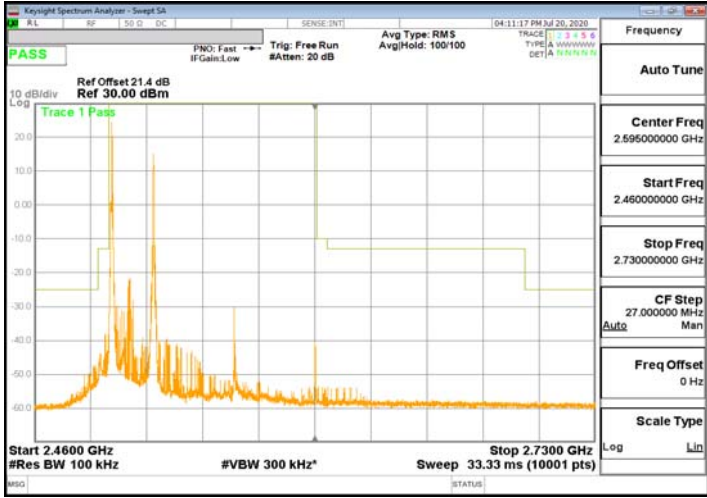
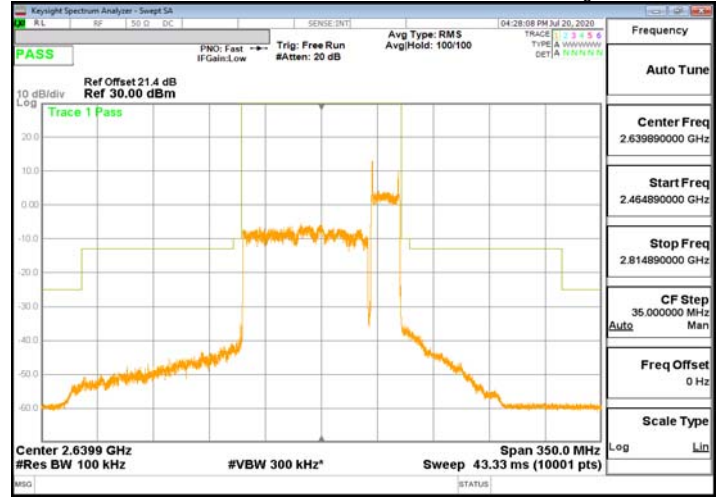


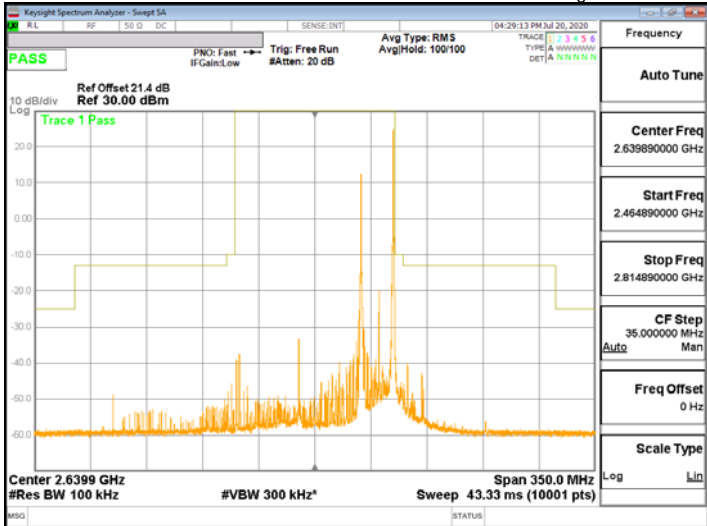
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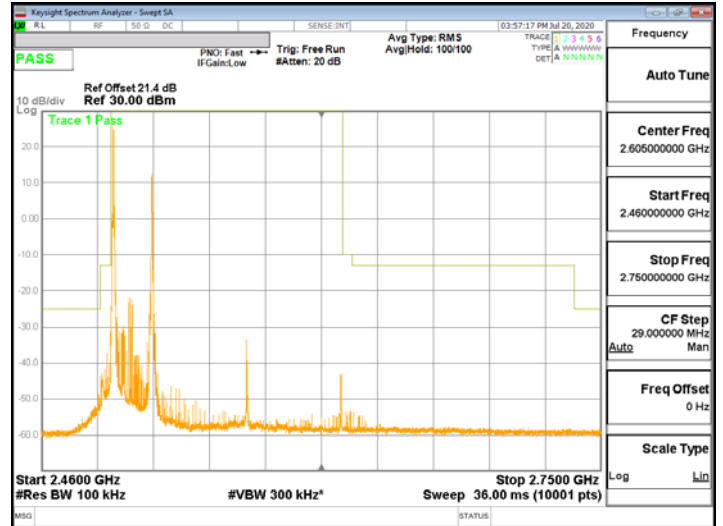
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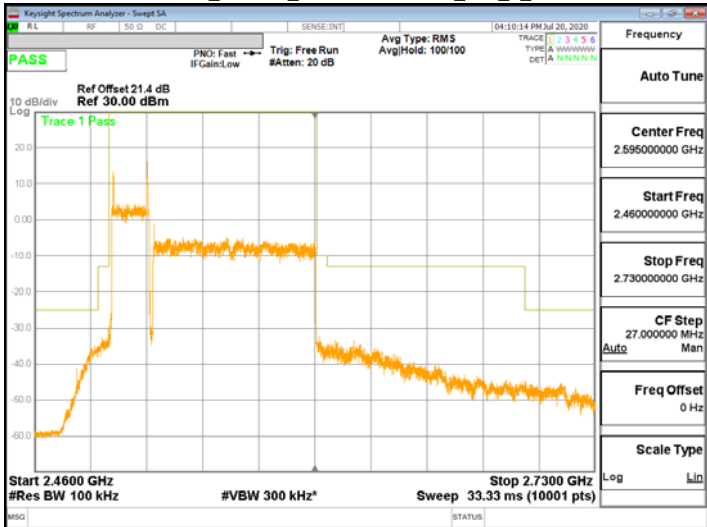
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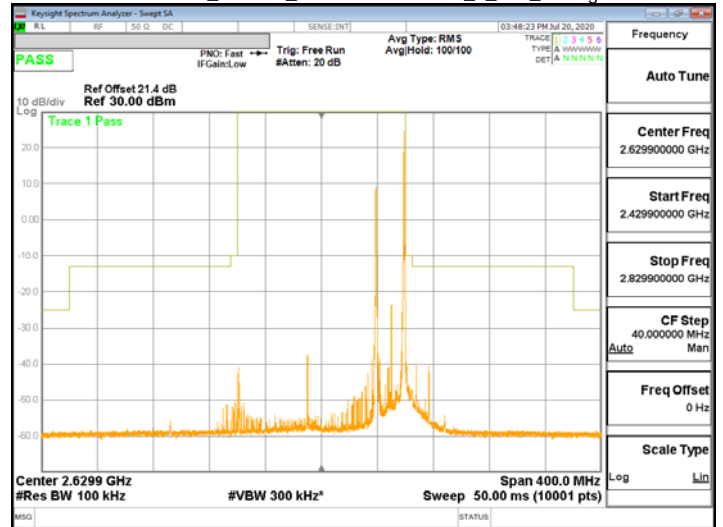
CP-OFDM_Band41_20+100MHzQPSK_1_0_CHLow



CP-OFDM_Band41_20+80MHzQPSK_217_0_CHLow



CP-OFDM_Band41_20+100MHzQPSK_1_272_CHHigh

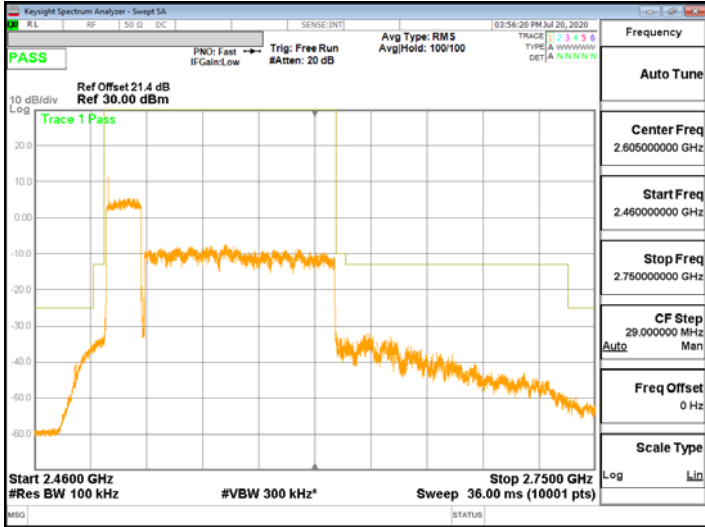


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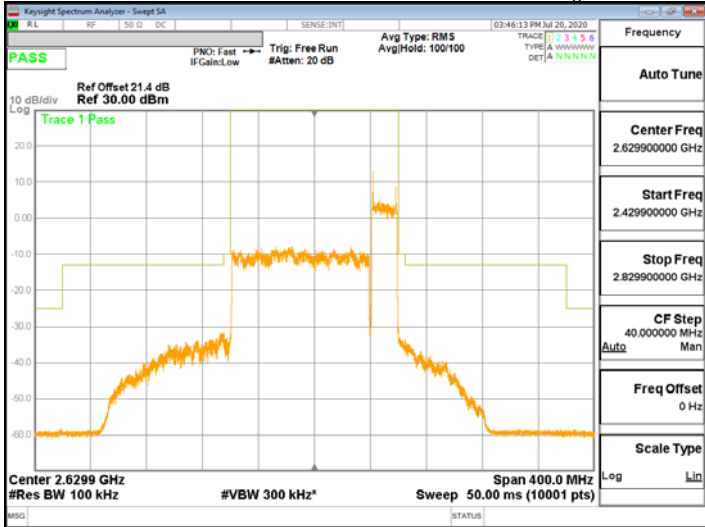
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CP-OFDM_Band41_20+100MHz\QPSK_273_0_CHLow



CP-OFDM_Band41_20+100MHz\QPSK_273_0_CHHigh



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9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

9.1 Standard Applicable

According to FCC §2.1053,

RSS-199 §4.5

Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

FCC §27.53(m) (4) (6) for LTE B41

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

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RSS-199 §4.5 for LTE B41

In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

$40 + 10 \log_{10} p$ from the channel edges to 5 MHz away

$43 + 10 \log_{10} p$ between 5 MHz and X MHz from the channel edges, and

$55 + 10 \log_{10} p$ at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than $43 + 10 \log_{10} p$ on all frequencies between 2490.5 MHz and 2496 MHz, and $55 + 10 \log_{10} p$ at or below 2490.5 MHz.

In (a) and (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

Table 2 — Unwanted Emissions for Mobile, Portable and Low-Power Fixed Subscriber Equipment

Frequency (MHz)	Attenuation (dB)
<2200	$43 + 10 \log_{10}(p)$
2200 - 2288	$70 + 10 \log_{10}(p)$
2288 - 2292	$67 + 10 \log_{10}(p)$
2292 - 2296	$61 + 10 \log_{10}(p)$
2296 - 2300	$55 + 10 \log_{10}(p)$
2300 - 2305	$43 + 10 \log_{10}(p)$
2305 - 2320	$43 + 10 \log_{10}(p)$ ^{Note}
2320 - 2324	$55 + 10 \log_{10}(p)$
2324 - 2328	$61 + 10 \log_{10}(p)$
2328 - 2337	$67 + 10 \log_{10}(p)$
2337 - 2341	$61 + 10 \log_{10}(p)$
2341 - 2345	$55 + 10 \log_{10}(p)$
2345 - 2360	$43 + 10 \log_{10}(p)$ ^{Note}
2360 - 2365	$43 + 10 \log_{10}(p)$
2365 - 2395	$70 + 10 \log_{10}(p)$
>2395	$43 + 10 \log_{10}(p)$

Note: Measured at the edges of the highest and lowest frequency range(s) in which the equipment is designed to operate. See Section 1.2 for the permitted frequency ranges for various equipment types.

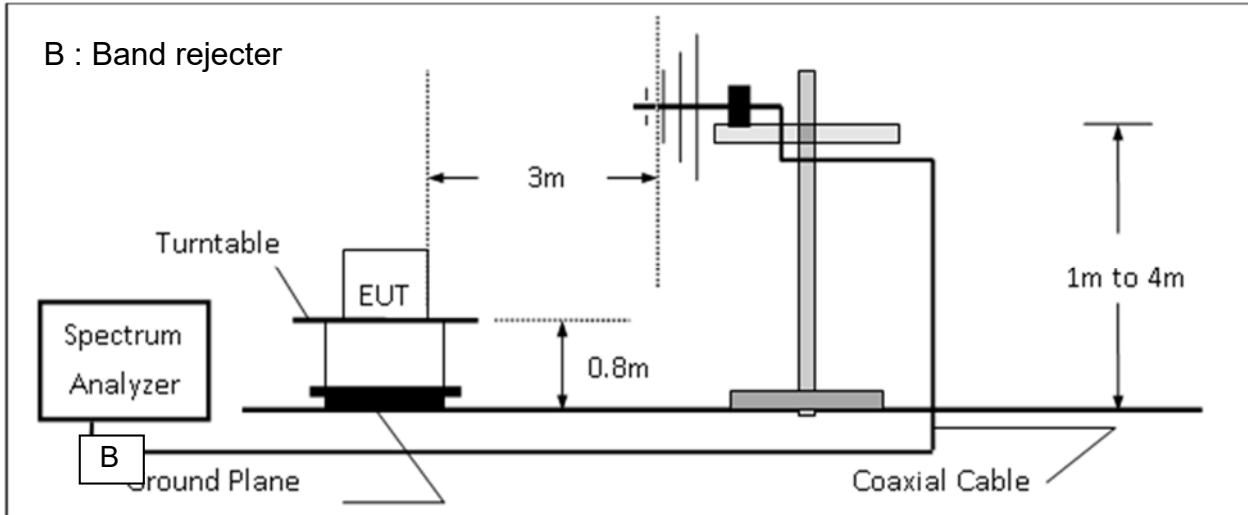
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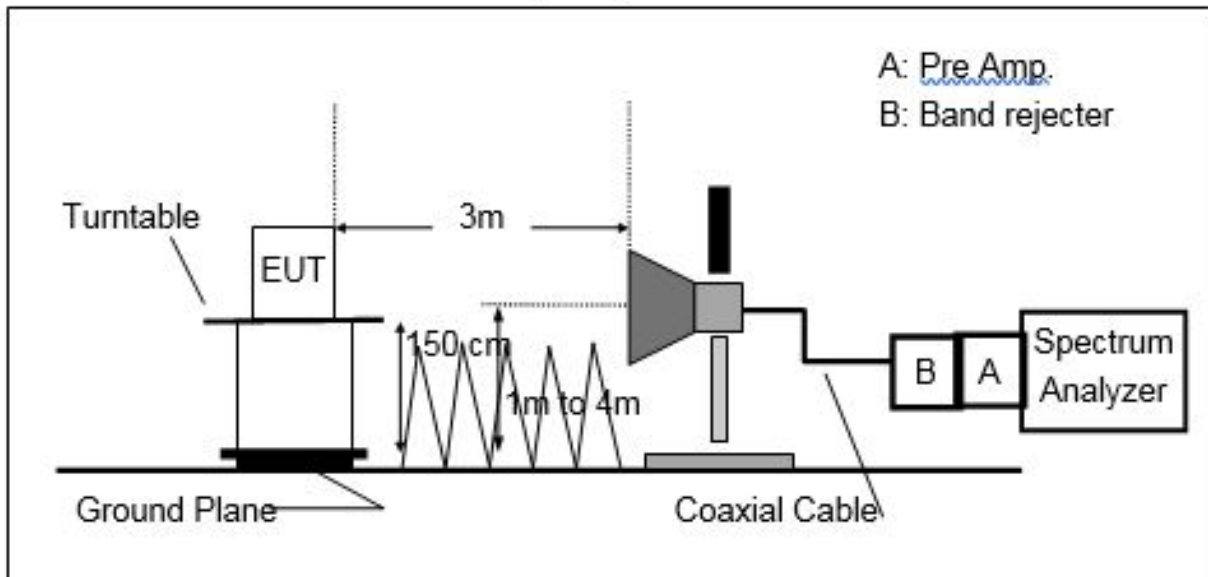
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9.2 EUT Setup

Radiated Emission Test Set-Up, Frequency Below 1000MHz



Radiated Emission Test Set-UP Frequency Over 1 GHz



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9.3 Measurement Procedure:

The EUT was placed on a non-conductive; the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$$\text{ERP (dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

$$\text{EIRP (dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

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9.4 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Horn Antenna	Schwarzbeck	BBHA9170	185	08/07/2019	08/06/2020
Horn Antenna	Schwarzbeck	BBHA9120D	D803	12/20/2019	12/19/2020
Bi-log Antenna	TESEO	CBL 6112D	35242 & AT-N0555	01/13/2020	01/12/2021
Spectrum Analyzer	Agilent	E4446A	MY51100003	10/23/2019	10/22/2020
EMI Test Receiver	R&S	ESCI 7	100759	07/13/2020	07/12/2021
UXM 5G	KEYSIGHT	E7515B	MY59321561	12/16/2019	12/15/2020
Pre-Amplifier	EMC Instruments	EMC184045B	980135	01/02/2020	01/01/2021
Pre-Amplifier	EMC Instruments	EMC051825	980152	01/02/2020	01/01/2021
Pre-Amplifier	HP	8447D	2944A09469	01/02/2020	01/01/2021
Filter 800-1000	Micro-Tronics	EWT	M1	01/02/2020	01/01/2021
Filter 1700-2000	Micro-Tronics	EWT	M3	01/02/2020	01/01/2021
Filter 2240-2700	Micro-Tronics	WI	2	01/02/2020	01/01/2021
High Pass Filter	WI	WHKX4.0/18G-10SS	22	01/02/2020	01/01/2021
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	01/02/2020	01/01/2021
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	01/02/2020	01/01/2021
Coaxial Cable	Huber Suhner	succoflex 102	MY2622/2	01/02/2020	01/01/2021
Coaxial Cable	Huber Suhner	succoflex 104A	800086/4a	01/02/2020	01/01/2021
Coaxial Cable	Huber Suhner	EMC 104-SM-SM-2000	160123	01/02/2020	01/01/2021

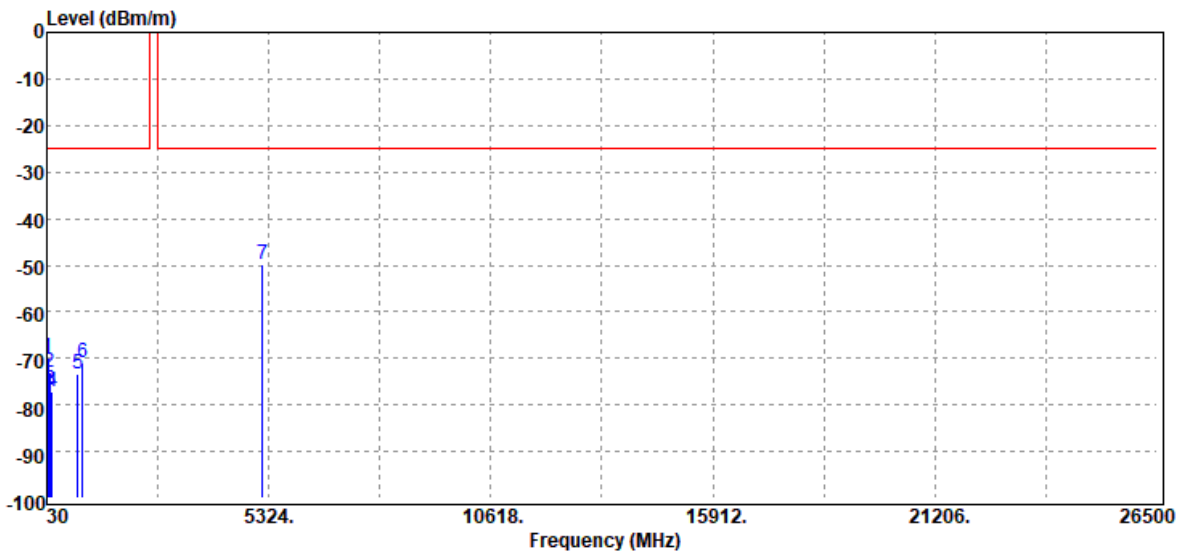
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9.5 Measurement Result:

Report Number	:ER/2020/30084	Test Site	:SAC I Chamber
Operation Mode	:41A_n41 (Contiguous)	Test Date	:2020-07-21
Test Mode	:Tx CH Mid	Temp./Humi.	:26.4/67
EUT Pol	:E1 Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2633.1_2583.09 MHz	Engineer	:Neo



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
62.01	-69.80	-54.66	-14.38	-0.76	-25.00	-44.80
90.14	-73.01	-66.30	-5.81	-0.90	-25.00	-48.01
109.54	-76.79	-68.70	-7.09	-1.00	-25.00	-51.79
159.01	-77.03	-68.82	-7.00	-1.21	-25.00	-52.03
765.26	-73.32	-69.15	-1.77	-2.40	-25.00	-48.32
890.39	-70.86	-66.46	-1.45	-2.95	-25.00	-45.86
5166.18	-49.88	-55.65	12.80	-7.03	-25.00	-24.88

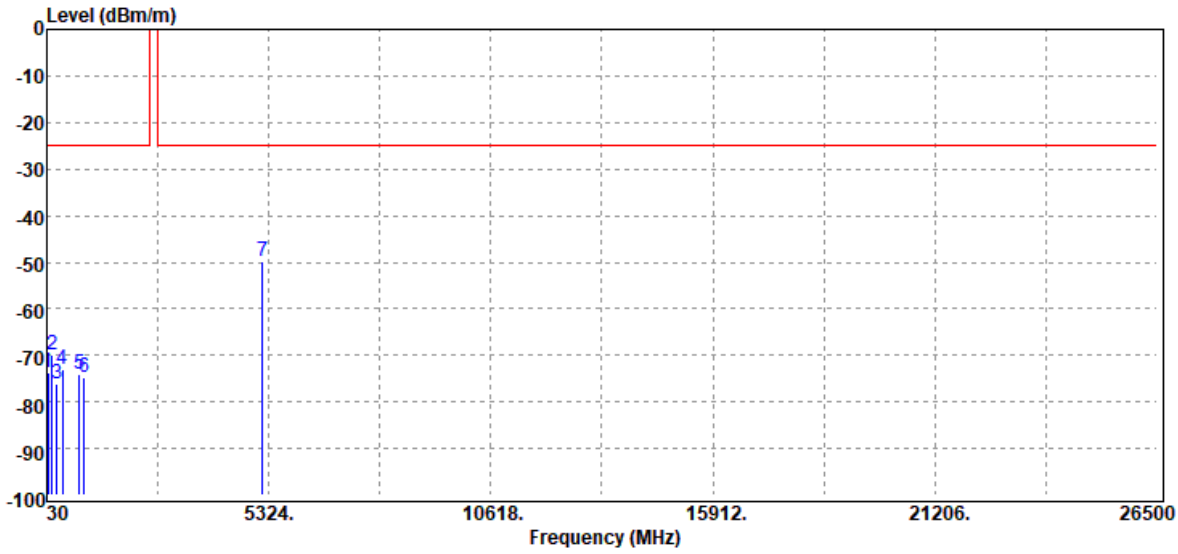
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Report Number :ER/2020/30084
 Operation Mode :41A_n41 (Contiguous)
 Test Mode :Tx CH Mid
 EUT Pol :E1 Plane
 Test Frequency :2633.1_2583.09 MHz

Test Site :SAC I Chamber
 Test Date :2020-07-21
 Temp./Humi. :26.4/67
 Antenna Pol. :HORIZONTAL
 Engineer :Neo



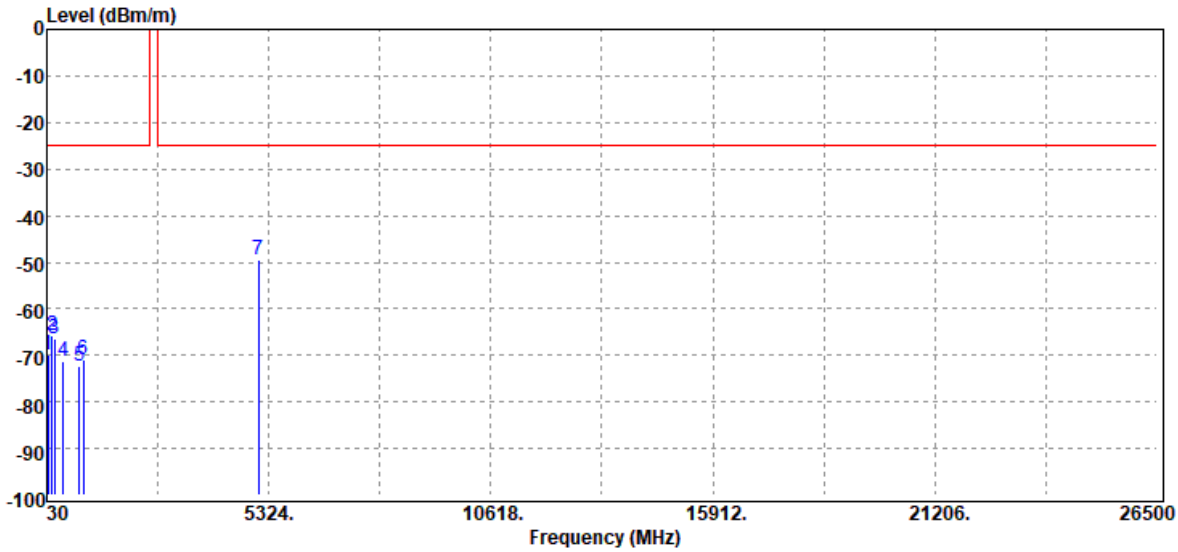
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
62.01	-73.56	-58.42	-14.38	-0.76	-25.00	-48.56
153.19	-69.84	-61.30	-7.32	-1.22	-25.00	-44.84
277.35	-76.27	-72.91	-1.81	-1.55	-25.00	-51.27
410.24	-73.05	-69.79	-1.38	-1.88	-25.00	-48.05
796.30	-74.07	-69.69	-1.61	-2.77	-25.00	-49.07
924.34	-74.63	-69.92	-1.90	-2.81	-25.00	-49.63
5166.18	-49.67	-55.44	12.80	-7.03	-25.00	-24.67

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Report Number	:ER/2020/30084	Test Site	:SAC I Chamber
Operation Mode	:41A_n41 (Non-Contiguous)	Test Date	:2020-07-21
Test Mode	:Tx CH Low	Temp./Humi.	:26.4/67
EUT Pol	:E1 Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2679.9_2536.2 MHz	Engineer	:Neo



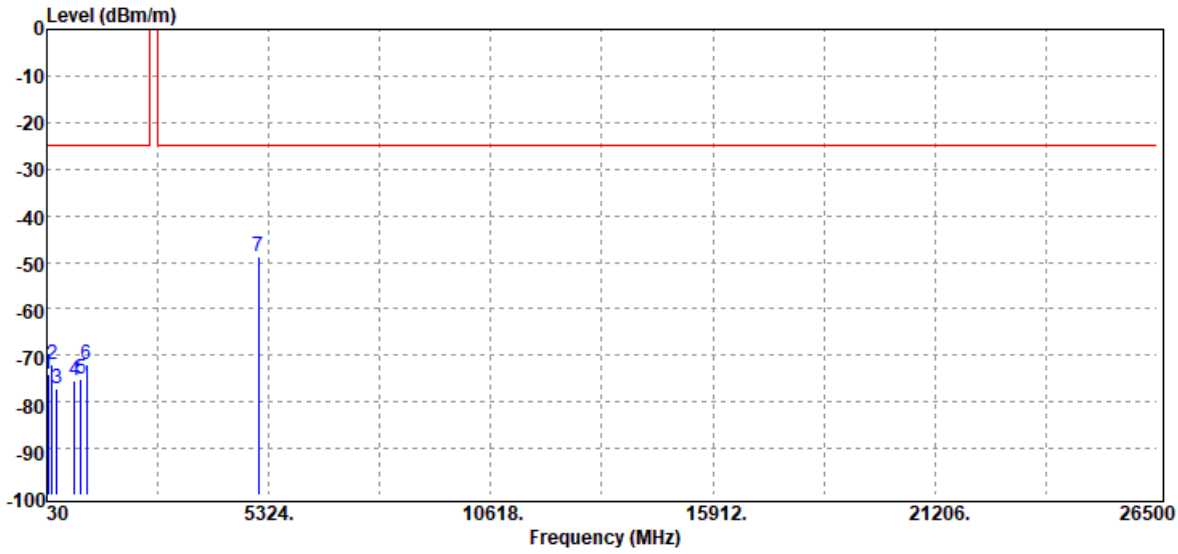
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
65.89	-70.04	-56.16	-13.09	-0.79	-25.00	-45.04
156.10	-65.59	-57.21	-7.17	-1.21	-25.00	-40.59
207.51	-66.27	-63.12	-1.79	-1.36	-25.00	-41.27
413.15	-71.28	-67.91	-1.43	-1.94	-25.00	-46.28
799.21	-72.31	-67.93	-1.57	-2.81	-25.00	-47.31
898.15	-71.09	-66.49	-1.62	-2.98	-25.00	-46.09
5072.40	-49.51	-55.28	12.56	-6.79	-25.00	-24.51

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Report Number	:ER/2020/30084	Test Site	:SAC I Chamber
Operation Mode	:41A_n41 (Non-Contiguous)	Test Date	:2020-07-21
Test Mode	:Tx CH Low	Temp./Humi.	:26.4/67
EUT Pol	:E1 Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2679.9_2536.2 MHz	Engineer	:Neo



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
62.98	-74.04	-59.22	-14.05	-0.77	-25.00	-49.04
160.95	-71.86	-63.85	-6.80	-1.21	-25.00	-46.86
275.41	-77.22	-73.93	-1.75	-1.54	-25.00	-52.22
681.84	-75.50	-71.77	-1.45	-2.28	-25.00	-50.50
852.56	-75.21	-71.30	-1.56	-2.35	-25.00	-50.21
980.60	-71.95	-66.93	-1.88	-3.14	-25.00	-46.95
5072.40	-48.70	-54.47	12.56	-6.79	-25.00	-23.70

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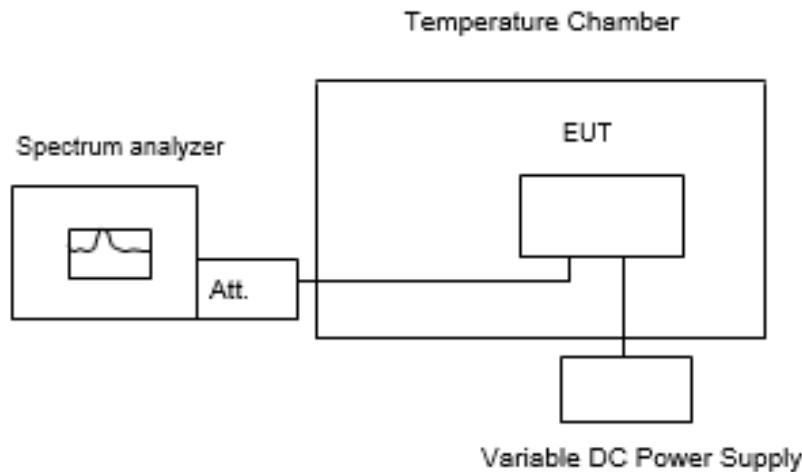
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10 FREQUENCY STABILITY MEASUREMENT

10.1 Standard Applicabl

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

10.2 Test Set-up



Note: Measurement setup for testing on Antenna connector

10.3 Measurement Procedure

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 25°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint as declared by the manufacturer, record the maximum frequency change.

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10.4 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
DC Power Supply	Agilent	E3640A	MY40000811	12/23/2019	12/22/2020
Temperature Chamber	TERCHY	MHG-120LF	911009	05/20/2020	05/19/2021
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY57120290	02/20/2020	02/19/2021
UXM 5G	KEYSIGHT	E7515B	MY59321561	12/16/2019	12/15/2020
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2020	01/01/2021

10.5 Measurement Result

5G NR 41A_n41				
Reference Freq.:	CP-OFDM_SCS 30 kHz		2593	MHz 20M+100M QPSK
Power Supply Vdc	Temp. (°C)	Freq. (MHz)	Delta (Hz)	Limit = +/- 2.5 ppm (Hz)
Freq. ERROR vs. VOLTAGE				
4.35	25	2593.000010	10	6482.5
3.85	25	2592.999985	-15	6482.5
3.65	25	2593.000027	27	6482.5
3.35 (End Point)	25	2592.999989	-11	6482.5
Freq. ERROR vs. Temp.				
3.85	-30	2593.000009	9	6482.5
3.85	-20	2593.000013	13	6482.5
3.85	-10	2592.999976	-24	6482.5
3.85	0	2592.999992	-8	6482.5
3.85	10	2593.000017	17	6482.5
3.85	20	2593.000031	31	6482.5
3.85	30	2593.000029	29	6482.5
3.85	40	2592.999998	-2	6482.5
3.85	50	2593.000018	18	6482.5

Note: The battery is rated 3.85V dc.

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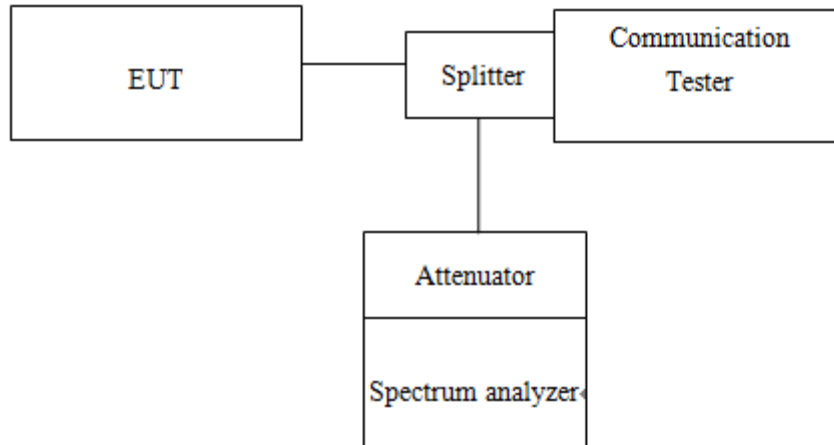
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11 PEAK TO AVERAGE RATIO

11.1 Standard Applicable

The peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

11.2 Test SET-UP



11.3 Measurement Procedure

1. KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:
2. Set resolution/measurement bandwidth \geq signal's occupied bandwidth; & internal = 1ms
3. Set the number of counts to a value that stabilizes the measured CCDF curve.

11.4 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
DC Power Supply	Agilent	E3640A	MY40000811	12/23/2019	12/22/2020
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY57120290	02/20/2020	02/19/2021
UXM 5G	KEYSIGHT	E7515B	MY59321561	12/16/2019	12/15/2020
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021
Splitter	RF-LAMBDA	RFLT2W1G18G	11-JSPF412-018	01/02/2020	01/01/2021

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11.5 Measurement Result

5G NR 41A_n41									
CP-OFDM_SCS 30 kHz									
Modulation	LTE			NR			Frequency (MHz)	PAPR(dBm)	Limit
	Bandwidth (MHz)	RB Size	RB Office	Bandwidth (MHz)	RB Size	RB Office			
256QAM	20MHz	100	0	100MHz	273	0	2556.2	10.63	13
	20MHz	100	0	100MHz	273	0	2593.0	10.69	13
	20MHz	100	0	100MHz	273	0	2629.9	10.64	13

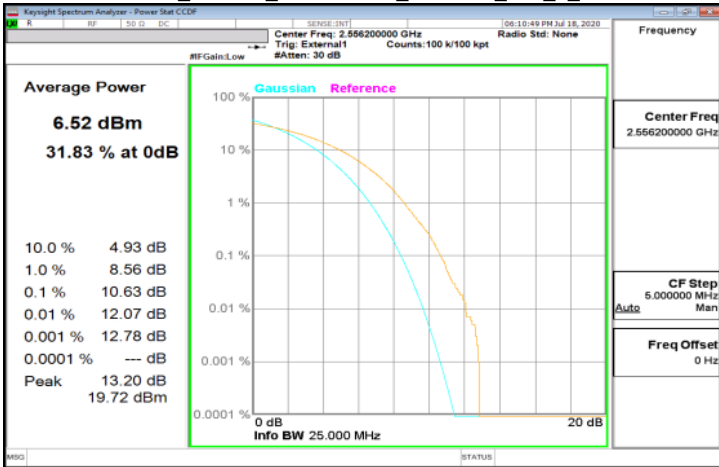
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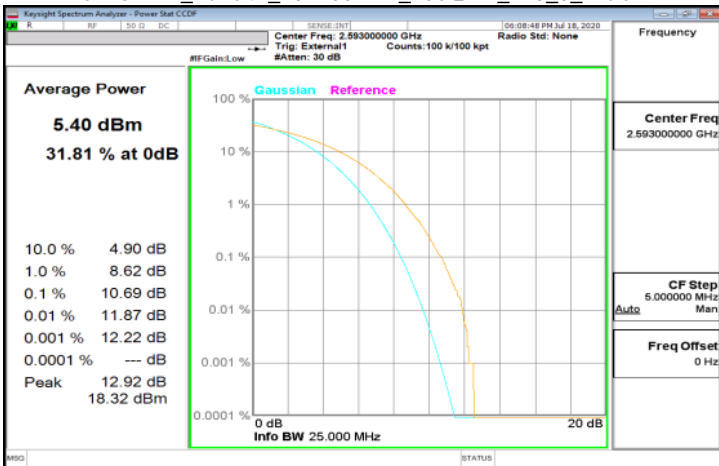
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CP-OFDM_Band41_20+100MHz_256QAM_273_0_LowCH

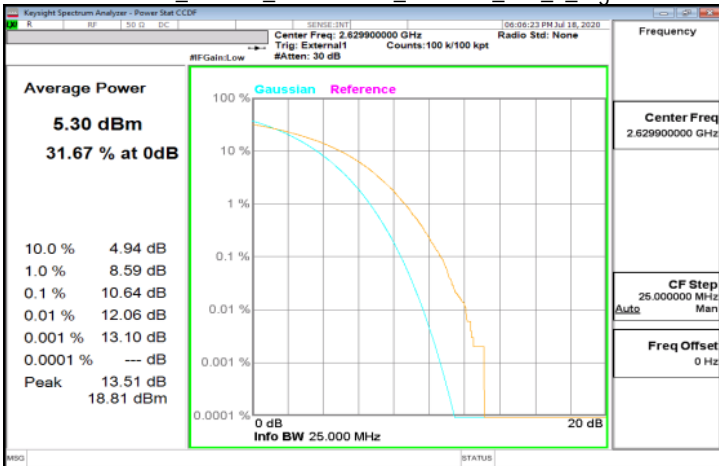
~ End of Report ~



CP-OFDM_Band41_20+100MHz_256QAM_273_0_MidCH



CP-OFDM_Band41_20+100MHz_256QAM_273_0_HighCH



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