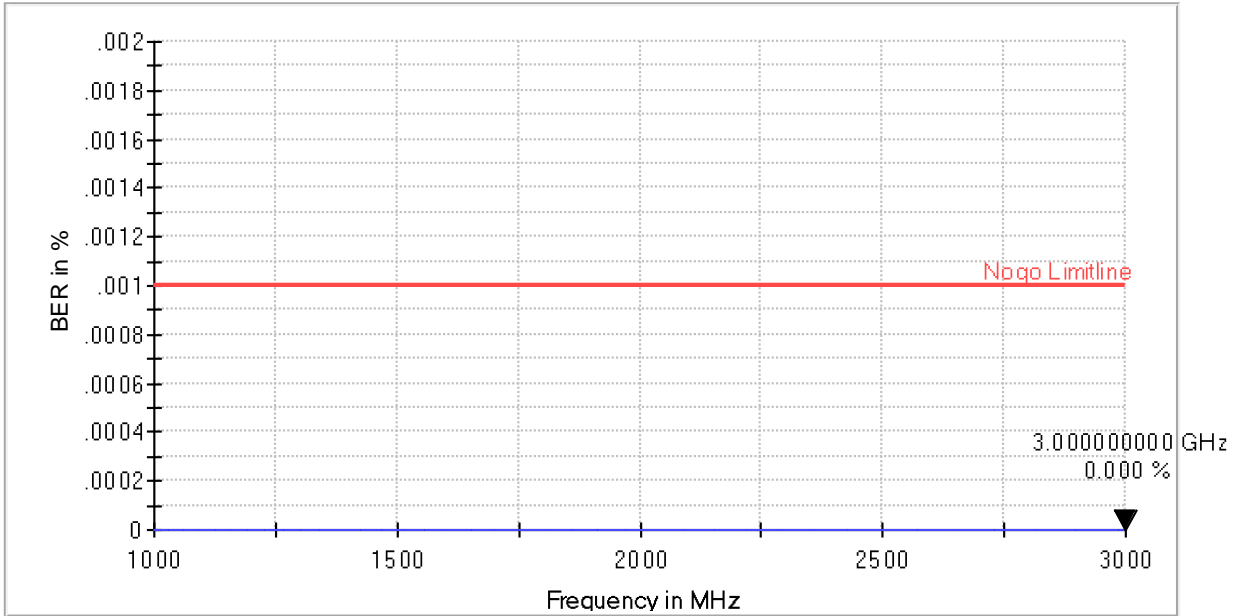
Vertical



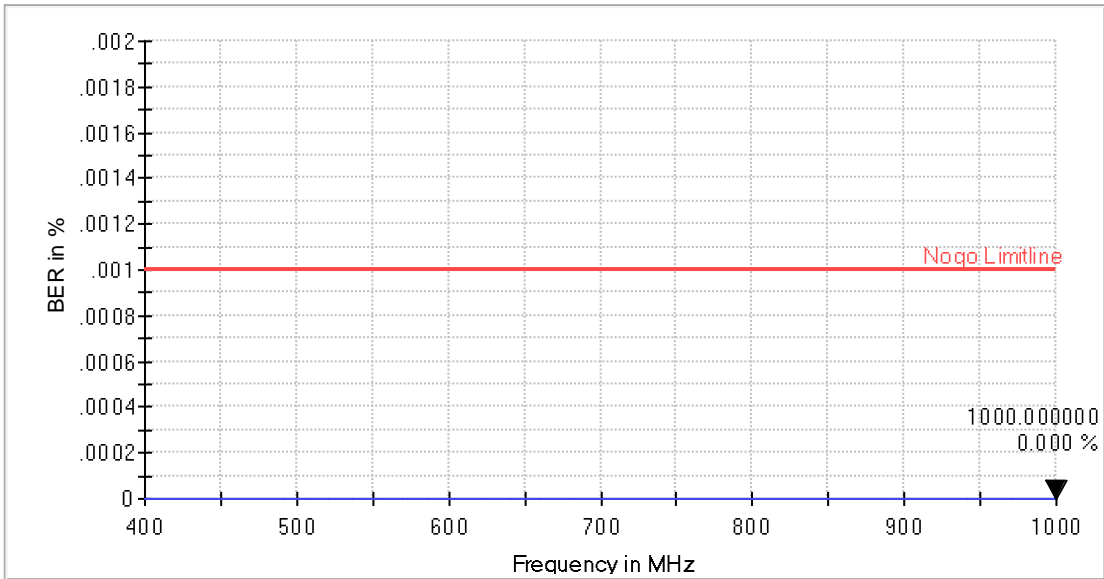
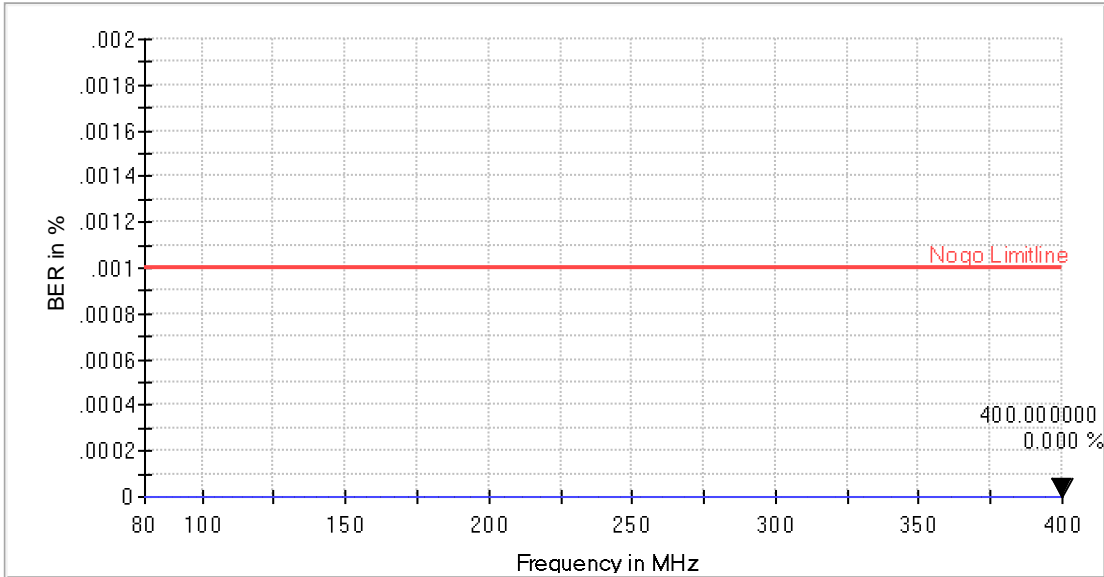
EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 7	Humidity	: 52%

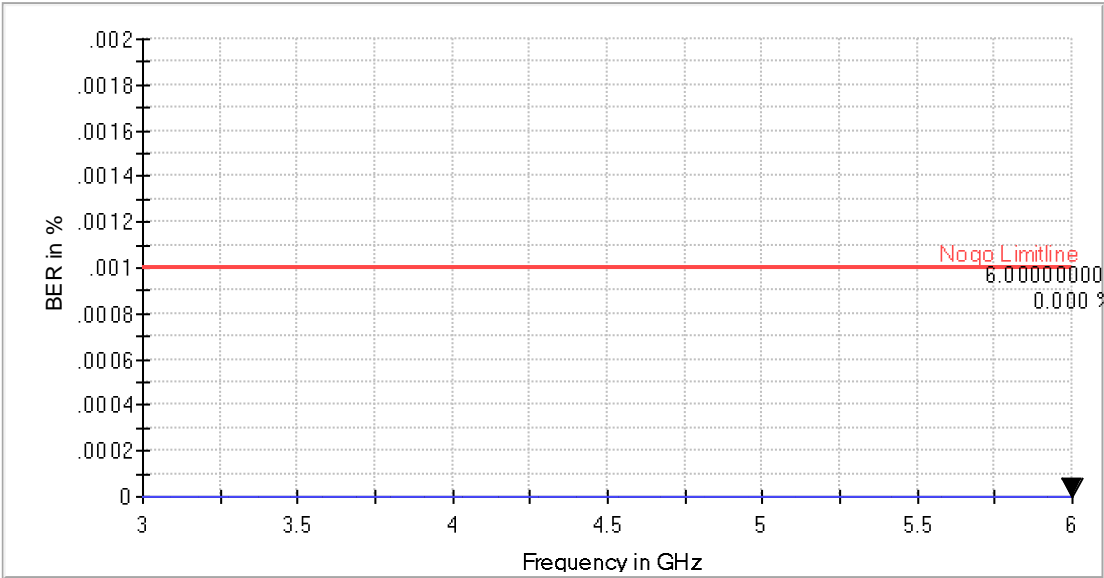
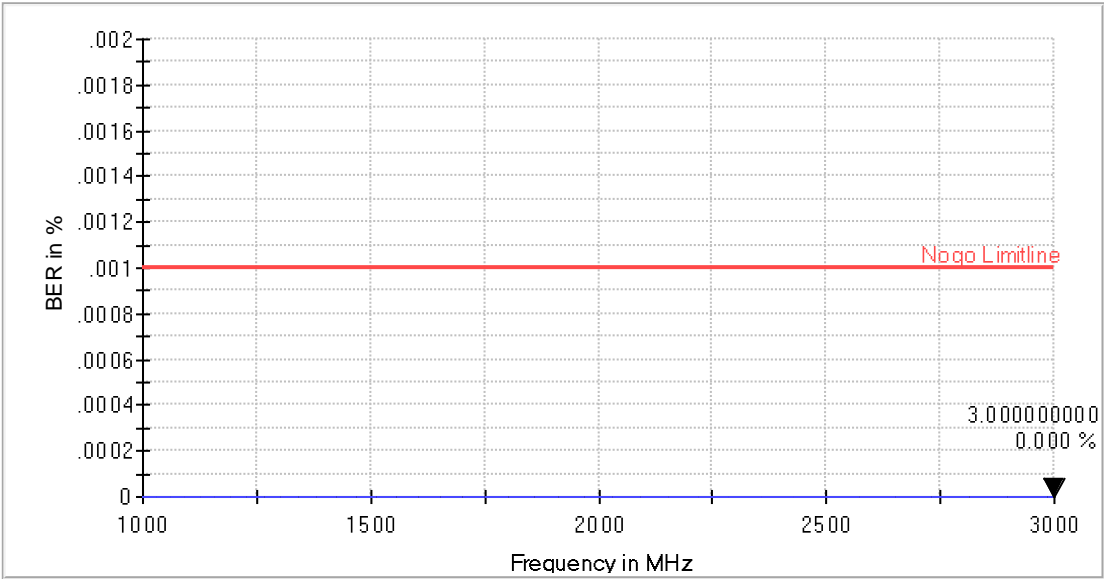
Horizontal





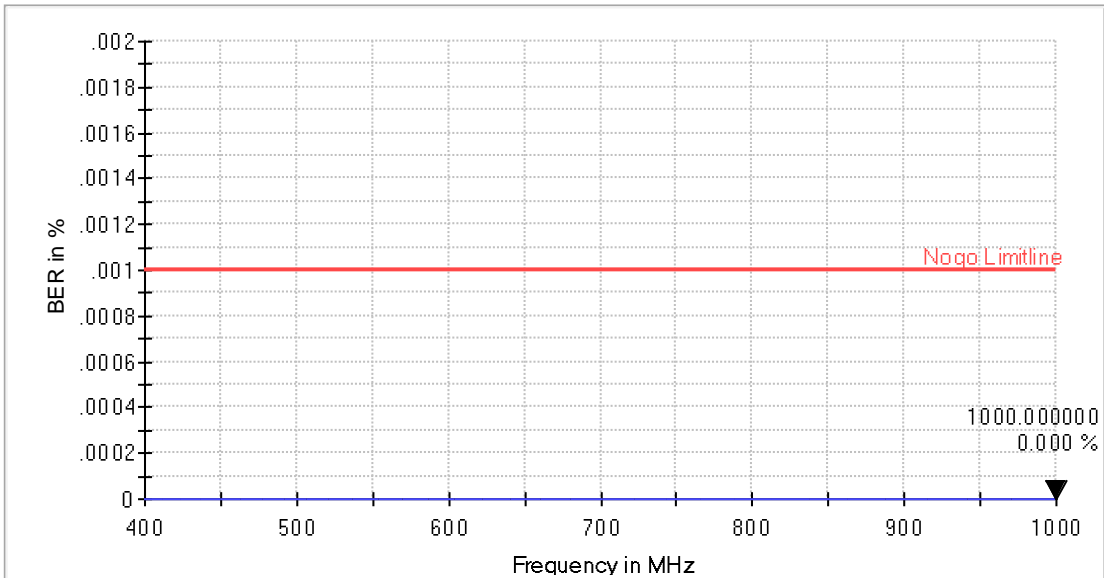
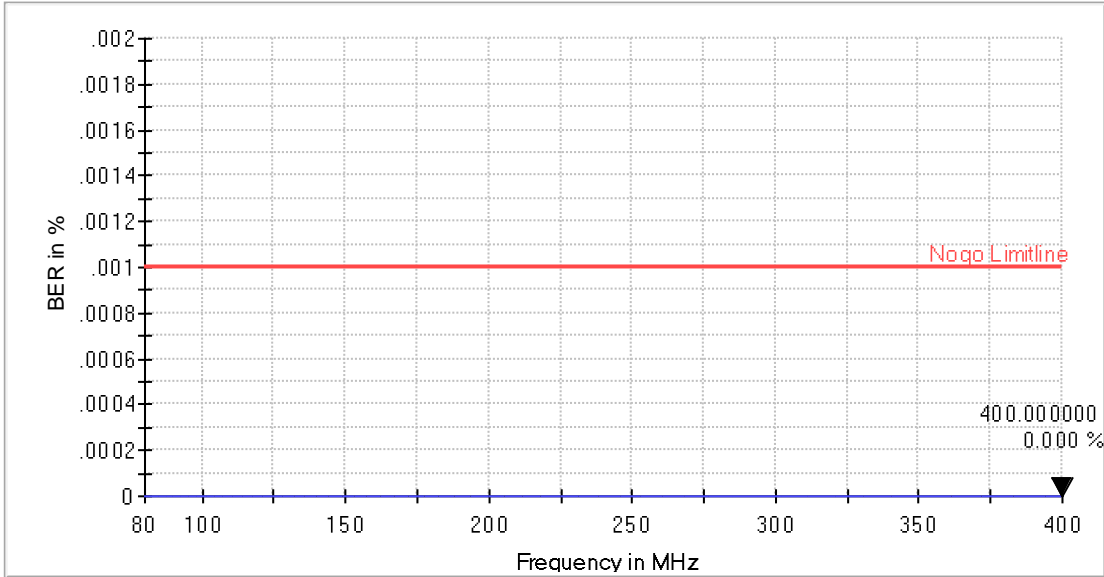
Vertical

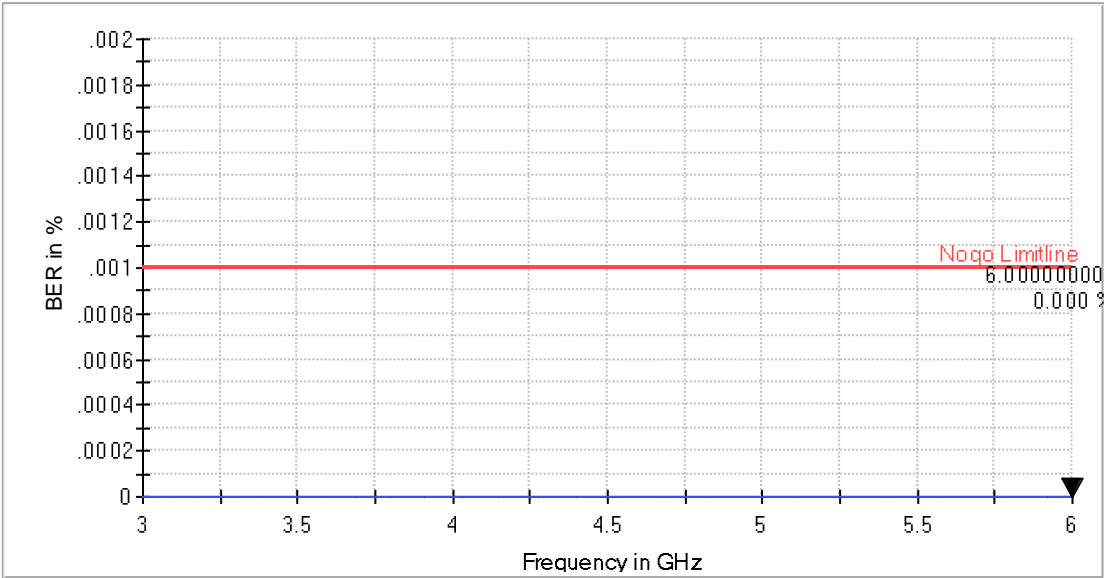
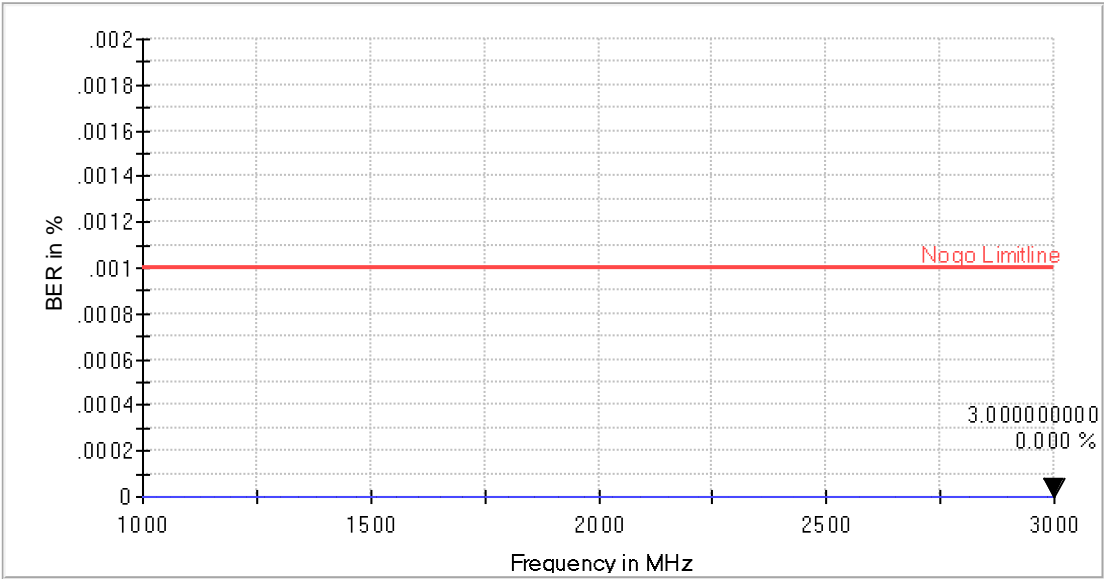




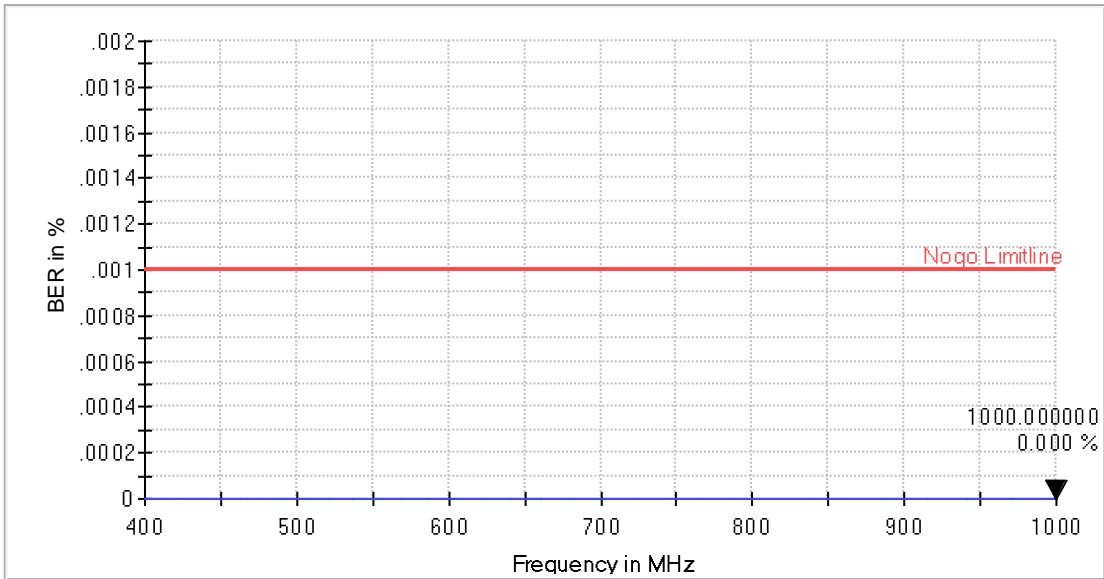
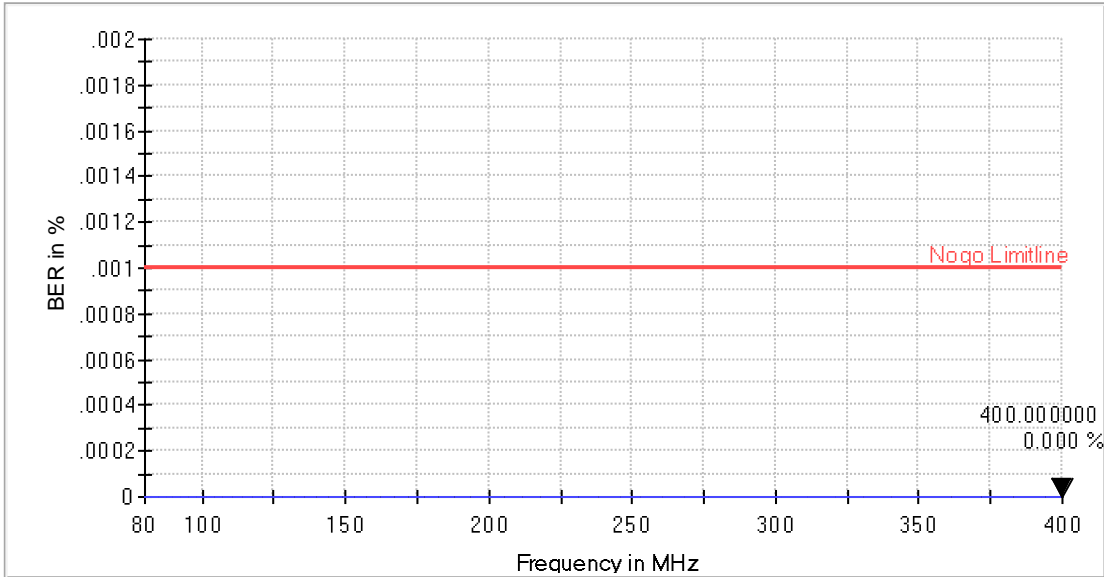
EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 8	Humidity	: 52%

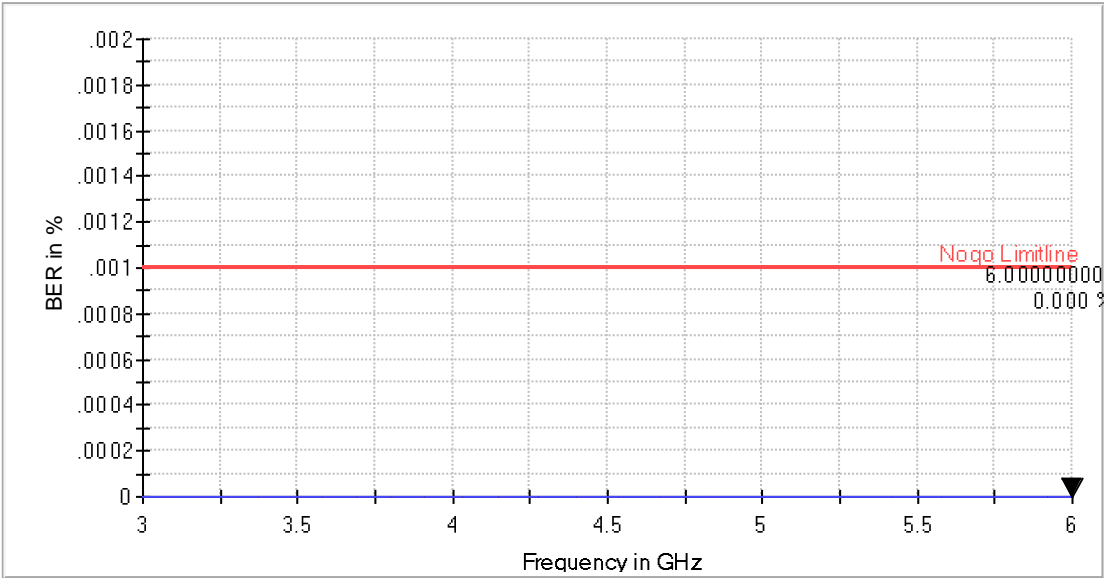
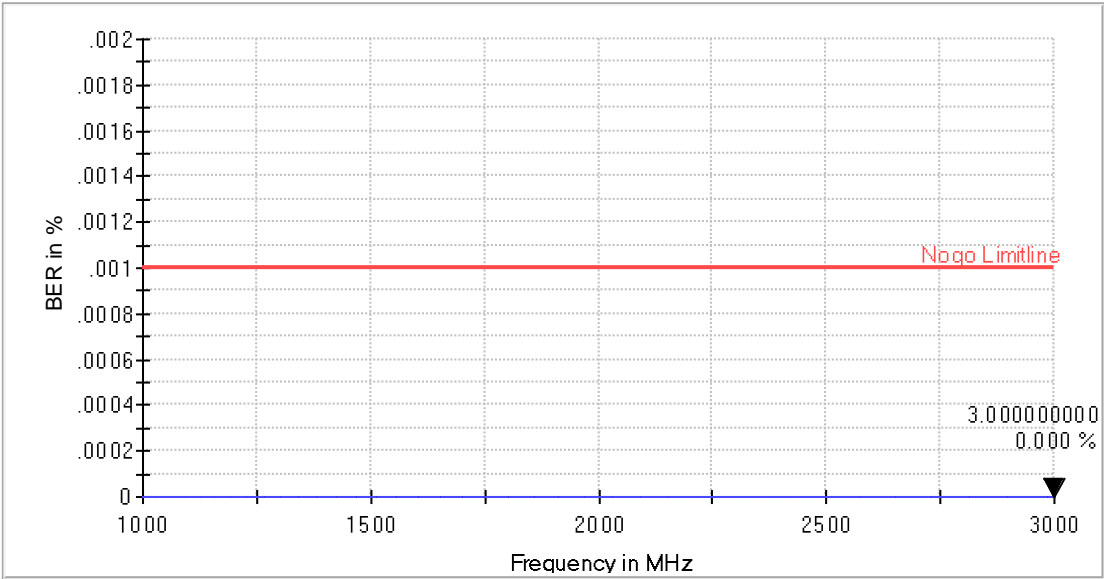
Horizontal





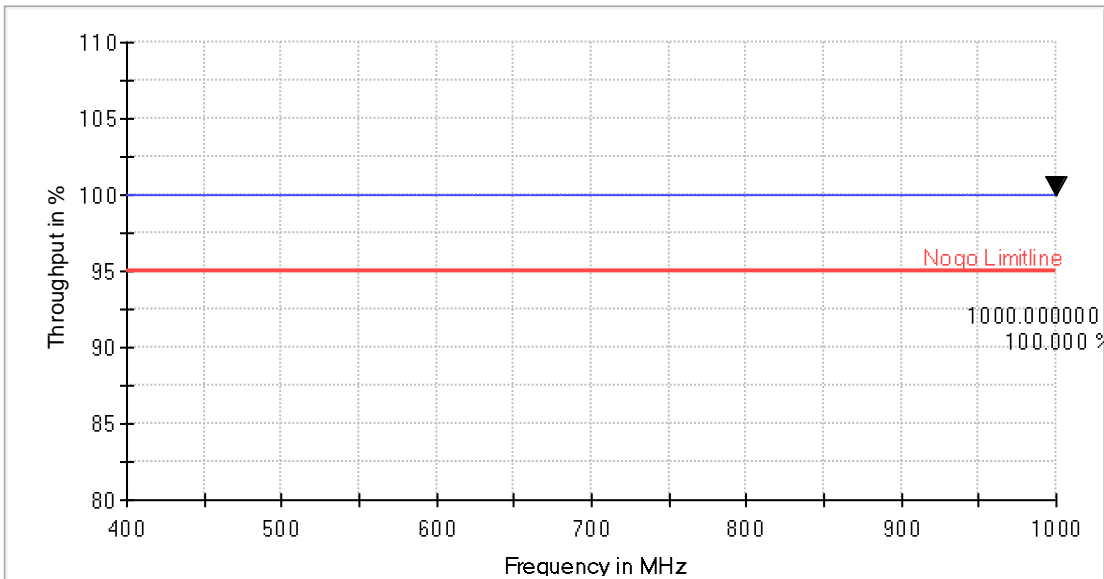
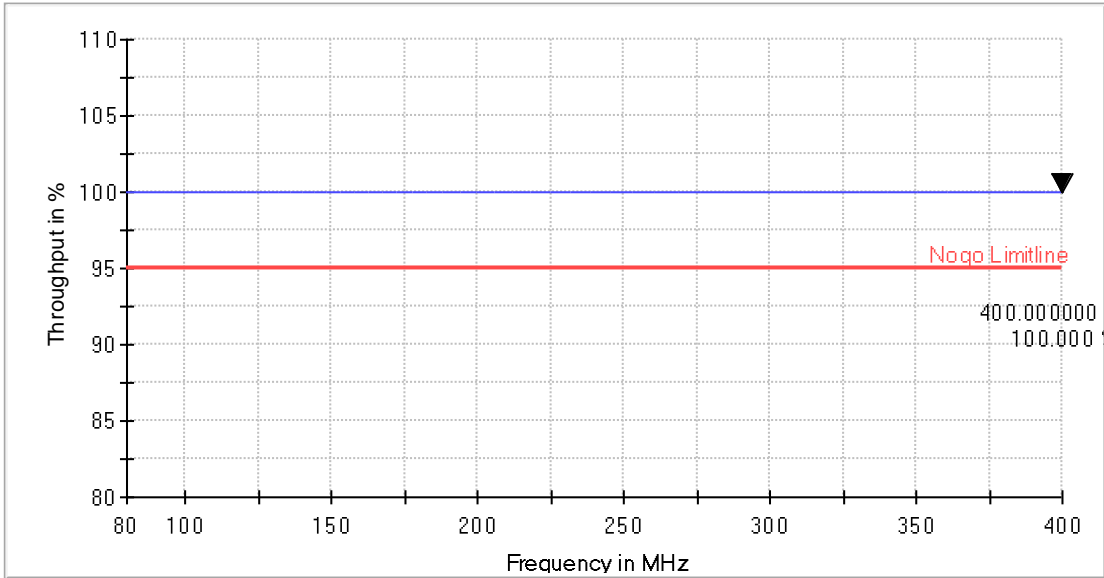
Vertical

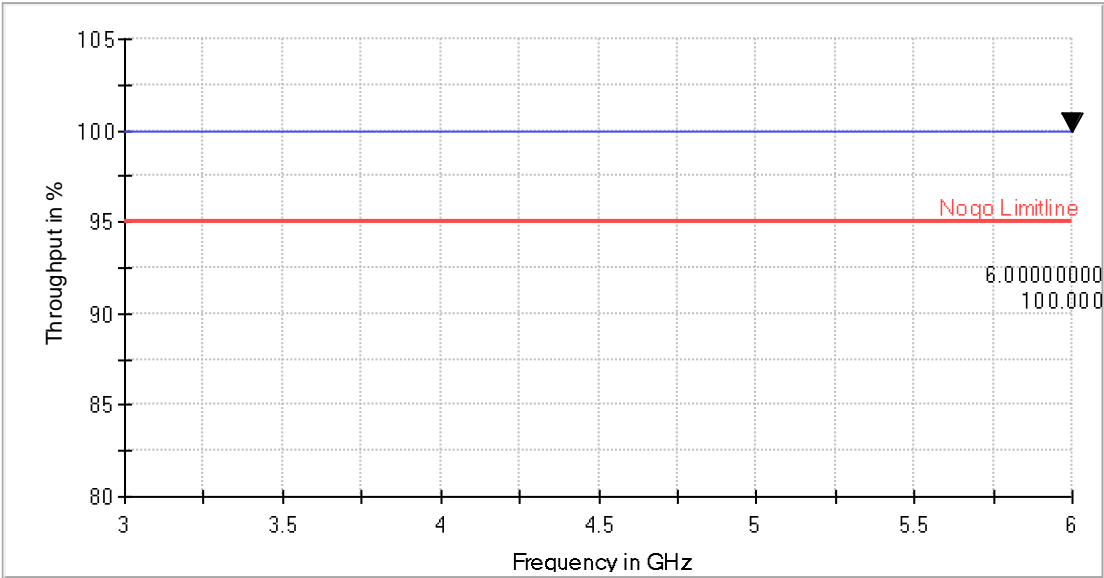
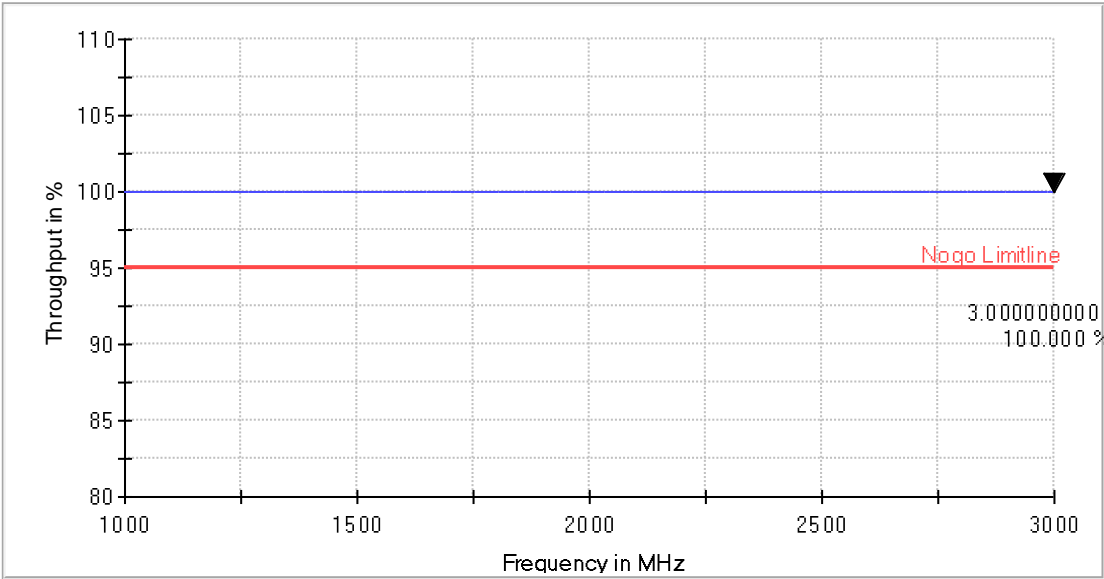




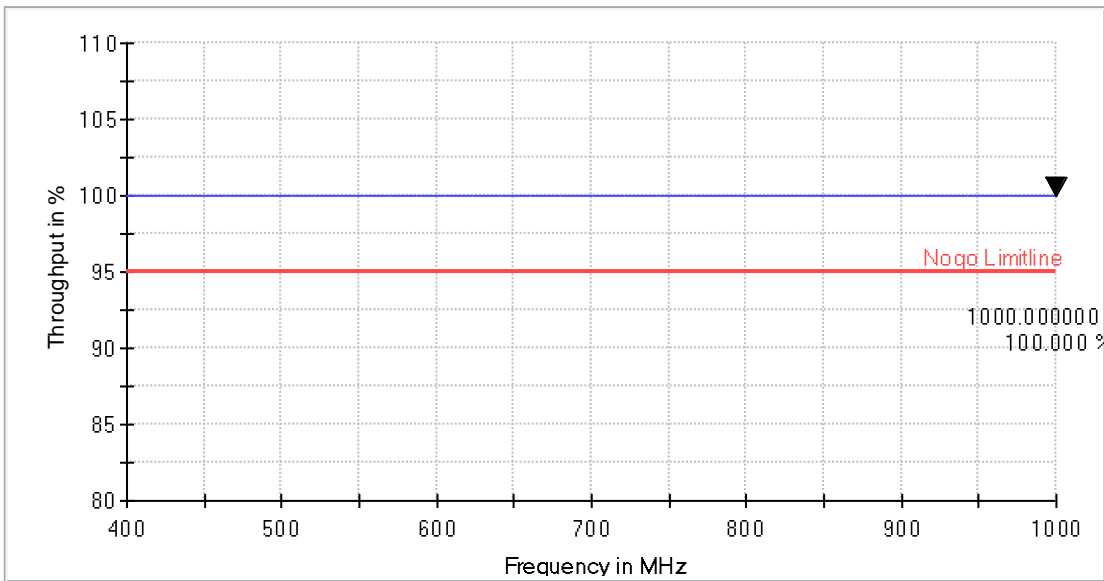
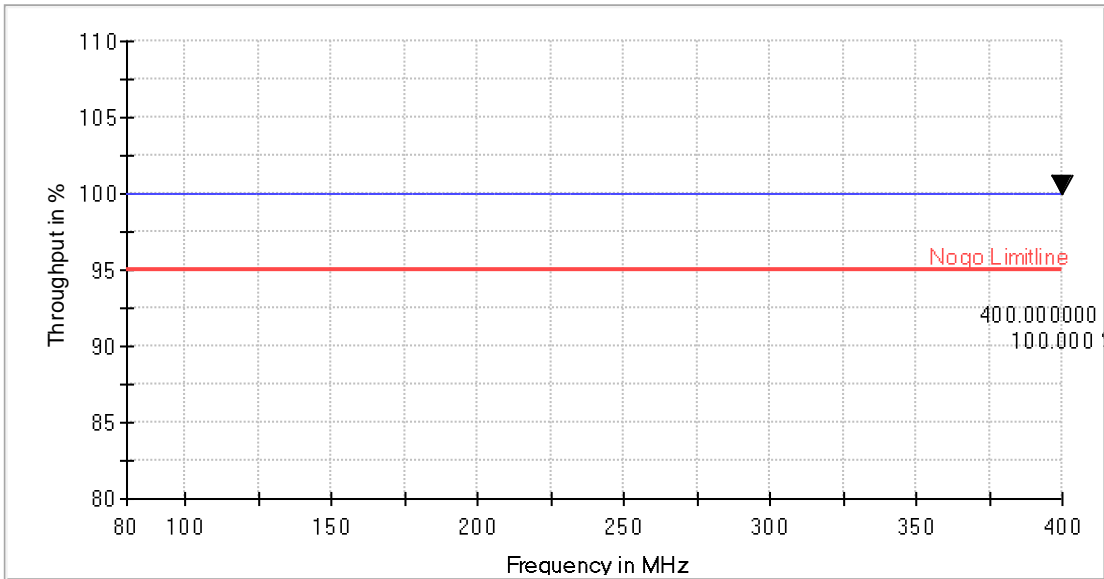
EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 13	Humidity	: 52%

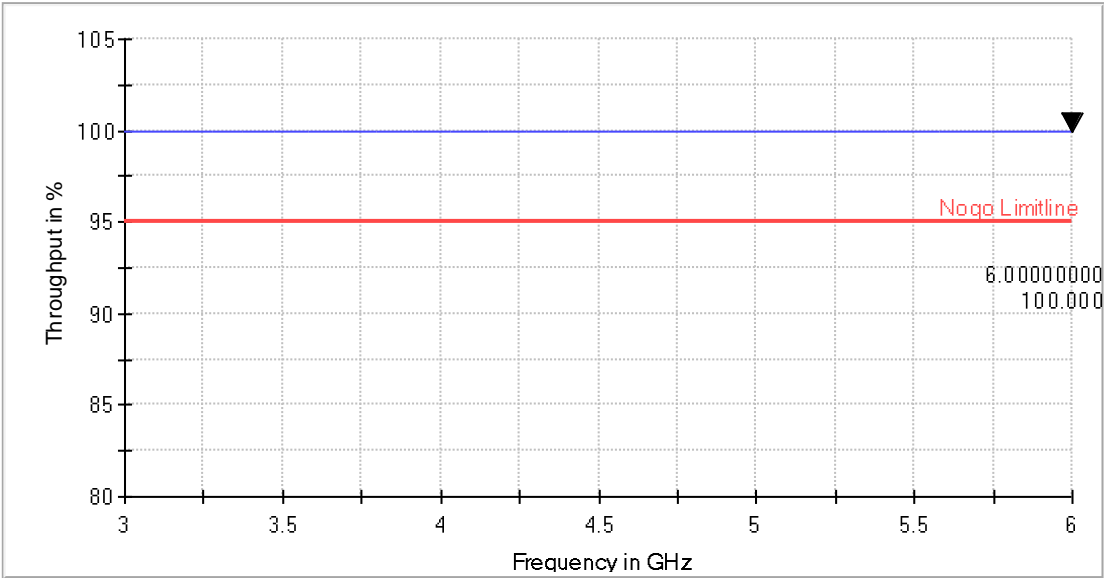
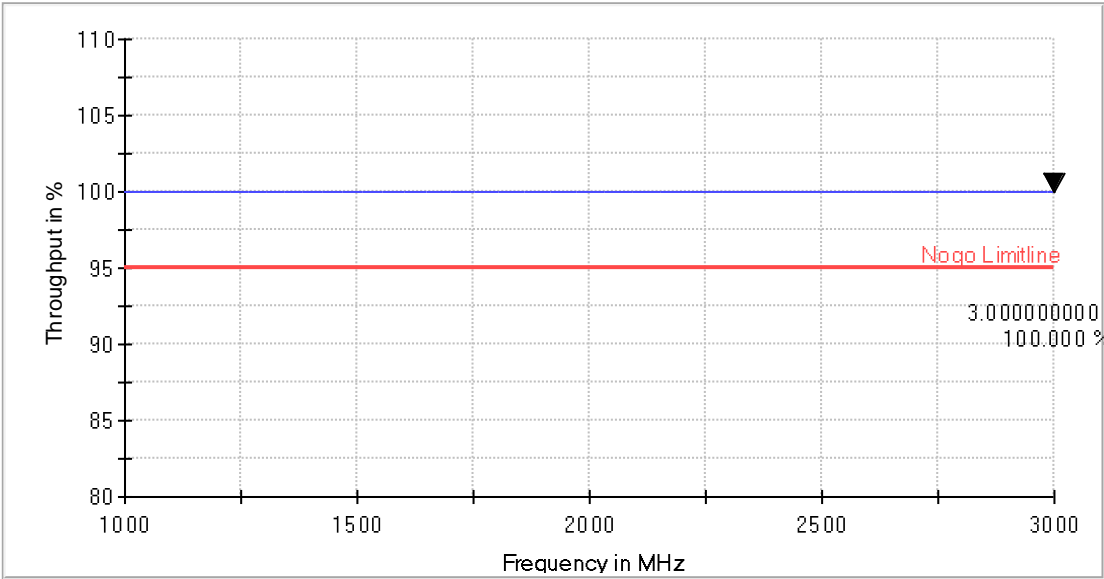
Horizontal





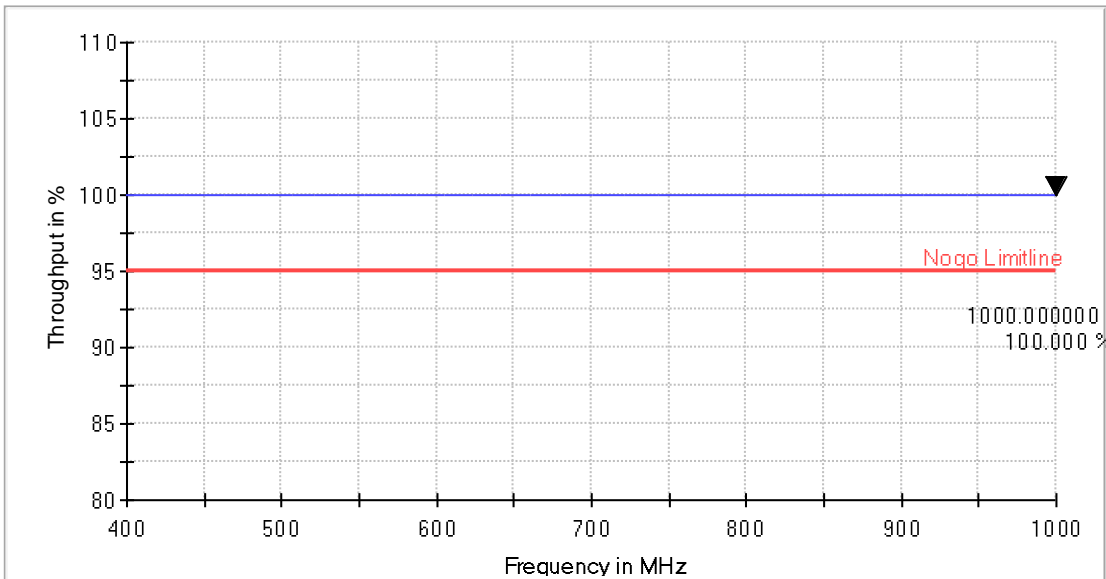
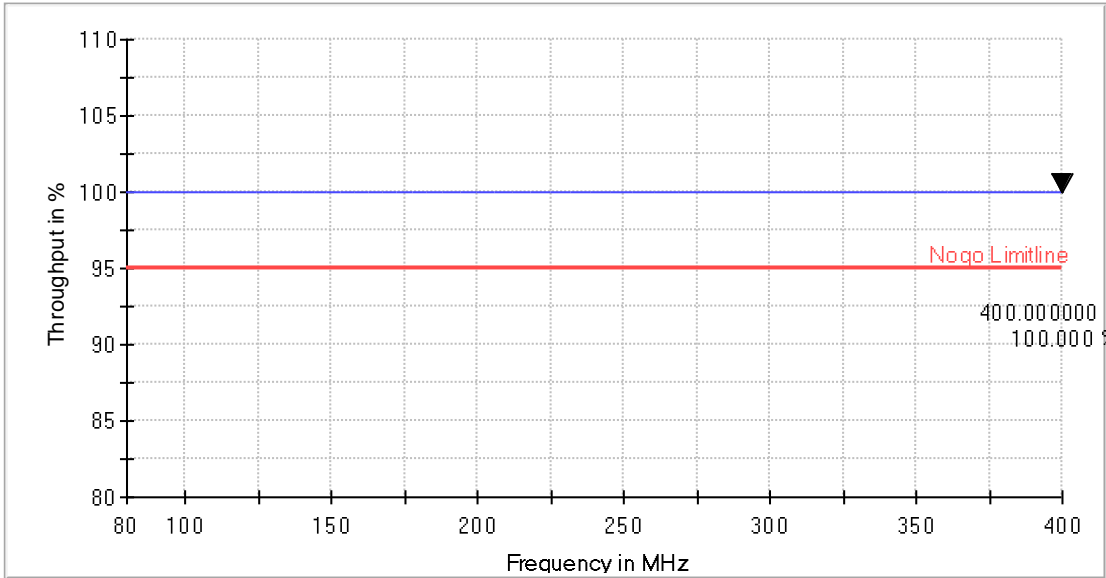
Vertical

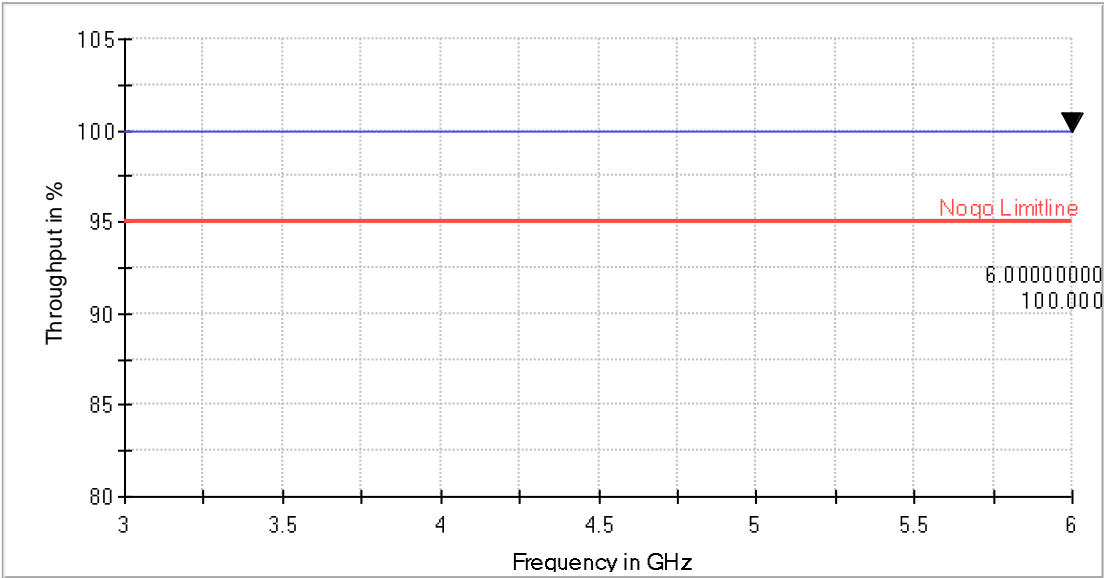
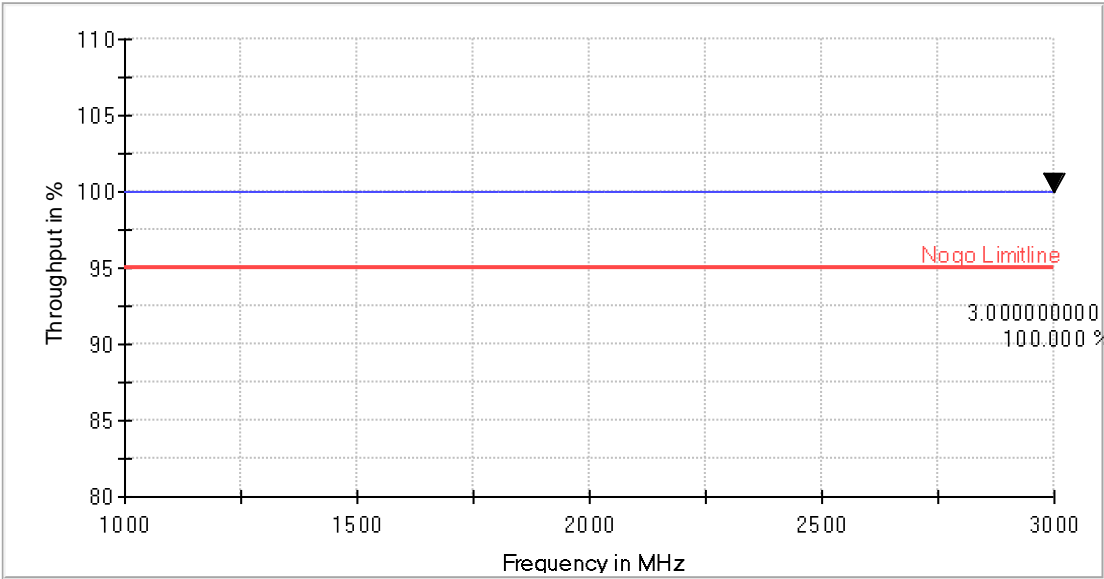




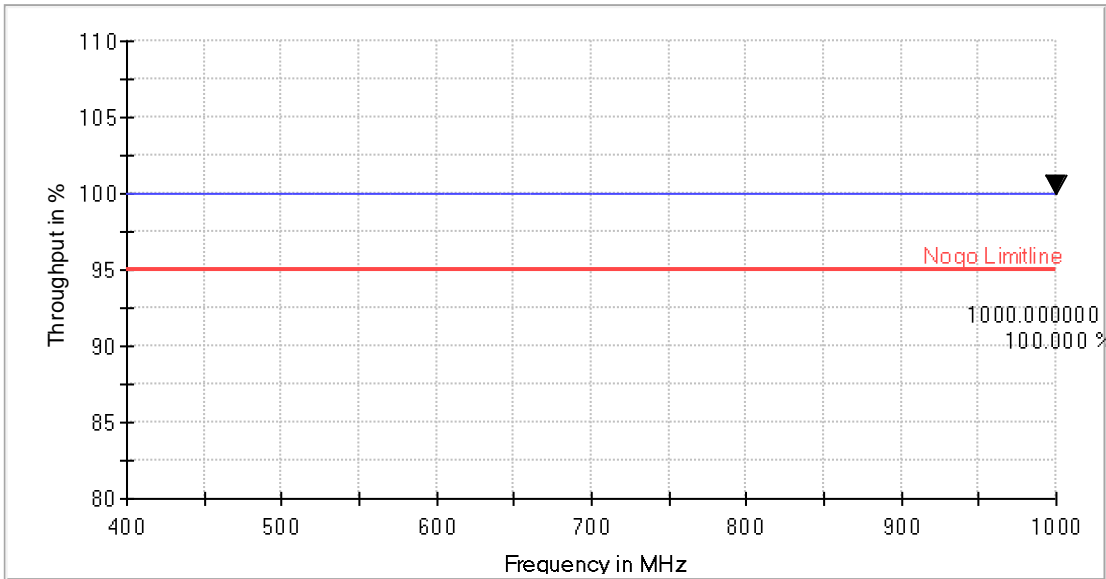
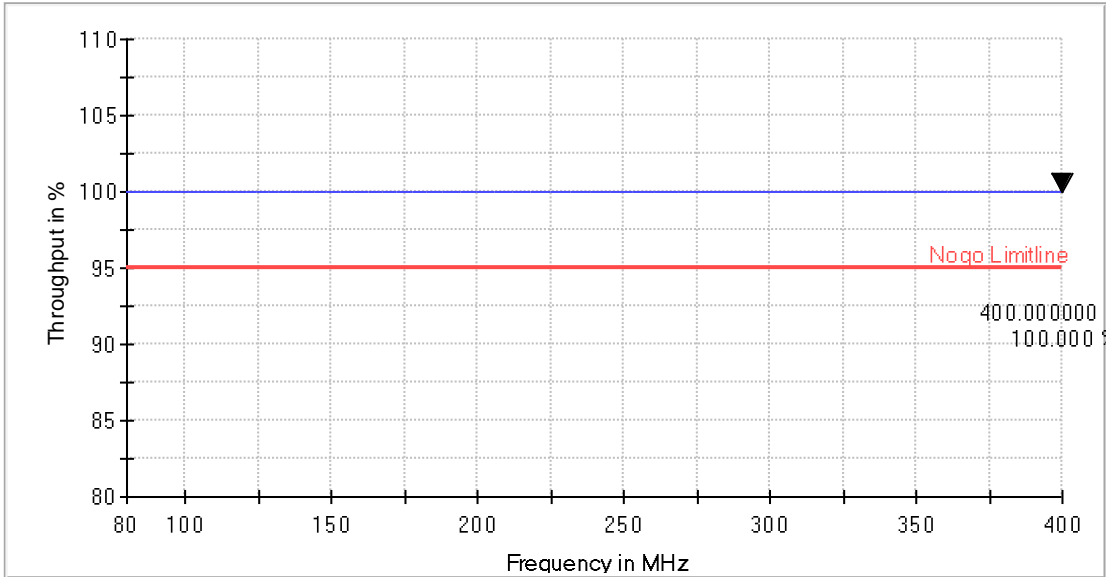
EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 14	Humidity	: 52%

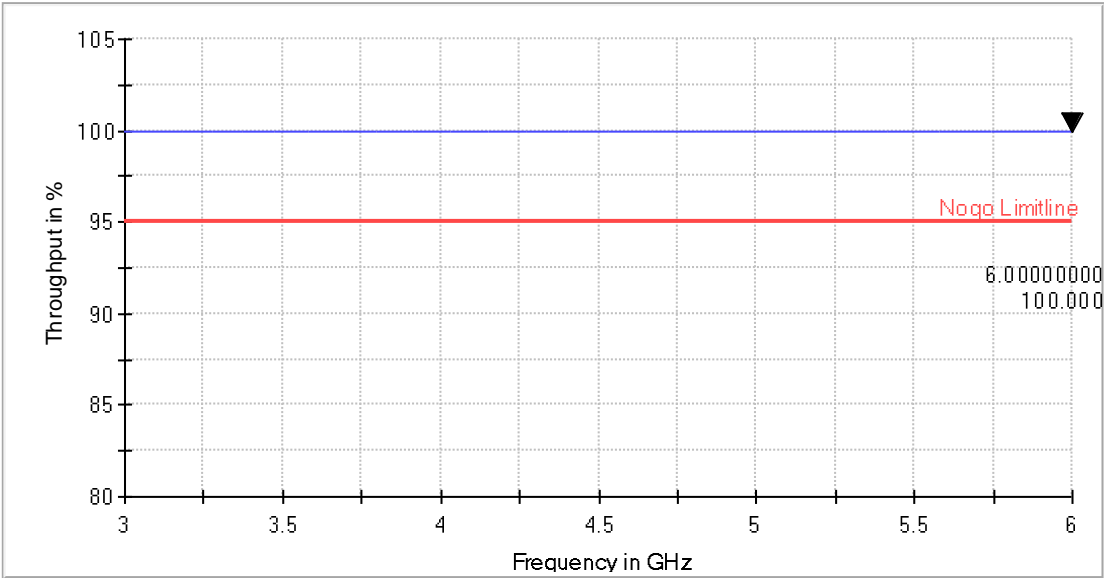
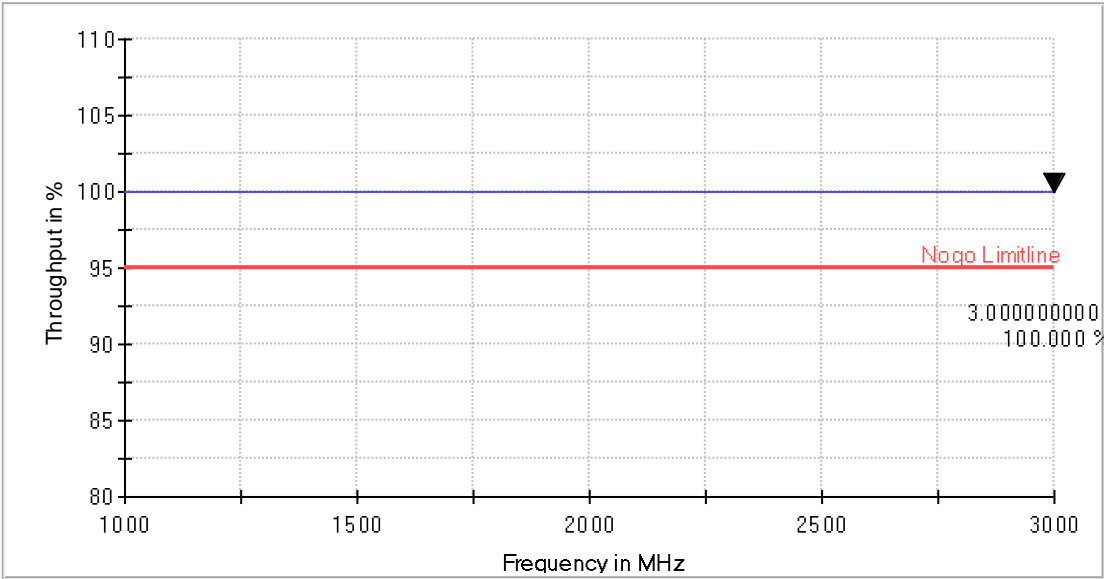
Horizontal





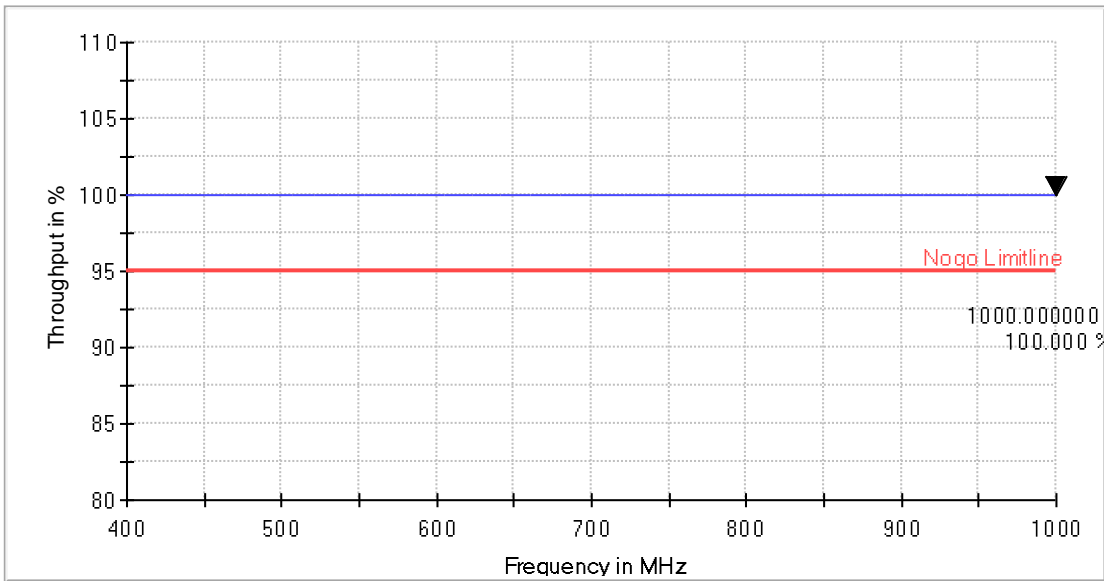
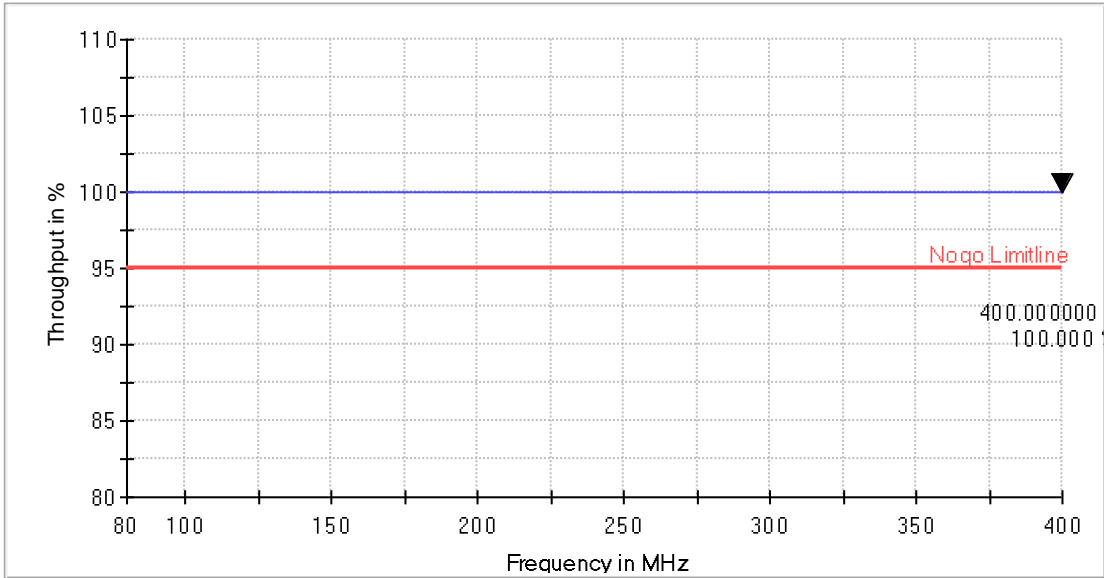
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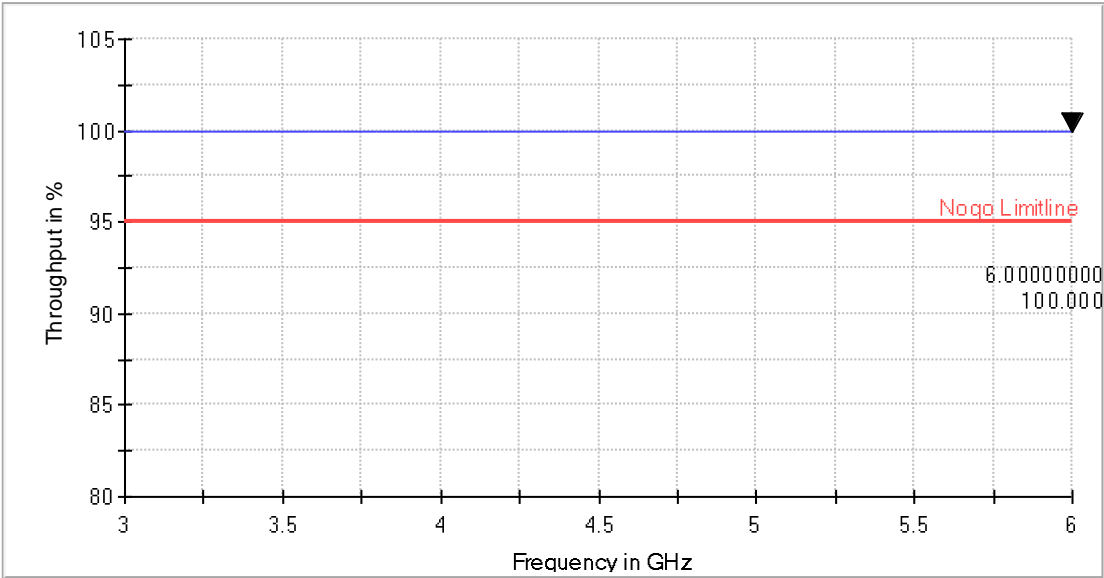
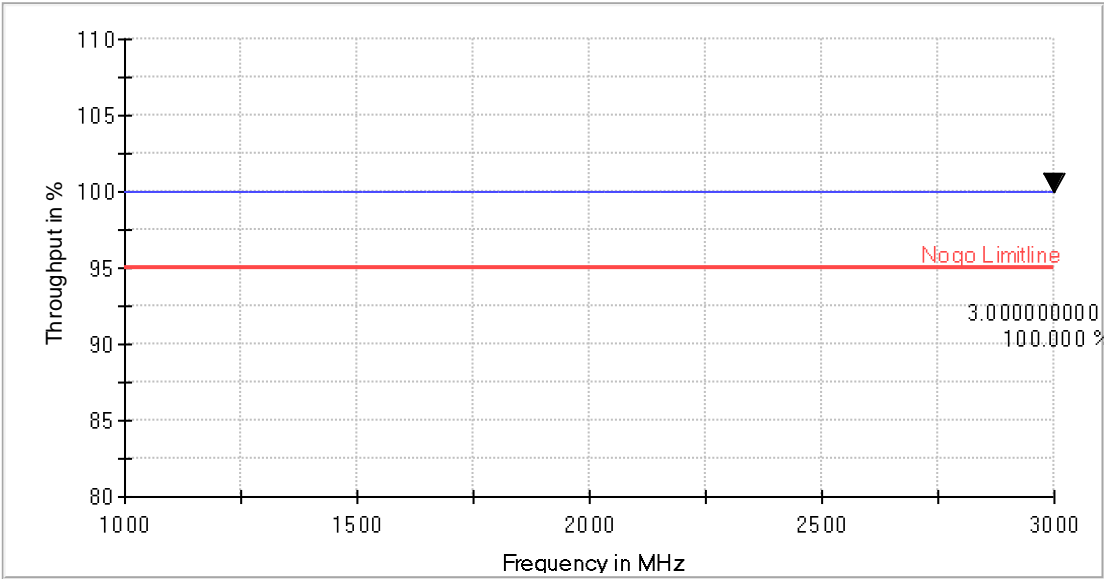




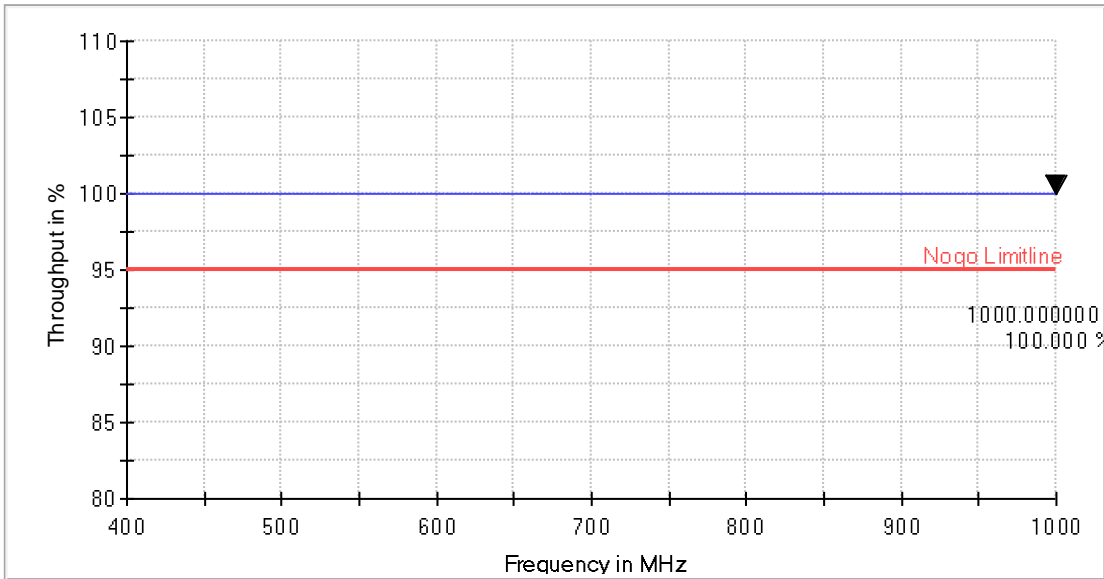
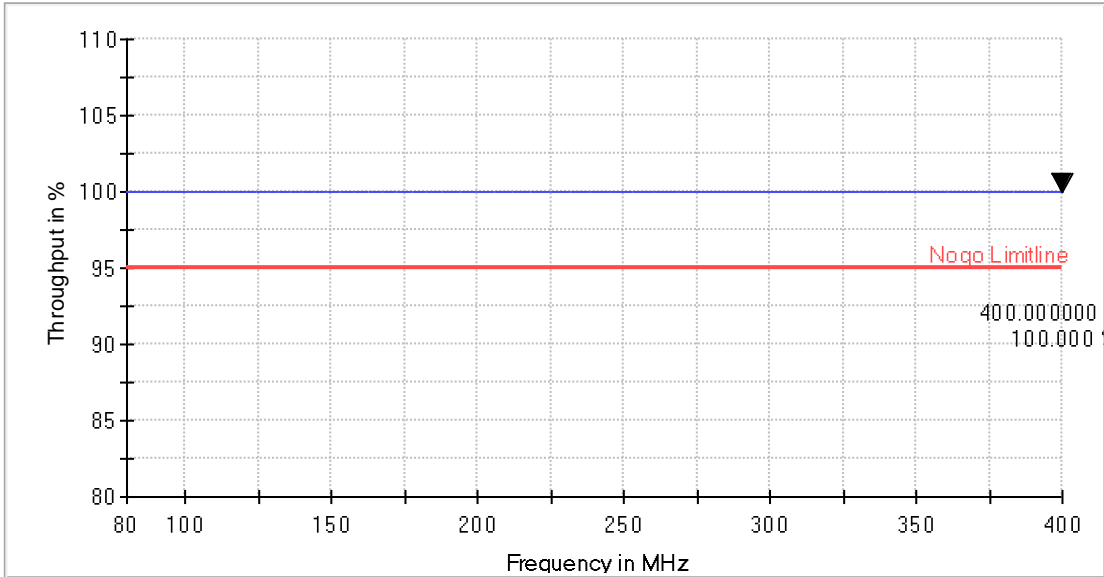
EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 15	Humidity	: 52%

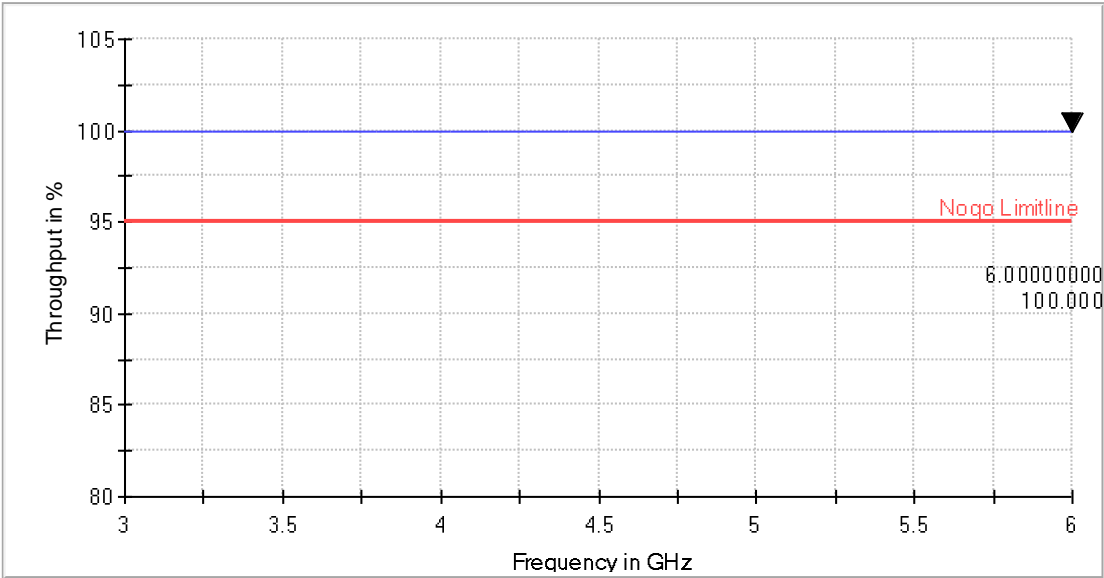
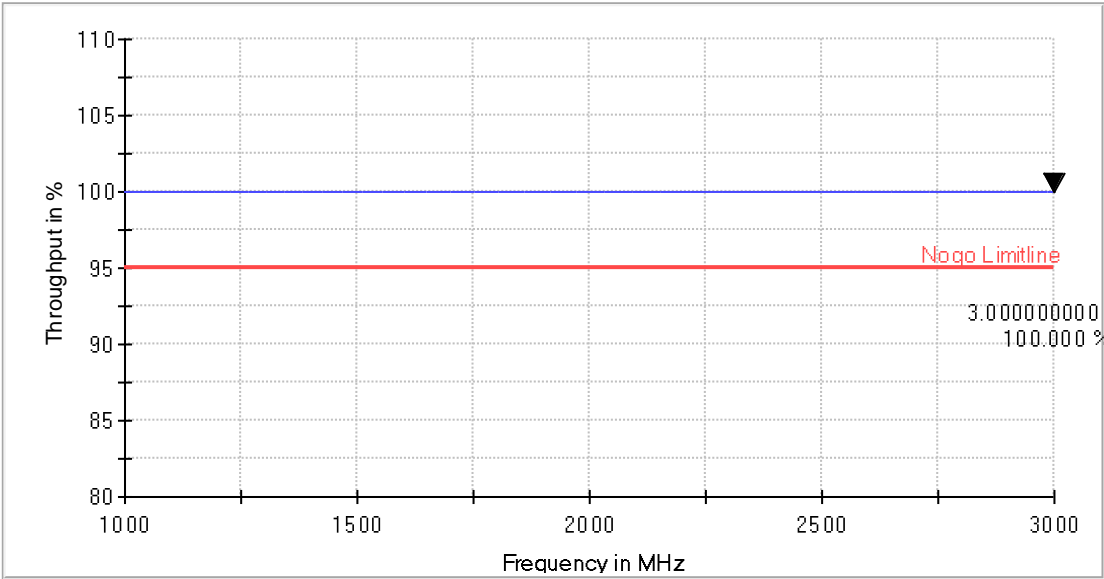
Horizontal





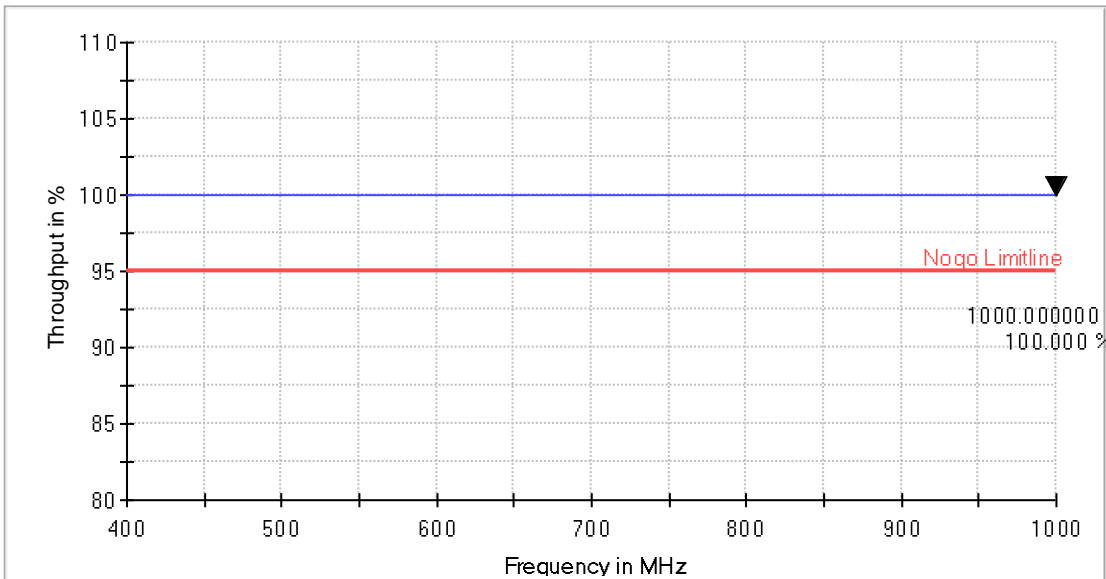
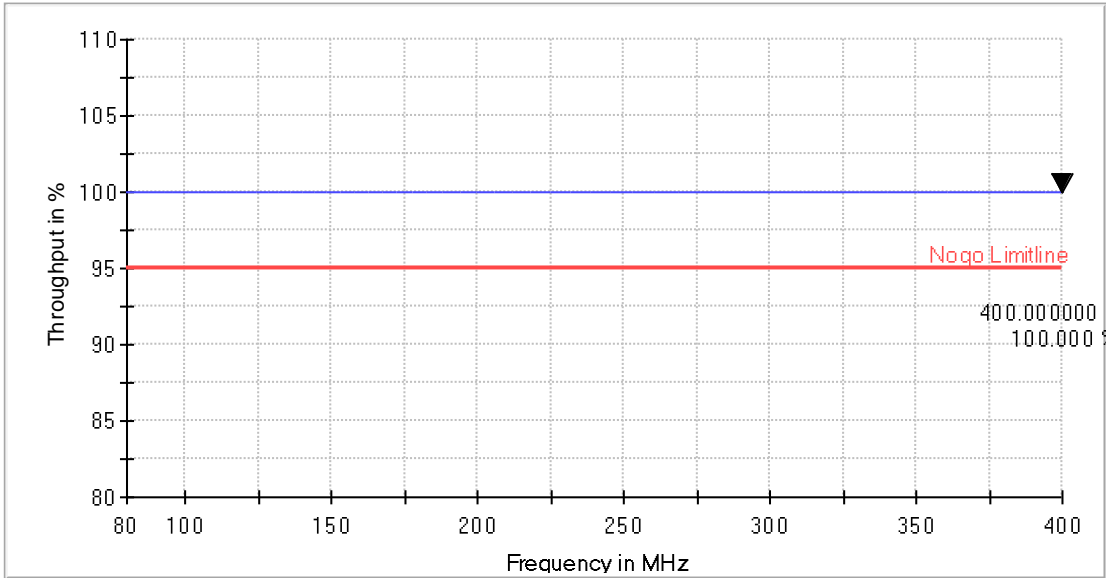
Vertical

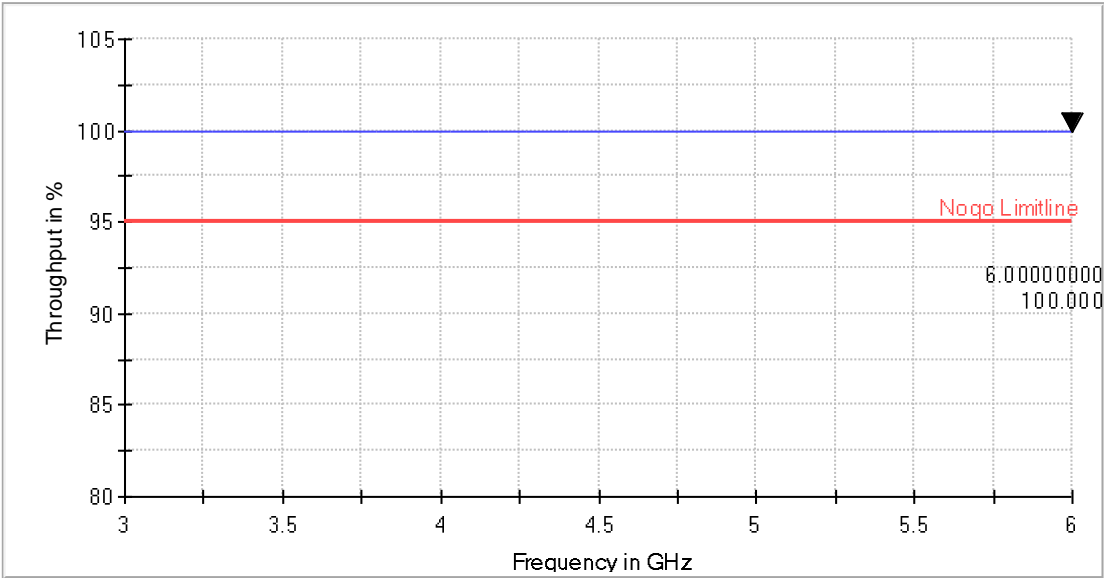
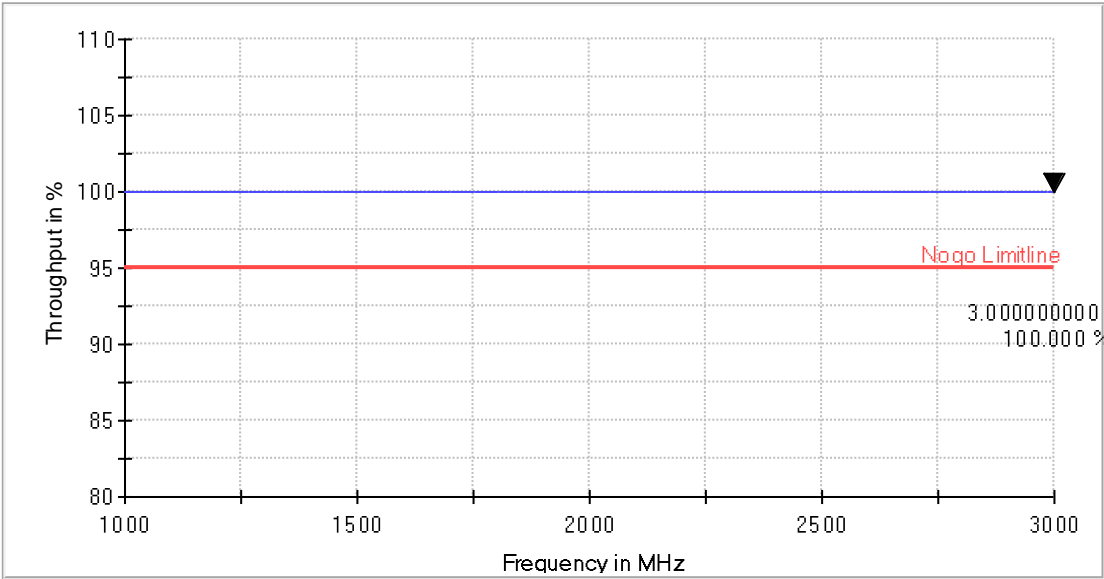




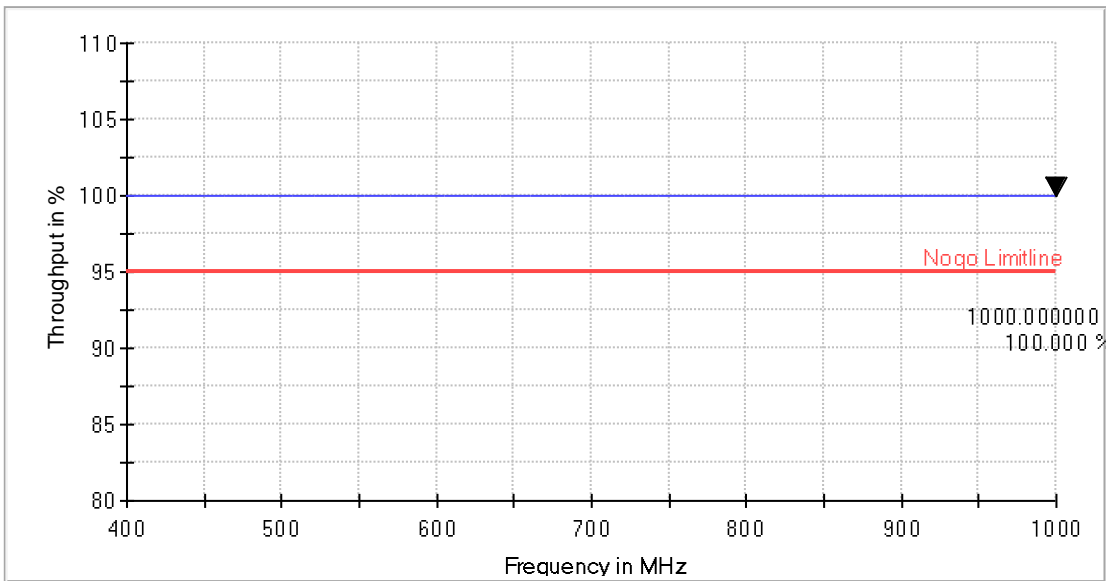
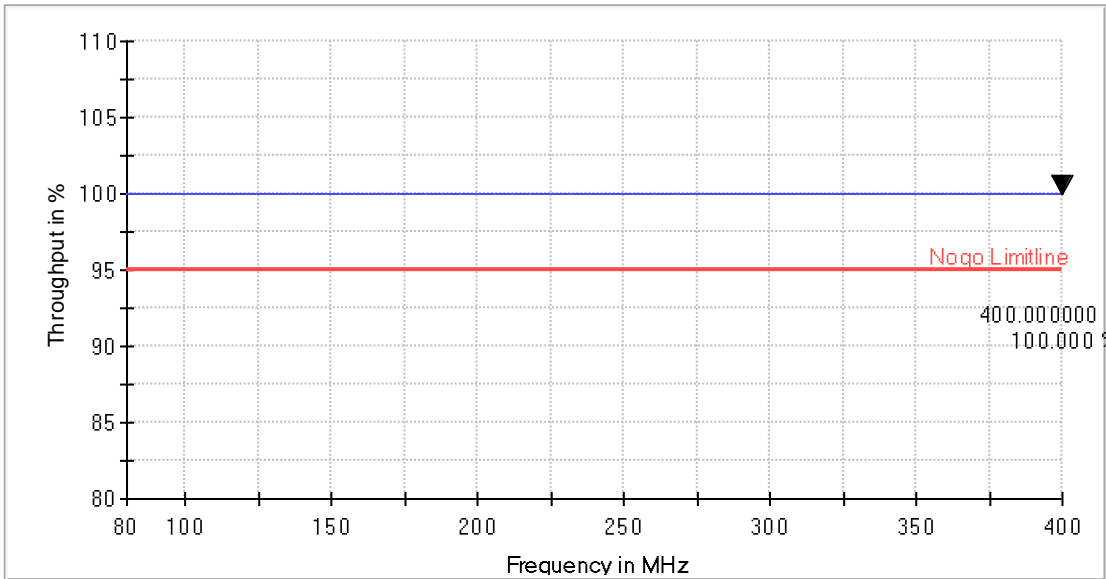
EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 16	Humidity	: 52%

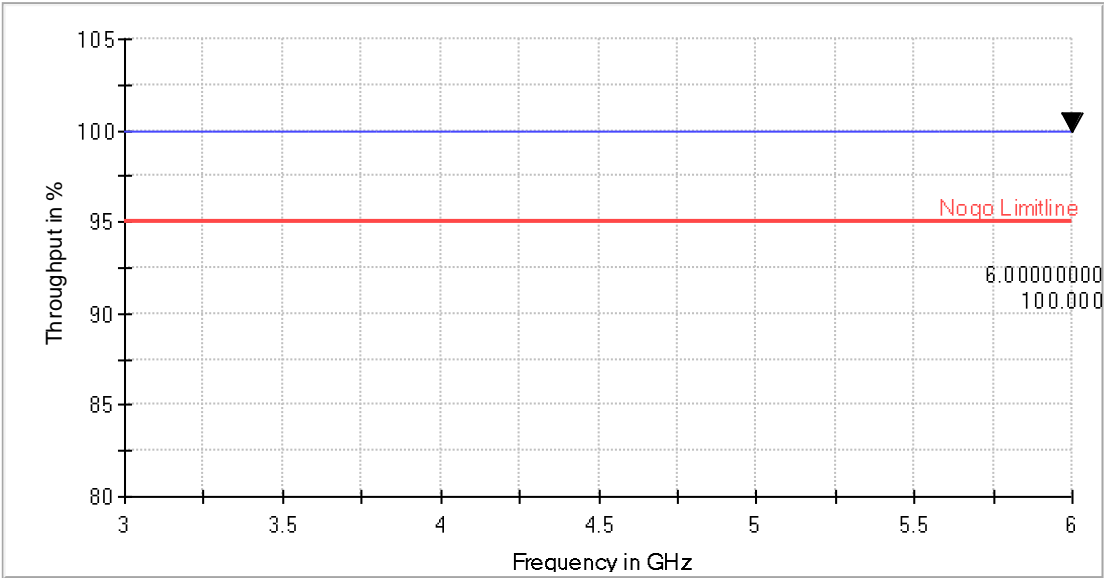
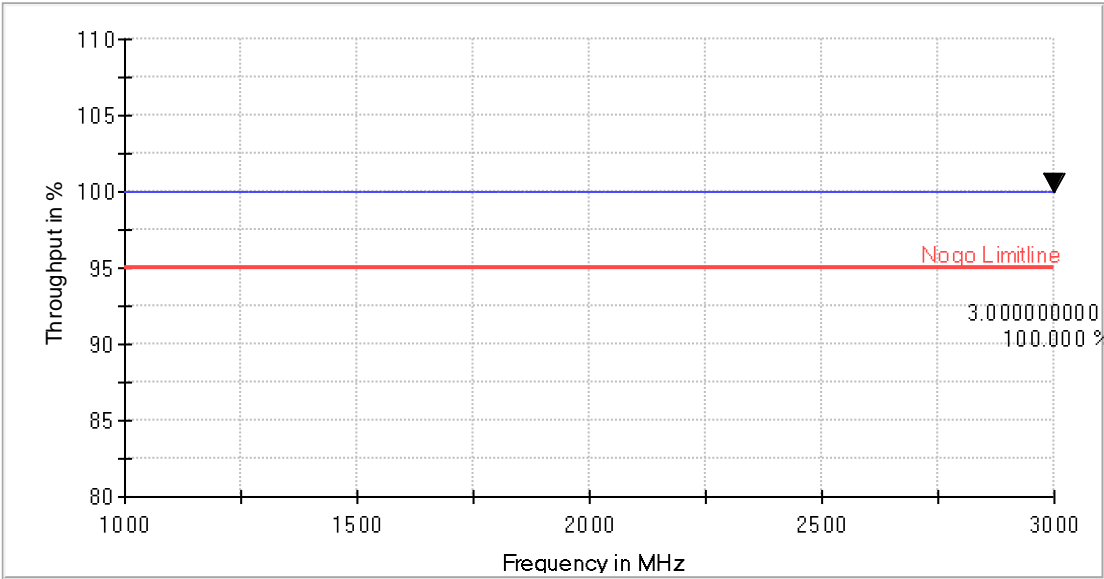
Horizontal





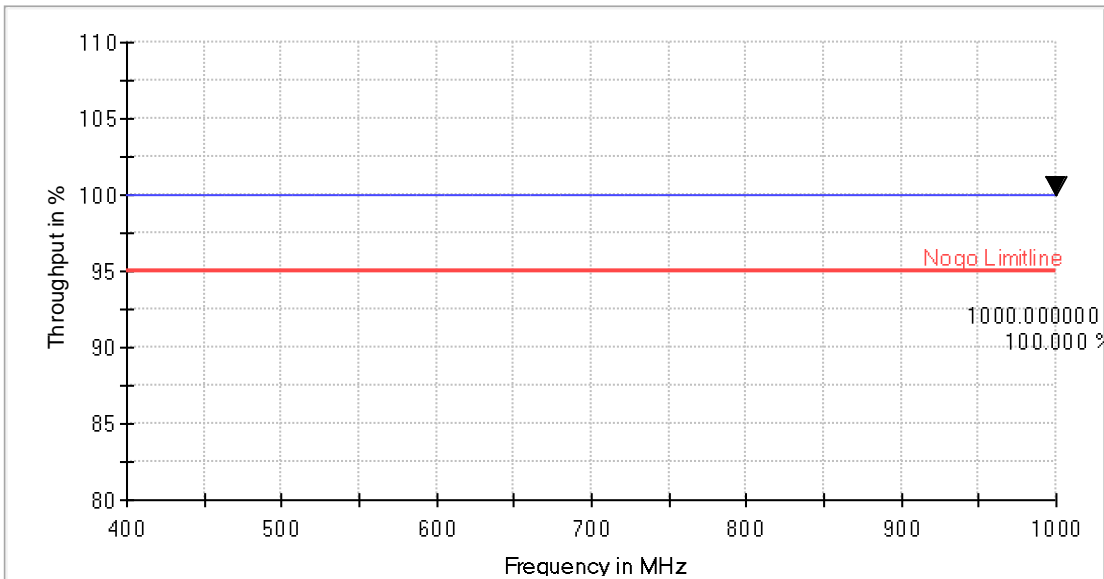
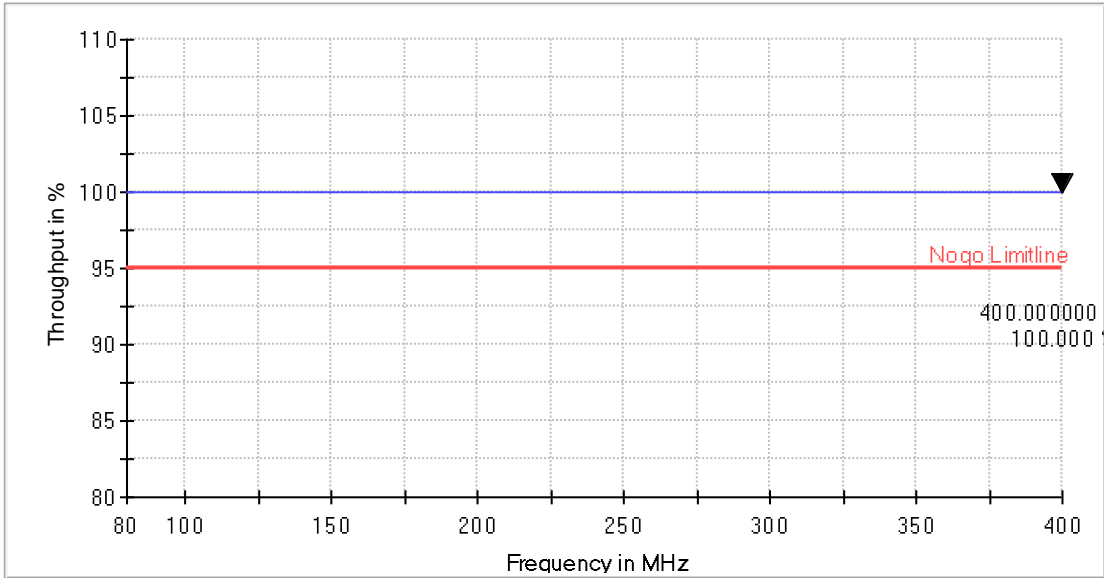
Vertical

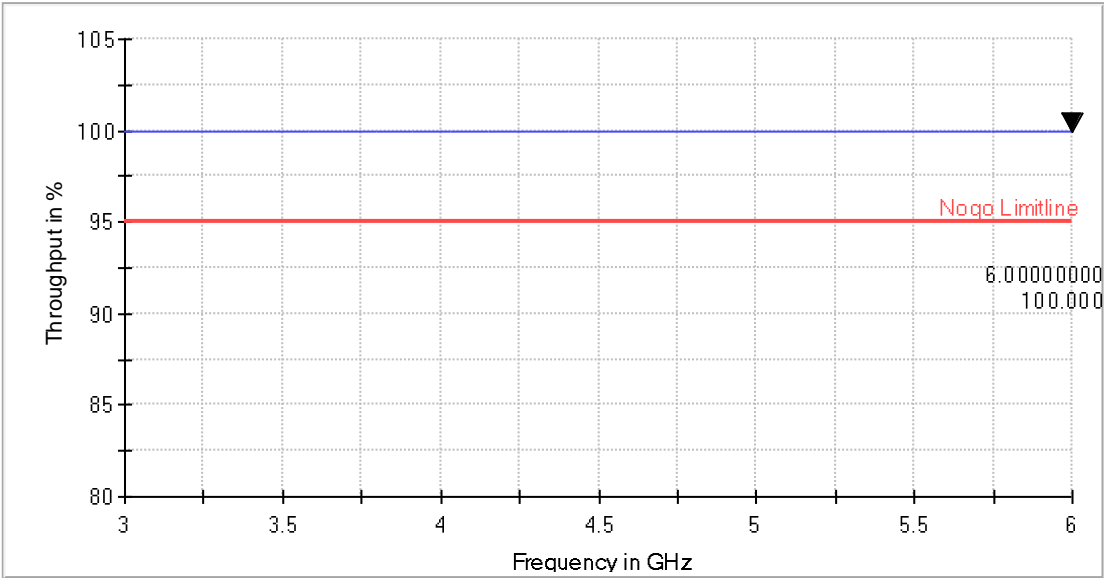
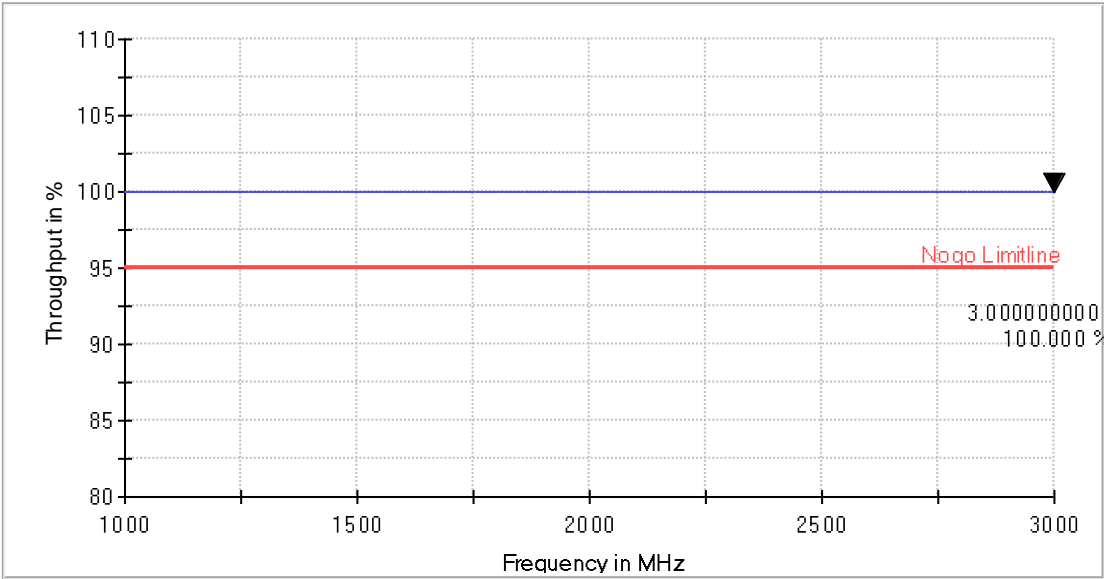




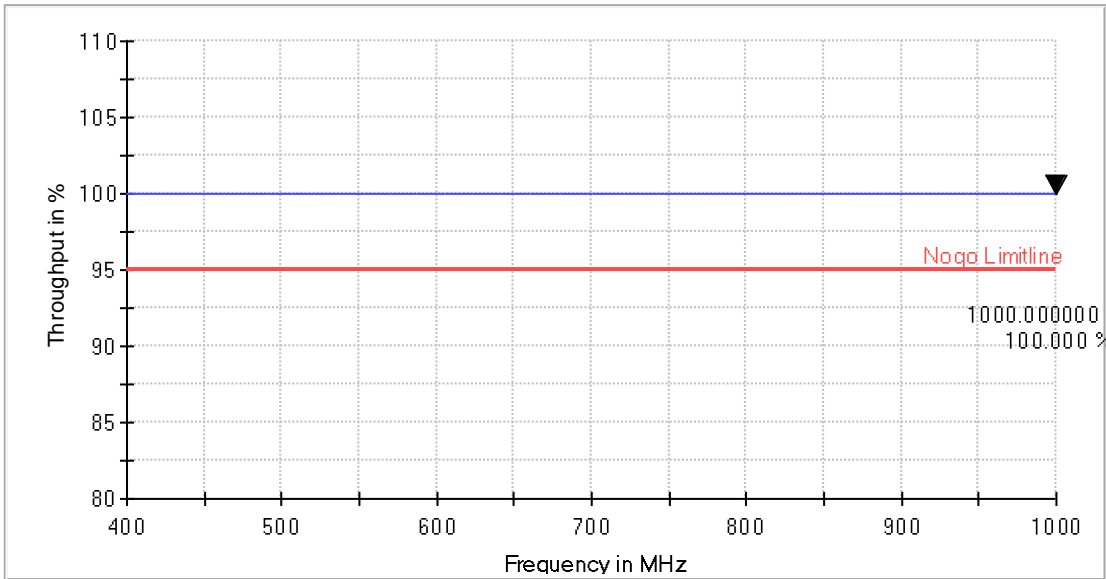
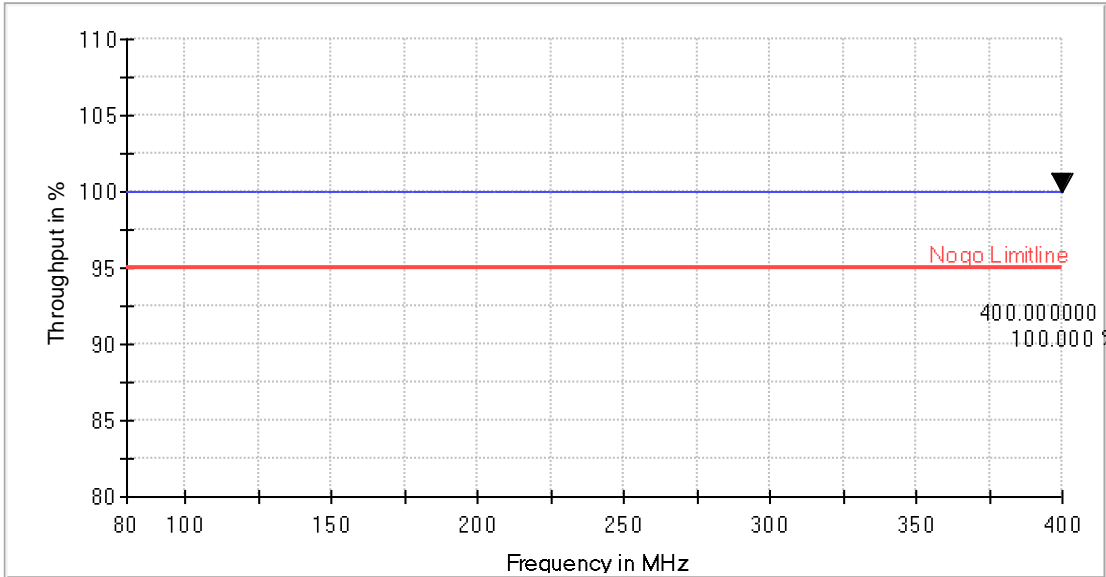
EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 17	Humidity	: 52%

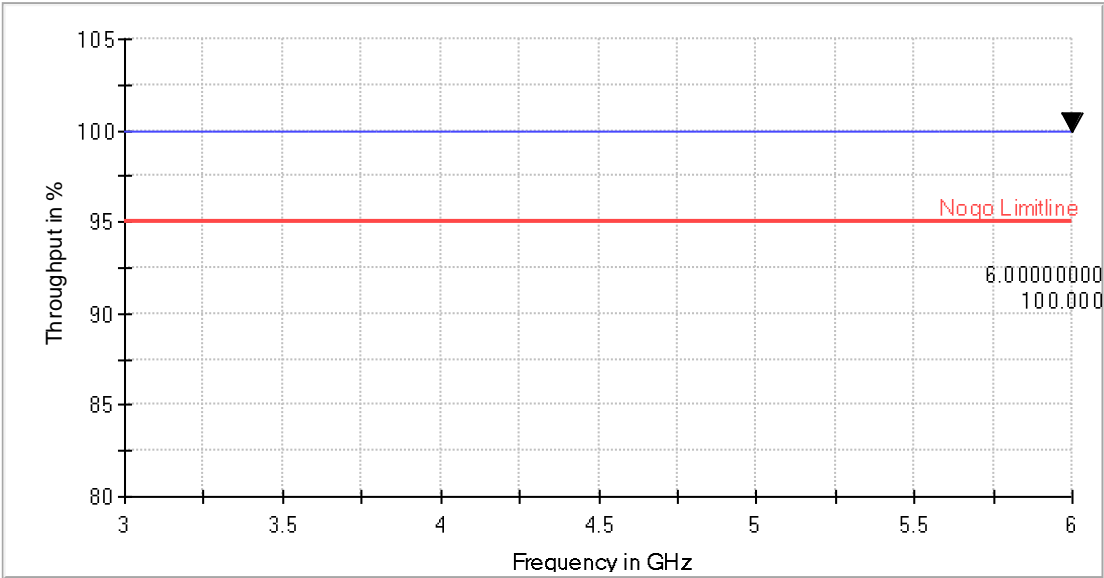
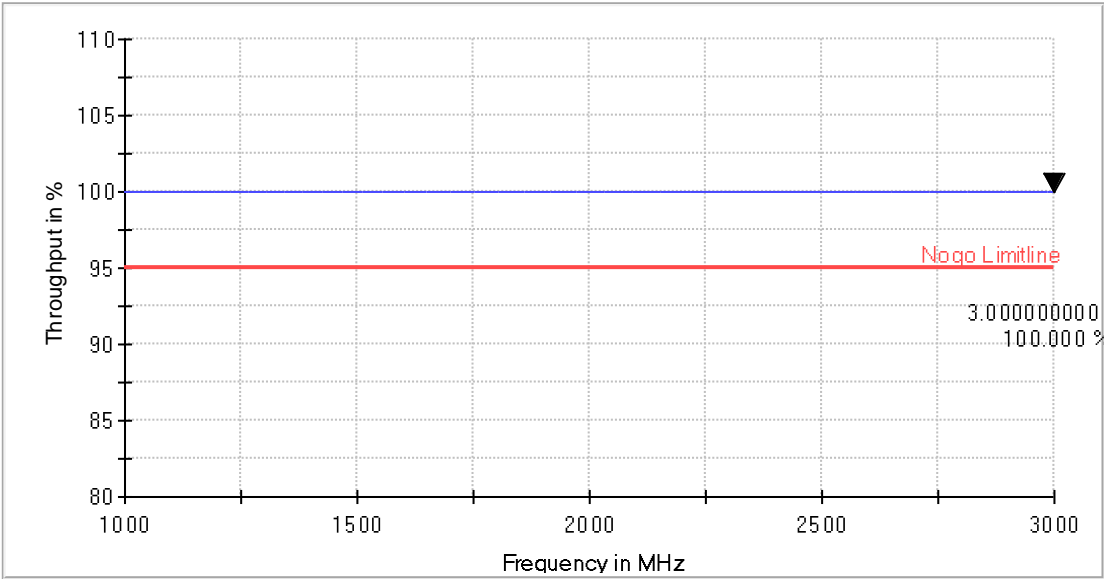
Horizontal





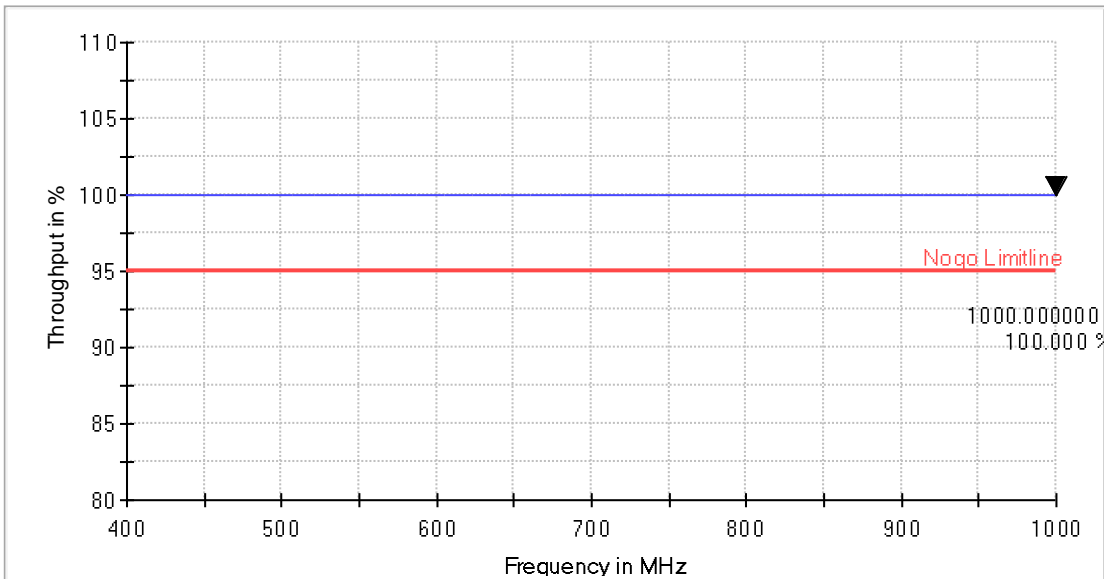
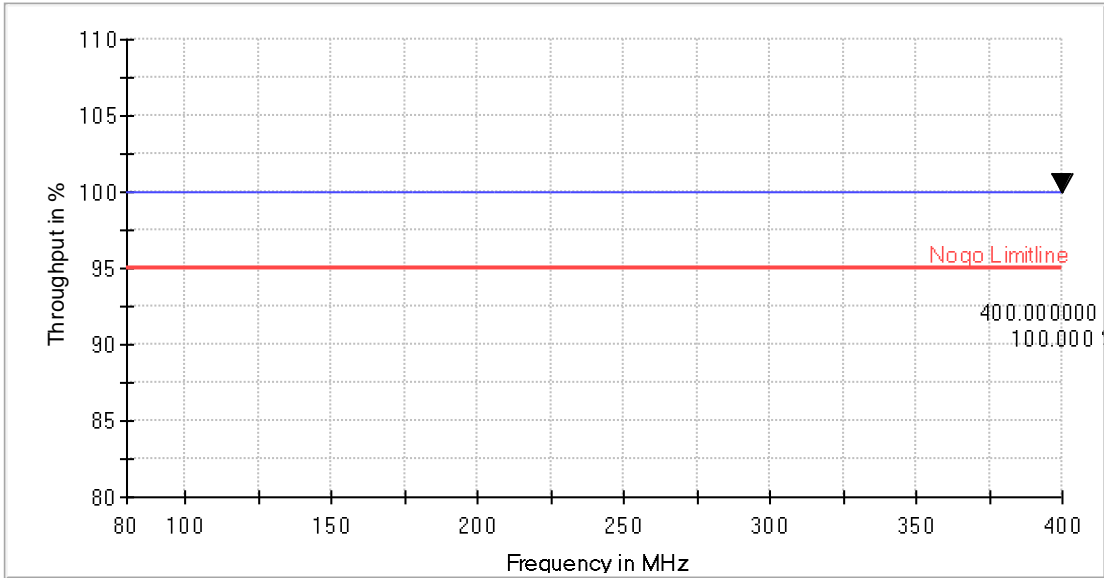
Vertical

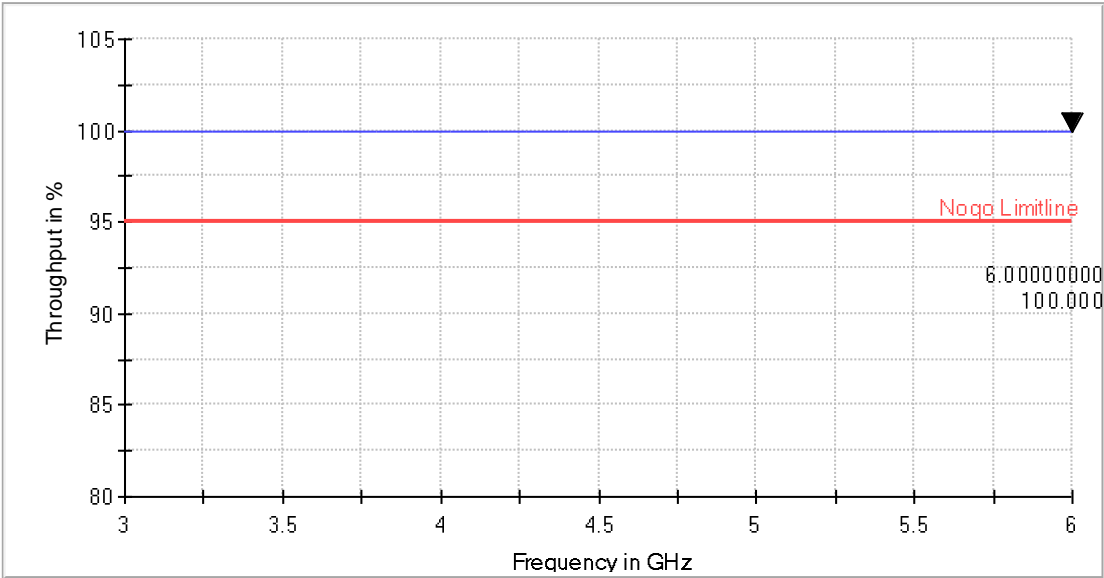
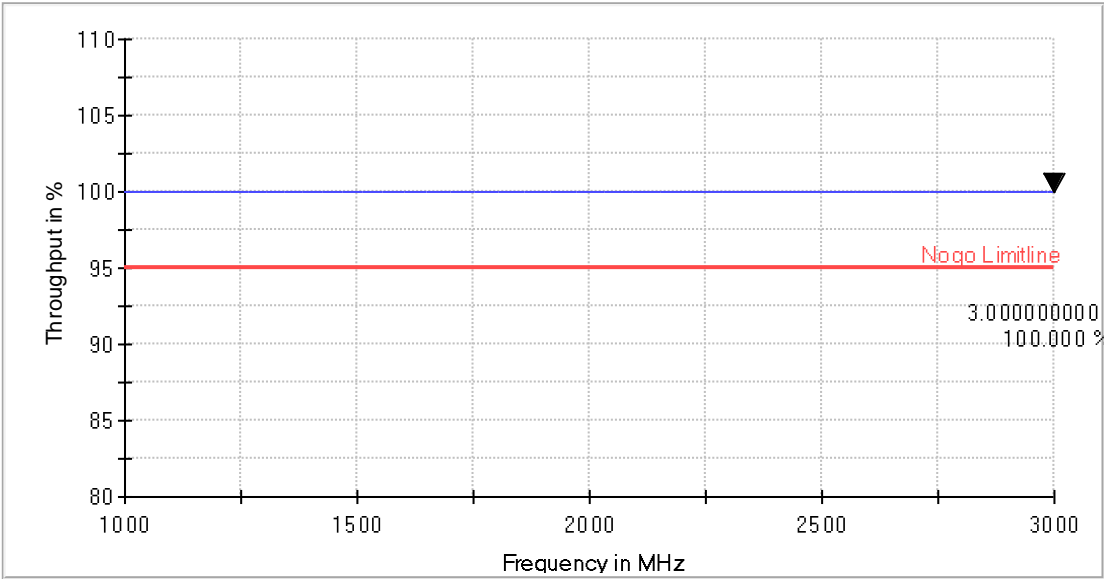




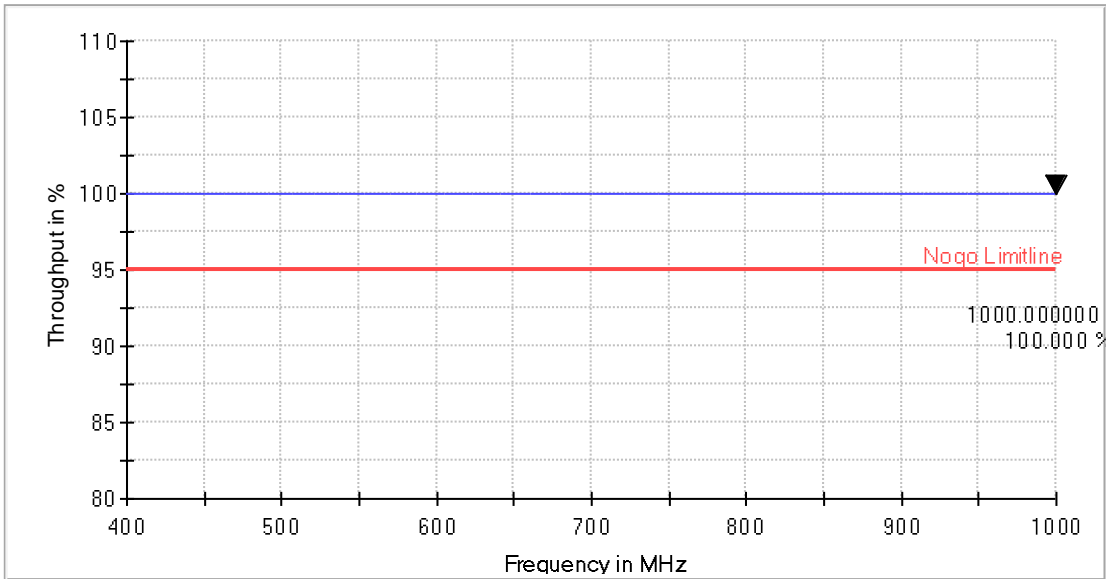
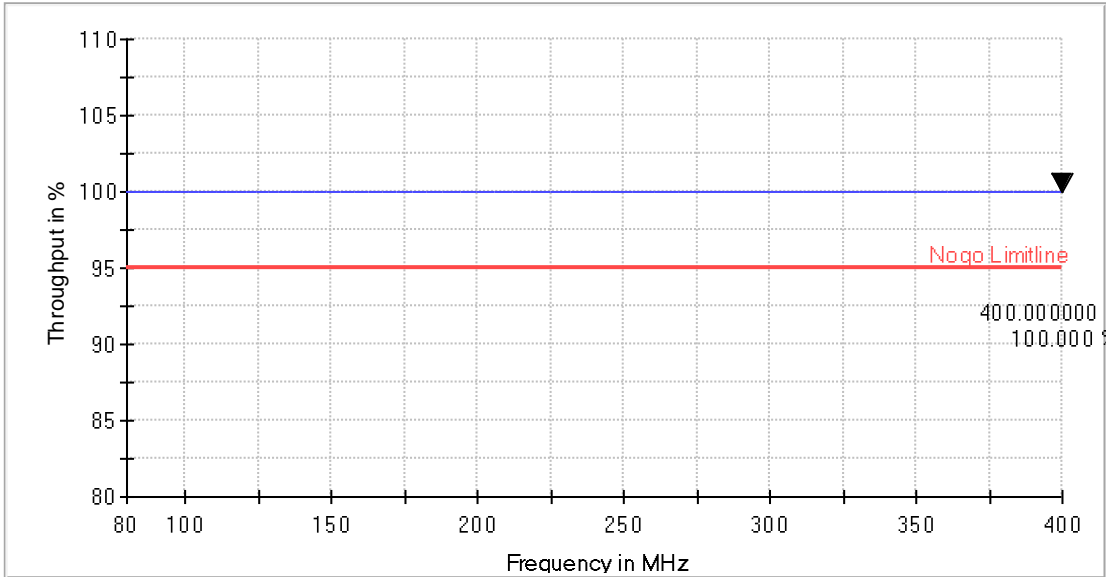
EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 18	Humidity	: 52%

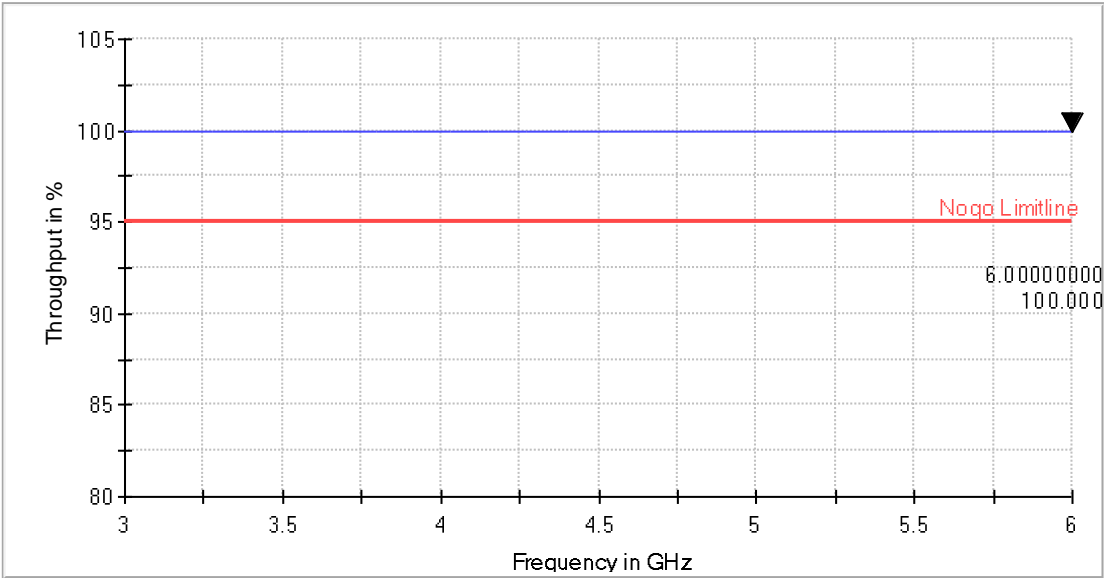
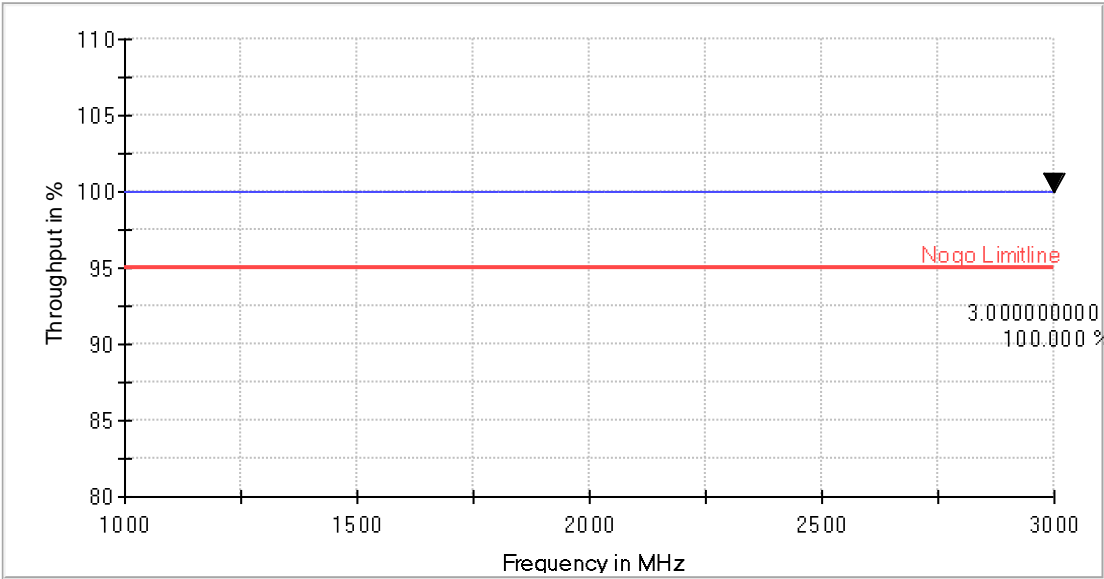
Horizontal





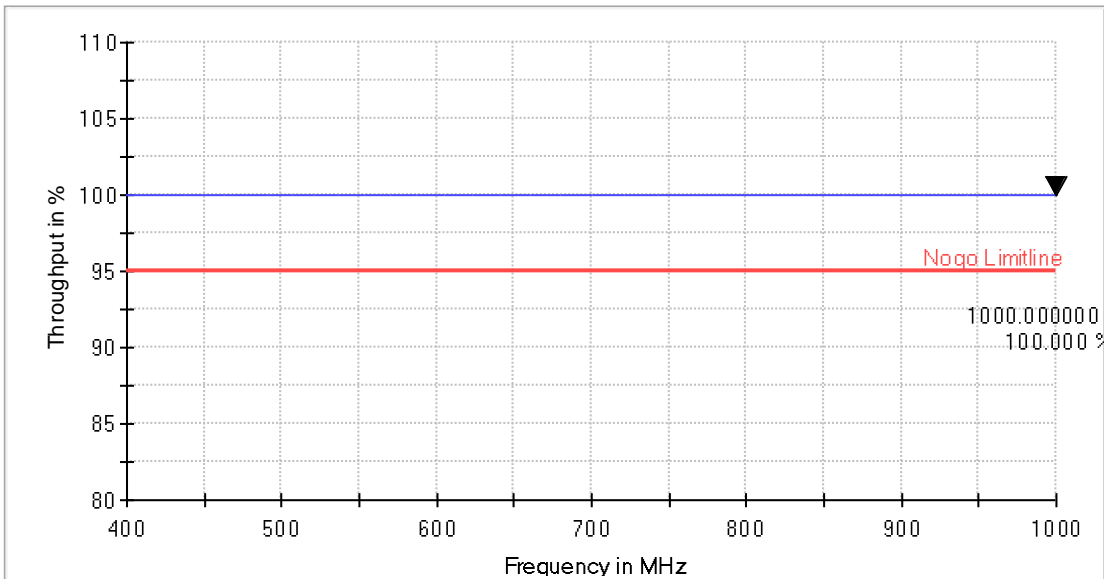
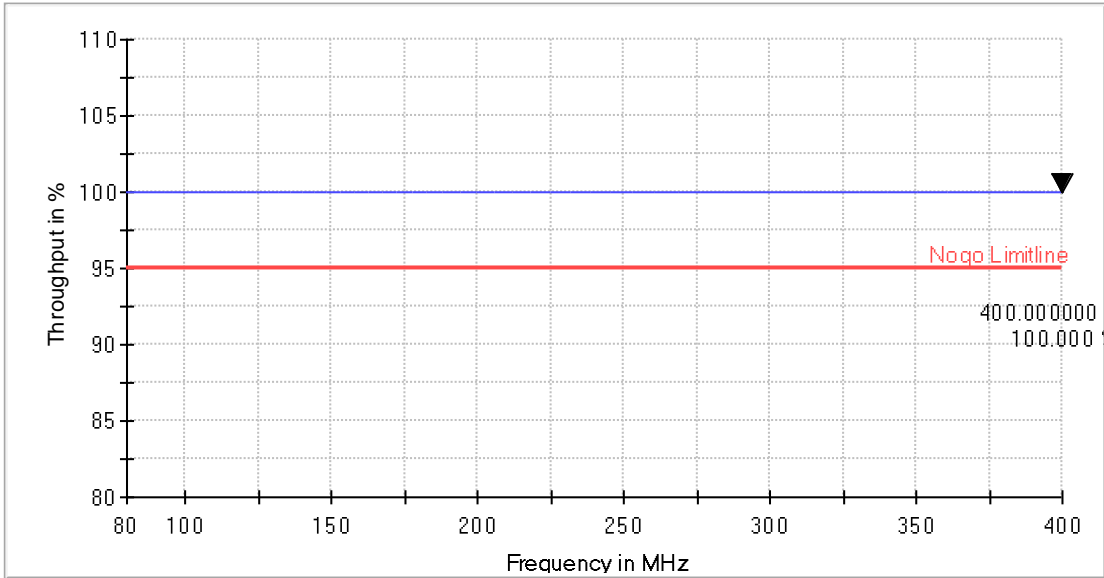
Vertical

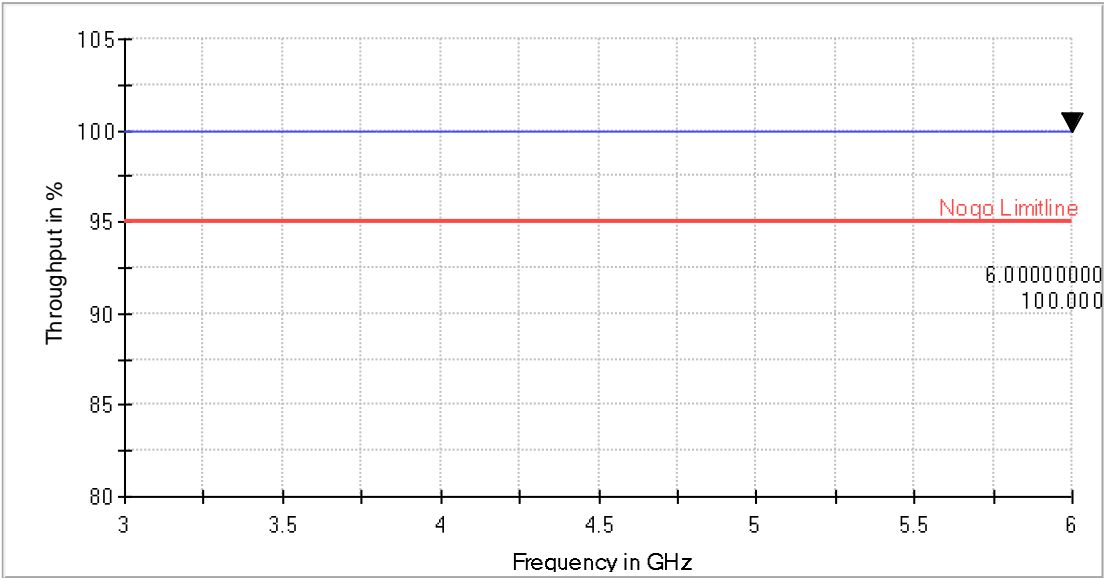
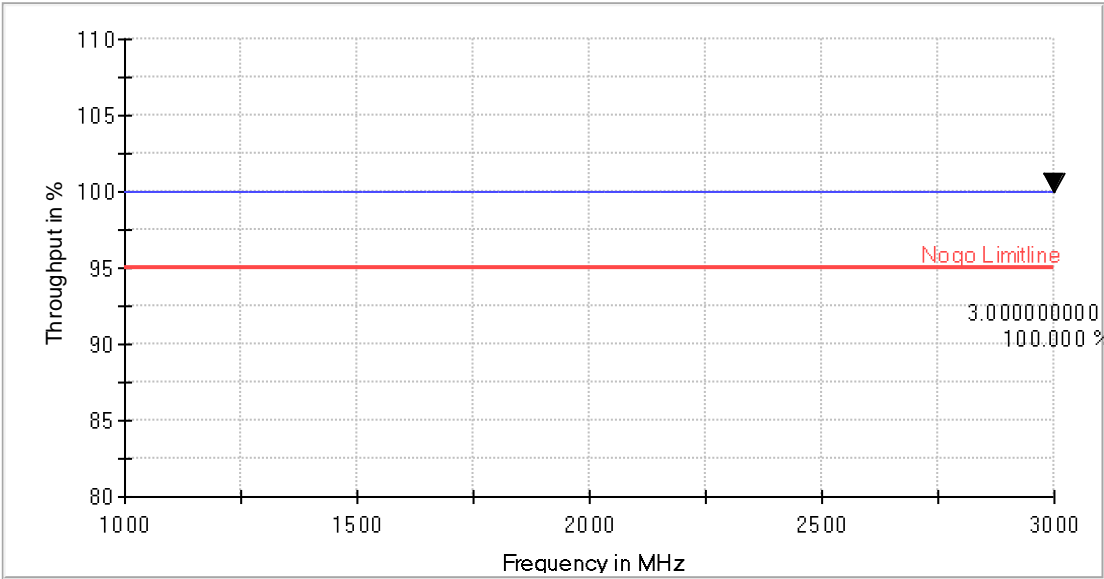




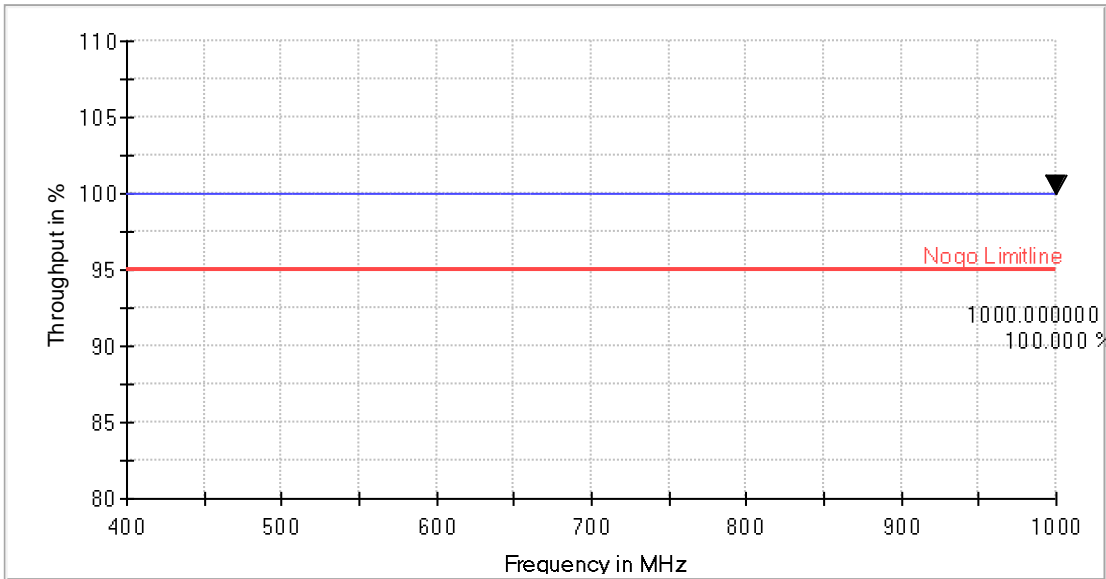
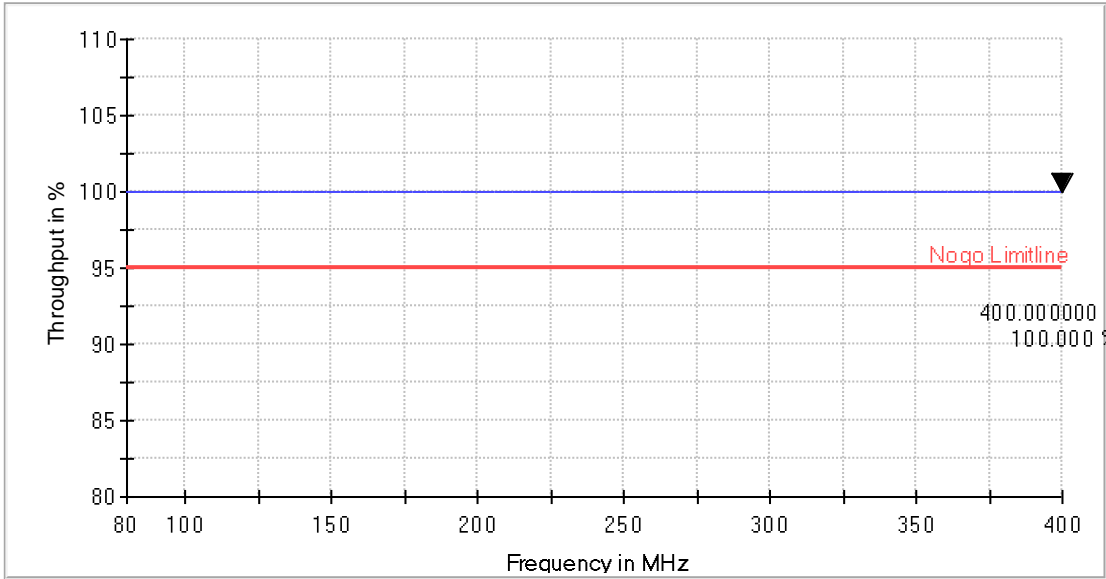
EUT	: LTE MODULE	M/N	: EC25-E, EC25-E MINIPCIE
Power	: DC 4.0V	Temperature	: 20℃
Mode	: Mode 19	Humidity	: 52%

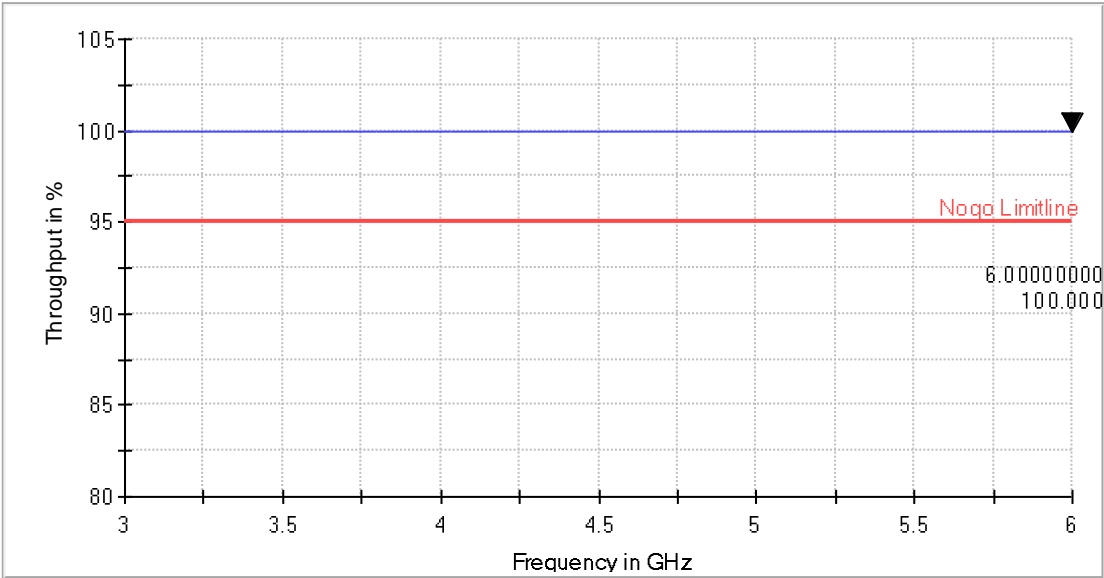
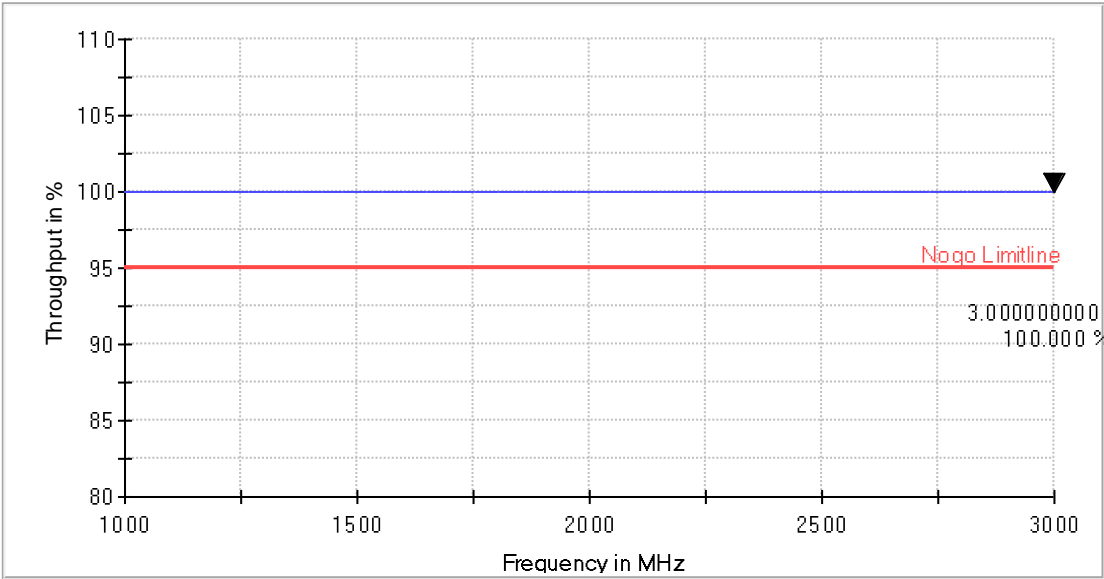
Horizontal





Vertical





EUT : LTE MODULE
Power : DC 4.0V
Mode : Mode 20

M/N : EC25-E, EC25-E MINIPCIE
Temperature : 20℃
Humidity : 52%

Frequency (MHz)	EUT Position	Antenna Polarization	Field Strength (V/m)	EUT Performanc	Result
80 – 6000	Front	Horizontal	3	CT/CR	PASS
80 – 6000	Front	Vertical	3	CT/CR	PASS
80 – 6000	Rear	Horizontal	3	CT/CR	PASS
80 – 6000	Rear	Vertical	3	CT/CR	PASS
80 – 6000	Left	Horizontal	3	CT/CR	PASS
80 – 6000	Left	Vertical	3	CT/CR	PASS
80 – 6000	Right	Horizontal	3	CT/CR	PASS
80 – 6000	Right	Vertical	3	CT/CR	PASS
80 – 6000	Floor	Horizontal	3	CT/CR	PASS
80 – 6000	Floor	Vertical	3	CT/CR	PASS
80 – 6000	Top	Horizontal	3	CT/CR	PASS
80 – 6000	Top	Vertical	3	CT/CR	PASS

4.5 ADDITIONAL RESULT INFORMATION

No observable change for EUT during the test and after test, and the following Performance criteria be conformed:

- In the speech mode, the performance criteria shall be that the Up Link and Down Link speech output levels shall be at least 35 dB less than the recorded reference levels.
- The EUT operate as intended with no loss of user control functions or stored data, and the communication link have been maintained.
- In the data transfer mode, the BER not exceed 0,001 during the test sequence.
- The transmitter did not unintentionally operate at the idle mode.

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Please refer to the file named “EMC Test Setup Photos“

APPENDIX 2 PHOTOGRAPHS OF EUT

Please refer to the file named “EUT Photos “

----End of the report----