



FCC Test Report

Equipment : Nest Cam Outdoor
Brand Name : Nest Labs
Model No. : A0033
FCC ID : ZQANC21
Standard : 47 CFR FCC Part 15
Applicant : Nest Labs Inc.
3400 Hillview Ave, Pola Alto, CA 94304 USA
Manufacturer : Chicony Electronics (Dong Guan) Co., Ltd.
San Zhong Guan Li Qu, Qingxi Town,
Dongguan City Guangdong 523651 China

The product sample received on May 16, 2016 and completely tested on Jul. 04, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

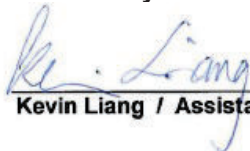

Kevin Liang / Assistant Manager





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1 CO-LOCATION

1.1 Transmitter Radiated Unwanted Emissions

1.1.1 Transmitter Radiated Unwanted Emissions Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

1.1.2 Measuring Instruments

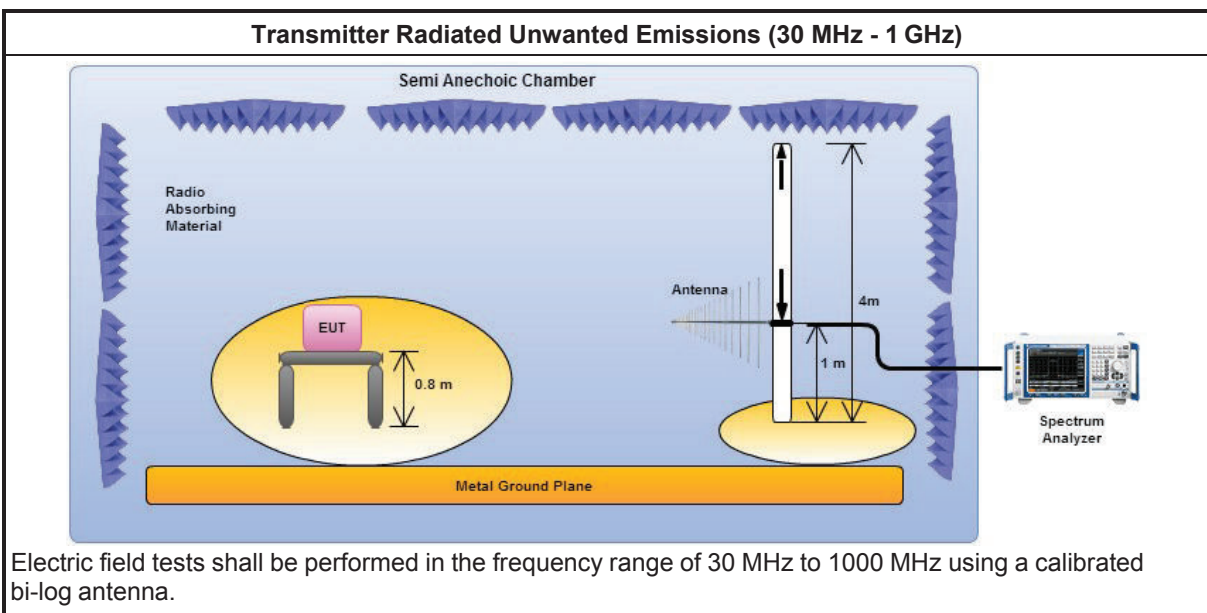
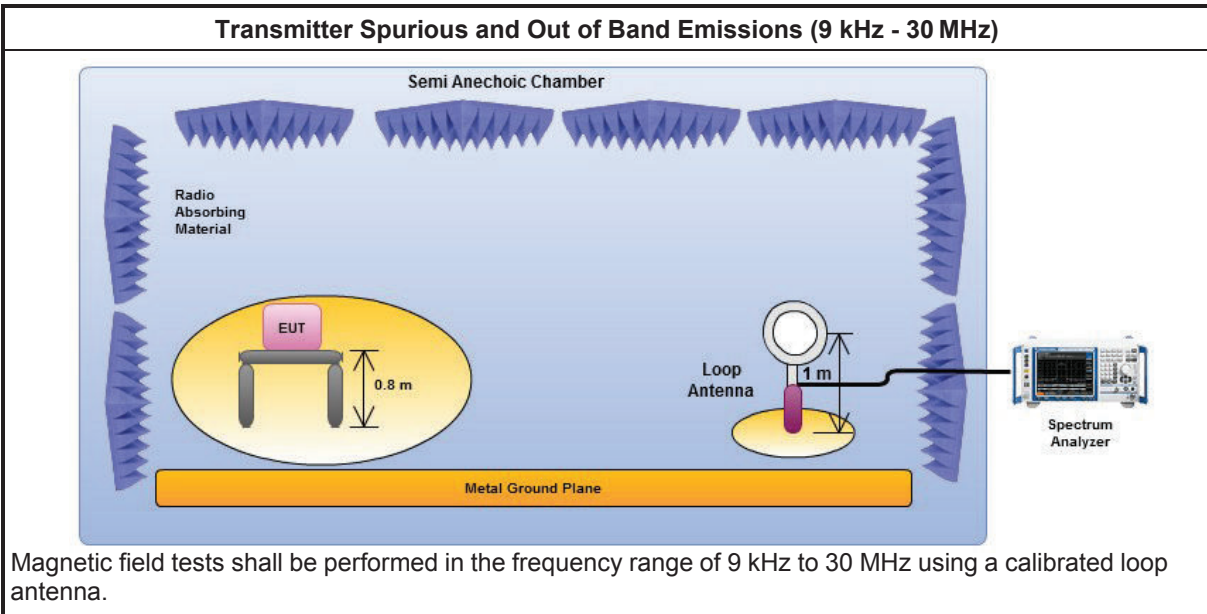
Refer a test equipment and calibration data table in this test report.

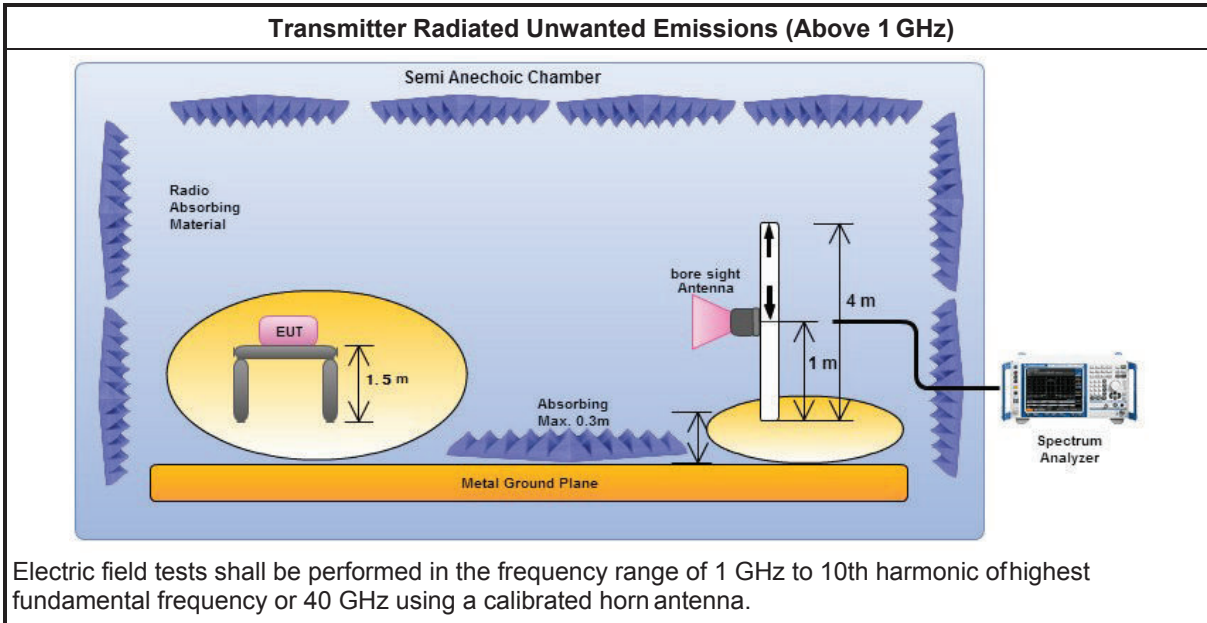


1.1.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
Note: After pretest, 5580MHz is worst emission in UNII-2a/UNII-2c, 5825MHz is worst emission in UNII-1/UNII-3	
<input checked="" type="checkbox"/>	The average emission levels shall be measured in [duty cycle \geq 98 or duty factor].
<input checked="" type="checkbox"/>	For the transmitter unwanted emissions shall be measured using following options below:
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 10.1 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 10.2 for unwanted emissions into restricted bands.
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 1 (spectral trace averaging)
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 2 (slow sweep speed).
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). $VBW \geq 1/T$, where T is pulse time.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 10.2.3.2 and 8.1.1 measurement procedure peak limit.
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 10.2.3.1 measurement procedure Quasi-Peak limit.
<input checked="" type="checkbox"/>	For radiated measurement, refer as FCC KDB 558074, clause 10.2.1.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.
<input type="checkbox"/>	For conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 10.2.2.
<input type="checkbox"/>	For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
<input type="checkbox"/>	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB

1.1.4 Test Setup



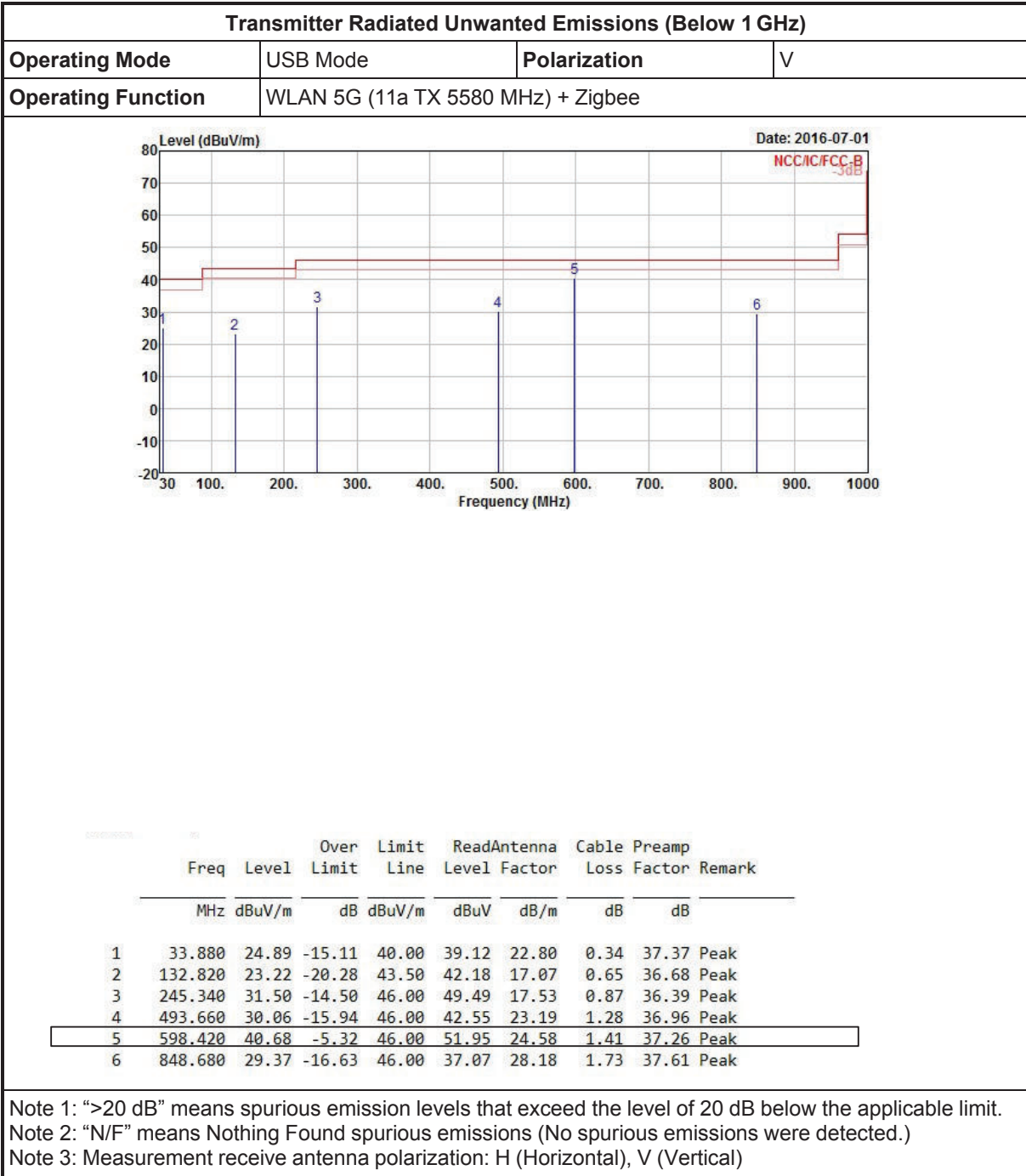


1.1.5 Transmitter Radiated Unwanted Emissions (Below 30 MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.



1.1.6 Results of Radiated Emissions (30 MHz – 1 GHz)

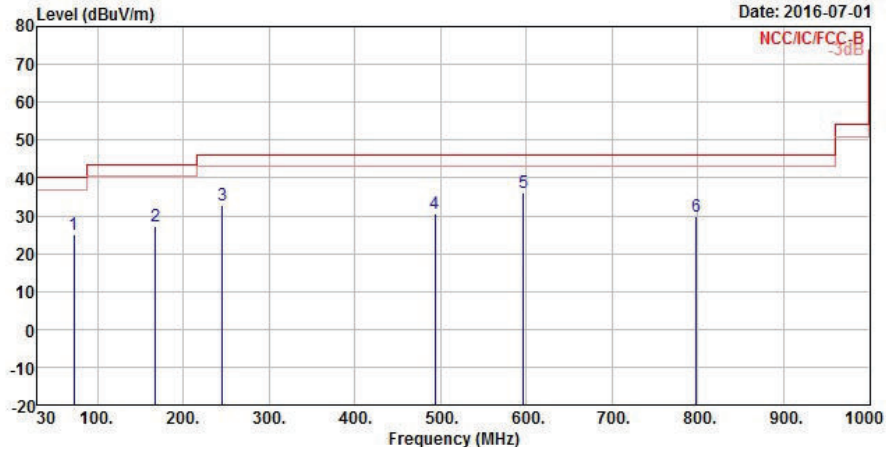




Transmitter Radiated Unwanted Emissions (Below 1 GHz)

Operating Mode	USB Mode	Polarization	H
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Operating Function	WLAN 5G (11a TX 5580 MHz) + Zigbee
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	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	72.680	25.16	-14.84	40.00	49.81	11.88	0.49	37.02	Peak
2	167.740	27.28	-16.22	43.50	47.75	15.33	0.73	36.53	Peak
3	245.340	32.76	-13.24	46.00	50.75	17.53	0.87	36.39	Peak
4	493.660	30.57	-15.43	46.00	43.06	23.19	1.28	36.96	Peak
5	596.480	35.98	-10.02	46.00	47.28	24.55	1.41	37.26	Peak
6	798.240	29.67	-16.33	46.00	38.16	27.38	1.67	37.54	Peak

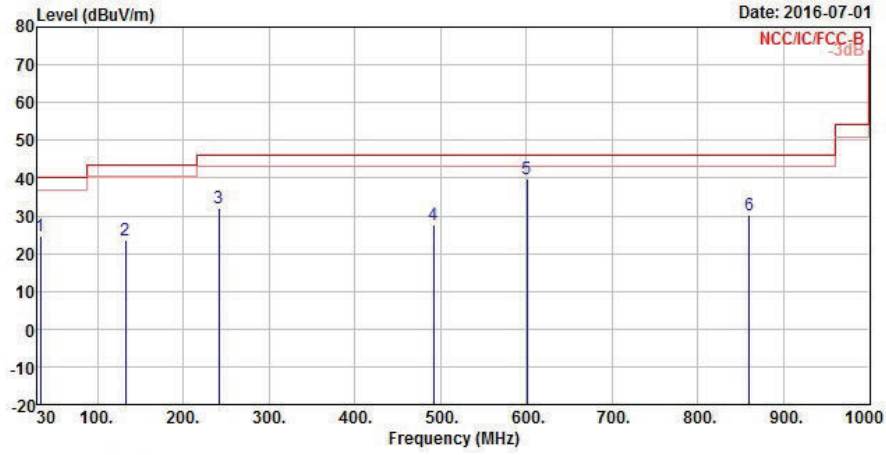
Note 1: ">20 dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



Transmitter Radiated Unwanted Emissions (Below 1 GHz)

Operating Mode	USB Mode	Polarization	V
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Operating Function	WLAN 5G (11a TX 5825 MHz) + Zigbee
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	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	33.880	24.66	-15.34	40.00	38.89	22.80	0.34	37.37	Peak
2	132.820	23.67	-19.83	43.50	42.63	17.07	0.65	36.68	Peak
3	241.460	32.17	-13.83	46.00	50.55	17.15	0.86	36.39	Peak
4	491.720	27.62	-18.38	46.00	40.14	23.15	1.28	36.95	Peak
5	600.360	39.81	-6.19	46.00	51.06	24.61	1.41	37.27	Peak
6	860.320	30.27	-15.73	46.00	37.92	28.24	1.74	37.63	Peak

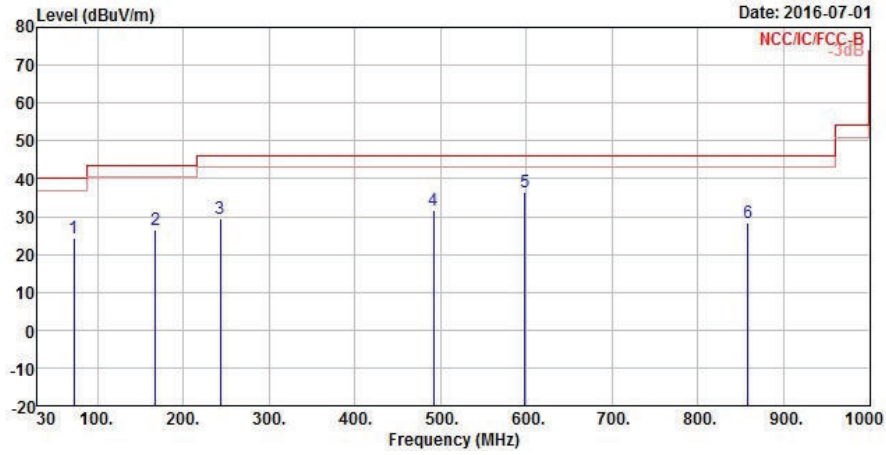
Note 1: ">20 dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



Transmitter Radiated Unwanted Emissions (Below 1 GHz)

Operating Mode	USB Mode	Polarization	H
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Operating Function	WLAN 5G (11a TX 5825 MHz) + Zigbee
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	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	72.680	24.41	-15.59	40.00	49.06	11.88	0.49	37.02	Peak
2	167.740	26.34	-17.16	43.50	46.81	15.33	0.73	36.53	Peak
3	243.400	29.61	-16.39	46.00	47.79	17.34	0.87	36.39	Peak
4	491.720	31.76	-14.24	46.00	44.28	23.15	1.28	36.95	Peak
5	598.420	36.50	-9.50	46.00	47.77	24.58	1.41	37.26	Peak
6	858.380	28.43	-17.57	46.00	36.09	28.23	1.74	37.63	Peak

Note 1: ">20 dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



1.1.7 Results for Radiated Emissions (1 GHz - 10th Harmonic)

Transmitter Radiated Unwanted Emissions (Above 1 GHz)			
Operating Mode	USB Mode	Polarization	V
Operating Function	WLAN 5G (11a TX 5580 MHz) + Zigbee		

Date: 2016-07-01

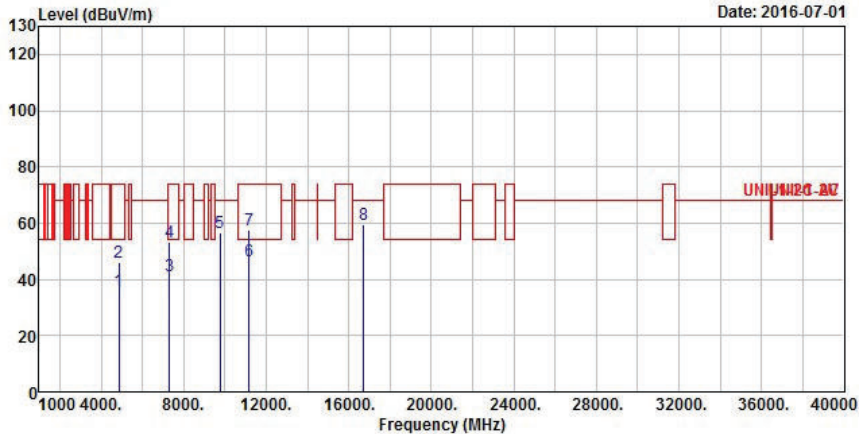
Line	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4880.000	35.82	-18.18	54.00	33.61	31.23	6.13	35.15	Average
2	4880.000	47.34	-26.66	74.00	45.13	31.23	6.13	35.15	Peak
3	7320.000	41.67	-12.33	54.00	33.36	36.13	7.60	35.42	Average
4	7320.000	52.47	-21.53	74.00	44.16	36.13	7.60	35.42	Peak
5	9760.000	56.19	-12.01	68.20	44.45	38.76	8.94	35.96	Peak
6	11160.000	47.33	-6.67	54.00	32.73	40.24	9.67	35.31	Average
7	11160.000	58.26	-15.74	74.00	43.66	40.24	9.67	35.31	Peak
8	16740.000	59.38	-8.82	68.20	43.45	39.52	11.67	35.26	Peak

Note 1: ">20 dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1 GHz)

Operating Mode	USB Mode	Polarization	H
Operating Function	WLAN 5G (11a TX 5580 MHz) + Zigbee		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4880.000	35.80	-18.20	54.00	33.59	31.23	6.13	35.15	Average
2	4880.000	46.19	-27.81	74.00	43.98	31.23	6.13	35.15	Peak
3	7320.000	41.37	-12.63	54.00	33.06	36.13	7.60	35.42	Average
4	7320.000	53.09	-20.91	74.00	44.78	36.13	7.60	35.42	Peak
5	9760.000	56.53	-11.67	68.20	44.79	38.76	8.94	35.96	Peak
6	11160.000	46.63	-7.37	54.00	32.03	40.24	9.67	35.31	Average
7	11160.000	57.65	-16.35	74.00	43.05	40.24	9.67	35.31	Peak
8	16740.000	59.40	-8.80	68.20	43.47	39.52	11.67	35.26	Peak

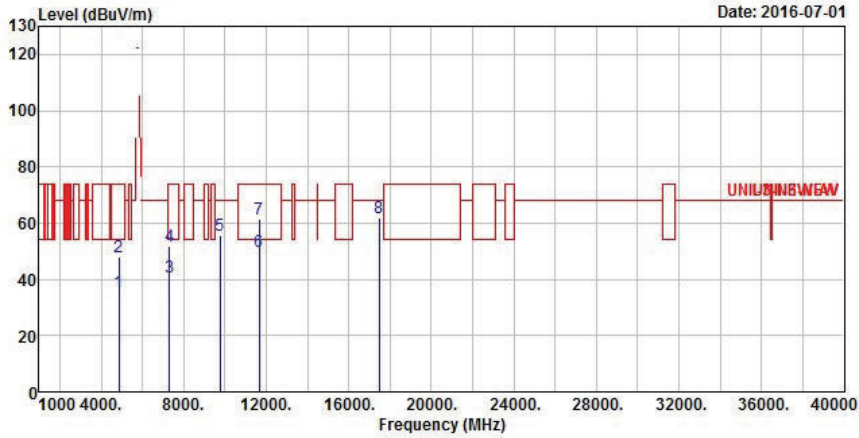
Note 1: ">20 dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1 GHz)

Operating Mode	USB Mode	Polarization	V
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Operating Function	WLAN 5G (11a TX 5825 MHz) + Zigbee
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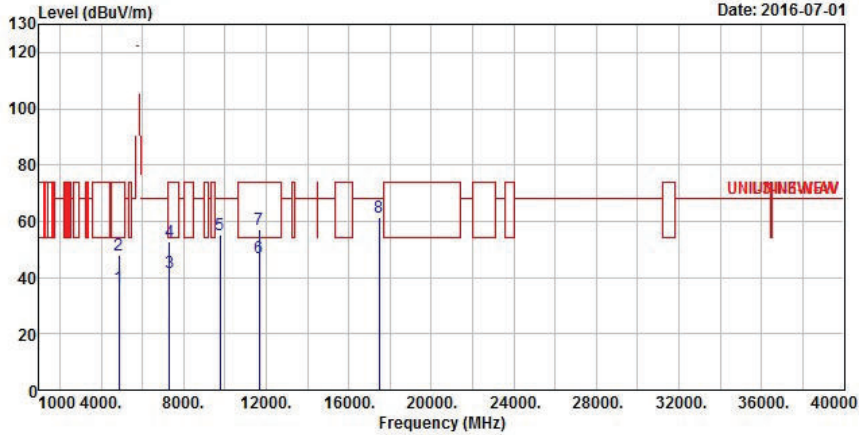


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4880.000	35.66	-18.34	54.00	33.45	31.23	6.13	35.15	Average
2	4880.000	48.09	-25.91	74.00	45.88	31.23	6.13	35.15	Peak
3	7320.000	40.60	-13.40	54.00	32.29	36.13	7.60	35.42	Average
4	7320.000	51.96	-22.04	74.00	43.65	36.13	7.60	35.42	Peak
5	9760.000	55.58	-12.62	68.20	43.84	38.76	8.94	35.96	Peak
6	11650.000	49.82	-4.18	54.00	35.58	39.74	9.84	35.34	Average
7	11650.000	61.62	-12.38	74.00	47.38	39.74	9.84	35.34	Peak
8	17475.000	61.83	-6.37	68.20	43.29	41.82	11.90	35.18	Peak

Note 1: ">20 dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1 GHz)			
Operating Mode	USB Mode	Polarization	H
Operating Function	WLAN 5G (11a TX 5825 MHz) + Zigbee		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4880.000	36.59	-17.41	54.00	34.38	31.23	6.13	35.15	Average
2	4880.000	48.16	-25.84	74.00	45.95	31.23	6.13	35.15	Peak
3	7320.000	41.63	-12.37	54.00	33.32	36.13	7.60	35.42	Average
4	7320.000	52.85	-21.15	74.00	44.54	36.13	7.60	35.42	Peak
5	9760.000	55.38	-12.82	68.20	43.64	38.76	8.94	35.96	Peak
6	11650.000	46.83	-7.17	54.00	32.59	39.74	9.84	35.34	Average
7	11650.000	57.01	-16.99	74.00	42.77	39.74	9.84	35.34	Peak
8	17475.000	61.41	-6.79	68.20	42.87	41.82	11.90	35.18	Peak

Note 1: ">20 dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

**1.2 Test Equipment and Calibration Data**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz 3m	May 14, 2016	May 13, 2017
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz 3m	Jul. 01, 2015	Jun. 30, 2016
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz 3m	Jul. 01, 2016	Jun. 30, 2017
Amplifier	EMC	EMC9135	980232	9kHz ~ 1.0GHz	Jan. 29, 2016	Jan. 28, 2017
Amplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	Apr. 11, 2016	Apr. 10, 2017
Spectrum	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	Jul. 15, 2015	Jul. 14, 2016
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL 6111D & MTJ6102	35418	30MHz ~ 1GHz	Mar. 31, 2016	Mar. 30, 2017
Horn Antenna	SCHWARZBECK	BBHA 9120D	BBHA 9120D 1534	1GHz ~ 18GHz	Apr. 22, 2016	Apr. 21, 2017
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170614	18GHz ~ 40GHz	Jan. 04, 2016	Jan. 03, 2017
Amplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	Jun. 01, 2017
Loop Antenna	ROHDE&SCHWARZ	HFH2-Z2	100330	9 kHz~30 MHz	Nov. 10, 2014	Nov. 09, 2016