

XMit 2020.12.30.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Spectrum Analyzer	Keysight	N9030B	R296	2021-07-15	2022-07-15

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dB.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4. The PAPR was measured using the CCDF function of the spectrum analyzer.

Per FCC Part 27.50, the PAPR limit shall not exceed 13 dB for more than the ANSI described 0.1% of the time.

RF conducted emissions testing was performed only on one port. The AZHL antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown during output power testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i, and 6.4.

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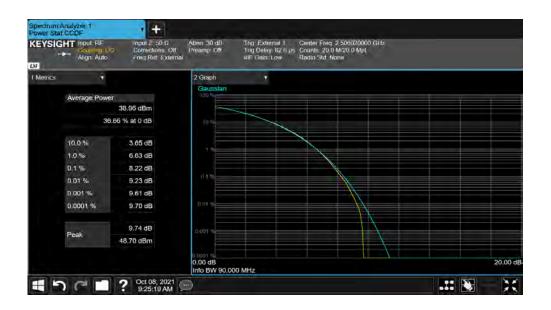


							TbtTx 2019.08.30.0	XMit 2020.12.30.0
EUT:	AZHL (C2PC LTE/5G NR	B41)				Work Order:	NOKI0035	
Serial Number:	YK203400025					Date:	8-Oct-21	
Customer:	Nokia Solutions and Net	works				Temperature:	21.3 °C	
	David Le, John Rattanav	ong				Humidity:		
Project:						Barometric Pres.:		
	Brandon Hobbs		Power:	54 VDC		Job Site:	TX09	
TEST SPECIFICATION	ONS			Test Method				
FCC 27:2021				ANSI C63.26:2015				
COMMENTS								
All losses in the me 86.2us and a gate le	ength = 3.714ms.	counted for: attenuators, cab	oles, DC block and filter whe	n in use. Band n41 carrie	ers and enabled at maximum	power. External 1 gati	ng was set using a	trig delay =
DEVIATIONS FROM	I TEST STANDARD							
None								
Configuration #	2	Signature	7-4	Jan				
						0.1%	Limit	D!!
Don't 1 EC ND Don'd	=44 2406 MH= 2600 MH	-				Value (dB)	(dB)	Result
	n41, 2496 MHz - 2690 MH (NR20) 20 MHz Bandwidth 256QAM Moo	1						
		Low Channel 2506.02 MHz				8.22	13	Pass
		Mid Channel 2592.99 MHz				8.13	13	Pass
		High Channel 2679.99 MHz				8.18	13	Pass
	(NR30) 30 MHz Bandwidth 256QAM Mod							
		Low Channel 2511.00 MHz				8.07	13	Pass
		Mid Channel 2592.99 MHz				7.99	13	Pass
		High Channel 2674.98 MHz				8.09	13	Pass
	(NR40) 40 MHz Bandwidth 256QAM Mod	dulation						
		Low Channel 2516.01 MHz				8.29	13	Pass
		Mid Channel 2592.99 MHz				8.21	13	Pass
		High Channel 2670.00 MHz				8.17	13	Pass
	(NR50) 50 MHz Bandwidth 256QAM Mod	dulation						
		Low Channel 2521.02 MHz				8.27	13	Pass
		Mid Channel 2592.99 MHz				8.11 8.22	13 13	Pass Pass
	(NR60) 60 MHz Bandwidth	High Channel 2664.99 MHz				0.22	13	Pass
	256QAM Mod	dulation				0.46	42	Deec
		Low Channel 2526.00 MHz Mid Channel 2592.99 MHz				8.16 8.09	13 13	Pass Pass
		High Channel 2659.98 MHz				8.17	13	Pass
	(NR70) 70 MHz Bandwidth 256QAM Moo	1				0.17	15	1 833
		Low Channel 2531.01 MHz				8.21	13	Pass
		Mid Channel 2592.99 MHz				8.19	13	Pass
		High Channel 2655.00 MHz				8.25	13	Pass
	(NR80) 80 MHz Bandwidth 256QAM Mod	dulation						
		Low Channel 2536.02 MHz				8.21	13	Pass
		Mid Channel 2592.99 MHz High Channel 2649.99 MHz				8.15 8.29	13 13	Pass Pass
	(NR90) 90 MHz Bandwidth					0.29	13	FdSS
	QPSK Modul	ation				8.03	13	Poor
	16QAM Mode	Mid Channel 2592.99 MHz				0.03	13	Pass
		Mid Channel 2592.99 MHz				8.02	13	Pass
	64QAM Mode						-	
		Mid Channel 2592.99 MHz				8.05	13	Pass
	256QAM Mod							
		Low Channel 2541.00 MHz				8.18	13	Pass
		Mid Channel 2592.99 MHz				8.05	13	Pass
		High Channel 2644.98 MHz				8.22	13	Pass

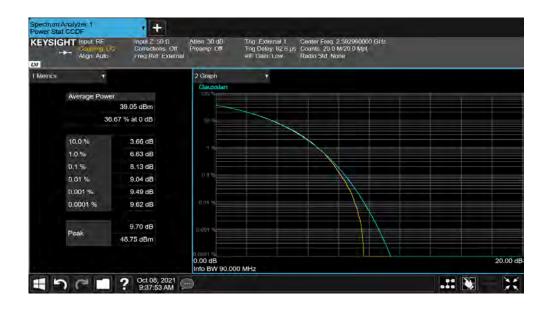
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Port	1, 5G NR, Band	n41, 2496 MHz -	2690 MHz, (NR2	20) 20 MHz Band	width, 256QAM N	Iodulation, Low C	hannel 2506.02 I	ИHz
			•	,	0.1%	Limit		
							Danult	
_					Value (dB)	(dB)	Result	_
			-		8.22	13	Pass	



Por	t 1, 5G NR, Band	l n41, 2496 MHz -	- 2690 MHz, (NR2	20) 20 MHz Band	width, 256QAM N	Modulation, Mid C	hannel 2592.99 N	ИНz
					0.1%	Limit		
					Value (dB)	(dB)	Result	
					8.13	13	Pass	



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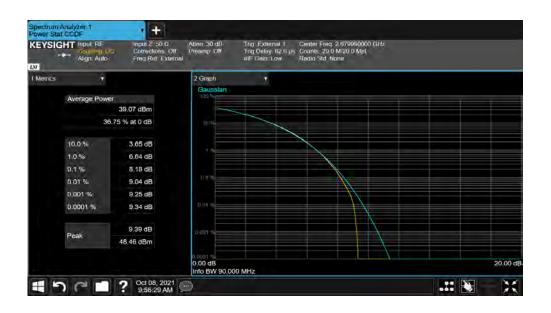


Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR20) 20 MHz Bandwidth, 256QAM Modulation, High Channel 2679.99 MHz

0.1% Limit

Value (dB) (dB) Result

8.18 13 Pass



Por	t 1, 5G NR, Band	n41, 2496 MHz -	2690 MHz, (NR3	30) 30 MHz Band	width, 256QAM N	lodulation, Low C	hannel 2511.00 N	ЛНz
					0.1%	Limit		
					Value (dB)	(dB)	Result	
					8.07	13	Pass	



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Port	1, 5G NR, Band	n41, 2496 MHz	- 2690 MHz, (NR3	30) 30 MHz Band	width, 256QAM N	Modulation, Mid C	hannel 2592.99 N	1Hz
					0.1%	Limit		
					Value (dB)	(dB)	Result	
					7.99	13	Pass	



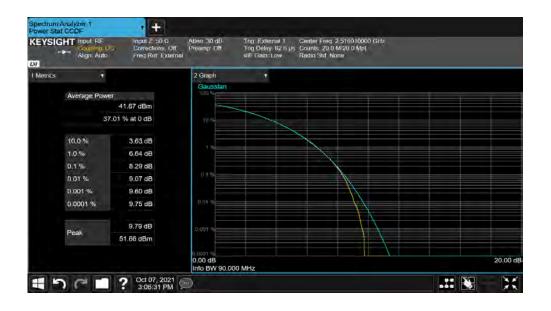
Port	1, 5G NR, Band	n41, 2496 MHz -	2690 MHz, (NR3	0) 30 MHz Bandv	vidth, 256QAM M	lodulation, High C	Channel 2674.98	MHz
					0.1%	Limit		
					Value (dB)	(dB)	Result	
					8.09	13	Pass	



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Port	1, 5G NR, Band	n41, 2496 MHz -	2690 MHz, (NR4	10) 40 MHz Band	width, 256QAM N	Indulation, Low C	hannel 2516.01 I	ИHz
		·	•	,	0.1%	Limit		
							Danult	
_					Value (dB)	(dB)	Result	_
ı		-			8.29	13	Pass	



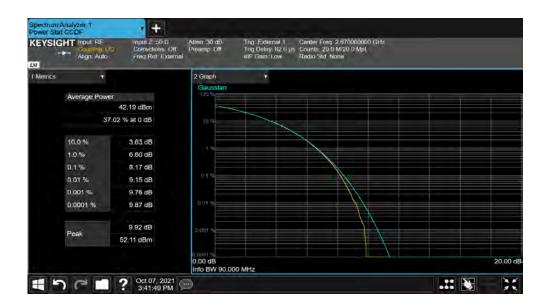
Por	t 1, 5G NR, Band	l n41, 2496 MHz -	- 2690 MHz, (NR4	10) 40 MHz Band	width, 256QAM N	Modulation, Mid C	hannel 2592.99 N	ИНz
					0.1%	Limit		
					Value (dB)	(dB)	Result	
					8.21	13	Pass	



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Por	t 1, 5G NR, Band	n41, 2496 MHz -	2690 MHz, (NR4	0) 40 MHz Band	vidth, 256QAM M	lodulation, High C	Channel 2670.00
					0.1%	Limit	
					Value (dB)	(dB)	Result
					8.17	13	Pass



Por	t 1, 5G NR, Band	n41, 2496 MHz -	2690 MHz, (NR5	50) 50 MHz Band	width, 256QAM N	lodulation, Low C	hannel 2521.02 l	ЛНz
					0.1%	Limit		
					Value (dB)	(dB)	Result	
					8.27	13	Pass	



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Port	1, 5G NR, Band	I n41, 2496 MHz	- 2690 MHz, (NR	50) 50 MHz Band	width, 256QAM N	Modulation, Mid C	hannel 2592.99 N	ЛHz
					0.1%	Limit		
					Value (dB)	(dB)	Result	
					8.11	13	Pass	



Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR50) 50 MHz Bandwidth, 256QAM Modulation, High Channel 2664.99 MHz										
0.1% Limit										
	Value (dB) (dB) Result									
					8.22	13	Pass			



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Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR60) 60 MHz Bandwidth, 256QAM Modulation, Low Channel 2526.00 MHz									
					0.1%	Limit			
					Value (dB)	(dB)	Result		
					8.16	13	Pass		



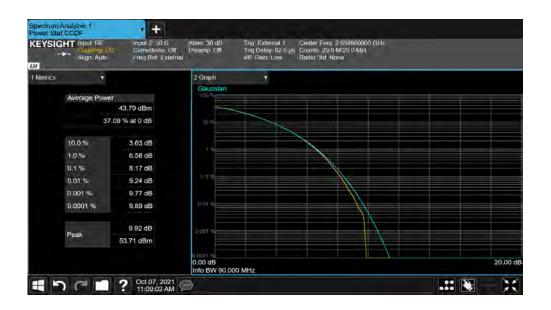
Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR60) 60 MHz Bandwidth, 256QAM Modulation, Mid Channel 2592.99 MHz									
0.1% Limit									
Value (dB) (dB) Result									
					8.09	13	Pass		



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Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR60) 60 MHz Bandwidth, 256QAM Modulation, High Channel 2659.98 MHz										
0.1% Limit										
	Value (dB) (dB) Result									
					value (ub)	(45)	rtoourt	-		
					8.17	13	Pass			



Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR70) 70 MHz Bandwidth, 256QAM Modulation, Low Channel 2531.01 MHz										
0.1% Limit										
	Value (dB) (dB) Result									
					8.21	13	Pass			



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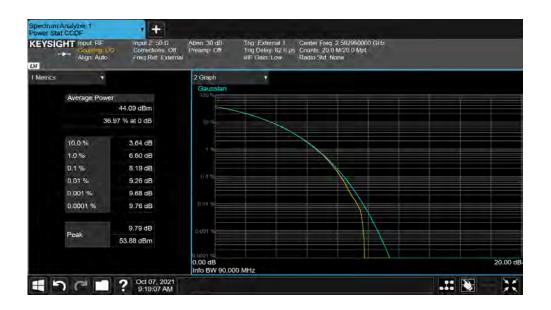


Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR70) 70 MHz Bandwidth, 256QAM Modulation, Mid Channel 2592.99 MHz

0.1% Limit

Value (dB) (dB) Result

8.19 13 Pass



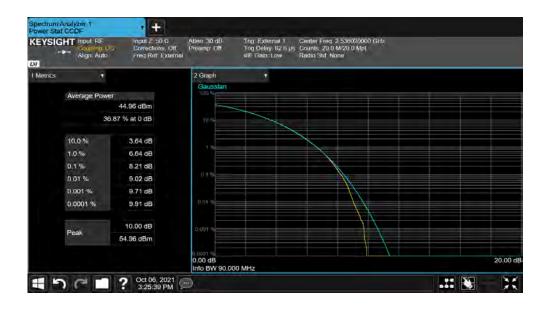
Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR70) 70 MHz Bandwidth, 256QAM Modulation, High Channel 2655.00 MHz										
0.1% Limit										
	Value (dB) (dB) Result									
					8.25	13	Pass			



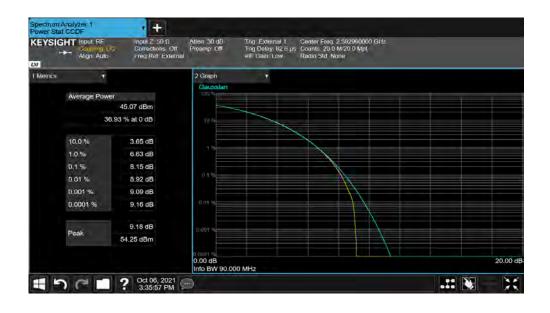
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Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR80) 80 MHz Bandwidth, 256QAM Modulation, Low Channel 2536.02 MHz										
0.1% Limit										
_					Value (dB)	(dB)	Result	_		
					8.21	13	Pass			



Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR80) 80 MHz Bandwidth, 256QAM Modulation, Mid Channel 2592.99 MHz									
0.1% Limit									
	Value (dB) (dB) Result								
					8.15	13	Pass		



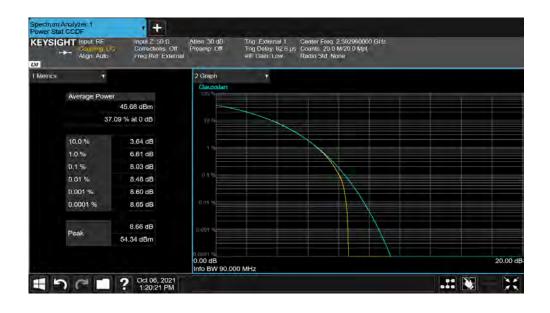
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Por	rt 1, 5G NR, Band	n41, 2496 MHz -	2690 MHz, (NR8	0) 80 MHz Band	vidth, 256QAM M	odulation, High C	Channel 2649.99 I
					0.1%	Limit	
					Value (dB)	(dB)	Result
					8.29	13	Pass



Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR90) 90 MHz Bandwidth, QPSK Modulation, Mid Channel 2592.99 MHz									
0.1% Limit									
	Value (dB) (dB) Result								
					8.03	13	Pass		



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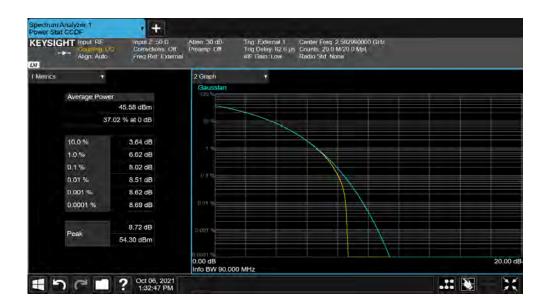


Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR90) 90 MHz Bandwidth, 16QAM Modulation, Mid Channel 2592.99 MHz

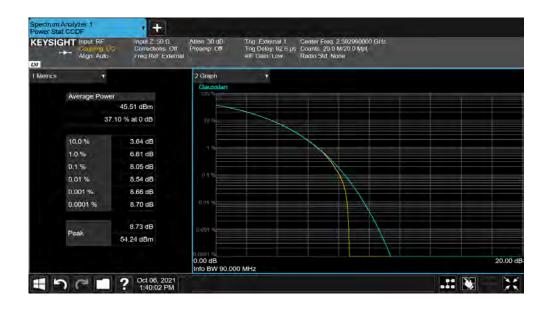
0.1% Limit

Value (dB) (dB) Result

8.02 13 Pass



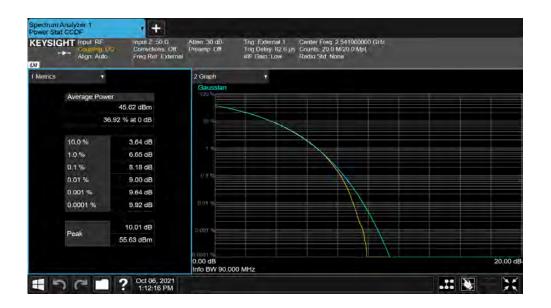
Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR90) 90 MHz Bandwidth, 64QAM Modulation, Mid Channel 2592.99 MHz									
0.1% Limit									
	Value (dB) (dB) Result								
					8.05	13	Pass		



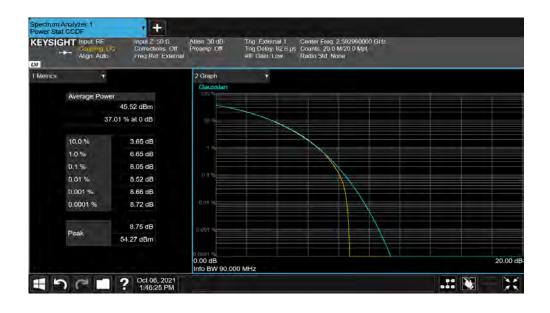
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Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR90) 90 MHz Bandwidth, 256QAM Modulation, Low Channel 2541.00 MHz										
	0.1% Limit									
	Value (dB) (dB) Result									
					8.18	13	Pass	1		



Po	ort 1, 5G NR, Band	l n41, 2496 MHz -	- 2690 MHz, (NR	90) 90 MHz Band	width, 256QAM N	Modulation, Mid C	hannel 2592.99 N	ИHz
					0.1%	Limit		
					Value (dB)	(dB)	Result	
					8.05	13	Pass	



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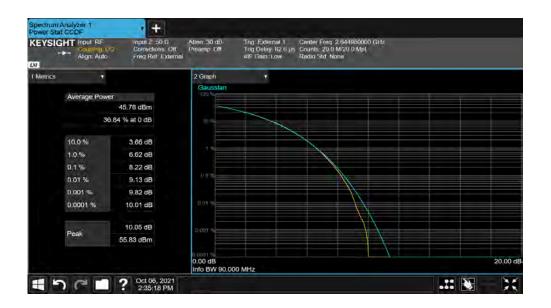


Port 1, 5G NR, Band n41, 2496 MHz - 2690 MHz, (NR90) 90 MHz Bandwidth, 256QAM Modulation, High Channel 2644.98 MHz

0.1% Limit

Value (dB) (dB) Result

8.22 13 Pass



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Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Spectrum Analyzer	Keysight	N9030B	R296	2021-07-15	2022-07-15

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dB.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4. The PAPR was measured using the CCDF function of the spectrum analyzer.

Per FCC 27.50, the PAPR limit shall not exceed 13 dB for more than the ANSI described 0.1% of the time.

RF conducted emissions testing was performed only on one port. The AZHL antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown during output power testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i, and 6.4.

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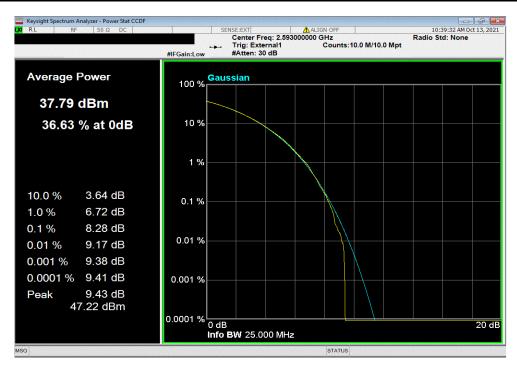


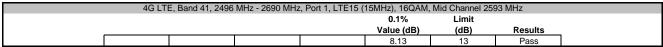
EUT. AZU				TbtTx 2021.03.19.	1 XMit 2020
	L (C2PC LTE/5G NR B41)		Work Order:		
Serial Number: YK2				13-Oct-21	
Customer: Nok	ia Solutions and Networks		Temperature:	22.9 °C	
Attendees: Davi	id Le, John Rattanavong		Humidity:	52% RH	
Project: Non	e		Barometric Pres.:	1011 mbar	
Tested by: Bran		Power: 54 VDC	Job Site:	TX09	
ST SPECIFICATIONS		Test Method			
27:2021		ANSI C63.26:2015			
MMENTS					
osses in the measur	ement path were accounted for	attenuators, cables, DC block and filter when in use. Band n41 care	riers and enabled at maximum power. External 1 gati	ng was set using a	trig delav =
4ms and a gate leng	th = 6.8061ms.				
/IATIONS FROM TES	ST STANDARD				
е					
nfiguration #	2	7-1			
		Signature			
•	•	•	0.1%	Limit	
			Value (dB)	(dB)	Results
LTE. Band 41. 2496 N	IHz - 2690 MHz		Talab (a2)	()	Nesuits
			value (az)	()	Results
TE, Band 41, 2496 N. Port	1		value (us)	()	Nesuna
	1 LTE15 (15MHz)		· and (all)	(==)	Results
	1	Mid Channal 2503 MHz		, ,	
	1 LTE15 (15MHz) QPSK	Mid Channel 2593 MHz	8.28	13	Pass
	1 LTE15 (15MHz)		8.28	13	Pass
	1 LTE15 (15MHz) QPSK	Mid Channel 2593 MHz Mid Channel 2593 MHz		, ,	
	1 LTE15 (15MHz) QPSK	Mid Channel 2593 MHz	8.28 8.13	13 13	Pass Pass
	1 LTE15 (15MHz) QPSK 16QAM 64QAM		8.28	13	Pass
	1 LTE15 (15MHz) QPSK	Mid Channel 2593 MHz Mid Channel 2593 MHz	8.28 8.13 8.10	13 13 13	Pass Pass Pass
	1 LTE15 (15MHz) QPSK 16QAM 64QAM	Mid Channel 2593 MHz Mid Channel 2593 MHz Low Channel 2503.5 MHz	8.28 8.13 8.10 7.98	13 13 13	Pass Pass Pass Pass
	1 LTE15 (15MHz) QPSK 16QAM 64QAM	Mid Channel 2593 MHz Mid Channel 2593 MHz Low Channel 2503.5 MHz Mid Channel 2593 MHz	8.28 8.13 8.10 7.98 8.09	13 13 13 13	Pass Pass Pass Pass Pass
	1 LTE15 (15MHz) QPSK 16QAM 64QAM 256QAM	Mid Channel 2593 MHz Mid Channel 2593 MHz Low Channel 2503.5 MHz	8.28 8.13 8.10 7.98	13 13 13	Pass Pass Pass Pass
	1 LTE15 (15MHz) QPSK 16QAM 64QAM 256QAM LTE20 (20MHz)	Mid Channel 2593 MHz Mid Channel 2593 MHz Low Channel 2503.5 MHz Mid Channel 2593 MHz	8.28 8.13 8.10 7.98 8.09	13 13 13 13	Pass Pass Pass Pass Pass
	1 LTE15 (15MHz) QPSK 16QAM 64QAM 256QAM	Mid Channel 2593 MHz Mid Channel 2593 MHz Low Channel 2503.5 MHz Mid Channel 2593 MHz High Channel 2682.5 MHz	8.28 8.13 8.10 7.98 8.09 8.06	13 13 13 13 13 13	Pass Pass Pass Pass Pass Pass Pass
	1 LTE15 (15MHz) QPSK 16QAM 64QAM 256QAM LTE20 (20MHz)	Mid Channel 2593 MHz Mid Channel 2593 MHz Low Channel 2503.5 MHz Mid Channel 2593 MHz High Channel 2682.5 MHz Low Channel 2680.5 MHz	8.28 8.13 8.10 7.98 8.09 8.06	13 13 13 13 13 13 13	Pass Pass Pass Pass Pass Pass Pass
LTE, Band 41, 2496 M Port	1 LTE15 (15MHz) QPSK 16QAM 64QAM 256QAM LTE20 (20MHz)	Mid Channel 2593 MHz Mid Channel 2593 MHz Low Channel 2503.5 MHz Mid Channel 2593 MHz High Channel 2682.5 MHz	8.28 8.13 8.10 7.98 8.09 8.06	13 13 13 13 13 13	Pass Pass Pass Pass Pass Pass Pass

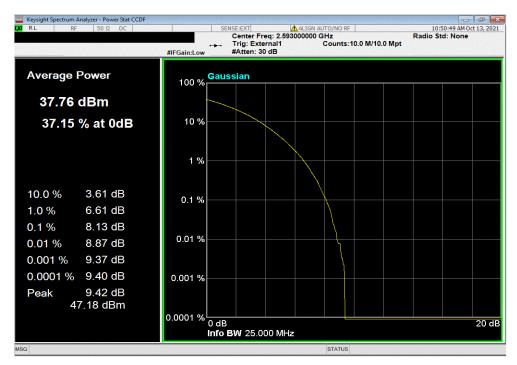
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4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE15 (15MHz), QPSK, Mid Channel 2593 MHz
0.1% Limit
Value (dB) (dB) Results
8.28 13 Pass







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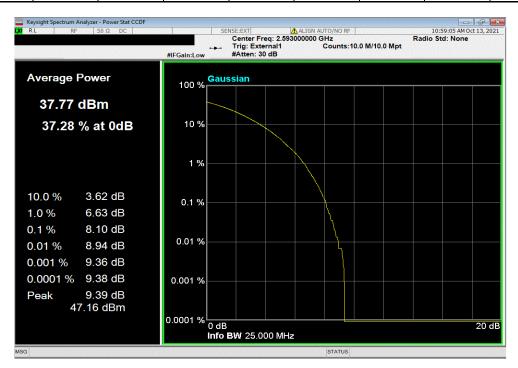


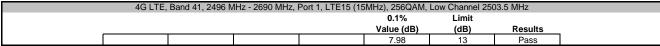
4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE15 (15MHz), 64QAM, Mid Channel 2593 MHz

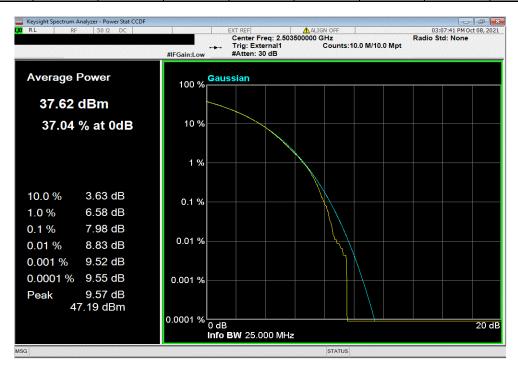
0.1% Limit

Value (dB) (dB) Results

8.1 13 Pass







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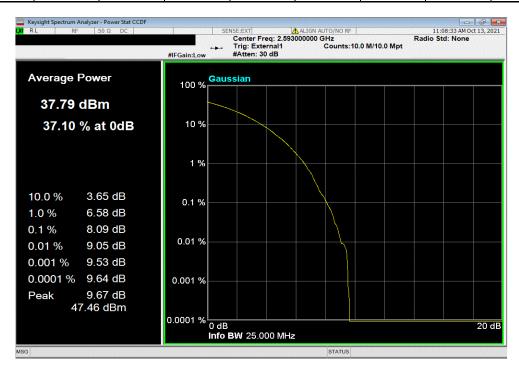


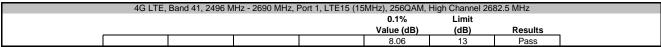
4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE15 (15MHz), 256QAM, Mid Channel 2593 MHz

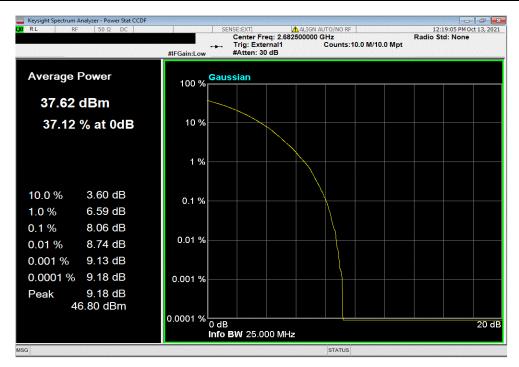
0.1% Limit

Value (dB) (dB) Results

8.09 13 Pass







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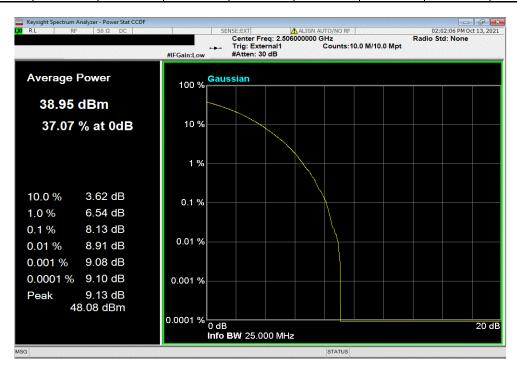


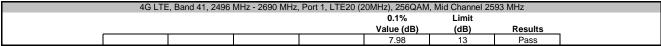
4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE20 (20MHz), 256QAM, Low Channel 2506 MHz

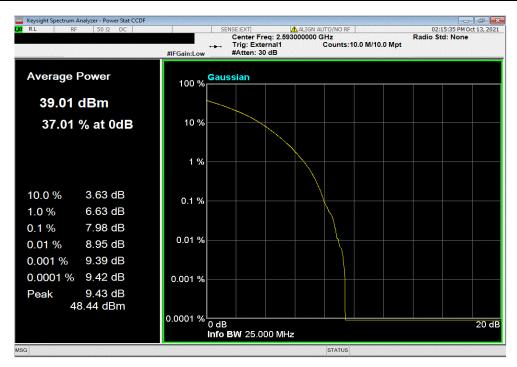
0.1% Limit

Value (dB) (dB) Results

8.13 13 Pass







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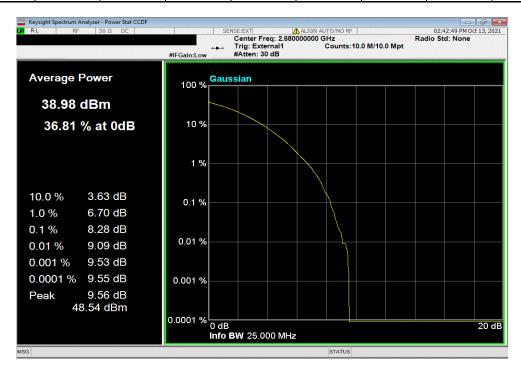
4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE20 (20MHz), 256QAM, High Channel 2680 MHz

0.1%

Limit

Value (dB) (dB) Results

8.28 13 Pass



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