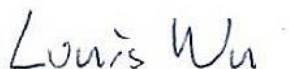


FCC RADIO TEST REPORT

FCC ID : KR5PPE1C
Equipment : Radio Frequency Bidirectional Key
Brand Name : Continental
Model Name : PPE1C
Applicant : Continental Automotive GmbH
Siemensstrasse 12, 93055, Regensburg, Germany
Manufacturer : Continental Automotive GmbH
Siemensstrasse 12, 93055, Regensburg, Germany
Factory : Continental Automotive Lithuania UAB
Davalgoniu str. 12, Sergeiciku I k., Karmelavos sen.,
Kaunas region 54462, Lithuania
Standard : Fcc Part 15 Subpart C §15.231

The product was received on Oct. 12, 2021, and testing was started from Oct. 26, 2021 and completed on Dec. 21, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in 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. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FR1O1258A	01	Initial issue of report	Jan. 04, 2022
FR1O1258A	02	1. Add Factory Information 2. Revise Product Specification of Equipment Under Test	Jan. 07, 2022
FR1O1258A	03	1. Revise Product Specification, EUT Operation Test Setup and Test Results of Conducted Test Items 2. Add description in Field Strength of Fundamental and Spurious Emissions	Feb. 08, 2022

Summary of The Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.207	AC Power Line Conducted Emissions	Not required	-
3.1	15.231(a)	Types of Momentary Signals	PASS	-
3.2	15.231(c)	20dB and 99% Occupied Bandwidth	PASS	-
3.3	15.231(b) 15.231(e)	Field Strength of Fundamental and Spurious Emissions	PASS	7.85 dB Under the limit at 866.940 MHz

Note: Not required means after assessing, test items are not necessary to carry out.

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Yun Huang

Report Producer: Vivian Hsu

1. General Information

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Radio Frequency Bidirectional Key
Brand Name	Continental
Model Name	PPE1C
FCC ID	KR5PPE1C
Sample 1	EUT with PANIC Button
Sample 2	EUT without PANIC Button
EUT supports Radios application	RFID/SRD/UWB
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer.
2. All the tests were performed with sample 2.

1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard	
Tx/Rx Frequency Range	433MHz
Antenna Type	printed loop antenna (pcb)
Antenna Gain	-17 dBi
Type of Modulation	FSK

Remark: The above EUT's information is declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.3 Modification of EUT

No modifications are made to the EUT during all test items.

1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	DF02-HY	03CH07-HY
Test Engineer	PH Yang	Jesse Wang
Temperature (°C)	24.4	19.6 ~ 25.3
Relative Humidity (%)	53.0	48.8 ~ 64.7

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190



1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.231
- ♦ ANSI C63.10-2013
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2. Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

Investigation has been done on all the possible configurations for searching the worst cases.

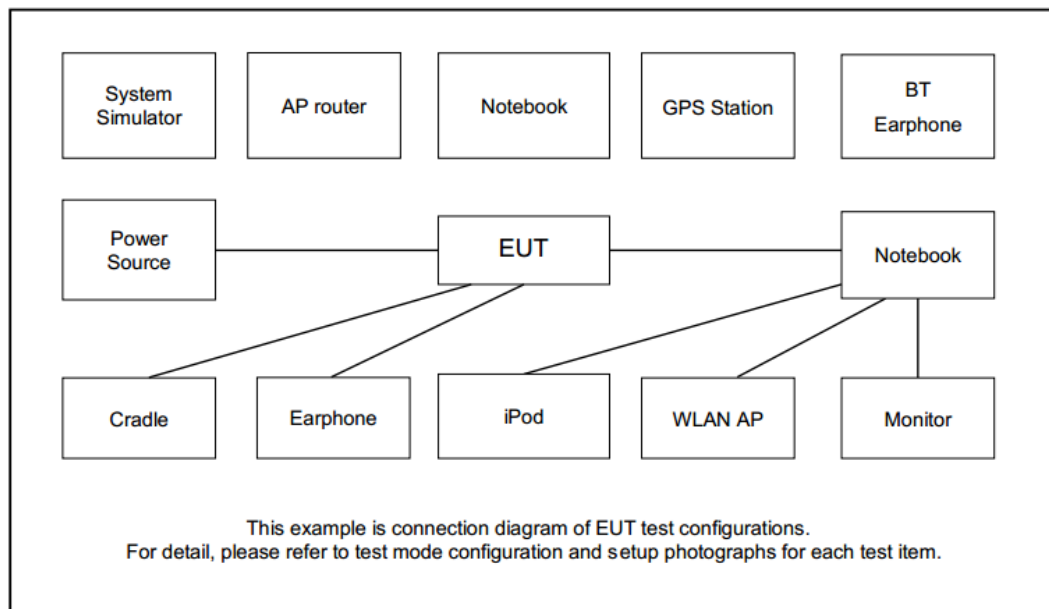
The following table is a list of the test modes shown in this test report.

The measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find X plane as worst plane.

Test Items	
Test Result of transmission time	
20dB and 99% occupied bandwidth	Field Strength of Fundamental and Spurious Emissions

Test Configuration	
Mode	Frequency
1	433.47MHz
2	433.92MHz
3	434.37MHz

2.2 Connection Diagram of Test System





2.3 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Battery	Panasonic	CR2032	N/A	N/A	N/A

2.4 EUT Operation Test Setup

The RF test items, make the EUT (SW: SW0241) get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

3. Test Results

3.1 Types of Momentarily Operated Devices

3.1.1 Limit

☒	§15.231 (a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
-------------------------------------	--

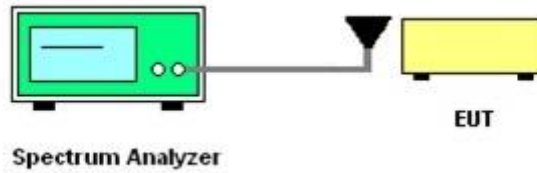
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

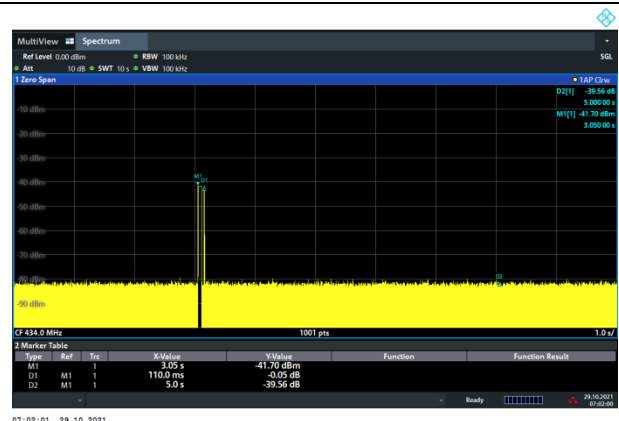
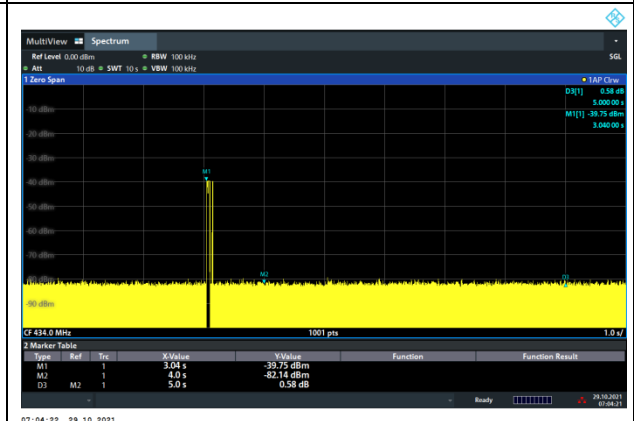
3.1.3 Test Procedures

1. The spectrum analyzer connected via a receive antenna placed near the EUT in peak Max hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.
4. Measured the transmission period of EUT under specified condition.

3.1.4 Test Setup



3.1.5 Test Result of transmission time

☒	§15.231 (a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
Condition 1	Condition 2
	
Button push and release @ M1	Button push @ M1 Button release @ M2

3.2 20dB and 99% Occupied Bandwidth Measurement

3.2.1 Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

The 99% bandwidth of momentarily operated devices shall be less or equal to 0.25% of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the 99% bandwidth shall be less or equal to 0.5% of the centre frequency.

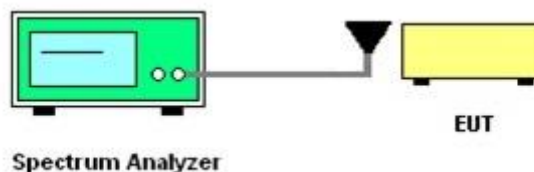
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The spectrum analyzer connected via a receive antenna placed near the EUT in peak Max hold mode.
2. The resolution bandwidth of 1 kHz and the video bandwidth of 3 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.
4. Measured the 99% OBW.

3.2.4 Test Setup



3.2.5 Test Result of Conducted Test Items

Please refer to Appendix A.

3.3 Field Strength of Fundamental and Spurious Emissions

3.3.1 Limit

☒

15.231(b)

In addition to the provisions of §15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following

From 15.231(b)(3), the limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.

Rules and specifications	FCC CFR 47 Part 15 section 15.231	
Fundamental frequency (f) (MHz)	Field strength of fundamental (µV/m) at 3m	Field strength of spurious emissions (dBµV/m) at 3m
40.66 ≤ f ≤ 40.70	2250	225
70 < f ≤ 130	1250	125
130 < f ≤ 174	1250 to 3750*	125 to 375*
174 < f ≤ 260	3750	375
260 < f ≤ 470	3750 to 12500*	375 to 1250*
470 < f	12500	1250

* Linear interpolation with frequency, f, in MHz.

3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

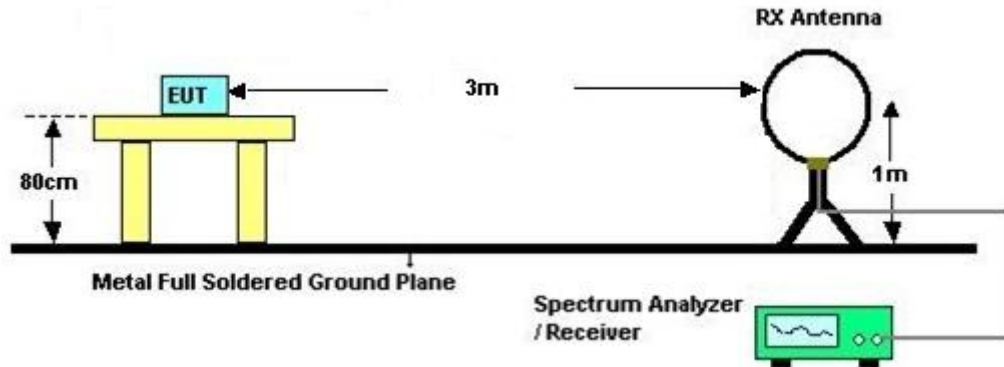
3.3.3 Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength.
4. For Fundamental emissions, use the receiver to measure Average reading.
5. For average measurement: use duty cycle correction factor method per 15.35(c).
Duty cycle = On time/100 milliseconds
$$\text{On time} = N1*L1+N2*L2+...+Nn-1*Ln-1+Nn*Ln$$

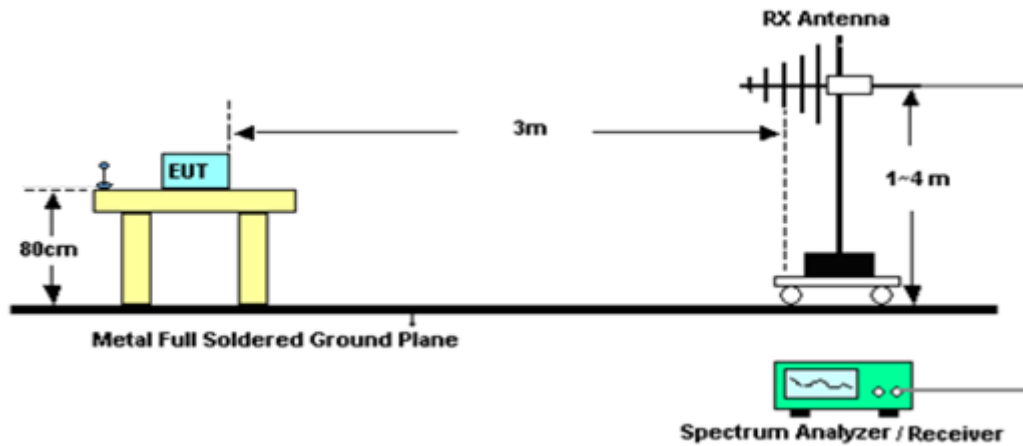
Where N1 is number of type 1 pulses, L1 is length of type 1 pulses, etc.
Average Emission Level = Peak Emission Level + 20*log(Duty cycle)
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-”.
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as “-”.

3.3.4 Test Setup

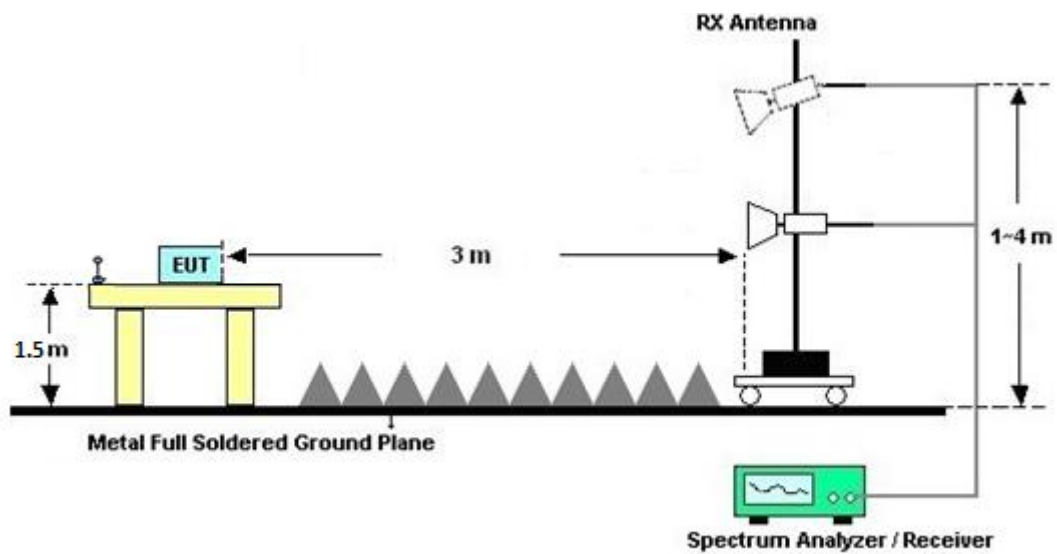
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



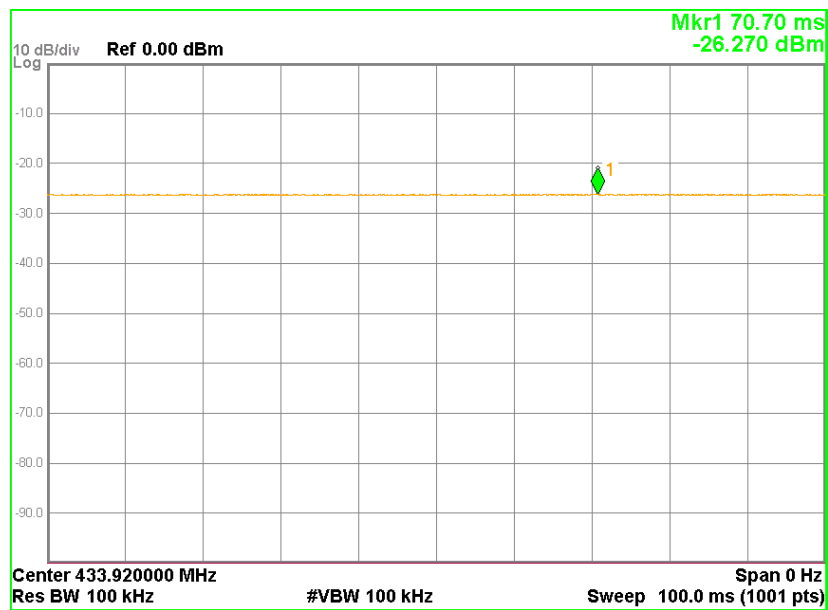
3.3.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which starts from 9 kHz to 30 MHz, is pre-scanned and the result which is 20 dB lower than the limit line is not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result comes out very similar.

3.3.6 Duty Cycle

433.92MHz on time Plot



Note:

1. Worst case Duty cycle = on time/100 milliseconds = 100 %
2. Worst case Duty cycle correction factor = $20 \times \log(\text{Duty cycle}) = 0 \text{ dB}$

3.3.7 Test Result of Fundamental and Spurious Emissions

Please refer to Appendix B.



4. List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	35419 & 03	30MHz~1GHz	Apr. 28, 2021	Oct. 26, 2021~Dec. 21, 2021	Apr. 27, 2022	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 01, 2020	Oct. 26, 2021~Nov. 29, 2021	Nov. 30, 2021	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00066584	1GHz ~ 18GHz	Oct. 25, 2021	Nov. 30, 2021~Dec. 21, 2021	Oct. 24, 2022	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz~40GHz	May 21, 2021	Oct. 26, 2021~Nov. 29, 2021	May 20, 2022	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Nov. 30, 2021	Nov. 30, 2021~Dec. 21, 2021	Nov. 29, 2022	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Jul. 23, 2021	Oct. 26, 2021~Dec. 21, 2021	Jul. 22, 2022	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Oct. 26, 2021~Dec. 21, 2021	Jan. 03, 2022	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 22, 2021	Oct. 26, 2021~Dec. 21, 2021	Apr. 21, 2022	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 04, 2021	Oct. 26, 2021~Dec. 21, 2021	Oct. 03, 2022	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Jul. 22, 2021	Oct. 26, 2021~Dec. 21, 2021	Jul. 21, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15682-4	30MHz to 18GHz	Feb. 24, 2021	Oct. 26, 2021~Dec. 21, 2021	Feb. 23, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971-4	9kHz to 18GHz	Feb. 24, 2021	Oct. 26, 2021~Dec. 21, 2021	Feb. 23, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655-4	9kHz to 18GHz	Feb. 24, 2021	Oct. 26, 2021~Dec. 21, 2021	Feb. 23, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126	532078/126E	30MHz~18GHz	Sep. 17, 2021	Oct. 26, 2021~Dec. 21, 2021	Sep. 16, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2,80 1606/2	18GHz~40GHz	Sep. 17, 2021	Oct. 26, 2021~Dec. 21, 2021	Sep. 16, 2022	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	Oct. 26, 2021~Dec. 21, 2021	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	Oct. 26, 2021~Dec. 21, 2021	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	Oct. 26, 2021~Dec. 21, 2021	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Oct. 26, 2021~Dec. 21, 2021	N/A	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	N/A	N/A	N/A	Oct. 26, 2021~Dec. 21, 2021	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	Mar. 09, 2021	Oct. 26, 2021~Dec. 21, 2021	Mar. 08, 2022	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV3044	101048	10Hz~44GHz	Apr. 20, 2021	Oct. 29, 2021	Apr. 19, 2022	Duty Cycle (DF02-HY)

5. Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

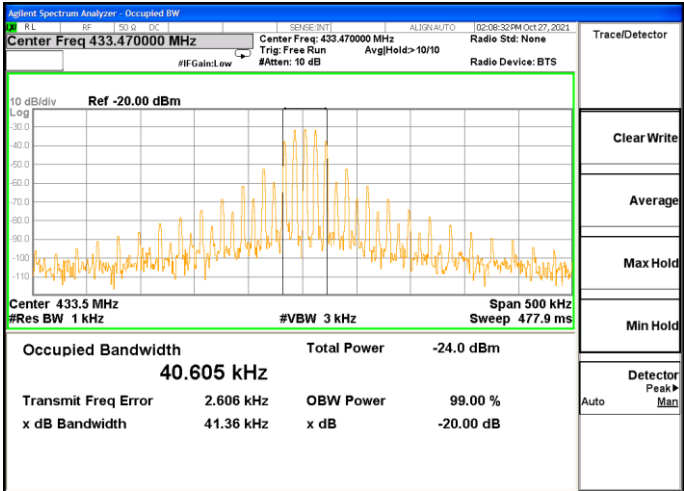
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1 dB
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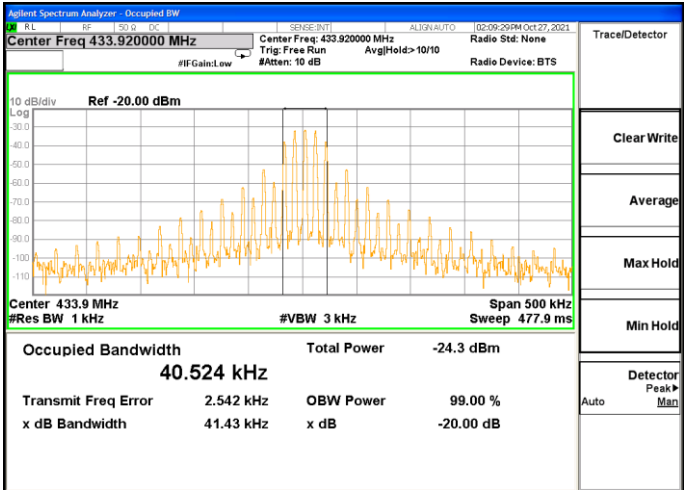
Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.8 dB
--	--------

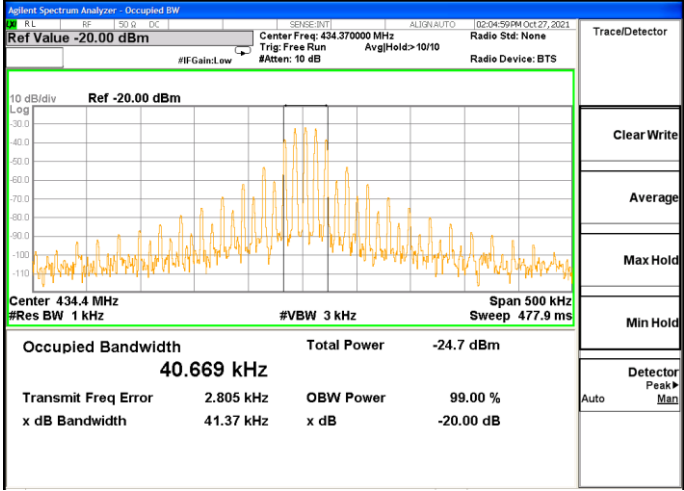


Appendix A. Test Results of Conducted Test Items

Test Mode	Mode 1	Test Frequency (MHz)	433.47MHz Tx
20dB Bandwidth (kHz)	41.36	99% Occupied BW (kHz)	46.605
			
Bandwidth Limit	Shall be less than 0.25% of 433.47MHz		
	< 1083.68kHz		
Test Result	Complies		

Test Mode	Mode 2	Test Frequency (MHz)	433.92MHz Tx
20dB Bandwidth (kHz)	41.43	99% Occupied BW (kHz)	40.524
			
Bandwidth Limit	Shall be less than 0.25% of 433.92MHz		
	< 1084.8kHz		
Test Result	Complies		

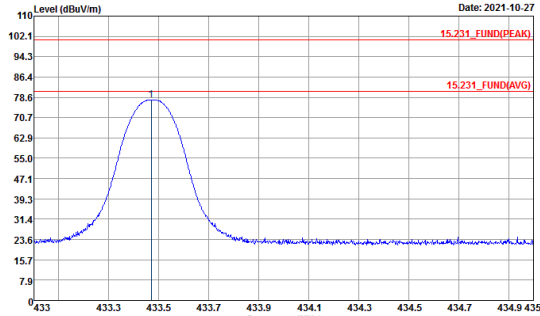
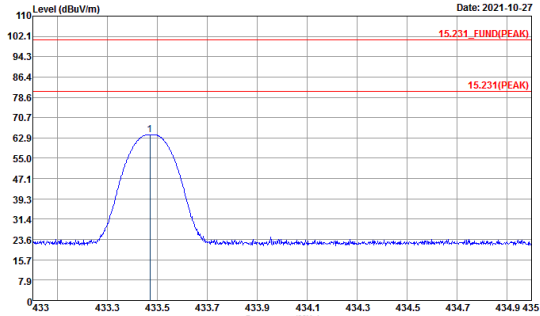


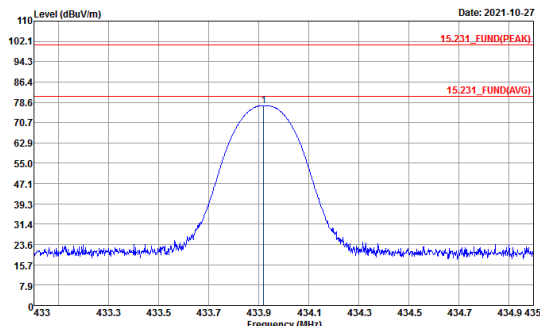
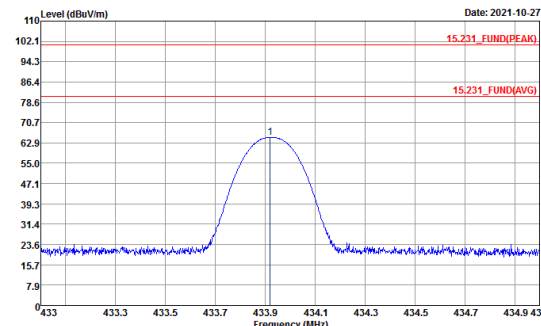
Test Mode	Mode 3	Test Frequency (MHz)	434.37MHz Tx
20dB Bandwidth (kHz)	41.37	99% Occupied BW (kHz)	40.669
			
Bandwidth Limit	Shall be less than 0.25% of 434.37MHz		
	< 1085.93kHz		
Test Result	Complies		



Appendix B. Test Results of Radiated Test Items

B1. Test Result of Field Strength of Fundamental Emissions

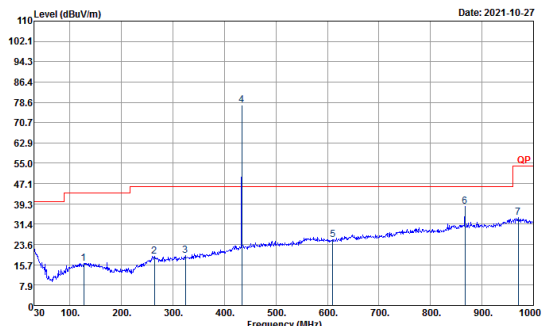
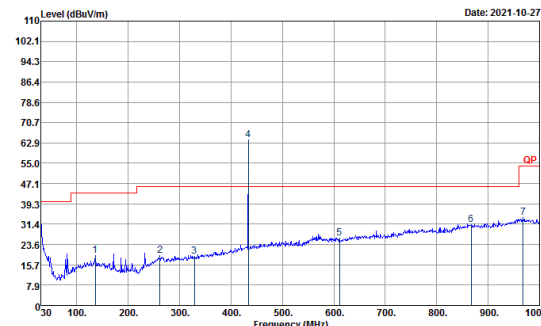
Test Mode		Mode 1				Test Frequency (MHz)		433.47MHz Tx			
Polarization: H						Polarization: V					
 Site : 03CH07-HY Condition : 15.231_FUND(PEAK) 3m LF-ANT-35419(6) HORIZONTAL Detector : Peak Project : 101258 Mode : 1						 Site : 03CH07-HY Condition : 15.231_FUND(PEAK) 3m LF-ANT-35419(6) VERTICAL Detector : Peak Project : 101258 Mode : 1					
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
433.47	77.51	-23.32	100.83	81.27	22.86	3.32	29.94	234	0	P	H
433.47	77.51	-3.32	80.83	-	-	-	-	-	-	A	H
433.47	64.11	-36.72	100.83	67.87	22.86	3.32	29.94	200	251	P	V
433.47	64.11	-16.72	80.83	-	-	-	-	-	-	A	V
Note: • Path Loss (dB) = Cable Loss (dB) + Filter Loss (dB) + Attenuator Loss (dB) • Level (dBuV/m) = Antenna Factor (dB/m) + Path Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) • Over Limit (dB) = Level (dBuV/m) – Limit Line (dBuV/m)											

Test Mode		Mode 2				Test Frequency (MHz)		433.92MHz Tx			
Polarization: H						Polarization: V					
 Date: 2021-10-27 15.231_FUND(PKAG) 15.231_FUND(AVG) Site : 03CH07-HY Condition : 15.231_FUND(PKAG) 3m LF-ANT-35419(6) HORIZONTAL Detector : Peak Project : 101258 Mode : 2						 Date: 2021-10-27 15.231_FUND(PKAG) 15.231_FUND(AVG) Site : 03CH07-HY Condition : 15.231_FUND(PKAG) 3m LF-ANT-35419(6) VERTICAL Detector : Peak Project : 101258 Mode : 2					
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamplifier Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
433.92	77.2	-23.63	100.83	80.96	22.86	3.32	29.94	234	0	P	H
433.92	77.2	-3.63	80.83	-	-	-	-	-	-	A	H
433.92	64.88	-35.95	100.83	68.64	22.86	3.32	29.94	226	260	P	V
433.92	64.88	-15.95	80.83	-	-	-	-	-	-	A	V
Note:											
• Path Loss (dB) = Cable Loss (dB) + Filter Loss (dB) + Attenuator Loss (dB) • Level (dBuV/m) = Antenna Factor (dB/m) + Path Loss (dB) + Read Level (dBuV) - Preamplifier Factor (dB) • Over Limit (dB) = Level (dBuV/m) – Limit Line (dBuV/m)											

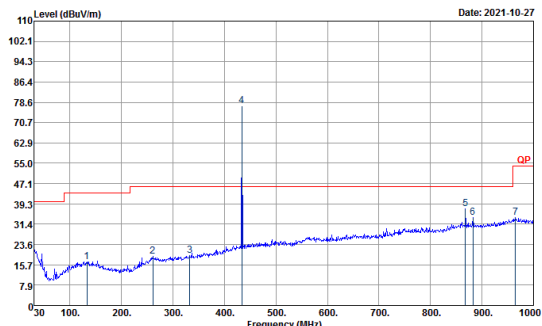
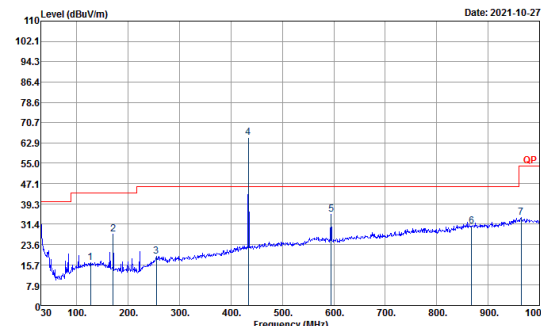


Test Mode		Mode 3				Test Frequency (MHz)		434.37MHz Tx			
Polarization: H						Polarization: V					
Site : 03CH07-HY Condition : 15.231_FUND(PK) 3m LF-ANT-35419(6) HORIZONTAL Detector : Peak Project : 101258 Mode : 3						Site : 03CH07-HY Condition : 15.231_FUND(PK) 3m LF-ANT-35419(6) VERTICAL Detector : Peak Project : 101258 Mode : 3					
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preampl Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
434.37	77.12	-23.71	100.83	80.87	22.87	3.32	29.94	229	0	P	H
434.37	77.12	-3.71	80.83	-	-	-	-	-	-	A	H
434.37	64.47	-36.36	100.83	68.22	22.87	3.32	29.94	224	259	P	V
434.37	64.47	-16.36	80.83	-	-	-	-	-	-	A	V
Note:											
• Path Loss (dB) = Cable Loss (dB) + Filter Loss (dB) + Attenuator Loss (dB)											
• Level (dBuV/m) = Antenna Factor (dB/m) + Path Loss (dB) + Read Level (dBuV) - Preampl Factor (dB)											
• Over Limit (dB) = Level (dBuV/m) – Limit Line (dBuV/m)											

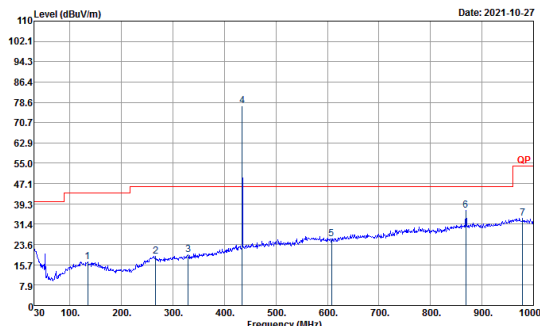
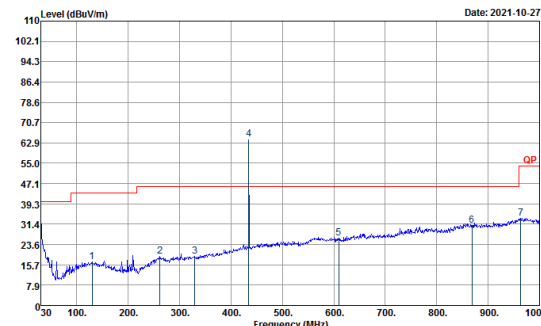
B2. Test Result of Radiated Spurious Emissions (30MHz~1GHz)

Test Mode		Mode 1				Test Frequency (MHz)		433.47MHz Tx			
Polarization: H						Polarization: V					
 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) HORIZONTAL Detector : Peak Project : 101258 Mode : 1						 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) VERTICAL Detector : Peak Project : 101258 Mode : 1					
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
127	16.3	-27.2	43.5	26.75	17.61	1.92	29.98	-	-	P	H
263.77	18.94	-27.06	46	26.56	19.71	2.65	29.98	-	-	P	H
323.91	19.32	-26.68	46	26.89	19.51	2.9	29.98	-	-	P	H
* 433.47	77.51	-	-	81.27	22.86	3.32	29.94	-	-	P	H
610.06	25.48	-20.52	46	26.4	25.11	3.88	29.91	-	-	P	H
866.94	38.15	-7.85	46	33.79	28.86	4.63	29.13	-	-	P	H
969.93	34.07	-19.93	54	26.82	30.93	4.95	28.63	-	-	P	H
135.73	19.21	-24.29	43.5	29.72	17.49	1.98	29.98	-	-	P	V
261.83	19.28	-26.72	46	26.98	19.64	2.64	29.98	-	-	P	V
328.76	18.98	-27.02	46	26.4	19.65	2.91	29.98	-	-	P	V
* 433.47	64.11	-	-	67.87	22.86	3.32	29.94	-	-	P	V
611.03	25.94	-20.06	46	26.83	25.12	3.89	29.9	-	-	P	V
866.94	31.4	-14.6	46	27.04	28.86	4.63	29.13	-	-	P	V
967.99	34.13	-19.87	54	26.92	30.91	4.94	28.64	-	-	P	V
Note:											
• Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)											
• 433.47MHz is fundamental signal which can be ignored											
• Path Loss (dB) = Cable Loss (dB) + Filter Loss (dB) + Attenuator Loss (dB)											
• Level (dBuV/m) = Antenna Factor (dB/m) + Path Loss (dB) + Read Level (dBuV) - Preamp Factor (dB)											
• Over Limit (dB) = Level (dBuV/m) – Limit Line (dBuV/m)											

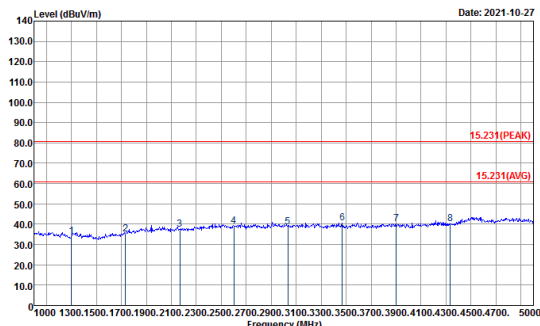
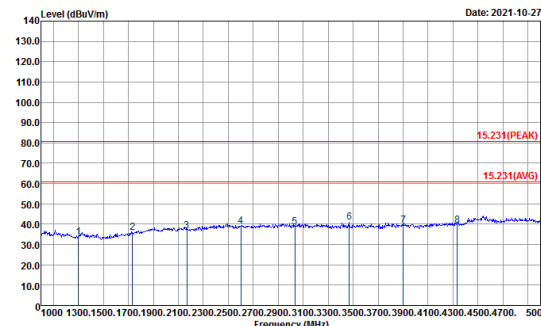


Test Mode		Mode 2				Test Frequency (MHz)		433.92MHz Tx				
Polarization: H						Polarization: V						
 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) HORIZONTAL Detector : Peak Project : 101258 Mode : 2						 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) VERTICAL Detector : Peak Project : 101258 Mode : 2						
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
132.82	16.91	-26.59	43.5	27.41	17.52	1.96	29.98	-	-	P	H	
260.86	18.85	-27.15	46	26.59	19.6	2.64	29.98	-	-	P	H	
332.64	19.18	-26.82	46	26.47	19.77	2.92	29.98	-	-	P	H	
* 433.92	77.2	-	-	80.96	22.86	3.32	29.94	-	-	P	H	
867.84	37.41	-8.59	46	33.08	28.83	4.63	29.13	-	-	P	H	
882.63	34.07	-11.93	46	29.79	28.67	4.64	29.03	-	-	P	H	
965.08	33.91	-20.09	54	26.75	30.88	4.93	28.65	-	-	P	H	
127	16.44	-27.06	43.5	26.89	17.61	1.92	29.98	-	-	P	V	
170.65	27.46	-16.04	43.5	39.7	15.56	2.18	29.98	-	-	P	V	
255.04	19.13	-26.87	46	27.63	18.87	2.61	29.98	-	-	P	V	
* 433.92	64.88	-	-	68.64	22.86	3.32	29.94	-	-	P	V	
594.54	35.2	-10.8	46	35.88	25.41	3.83	29.92	-	-	P	V	
867.84	30.54	-15.46	46	26.21	28.83	4.63	29.13	-	-	P	V	
964.11	34.13	-19.87	54	26.98	30.87	4.93	28.65	-	-	P	V	
Note:												
• Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)												
• 433.92MHz is fundamental signal which can be ignored												
• Path Loss (dB) = Cable Loss (dB) + Filter Loss (dB) + Attenuator Loss (dB)												
• Level (dBuV/m) = Antenna Factor (dB/m) + Path Loss (dB) + Read Level (dBuV) - Preamp Factor (dB)												
• Over Limit (dB) = Level (dBuV/m) – Limit Line (dBuV/m)												

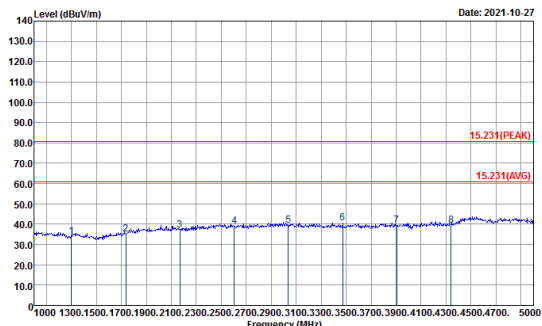
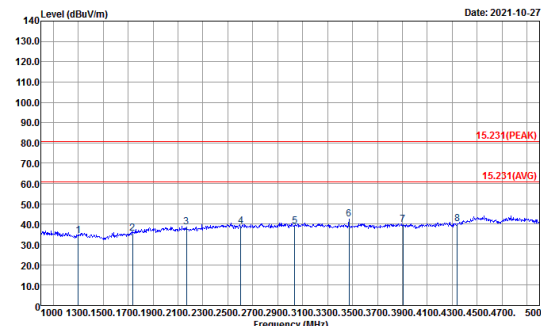


Test Mode		Mode 3				Test Frequency (MHz)		434.37MHz Tx				
Polarization: H						Polarization: V						
 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) HORIZONTAL Detector : Peak Project : 101258 Mode : 3						 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) VERTICAL Detector : Peak Project : 101258 Mode : 3						
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
134.76	16.81	-26.69	43.5	27.32	17.5	1.97	29.98	-	-	P	H	
266.68	18.95	-27.05	46	26.75	19.51	2.67	29.98	-	-	P	H	
329.73	19.6	-26.4	46	26.98	19.68	2.92	29.98	-	-	P	H	
* 434.37	77.12	-	-	80.87	22.87	3.32	29.94	-	-	P	H	
608.12	25.8	-20.2	46	26.69	25.14	3.88	29.91	-	-	P	H	
868.74	36.74	-9.26	46	32.44	28.8	4.63	29.13	-	-	P	H	
978.66	33.8	-20.2	54	26.78	30.64	4.98	28.6	-	-	P	H	
129.91	16.71	-26.79	43.5	27.28	17.47	1.94	29.98	-	-	P	V	
261.83	18.85	-27.15	46	26.55	19.64	2.64	29.98	-	-	P	V	
329.73	18.91	-27.09	46	26.29	19.68	2.92	29.98	-	-	P	V	
* 434.37	64.47	-	-	68.22	22.87	3.32	29.94	-	-	P	V	
609.09	26.08	-19.92	46	26.99	25.12	3.88	29.91	-	-	P	V	
868.74	31.01	-14.99	46	26.71	28.8	4.63	29.13	-	-	P	V	
963.14	33.69	-20.31	54	26.57	30.86	4.92	28.66	-	-	P	V	
Note: - Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB) 434.37MHz is fundamental signal which can be ignored - Path Loss (dB) = Cable Loss (dB) + Filter Loss (dB) + Attenuator Loss (dB) - Level (dBuV/m) = Antenna Factor (dB/m) + Path Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) - Over Limit (dB) = Level (dBuV/m) – Limit Line (dBuV/m)												

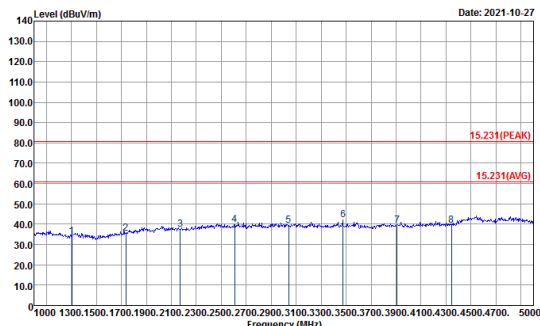
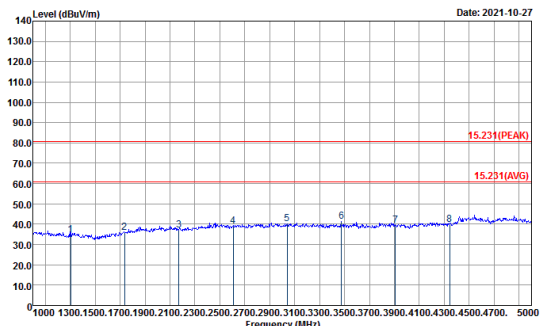
B3. Test Result of Field Radiated Spurious Emissions (1GHz~5GHz)

Test Mode		Mode 1				Test Frequency (MHz)			433.47MHz Tx			
Polarization: H						Polarization: V						
 Site : 03CH07-HY Condition : 15.231(PEAK) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 101258 Mode : 1						 Site : 03CH07-HY Condition : 15.231(PEAK) 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 101258 Mode : 1						
	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	1300.41	33.97	-46.86	80.83	58.8	28.7	6.1	59.63	-	-	P	H
	1733.88	35.22	-45.61	80.83	58.08	29.63	6.9	59.39	-	-	P	H
	2167.35	37.54	-43.29	80.83	57.47	31.57	7.8	59.3	-	-	P	H
	2600.82	39.06	-41.77	80.83	57.12	32.5	8.77	59.33	-	-	P	H
	3034.29	38.48	-42.35	80.83	55.47	32.8	9.68	59.47	-	-	P	H
	3467.76	40.39	-40.44	80.83	57.41	32.7	10.37	60.09	-	-	P	H
	3901.23	40.13	-40.7	80.83	56.12	33.3	11.18	60.47	-	-	P	H
	4334.7	40.25	-40.58	80.83	53.94	33.77	11.62	59.08	-	-	P	H
	1300.41	33.36	-47.47	80.83	58.19	28.7	6.1	59.63	-	-	P	V
	1733.88	35.71	-45.12	80.83	58.57	29.63	6.9	59.39	-	-	P	V
	2167.35	36.84	-43.99	80.83	56.77	31.57	7.8	59.3	-	-	P	V
	2600.82	38.8	-42.03	80.83	56.86	32.5	8.77	59.33	-	-	P	V
	3034.29	38.59	-42.24	80.83	55.58	32.8	9.68	59.47	-	-	P	V
	3467.76	40.77	-40.06	80.83	57.79	32.7	10.37	60.09	-	-	P	V
	3901.23	39.33	-41.5	80.83	55.32	33.3	11.18	60.47	-	-	P	V
	4334.7	39.48	-41.35	80.83	53.17	33.77	11.62	59.08	-	-	P	V
Note: - Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB) - Path Loss (dB) = Cable Loss (dB) + Filter Loss (dB) + Attenuator Loss (dB) - Level (dBuV/m) = Antenna Factor (dB/m) + Path Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) - Over Limit (dB) = Level (dBuV/m) – Limit Line (dBuV/m)												



Test Mode		Mode 2				Test Frequency (MHz)		433.92MHz Tx				
Polarization: H						Polarization: V						
 Site : 03CH07-HY Condition : 15.231(PEAK) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 101258 Mode : 2						 Site : 03CH07-HY Condition : 15.231(PEAK) 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 101258 Mode : 2						
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
1301.76	33.97	-46.86	80.83	58.79	28.7	6.1	59.62	-	-	P	H	
1735.68	35.04	-45.79	80.83	57.89	29.63	6.91	59.39	-	-	P	H	
2169.6	37.1	-43.73	80.83	57.02	31.57	7.81	59.3	-	-	P	H	
2603.52	39.17	-41.66	80.83	57.22	32.5	8.78	59.33	-	-	P	H	
3037.44	39.21	-41.62	80.83	56.19	32.8	9.69	59.47	-	-	P	H	
3471.36	40.7	-40.13	80.83	57.72	32.7	10.38	60.1	-	-	P	H	
3905.28	39.32	-41.51	80.83	55.49	33.3	11	60.47	-	-	P	H	
4339.2	39.26	-41.57	80.83	53.04	33.77	11.51	59.06	-	-	P	H	
1301.76	34.4	-46.43	80.83	59.22	28.7	6.1	59.62	-	-	P	V	
1735.68	35.54	-45.29	80.83	58.39	29.63	6.91	59.39	-	-	P	V	
2169.6	38.45	-42.38	80.83	58.37	31.57	7.81	59.3	-	-	P	V	
2603.52	39.16	-41.67	80.83	57.21	32.5	8.78	59.33	-	-	P	V	
3037.44	38.97	-41.86	80.83	55.95	32.8	9.69	59.47	-	-	P	V	
3471.36	42.66	-38.17	80.83	59.68	32.7	10.38	60.1	-	-	P	V	
3905.28	39.93	-40.9	80.83	56.1	33.3	11	60.47	-	-	P	V	
4339.2	40.31	-40.52	80.83	54.09	33.77	11.51	59.06	-	-	P	V	
Note: - Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB) - Path Loss (dB) = Cable Loss (dB) + Filter Loss (dB) + Attenuator Loss (dB) - Level (dBuV/m) = Antenna Factor (dB/m) + Path Loss (dB) + Read Level (dBuV) - Preamp Factor (dB) - Over Limit (dB) = Level (dBuV/m) – Limit Line (dBuV/m)												



Test Mode		Mode 3				Test Frequency (MHz)		434.37MHz Tx				
Polarization: H						Polarization: V						
 Site : 03CH07-HY Condition : 15.231(Peak) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 101258 Mode : 3						 Site : 03CH07-HY Condition : 15.231(Peak) 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 101258 Mode : 3						
	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preampl Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	1303.11	34.11	-46.72	80.83	58.93	28.7	6.1	59.62	-	-	P	H
	1737.48	35.63	-45.2	80.83	58.47	29.63	6.91	59.38	-	-	P	H
	2171.85	37.36	-43.47	80.83	57.28	31.57	7.81	59.3	-	-	P	H
	2606.22	39.86	-40.97	80.83	57.91	32.5	8.78	59.33	-	-	P	H
	3040.59	39.42	-41.41	80.83	56.41	32.8	9.69	59.48	-	-	P	H
	3474.96	42.24	-38.59	80.83	59.24	32.7	10.4	60.1	-	-	P	H
	3909.33	39.27	-41.56	80.83	55.25	33.3	11.2	60.48	-	-	P	H
	4343.7	39.27	-41.56	80.83	52.88	33.8	11.63	59.04	-	-	P	H
	1303.11	34.72	-46.11	80.83	59.54	28.7	6.1	59.62	-	-	P	V
	1737.48	35.91	-44.92	80.83	58.75	29.63	6.91	59.38	-	-	P	V
	2171.85	37.24	-43.59	80.83	57.16	31.57	7.81	59.3	-	-	P	V
	2606.22	39.09	-41.74	80.83	57.14	32.5	8.78	59.33	-	-	P	V
	3040.59	40.16	-40.67	80.83	57.15	32.8	9.69	59.48	-	-	P	V
	3474.96	41.42	-39.41	80.83	58.42	32.7	10.4	60.1	-	-	P	V
	3909.33	39.58	-41.25	80.83	55.56	33.3	11.2	60.48	-	-	P	V
	4343.7	39.96	-40.87	80.83	53.57	33.8	11.63	59.04	-	-	P	V
Note:												
• Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB)												
• Path Loss (dB) = Cable Loss (dB) + Filter Loss (dB) + Attenuator Loss (dB)												
• Level (dBuV/m) = Antenna Factor (dB/m) + Path Loss (dB) + Read Level (dBuV) - Preampl Factor (dB)												
• Over Limit (dB) = Level (dBuV/m) – Limit Line (dBuV/m)												