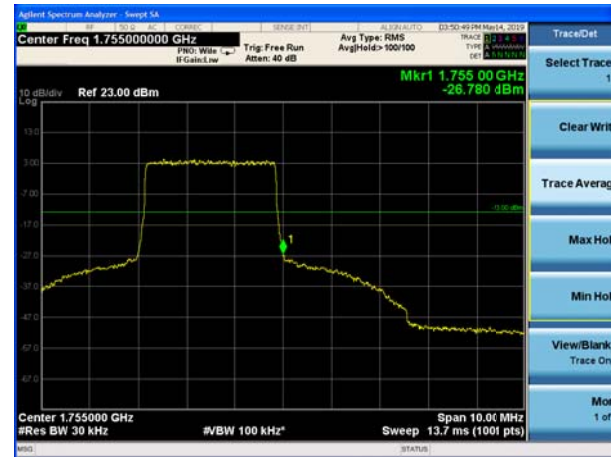




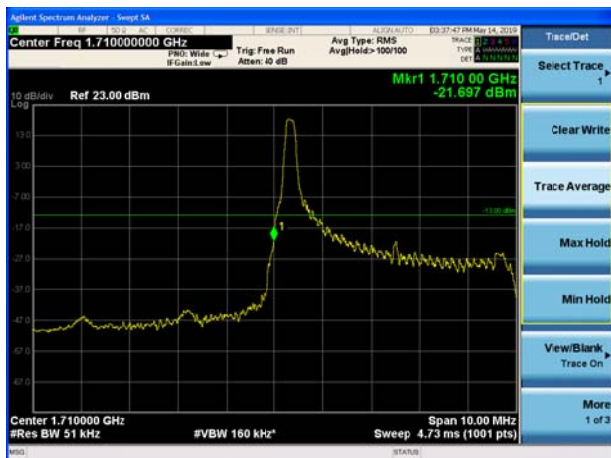
LTE Band 4 QPSK 3MHz CH-Low, 100%RB



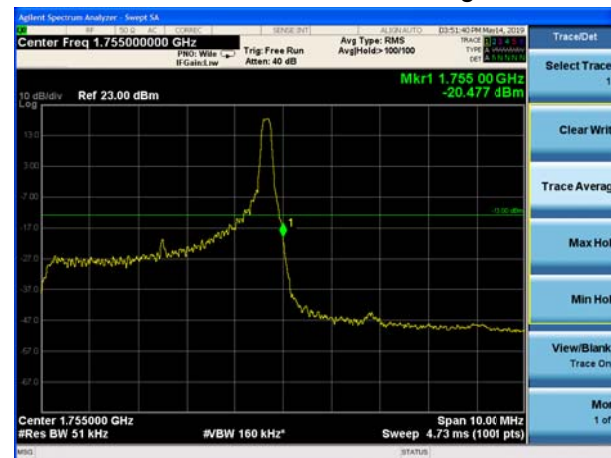
LTE Band 4 QPSK 3MHz CH-High, 100%RB



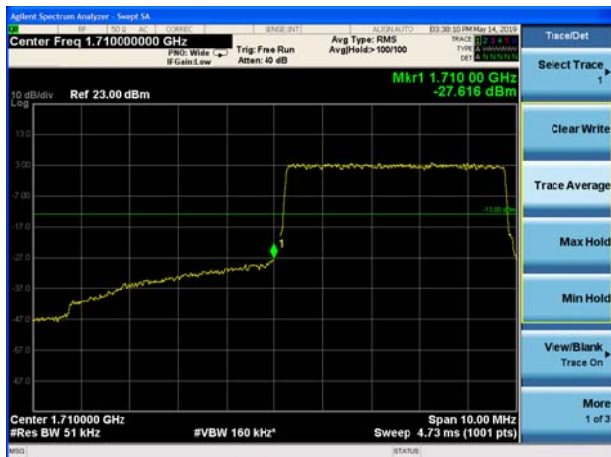
LTE Band 4 QPSK 5MHz CH-Low, 1 RB



LTE Band 4 QPSK 5MHz CH-High, 1 RB

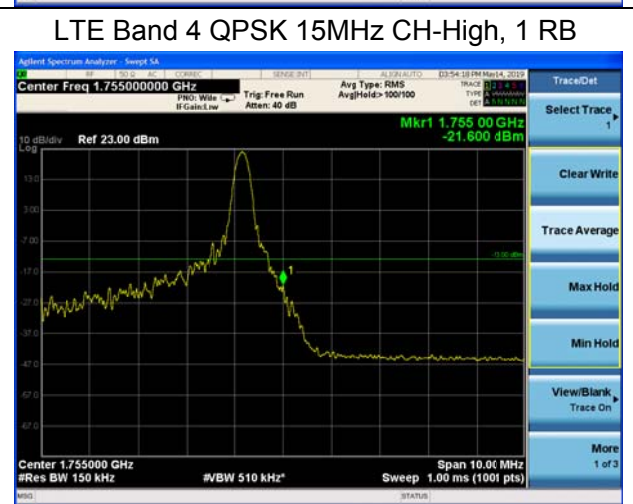
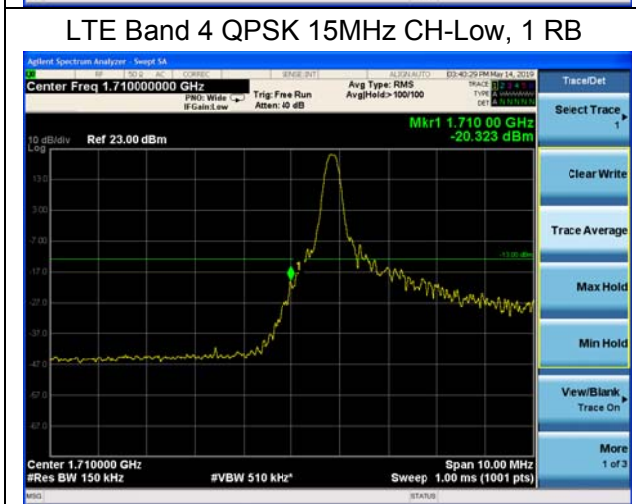
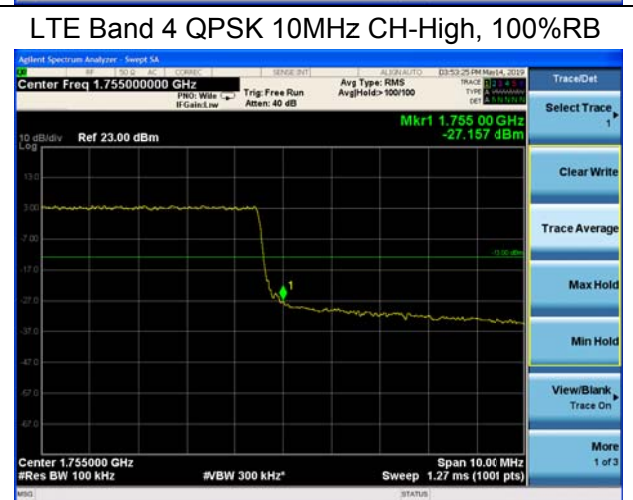
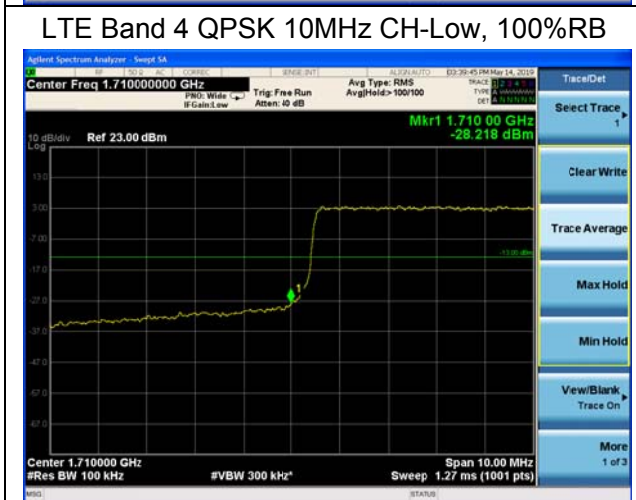
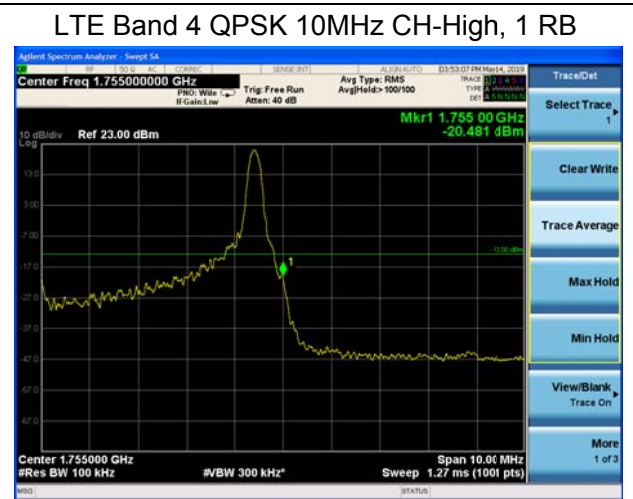
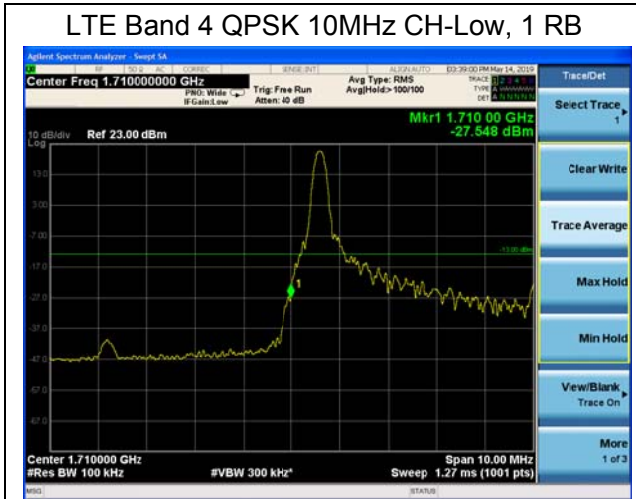


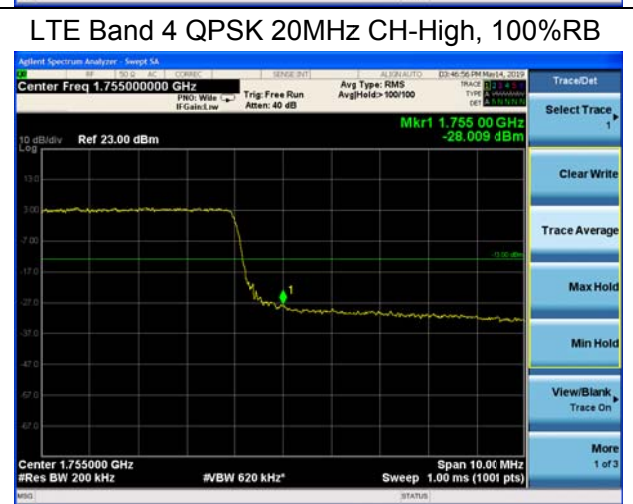
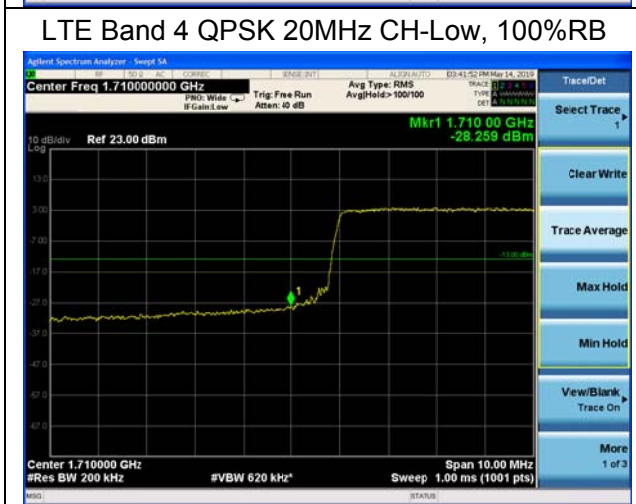
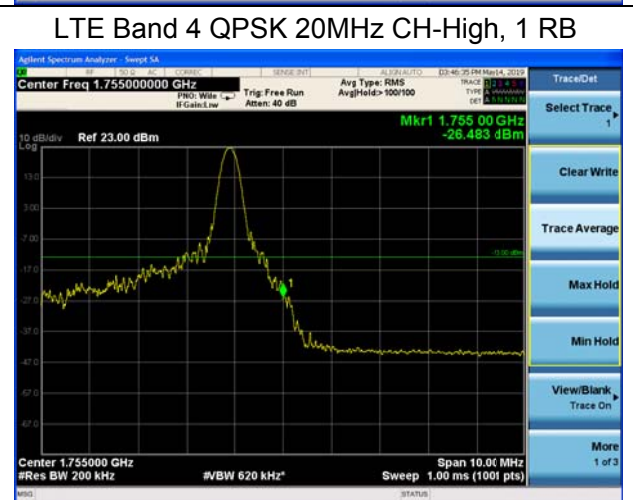
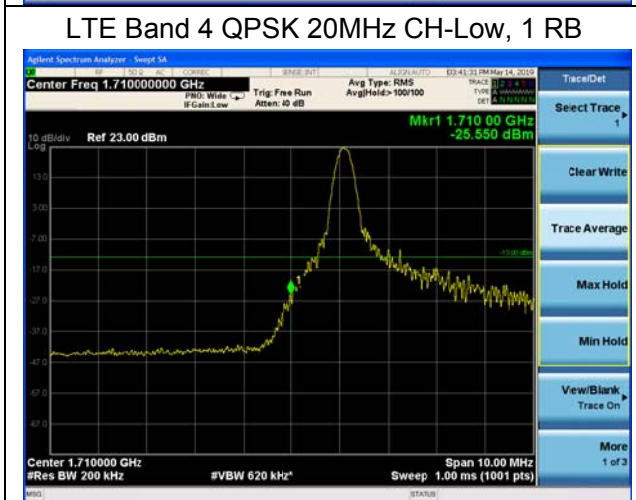
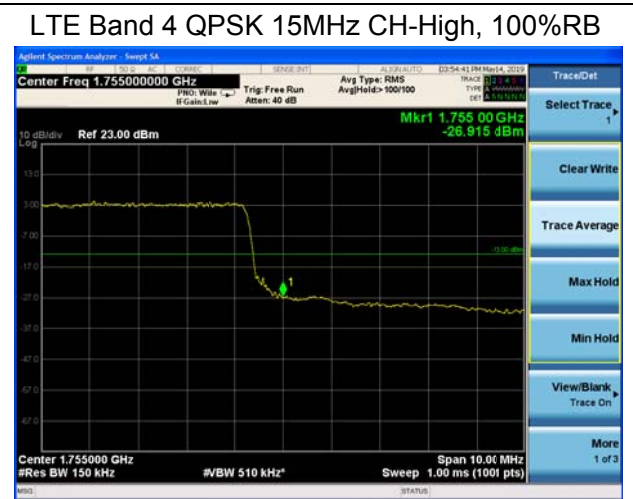
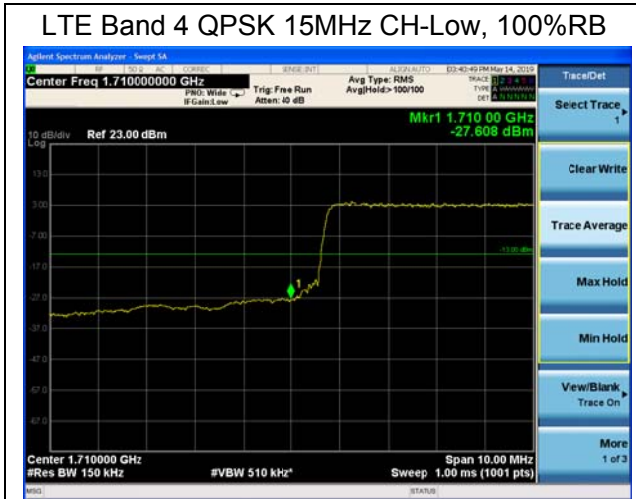
LTE Band 4 QPSK 5MHz CH-Low, 100%RB

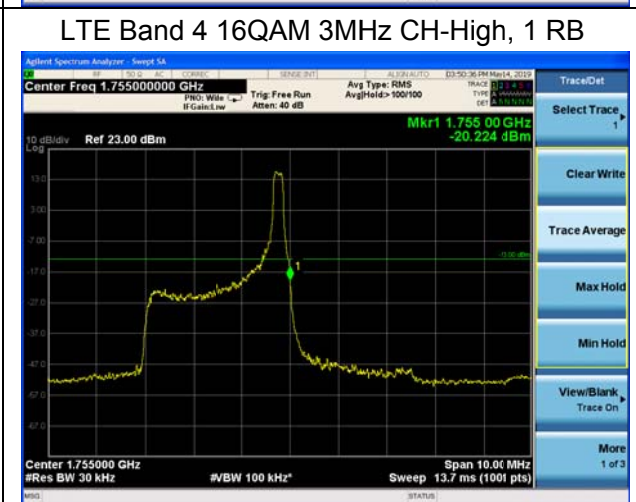
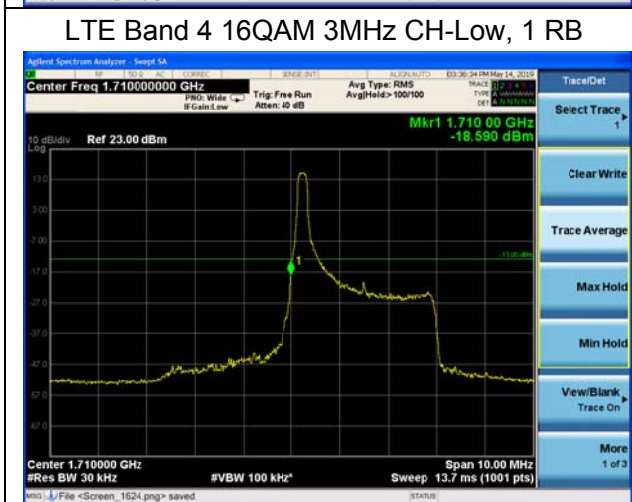
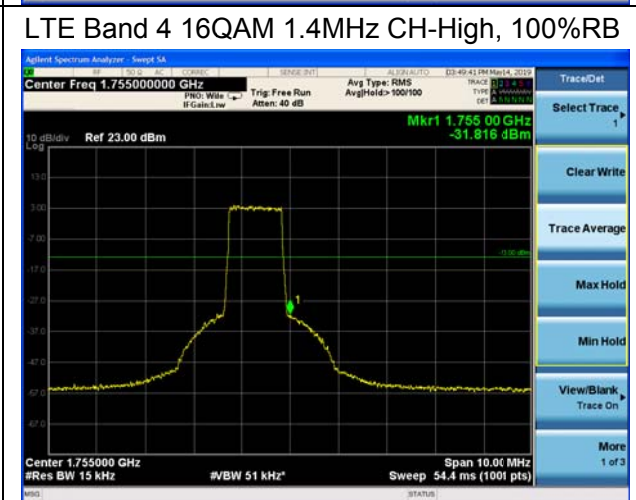
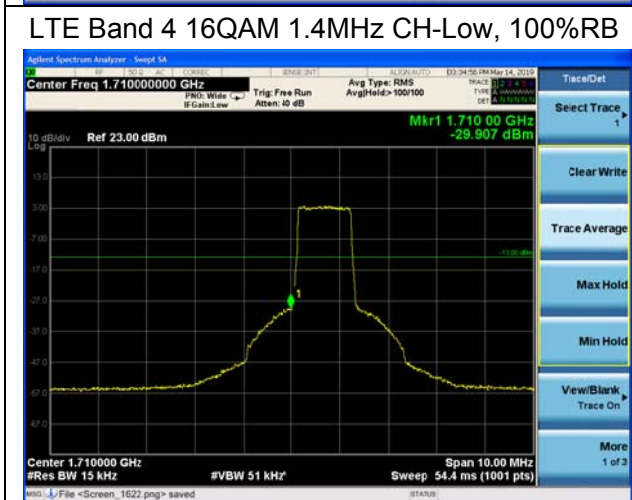
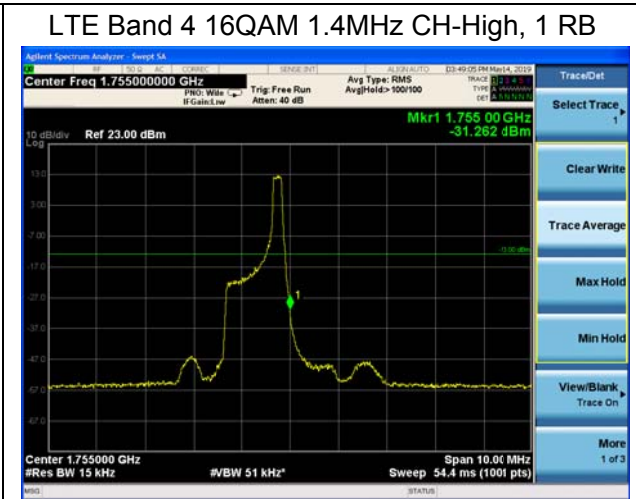
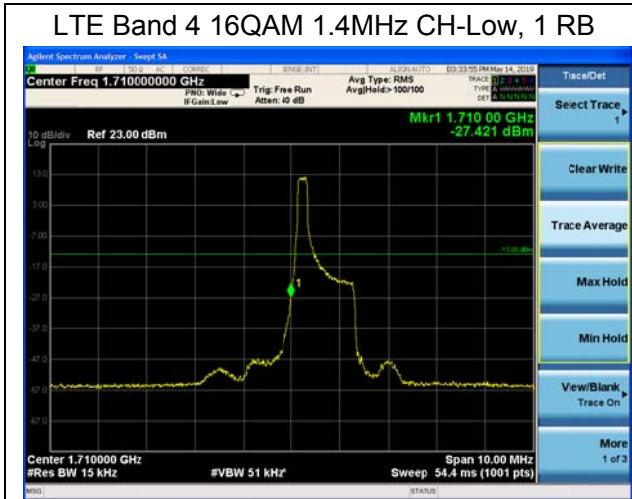


LTE Band 4 QPSK 5MHz CH-High, 100%RB



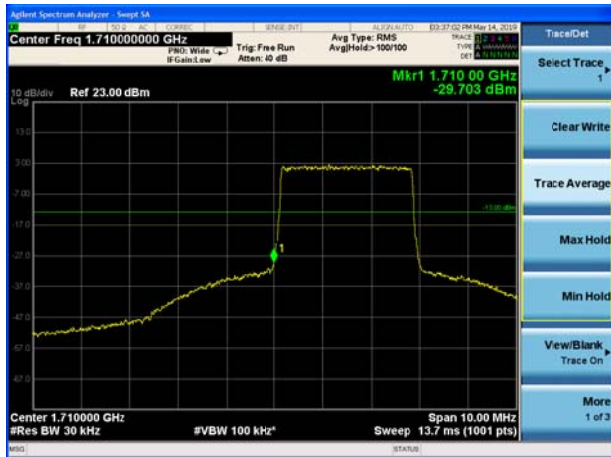








LTE Band 4 16QAM 3MHz CH-Low, 100%RB



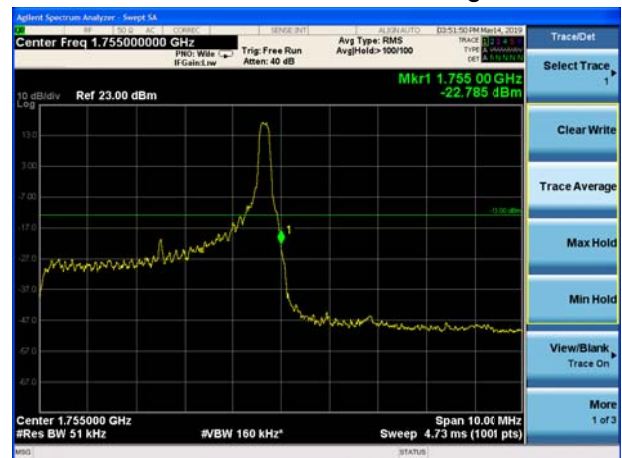
LTE Band 4 16QAM 3MHz CH-High, 100%RB



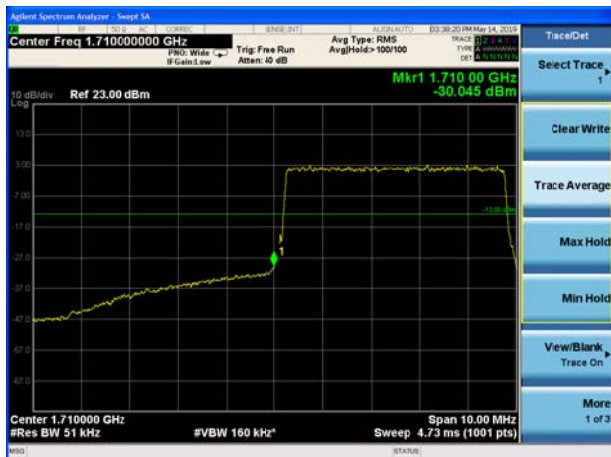
LTE Band 4 16QAM 5MHz CH-Low, 1 RB



LTE Band 4 16QAM 5MHz CH-High, 1 RB

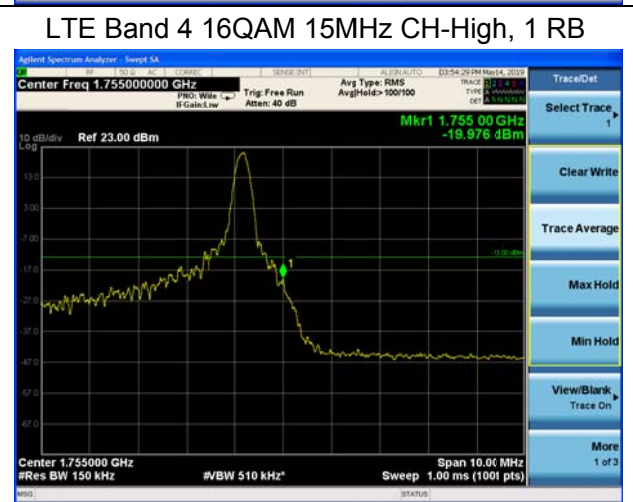
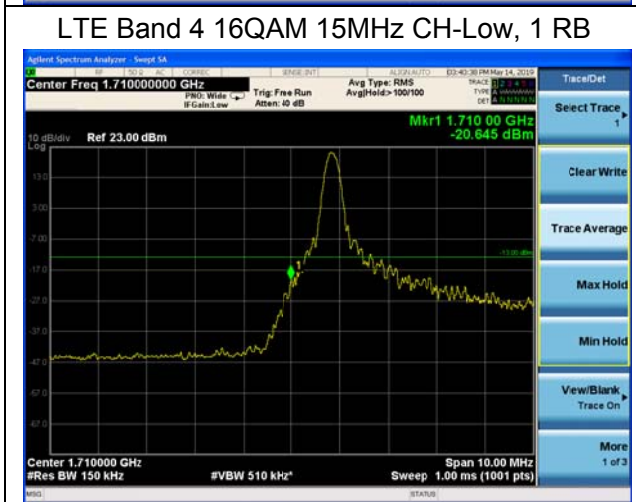
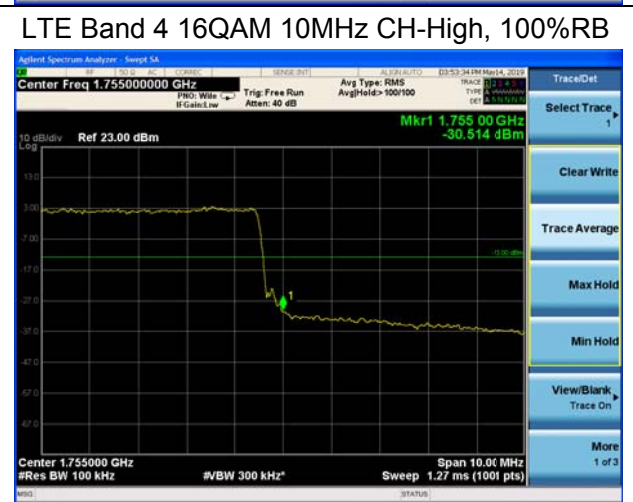
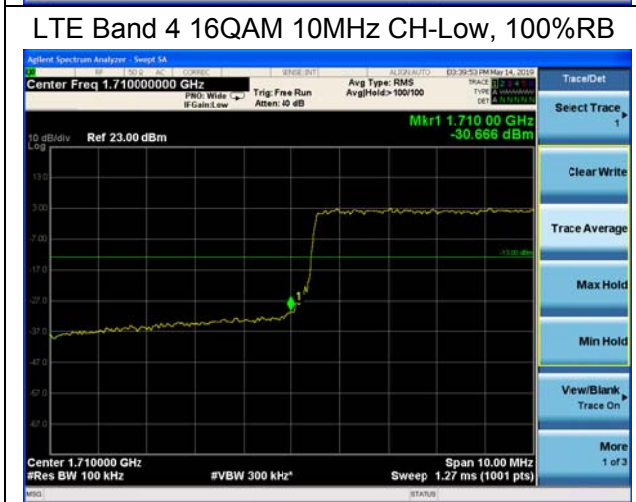
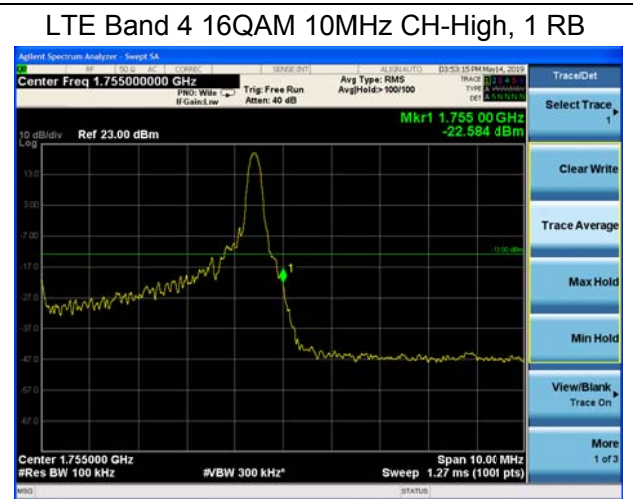
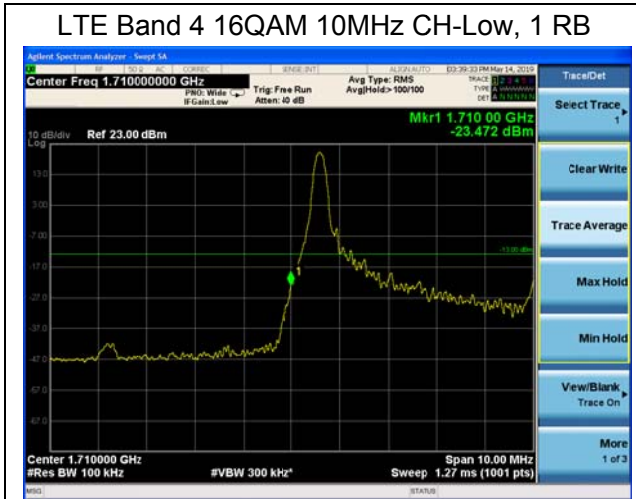


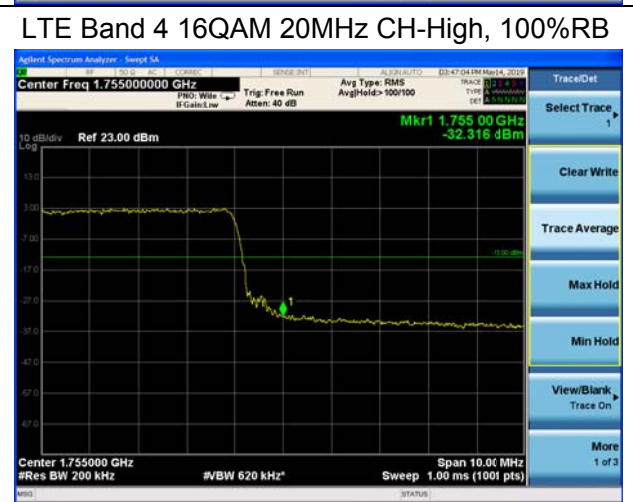
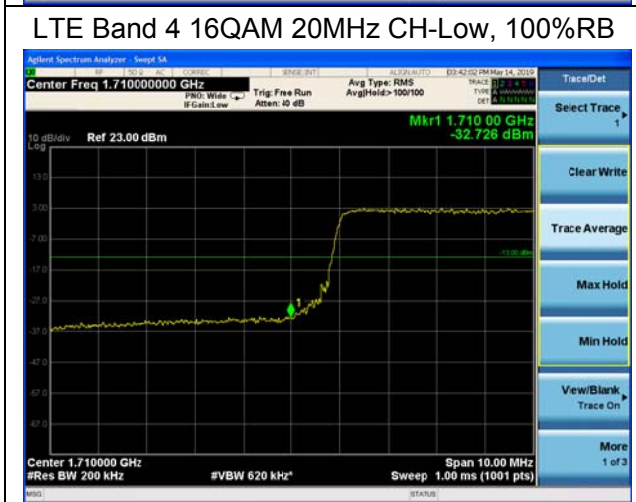
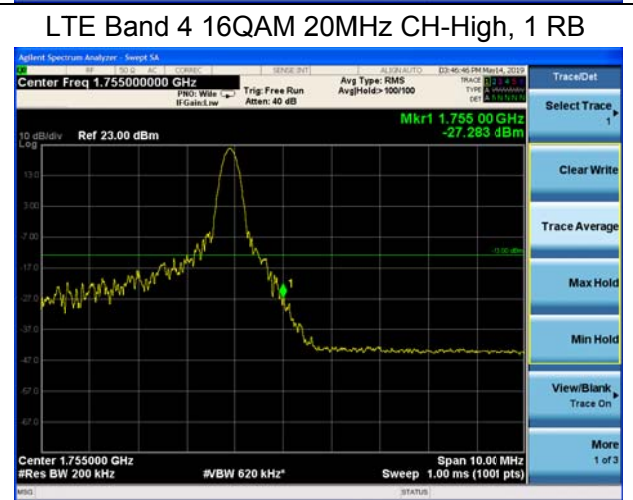
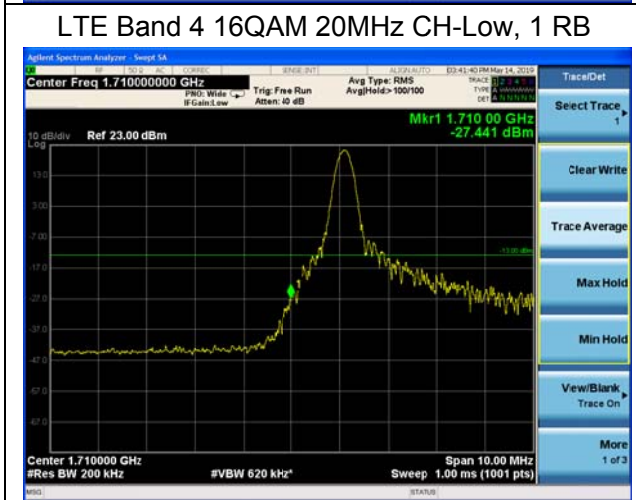
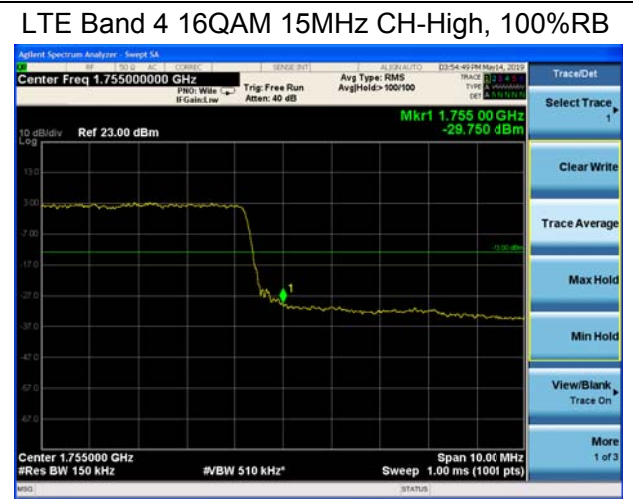
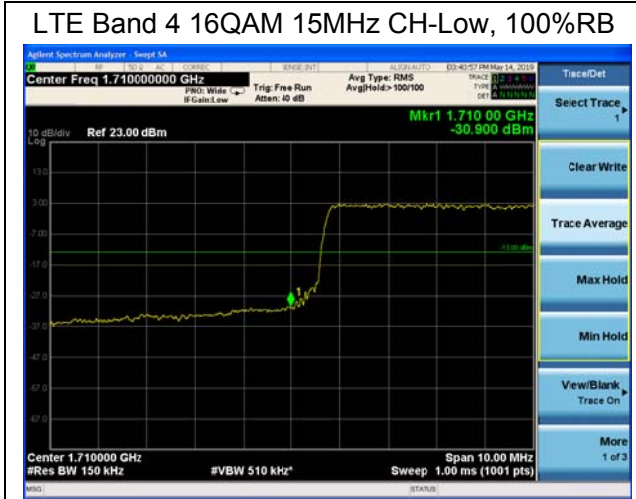
LTE Band 4 16QAM 5MHz CH-Low, 100%RB

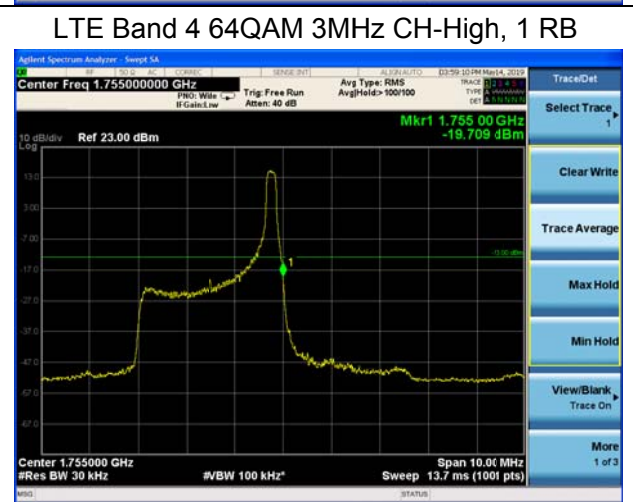
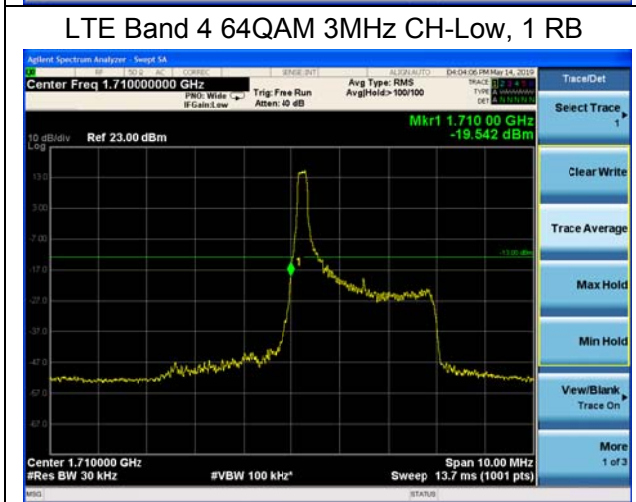
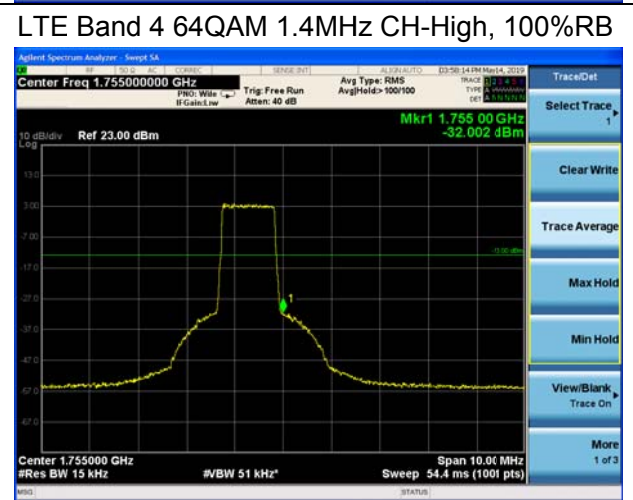
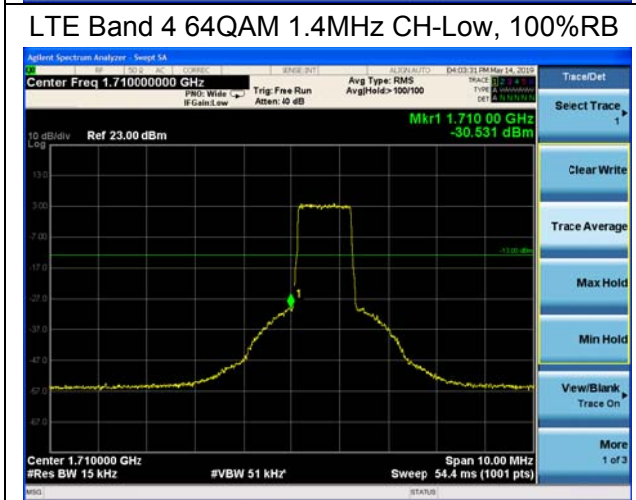
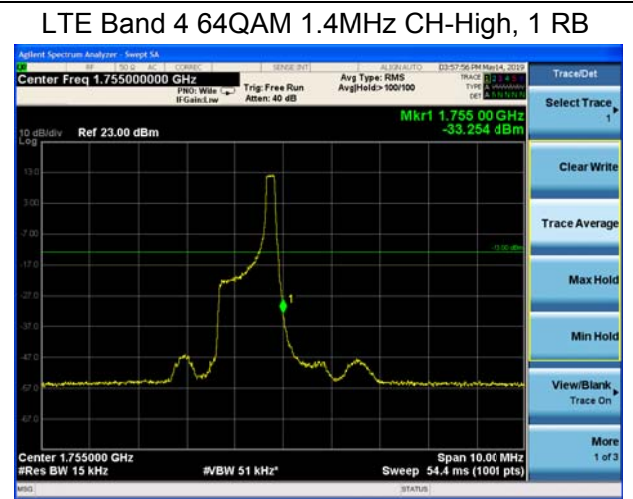
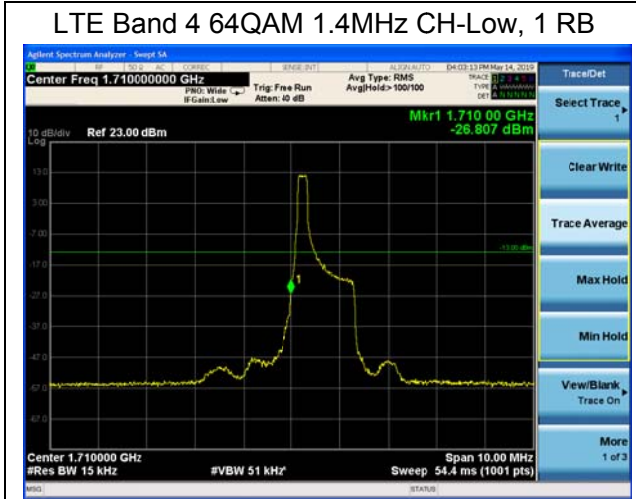


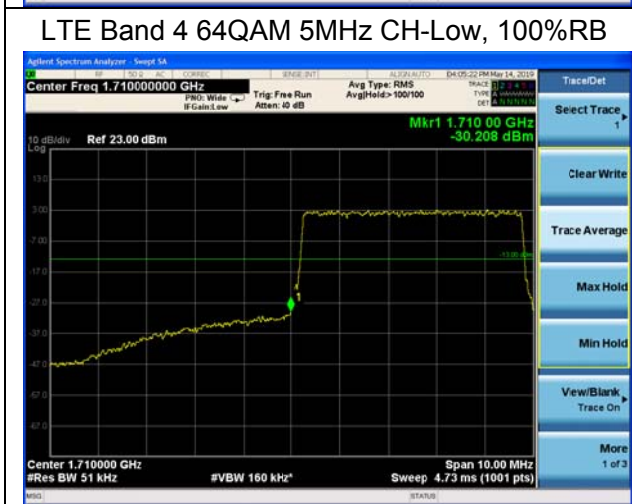
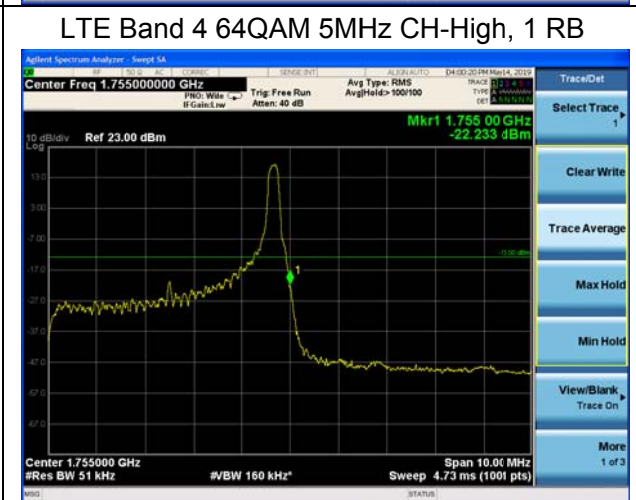
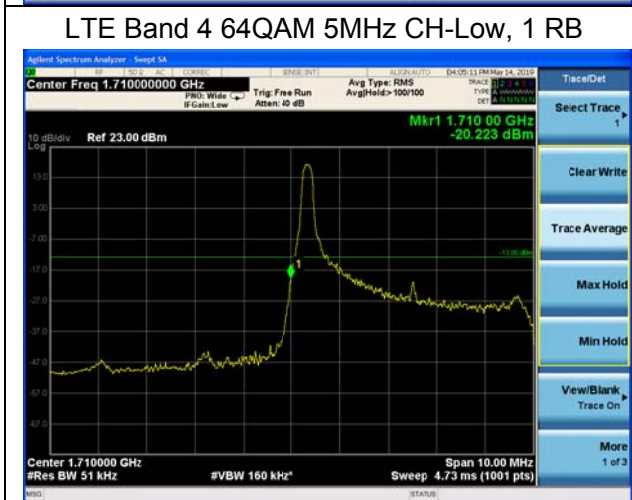
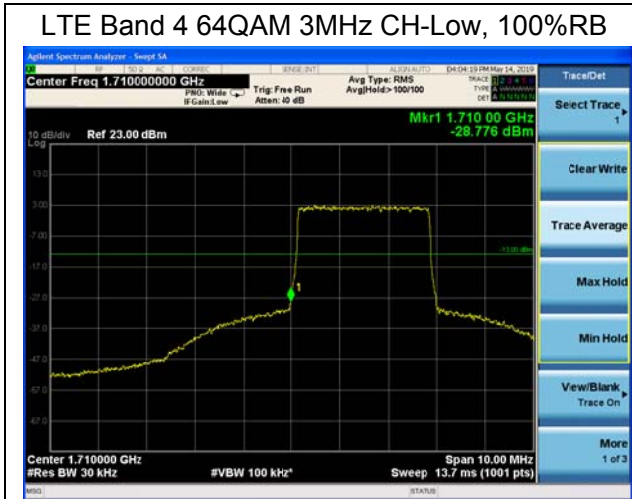
LTE Band 4 16QAM 5MHz CH-High, 100%RB

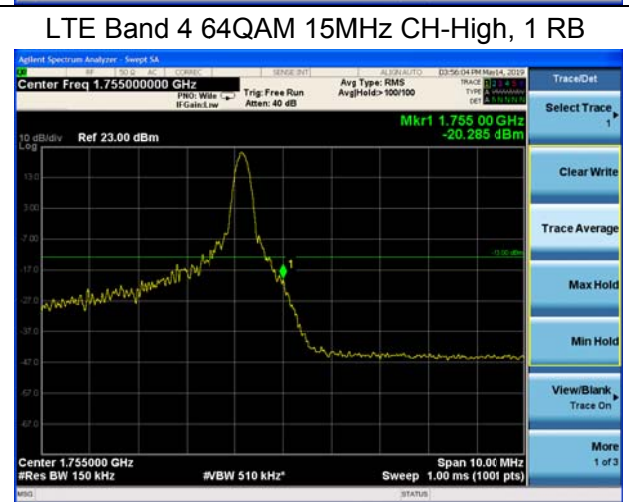
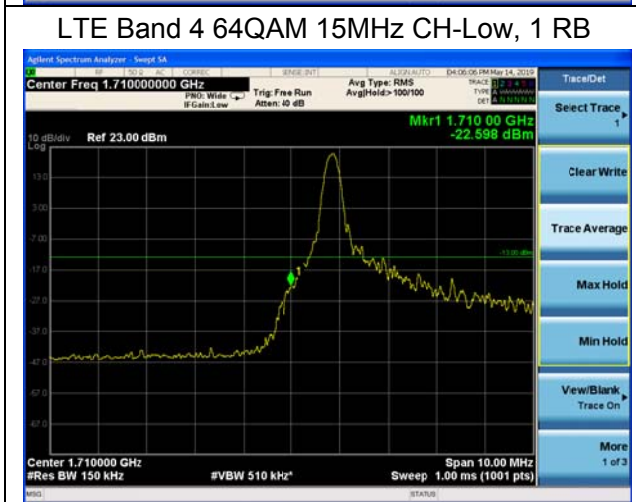
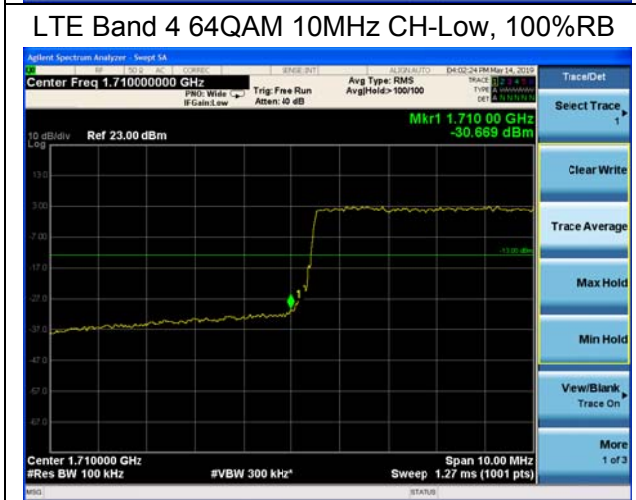
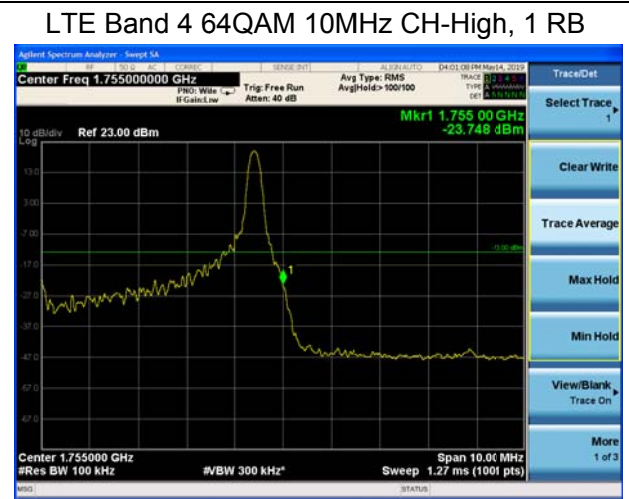
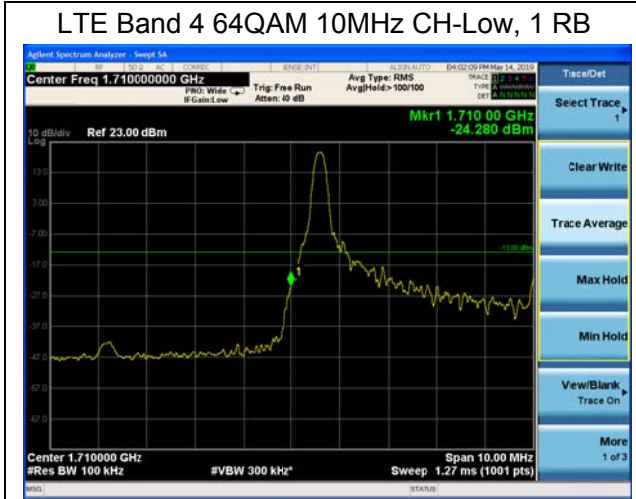


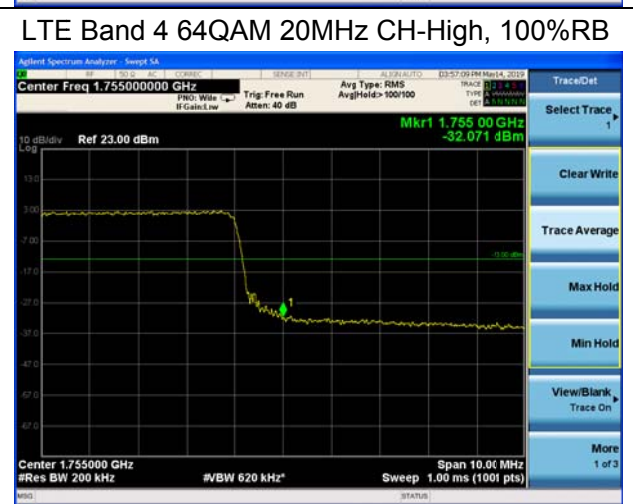
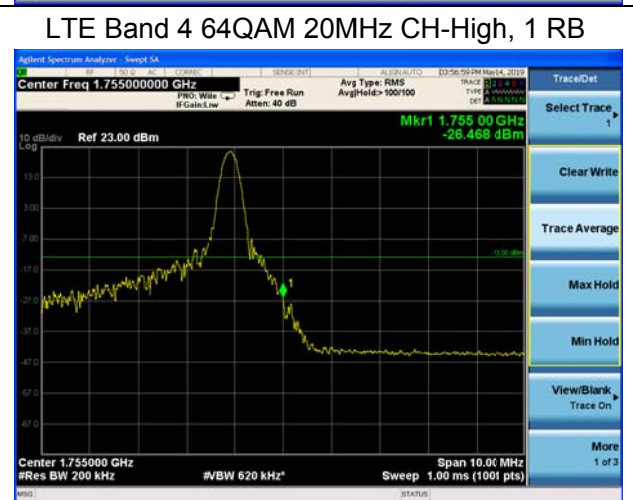
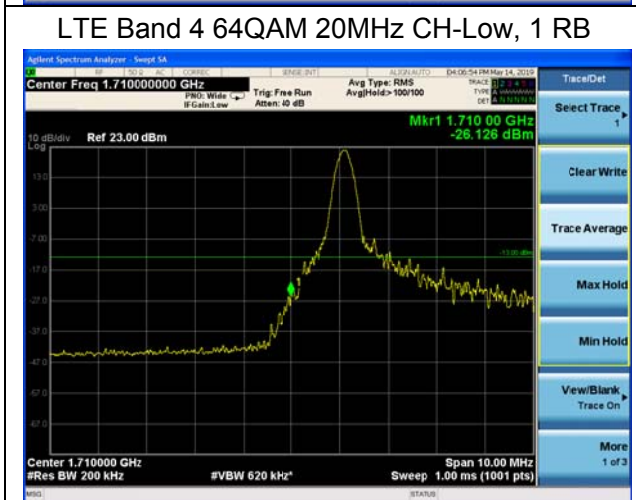
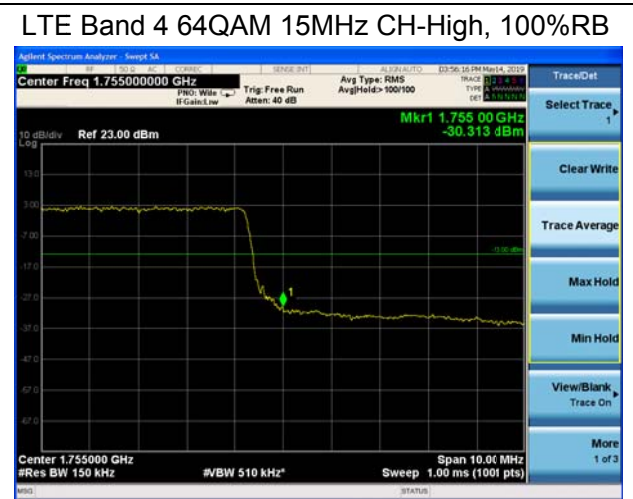
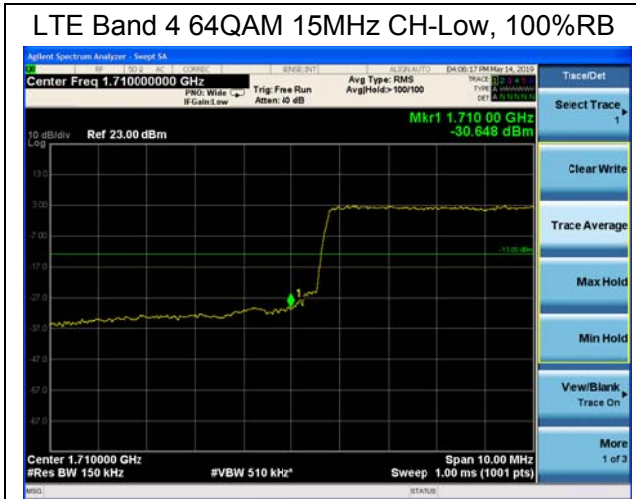






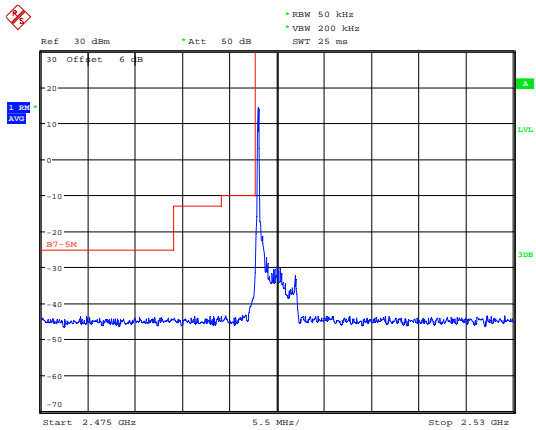






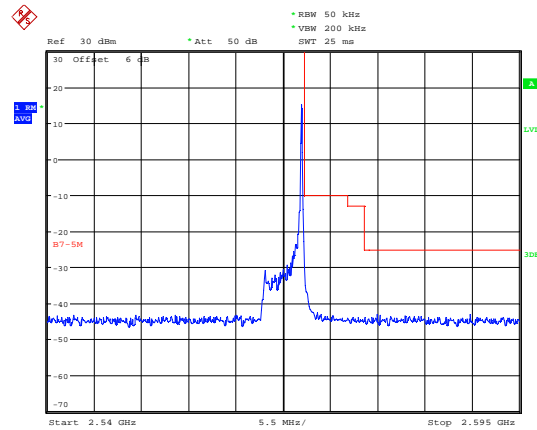


LTE Band 7 QPSK 5MHz CH-Low, 1 RB



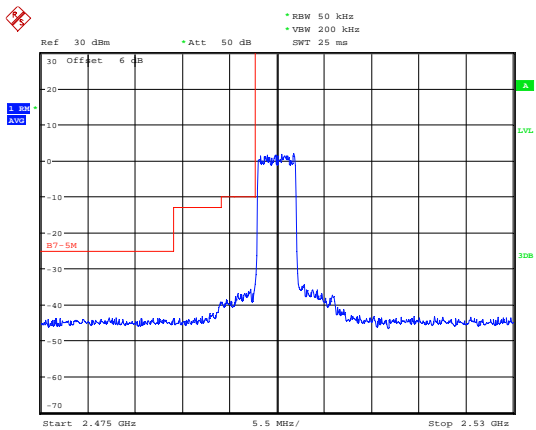
Date: 16.MAY.2019 11:20:29

LTE Band 7 QPSK 5MHz CH-High, 1 RB



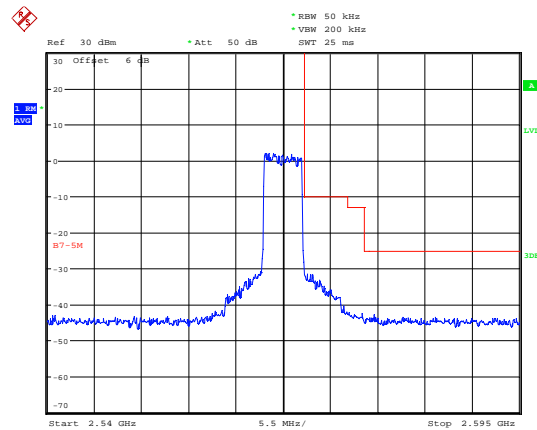
Date: 16.MAY.2019 11:36:36

LTE Band 7 QPSK 5MHz CH-Low, 100%RB



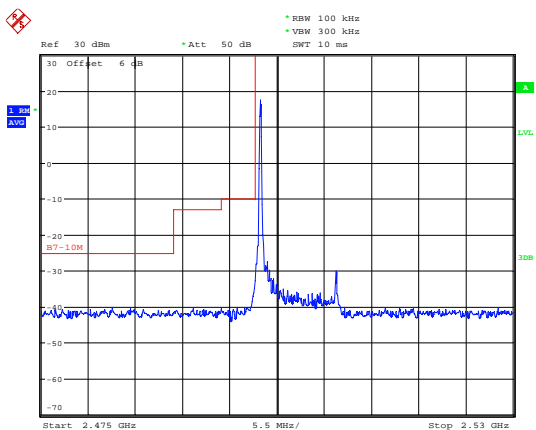
Date: 16.MAY.2019 11:21:03

LTE Band 7 QPSK 5MHz CH-High, 100%RB



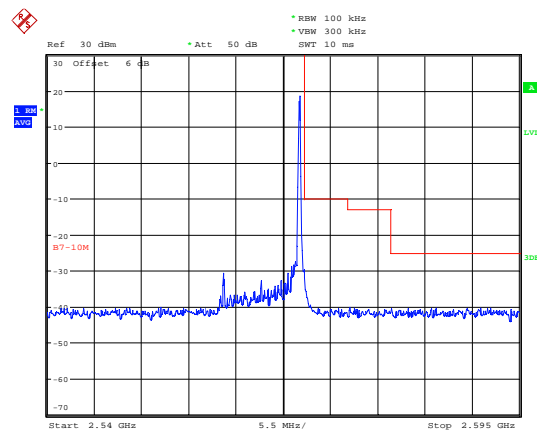
Date: 16.MAY.2019 11:37:04

LTE Band 7 QPSK 10MHz CH-Low, 1 RB



Date: 16.MAY.2019 11:22:22

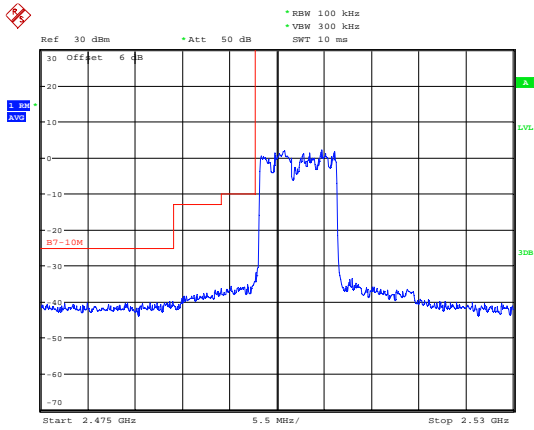
LTE Band 7 QPSK 10MHz CH-High, 1 RB



Date: 16.MAY.2019 11:38:11

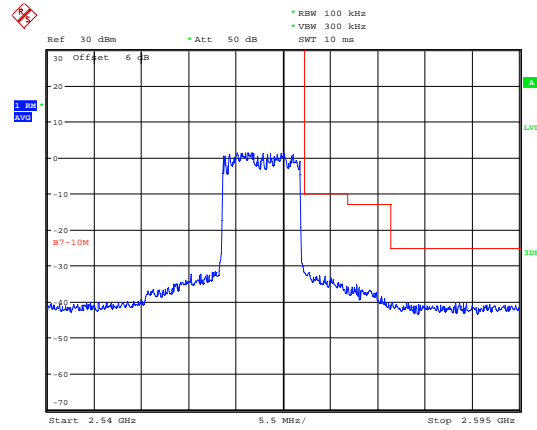


LTE Band 7 QPSK 10MHz CH-Low, 100%RB



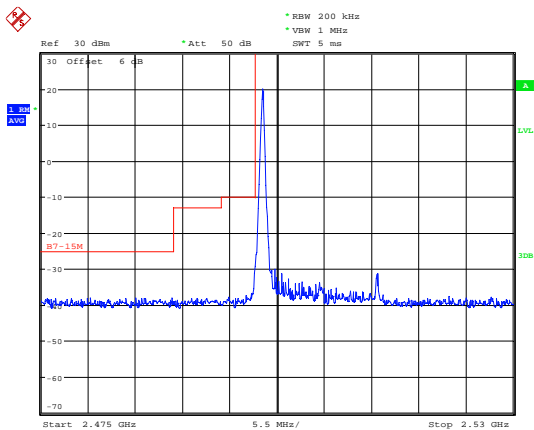
Date: 16.MAY.2019 11:22:49

LTE Band 7 QPSK 10MHz CH-High, 100%RB



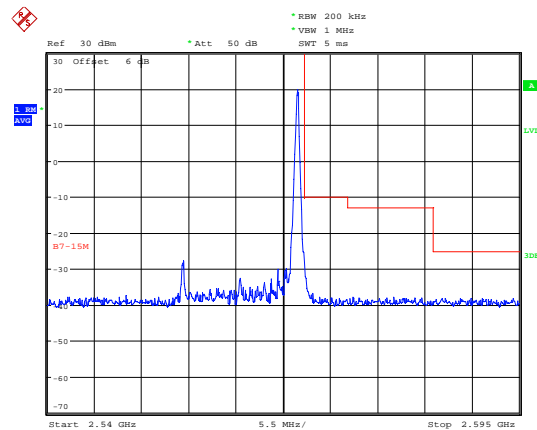
Date: 16.MAY.2019 11:38:41

LTE Band 7 QPSK 15MHz CH-Low, 1 RB



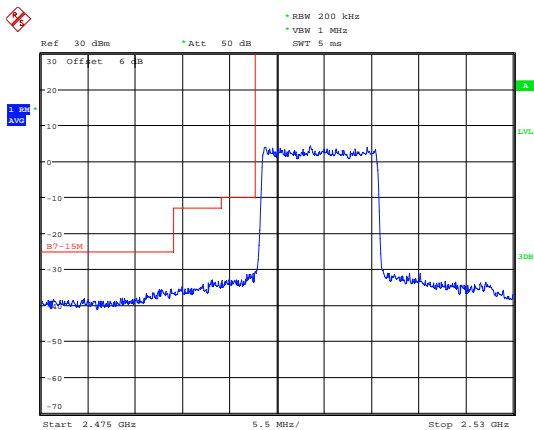
Date: 16.MAY.2019 11:23:54

LTE Band 7 QPSK 15MHz CH-High, 1 RB



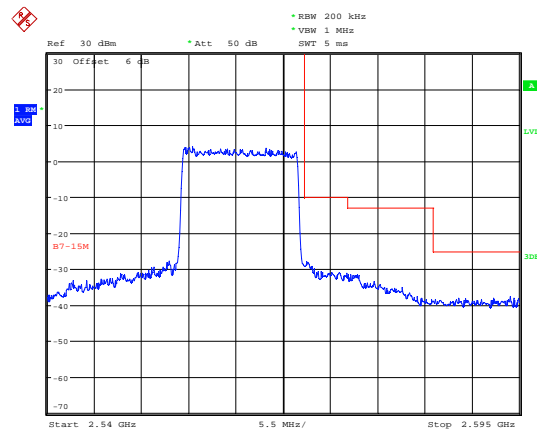
Date: 16.MAY.2019 11:34:37

LTE Band 7 QPSK 15MHz CH-Low, 100%RB



Date: 16.MAY.2019 11:24:27

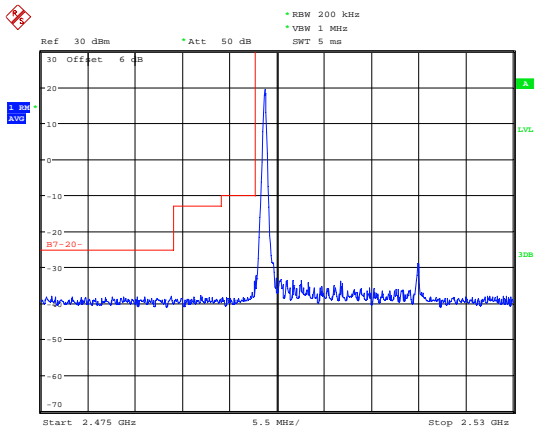
LTE Band 7 QPSK 15MHz CH-High, 100%RB



Date: 16.MAY.2019 11:35:20

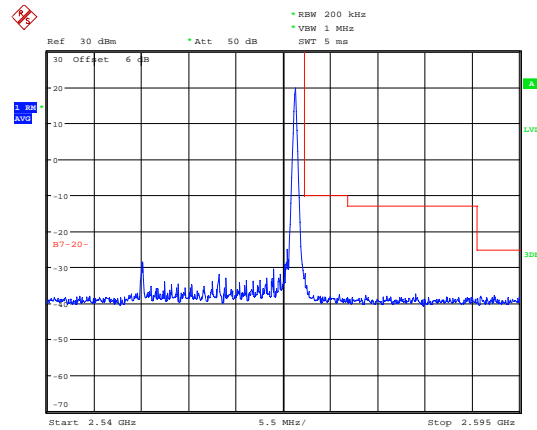


LTE Band 7 QPSK 20MHz CH-Low, 1 RB



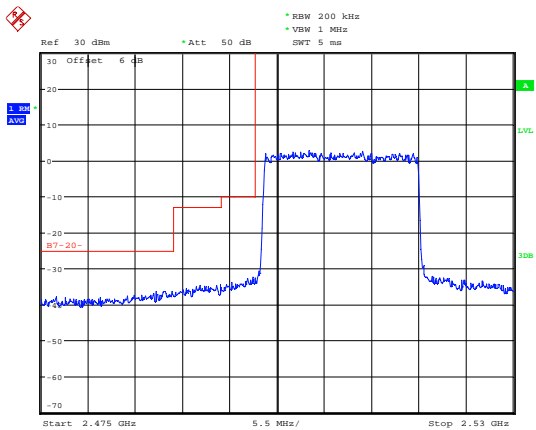
Date: 16.MAY.2019 11:30:43

LTE Band 7 QPSK 20MHz CH-High, 1 RB



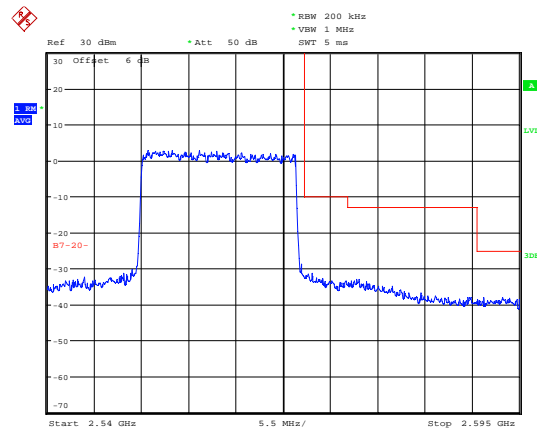
Date: 16.MAY.2019 11:32:38

LTE Band 7 QPSK 20MHz CH-Low, 100%RB



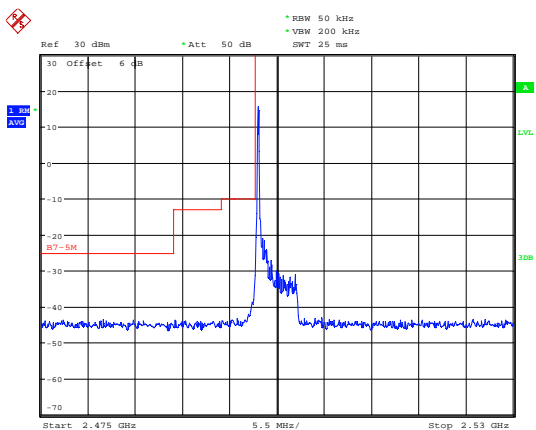
Date: 16.MAY.2019 11:31:19

LTE Band 7 QPSK 20MHz CH-High, 100%RB



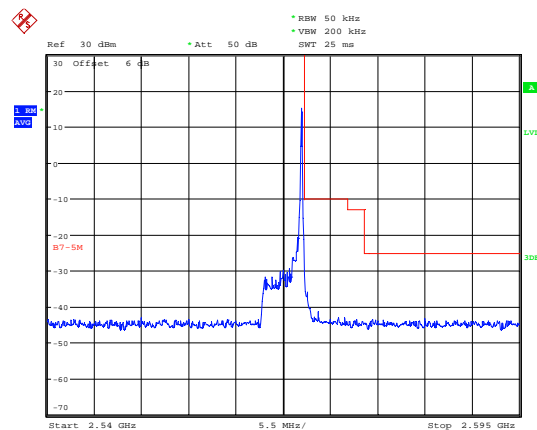
Date: 16.MAY.2019 11:33:12

LTE Band 7 16QAM 5MHz CH-Low, 1 RB



Date: 16.MAY.2019 11:20:49

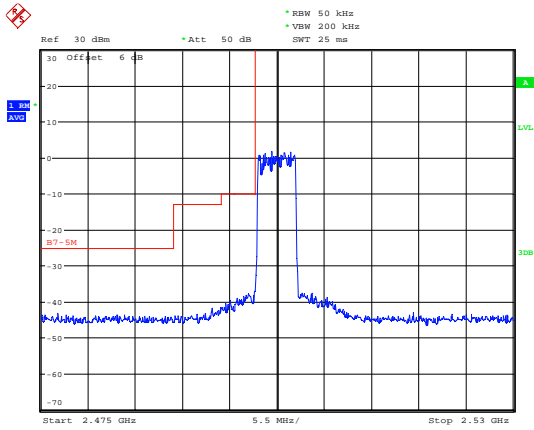
LTE Band 7 16QAM 5MHz CH-High, 1 RB



Date: 16.MAY.2019 11:36:49

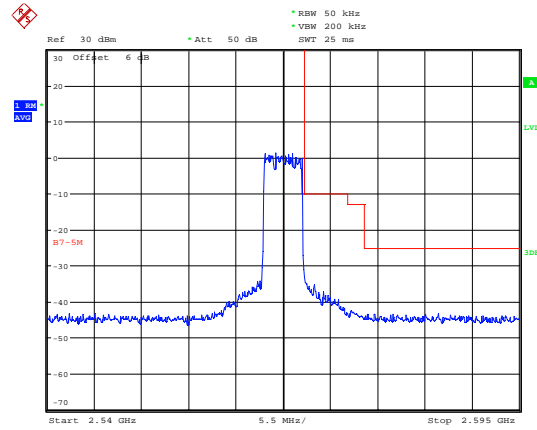


LTE Band 7 16QAM 5MHz CH-Low, 100%RB



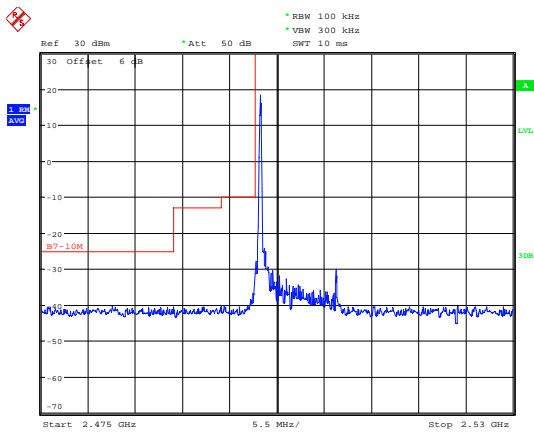
Date: 16.MAY.2019 11:21:15

LTE Band 7 16QAM 5MHz CH-High, 100%RB



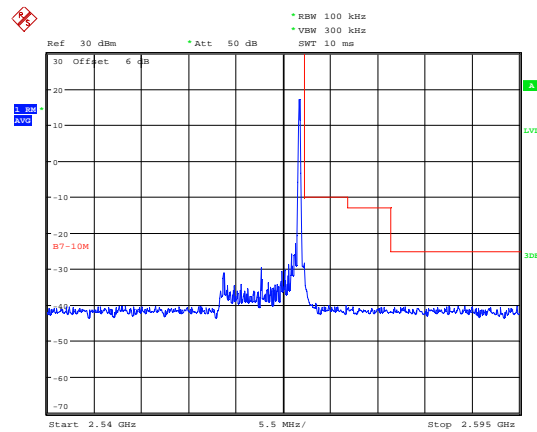
Date: 16.MAY.2019 11:37:15

LTE Band 7 16QAM 10MHz CH-Low, 1 RB



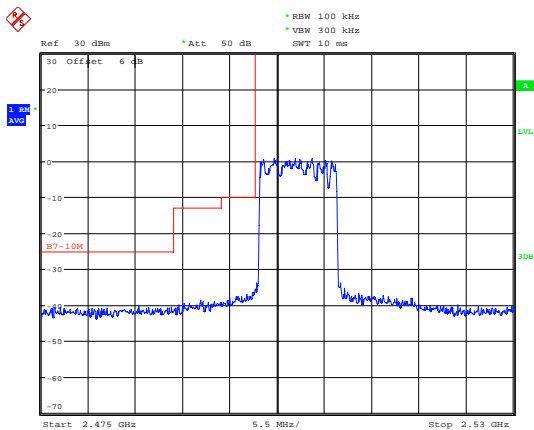
Date: 16.MAY.2019 11:22:35

LTE Band 7 16QAM 10MHz CH-High, 1 RB



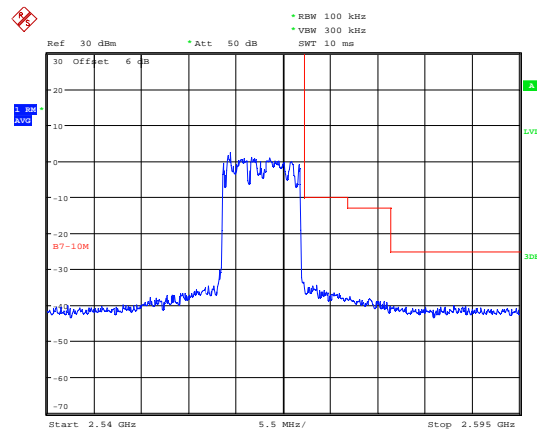
Date: 16.MAY.2019 11:38:24

LTE Band 7 16QAM 10MHz CH-Low, 100%RB



Date: 16.MAY.2019 11:23:02

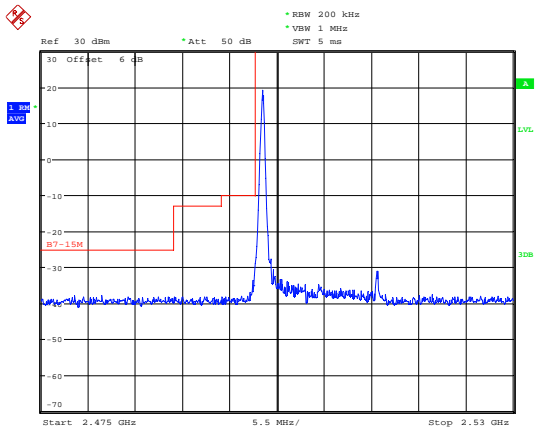
LTE Band 7 16QAM 10MHz CH-High, 100%RB



Date: 16.MAY.2019 11:38:57

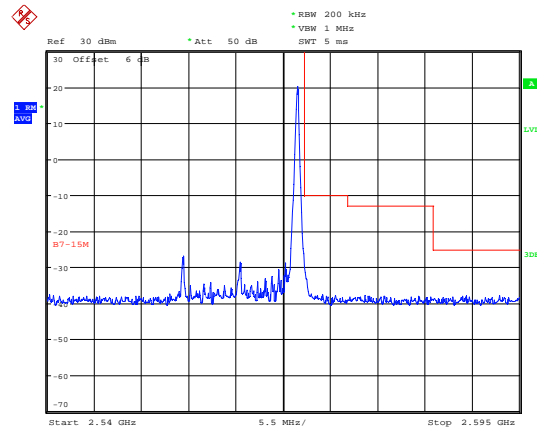


LTE Band 7 16QAM 15MHz CH-Low, 1 RB



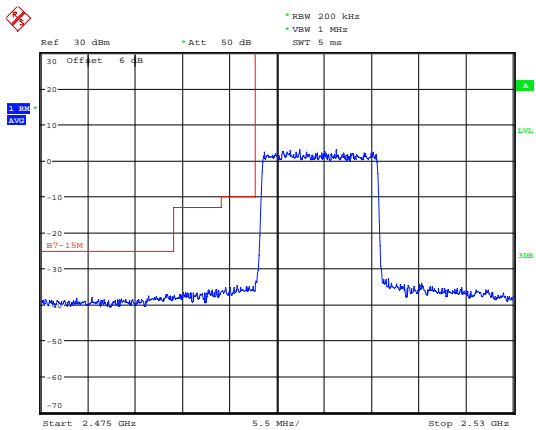
Date: 16.MAY.2019 11:24:10

LTE Band 7 16QAM 15MHz CH-High, 1 RB



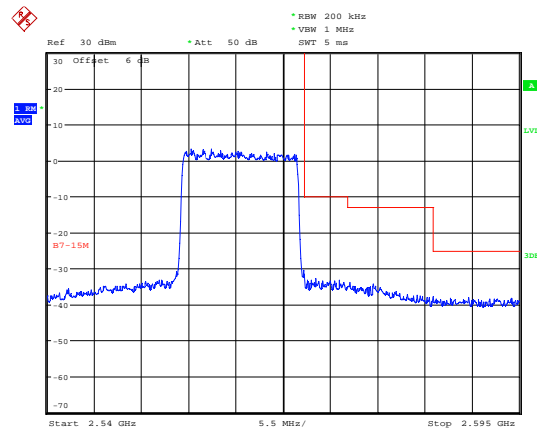
Date: 16.MAY.2019 11:34:53

LTE Band 7 16QAM 15MHz CH-Low, 100%RB



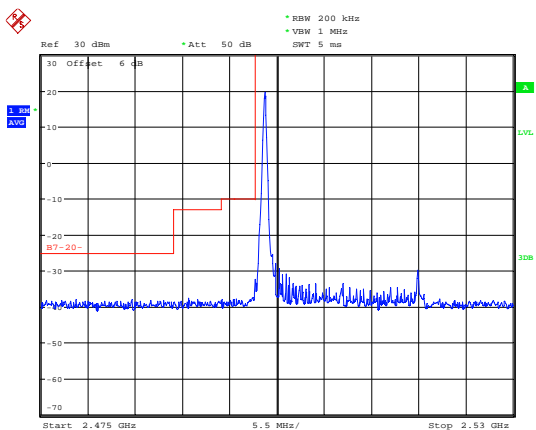
Date: 16.MAY.2019 11:24:40

LTE Band 7 16QAM 15MHz CH-High, 100%RB



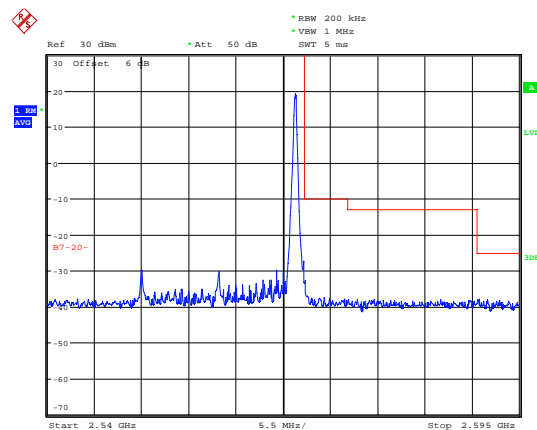
Date: 16.MAY.2019 11:35:33

LTE Band 7 16QAM 20MHz CH-Low, 1 RB



Date: 16.MAY.2019 11:31:00

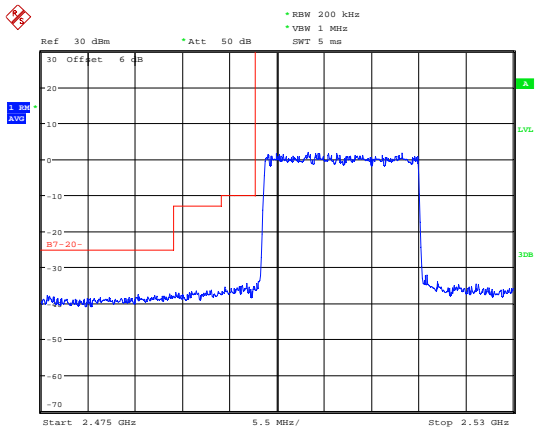
LTE Band 7 16QAM 20MHz CH-High, 1 RB



Date: 16.MAY.2019 11:32:55

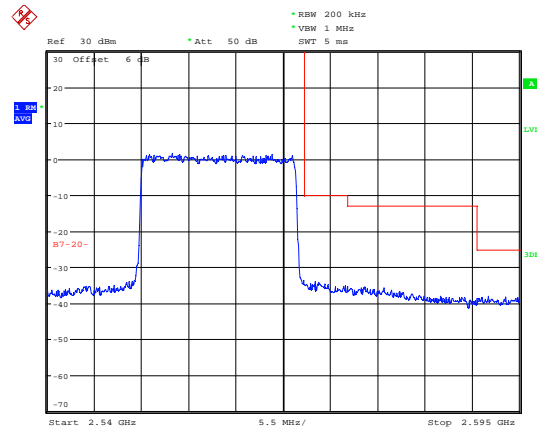


LTE Band 7 16QAM 20MHz CH-Low, 100%RB



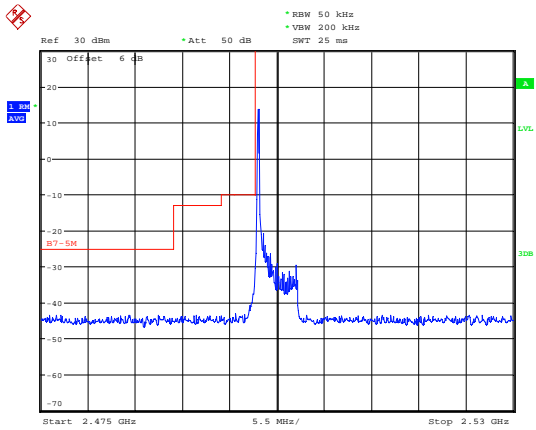
Date: 16.MAY.2019 11:31:32

LTE Band 7 16QAM 20MHz CH-High, 100%RB



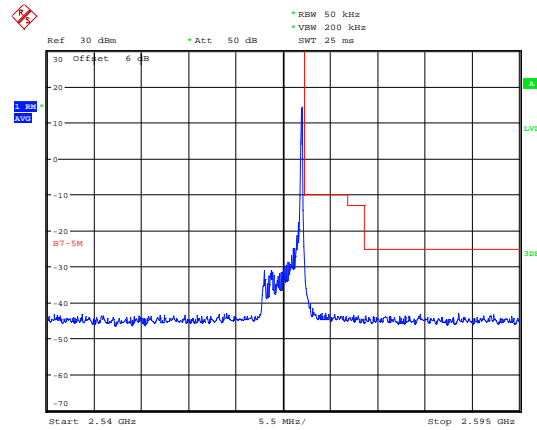
Date: 16.MAY.2019 11:33:26

LTE Band 7 64QAM 5MHz CH-Low, 1 RB



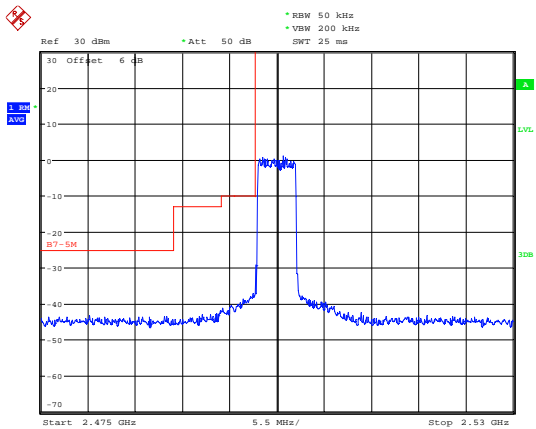
Date: 16.MAY.2019 13:25:56

LTE Band 7 64QAM 5MHz CH-High, 1 RB



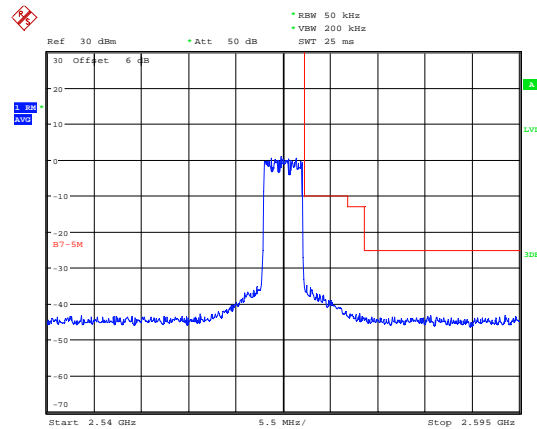
Date: 16.MAY.2019 14:46:30

LTE Band 7 64QAM 5MHz CH-Low, 100%RB



Date: 16.MAY.2019 13:26:05

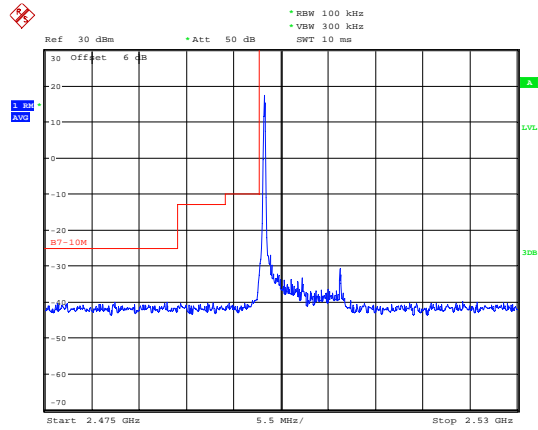
LTE Band 7 64QAM 5MHz CH-High, 100%RB



Date: 16.MAY.2019 14:46:37

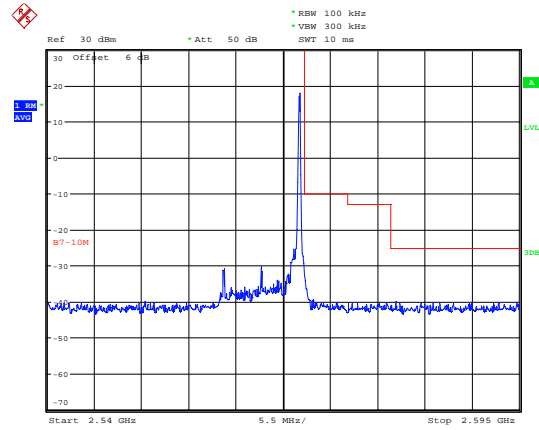


LTE Band 7 64QAM 10MHz CH-Low, 1 RB



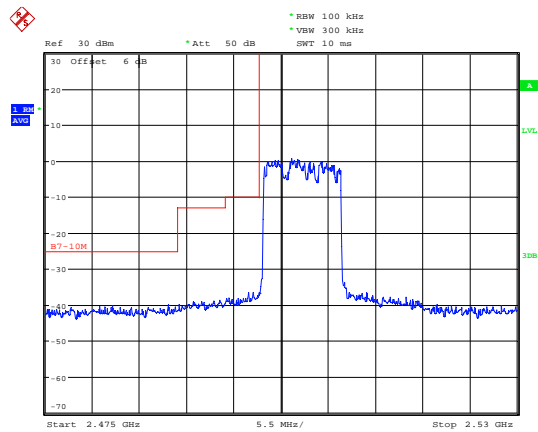
Date: 16.MAY.2019 14:42:47

LTE Band 7 64QAM 10MHz CH-High, 1 RB



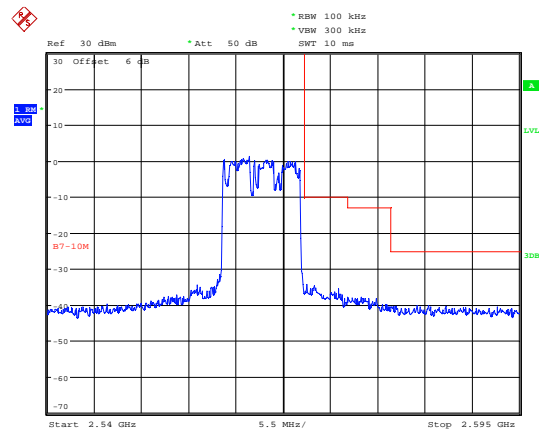
Date: 16.MAY.2019 14:47:19

LTE Band 7 64QAM 10MHz CH-Low, 100%RB



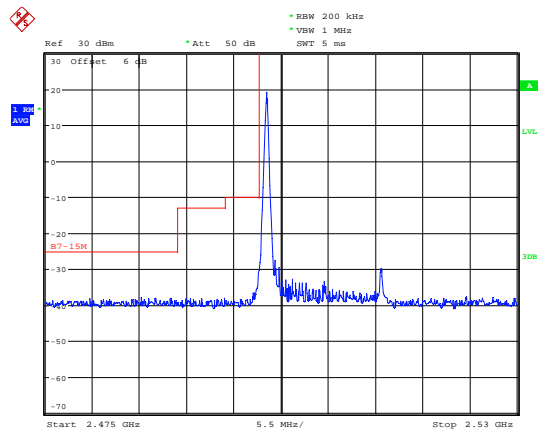
Date: 16.MAY.2019 14:42:56

LTE Band 7 64QAM 10MHz CH-High, 100%RB



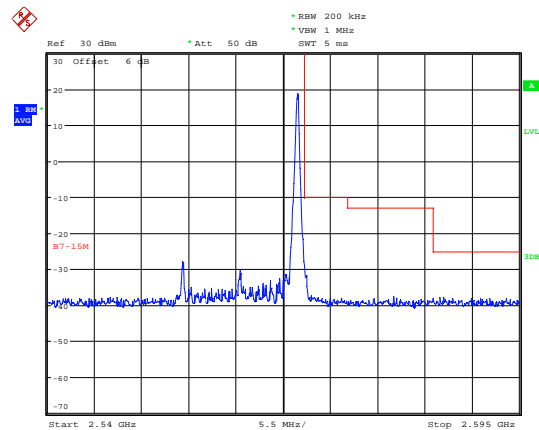
Date: 16.MAY.2019 14:47:27

LTE Band 7 64QAM 15MHz CH-Low, 1 RB



Date: 16.MAY.2019 14:43:35

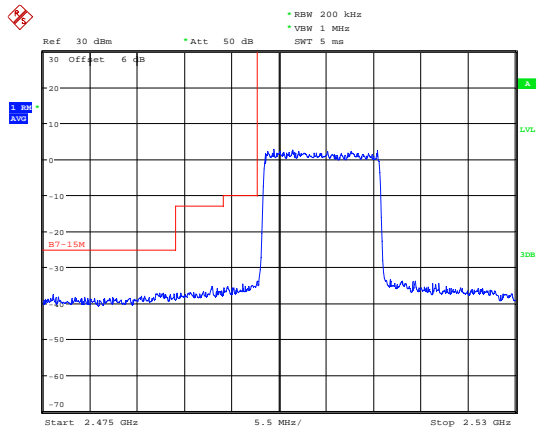
LTE Band 7 64QAM 15MHz CH-High, 1 RB



Date: 16.MAY.2019 14:45:37

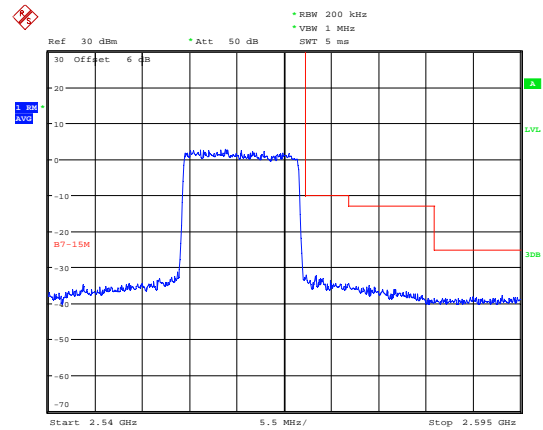


LTE Band 7 64QAM 15MHz CH-Low, 100%RB



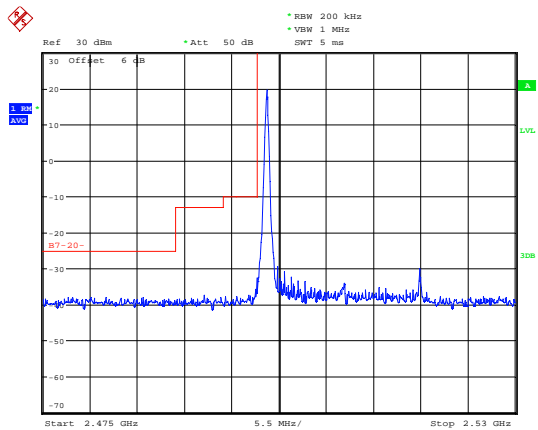
Date: 16.MAY.2019 14:43:42

LTE Band 7 64QAM 15MHz CH-High, 100%RB



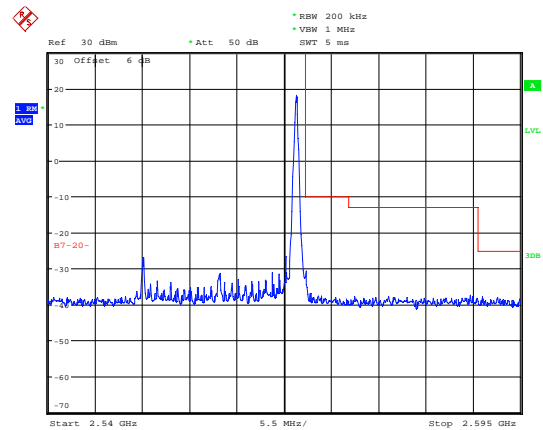
Date: 16.MAY.2019 14:45:44

LTE Band 7 64QAM 20MHz CH-Low, 1 RB



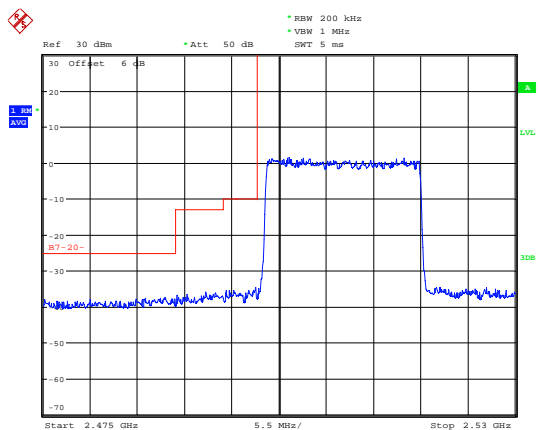
Date: 16.MAY.2019 14:44:10

LTE Band 7 64QAM 20MHz CH-High, 1 RB



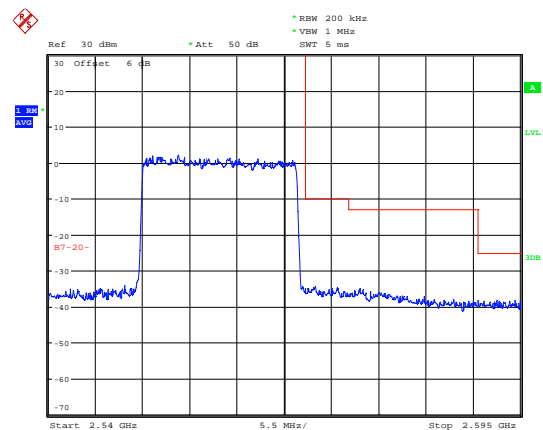
Date: 16.MAY.2019 14:44:58

LTE Band 7 64QAM 20MHz CH-Low, 100%RB



Date: 16.MAY.2019 14:44:17

LTE Band 7 64QAM 20MHz CH-High, 100%RB

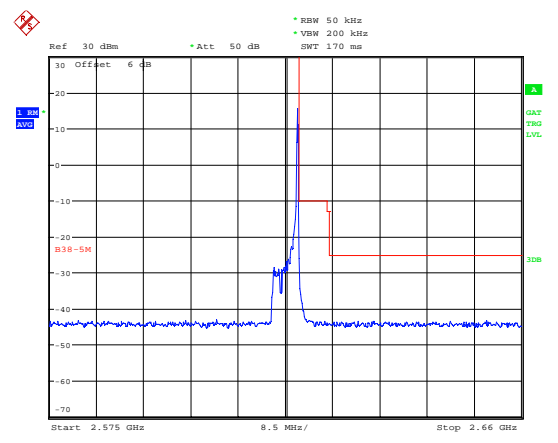
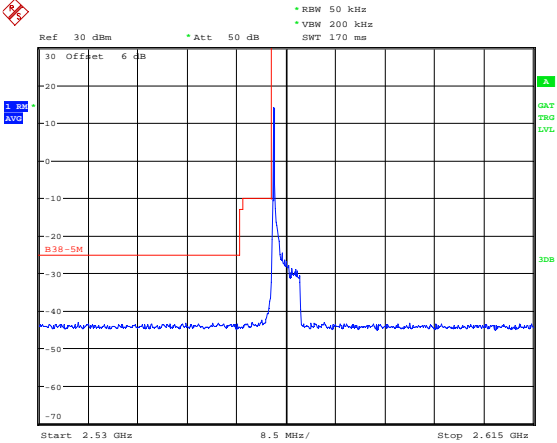


Date: 16.MAY.2019 14:45:05



LTE Band 38 QPSK 5MHz CH-Low, 1 RB

LTE Band 38 QPSK 5MHz CH-High, 1 RB

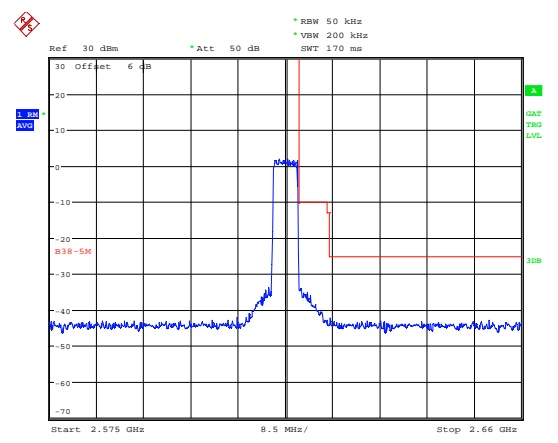
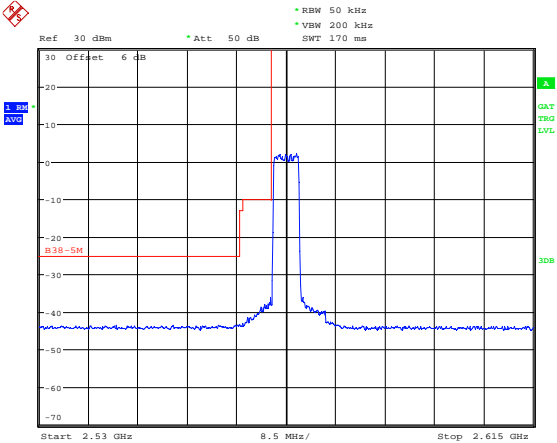


Date: 16.MAY.2019 11:56:16

Date: 16.MAY.2019 12:55:20

LTE Band 38 QPSK 5MHz CH-Low, 100%RB

LTE Band 38 QPSK 5MHz CH-High, 100%RB

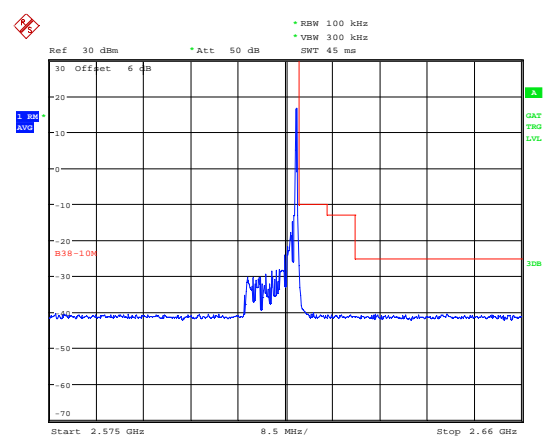
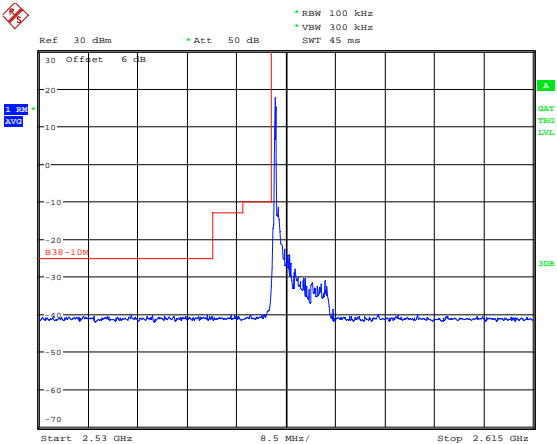


Date: 16.MAY.2019 12:01:11

Date: 16.MAY.2019 12:55:53

LTE Band 38 QPSK 10MHz CH-Low, 1 RB

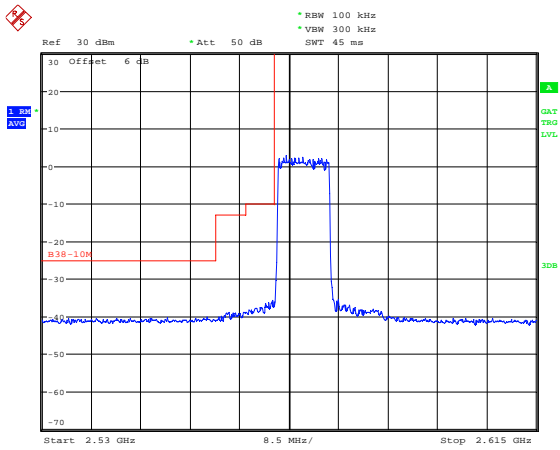
LTE Band 38 QPSK 10MHz CH-High, 1 RB



Date: 16.MAY.2019 12:04:03

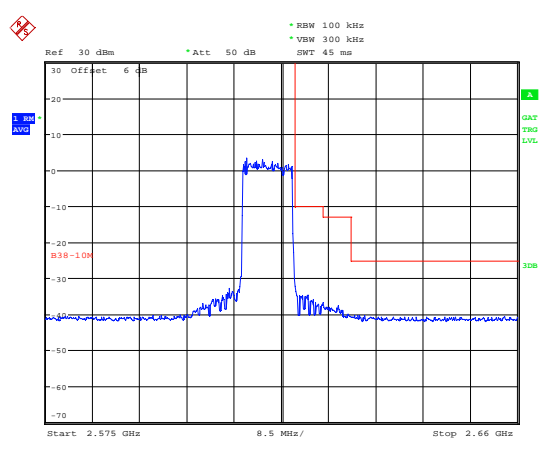
Date: 16.MAY.2019 12:57:28

LTE Band 38 QPSK 10MHz CH-Low, 100%RB



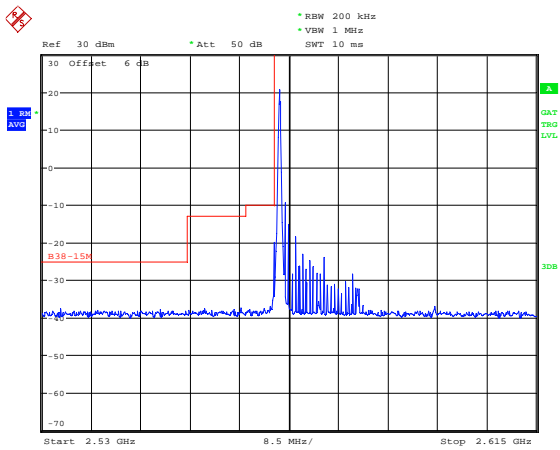
Date: 16.MAY.2019 12:04:36

LTE Band 38 QPSK 10MHz CH-High, 100%RB



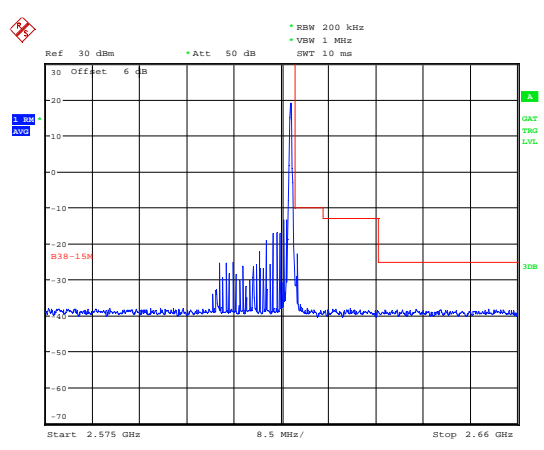
Date: 16.MAY.2019 12:58:04

LTE Band 38 QPSK 15MHz CH-Low, 1 RB



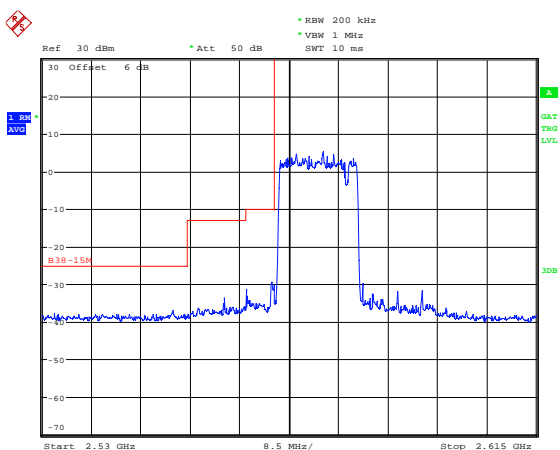
Date: 16.MAY.2019 12:19:14

LTE Band 38 QPSK 15MHz CH-High, 1 RB



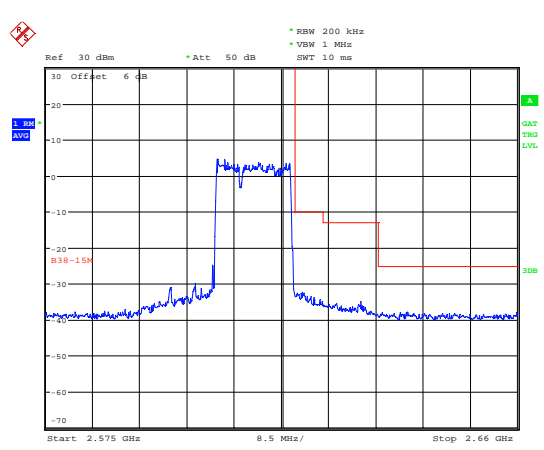
Date: 16.MAY.2019 12:53:07

LTE Band 38 QPSK 15MHz CH-Low, 100%RB



Date: 16.MAY.2019 12:19:47

LTE Band 38 QPSK 15MHz CH-High, 100%RB

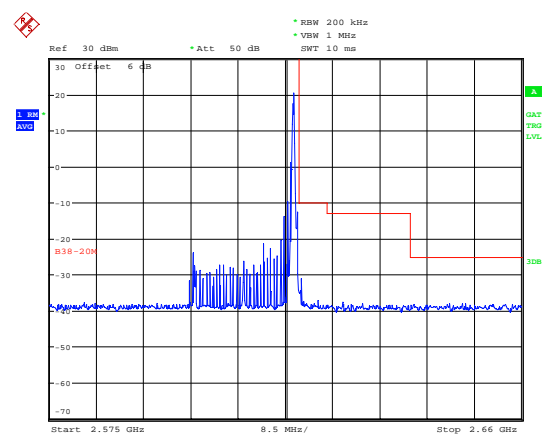
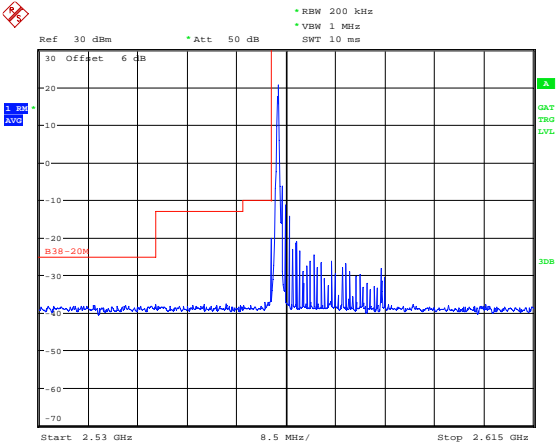


Date: 16.MAY.2019 12:53:43



LTE Band 38 QPSK 20MHz CH-Low, 1 RB

LTE Band 38 QPSK 20MHz CH-High, 1 RB

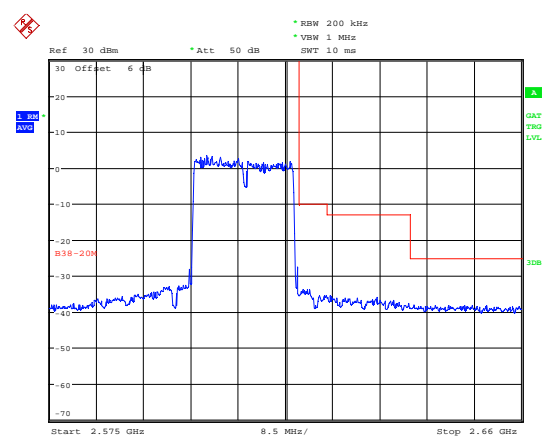
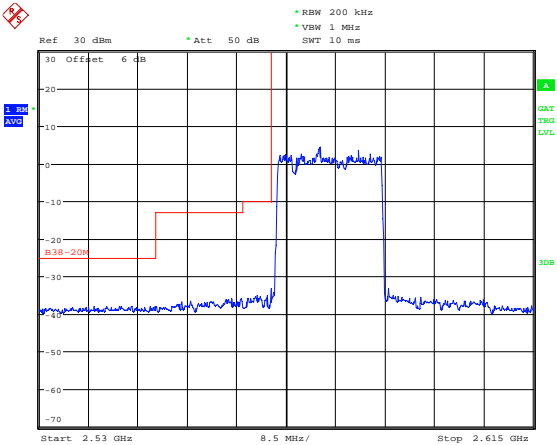


Date: 16.MAY.2019 12:20:41

Date: 16.MAY.2019 12:30:10

LTE Band 38 QPSK 20MHz CH-Low, 100%RB

LTE Band 38 QPSK 20MHz CH-High, 100%RB

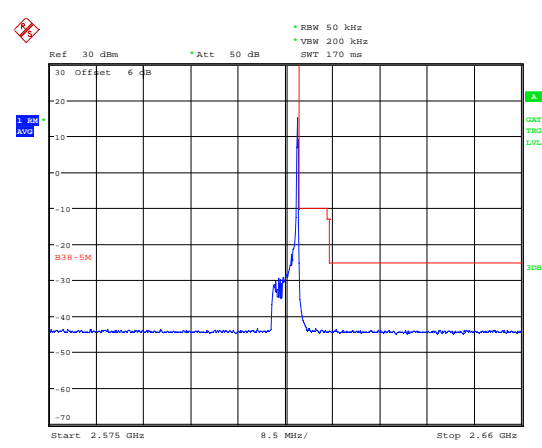
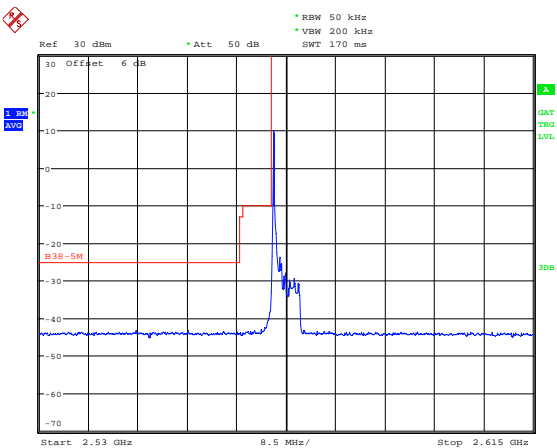


Date: 16.MAY.2019 12:21:20

Date: 16.MAY.2019 12:30:37

LTE Band 38 16QAM 5MHz CH-Low, 1 RB

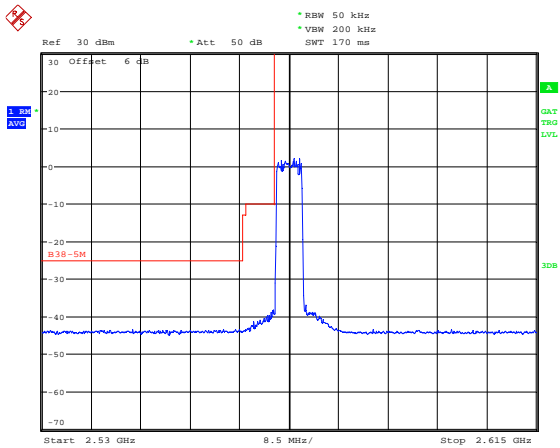
LTE Band 38 16QAM 5MHz CH-High, 1 RB



Date: 16.MAY.2019 11:57:18

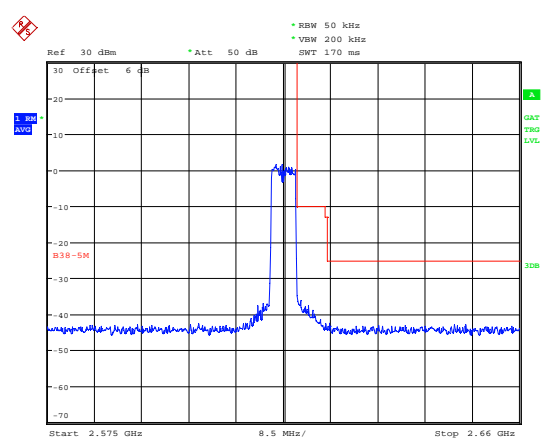
Date: 16.MAY.2019 12:55:34

LTE Band 38 16QAM 5MHz CH-Low, 100%RB



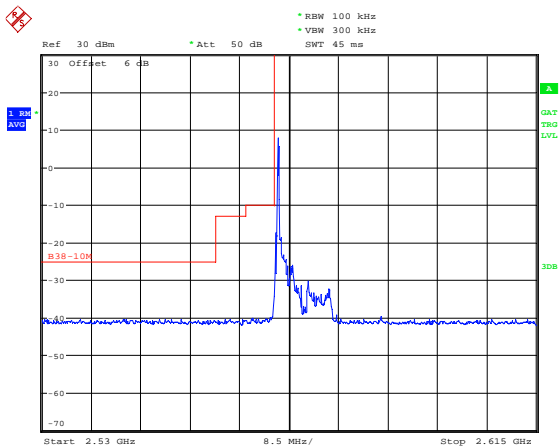
Date: 16.MAY.2019 12:01:29

LTE Band 38 16QAM 5MHz CH-High, 100%RB



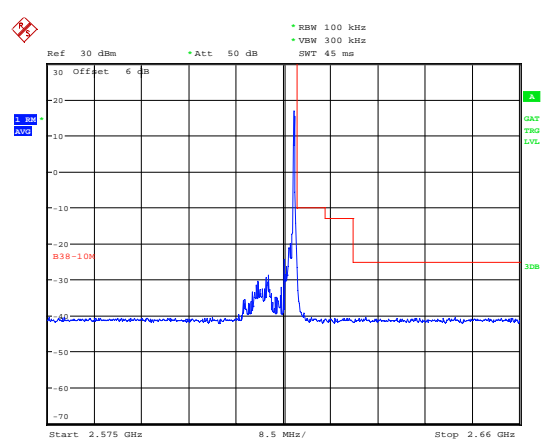
Date: 16.MAY.2019 12:56:15

LTE Band 38 16QAM 10MHz CH-Low, 1 RB



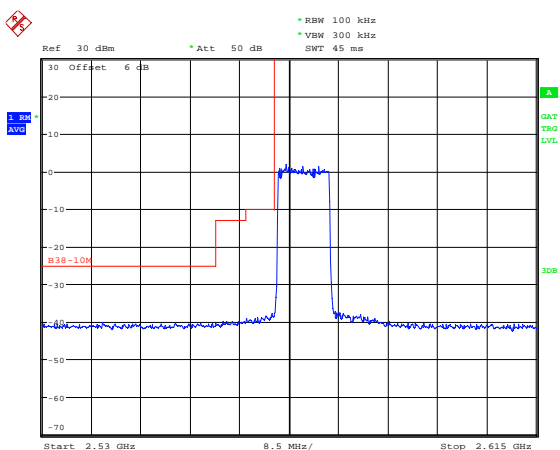
Date: 16.MAY.2019 12:04:13

LTE Band 38 16QAM 10MHz CH-High, 1 RB



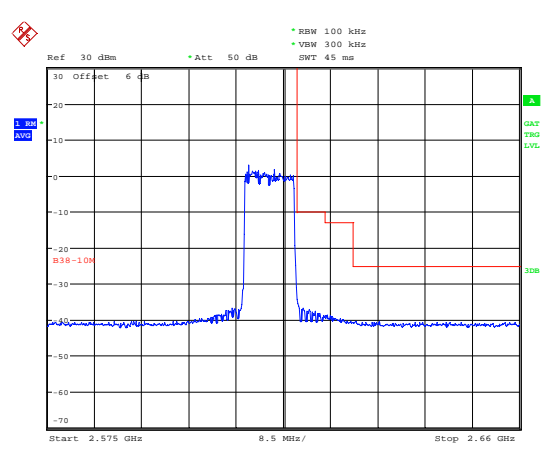
Date: 16.MAY.2019 12:57:45

LTE Band 38 16QAM 10MHz CH-Low, 100%RB



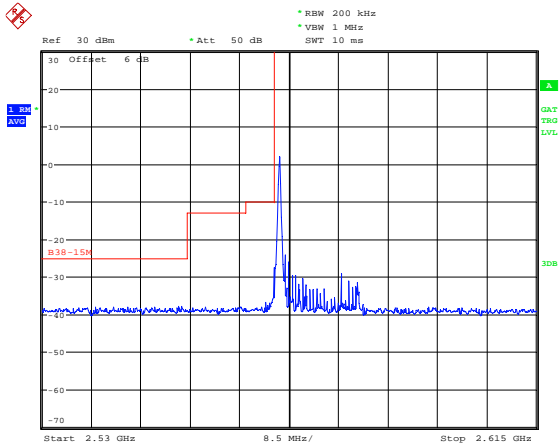
Date: 16.MAY.2019 12:04:48

LTE Band 38 16QAM 10MHz CH-High, 100%RB



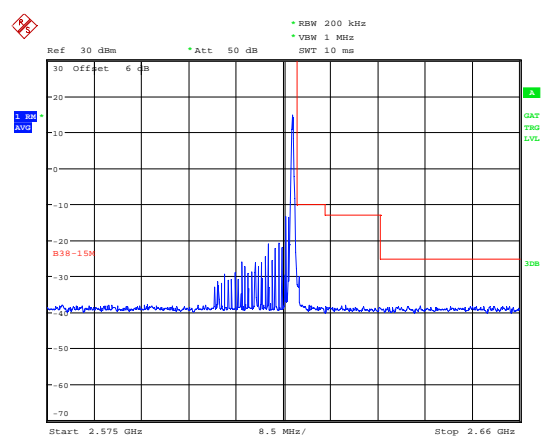
Date: 16.MAY.2019 12:58:23

LTE Band 38 16QAM 15MHz CH-Low, 1 RB



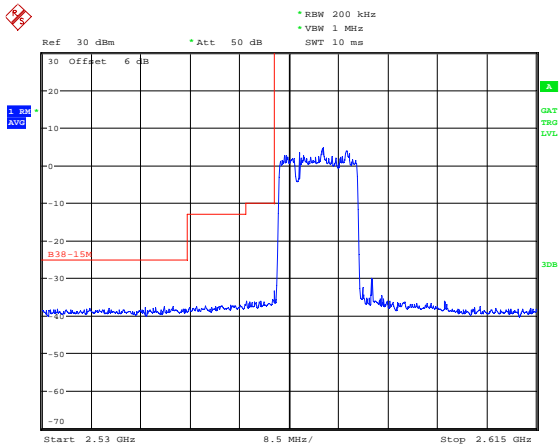
Date: 16.MAY.2019 12:19:30

LTE Band 38 16QAM 15MHz CH-High, 1 RB



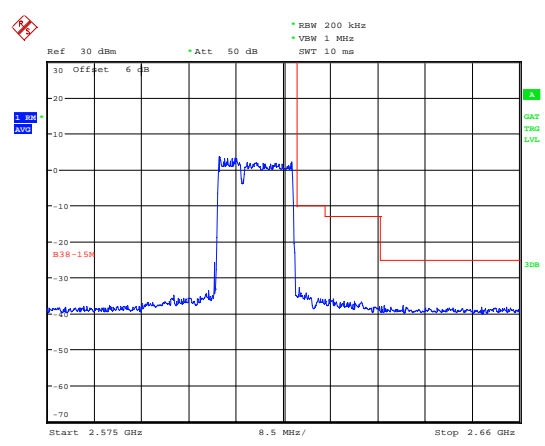
Date: 16.MAY.2019 12:53:28

LTE Band 38 16QAM 15MHz CH-Low, 100%RB



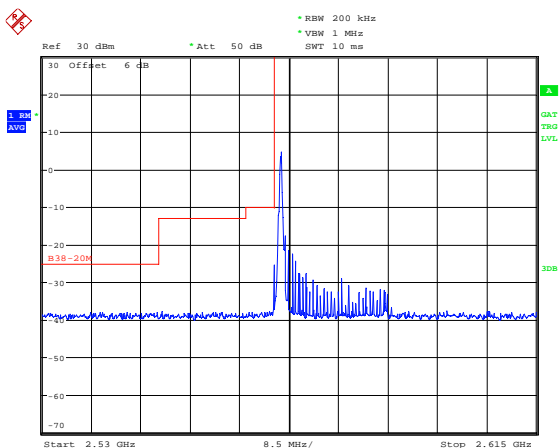
Date: 16.MAY.2019 12:19:57

LTE Band 38 16QAM 15MHz CH-High, 100%RB



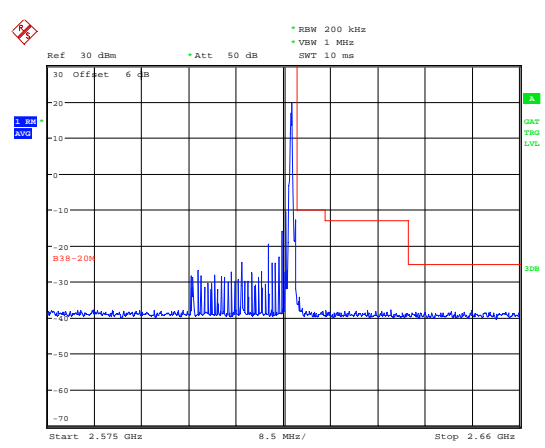
Date: 16.MAY.2019 12:53:51

LTE Band 38 16QAM 20MHz CH-Low, 1 RB



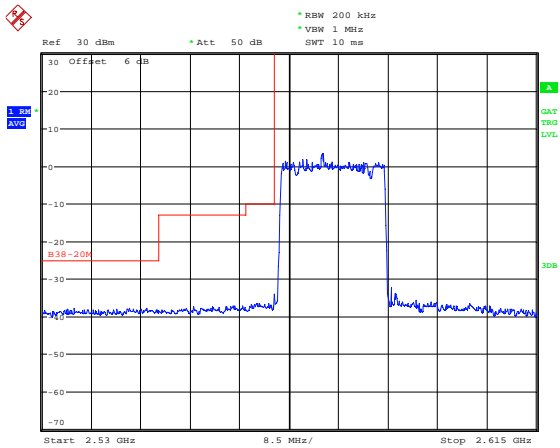
Date: 16.MAY.2019 12:20:57

LTE Band 38 16QAM 20MHz CH-High, 1 RB



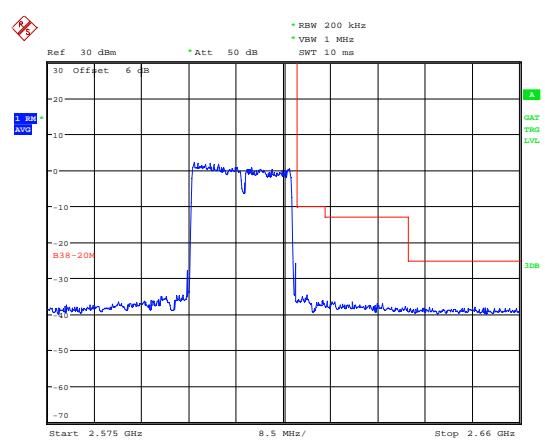
Date: 16.MAY.2019 12:30:23

LTE Band 38 16QAM 20MHz CH-Low, 100%RB



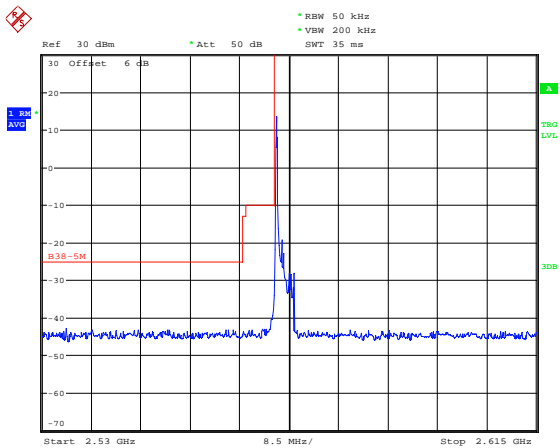
Date: 16.MAY.2019 12:21:31

LTE Band 38 16QAM 20MHz CH-High, 100%RB



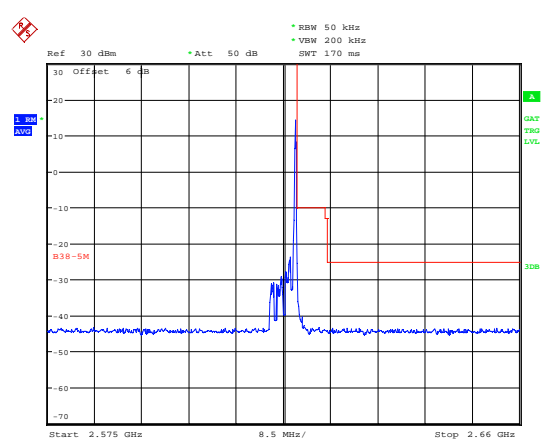
Date: 16.MAY.2019 12:30:50

LTE Band 38 64QAM 5MHz CH-Low, 1 RB



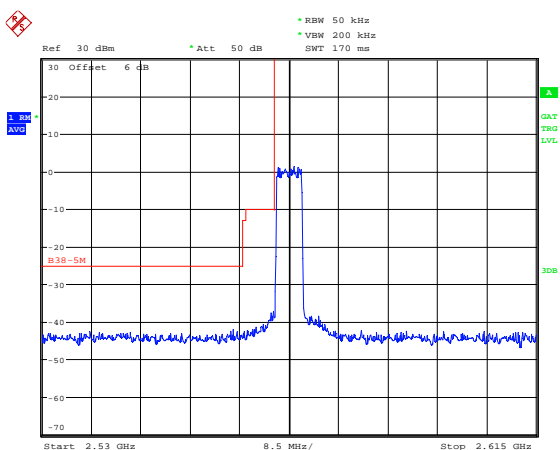
Date: 16.MAY.2019 13:13:03

LTE Band 38 64QAM 5MHz CH-High, 1 RB



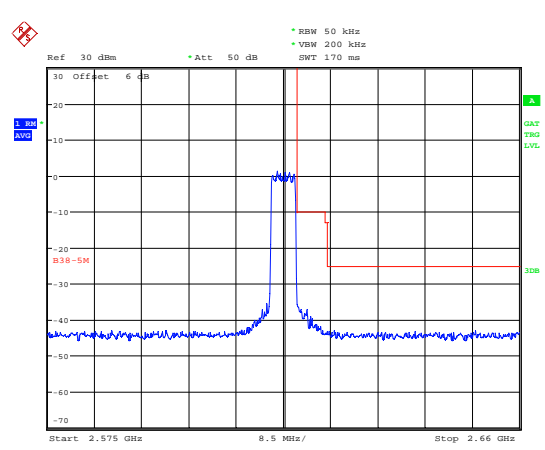
Date: 16.MAY.2019 13:04:29

LTE Band 38 64QAM 5MHz CH-Low, 100%RB



Date: 16.MAY.2019 13:12:43

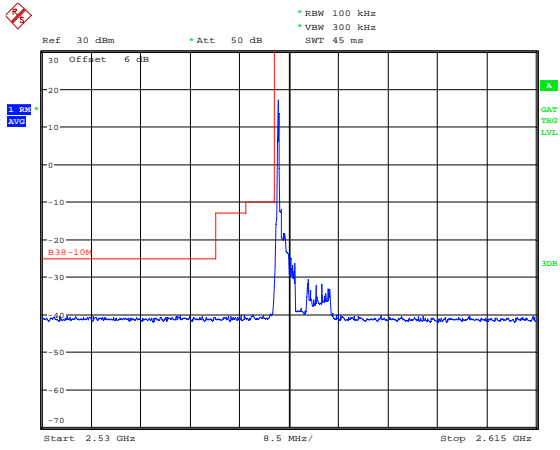
LTE Band 38 64QAM 5MHz CH-High, 100%RB



Date: 16.MAY.2019 13:04:45

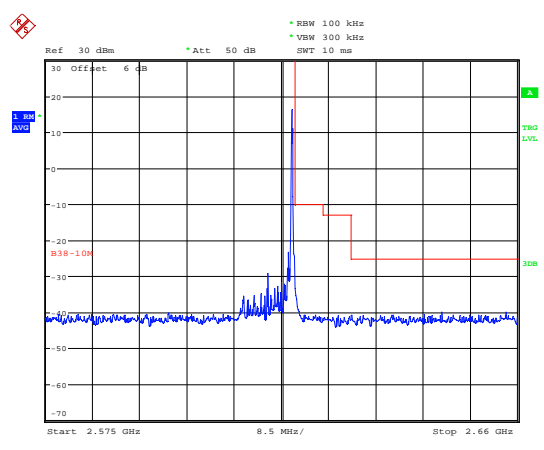


LTE Band 38 64QAM 10MHz CH-Low, 1 RB



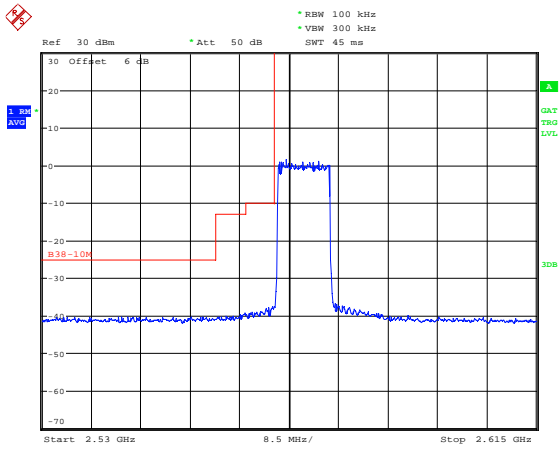
Date: 16.MAY.2019 13:24:18

LTE Band 38 64QAM 10MHz CH-High, 1 RB



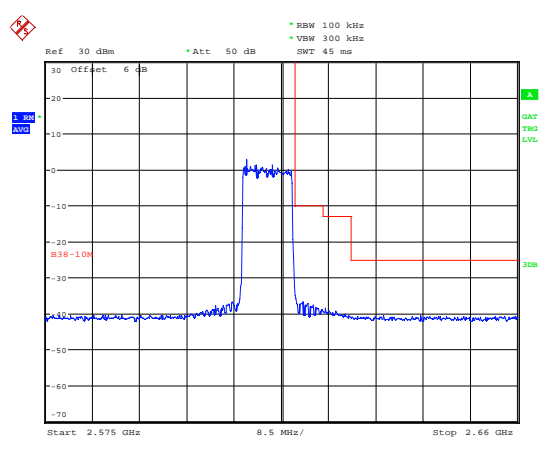
Date: 16.MAY.2019 13:03:02

LTE Band 38 64QAM 10MHz CH-Low, 100%RB



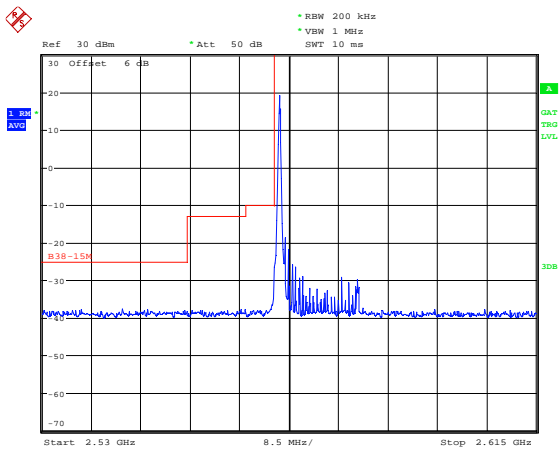
Date: 16.MAY.2019 13:24:29

LTE Band 38 64QAM 10MHz CH-High, 100%RB



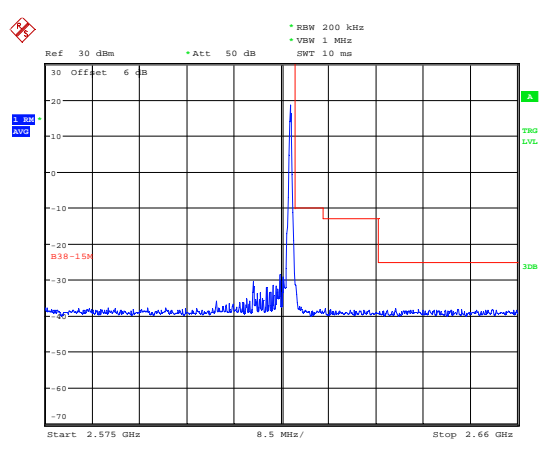
Date: 16.MAY.2019 13:03:32

LTE Band 38 64QAM 15MHz CH-Low, 1 RB



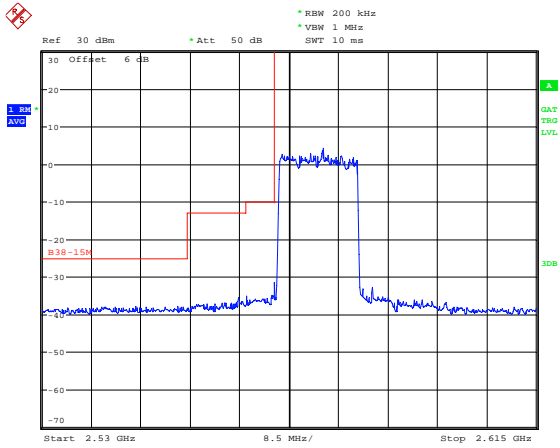
Date: 16.MAY.2019 13:10:26

LTE Band 38 64QAM 15MHz CH-High, 1 RB



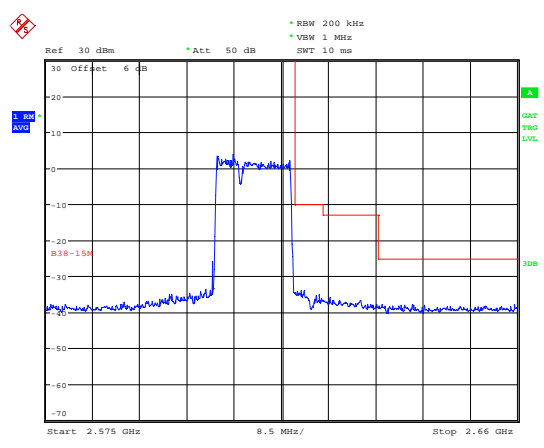
Date: 16.MAY.2019 13:05:44

LTE Band 38 64QAM 15MHz CH-Low, 100%RB



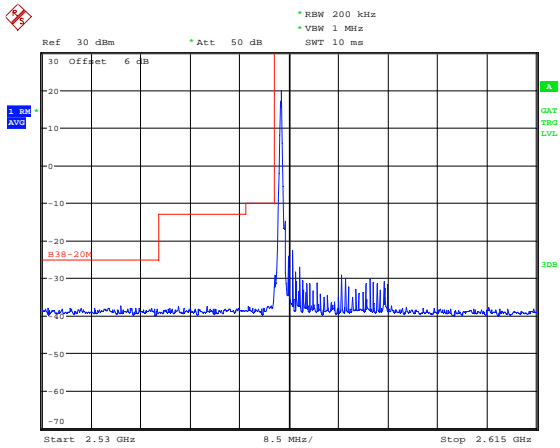
Date: 16.MAY.2019 13:10:36

LTE Band 38 64QAM 15MHz CH-High, 100%RB



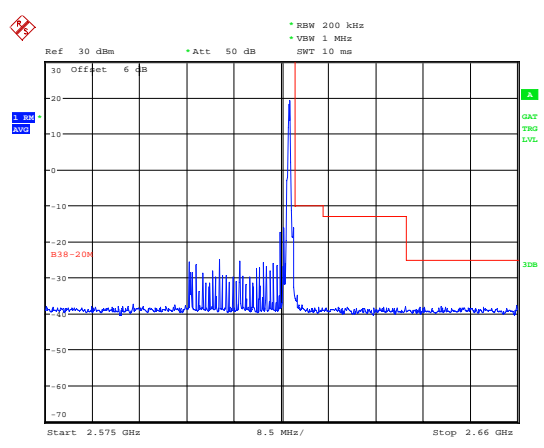
Date: 16.MAY.2019 13:06:03

LTE Band 38 64QAM 20MHz CH-Low, 1 RB



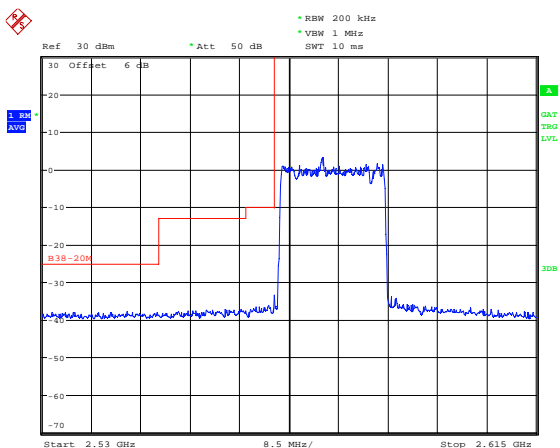
Date: 16.MAY.2019 13:09:42

LTE Band 38 64QAM 20MHz CH-High, 1 RB



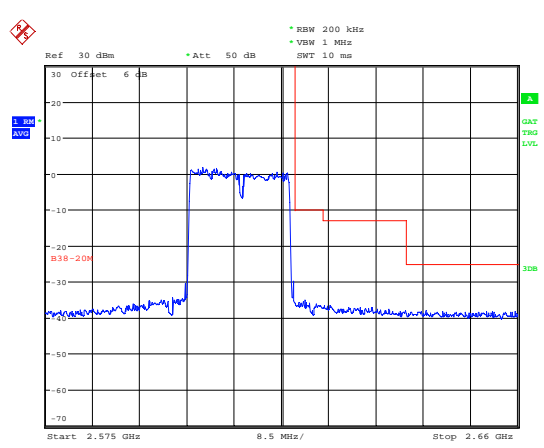
Date: 16.MAY.2019 13:06:36

LTE Band 38 64QAM 20MHz CH-Low, 100%RB



Date: 16.MAY.2019 13:09:51

LTE Band 38 64QAM 20MHz CH-High, 100%RB



Date: 16.MAY.2019 13:06:47

5.5 Peak-to-Average Power Ratio (PAPR)

Ambient condition

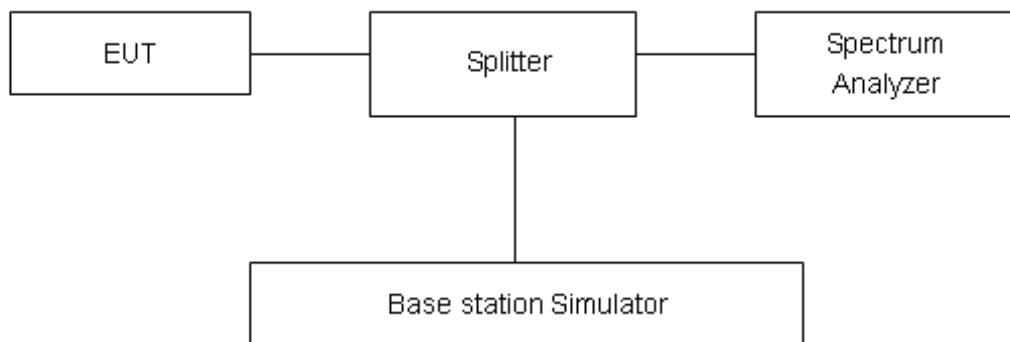
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

Measure the total peak power and record as Ppk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$PAPR (dB) = Ppk (dBm) - PAvg (dBm).$$

Test Setup



Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.4 dB.

Test Results

WCDMA Band IV	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
RMC	1312	1712.4	25.46	22.70	2.76	≤13	PASS
	1413	1732.6	25.67	22.96	2.71	≤13	PASS
	1513	1752.6	25.70	22.94	2.76	≤13	PASS

LTE Band 4								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	19957	1710.7	26.95	22.42	4.53	≤13	PASS
		20175	1732.5	26.99	22.25	4.74	≤13	PASS
		20393	1754.3	27.34	22.54	4.80	≤13	PASS
	3	19965	1711.5	27.19	22.49	4.70	≤13	PASS
		20175	1732.5	27.21	22.44	4.77	≤13	PASS
		20385	1753.5	27.45	22.52	4.93	≤13	PASS
	5	19975	1712.5	27.20	22.45	4.75	≤13	PASS
		20175	1732.5	27.09	22.27	4.82	≤13	PASS
		20375	1752.5	27.39	22.50	4.89	≤13	PASS
	10	20000	1715	27.26	22.39	4.87	≤13	PASS
		20175	1732.5	27.19	22.28	4.91	≤13	PASS
		20350	1750	27.44	22.51	4.93	≤13	PASS
	15	20025	1717.5	27.14	22.31	4.83	≤13	PASS
		20175	1732.5	27.18	22.26	4.92	≤13	PASS
		20325	1747.5	27.29	22.40	4.89	≤13	PASS
20	20050	1720	27.17	22.32	4.85	≤13	PASS	
	20175	1732.5	27.23	22.29	4.94	≤13	PASS	
	20300	1745	27.25	22.33	4.92	≤13	PASS	
16QAM	1.4	19957	1710.7	26.70	21.45	5.25	≤13	PASS
		20175	1732.5	26.73	21.29	5.44	≤13	PASS
		20393	1754.3	27.11	21.53	5.58	≤13	PASS
	3	19965	1711.5	26.95	21.45	5.50	≤13	PASS
		20175	1732.5	26.95	21.42	5.53	≤13	PASS
		20385	1753.5	27.19	21.54	5.65	≤13	PASS
	5	19975	1712.5	26.91	21.40	5.51	≤13	PASS
		20175	1732.5	26.83	21.25	5.58	≤13	PASS
		20375	1752.5	27.22	21.52	5.70	≤13	PASS
	10	20000	1715	26.98	21.35	5.63	≤13	PASS
		20175	1732.5	26.90	21.22	5.68	≤13	PASS
		20350	1750	27.20	21.53	5.67	≤13	PASS



	15	20025	1717.5	26.85	21.34	5.51	≤13	PASS
		20175	1732.5	26.82	21.26	5.56	≤13	PASS
		20325	1747.5	26.97	21.46	5.51	≤13	PASS
	20	20050	1720	26.92	21.31	5.61	≤13	PASS
		20175	1732.5	26.93	21.26	5.67	≤13	PASS
		20300	1745	26.97	21.30	5.67	≤13	PASS
64QAM	1.4	19957	1710.7	26.57	21.19	5.38	≤13	PASS
		20175	1732.5	26.43	21.00	5.43	≤13	PASS
		20393	1754.3	26.78	21.22	5.56	≤13	PASS
	3	19965	1711.5	26.66	21.18	5.48	≤13	PASS
		20175	1732.5	26.62	20.99	5.63	≤13	PASS
		20385	1753.5	26.96	21.27	5.69	≤13	PASS
	5	19975	1712.5	26.70	21.17	5.53	≤13	PASS
		20175	1732.5	26.58	20.96	5.62	≤13	PASS
		20375	1752.5	26.89	21.17	5.72	≤13	PASS
	10	20000	1715	26.68	21.06	5.62	≤13	PASS
		20175	1732.5	26.63	20.98	5.65	≤13	PASS
		20350	1750	26.78	21.06	5.72	≤13	PASS
	15	20025	1717.5	26.59	21.01	5.58	≤13	PASS
		20175	1732.5	26.43	20.84	5.59	≤13	PASS
		20325	1747.5	26.66	21.02	5.64	≤13	PASS
	20	20050	1720	26.72	21.05	5.67	≤13	PASS
		20175	1732.5	26.63	20.97	5.66	≤13	PASS
		20300	1745	26.72	20.99	5.73	≤13	PASS

LTE Band 7								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	20775	2502.5	28.10	23.31	4.79	≤13	PASS
		21100	2535	28.14	23.29	4.85	≤13	PASS
		21425	2567.5	27.91	23.31	4.60	≤13	PASS
	10	20800	2505	28.21	23.32	4.89	≤13	PASS
		21100	2535	28.19	23.30	4.89	≤13	PASS
		21400	2565	27.96	23.16	4.80	≤13	PASS
	15	20825	2507.5	28.10	23.29	4.81	≤13	PASS
		21100	2535	28.03	23.24	4.79	≤13	PASS
		21375	2562.5	27.84	23.08	4.76	≤13	PASS
	20	20850	2510	28.31	23.54	4.77	≤13	PASS



		21100	2535	28.14	23.25	4.89	≤13	PASS
		21350	2560	28.01	23.10	4.91	≤13	PASS
16QAM	5	20775	2502.5	27.94	22.29	5.65	≤13	PASS
		21100	2535	27.92	22.27	5.65	≤13	PASS
		21425	2567.5	27.74	22.28	5.46	≤13	PASS
	10	20800	2505	28.02	22.31	5.71	≤13	PASS
		21100	2535	28.02	22.31	5.71	≤13	PASS
		21400	2565	27.80	22.16	5.64	≤13	PASS
	15	20825	2507.5	27.92	22.32	5.60	≤13	PASS
		21100	2535	27.83	22.22	5.61	≤13	PASS
		21375	2562.5	27.63	22.04	5.59	≤13	PASS
	20	20850	2510	28.10	22.45	5.65	≤13	PASS
		21100	2535	27.95	22.24	5.71	≤13	PASS
		21350	2560	27.81	22.08	5.73	≤13	PASS
64QAM	5	20775	2502.5	27.68	21.98	5.70	≤13	PASS
		21100	2535	27.59	21.78	5.81	≤13	PASS
		21425	2567.5	27.55	21.90	5.65	≤13	PASS
	10	20800	2505	27.70	21.95	5.75	≤13	PASS
		21100	2535	27.59	21.79	5.80	≤13	PASS
		21400	2565	27.60	21.89	5.71	≤13	PASS
	15	20825	2507.5	27.63	21.95	5.68	≤13	PASS
		21100	2535	27.54	21.81	5.73	≤13	PASS
		21375	2562.5	27.51	21.86	5.65	≤13	PASS
	20	20850	2510	27.74	21.97	5.77	≤13	PASS
		21100	2535	27.64	21.85	5.79	≤13	PASS
		21350	2560	27.67	21.90	5.77	≤13	PASS

LTE Band 38								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	37775	2572.5	27.71	19.08	8.63	≤13	PASS
		38000	2595	27.69	18.97	8.72	≤13	PASS
		38225	2617.5	27.49	18.99	8.50	≤13	PASS
	10	37800	2575	27.81	18.85	8.96	≤13	PASS



		38000	2595	27.63	18.96	8.67	≤13	PASS	
		38200	2615	27.62	19.18	8.44	≤13	PASS	
		37825	2577.5	27.89	19.27	8.62	≤13	PASS	
	15	38000	2595	27.76	18.80	8.96	≤13	PASS	
		38175	2612.5	27.74	18.63	9.11	≤13	PASS	
		37850	2580	27.74	19.06	8.68	≤13	PASS	
	20	38000	2595	27.73	19.10	8.63	≤13	PASS	
		38150	2610	27.60	18.54	9.06	≤13	PASS	
		37775	2572.5	27.39	18.15	9.24	≤13	PASS	
16QAM	5	38000	2595	27.39	17.78	9.61	≤13	PASS	
		38225	2617.5	27.15	17.69	9.46	≤13	PASS	
		37800	2575	27.45	17.91	9.54	≤13	PASS	
	10	38000	2595	27.29	17.63	9.66	≤13	PASS	
		38200	2615	27.30	17.98	9.32	≤13	PASS	
		37825	2577.5	27.45	17.79	9.66	≤13	PASS	
	15	38000	2595	27.39	17.53	9.86	≤13	PASS	
		38175	2612.5	27.38	18.03	9.35	≤13	PASS	
		37850	2580	27.38	17.72	9.66	≤13	PASS	
	20	38000	2595	27.40	18.08	9.32	≤13	PASS	
		38150	2610	27.32	17.63	9.69	≤13	PASS	
		37775	2572.5	27.17	18.14	9.03	≤13	PASS	
	64QAM	5	38000	2595	26.99	17.50	9.49	≤13	PASS
			38225	2617.5	26.83	17.22	9.61	≤13	PASS
			37800	2575	27.04	17.39	9.65	≤13	PASS
10		38000	2595	27.05	17.39	9.66	≤13	PASS	
		38200	2615	27.01	17.57	9.44	≤13	PASS	
		37825	2577.5	27.19	17.57	9.62	≤13	PASS	
15		38000	2595	27.20	17.87	9.33	≤13	PASS	
		38175	2612.5	27.02	17.52	9.50	≤13	PASS	
		37850	2580	27.03	17.09	9.94	≤13	PASS	
20		38000	2595	27.14	17.90	9.24	≤13	PASS	
		38150	2610	27.16	17.92	9.24	≤13	PASS	

5.6 Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +55°C in 10°C step size.

(1) With all power removed, the temperature was decreased to -10°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -30°C to +55°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

Frequency Stability (Voltage Variation)

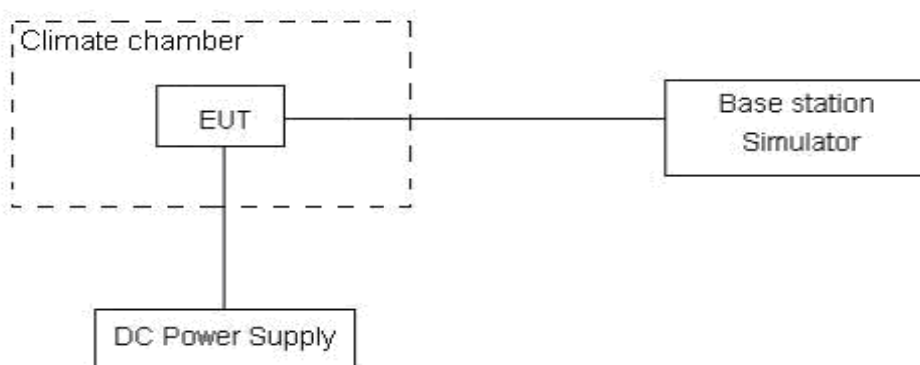
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.6 V and 4.35 V, with a nominal voltage of 3.8V.

Test setup



Limits

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 3$, $U=0.01\text{ppm}$.

Test Result
WCDMA Band IV

WCDMA Band IV						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal (25°C)	Normal	2.34	7.63	0.00124	0.00406	PASS
Extreme (55°C)		9.62	17.76	0.00512	0.00945	PASS
Extreme (50°C)		7.45	15.54	0.00396	0.00827	PASS
Extreme (40°C)		8.51	12.40	0.00453	0.00660	PASS
Extreme (30°C)		4.43	6.72	0.00235	0.00358	PASS
Extreme (20°C)		14.26	3.63	0.00758	0.00193	PASS
Extreme (10°C)		14.88	11.35	0.00791	0.00604	PASS
Extreme (0°C)		9.67	4.62	0.00514	0.00246	PASS
Extreme (-10°C)		11.49	3.85	0.00611	0.00205	PASS
Extreme (-20°C)		1.16	5.65	0.00062	0.00301	PASS
Extreme (-30°C)		15.13	3.73	0.00805	0.00198	PASS
25°C		LV	7.04	12.73	0.00375	0.00677
	HV	16.26	16.30	0.00865	0.00867	PASS

LTE Band 4, BANDWIDTH, 1.4MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	14.41	17.76	15.96	0.00766	0.00944	0.00849	PASS
Extreme (55°C)		2.89	16.73	2.67	0.00154	0.00890	0.00142	PASS
Extreme (50°C)		17.63	5.64	8.72	0.00938	0.00300	0.00464	PASS
Extreme (40°C)		1.41	17.64	6.19	0.00075	0.00939	0.00329	PASS
Extreme (30°C)		10.92	10.09	12.87	0.00581	0.00537	0.00685	PASS
Extreme (20°C)		12.68	2.73	11.56	0.00675	0.00145	0.00615	PASS
Extreme (10°C)		8.98	10.62	12.14	0.00478	0.00565	0.00646	PASS
Extreme (0°C)		11.56	12.26	2.24	0.00615	0.00652	0.00119	PASS
Extreme (-10°C)		12.46	2.45	16.63	0.00663	0.00130	0.00885	PASS
Extreme (-20°C)		12.82	4.48	1.23	0.00682	0.00238	0.00065	PASS
Extreme (-30°C)		8.29	12.21	11.37	0.00441	0.00649	0.00605	PASS
25°C		LV	16.18	10.36	14.00	0.00860	0.00551	0.00745
	HV	5.65	3.14	2.97	0.00301	0.00167	0.00158	PASS

LTE Band 4, BANDWIDTH, 3MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	7.95	2.56	2.95	0.00423	0.00136	0.00157	PASS
Extreme (55°C)		17.32	14.46	10.23	0.00921	0.00769	0.00544	PASS
Extreme (50°C)		2.77	2.29	12.07	0.00147	0.00122	0.00642	PASS
Extreme (40°C)		8.86	2.03	12.56	0.00471	0.00108	0.00668	PASS
Extreme (30°C)		2.61	17.14	13.92	0.00139	0.00912	0.00740	PASS
Extreme (20°C)		14.55	11.06	5.60	0.00774	0.00588	0.00298	PASS
Extreme (10°C)		2.76	17.45	11.38	0.00147	0.00928	0.00605	PASS
Extreme (0°C)		6.93	11.61	13.50	0.00368	0.00618	0.00718	PASS
Extreme (-10°C)		5.50	5.50	16.50	0.00292	0.00293	0.00877	PASS
Extreme (-20°C)		7.91	6.03	13.80	0.00421	0.00321	0.00734	PASS
Extreme (-30°C)		2.30	7.37	17.57	0.00123	0.00392	0.00935	PASS
25°C		LV	17.03	1.29	12.55	0.00906	0.00069	0.00668
	HV	6.13	13.83	13.02	0.00326	0.00736	0.00692	PASS

LTE Band 4, BANDWIDTH, 5MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	5.43	8.18	17.52	0.00289	0.00435	0.00932	PASS
Extreme (55°C)		1.05	9.38	3.58	0.00056	0.00499	0.00190	PASS
Extreme (50°C)		12.38	17.19	9.01	0.00659	0.00914	0.00479	PASS
Extreme (40°C)		6.43	17.08	16.94	0.00342	0.00909	0.00901	PASS
Extreme (30°C)		16.08	1.15	13.42	0.00856	0.00061	0.00714	PASS
Extreme (20°C)		5.16	13.85	7.95	0.00274	0.00737	0.00423	PASS
Extreme (10°C)		4.12	12.96	13.01	0.00219	0.00689	0.00692	PASS
Extreme (0°C)		6.92	4.08	15.04	0.00368	0.00217	0.00800	PASS
Extreme (-10°C)		11.60	15.83	9.21	0.00617	0.00842	0.00490	PASS
Extreme (-20°C)		10.77	10.91	1.34	0.00573	0.00580	0.00071	PASS
Extreme (-30°C)		6.74	13.82	5.47	0.00358	0.00735	0.00291	PASS
25°C		LV	14.96	11.16	15.49	0.00796	0.00593	0.00824
	HV	11.14	8.25	8.71	0.00593	0.00439	0.00463	PASS

LTE Band 4, BANDWIDTH, 10MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	7.58	10.44	1.91	0.00403	0.00556	0.00102	PASS
Extreme (55°C)		11.41	12.34	16.88	0.00607	0.00656	0.00898	PASS
Extreme (50°C)		14.27	7.79	10.03	0.00759	0.00414	0.00534	PASS
Extreme (40°C)		3.78	5.36	12.17	0.00201	0.00285	0.00647	PASS
Extreme (30°C)		12.25	11.45	11.66	0.00651	0.00609	0.00620	PASS
Extreme (20°C)		14.28	15.85	1.10	0.00759	0.00843	0.00059	PASS
Extreme (10°C)		13.36	4.36	2.77	0.00711	0.00232	0.00147	PASS
Extreme (0°C)		8.06	3.14	2.59	0.00428	0.00167	0.00138	PASS
Extreme (-10°C)		11.17	6.44	16.22	0.00594	0.00342	0.00863	PASS
Extreme (-20°C)		17.06	1.52	10.65	0.00907	0.00081	0.00566	PASS
Extreme (-30°C)		6.56	4.57	7.18	0.00349	0.00243	0.00382	PASS
25°C		LV	1.20	16.84	2.73	0.00064	0.00896	0.00145
	HV	14.01	17.40	12.85	0.00745	0.00926	0.00683	PASS

LTE Band 4, BANDWIDTH, 15MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	6.51	8.32	12.60	0.00346	0.00443	0.00670	PASS
Extreme (55°C)		15.29	12.46	8.51	0.00813	0.00663	0.00453	PASS
Extreme (50°C)		3.17	6.83	7.81	0.00168	0.00364	0.00416	PASS
Extreme (40°C)		10.65	9.12	2.69	0.00567	0.00485	0.00143	PASS
Extreme (30°C)		3.43	11.91	7.64	0.00182	0.00634	0.00406	PASS
Extreme (20°C)		10.26	2.17	10.09	0.00546	0.00115	0.00536	PASS
Extreme (10°C)		11.75	17.59	10.91	0.00625	0.00936	0.00580	PASS
Extreme (0°C)		14.20	16.27	12.67	0.00755	0.00865	0.00674	PASS
Extreme (-10°C)		5.10	8.23	6.32	0.00271	0.00438	0.00336	PASS
Extreme (-20°C)		7.51	14.57	9.47	0.00399	0.00775	0.00504	PASS
Extreme (-30°C)		10.64	3.92	9.86	0.00566	0.00209	0.00524	PASS
25°C		LV	1.78	4.50	6.92	0.00095	0.00239	0.00368
	HV	1.81	9.46	14.14	0.00096	0.00503	0.00752	PASS

LTE Band 4, BANDWIDTH, 20MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	11.25	7.67	2.97	0.00598	0.00408	0.00158	PASS
Extreme (55°C)		11.14	1.78	6.37	0.00593	0.00095	0.00339	PASS
Extreme (50°C)		10.31	3.03	9.40	0.00548	0.00161	0.00500	PASS
Extreme (40°C)		3.38	1.84	13.23	0.00180	0.00098	0.00703	PASS
Extreme (30°C)		17.93	7.33	17.30	0.00954	0.00390	0.00920	PASS
Extreme (20°C)		9.48	7.58	1.11	0.00504	0.00403	0.00059	PASS
Extreme (10°C)		11.35	11.71	17.41	0.00604	0.00623	0.00926	PASS
Extreme (0°C)		10.50	1.53	7.11	0.00559	0.00082	0.00378	PASS
Extreme (-10°C)		14.66	12.40	7.37	0.00780	0.00660	0.00392	PASS
Extreme (-20°C)		5.01	13.63	11.53	0.00266	0.00725	0.00613	PASS
Extreme (-30°C)		10.16	15.95	7.27	0.00540	0.00848	0.00387	PASS
25°C		LV	17.19	7.49	4.57	0.00914	0.00398	0.00243
	HV	2.54	9.80	12.52	0.00135	0.00521	0.00666	PASS

LTE Band 7, BANDWIDTH, 5MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	9.27	14.55	17.09	0.00493	0.00774	0.00909	PASS
Extreme (55°C)		2.16	7.44	12.22	0.00115	0.00396	0.00650	PASS
Extreme (50°C)		7.61	3.84	8.91	0.00405	0.00204	0.00474	PASS
Extreme (40°C)		11.30	10.97	17.66	0.00601	0.00583	0.00939	PASS
Extreme (30°C)		12.63	15.16	1.14	0.00672	0.00807	0.00061	PASS
Extreme (20°C)		17.84	15.50	8.02	0.00949	0.00824	0.00427	PASS
Extreme (10°C)		15.36	4.93	2.46	0.00817	0.00262	0.00131	PASS
Extreme (0°C)		13.30	12.84	17.40	0.00707	0.00683	0.00926	PASS
Extreme (-10°C)		12.24	3.46	4.79	0.00651	0.00184	0.00255	PASS
Extreme (-20°C)		5.28	2.03	14.99	0.00281	0.00108	0.00797	PASS
Extreme (-30°C)		4.45	11.89	9.83	0.00236	0.00632	0.00523	PASS
25°C		LV	13.80	8.56	2.27	0.00734	0.00455	0.00121
	HV	9.66	1.34	1.87	0.00514	0.00071	0.00100	PASS

LTE Band 7, BANDWIDTH, 10MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	9.62	16.25	11.82	0.00512	0.00864	0.00629	PASS
Extreme (55°C)		16.54	13.84	15.93	0.00880	0.00736	0.00847	PASS
Extreme (50°C)		5.26	7.79	4.13	0.00280	0.00414	0.00220	PASS
Extreme (40°C)		6.45	12.44	13.71	0.00343	0.00662	0.00729	PASS
Extreme (30°C)		12.46	7.64	13.93	0.00663	0.00406	0.00741	PASS
Extreme (20°C)		1.97	13.35	8.13	0.00105	0.00710	0.00432	PASS
Extreme (10°C)		7.49	4.02	17.14	0.00398	0.00214	0.00912	PASS
Extreme (0°C)		11.81	3.44	10.49	0.00628	0.00183	0.00558	PASS
Extreme (-10°C)		6.40	5.18	11.43	0.00341	0.00276	0.00608	PASS
Extreme (-20°C)		1.92	3.96	12.50	0.00102	0.00211	0.00665	PASS
Extreme (-30°C)		3.29	15.55	11.58	0.00175	0.00827	0.00616	PASS
25°C		LV	8.38	13.65	16.20	0.00446	0.00726	0.00861
	HV	12.33	5.37	17.31	0.00656	0.00286	0.00921	PASS

LTE Band 7, BANDWIDTH, 15MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	16.40	13.73	12.39	0.00872	0.00730	0.00659	PASS
Extreme (55°C)		3.89	5.88	16.16	0.00207	0.00313	0.00859	PASS
Extreme (50°C)		11.47	4.41	6.58	0.00610	0.00235	0.00350	PASS
Extreme (40°C)		15.51	8.84	15.15	0.00825	0.00470	0.00806	PASS
Extreme (30°C)		2.65	1.55	15.29	0.00141	0.00083	0.00814	PASS
Extreme (20°C)		6.83	7.62	7.49	0.00363	0.00405	0.00398	PASS
Extreme (10°C)		1.07	9.67	17.18	0.00057	0.00514	0.00914	PASS
Extreme (0°C)		11.85	15.24	10.63	0.00630	0.00810	0.00565	PASS
Extreme (-10°C)		1.76	8.08	3.04	0.00094	0.00430	0.00161	PASS
Extreme (-20°C)		16.48	15.69	17.70	0.00877	0.00835	0.00942	PASS
Extreme (-30°C)		14.33	5.09	7.78	0.00762	0.00271	0.00414	PASS
25°C		LV	4.63	16.22	4.39	0.00246	0.00863	0.00233
	HV	13.25	7.30	16.42	0.00705	0.00388	0.00873	PASS

LTE Band 7, BANDWIDTH, 20MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	10.43	5.25	11.61	0.00555	0.00279	0.00618	PASS
Extreme (55°C)		6.13	17.27	4.39	0.00326	0.00918	0.00233	PASS
Extreme (50°C)		15.75	2.23	15.63	0.00838	0.00119	0.00831	PASS
Extreme (40°C)		3.78	10.67	1.69	0.00201	0.00567	0.00090	PASS
Extreme (30°C)		16.13	7.97	15.25	0.00858	0.00424	0.00811	PASS
Extreme (20°C)		13.09	8.55	15.15	0.00696	0.00455	0.00806	PASS
Extreme (10°C)		11.47	15.84	6.06	0.00610	0.00843	0.00322	PASS
Extreme (0°C)		2.37	9.33	2.34	0.00126	0.00496	0.00124	PASS
Extreme (-10°C)		2.58	10.34	7.71	0.00137	0.00550	0.00410	PASS
Extreme (-20°C)		16.37	10.56	8.36	0.00871	0.00561	0.00445	PASS
Extreme (-30°C)		14.21	7.21	15.87	0.00756	0.00383	0.00844	PASS
25°C		LV	4.75	9.73	10.52	0.00253	0.00518	0.00559
	HV	6.19	5.30	4.88	0.00329	0.00282	0.00260	PASS

LTE Band 38, BANDWIDTH, 5MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	1.12	12.09	2.52	0.00059	0.00643	0.00134	PASS
Extreme (55°C)		9.87	15.94	9.05	0.00525	0.00848	0.00481	PASS
Extreme (50°C)		10.35	13.80	6.14	0.00551	0.00734	0.00326	PASS
Extreme (40°C)		16.71	6.61	1.34	0.00889	0.00351	0.00072	PASS
Extreme (30°C)		2.75	4.27	9.12	0.00146	0.00227	0.00485	PASS
Extreme (20°C)		8.58	3.01	1.46	0.00457	0.00160	0.00078	PASS
Extreme (10°C)		7.58	5.36	8.10	0.00403	0.00285	0.00431	PASS
Extreme (0°C)		2.00	1.49	12.70	0.00106	0.00079	0.00676	PASS
Extreme (-10°C)		17.67	12.65	8.83	0.00940	0.00673	0.00470	PASS
Extreme (-20°C)		15.28	8.53	6.26	0.00813	0.00454	0.00333	PASS
Extreme (-30°C)		1.51	11.61	6.26	0.00081	0.00617	0.00333	PASS
25°C		LV	11.07	3.24	2.25	0.00589	0.00172	0.00120
	HV	11.55	8.23	11.51	0.00614	0.00438	0.00612	PASS

LTE Band 38, BANDWIDTH, 10MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	17.09	5.58	7.44	0.00909	0.00297	0.00396	PASS
Extreme (55°C)		7.72	17.17	12.04	0.00411	0.00913	0.00640	PASS
Extreme (50°C)		8.33	6.98	5.22	0.00443	0.00371	0.00278	PASS
Extreme (40°C)		8.89	7.98	6.73	0.00473	0.00425	0.00358	PASS
Extreme (30°C)		12.31	10.77	8.45	0.00655	0.00573	0.00449	PASS
Extreme (20°C)		2.76	8.72	10.31	0.00147	0.00464	0.00548	PASS
Extreme (10°C)		12.00	2.89	13.73	0.00638	0.00154	0.00730	PASS
Extreme (0°C)		2.69	8.52	3.56	0.00143	0.00453	0.00190	PASS
Extreme (-10°C)		16.53	16.84	6.53	0.00879	0.00896	0.00347	PASS
Extreme (-20°C)		11.83	5.63	4.35	0.00629	0.00299	0.00231	PASS
Extreme (-30°C)		8.45	5.36	9.12	0.00449	0.00285	0.00485	PASS
25°C		LV	13.12	14.73	16.05	0.00698	0.00784	0.00853
	HV	3.61	15.92	9.63	0.00192	0.00847	0.00512	PASS

LTE Band 38, BANDWIDTH, 15MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	2.09	4.39	9.09	0.00111	0.00234	0.00484	PASS
Extreme (55°C)		13.87	11.38	16.48	0.00738	0.00605	0.00877	PASS
Extreme (50°C)		16.30	9.80	5.36	0.00867	0.00521	0.00285	PASS
Extreme (40°C)		8.17	17.61	1.92	0.00434	0.00936	0.00102	PASS
Extreme (30°C)		14.95	8.50	3.92	0.00795	0.00452	0.00209	PASS
Extreme (20°C)		14.87	12.62	3.43	0.00791	0.00671	0.00182	PASS
Extreme (10°C)		9.38	7.78	10.53	0.00499	0.00414	0.00560	PASS
Extreme (0°C)		17.76	9.08	15.64	0.00945	0.00483	0.00832	PASS
Extreme (-10°C)		14.37	1.38	10.23	0.00764	0.00073	0.00544	PASS
Extreme (-20°C)		17.65	10.43	12.39	0.00939	0.00555	0.00659	PASS
Extreme (-30°C)		6.74	12.89	9.67	0.00358	0.00686	0.00515	PASS
25°C		LV	5.99	6.08	5.49	0.00319	0.00323	0.00292
	HV	6.08	11.91	17.13	0.00323	0.00634	0.00911	PASS

LTE Band 38, BANDWIDTH, 20MHz								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	7.62	13.31	12.84	0.00405	0.00708	0.00683	PASS
Extreme (55°C)		5.41	9.69	16.95	0.00288	0.00516	0.00901	PASS
Extreme (50°C)		11.61	4.43	12.51	0.00618	0.00236	0.00665	PASS
Extreme (40°C)		8.61	11.20	8.06	0.00458	0.00596	0.00429	PASS
Extreme (30°C)		2.35	14.86	7.67	0.00125	0.00790	0.00408	PASS
Extreme (20°C)		8.62	11.79	13.53	0.00458	0.00627	0.00720	PASS
Extreme (10°C)		17.16	13.96	14.73	0.00913	0.00743	0.00783	PASS
Extreme (0°C)		4.53	14.88	14.99	0.00241	0.00791	0.00798	PASS
Extreme (-10°C)		12.62	14.93	4.56	0.00671	0.00794	0.00243	PASS
Extreme (-20°C)		10.13	17.57	2.89	0.00539	0.00934	0.00154	PASS
Extreme (-30°C)		13.23	14.20	5.60	0.00704	0.00755	0.00298	PASS
25°C		LV	7.87	15.71	1.91	0.00419	0.00836	0.00102
	HV	15.37	15.35	4.58	0.00817	0.00817	0.00244	PASS

5.7 Spurious Emissions at Antenna Terminals

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier. The peak detector is used.

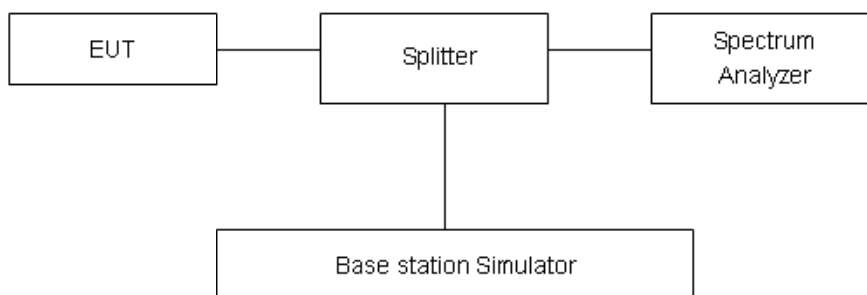
RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz

RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.

The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup



Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB..”

Rule Part 27.53(m) $55 + 10 \log(P)$ 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)(4) of this section.

Part 27.53(h) Limit	-13 dBm
Part 27.53(m) Limit	-25 dBm

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

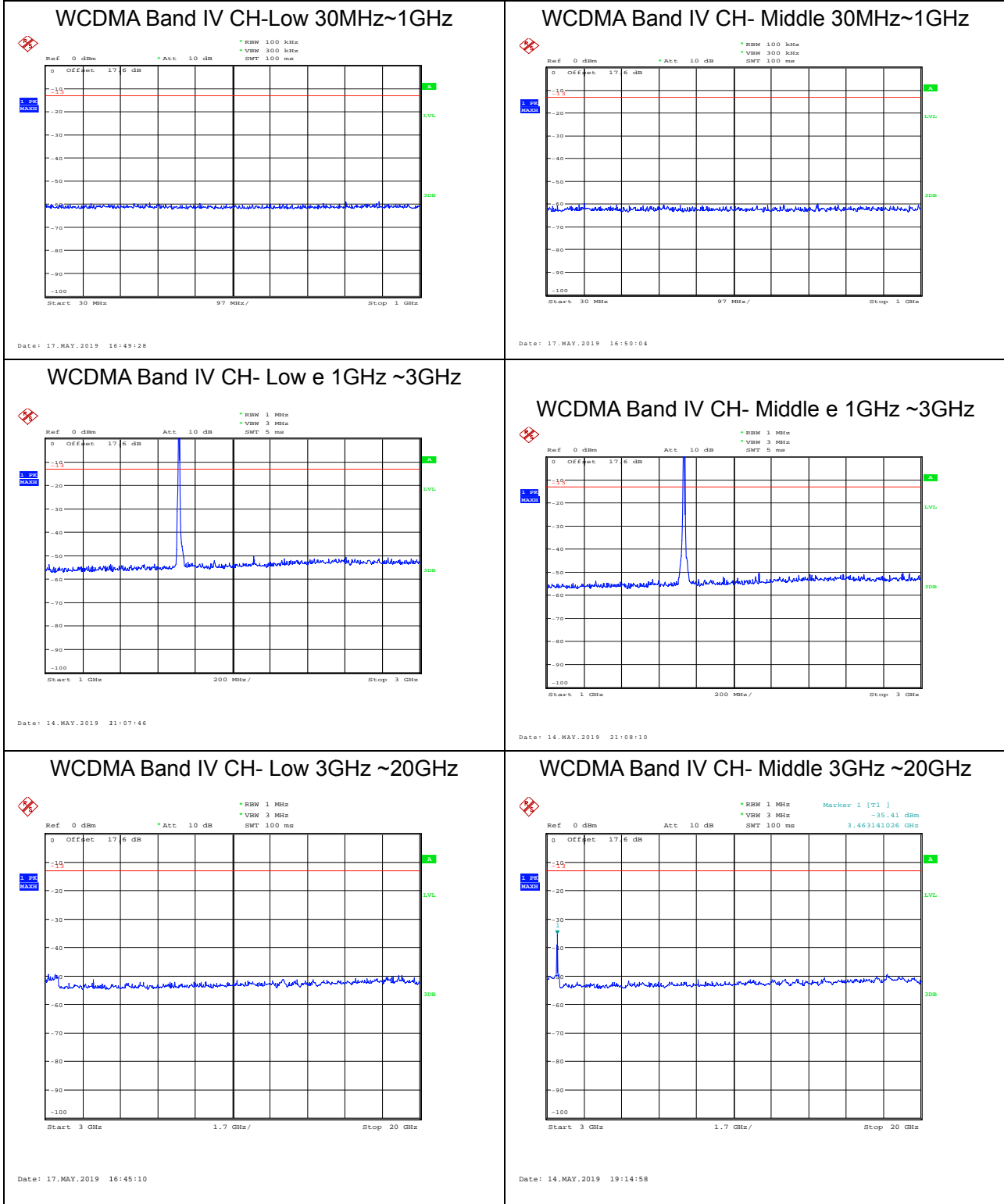


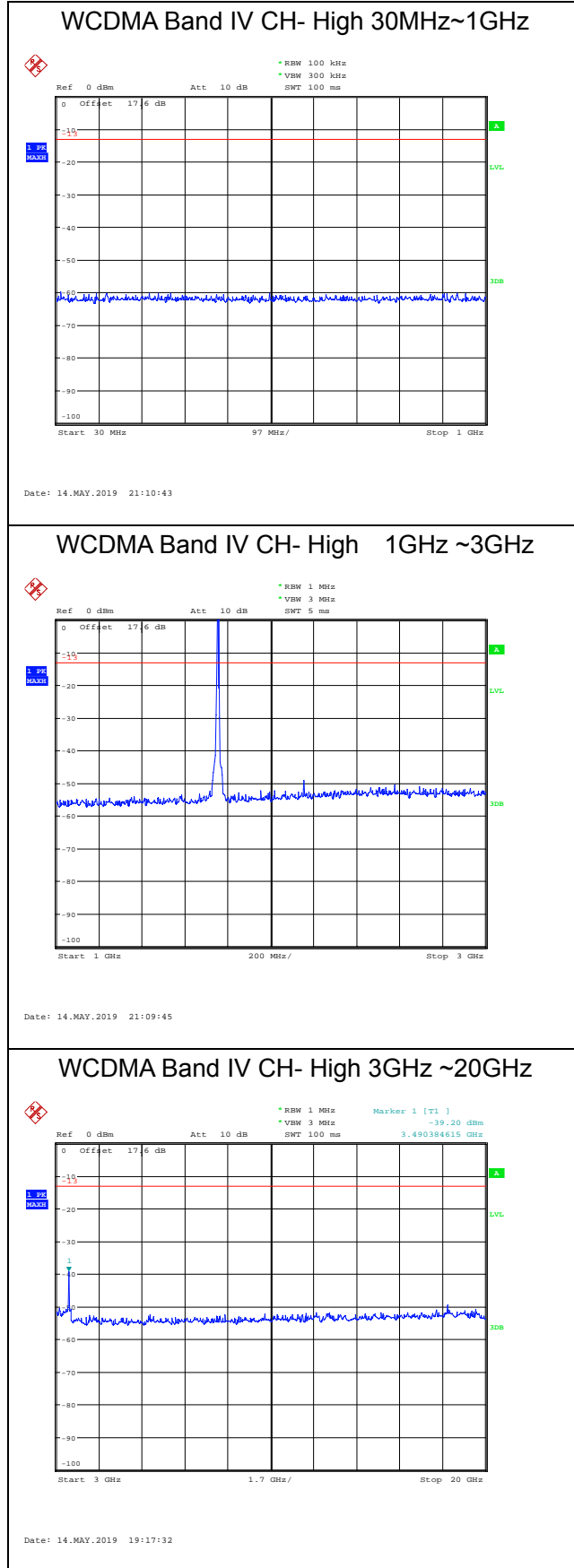
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-27GHz	1.407 dB

Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

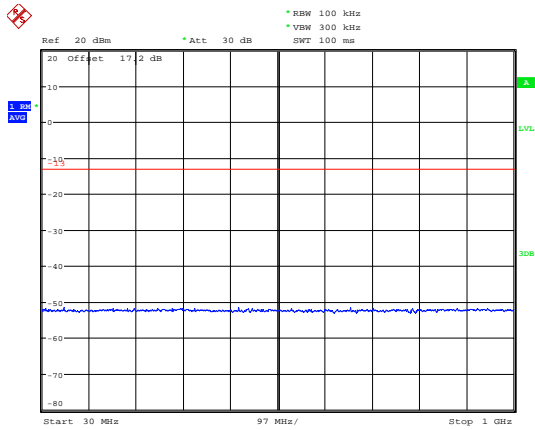
The signal beyond the limit is carrier.





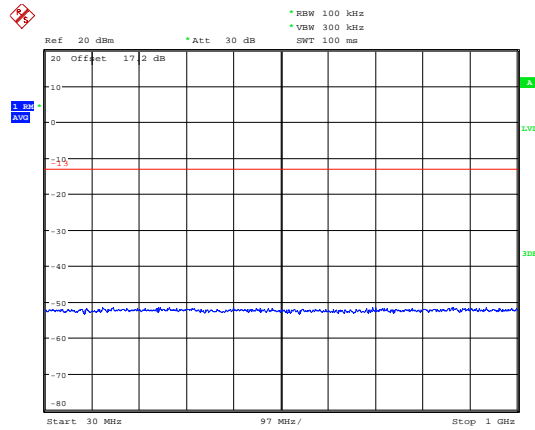


LTE Band 4 1.4MHz CH-Low 30MHz~1GHz



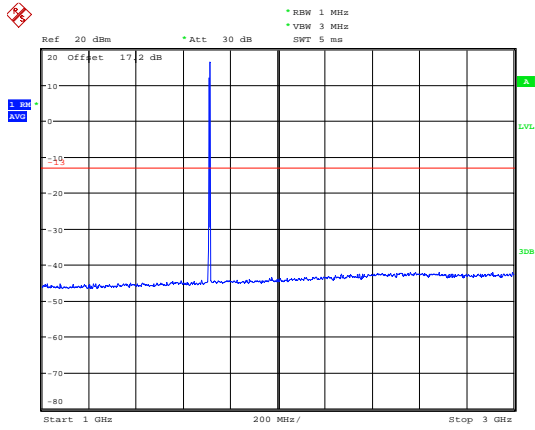
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LTE Band 4 1.4MHz CH-Middle 30MHz~1GHz



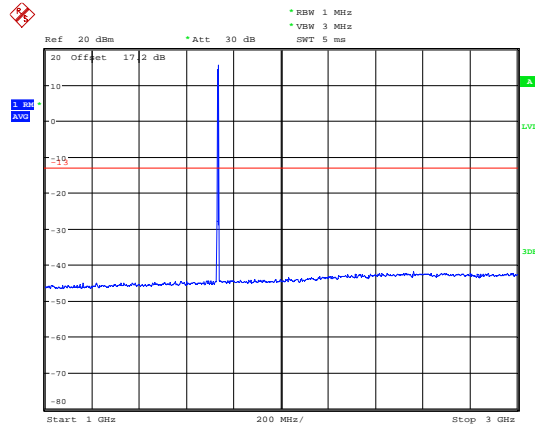
Date: 15.MAY.2019 15:33:36

LTE Band 4 1.4MHz CH-Low 1GHz~3GHz



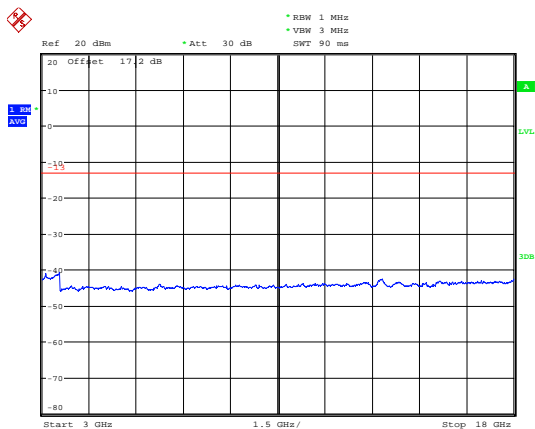
Date: 15.MAY.2019 16:00:36

LTE Band 4 1.4MHz CH-Middle 1GHz~3GHz



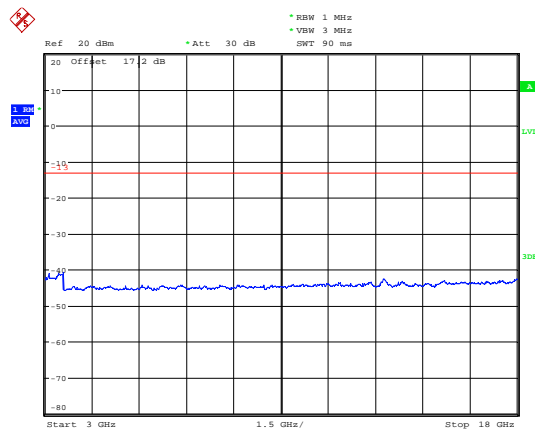
Date: 15.MAY.2019 16:00:50

LTE Band 4 1.4MHz CH-Low 3GHz~18GHz



Date: 15.MAY.2019 17:15:23

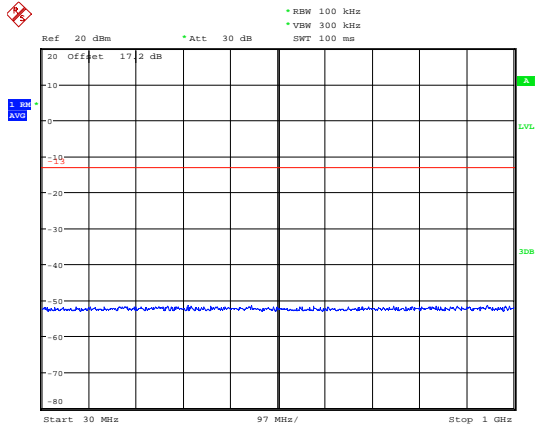
LTE Band 4 1.4MHz CH-Middle 3GHz~18GHz



Date: 15.MAY.2019 17:15:41

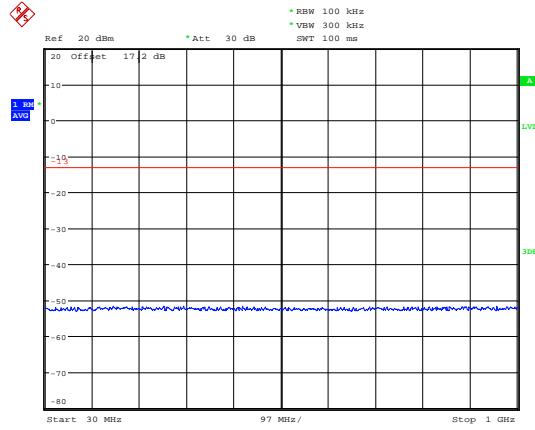


LTE Band 4 1.4MHz CH-High 30MHz~1GHz



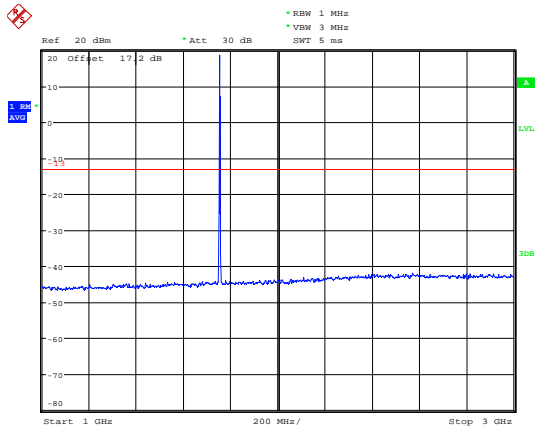
Date: 15.MAY.2019 15:33:54

LTE Band 4 3MHz CH-Low 30MHz~1GHz



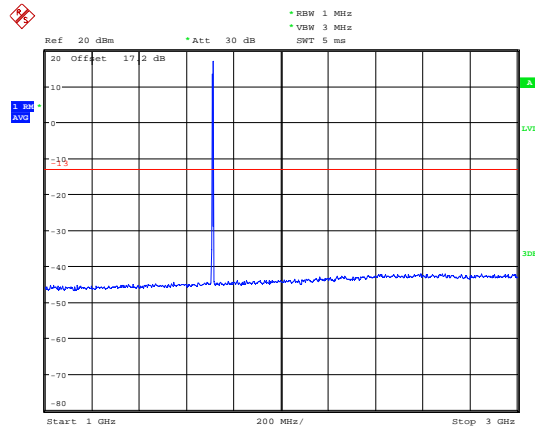
Date: 15.MAY.2019 15:37:46

LTE Band 4 1.4MHz CH-High 1GHz~3GHz



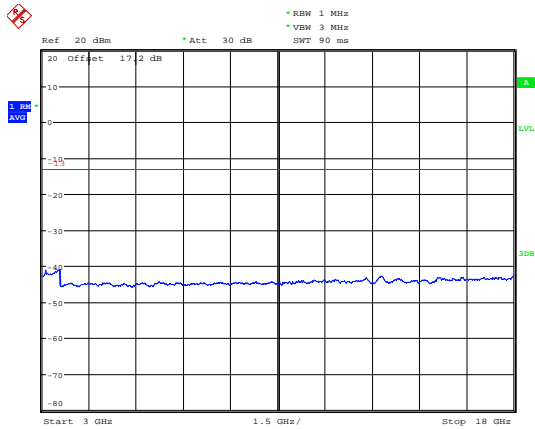
Date: 15.MAY.2019 16:01:07

LTE Band 4 3MHz CH-Low 1GHz~3GHz



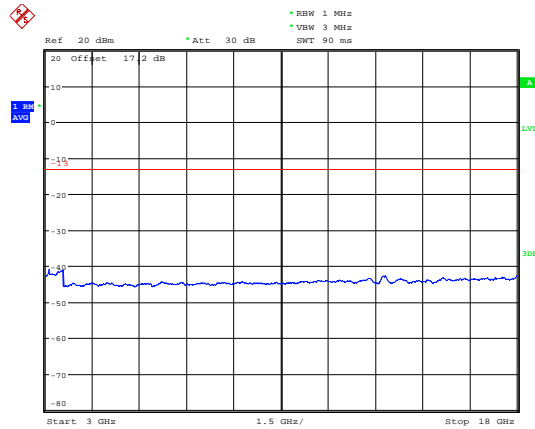
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LTE Band 4 1.4MHz CH-High 3GHz~18GHz



Date: 15.MAY.2019 17:15:55

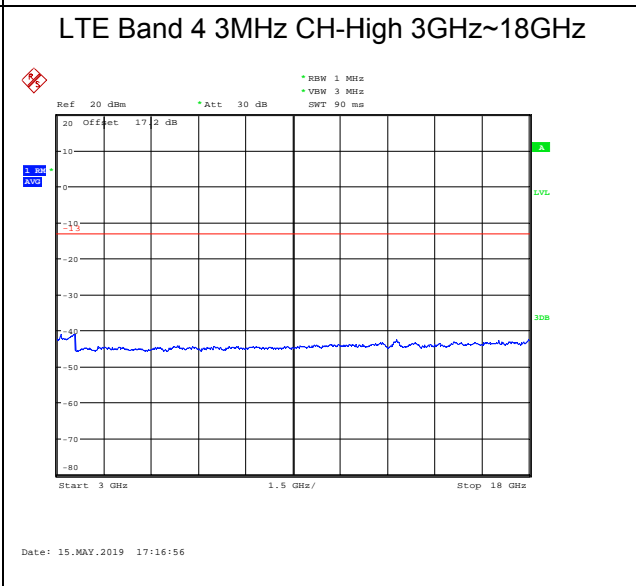
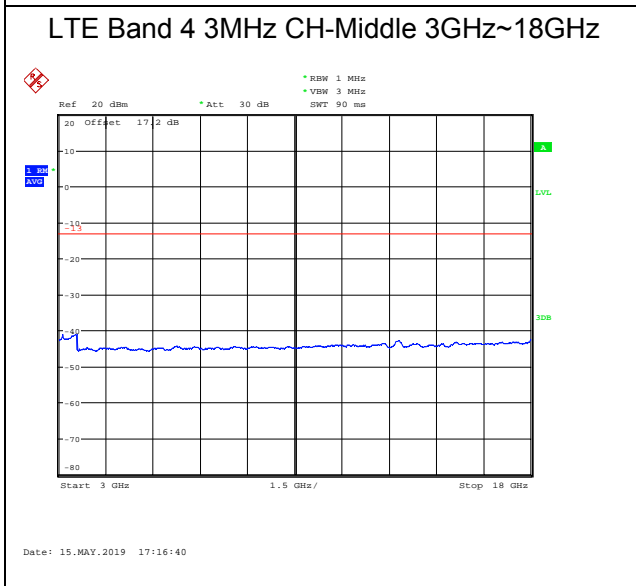
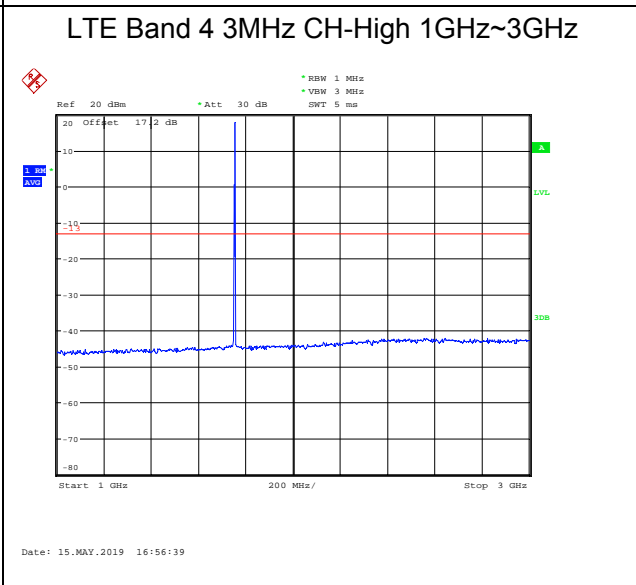
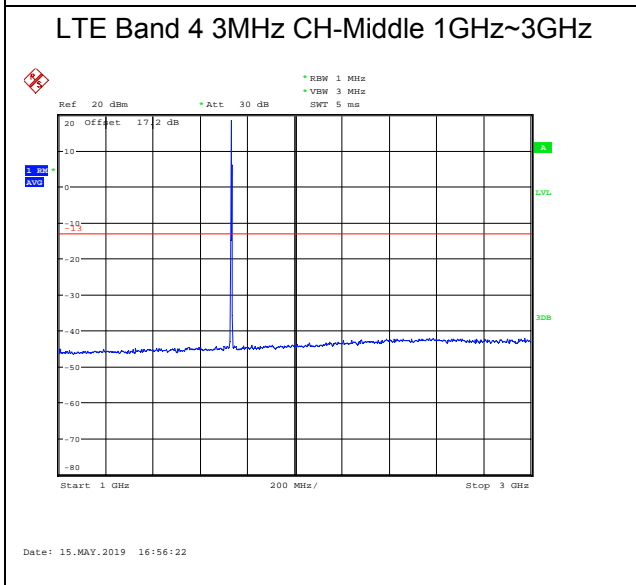
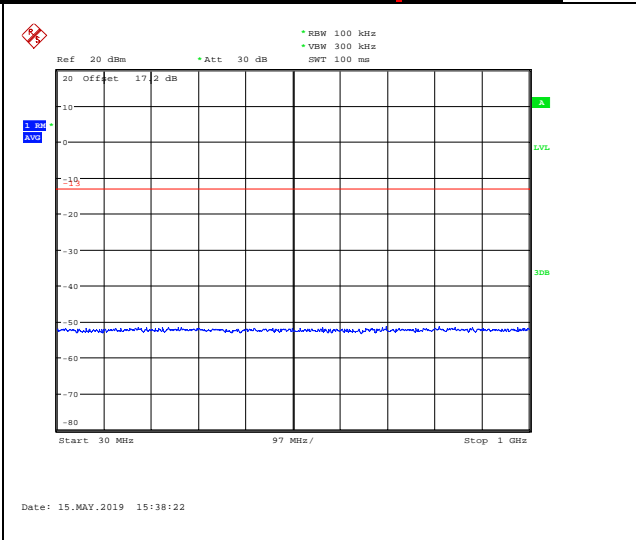
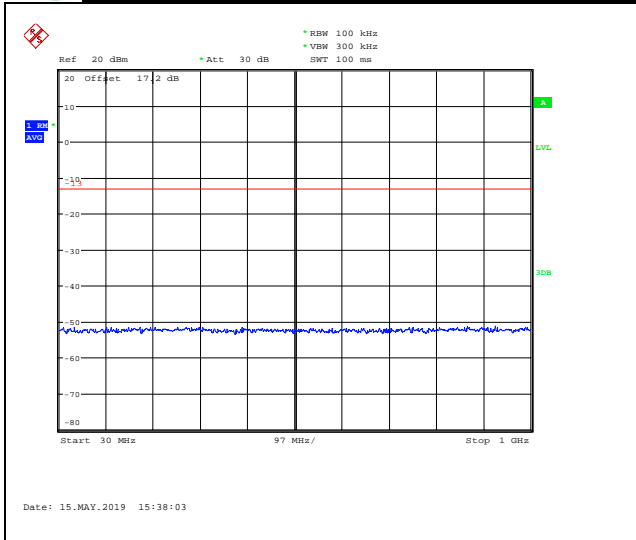
LTE Band 4 3MHz CH-Low 3GHz~18GHz



Date: 15.MAY.2019 17:16:19

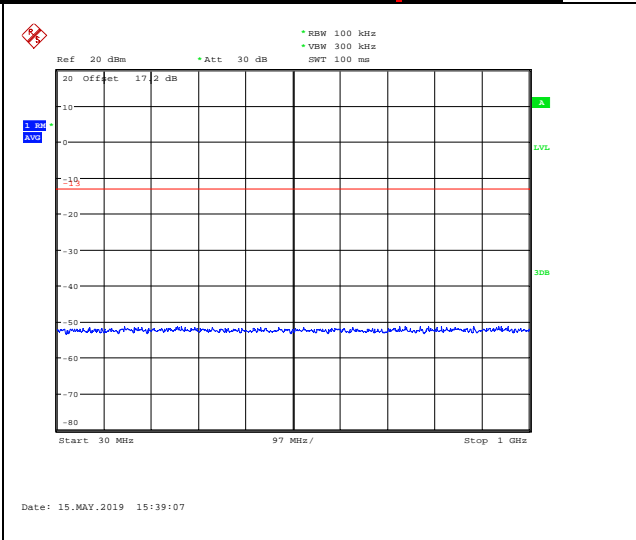
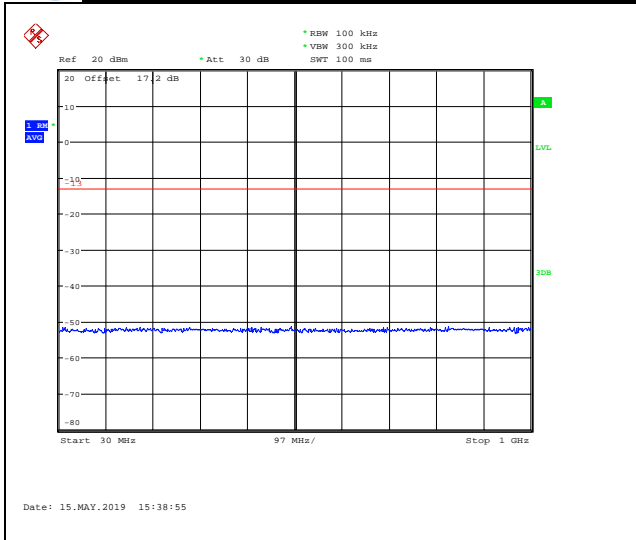
LTE Band 4 3MHz CH-Middle 30MHz~1GHz

LTE Band 4 3MHz CH-High 30MHz~1GHz



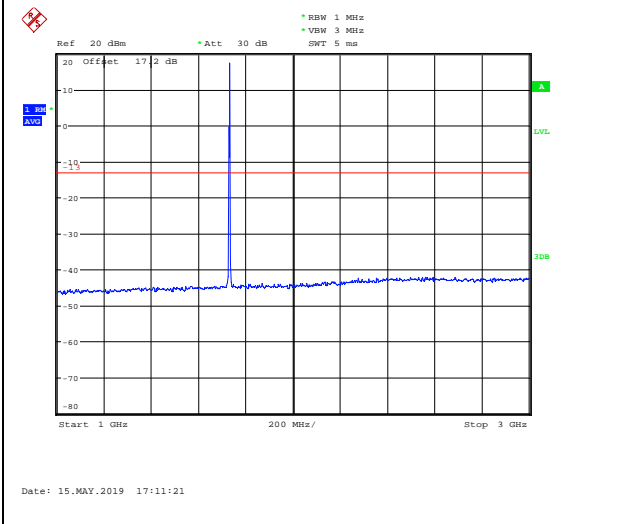
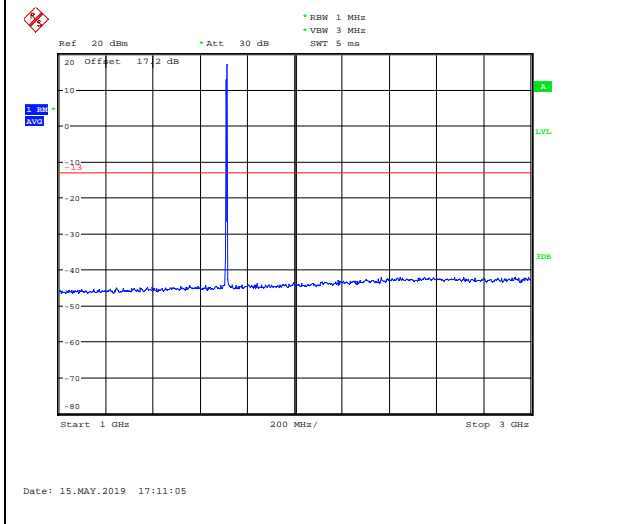
LTE Band 4 5MHz CH-Low 30MHz~1GHz

LTE Band 4 5MHz CH-Middle 30MHz~1GHz



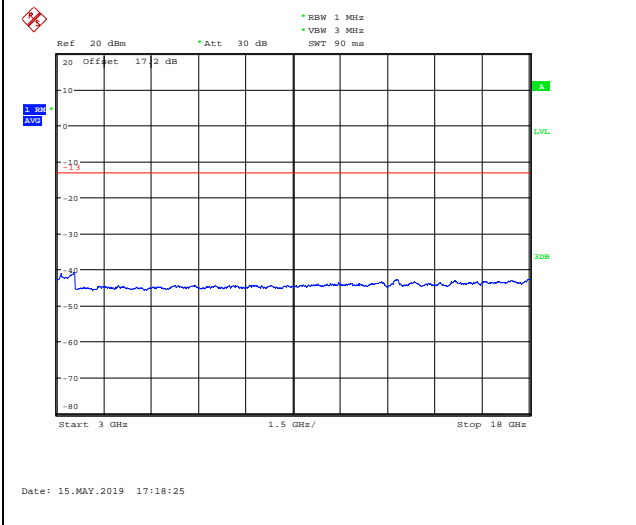
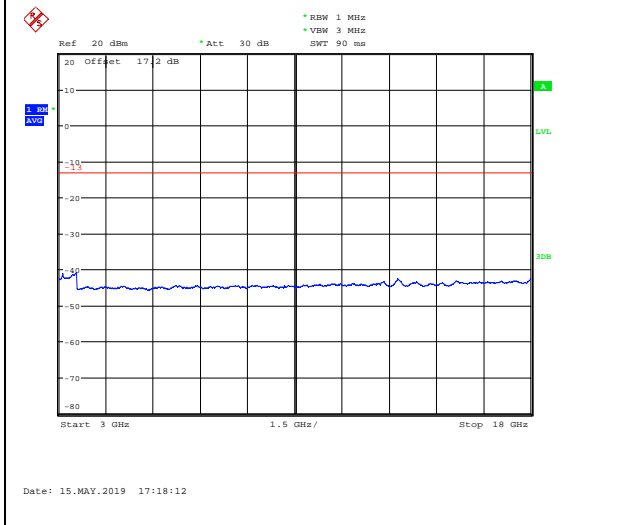
LTE Band 4 5MHz CH-Low 1GHz~3GHz

LTE Band 4 5MHz CH-Middle 1GHz~3GHz



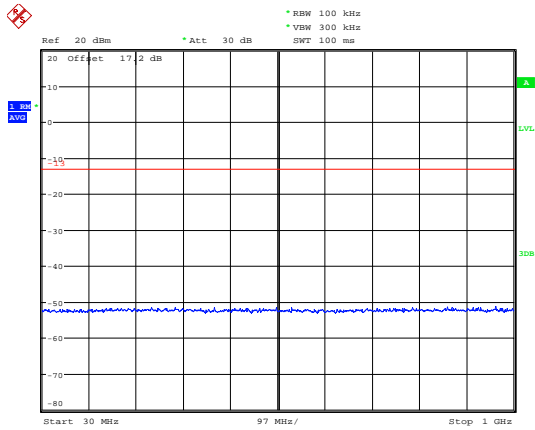
LTE Band 4 5MHz CH-Low 3GHz~18GHz

LTE Band 4 5MHz CH-Middle 3GHz~18GHz



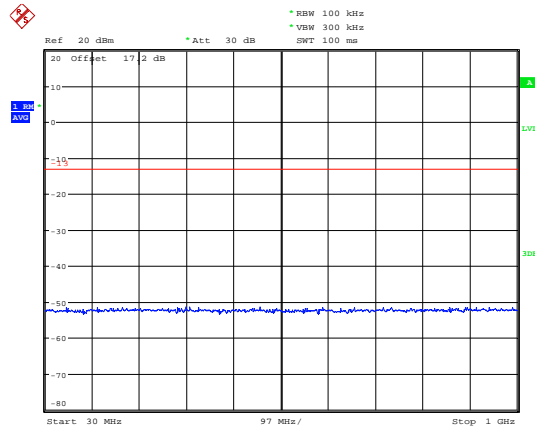


LTE Band 4 5MHz CH-High 30MHz~1GHz



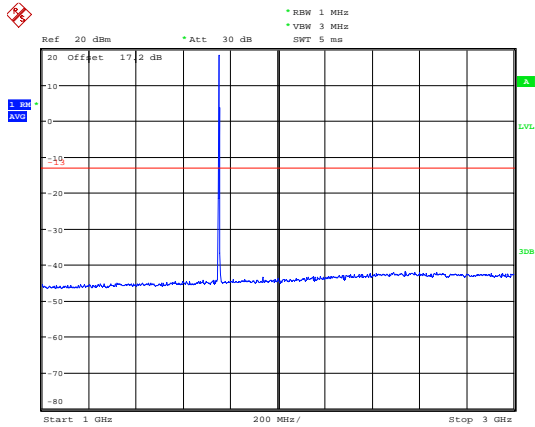
Date: 15.MAY.2019 15:39:24

LTE Band 4 10MHz CH-Low 30MHz~1GHz



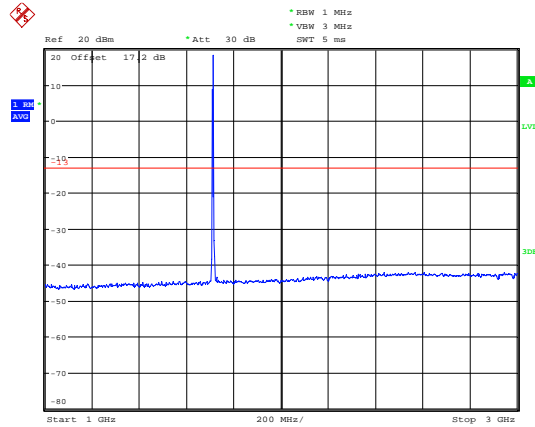
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LTE Band 4 5MHz CH-High 1GHz~3GHz



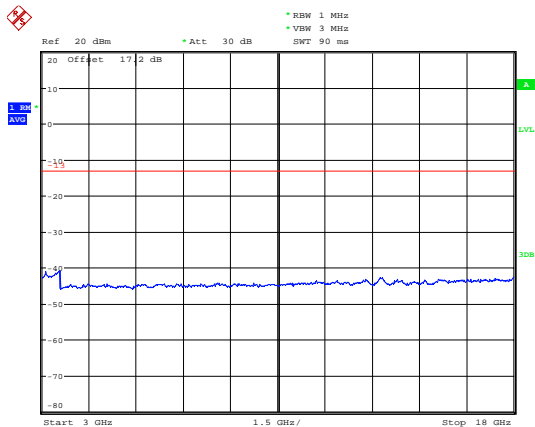
Date: 15.MAY.2019 17:11:35

LTE Band 4 10MHz CH-Low 1GHz~3GHz



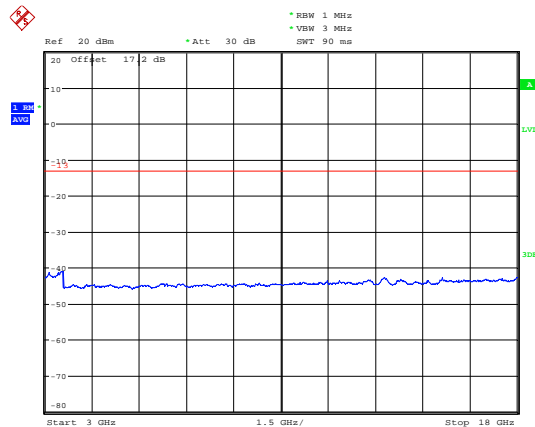
Date: 15.MAY.2019 17:12:09

LTE Band 4 5MHz CH-High 3GHz~18GHz



Date: 15.MAY.2019 17:18:43

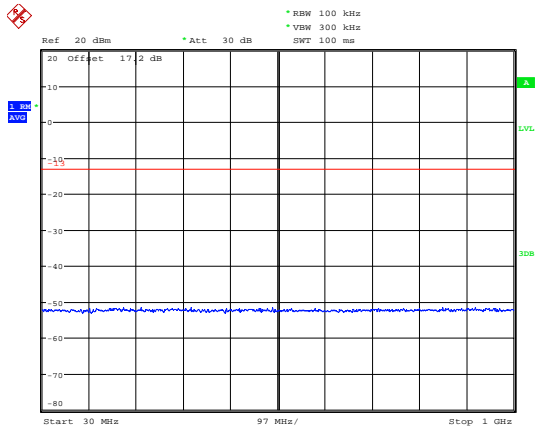
LTE Band 4 10MHz CH-Low 3GHz~18GHz



Date: 15.MAY.2019 17:19:05

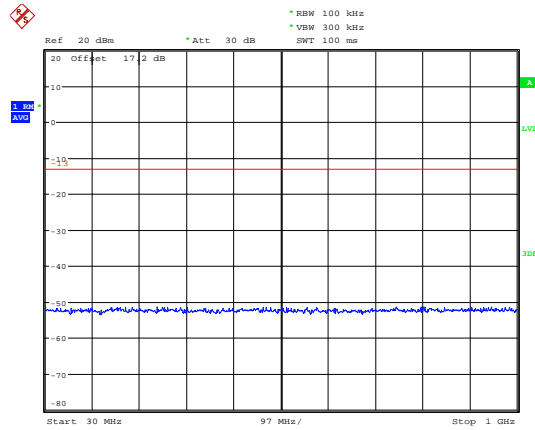


LTE Band 4 10MHz CH-Middle 30MHz~1GHz



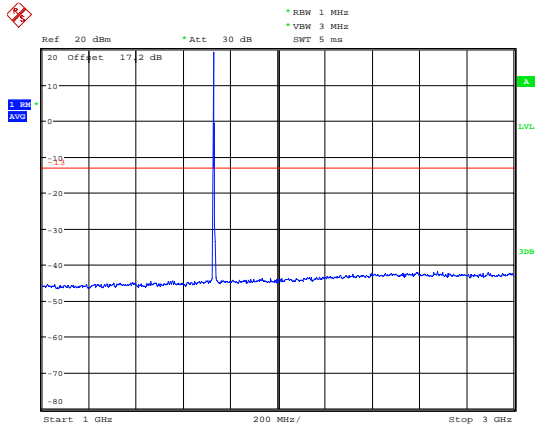
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LTE Band 4 10MHz CH-High 30MHz~1GHz



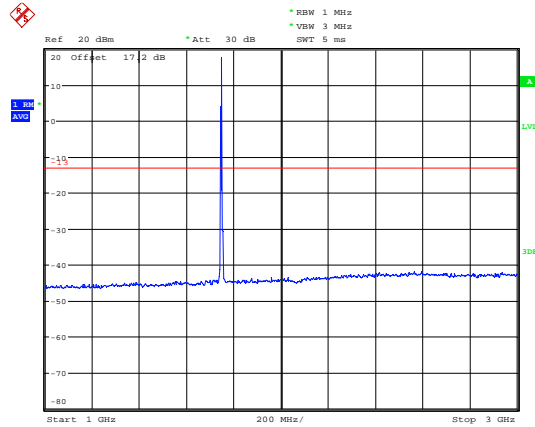
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LTE Band 4 10MHz CH-Middle 1GHz~3GHz



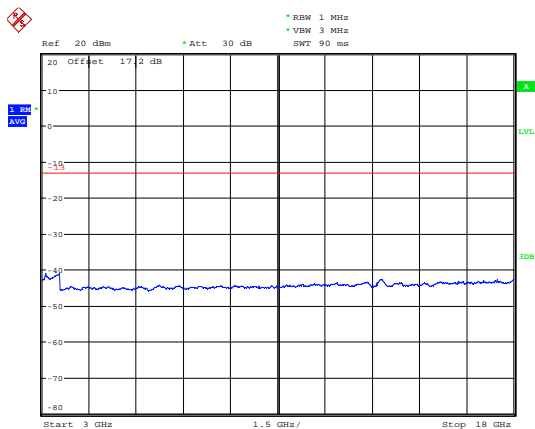
Date: 15.MAY.2019 17:12:36

LTE Band 4 10MHz CH-High 1GHz~3GHz



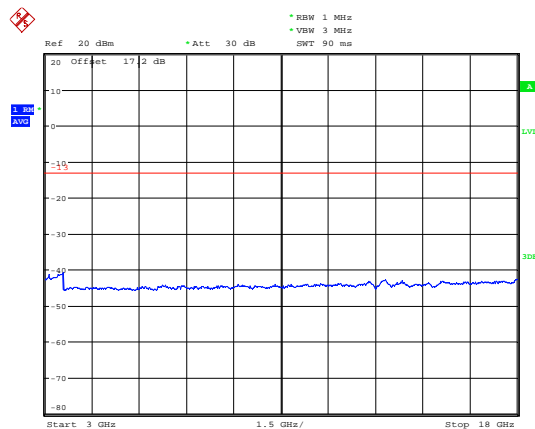
Date: 15.MAY.2019 17:12:53

LTE Band 4 10MHz CH-Middle 3GHz~18GHz



Date: 15.MAY.2019 17:19:22

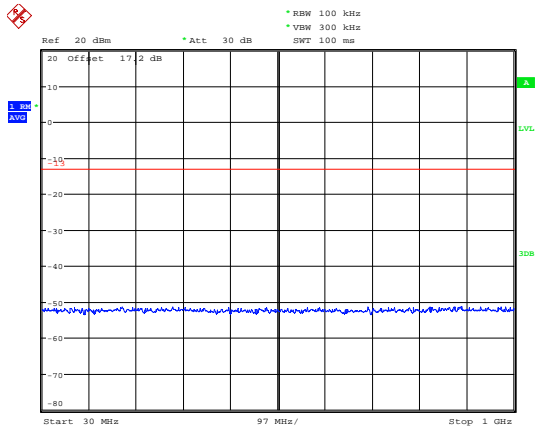
LTE Band 4 10MHz CH-High 3GHz~18GHz



Date: 15.MAY.2019 17:19:35

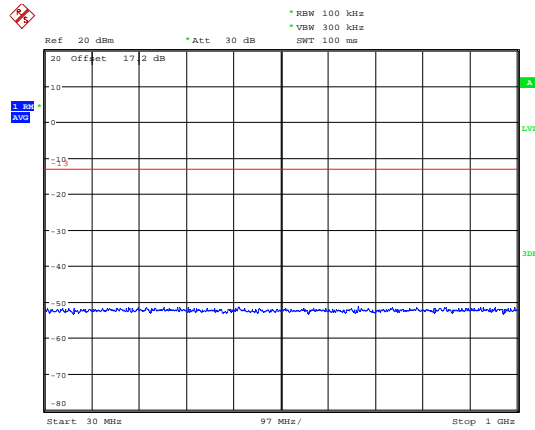


LTE Band 4 15MHz CH-Low 30MHz~1GHz



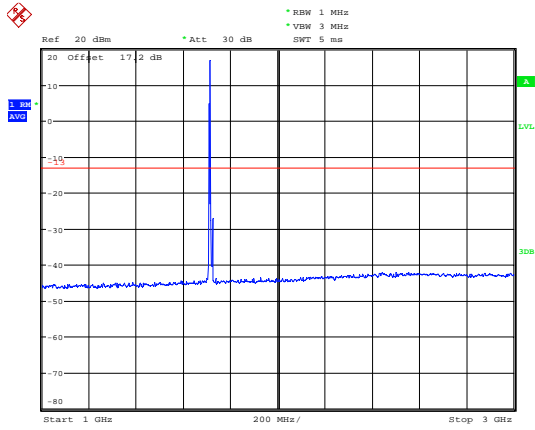
Date: 15.MAY.2019 15:40:43

LTE Band 4 15MHz CH-Middle 30MHz~1GHz



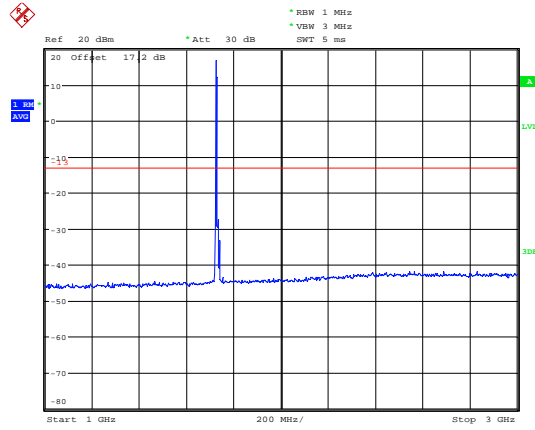
Date: 15.MAY.2019 15:40:56

LTE Band 4 15MHz CH-Low 1GHz~3GHz



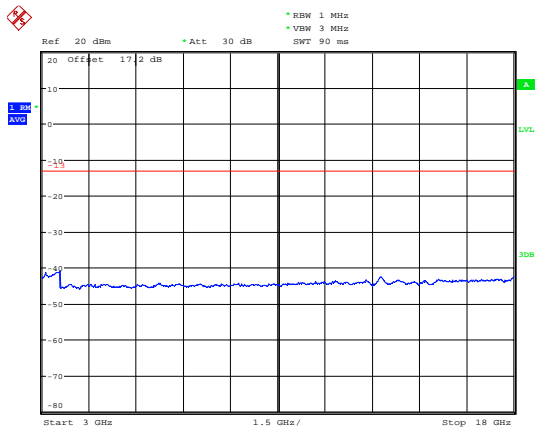
Date: 15.MAY.2019 17:13:13

LTE Band 4 15MHz CH-Middle 1GHz~3GHz



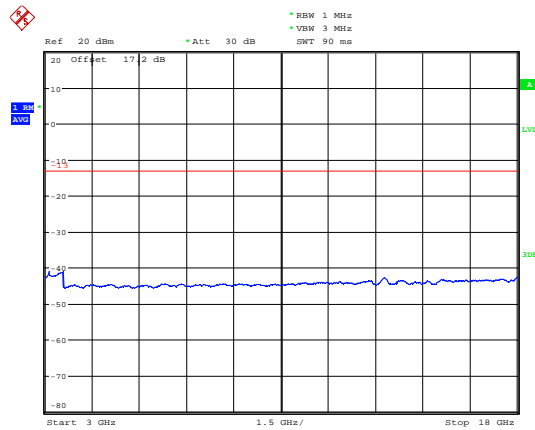
Date: 15.MAY.2019 17:13:26

LTE Band 4 15MHz CH-Low 3GHz~18GHz



Date: 15.MAY.2019 17:19:56

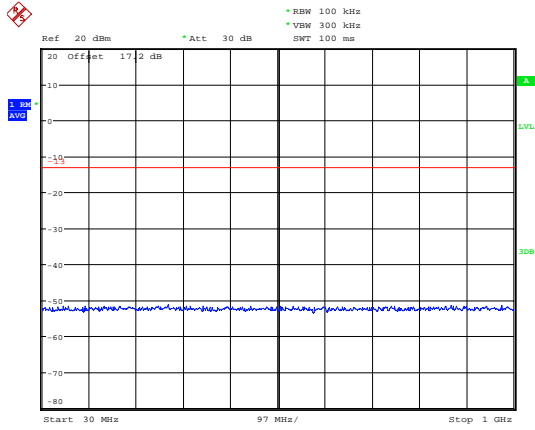
LTE Band 4 15MHz CH-Middle 3GHz~18GHz



Date: 15.MAY.2019 17:20:25

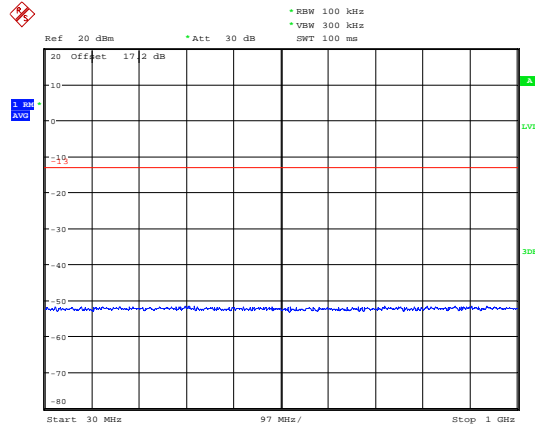


LTE Band 4 15MHz CH-High 30MHz~1GHz



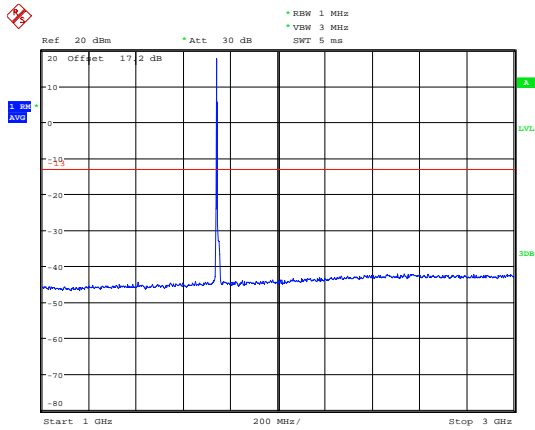
Date: 15.MAY.2019 15:41:09

LTE Band 4 20MHz CH-Low 30MHz~1GHz



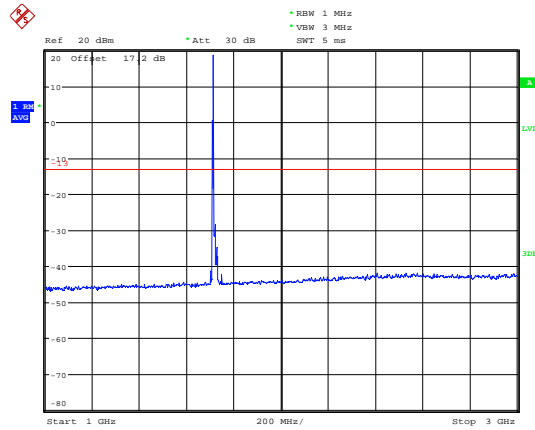
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LTE Band 4 15MHz CH-High 1GHz~3GHz



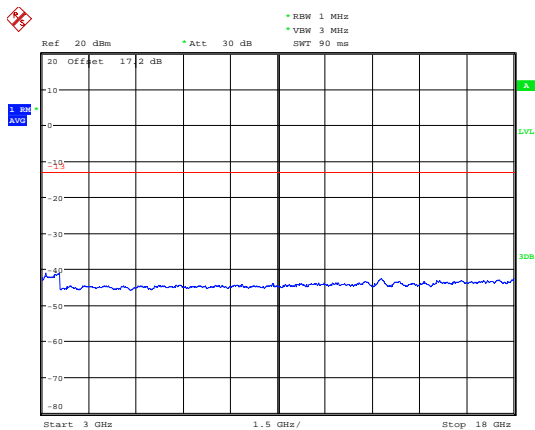
Date: 15.MAY.2019 17:13:39

LTE Band 4 20MHz CH-Low 1GHz~3GHz



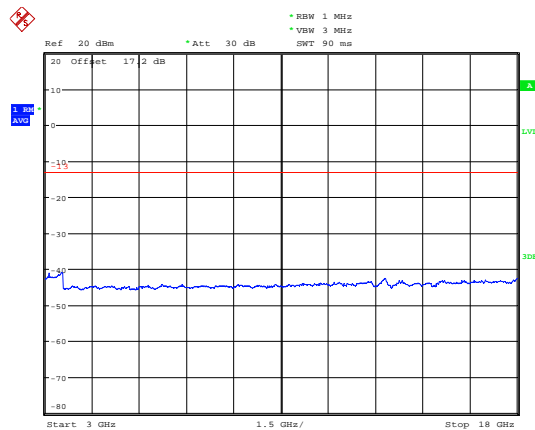
Date: 15.MAY.2019 15:59:56

LTE Band 4 15MHz CH-High 3GHz~18GHz



Date: 15.MAY.2019 17:20:39

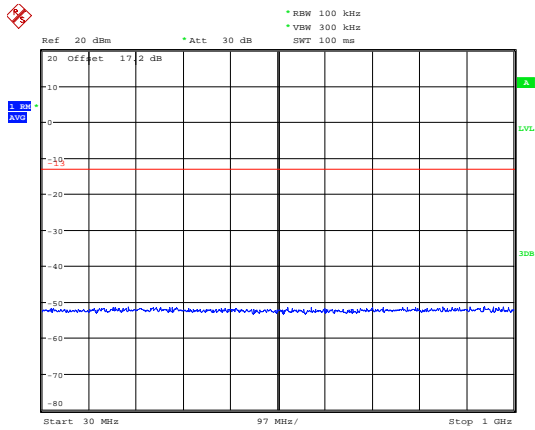
LTE Band 4 20MHz CH-Low 3GHz~18GHz



Date: 15.MAY.2019 17:21:19

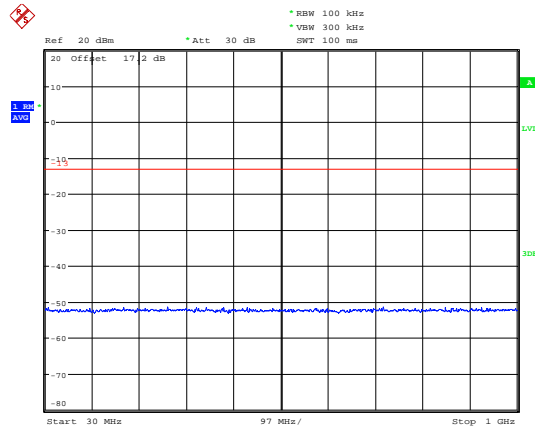


LTE Band 4 15MHz CH- Middle 30MHz~1GHz



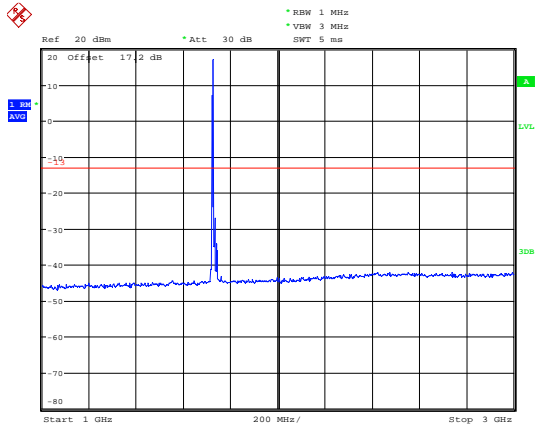
Date: 15.MAY.2019 15:41:59

LTE Band 4 20MHz CH- High 30MHz~1GHz



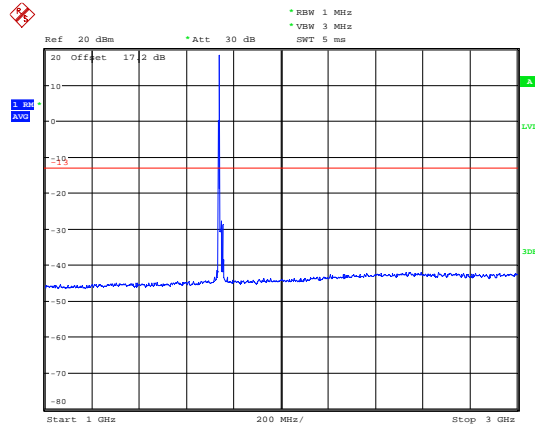
Date: 15.MAY.2019 15:43:26

LTE Band 4 15MHz CH- Middle 1GHz~3GHz



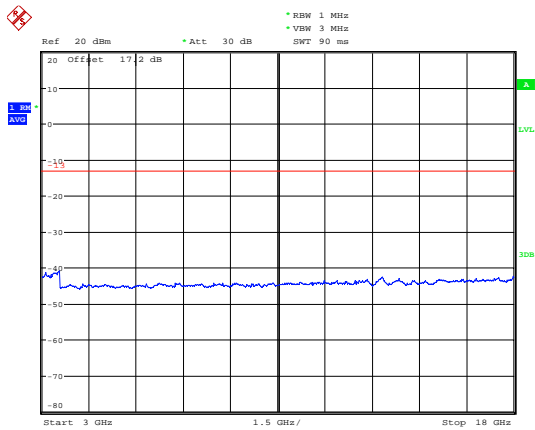
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LTE Band 4 20MHz CH- High 1GHz~3GHz



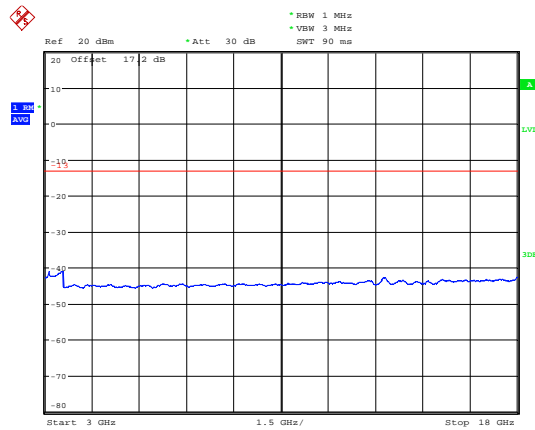
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LTE Band 4 15MHz CH- Middle 3GHz~18GHz



Date: 15.MAY.2019 17:21:33

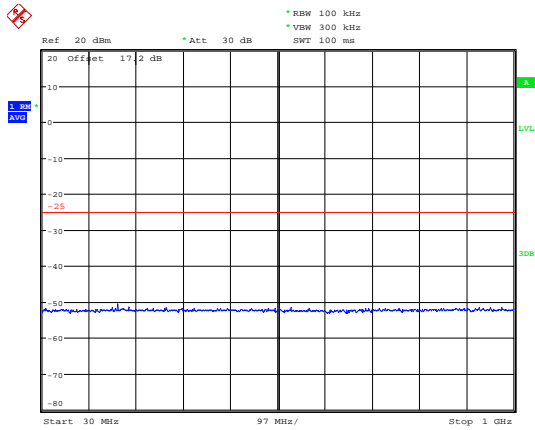
LTE Band 4 20MHz CH- High 3GHz~18GHz



Date: 15.MAY.2019 17:21:50

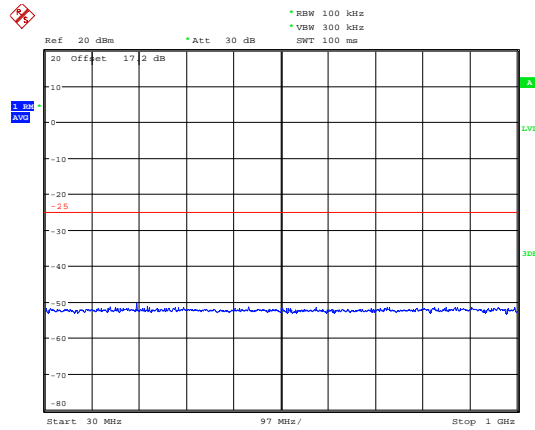


LTE Band 7 5MHz CH-Low 30MHz~1GHz



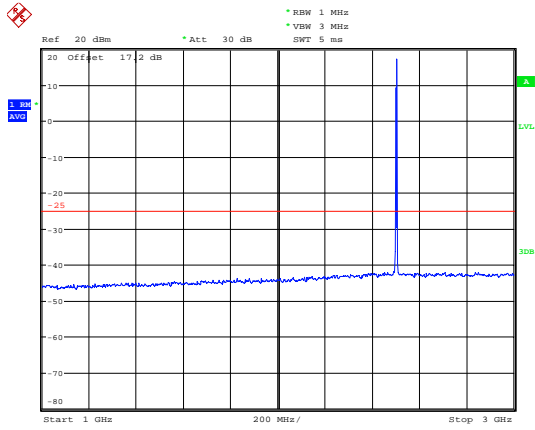
Date: 15.MAY.2019 17:23:24

LTE Band 7 5MHz CH-Middle 30MHz~1GHz



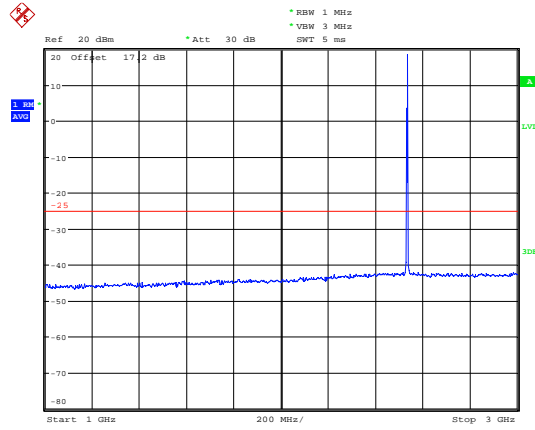
Date: 15.MAY.2019 17:23:38

LTE Band 7 5MHz CH-Low 1GHz~3GHz



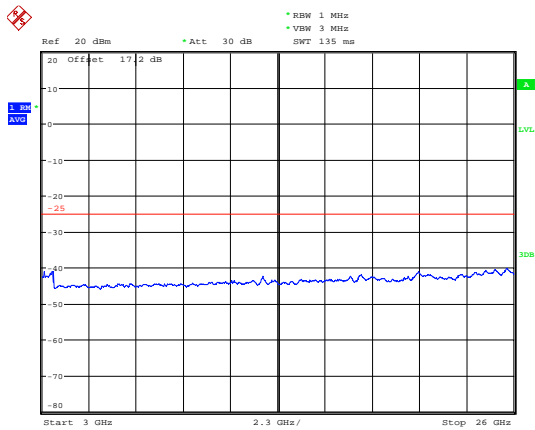
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LTE Band 7 5MHz CH-Middle 1GHz~3GHz



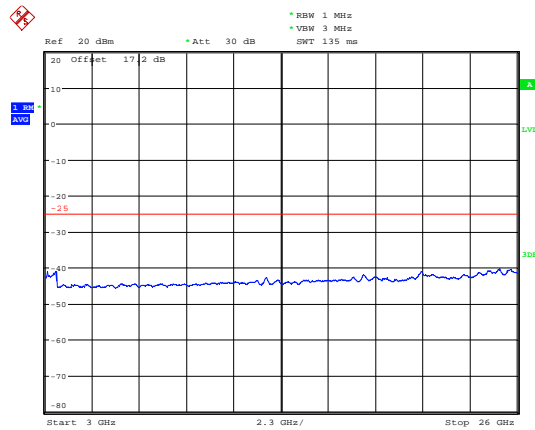
Date: 15.MAY.2019 18:32:03

LTE Band 7 5MHz CH-Low 3GHz~26GHz



Date: 15.MAY.2019 19:17:37

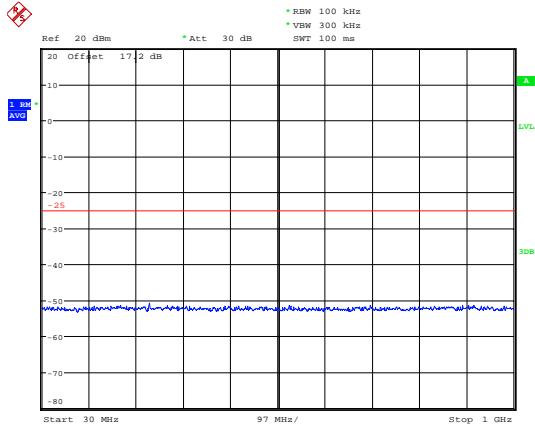
LTE Band 7 5MHz CH-Middle 3GHz~26GHz



Date: 15.MAY.2019 19:17:54

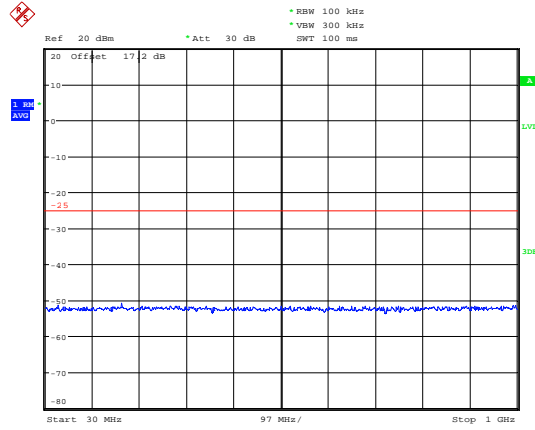


LTE Band 7 5MHz CH-High 30MHz~1GHz



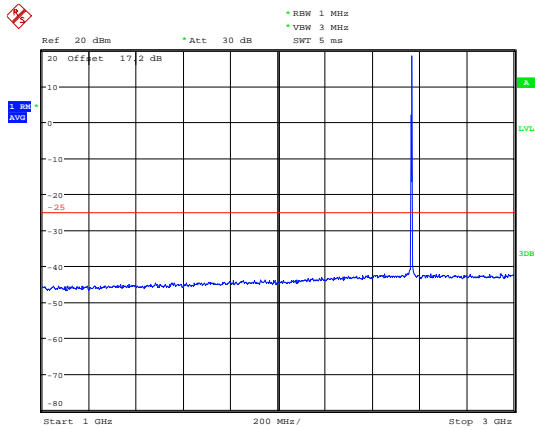
Date: 15.MAY.2019 17:23:53

LTE Band 7 10MHz CH-Low 30MHz~1GHz



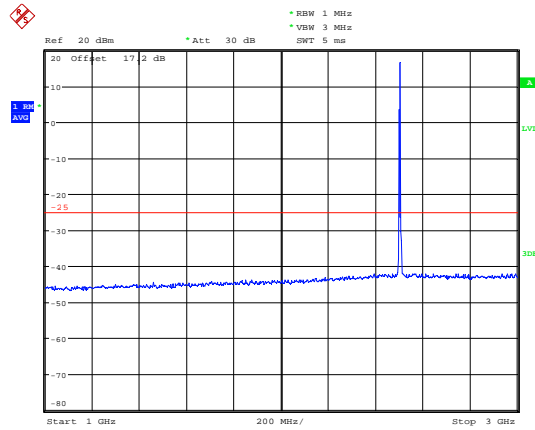
Date: 15.MAY.2019 17:24:18

LTE Band 7 5MHz CH-High 1GHz~3GHz



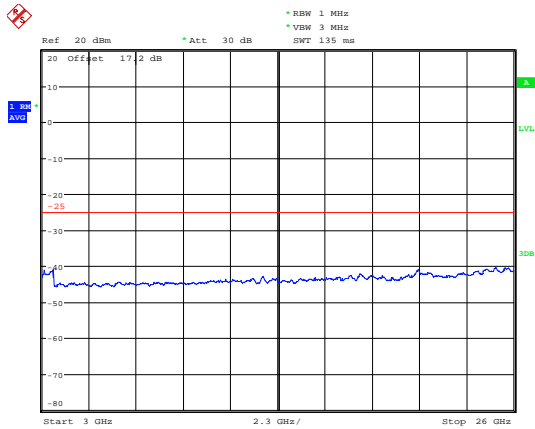
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LTE Band 7 10MHz CH-Low 1GHz~3GHz



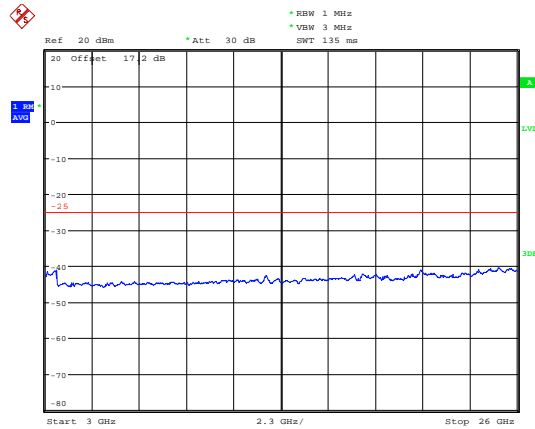
Date: 15.MAY.2019 18:33:37

LTE Band 7 5MHz CH-High 3GHz~26GHz



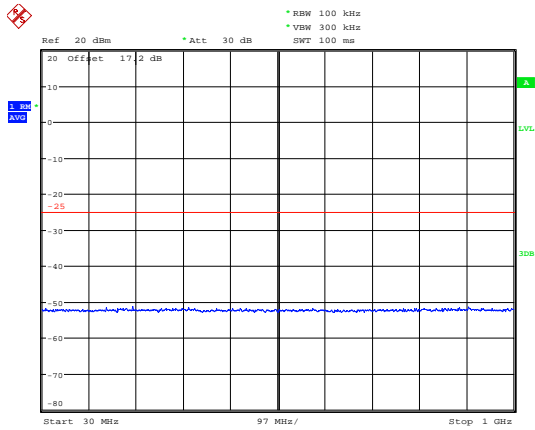
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LTE Band 7 10MHz CH-Low 3GHz~26GHz



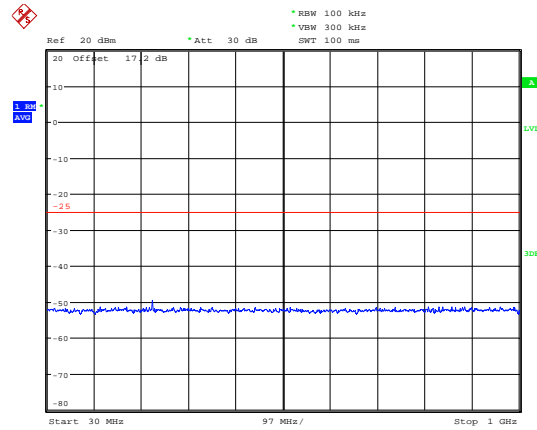
Date: 15.MAY.2019 19:18:31

LTE Band 7 10MHz CH-Middle 30MHz~1GHz



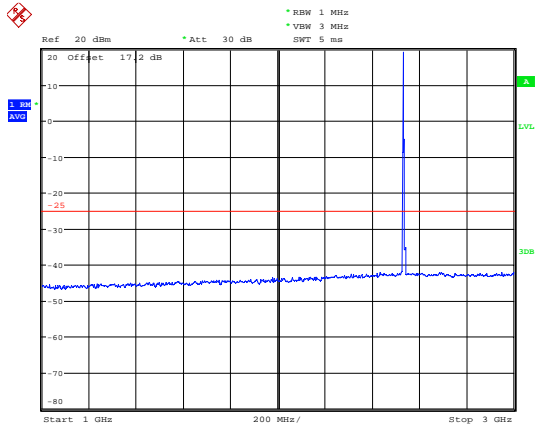
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LTE Band 7 10MHz CH-High 30MHz~1GHz



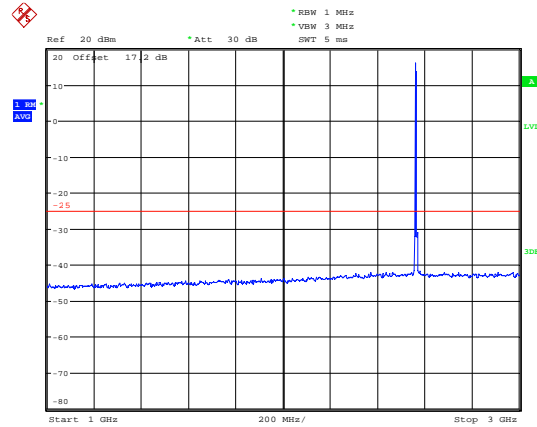
Date: 15.MAY.2019 17:24:58

LTE Band 7 10MHz CH-Middle 1GHz~3GHz



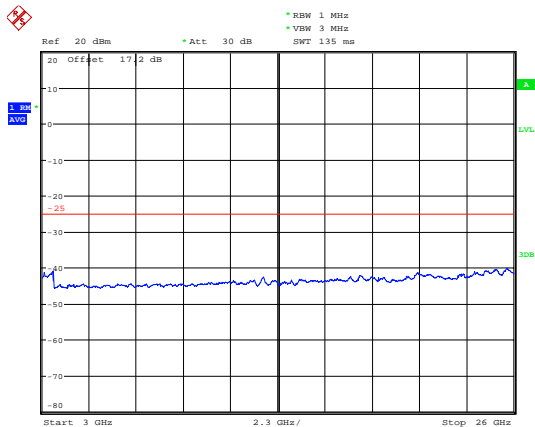
Date: 15.MAY.2019 18:33:50

LTE Band 7 10MHz CH-High 1GHz~3GHz



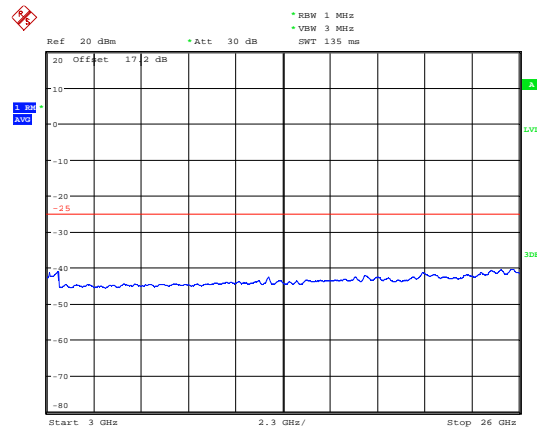
Date: 15.MAY.2019 18:34:03

LTE Band 7 10MHz CH-Middle 3GHz~26GHz



Date: 15.MAY.2019 19:18:44

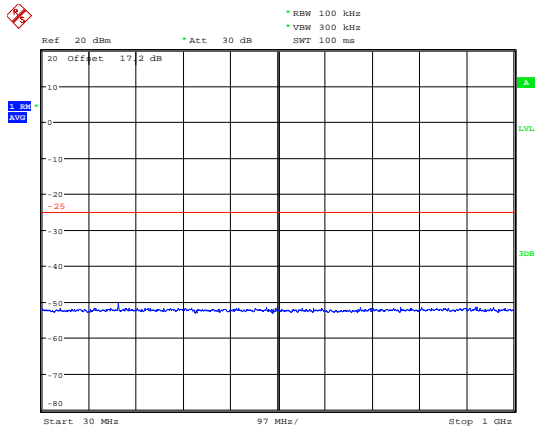
LTE Band 7 10MHz CH-High 3GHz~26GHz



Date: 15.MAY.2019 19:19:03

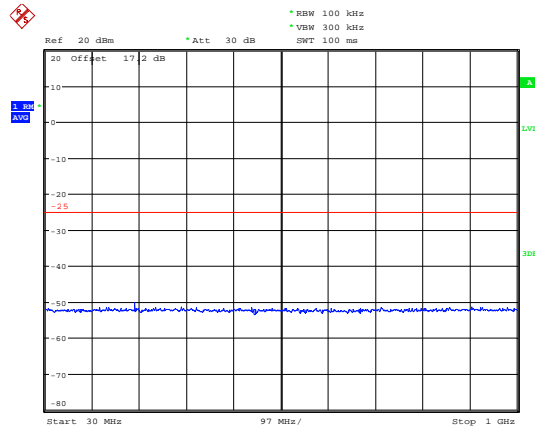


LTE Band 7 15MHz CH-Low 30MHz~1GHz



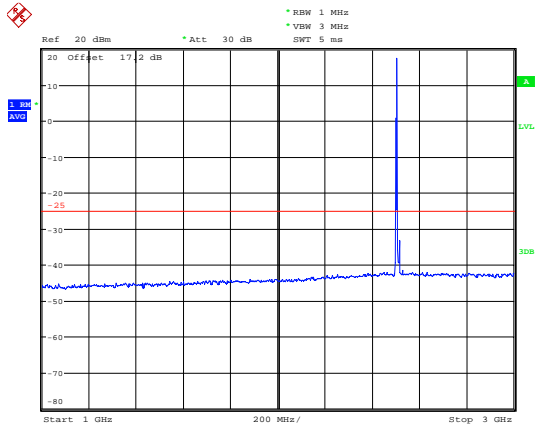
Date: 15.MAY.2019 17:25:23

LTE Band 7 15MHz CH-Middle 30MHz~1GHz



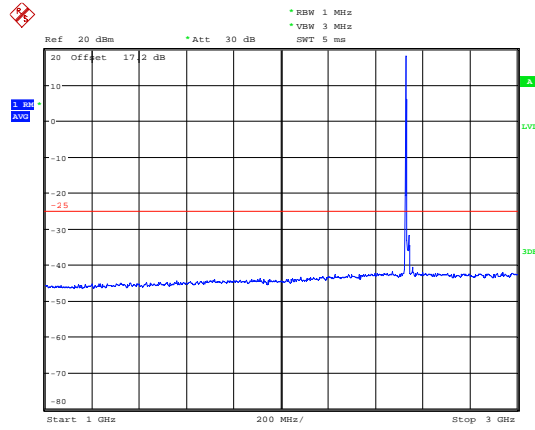
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LTE Band 7 15MHz CH-Low 1GHz~3GHz



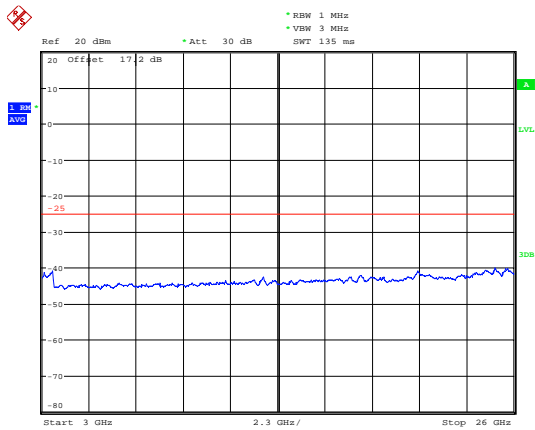
Date: 15.MAY.2019 18:34:26

LTE Band 7 15MHz CH-Middle 1GHz~3GHz



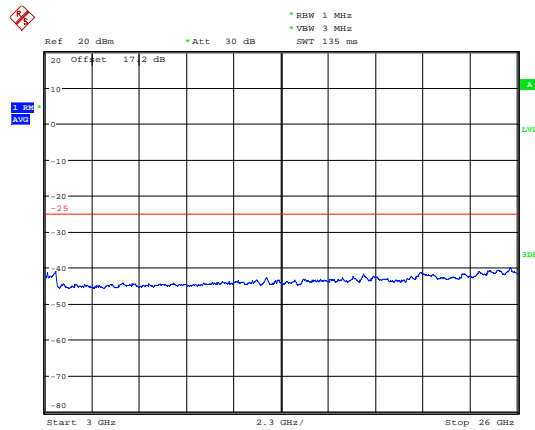
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LTE Band 7 15MHz CH-Low 3GHz~26GHz



Date: 15.MAY.2019 19:19:22

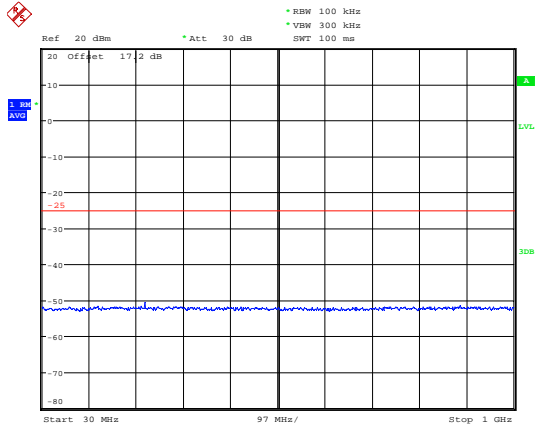
LTE Band 7 15MHz CH-Middle 3GHz~26GHz



Date: 15.MAY.2019 19:19:35

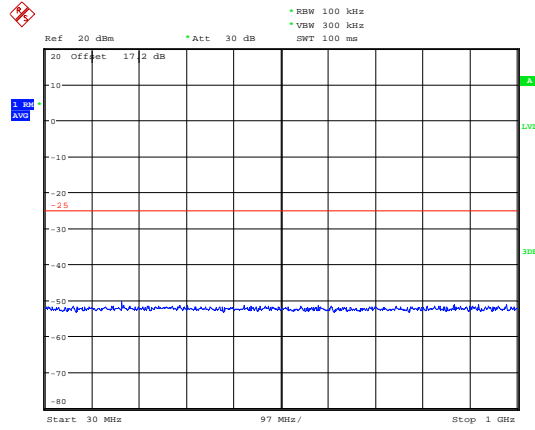


LTE Band 7 15MHz CH-High 30MHz~1GHz



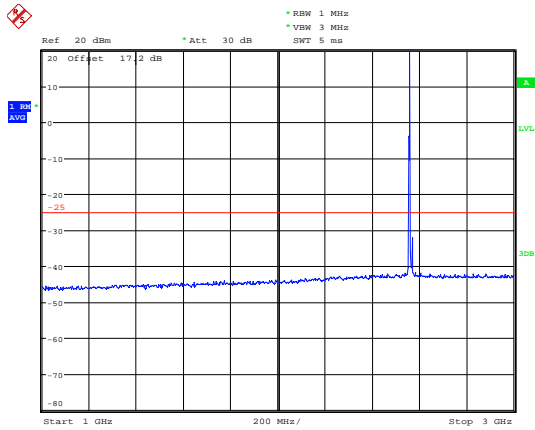
Date: 15.MAY.2019 17:25:56

LTE Band 7 20MHz CH-Low 30MHz~1GHz



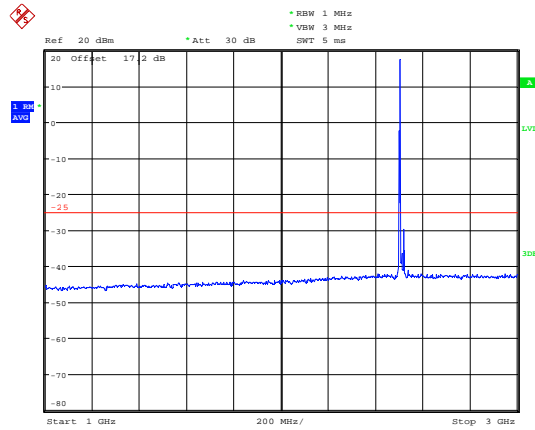
Date: 15.MAY.2019 17:26:25

LTE Band 7 15MHz CH-High 1GHz~3GHz



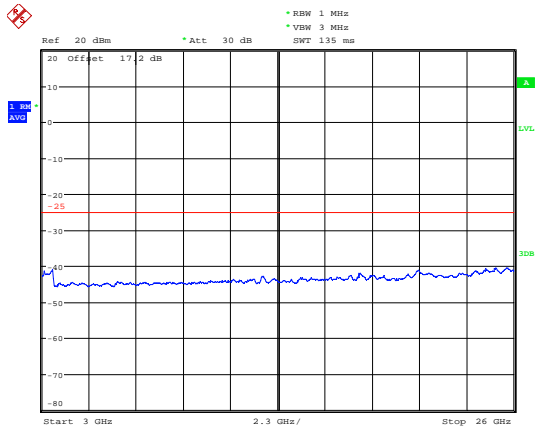
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LTE Band 7 20MHz CH-Low 1GHz~3GHz



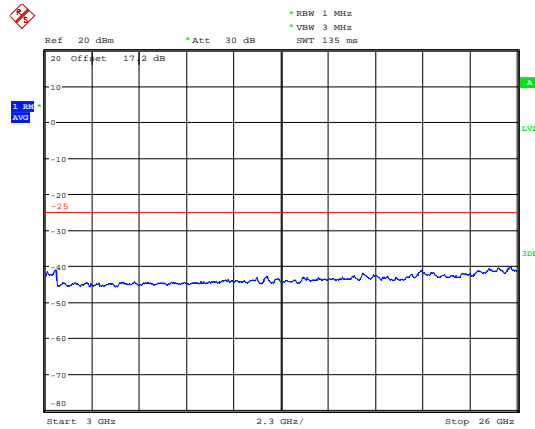
Date: 15.MAY.2019 18:35:26

LTE Band 7 15MHz CH-High 3GHz~26GHz



Date: 15.MAY.2019 19:19:51

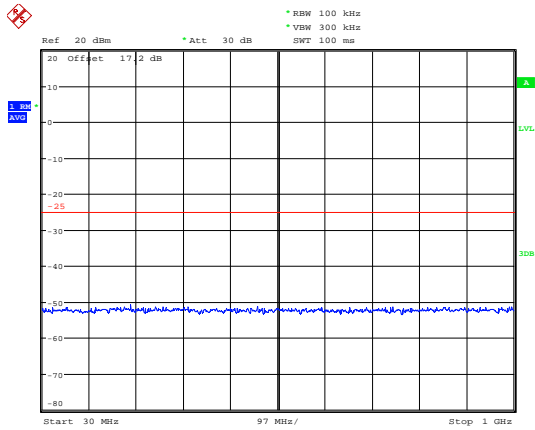
LTE Band 7 20MHz CH-Low 3GHz~26GHz



Date: 15.MAY.2019 19:20:22

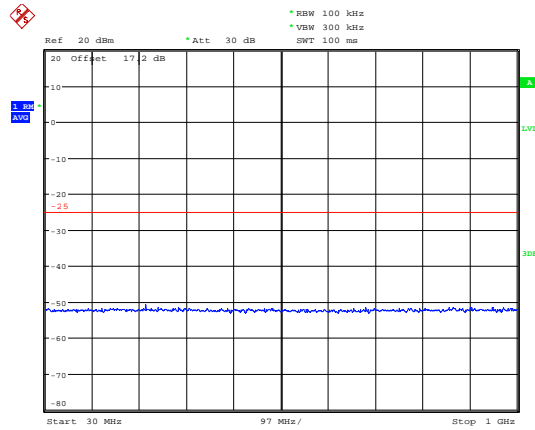


LTE Band 7 20MHz CH-Middle 30MHz~1GHz



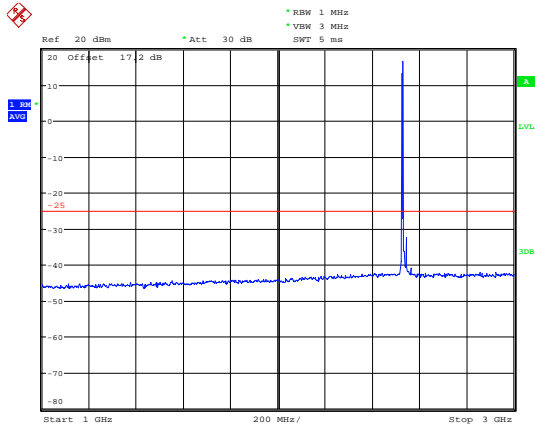
Date: 15.MAY.2019 17:26:37

LTE Band 7 20MHz CH-High 30MHz~1GHz



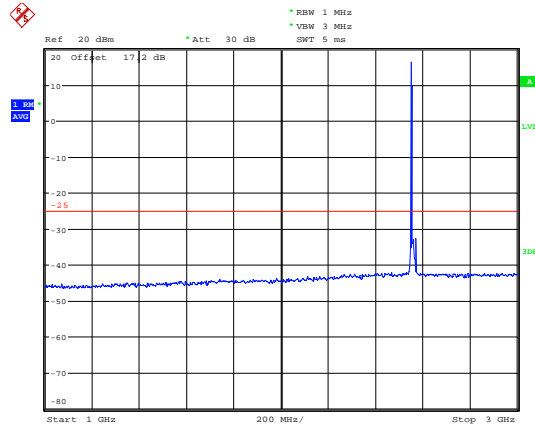
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LTE Band 7 20MHz CH-Middle 1GHz~3GHz



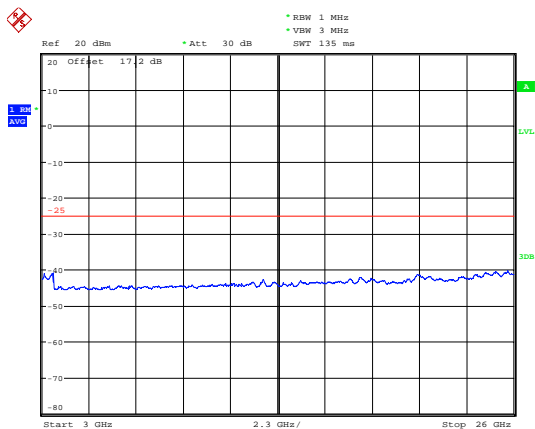
Date: 15.MAY.2019 18:35:38

LTE Band 7 20MHz CH-High 1GHz~3GHz



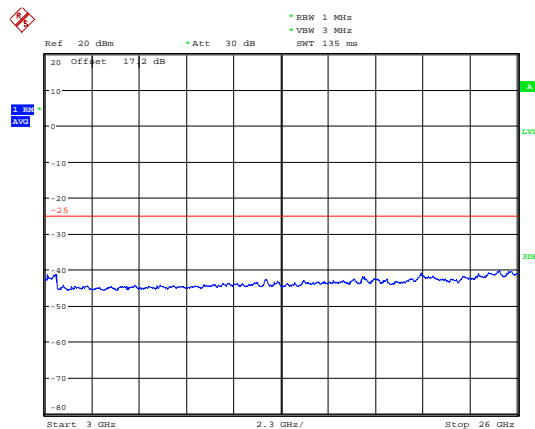
Date: 15.MAY.2019 18:36:26

LTE Band 7 20MHz CH-Middle 3GHz~26GHz



Date: 15.MAY.2019 19:20:40

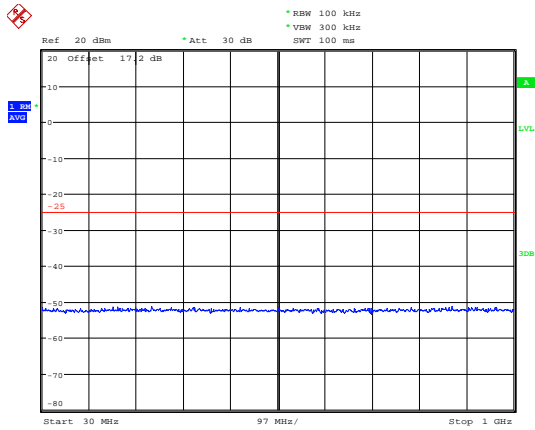
LTE Band 7 20MHz CH-High 3GHz~26GHz



Date: 15.MAY.2019 19:20:52

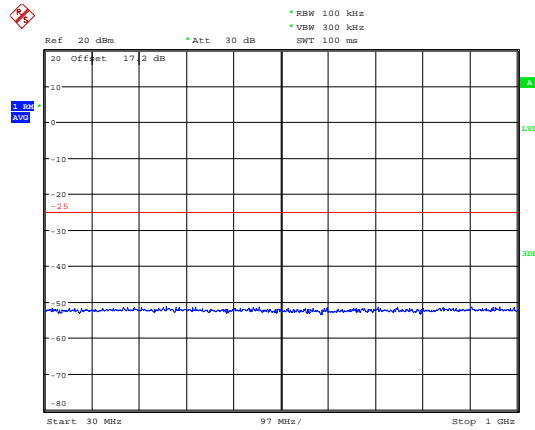


LTE Band 38 5MHz CH-Low 30MHz~1GHz



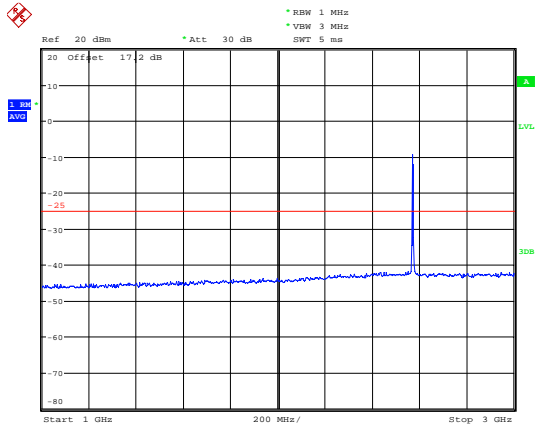
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LTE Band 38 5MHz CH-Middle 30MHz~1GHz



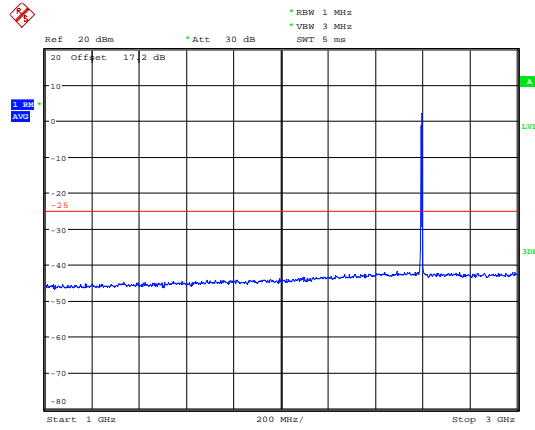
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LTE Band 38 5MHz CH-Low 1GHz~3GHz



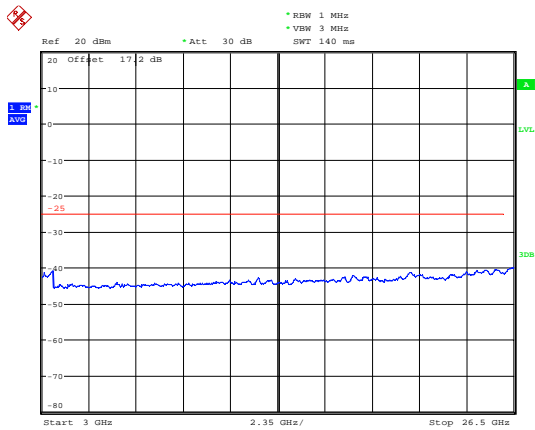
Date: 15.MAY.2019 19:04:05

LTE Band 38 5MHz CH-Middle 1GHz~3GHz



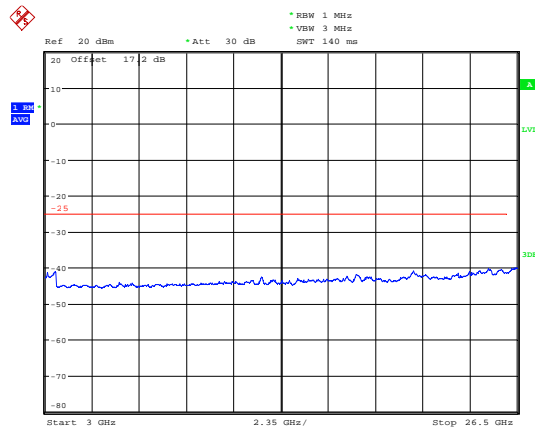
Date: 15.MAY.2019 19:04:31

LTE Band 38 5MHz CH-Low 3GHz~26.5GHz



Date: 15.MAY.2019 19:21:42

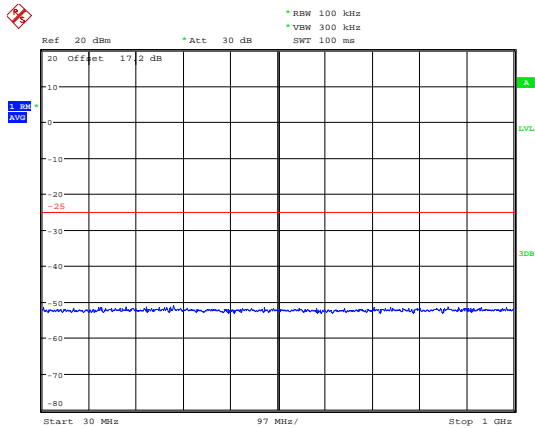
LTE Band 38 5MHz CH-Middle 3GHz~26.5GHz



Date: 15.MAY.2019 19:21:55

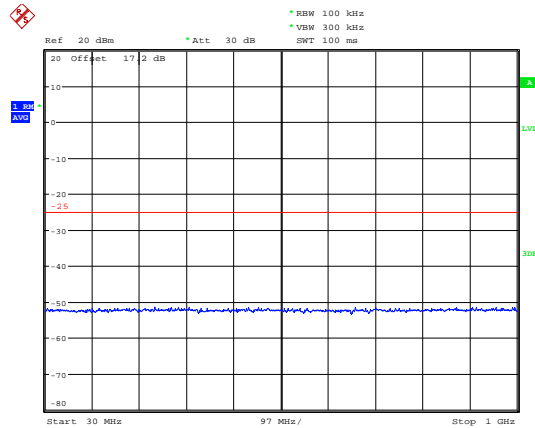


LTE Band 38 5MHz CH-High 30MHz~1GHz



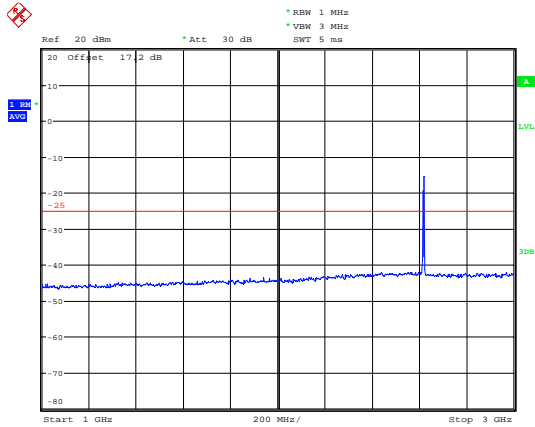
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LTE Band 38 10MHz CH-Low 30MHz~1GHz



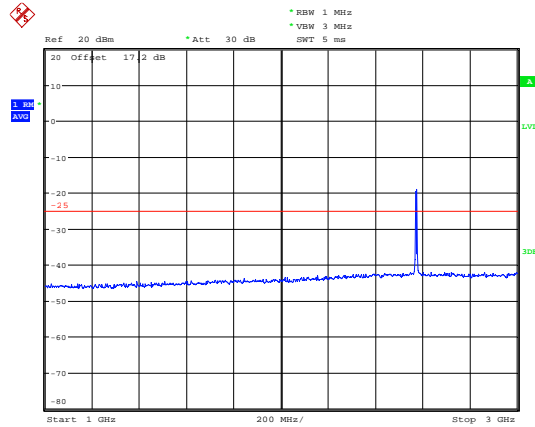
Date: 15.MAY.2019 17:38:10

LTE Band 38 5MHz CH-High 1GHz~3GHz



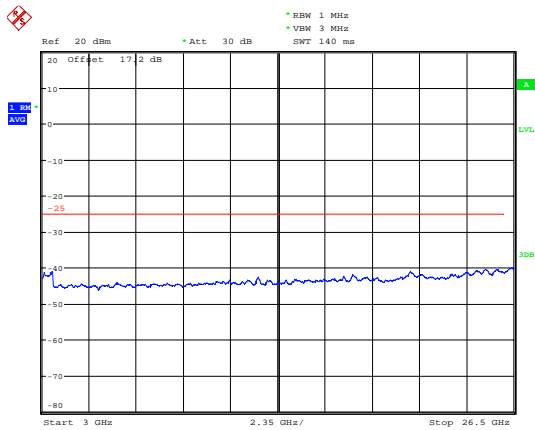
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LTE Band 38 10MHz CH-Low 1GHz~3GHz



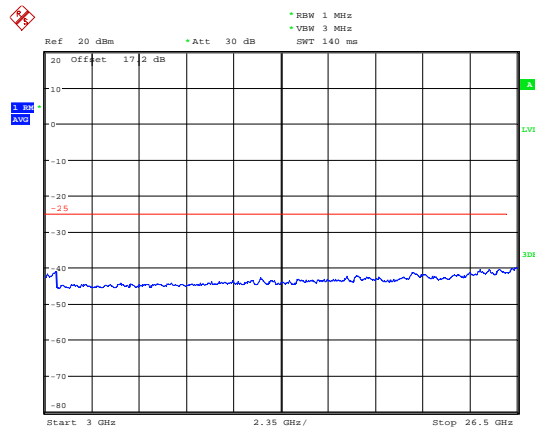
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LTE Band 38 5MHz CH-High 3GHz~26.5GHz



Date: 15.MAY.2019 19:22:10

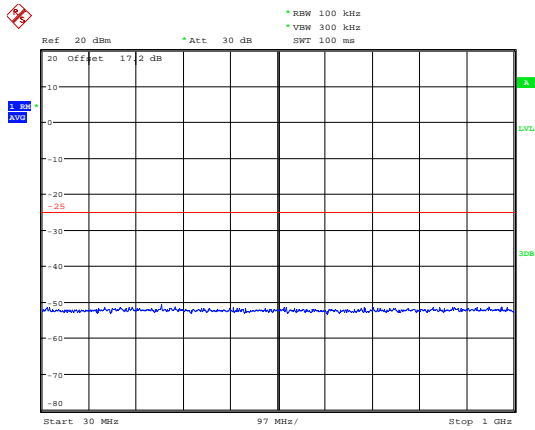
LTE Band 38 10MHz CH-Low 3GHz~26.5GHz



Date: 15.MAY.2019 19:22:32

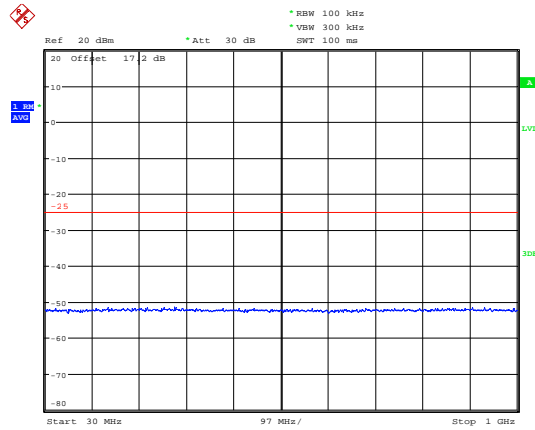


LTE Band 38 10MHz CH-Middle 30MHz~1GHz



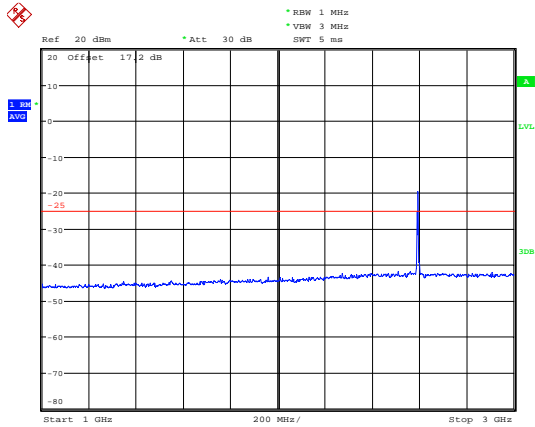
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LTE Band 38 10MHz CH-High 30MHz~1GHz



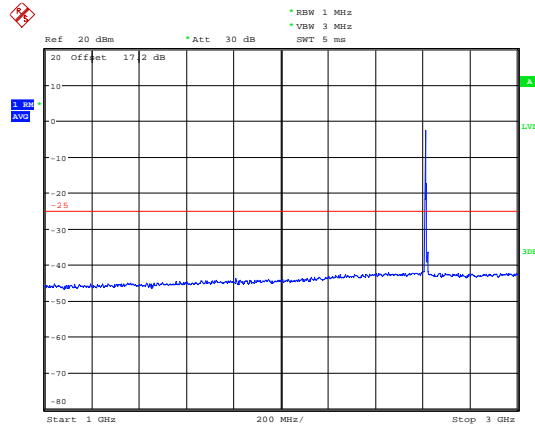
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LTE Band 38 10MHz CH-Middle 1GHz~3GHz



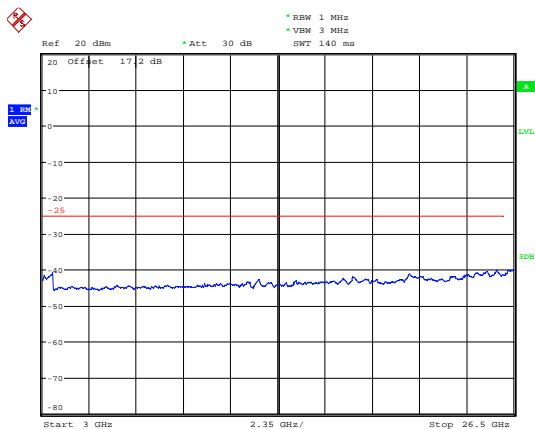
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LTE Band 38 10MHz CH-High 1GHz~3GHz



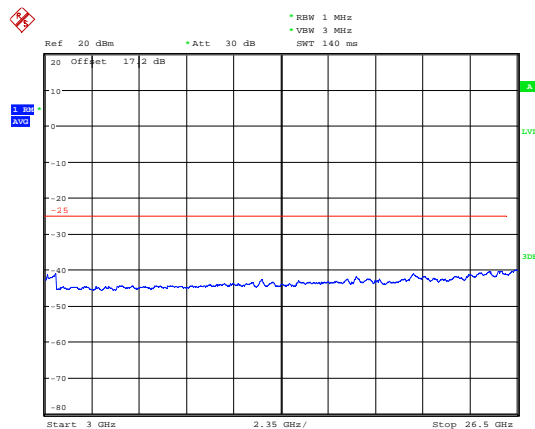
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LTE Band 38 10MHz CH-Middle 3GHz~26.5GHz



Date: 15.MAY.2019 19:22:43

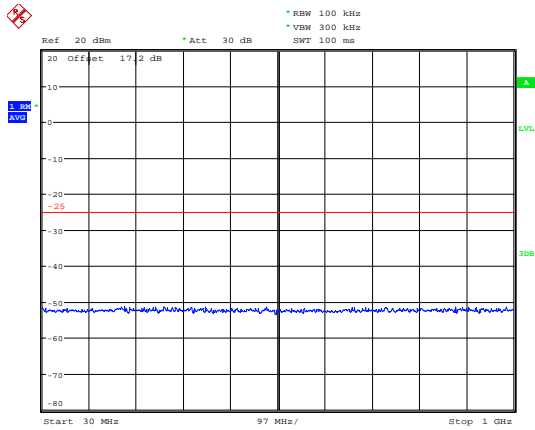
LTE Band 38 10MHz CH-High 3GHz~26.5GHz



Date: 15.MAY.2019 19:22:58

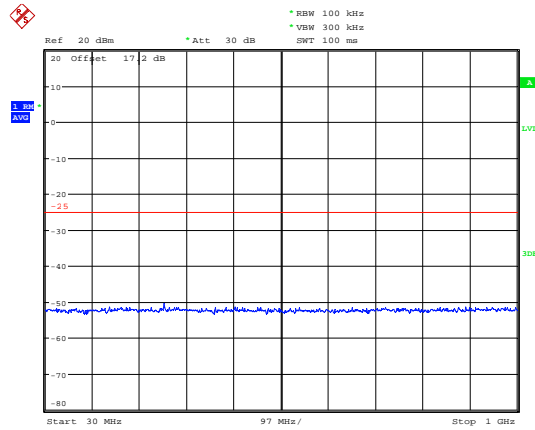


LTE Band 38 15MHz CH-Low 30MHz~1GHz



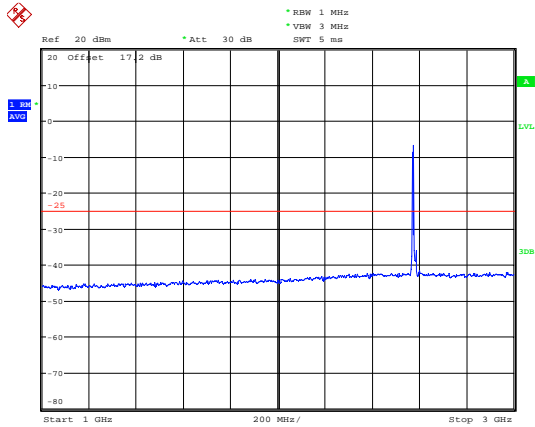
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LTE Band 38 15MHz CH-Middle 30MHz~1GHz



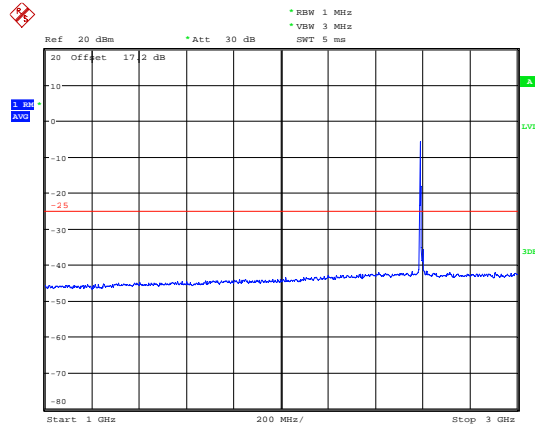
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LTE Band 38 15MHz CH-Low 1GHz~3GHz



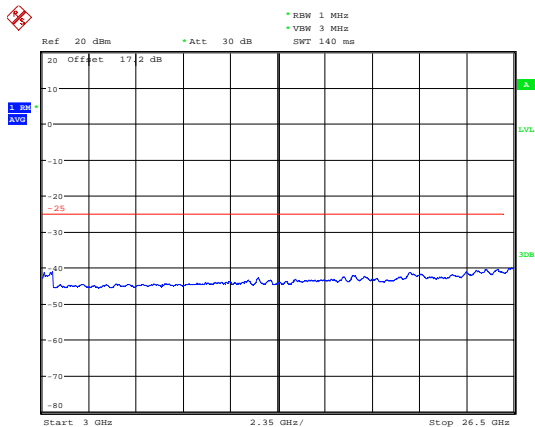
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LTE Band 38 15MHz CH-Middle 1GHz~3GHz



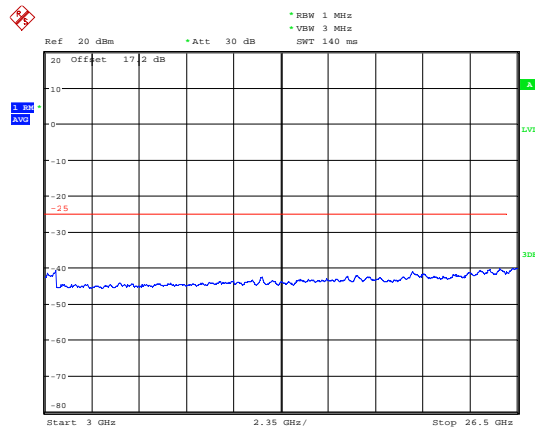
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LTE Band 38 15MHz CH-Low 3GHz~26.5GHz



Date: 15.MAY.2019 19:23:21

LTE Band 38 15MHz CH-Middle 3GHz~26.5GHz



Date: 15.MAY.2019 19:23:33