

FCC Test Report

Product Name	Tyre Pressure Monitoring Sensor
Model No.	SHR3
FCC ID	MRXSHR3

Applicant	Schrader Electronics Ltd.
Address	11 Technology Park, Belfast Road, Antrim, BT41 1QS, Northern Ireland

Date of Receipt	May 25, 2016
Issued Date	Jun. 27, 2016
Report No.	1650524R-RFUSP14V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of QuieTek Corporation.

Test Report

Issued Date : Jun. 27, 2016

Report No. : 1650524R-RFUSP14V00



Product Name	Tyre Pressure Monitoring Sensor
Applicant	Schrader Electronics Ltd.
Address	11 Technology Park, Belfast Road, Antrim, BT41 1QS, Northern Ireland
Manufacturer	Schrader Electronics Ltd.
Model No.	SHR3
FCC ID	MRXSHR3
EUT Rated Voltage	DC 3V(Power by Battery)
EUT Test Voltage	DC 3V(Power by Battery)
Trade Name	SCHRADER ELECTRONICS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2015 ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Joanne Lin)

Tested By :



(Engineer / Daniel Chen)

Approved By :



(Director / Vincent Lin)

TABLE OF CONTENTS

Description	Page
1. General Information	4
1.1. EUT Description.....	4
1.2. Operation Description	5
1.3. Tested System Details.....	6
1.4. Configuration of tested System	6
1.5. EUT Exercise Software	6
1.6. Test Facility	7
2. Conducted Emission.....	8
2.1. Test Equipment.....	8
2.2. Test Setup	8
2.3. Limits	9
2.4. Test Procedure	9
2.5. Test Specification	9
2.6. Uncertainty	9
2.7. Test Result	10
3. Radiated Emission.....	11
3.1. Test Equipment.....	11
3.2. Test Setup	12
3.3. Limits	13
3.4. Test Procedure	14
3.5. Test Specification	14
3.6. Uncertainty	14
3.7. Test Result	15
4. Transmit time.....	21
4.1. Test Equipment.....	21
4.2. Test Setup	21
4.3. Limits	21
4.4. Test Specification	21
4.5. Uncertainty	21
4.6. Test Result	22
5. Occupied Bandwidth.....	24
5.1. Test Equipment.....	24
5.2. Test Setup	24
5.3. Limits	24
5.4. Test Specification	24
5.5. Uncertainty	24
5.6. Test Result	25
6. Duty Cycle.....	26
6.1. Test Equipment.....	26
6.2. Test Setup	26
6.3. Test Specification	26
6.4. Uncertainty	26
Attachment 1: EUT Test Photographs	
Attachment 2: EUT Detailed Photographs	

1. General Information

1.1. EUT Description

Product Name	Tyre Pressure Monitoring Sensor
Trade Name	SCHRADER ELECTRONICS
Model No.	SHR3
FCC ID	MRXSHR3
Frequency Range	433.92MHz
Number of Channels	1
Type of Modulation	FSK
Antenna Information	Integral Antenna

Frequency of Each Channel:

Channel	Frequency
Channel 1:	433.92MHz

Note:

1. The EUT is a Tyre Pressure Monitoring Sensor with a built-in 433.92 MHz transmitter.
2. The antenna of EUT is conform to FCC 15.203
3. These tests are conducted on a sample for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.231(e).
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit
-----------	------------------

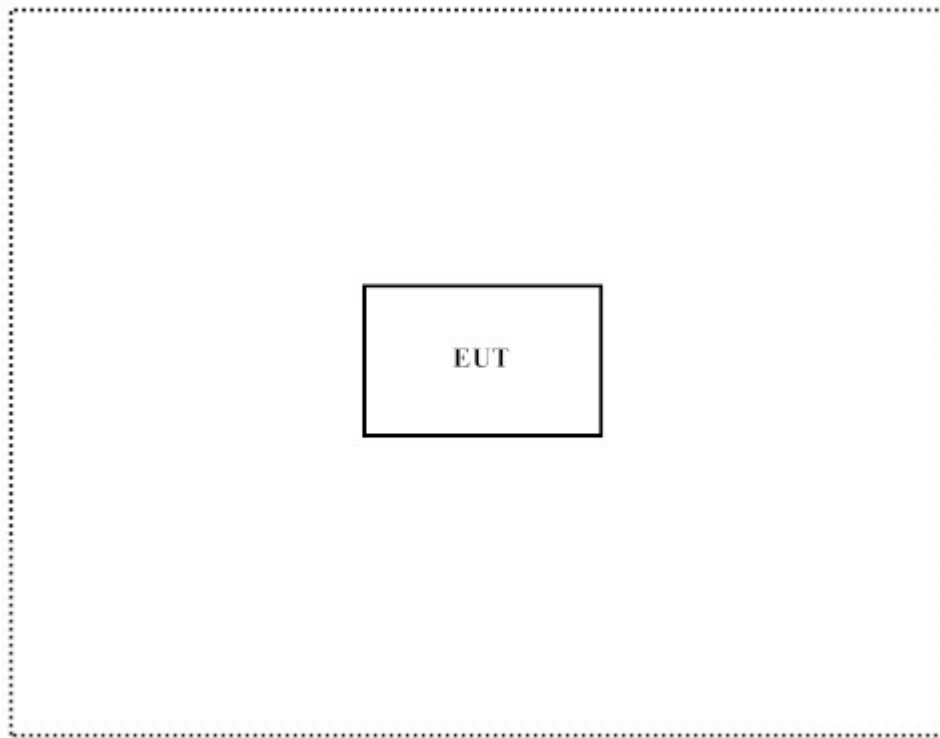
1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
N/A					

Signal Cable Type	Signal cable Description
N/A	

1.4. Configuration of tested System



1.5. EUT Exercise Software

1	Setup the EUT as shown in section 1.4.
2	Inserts the battery.
3	Start transmits continually.
4	Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site: <http://www.quietek.com/chinese/about/certificates.aspx?bval=5>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site: <http://www.quietek.com/>

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195

Site Name: Quietek Corporation
Site Address: No.5-22, Ruishukeng,
Linkou Dist. New Taipei City 24451,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Conducted Emission

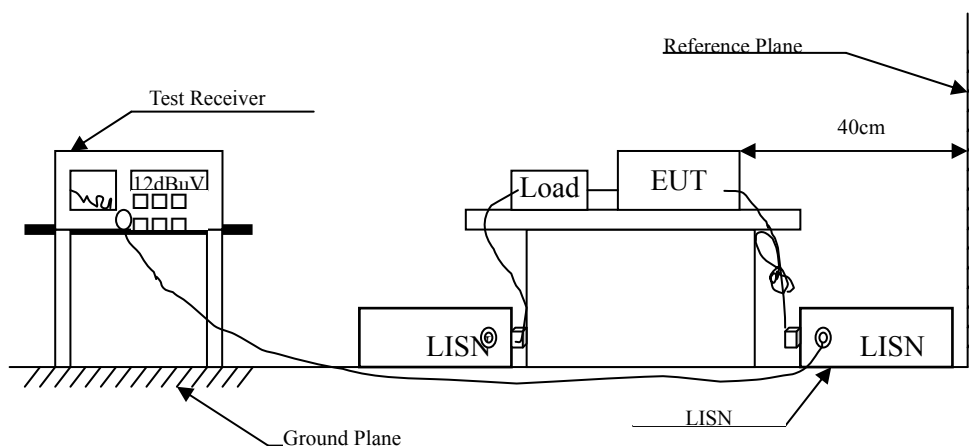
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2015	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2016	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2016	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar., 2016	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2016	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231(e)

2.6. Uncertainty

± 2.26 dB

2.7. Test Result

Owing to the DC operation of EUT, this test item is not performed.

3. Radiated Emission

3.1. Test Equipment

The following test equipments are used during the radiated emission test:

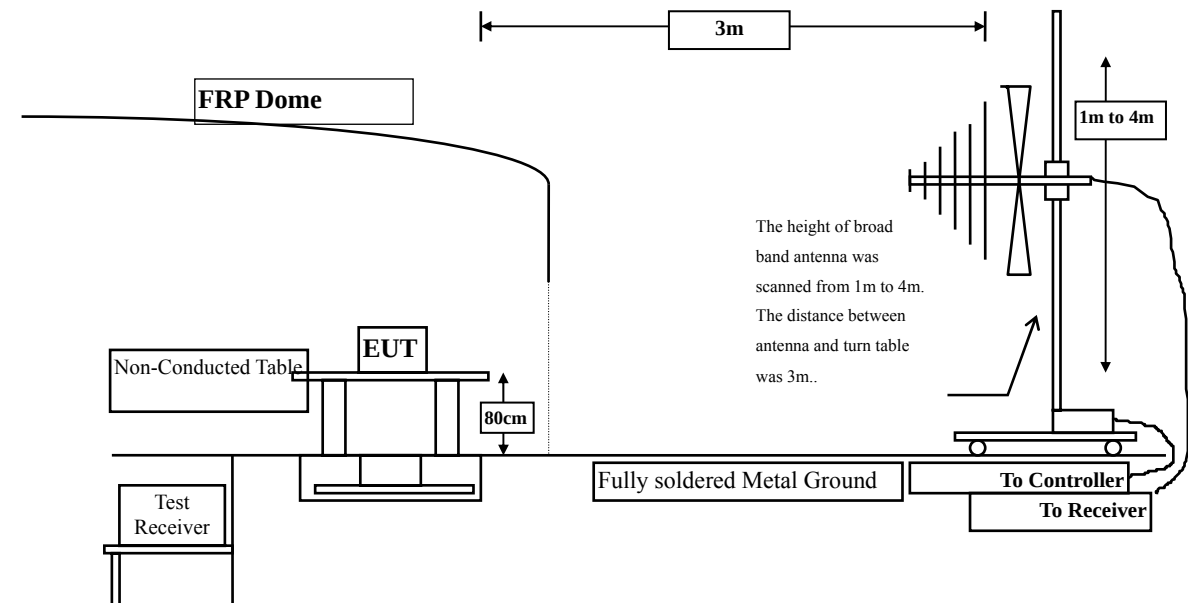
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Magnetic Loop Antenna	Teseq	HLA6121/ 37133	Sep, 2015
	X	Bilog Antenna	Schaffner Chase	CBL6112B/ 2707	Jun., 2016
	X	EMI Test Receiver	R&S	ESCS 30/838251/ 001	Jun., 2016
	X	Coaxial Cable	QTK(Arnist)	RG 214/ LC003-RG	Jun., 2016
	X	Coaxial signal switch	Arnist	MP59B/ 6200798682	Jun., 2016

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ CB # 8	X	Spectrum Analyzer	R&S	FSP40/ 100339	Oct., 2015
	X	Horn Antenna	ETS-Lindgren	3117/ 35205	Mar., 2016
	X	Horn Antenna	Schwarzbeck	BBHA9170/209	Jan., 2016
	X	Horn Antenna	TRC	AH-0801/95051	Aug., 2015
	X	Pre-Amplifier	EMCI	EMC012630SE/980210	Jan., 2016
	X	Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul., 2015
	X	Pre-Amplifier	NARDA	DBL-1840N506/013	Jul., 2015

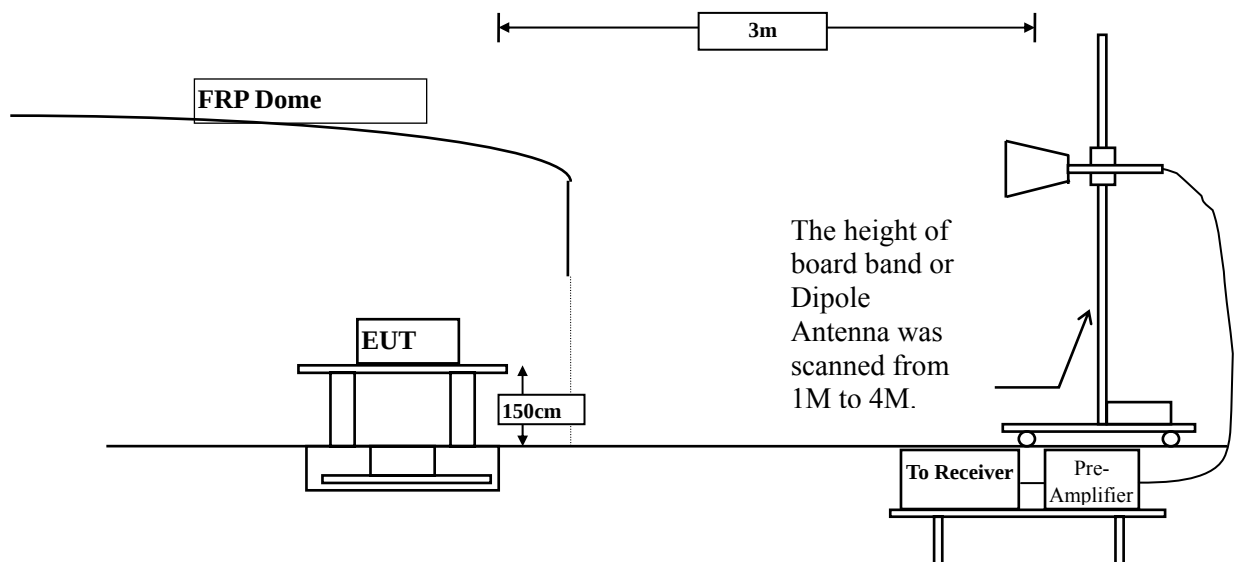
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with "X" are used to measure the final test results.

3.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.3. Limits

➤ Fundamental and Harmonics Emission Limits

FCC Part 15 Subpart C Paragraph 15.231(e) Limits		
Fundamental Frequency MHz	Field Strength of Fundamental	Field Strength of Spurious Emission
40.66-40.70	1000	100
70-130	500	50
130-174	500 to 1500	50 to 150
174-260	1500	150
260-470	1500 to 5000	150 to 500
above 470	5000	500

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

➤ Spurious electric field strength limits

FCC Part 15 Subpart C Paragraph 15.209 Limits			
Frequency MHz	uV/m	dBuV/m	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	See Remark ¹	300
0.490-1.705	24000/F(kHz)	See Remark ¹	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. Test Procedure

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10, 2013 on radiated measurement.

On the field strength of fundamental and harmonics, the limits shown are based on measuring equipment employing a average detector function. As an alternative, compliance with the limits may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

On the field strength of spurious electric, on any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function.

When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

The bandwidth The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231(e).

3.6. Uncertainty

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

3.7. Test Result

Product	Tyre Pressure Monitoring Sensor				
Test Item	Fundamental Radiated Emission				
Test Mode	Mode 1: Transmit				
Date of Test	2016/05/27	Test Site	No.3 OATS		

Fundamental Power (X-Line)

Peak Detector:

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dB μ V	dB μ V/m	dB	dB μ V/m

Horizontal

433.920	-11.685	84.040	72.355	-20.505	92.860
---------	---------	--------	--------	---------	--------

Vertical

433.920	-12.615	90.410	77.795	-15.065	92.860
---------	---------	--------	--------	---------	--------

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Average Detector:

Frequency	Peak Measurement	Duty Cycle Correct Factor	Measurement Level	Margin	Limit
MHz	dB μ V/m	dB	dB μ V/m	dB	dB μ V/m

Horizontal

433.920	72.355	-20.724	51.631	-21.229	72.860
---------	--------	---------	--------	---------	--------

Vertical

433.920	77.795	-20.724	57.071	-15.789	72.860
---------	--------	---------	--------	---------	--------

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 6.
3. Limit = $20\log(4398\mu\text{V}) = 72.86\text{dB}\mu\text{V}$.

Product	Tyre Pressure Monitoring Sensor		
Test Item	Fundamental Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2016/05/27	Test Site	No.3 OATS

Fundamental Power (Y-Line)

Peak Detector:

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
------------------	-------------------------	--------------------------------	--------------------------------------	--------------	-----------------------

Horizontal

433.920	-11.685	83.960	72.275	-20.585	92.860
---------	---------	--------	--------	---------	--------

Vertical

433.920	-12.615	90.910	78.295	-14.565	92.860
---------	---------	--------	--------	---------	--------

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Average Detector:

Frequency MHz	Peak Measurement dB μ V/m	Duty Cycle Correct Factor dB	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
------------------	-------------------------------------	------------------------------------	--------------------------------------	--------------	-----------------------

Horizontal

433.920	72.275	-20.724	51.551	-21.309	72.860
---------	--------	---------	--------	---------	--------

Vertical

433.920	78.295	-20.724	57.571	-15.289	72.860
---------	--------	---------	--------	---------	--------

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 6.
3. Limit = $20\log(4398\mu\text{V}) = 72.86\text{dB}\mu\text{V}$.

Product	Tyre Pressure Monitoring Sensor		
Test Item	Fundamental Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2016/05/27	Test Site	No.3 OATS

Fundamental Power (Z-Line)

Peak Detector:

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
------------------	-------------------------	--------------------------------	--------------------------------------	--------------	-----------------------

Horizontal

433.920	-11.685	89.010	77.325	-15.535	92.860
---------	---------	--------	--------	---------	--------

Vertical

433.920	-12.615	81.290	68.675	-24.185	92.860
---------	---------	--------	--------	---------	--------

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Average Detector:

Frequency MHz	Peak Measurement dB μ V/m	Duty Cycle Correct Factor dB	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
------------------	-------------------------------------	------------------------------------	--------------------------------------	--------------	-----------------------

Horizontal

433.920	77.325	-20.724	56.601	-16.259	72.860
---------	--------	---------	--------	---------	--------

Vertical

433.920	68.675	-20.724	47.951	-24.909	72.860
---------	--------	---------	--------	---------	--------

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 6.
3. Limit = $20\log(4398\mu\text{V}) = 72.86\text{dB}\mu\text{V}$.

Product	Tyre Pressure Monitoring Sensor		
Test Item	Harmonic Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2016/05/30	Test Site	No.3 OATS

Frequency	Correct	Reading	Measurement	Margin	Peak	Average
MHz	Factor	Level	Level		Limit	Limit
	dB	dB μ V	dB μ V/m	dB	dB μ V/m	dB μ V/m

Harmonic Radiated Emission

Horizontal

Peak

1301.760	-4.795	44.535	39.740	-34.260	74.000	54.000
1735.680	-3.977	49.667	45.690	-28.310	74.000	54.000
2169.600	-2.387	47.928	45.540	-28.460	74.000	54.000
2603.520	-1.040	41.760	40.721	-33.279	74.000	54.000
3037.440	-1.438	41.050	39.612	-34.388	74.000	54.000
3471.360	-0.947	46.640	45.694	-28.306	74.000	54.000
3905.280	0.463	43.580	44.043	-29.957	74.000	54.000
4339.200	1.637	39.700	41.338	-32.662	74.000	54.000
4773.120	2.972	41.340	44.313	-29.687	74.000	54.000
5207.040	3.223	38.280	41.503	-32.497	74.000	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	Tyre Pressure Monitoring Sensor		
Test Item	Harmonic Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2016/05/30	Test Site	No.3 OATS

Frequency	Correct	Reading	Measurement	Margin	Peak	Average
MHz	Factor	Level	Level		Limit	Limit
	dB	dB μ V	dB μ V/m	dB	dB μ V/m	dB μ V/m

Harmonic Radiated Emission

Vertical

Peak

1301.760	-4.143	35.860	31.717	-42.283	74.000	54.000
1735.680	-2.068	43.840	41.772	-32.228	74.000	54.000
2169.600	-2.089	38.560	36.470	-37.530	74.000	54.000
2603.520	-1.300	41.060	39.761	-34.239	74.000	54.000
3037.440	-1.352	43.920	42.568	-31.432	74.000	54.000
3471.360	-0.299	51.970	51.672	-22.328	74.000	54.000
3905.280	1.579	52.360	53.939	-20.061	74.000	54.000
4339.200	3.429	44.090	47.520	-26.480	74.000	54.000
4773.120	6.471	42.380	48.852	-25.148	74.000	54.000
5207.040	5.426	40.450	45.876	-28.124	74.000	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	Tyre Pressure Monitoring Sensor		
Test Item	General Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2016/05/31	Test Site	No.3 OATS

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Quasi-Peak					
30.000	2.120	23.825	25.945	-14.055	40.000
98.884	-7.565	32.115	24.551	-18.949	43.500
243.681	-6.428	27.845	21.417	-24.583	46.000
544.522	3.597	24.344	27.941	-18.059	46.000
630.275	1.549	28.663	30.212	-15.788	46.000
867.855	5.424	31.472	36.896	-9.104	46.000
Vertical					
Quasi-Peak					
42.652	-2.419	30.394	27.975	-12.025	40.000
100.290	0.009	32.287	32.296	-11.204	43.500
343.493	-3.321	27.440	24.119	-21.881	46.000
507.971	-0.350	24.186	23.835	-22.165	46.000
687.913	2.458	23.223	25.681	-20.319	46.000
867.855	0.641	33.965	34.606	-11.394	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

4. Transmit time

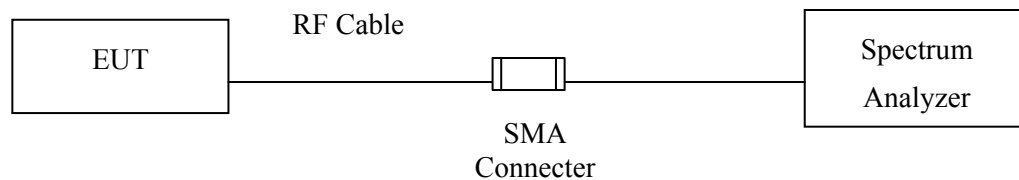
4.1. Test Equipment

The following test equipment are used during the test:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2016
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2016
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2016

Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

4.2. Test Setup



4.3. Limits

In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

4.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231(e).

4.5. Uncertainty

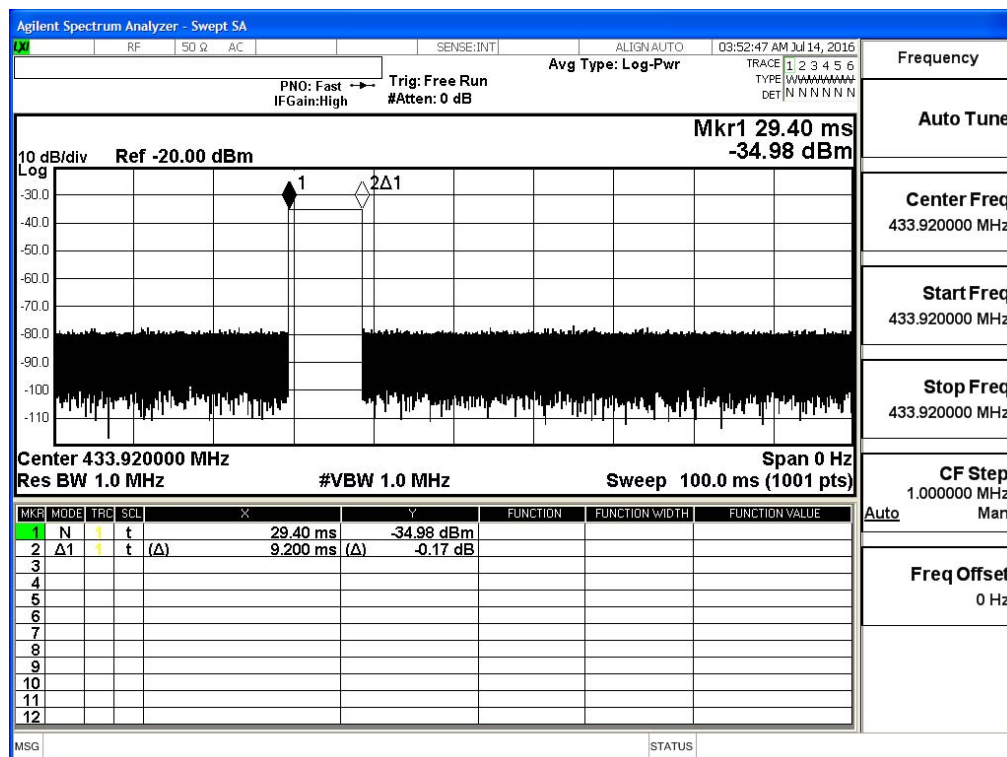
± 25ms

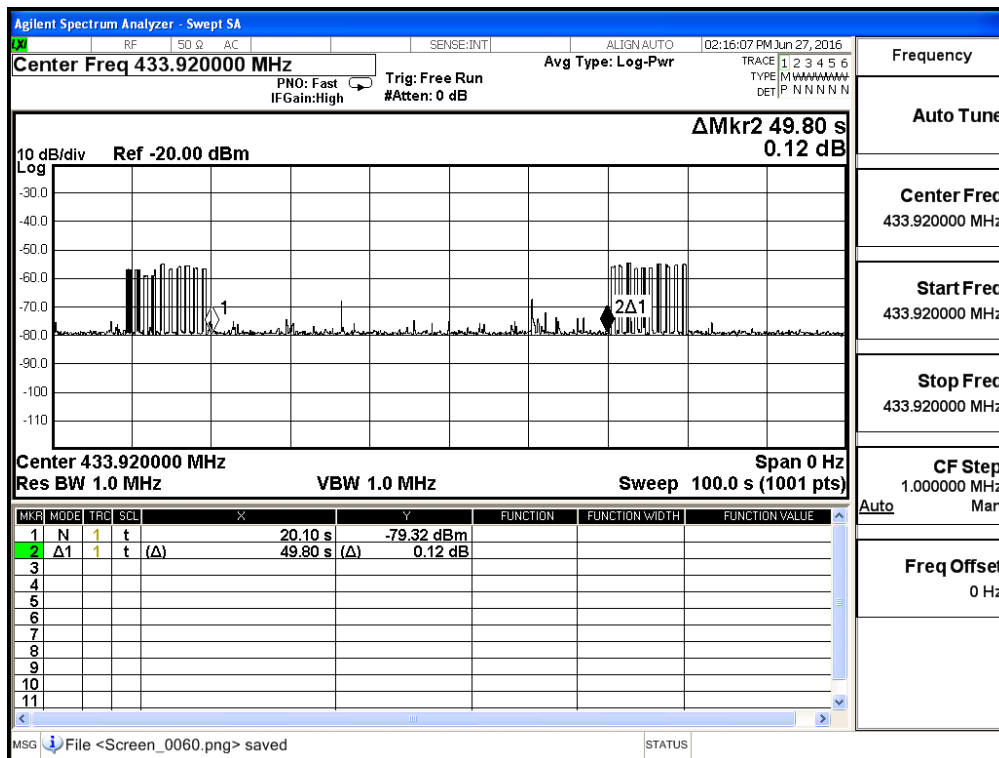
4.6. Test Result

Product	Tyre Pressure Monitoring Sensor		
Test Item	Transmit time		
Test Mode	Mode 1: Transmit		
Date of Test	2016/05/31	Test Site	No.3 OATS

Channel No.	Frequency (MHz)	Measurement Value (Sec)	Limit (Sec)	Result
1 (Transmit time)	433.92	0.0092	< 1	Pass
1 (Silent period time)	433.92	49.80	> 10	Pass
1 (Silent period time)	433.92	49.80	> 0.276 _{note}	Pass

Note: Silent period time= Transmissions * 30 times =0.0092s * 30 = 0.276s





5. Occupied Bandwidth

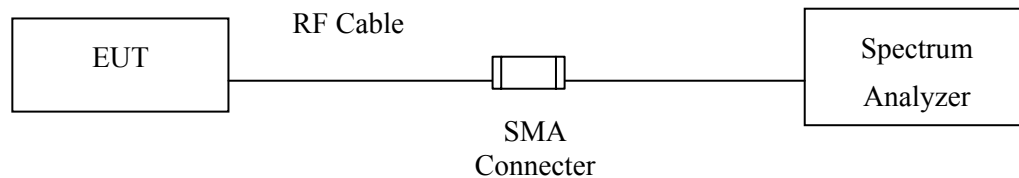
5.1. Test Equipment

The following test equipment are used during the test:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2016
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2016
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2016

Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

5.2. Test Setup



5.3. Limits

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, 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

5.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231(e)

5.5. Uncertainty

± 150Hz

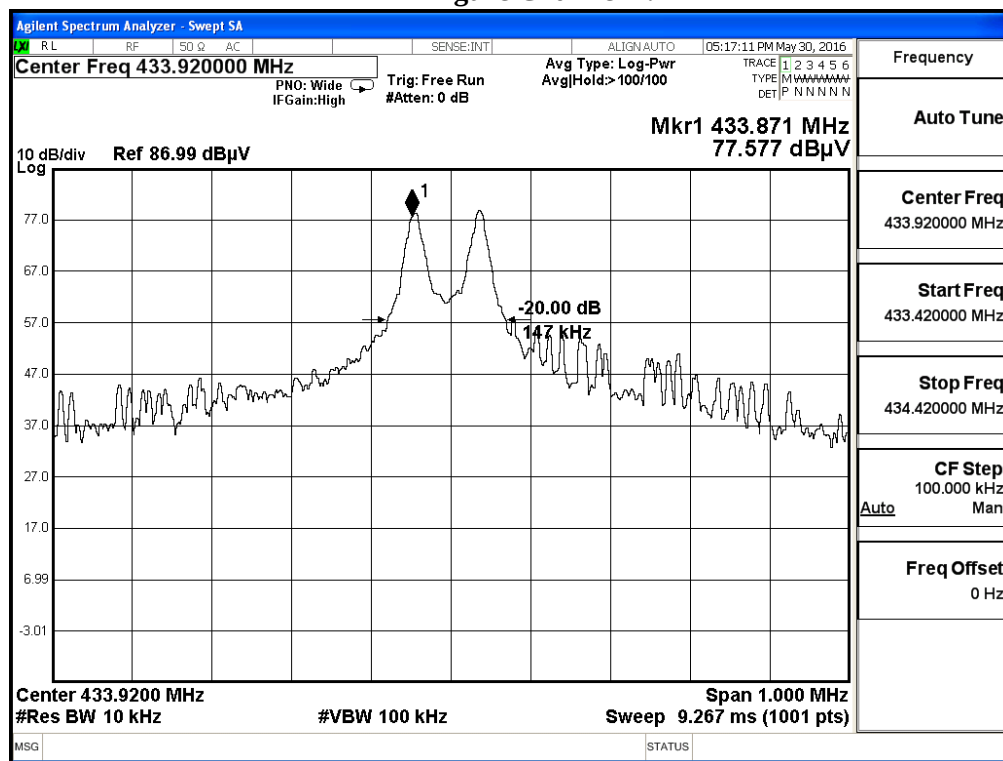
5.6. Test Result

Product	Tyre Pressure Monitoring Sensor		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2016/05/30	Test Site	No.3 OATS

Channel No.	Frequency (MHz)	Measurement Value (MHz)	Limit (MHz)	Result
1	433.92	0.147	1.0848	Pass

Note: Limit = 433.92MHz * 0.25% = 1.0848MHz

Figure Channel 1:



6. Duty Cycle

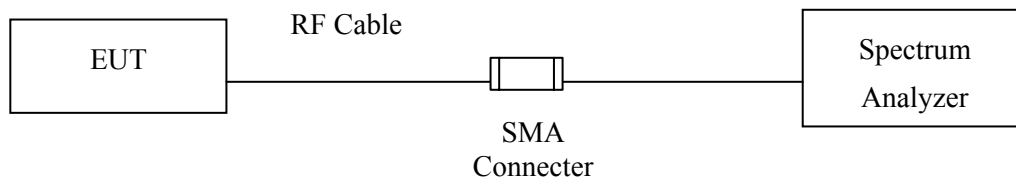
6.1. Test Equipment

The following test equipment are used during the test:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2016
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2016
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2016

Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

6.2. Test Setup



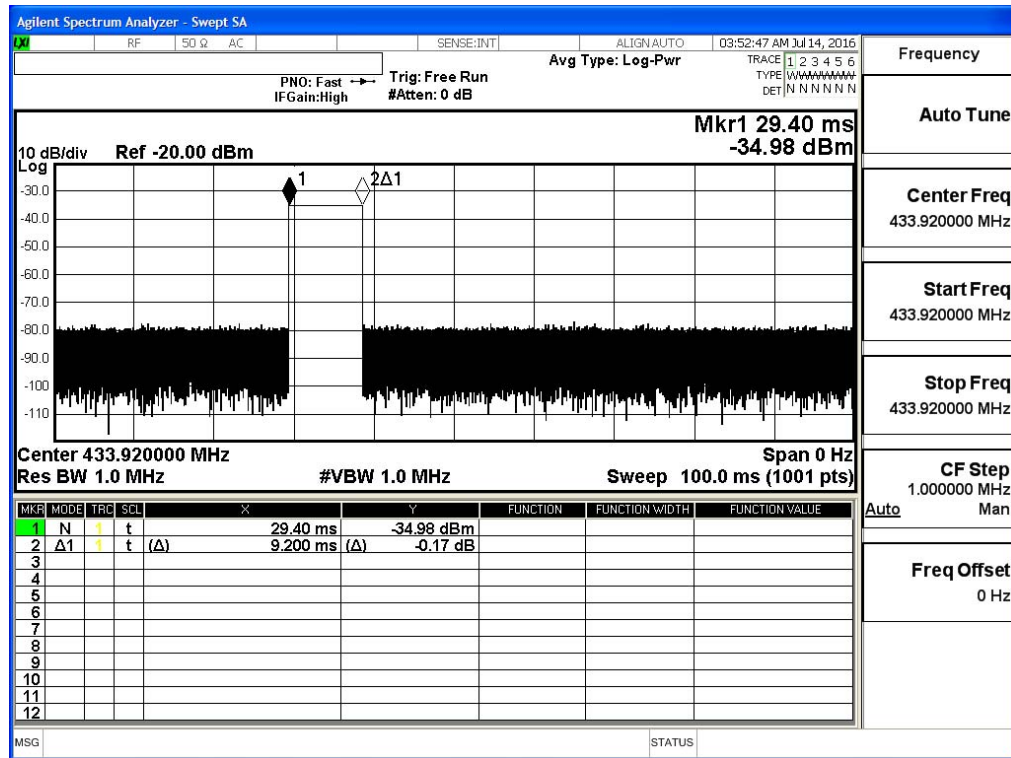
6.3. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231

6.4. Uncertainty

$\pm 25\text{ms}$

Product	Tyre Pressure Monitoring Sensor		
Test Item	Duty Cycle		
Test Mode	Mode 1: Transmit		
Date of Test	2016/05/30	Test Site	No.3 OATS



1 Cycle= 9.20ms*1=9.20 ms

Duty Cycle=9.20msec /100msec=0.092

Duty Cycle correction factor= 20 LOG 0.092=-20.724

Duty Cycle correction factor	-20.724	dB
------------------------------	---------	----

Attachment 1 : EUT Test Photographs

Attachment 2 : EUT Detailed Photographs