RF TEST REPORT

Report No.: FCC_RF_SL17062101-SEV-039_GSM_WCDMA
Supersede Report No.:

Applicant	Continental Automotive Systems, Inc
Product Name	FLEX CM
Model No.	1819-X
Test Standard	47CFR Part22 47CFR Part24
Test Method	TIA-603-D: 2010
FCC ID	2AJW5FLEXCM
Date of test	06/22/2017 - 06/23/2017
Issue Date	07/17/2017
Test Result	Pass Fail
Equipment complied with the specification	[x]
Equipment did not comply with the specification	[ ]

Gary Chou	Chen Ge
Test Engineer	Engineering Reviewer

This test report may be reproduced in full only
Test result presented in this test report is applicable to the tested sample only

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA

ACCREDITED
TESTING CERT # 2742-01

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC , RF/Wireless , Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless ,Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF , Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF , Telecom
HongKong	OFTA (US002)	RF , Telecom

CONTENTS

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_RF_SL17062101-SEV-039_GSM_WCDMA	None	Original	07/17/2017

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Continental Automotive Systems, Inc
Product: FLEX CM
Model: 1819-X

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	:	Continental Automotive Systems, Inc
Applicant Address	:	6755 Snowdrift Road, US
Manufacturer Name	:	Continental Automotive Guadalajara México, S.A. de C.V
Manufacturer Address	:	Camino a la Tijera 3 Municipio de Tlajomulco de Zuniga, Jalisco Mexico

4 Test site information

Lab performing tests	SIEMIC Laboratories
Lab Address	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	881796
IC Test Site No.	4842D-2
VCCI Test Site No.	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	:	FLEX CM
Model No.	:	1819-X
Trade Name	:	Continental
Serial No.	:	0029
Input Power	:	12VDC
Power Adapter Manu/Model	:	N/A
Power Adapter SN	:	N/A
Product Hardware version	:	1819-X
Product Software version	:	4.1
Radio Hardware version	:	PDS6 / RBHA-C213B
Radio Software version	:	3.001
Date of EUT received	:	06/21/2017
Equipment Class/ Category	:	Class B
Port/Connectors	:	USB,RS-232,CAN/LIN, Dig I/O, Ana In, Power, Ground, Ignition

6.2 Radio Description

Item	GSM/EDGE	GSM/EDGE
Operating Band /Radio Type	GSM-850	PCS-1900
Bandwidth	25MHz	25MHz
Modulation	GMSK,8PSK	GMSK,8PSK
Tx Frequency Range (MHz)	824.2MHz to 848.8MHz	1850.2MHz to 1909.8MHz
Rx Frequency Range (MHz)	869.2MHz to 893.8MHz	1930.2MHz to 1989.8MHz
Antenna Type	PCB	PCB
Antenna Gain	5.5dBi	2.5dBi
Antenna Connector Type	intern. microstrip line / ext. FAKRA	intern. microstrip line / ext. FAKRA

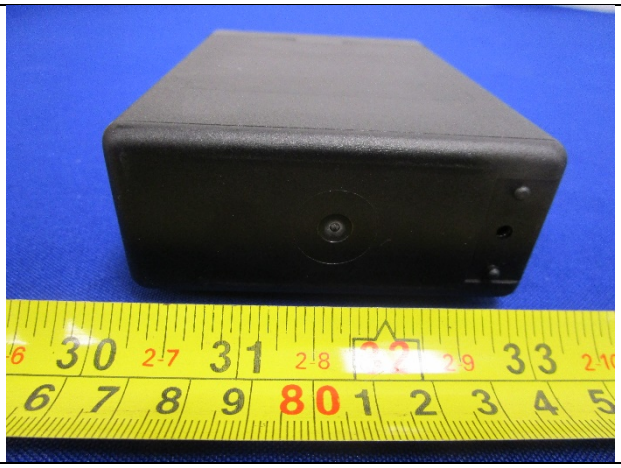
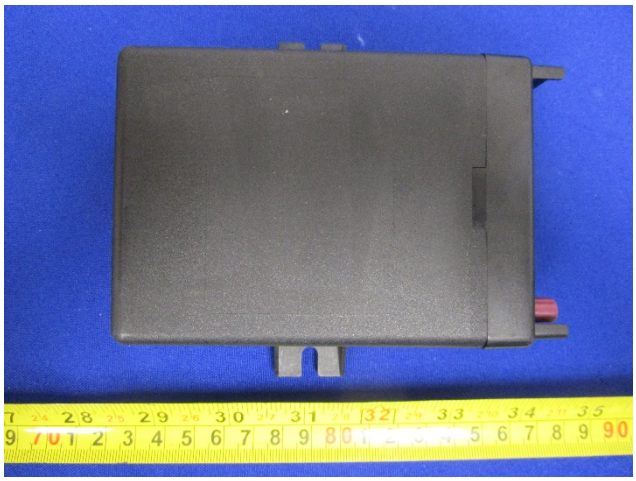
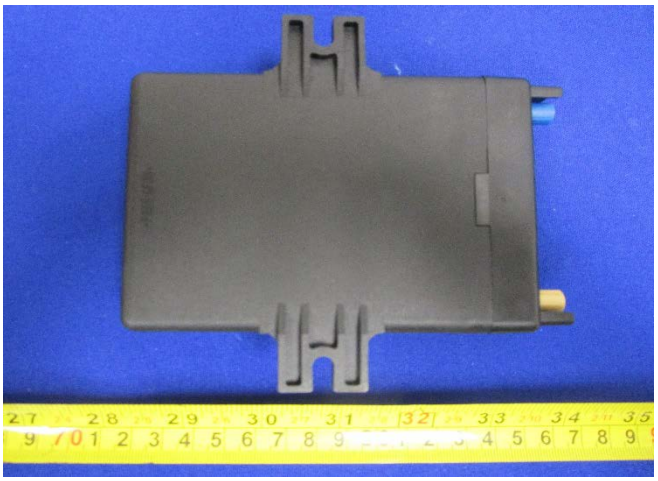
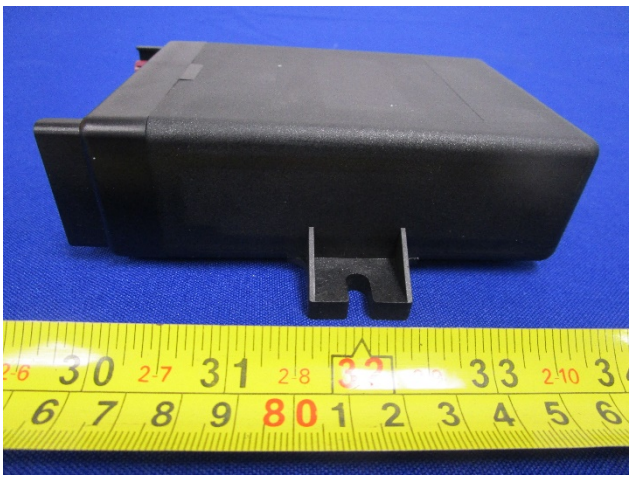
Item	WCDMA	WCDMA
Operating Band /Radio Type	WCDMA Band II	WCDMA Band V
Bandwidth	3.84MHz	3.84MHz
Modulation	QPSK	QPSK
Tx Frequency Range (MHz)	1850MHz to 1910MHz	824MHz to 849MHz
Rx Frequency Range (MHz)	1930MHz to 1990MHz	869MHz to 894MHz
Antenna Type	PCB	PCB
Antenna Gain	2.5dBi	5.5dBi
Antenna Connector Type	intern. microstrip line / ext. FAKRA	intern. microstrip line / ext. FAKRA

6.3 EUT test modes/configuration Description

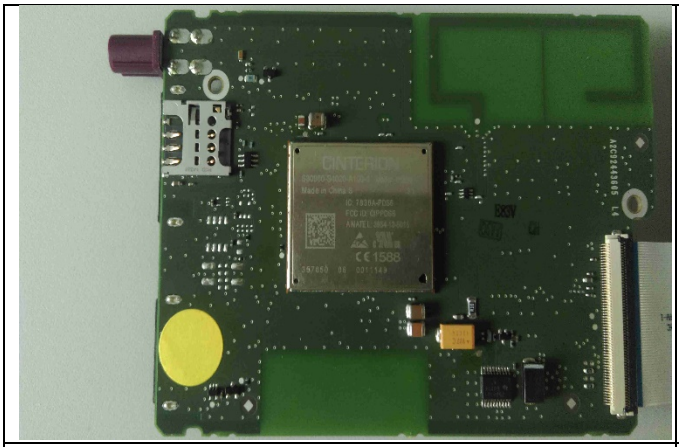
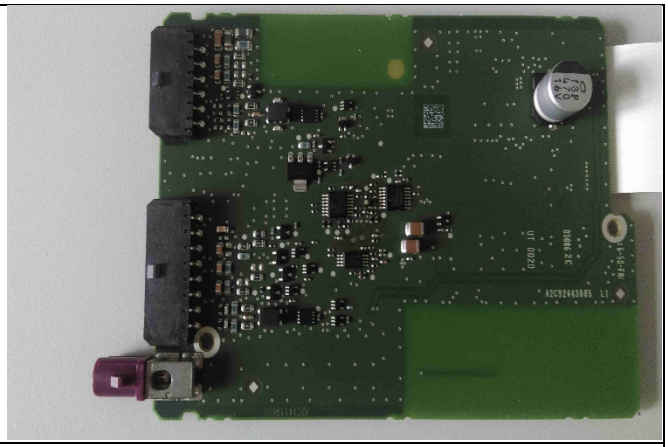
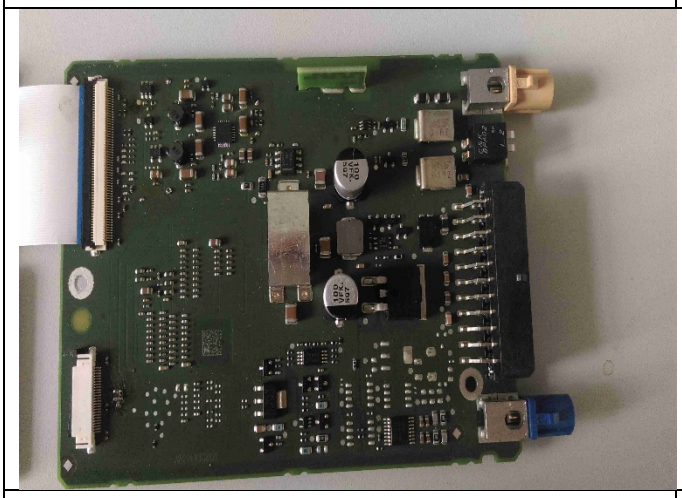
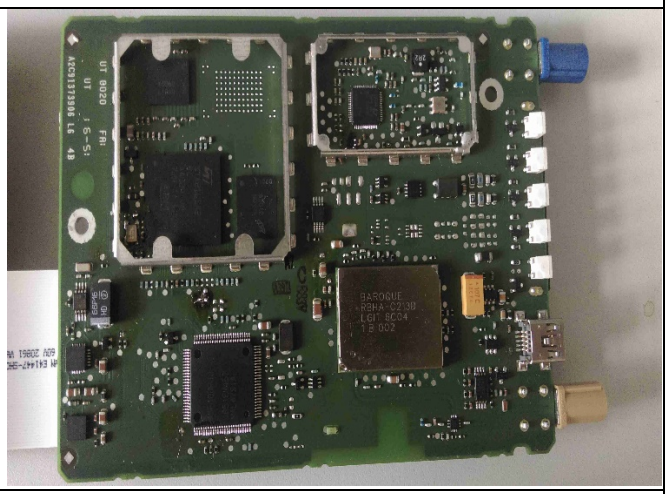
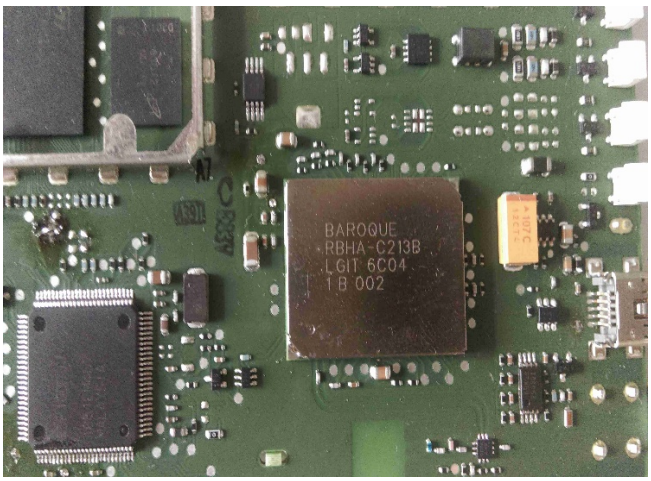
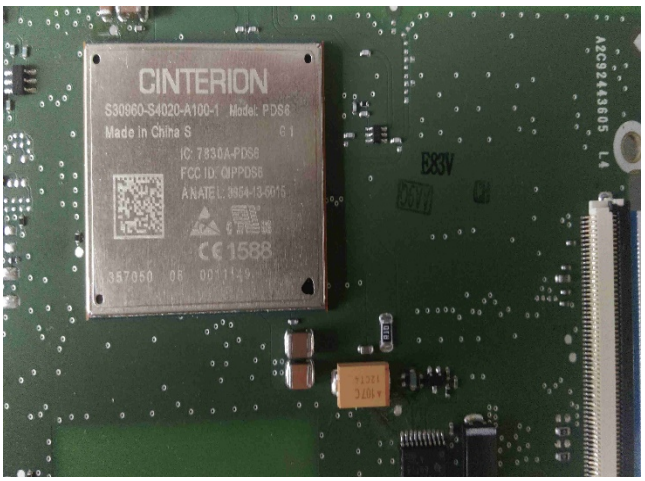
Test mode

Final Test Mode		Note
Final_test_mode_1	Continuous transmission, single channel	GSM
Final_test_mode_2	Continuous transmission, single channel	UMTS
Remark: LTE/UMTS band 2 and band 5 are evaluated.		

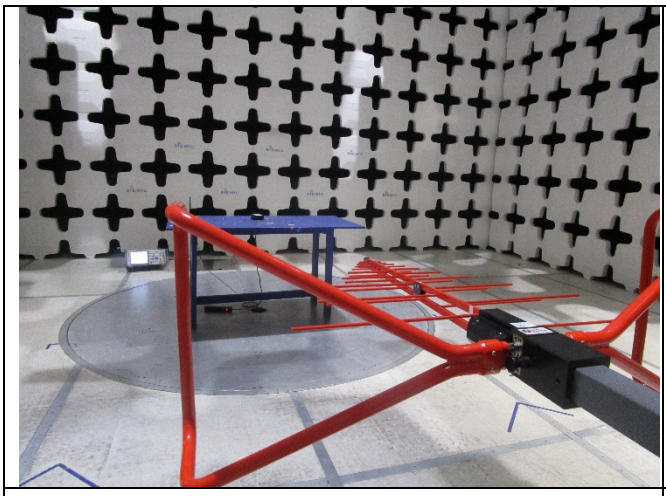
6.4 EUT Photos - External

	
EUT – Front View	EUT – Rear View
	
EUT – Top View	EUT – Bottom View
	
EUT – Left Side View	EUT – Right Side View

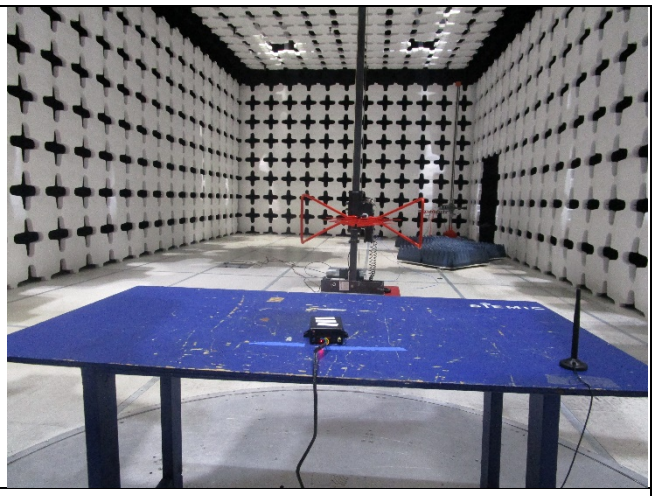
6.5 EUT Photos – Internal

	
FLEXCM- External Board- Top View	FLEXCM-External Board- Bottom View
	
FLEXCM- Main Board- Top View	FLEXCM-Main Board- Bottom View
	
FLEXCM-WLAN and BT Module	FLEXCM-Cellular Module

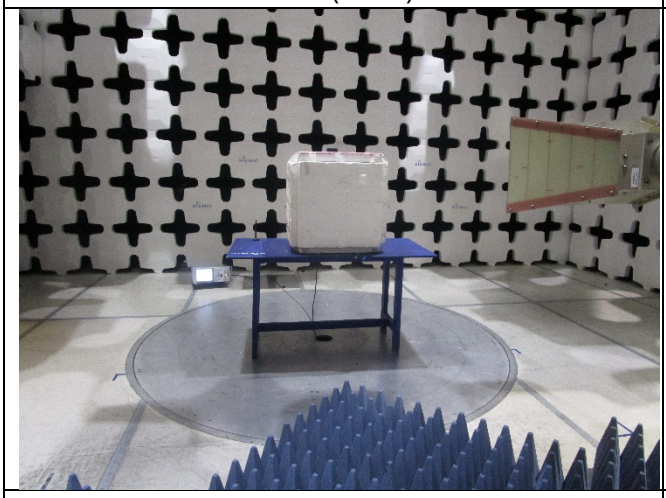
6.6 EUT Test Setup Photos



Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (>1GHz) – Front View

Radiated Emissions (>1GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	Lattitude 3550	N/A	Dell	-
2	DC Power Supply	DP712	DP7B190700020	RIGOL	-

7.1 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
USB	EUT	I/O Port	Laptop	USB	2	Unshielded	-

7.2 Test Software Description

Test Item	Software	Description
RF testing	Putty	Set the EUT to transmit continuously in different test mode

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
E.R.P/ E.I.R.P	FCC	47CFR24.232, 47CFR27.50	FCC	TIA-603-D: 2010	☒ Pass * ☐ N/A
Occupied Bandwidth	FCC	47CFR24.238(a), 47CFR27.53	FCC	TIA-603-D: 2010	☒ Pass* ☐ N/A
Peak-Average Ratio	FCC	47CFR24.232, 47CFR27.50	FCC	TIA-603-D: 2010	☒ Pass* ☐ N/A
Spurious and harmonic Emission at antenna port	FCC	47CFR2.1051, 47CFR22.917, 47CFR24.238,	FCC	TIA-603-D: 2010	☒ Pass ☐ N/A
Band Edge	FCC	47CFR2.1053,47CFR24.238, 47CFR27.53	FCC	TIA-603-D: 2010	☒ Pass* ☐ N/A
Radiated spurious and harmonic emission	FCC	47CFR2.1053, 47CFR22.917, 47CFR24.238	FCC	TIA-603-D: 2010	☒ Pass ☐ N/A
Frequency stability	FCC	47CFR2.1055, 47CFR24.135, 47CFR27.54	FCC	TIA-603-D: 2010	☒ Pass* ☐ N/A

Remark	
	1. All measurement uncertainties do not take into consideration for all presented test results. 2. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual. 3. Pass *: Please refer to test report no. UL05420150130FCC/IC038-1.

9 Measurement Uncertainty

9.1 Conducted Emissions

The test is to measure the conducted emissions to the mains port of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the LISN
- Uncertainty of cables
- Uncertainty due to the mismatches
- Etc, see the below table for details

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
LISN Insertion Loss	0.40	Normal	2	1	0.20
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch LISN - Receiver	0.25	U-Shape	1.414	1	0.1768033
LISN Impedance	2.5	Triangular	2.449	1	1.0208248
Combined Standard Uncertainty					1.928133
Expanded Uncertainty (K=2)					3.856266

The total derived measurement uncertainty is +/- 3.86 dB.

9.2 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
Antenna Factor	0.65	Normal	2	1	0.325
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
NSA Calibration	4.0	U-Shape	1.414	1	2.8288543
Combined Standard Uncertainty					3.0059131
Expanded Uncertainty (K=2)					6.0118262

The total derived measurement uncertainty is +/- 6.00 dB.

9.3 Radiated Emissions (1GHz to 40GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:
- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.0692840
Cable Insertion Loss	0.21	Normal	2	1	0.1050000
Filter Insertion Loss	0.25	Normal	2	1	0.1250000
Antenna Factor	0.65	Normal	2	1	0.3250000
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.8660508
PRF Response	1.5	Rectangular	1.732	1	0.8660508
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
VSWR Calibration	2.0	U-Shape	1.414	1	1.4144272
Combined Standard Uncertainty					4.2363
Expanded Uncertainty (K=2)					8.4726

The total derived measurement uncertainty is +/- 8.47 dB.

9.4 RF conducted measurement

The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the Reference Level Uncertainty
- Uncertainty of variable attenuators
- Uncertainty of cables
- Uncertainty due to the mismatches

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty					0.476087
Expanded Uncertainty (K=2)					0.952174

The total derived measurement uncertainty is +/- 0.95 dB.

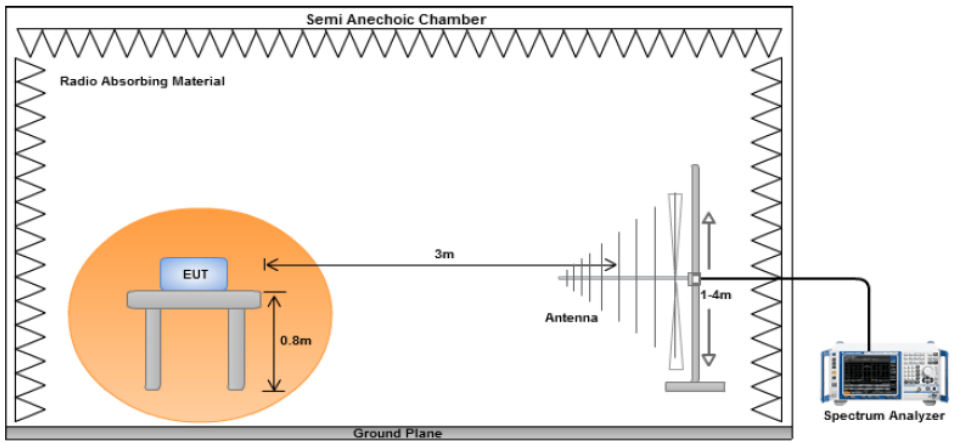
10 Measurements, Examination and Derived Results

10.1 Radiated Spurious Emission below 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR22.917	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.	☒
47CFR24.238	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.	☒

Test Setup



Test Procedure

Substitution method:

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
   a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
   b. The EUT was then rotated to the direction that gave the maximum emission.
   c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter.
4. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained.
5. Steps 4 were repeated for the next frequency point, until all selected frequency points were measured.

Test Date	06/22/2017 – 06/23/2017	Environmental condition	Temperature	23°C
			Relative Humidity	48%
			Atmospheric Pressure	1008mbar

Remark

Both horizontal and vertical polarities were investigated. The results show only the worst case.
Limit calculation:
Emission limit = PdBm – [43+ 10 log (PW)] = 10log(1000 x PW) - 43 - 10log(PW) = 30 dBm - 43 = -13 dBm
All different modulation and bandwidth configuration has been verified and only the test data of worst case with QPSK modulation and greatest bandwidth was presented in this report.

Result ☒ Pass ☐ Fail

Test Data ☒ Yes (See below) ☐ N/A
Test Plot ☒ Yes (See below) ☐ N/A
Test was done by *Gary Chou* at *10m chamber*.

Radiated Emission Test Results for GSM850

Test specification	Below 1GHz		Result	Pass
Environmental Conditions:	Temp (°C):	24		
	Humidity (%)	39		
	Atmospheric (mbar):	1012		
Mains Power:	12VDC			
Tested by:	Gary Chou			
Test Date:	06/22/2017			
Remarks:	GSM850-Mid Channel			

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
100.22	-60.91	236	165	V	100.22	-62.21	0	0.8	-63.01	-13	-50.01
100.22	-59.73	167	176	H	100.22	-61.03	0	0.8	-61.83	-13	-48.83
200.05	-65.15	264	168	V	200.05	-66.45	0	1.28	-67.73	-13	-54.73
200.05	-62.56	153	156	H	200.05	-63.86	0	1.28	-65.14	-13	-52.14
176.10	-65.71	269	169	V	176.10	-67.01	0	1.09	-68.10	-13	-55.10
176.10	-63.98	147	161	H	176.10	-65.28	0	1.09	-66.37	-13	-53.37

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

Radiated Emission Test Results for PCS1900

Test specification	Below 1GHz		Result	Pass
Environmental Conditions:	Temp (°C):	24		
	Humidity (%)	39		
	Atmospheric (mbar):	1012		
Mains Power:	12VDC			
Tested by:	Gary Chou			
Test Date:	06/22/2016			
Remarks:	PCS1900 – Mid Channel			

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
100.22	-61.26	236	165	V	100.22	-62.56	0	0.8	-63.36	-13	-50.36
100.22	-59.17	167	176	H	100.22	-60.47	0	0.8	-61.27	-13	-48.27
200.05	-64.85	264	168	V	200.05	-66.15	0	1.28	-67.43	-13	-54.43
200.05	-62.98	153	156	H	200.05	-64.28	0	1.28	-65.56	-13	-52.56
176.10	-66.40	269	169	V	176.1	-67.70	0	1.09	-68.79	-13	-55.79
176.10	-64.45	147	161	H	176.1	-65.75	0	1.09	-66.84	-13	-53.84

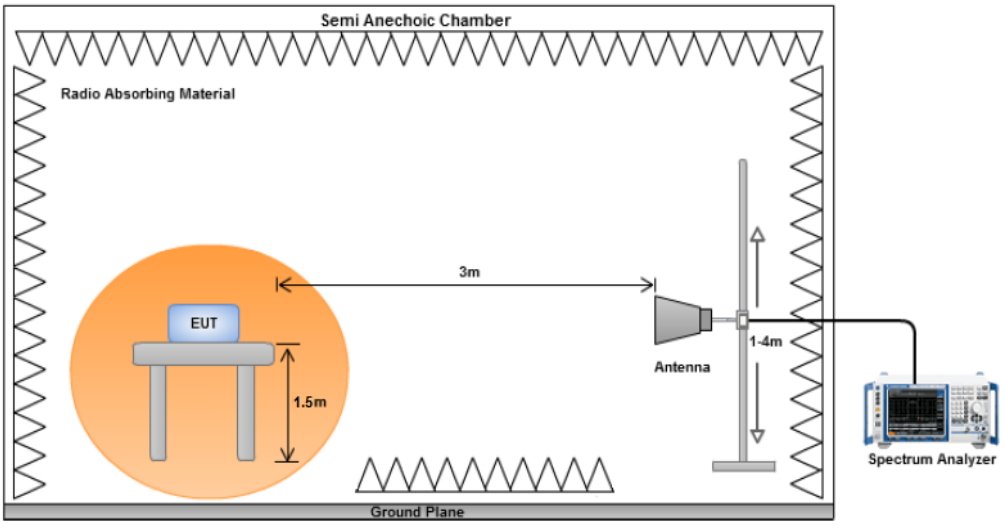
Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

10.2 Radiated Spurious Emissions above 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR22.917	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.	☒
47CFR24.238	-	Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.	☒

Test Setup



Test Procedure

Substitution method:

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
   a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
   b. The EUT was then rotated to the direction that gave the maximum emission.
   c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter.
4. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained.
5. Steps 4 were repeated for the next frequency point, until all selected frequency points were measured.

Test Date	06/22/2017 – 06/23/2017	Environmental condition	Temperature	23°C
			Relative Humidity	48%
			Atmospheric Pressure	1008mbar

Remark

Both horizontal and vertical polarities were investigated. The results show only the worst case.
Limit calculation:
Emission limit = PdBm – [43+ 10 log (PW)] = 10log(1000 x PW) - 43 - 10log(PW) = 30 dBm - 43 = -13 dBm
All different modulation and bandwidth configuration has been verified and only the test data of worst case with QPSK modulation and greatest bandwidth was presented in this report.

Result ☒ Pass ☐ Fail

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by *Gary Chou* at 10*m chamber*.

Radiated Emission Test Results (Above 1GHz):

GSM/EDGE:

GSM850- Low Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1648.46	-67.30	236	165	V	1648.46	-57.90	10.08	1.78	-66.20	-13	-53.20
2472.86	-68.78	167	176	V	2472.86	-54.06	8.91	2.36	-60.61	-13	-47.61
3297.19	-69.36	264	168	V	3297.19	-52.64	9.03	2.58	-59.09	-13	-46.09

GSM850- Mid Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1673.99	-64.19	236	165	V	1673.99	-54.80	10.08	1.78	-63.10	-13	-50.10
2510.00	-68.51	167	176	V	2510.00	-53.79	8.91	2.36	-60.34	-13	-47.34
3348.06	-69.23	264	168	V	3348.06	-52.51	9.03	2.58	-58.96	-13	-45.96

GSM850- High Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1697.35	-63.52	236	165	V	1697.35	-54.12	10.08	1.78	-62.42	-13	-49.42
2546.48	-69.44	167	176	V	2546.48	-54.72	8.91	2.36	-61.27	-13	-48.27
3395.29	-70.09	264	168	V	3395.29	-53.37	9.03	2.58	-59.82	-13	-46.82

PCS1900- Low Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
3700.40	-65.37	236	165	V	3700.40	-46.97	11.11	2.93	-55.15	-13	-42.15
5550.00	-69.43	167	176	V	5550.00	-44.71	12.03	3.71	-53.03	-13	-40.03
7401.00	-70.52	264	168	V	7401.00	-42.80	10.67	4.34	-49.13	-13	-36.13

PCS1900- Middle Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
3759.80	-66.25	236	165	V	3759.80	-48.02	11.11	2.93	-56.20	-13	-43.20
5639.90	-69.14	167	176	V	5639.90	-43.64	12.03	3.71	-51.96	-13	-38.96
7519.60	-70.37	264	168	V	7519.60	-41.91	10.67	4.34	-48.24	-13	-35.24

PCS1900- High Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
3810.00	-67.42	236	165	V	3810.00	-49.19	11.11	2.93	-57.37	-13	-44.37
5729.60	-69.53	167	176	V	5729.60	-44.03	12.03	3.71	-52.35	-13	-39.35
7639.00	-70.27	264	168	V	7639.00	-41.81	10.67	4.34	-48.14	-13	-35.14

WCDMA Band II -Low Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
3703.40	-66.05	120	150	V	3703.4	-47.82	11.11	3.12	-55.81	-13	-42.81
5557.52	-63.15	156	153	V	5557.52	-44.65	12.21	3.57	-53.29	-13	-40.29
7410.16	-70.70	243	150	V	7410.16	-42.24	10.67	4.34	-48.57	-13	-35.57

WCDMA Band II-Middle Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
3578.16	-63.14	120	150	V	3578.16	-44.91	11.18	2.89	-53.20	-13	-40.20
5639.84	-69.95	156	153	V	5639.84	-43.45	12.21	3.62	-52.04	-13	-39.04
7519.86	-70.56	243	150	V	7519.86	-42.10	11.11	4.34	-48.87	-13	-35.87

WCDMA Band II-High Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
3817.12	-65.40	120	150	V	3817.12	-47.17	10.77	3.52	-54.42	-13	-41.42
5723.40	-68.99	156	153	V	5723.4	-43.49	12.30	3.61	-52.18	-13	-39.18
7630.32	-68.75	243	150	V	7630.32	-42.29	11.09	4.36	-49.02	-13	-36.02

WCDMA Band V-Low Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1655.01	-63.64	120	150	V	1655.01	-49.24	10.08	1.78	-57.54	-13	-44.54
2478.10	-68.68	156	153	V	2478.10	-48.96	8.91	2.36	-55.51	-13	-42.51
3304.00	-68.68	243	150	V	3304.00	-51.96	9.03	2.58	-58.41	-13	-45.41

WCDMA Band V-Middle Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1673.18	-66.16	120	150	V	1673.18	-50.76	10.08	1.78	-59.06	-13	-46.06
2509.77	-67.56	156	153	V	2509.77	-48.84	8.91	2.36	-55.39	-13	-42.39
3346.00	-67.91	243	150	V	3346.00	-51.19	9.03	2.58	-57.64	-13	-44.64

WCDMA Band V-High Channel

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1693.43	-67.60	120	150	V	1693.43	-49.62	10.08	1.78	-57.92	-13	-44.92
2539.31	-68.41	156	153	V	2539.31	-48.69	8.91	2.36	-55.24	-13	-42.24
3386.29	-69.91	243	150	V	3386.29	-53.19	9.03	2.58	-59.64	-13	-46.64

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
Keysight EXA 44GHz Spectrum Analyzer	N9010A	MY51440112	08/02/2016	1 Year	08/02/2017	☑
R & S Wideband Communication Tester	CMW500	108852	07/28/2016	1 Year	07/28/2017	☑
R & S Universal Radio Communication Tester	CMU200	111078	N/A	N/A	N/A	☑
Pre-Amplifier (1-40GHz)	SAS-474	579	04/04/2017	1 Year	04/04/2018	☑
Preamplifier (100KHz-7GHz)	LPA-6-30	11140711	02/09/2017	1 Year	02/09/2018	☑
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	01/13/2017	1 Year	01/13/2018	☑
Horn Antenna (1-26.5GHz)	3115	10SL0059	08/11/2016	1 Year	08/11/2017	☑
Horn Antenna (700MHz-18GHz)	SAS-571	411	05/13/2017	1 Year	05/13/2018	☑
Tuned Dipole Antenna 30 - 1000 MHz (4pcs set)	AD-100	40133	03/08/2017	1 Year	03/08/2018	☑
10 Meters SAC	10M	N/A	07/06/2016	1 Year	07/06/2017	☑

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1, A2, A3, A4, B1, B2, B3, B4, C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		Radio & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I, Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
HongKong OFCA		(Phase II) OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		Radio: Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		Radio : A1. Terminal equipment for purpose of calling Telecom : B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMIEMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS
		Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68
		Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measuremet
Australia CAB Regocnition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4
		Radiocommunications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771
		Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016,AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2