

Fluid Management Technology Pty Ltd

SmartFill Gen 3 FMS

FCC 15.225:2025

13.56 MHz Radio

Report: FDMT0001.1 Rev. 1, Issue Date: April 7, 2025





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Last Date of Test: March 12, 2025 Fluid Management Technology Pty Ltd EUT: SmartFill Gen 3 FMS

Radio Equipment Testing

Standards	
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Specification	Method
FCC 15.225:2025	ANSI C63.10:2013

Guidance

KDB 174176 v01r01

Results

Test Description	Result	Specification Section(s)	Method Section(s)	Comments
Powerline Conducted Emissions	Pass	15.207	6.2	
Emissions Bandwidth (20 dB)	Pass	15.215(c)	6.9.2	
Field Strength of Fundamental	Pass	15.225(a)-(c)	6.4	
Field Strength of Spurious Emissions (Less Than 30 MHz)	Pass	15.225(d), 15.209	6.4	
Field Strength of Spurious Emissions (Greater Than 30 MHz)	Pass	15.225(d), 15.209	6.5	
Frequency Stability	Pass	15.225(e), 15.31(e), 15.215(c), 2.1055	6.8	

Deviations From Test Standards

None

Approved By:

Trevor Buls, Principal EMC Test Engineer Signed for and on behalf of Element

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY



Revision Number	Description	Date (yyyy-mm-dd)	Page Number
01	Confirmed signal is modulated and retested to correct settings.	2025-04-07	58
01	Changed cal dates to previous cal dates, (2-14-2024).	2025-04-07	47, 52

ACCREDITATIONS AND AUTHORIZATIONS



United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

FDA - Recognized by the FDA as an Accreditation Scheme for Conformity Assessment (ASCA)-accredited testing laboratory for basic safety and essential performance.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission - Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

SCOPE				
For details on the Scopes of our Accreditations, please visit:				
<u>California</u>	<u>Minnesota</u>	<u>Oregon</u>	Washington	

FACILITIES



	Location	Labs (1)	Address	A2LA (2)	ISED (3)	BSMI (4)	VCCI (5)	CAB (6)	FDA (7)
	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A
~									

Testing was performed at the following location(s)

See data sheets for specific labs

(1) (2) (3) (4) (5) (6) (7)

The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.) A2LA Certificate No. ISED Company No. BSMI No. VCCI Site Filing No. CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MOC, NCC, OFCA FDA ASCA No.



MEASUREMENT UNCERTAINTY



Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation reported is based on statistical analysis that was performed by the laboratory. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (k=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable) and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Various Measurements

Test	All Labs
	(+/-)
Frequency Accuracy (%)	0.0007
Amplitude Accuracy (dB)	1.2
Conducted Power (dB)	1.2
Radiated Power via Substitution (dB)	0.7
Temperature (degrees C)	0.7
Humidity (% RH)	2.5
Voltage (AC) (%)	1
Voltage (DC) (%)	0.7

Field Strength Measurements (dB)

Range	OC08	OC10
	(+/-)	(+/-)
10kHz-30MHz	1.8	1.8
30MHz-1GHz 3m	N/A	4.6
30MHz-1GHz 10m	3.4	N/A
1GHz-6GHz	N/A	5
6GHz-40GHz	N/A	5.1

AC Powerline Conducted Emissions Measurements (dB)

Range	OC06
	(+/-)
9kHz-150kHz LISN	3.6
150kHz-30MHz LISN	3.2
150kHz-30MHz CVP	3
150kHz-30MHz Telecom-ISN	4.4

TEST SETUP BLOCK DIAGRAMS



Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

Antenna Port Conducted Measurements



Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements



42.6

+

=

28.6

TEST SETUP BLOCK DIAGRAMS



Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

				Factor								
Measured Level (Amplitude)		Antenna Factor		Cable Factor		Amplifier Gain		Distance Adjustment Factor		External Attenuation		Field Strength
42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0	=	33.5

Conducted Emissions:



Radiated Power (ERP/EIRP) – Substitution Method:

Measured Level into Substitution Antenna (Amplitude dBm)		Substitution Antenna Factor (dBi)		EIRP to ERP (if applicable)		Measured power (dBm ERP/EIRP)
10.0	+	6.0	-	2.15	=	13.9/16.0

TEST SETUP BLOCK DIAGRAMS



Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION



Client and Equipment under Test (EUT) Information

Company Name:	Fluid Management Technology Pty Ltd
Address:	147 William St
City, State, Zip:	Beverley SA 5009Australia
Test Requested By:	Bob Thomas
EUT:	SmartFill Gen 3 FMS
First Date of Test:	January 14, 2025
Last Date of Test:	March 12, 2025
Receipt Date of Samples:	January 14, 2025
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

System with NFC, Cellular (Model No: LE910C1-WWXD) and WiFi radio (FCC ID: RI7WE310G4). The system will always have NFC but the Wi-Fi and Cellular radios will be either/or, not both.

Testing Objective:

To demonstrate compliance of the 13.56 MHz radio to FCC 15.225 requirements.

POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA INFORMATION

Туре	Provided by:	Frequency Range (MHz)	Gain (dBi)	Dimensions	RFID Protocol
PCB loop antenna	Customer (Fluid Management Technology)	13.56Mhz	N/A	58 mm x 46 mm	ISO/IEC 14443 Type A

The EUT was tested using the power settings provided by the manufacturer which were based upon:

□ Test software settings

Software / firmware used for testing: See configurations

☑ Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types	Power Setting
Single Data Rate / Modulation	20 dBm

CONFIGURATIONS



Configuration FDMT0001-2

Software/Firmware Running During Test				
Description	Version			
Gen 3 Firmware	3.1.7.2			

EUT						
Description	Manufacturer	Model/Part Number	Serial Number			
SmartFill Gen 3 FMS	Fluid Management Technology Pty Ltd	SF3-AC	12374			

Peripherals in Test Setup Boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
3x Antennas	Signal Plus Technology Co., Ltd.	BII12NJXX085	None		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
3x Antenna Cables	Yes	5 m	No	SmartFill Gen 3 FMS	3x Antennas

Configuration FDMT0001-3

Software/Firmware Running During Test	
Description	Version
Gen 3 Firmware	3.1.7.3

EUT						
Description	Manufacturer	Model/Part Number	Serial Number			
SmartFill Gen 3 FMS	Fluid Management Technology Pty Ltd	SF3-AC	12374			

Peripherals in Test Setup Boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
1x Antennas	Signal Plus Technology Co., Ltd.	BII12NJXX085	None		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
1x Antenna Cables	Yes	5 m	No	SmartFill Gen 3 FMS	1x Antennas

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2025-01-14	Field Strength of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2025-01-16	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2025-01-23	Field Strength of Spurious Emissions (Greater than 30MHz)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2025-01-27	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2025-03-10	Field Strength of Spurious Emissions (Less than 30 MHz)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2025-03-12	Emissions Bandwidth (20dB)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.



TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT.

The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10.

In the event that the operating frequency of 13.56 MHz is causing the product to fail the FCC 15.207 limits, the following guidance can be used:

FCC KDB 174176 D01 AC Conducted FAQ v01r01, June 3, 2015 Section Q5:

For a device with a permanent or detachable antenna operating at or below 30 MHz, the FCC will accept measurements performed with a suitable dummy load in lieu of the antenna under the following conditions:

(1) perform the AC power-line conducted tests with the antenna connected to determine compliance with Section 15.207 limits outside the transmitter's fundamental emission band;

(2) retest with a dummy load in lieu of the antenna to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network which simulates the antenna in the fundamental frequency band.

All measurements must be performed as specified in clause 6.2 of ANSI C63.10-2013.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Gauss Instruments	TDEMI 30M	ARO	2024-05-07	2025-05-07
LISN	Solar Electronics	9252-50-24-BNC	LIA	2024-09-12	2025-09-12
Cable - Conducted Cable Assembly	Northwest EMC	None	OCP	NCR	NCR

CONFIGURATIONS INVESTIGATED

FDMT0001-3 FDMT0001-2

MODES INVESTIGATED

Transmitting RFID 13.56 MHz, with Wi-Fi Module and NFC Board Rev 2.1 Transmitting RFID 13.56 MHz, with LTE Module and 50 Ohm Terminated NFC Board Rev 2.1 Transmitting RFID 13.56 MHz, with LTE Module and NFC Board Rev 2.1



EUT:	SmartFill Ger	n 3 FMS			Work Order:	FDMT0001		
Serial Number:	12374				Date:	2025-01-24		
Customer:	Fluid Manage	ement Tech	nology Pty Ltd		Temperature:	20.8°C		
Attendees:	None				Relative Humidity:	23.8%		
Customer Project:	None				Bar. Pressure (PMSL):	1016 mb		
Tested By:	Matthew Ng				Job Site:	OC06		
Power:	120VAC/60H	z			Configuration:	FDMT0001-3		
TEST SPECIFIC	CATIONS							
Specification:				Method:				
FCC 15.225:2025				ANSI C63.10:20)13			
TEST PARAME	TERS							
Run #: 16		Line:	High Line		Add. Ext. Attenuation (dB)): 0		
COMMENTS								
NFC Board Rev 2.1	, Wi-Fi Module	with 1x an	tennas					
EUT OPERATING MODES								
Transmitting RFID 1	3.56 MHz, wit	h Wi-Fi Mo	dule and NFC Bo	ard Rev 2.1				
DEVIATIONS F	DEVIATIONS FROM TEST STANDARD							
None								





Average Data - vs - Average Limit



RESULTS - Run #16

Quasi Peak Data - vs - Quasi Peak Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
0.373	24.3	20.0	44.3	58.4	-14.1	
13.560	23.5	21.1	44.6	60.0	-15.4	
0.187	25.8	20.1	45.9	64.2	-18.3	
15.118	19.1	21.3	40.4	60.0	-19.6	
0.747	13.6	20.1	33.7	56.0	-22.3	
0.560	13.3	20.0	33.3	56.0	-22.7	
0.315	16.8	20.1	36.9	59.8	-22.9	
1.307	12.6	20.2	32.8	56.0	-23.2	
0.182	21.0	20.1	41.1	64.4	-23.3	
0.933	12.2	20.1	32.3	56.0	-23.7	
27.622	13.8	22.5	36.3	60.0	-23.7	
1.867	11.5	20.3	31.8	56.0	-24.2	
0.614	11.6	20.1	31.7	56.0	-24.3	
1.311	11.3	20.2	31.5	56.0	-24.5	
2.240	11.0	20.3	31.3	56.0	-24.7	
2.425	10.8	20.4	31.2	56.0	-24.8	
3.713	10.4	20.5	30.9	56.0	-25.1	
2.986	10.4	20.4	30.8	56.0	-25.2	
4.854	10.2	20.6	30.8	56.0	-25.2	
0.402	12.3	20.0	32.3	57.8	-25.5	
16.984	11.3	21.4	32.7	60.0	-27.3	
22.582	10.3	21.9	32.2	60.0	-27.8	
11.377	9.9	21.1	31.0	60.0	-29.0	
5.275	10.3	20.6	30.9	60.0	-29.1	
6.336	10.1	20.7	30.8	60.0	-29.2	

Average Data - vs - Average Limit							
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)		
0.373	22.7	20.0	42.7	48.4	-5.7		
13.560	22.1	21.1	43.2	50.0	-6.8		
0.187	23.9	20.1	44.0	54.2	-10.2		
15.304	13.8	21.3	35.1	50.0	-14.9		
0.182	17.9	20.1	38.0	54.4	-16.4		
0.747	8.4	20.1	28.5	46.0	-17.5		
0.559	7.7	20.0	27.7	46.0	-18.3		
1.307	7.1	20.2	27.3	46.0	-18.7		
27.622	8.7	22.5	31.2	50.0	-18.8		
0.933	6.4	20.1	26.5	46.0	-19.5		
0.312	9.9	20.1	30.0	49.9	-19.9		
1.867	5.8	20.3	26.1	46.0	-19.9		
0.600	5.6	20.0	25.6	46.0	-20.4		
1.311	5.3	20.2	25.5	46.0	-20.5		
2.425	4.9	20.4	25.3	46.0	-20.7		
2.239	4.9	20.3	25.2	46.0	-20.8		
2.985	4.4	20.4	24.8	46.0	-21.2		
3.919	4.3	20.5	24.8	46.0	-21.2		
4.334	4.2	20.5	24.7	46.0	-21.3		
0.402	6.3	20.0	26.3	47.8	-21.5		
16.978	5.4	21.4	26.8	50.0	-23.2		
22.581	4.4	21.9	26.3	50.0	-23.7		
11.375	3.8	21.1	24.9	50.0	-25.1		
5.301	4.1	20.6	24.7	50.0	-25.3		
6.336	4.0	20.7	24.7	50.0	-25.3		

CONCLUSION

Pass

0

Tested By



EUT:	SmartFill Ger	n 3 FMS			Work Order:	FDMT0001		
Serial Number:	12374				Date:	2025-01-24		
Customer:	Fluid Manage	ement Tech	nnology Pty Ltd		Temperature:	20.8°C		
Attendees:	None				Relative Humidity:	23.8%		
Customer Project:	None				Bar. Pressure (PMSL):	1016 mb		
Tested By:	Matthew Ng				Job Site:	OC06		
Power:	120VAC/60H	z			Configuration:	FDMT0001-3		
TEST SPECIFIC	CATIONS							
Specification:				Method:				
FCC 15.225:2025				ANSI C63.10:20)13			
TEST PARAME	TERS							
Run #: 17		Line:	Neutral		Add. Ext. Attenuation (dB)): 0		
COMMENTS								
NFC Board Rev 2.1	, Wi-Fi Module	with 1x an	tennas					
EUT OPERATING MODES								
Transmitting RFID 1	13.56 MHz, wit	h Wi-Fi Mo	dule and NFC Bo	ard Rev 2.1				
DEVIATIONS FROM TEST STANDARD								
None								





Average Data - vs - Average Limit



RESULTS - Run #17

Quasi Peak Data - vs - Quasi Peak Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
0.373	24.0	20.0	44.0	58.4	-14.4	
0.187	25.8	20.1	45.9	64.2	-18.3	
13.560	19.9	21.1	41.0	60.0	-19.0	
14.938	17.7	21.3	39.0	60.0	-21.0	
0.747	13.7	20.1	33.8	56.0	-22.2	
0.315	16.9	20.1	37.0	59.8	-22.8	
1.307	12.9	20.2	33.1	56.0	-22.9	
0.559	12.9	20.0	32.9	56.0	-23.1	
27.259	14.3	22.5	36.8	60.0	-23.2	
0.182	20.7	20.1	40.8	64.4	-23.6	
0.933	12.3	20.1	32.4	56.0	-23.6	
0.489	12.4	20.0	32.4	56.2	-23.8	
1.867	11.8	20.3	32.1	56.0	-23.9	
1.311	11.8	20.2	32.0	56.0	-24.0	
0.609	11.7	20.0	31.7	56.0	-24.3	
2.427	10.9	20.4	31.3	56.0	-24.7	
2.242	10.9	20.3	31.2	56.0	-24.8	
3.363	10.5	20.4	30.9	56.0	-25.1	
3.765	10.4	20.5	30.9	56.0	-25.1	
16.992	10.9	21.4	32.3	60.0	-27.7	
22.598	10.1	21.9	32.0	60.0	-28.0	
11.391	9.9	21.1	31.0	60.0	-29.0	
5.020	10.2	20.6	30.8	60.0	-29.2	
5.503	10.2	20.6	30.8	60.0	-29.2	
6.409	10.1	20.7	30.8	60.0	-29.2	

Average Data - vs - Average Limit							
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)		
0.373	22.3	20.0	42.3	48.4	-6.1		
0.187	23.9	20.1	44.0	54.2	-10.2		
13.560	17.9	21.1	39.0	50.0	-11.0		
14.938	13.2	21.3	34.5	50.0	-15.5		
0.182	17.7	20.1	37.8	54.4	-16.6		
0.747	8.6	20.1	28.7	46.0	-17.3		
27.447	9.5	22.5	32.0	50.0	-18.0		
1.307	7.5	20.2	27.7	46.0	-18.3		
0.560	7.4	20.0	27.4	46.0	-18.6		
0.933	6.5	20.1	26.6	46.0	-19.4		
1.867	6.0	20.3	26.3	46.0	-19.7		
0.312	10.0	20.1	30.1	49.9	-19.8		
1.311	5.8	20.2	26.0	46.0	-20.0		
0.599	5.6	20.0	25.6	46.0	-20.4		
2.427	5.0	20.4	25.4	46.0	-20.6		
2.240	4.9	20.3	25.2	46.0	-20.8		
2.986	4.4	20.4	24.8	46.0	-21.2		
3.627	4.2	20.5	24.7	46.0	-21.3		
0.402	6.4	20.0	26.4	47.8	-21.4		
4.273	4.1	20.5	24.6	46.0	-21.4		
16.992	5.1	21.4	26.5	50.0	-23.5		
22.590	4.1	21.9	26.0	50.0	-24.0		
11.377	3.8	21.1	24.9	50.0	-25.1		
5.904	4.0	20.7	24.7	50.0	-25.3		
6.336	4.0	20.7	24.7	50.0	-25.3		

CONCLUSION

Pass

0

Tested By



EUT:	SmartFill Ger	n 3 FMS			Work Order:	FDMT0001		
Serial Number:	12374				Date:	2025-01-24		
Customer:	Fluid Manage	ement Tech	nnology Pty Ltd		Temperature:	20.8°C		
Attendees:	None				Relative Humidity:	23.8%		
Customer Project:	None				Bar. Pressure (PMSL):	1016 mb		
Tested By:	Matthew Ng				Job Site:	OC06		
Power:	120VAC/60H	Z			Configuration:	FDMT0001-2		
TEST SPECIFIC	CATIONS							
Specification:				Method:				
FCC 15.225:2025				ANSI C63.10:20)13			
TEST PARAME	TERS							
Run #: 14		Line:	High Line		Add. Ext. Attenuation (dB): 0			
COMMENTS								
NFC Board Rev 2.1	, LTE Module v	with 3x ant	ennas					
EUT OPERATING MODES								
Transmitting RFID 2	3.56 MHz, wit	h LTE Mod	ule and NFC Boa	rd Rev 2.1				
DEVIATIONS F	DEVIATIONS FROM TEST STANDARD							
None								





Average Data - vs - Average Limit



RESULTS - Run #14

Quasi Peak Data - vs - Quasi Peak Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
13.560	54.9	21.1	76.0	60.0	16.0	
13.638	31.1	21.1	52.2	60.0	-7.8	
0.373	23.9	20.0	43.9	58.4	-14.5	
0.187	25.5	20.1	45.6	64.2	-18.6	
0.745	13.3	20.1	33.4	56.0	-22.6	
13.984	16.0	21.2	37.2	60.0	-22.8	
0.559	13.2	20.0	33.2	56.0	-22.8	
0.182	21.2	20.1	41.3	64.4	-23.1	
0.313	16.1	20.1	36.2	59.9	-23.7	
1.307	12.1	20.2	32.3	56.0	-23.7	
0.933	12.0	20.1	32.1	56.0	-23.9	
0.614	11.6	20.1	31.7	56.0	-24.3	
1.863	11.2	20.2	31.4	56.0	-24.6	
26.665	13.0	22.3	35.3	60.0	-24.7	
1.311	11.0	20.2	31.2	56.0	-24.8	
2.236	10.8	20.3	31.1	56.0	-24.9	
2.423	10.7	20.4	31.1	56.0	-24.9	
2.965	10.5	20.4	30.9	56.0	-25.1	
3.701	10.4	20.5	30.9	56.0	-25.1	
0.403	12.4	20.0	32.4	57.8	-25.4	
22.564	10.5	21.9	32.4	60.0	-27.6	
18.833	10.6	21.5	32.1	60.0	-27.9	
11.296	10.7	21.0	31.7	60.0	-28.3	
0.234	13.5	20.0	33.5	62.3	-28.8	
6.001	10.3	20.7	31.0	60.0	-29.0	

Average Data - vs - Average Limit							
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)		
13.560	54.8	21.1	75.9	50.0	25.9		
0.373	22.3	20.0	42.3	48.4	-6.1		
0.187	23.5	20.1	43.6	54.2	-10.6		
13.600	14.6	21.1	35.7	50.0	-14.3		
0.182	18.2	20.1	38.3	54.4	-16.1		
0.747	7.9	20.1	28.0	46.0	-18.0		
0.559	7.6	20.0	27.6	46.0	-18.4		
1.305	6.5	20.2	26.7	46.0	-19.3		
26.665	8.0	22.3	30.3	50.0	-19.7		
0.933	6.1	20.1	26.2	46.0	-19.8		
13.984	8.7	21.2	29.9	50.0	-20.1		
0.313	9.5	20.1	29.6	49.9	-20.3		
0.599	5.7	20.0	25.7	46.0	-20.3		
1.865	5.4	20.2	25.6	46.0	-20.4		
1.311	5.0	20.2	25.2	46.0	-20.8		
2.236	4.8	20.3	25.1	46.0	-20.9		
2.423	4.7	20.4	25.1	46.0	-20.9		
2.983	4.4	20.4	24.8	46.0	-21.2		
3.650	4.3	20.5	24.8	46.0	-21.2		
0.402	6.5	20.0	26.5	47.8	-21.3		
4.273	4.2	20.5	24.7	46.0	-21.3		
18.833	4.7	21.5	26.2	50.0	-23.8		
22.563	4.3	21.9	26.2	50.0	-23.8		
11.296	4.7	21.0	25.7	50.0	-24.3		
8.785	4.2	20.8	25.0	50.0	-25.0		

CONCLUSION

Evaluation

0

Tested By



EUT:	SmartFill Ger	n 3 FMS			Work Order:	FDMT0001
Serial Number:	12374				Date:	2025-01-24
Customer:	Fluid Manage	ement Tech	nnology Pty Ltd		Temperature:	20.8°C
Attendees:	None				Relative Humidity:	23.8%
Customer Project:	None				Bar. Pressure (PMSL):	1016 mb
Tested By:	Matthew Ng				Job Site:	OC06
Power:	120VAC/60H	z			Configuration:	FDMT0001-2
TEST SPECIFIC	CATIONS					
Specification:				Method:		
FCC 15.225:2025 ANSI C63.10:2013						
TEST PARAME	TERS					
Run #: 15		Line:	Neutral		Add. Ext. Attenuation (dB)): 0
COMMENTS						
NFC Board Rev 2.1	, LTE Module v	with 3x ant	ennas			
EUT OPERATIN						
Transmitting RFID 2	3.56 MHz, wit	h LTE Mod	lule and NFC Boa	rd Rev 2.1		
DEVIATIONS F	ROM TEST	STANDA	ARD			
None						





Average Data - vs - Average Limit



RESULTS - Run #15

Quasi Peak Data - vs - Quasi Peak Limit					
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	53.7	21.1	74.8	60.0	14.8
13.638	29.9	21.1	51.0	60.0	-9.0
0.373	23.9	20.0	43.9	58.4	-14.5
0.187	25.7	20.1	45.8	64.2	-18.4
0.747	13.6	20.1	33.7	56.0	-22.3
0.559	13.1	20.0	33.1	56.0	-22.9
0.182	21.2	20.1	41.3	64.4	-23.1
1.307	12.6	20.2	32.8	56.0	-23.2
0.313	16.3	20.1	36.4	59.9	-23.5
0.931	12.1	20.1	32.2	56.0	-23.8
13.984	14.7	21.2	35.9	60.0	-24.1
0.615	11.7	20.1	31.8	56.0	-24.2
1.867	11.5	20.3	31.8	56.0	-24.2
1.311	11.1	20.2	31.3	56.0	-24.7
26.672	13.0	22.3	35.3	60.0	-24.7
2.423	10.8	20.4	31.2	56.0	-24.8
2.237	10.8	20.3	31.1	56.0	-24.9
3.089	10.6	20.4	31.0	56.0	-25.0
3.807	10.4	20.5	30.9	56.0	-25.1
4.401	10.3	20.5	30.8	56.0	-25.2
0.402	12.5	20.0	32.5	57.8	-25.3
22.569	10.1	21.9	32.0	60.0	-28.0
18.837	10.3	21.5	31.8	60.0	-28.2
11.296	10.6	21.0	31.6	60.0	-28.4
0.240	13.5	20.0	33.5	62.1	-28.6

Average Data - vs - Average Limit					
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	53.6	21.1	74.7	50.0	24.7
0.373	22.2	20.0	42.2	48.4	-6.2
0.187	23.8	20.1	43.9	54.2	-10.3
13.600	13.7	21.1	34.8	50.0	-15.2
0.182	18.3	20.1	38.4	54.4	-16.0
0.745	8.1	20.1	28.2	46.0	-17.8
0.559	7.3	20.0	27.3	46.0	-18.7
1.307	7.0	20.2	27.2	46.0	-18.8
0.931	6.2	20.1	26.3	46.0	-19.7
26.858	7.8	22.4	30.2	50.0	-19.8
0.313	9.6	20.1	29.7	49.9	-20.2
1.865	5.6	20.2	25.8	46.0	-20.2
0.606	5.7	20.0	25.7	46.0	-20.3
1.311	5.1	20.2	25.3	46.0	-20.7
2.239	4.8	20.3	25.1	46.0	-20.9
2.423	4.7	20.4	25.1	46.0	-20.9
0.403	6.6	20.0	26.6	47.8	-21.2
2.983	4.4	20.4	24.8	46.0	-21.2
3.647	4.3	20.5	24.8	46.0	-21.2
4.273	4.2	20.5	24.7	46.0	-21.3
13.984	7.4	21.2	28.6	50.0	-21.4
22.381	4.2	21.8	26.0	50.0	-24.0
18.835	4.3	21.5	25.8	50.0	-24.2
11.296	4.6	21.0	25.6	50.0	-24.4
8.786	4.1	20.8	24.9	50.0	-25.1

CONCLUSION

Evaluation

0

Tested By



EUT:	SmartFill Ger	n 3 FMS			Work Order:	FDMT0001
Serial Number:	12374				Date:	2025-01-27
Customer:	Fluid Manage	ement Tech	nology Pty Ltd		Temperature:	20.5°C
Attendees:	None				Relative Humidity:	42%
Customer Project:	None				Bar. Pressure (PMSL):	1018 mb
Tested By:	Matthew Ng				Job Site:	OC06
Power:	120VAC/60H	z			Configuration:	FDMT0001-2
TEST SPECIFIC	CATIONS					
Specification:				Method:		
FCC 15.225:2025 ANSI C63.10:2013						
TEST PARAME	TERS					
Run #: 20		Line:	High Line		Add. Ext. Attenuation (dB)): 0
COMMENTS						
NFC Board Rev 2.1	, LTE module	with 3x ante	ennas			
EUT OPERATI						
Transmitting RFID	13.56 MHz, wit	h LTE Mod	ule and 50 Ohm ⁻	Ferminated NFC E	Board Rev 2.1	
DEVIATIONS F	ROM TEST	STAND	RD			
None						





Average Data - vs - Average Limit



RESULTS - Run #20

Quasi Peak Data - vs - Quasi Peak Limit					
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.373	24.2	20.0	44.2	58.4	-14.2
13.559	22.8	21.1	43.9	60.0	-16.1
0.187	25.8	20.1	45.9	64.2	-18.3
0.745	13.4	20.1	33.5	56.0	-22.5
0.557	13.3	20.0	33.3	56.0	-22.7
13.981	15.8	21.2	37.0	60.0	-23.0
27.199	14.4	22.5	36.9	60.0	-23.1
0.182	21.2	20.1	41.3	64.4	-23.1
0.313	16.7	20.1	36.8	59.9	-23.1
1.305	12.3	20.2	32.5	56.0	-23.5
0.933	12.2	20.1	32.3	56.0	-23.7
0.629	11.7	20.1	31.8	56.0	-24.2
1.863	11.5	20.2	31.7	56.0	-24.3
24.224	13.2	22.0	35.2	60.0	-24.8
1.319	10.9	20.2	31.1	56.0	-24.9
2.236	10.8	20.3	31.1	56.0	-24.9
2.425	10.7	20.4	31.1	56.0	-24.9
3.951	10.5	20.5	31.0	56.0	-25.0
2.991	10.5	20.4	30.9	56.0	-25.1
4.273	10.4	20.5	30.9	56.0	-25.1
0.403	12.4	20.0	32.4	57.8	-25.4
18.835	10.6	21.5	32.1	60.0	-27.9
11.310	10.7	21.0	31.7	60.0	-28.3
8.798	10.3	20.8	31.1	60.0	-28.9
5.283	10.4	20.6	31.0	60.0	-29.0

Average Data - vs - Average Limit					
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.373	22.6	20.0	42.6	48.4	-5.8
0.187	23.9	20.1	44.0	54.2	-10.2
13.560	18.6	21.1	39.7	50.0	-10.3
0.182	18.5	20.1	38.6	54.4	-15.8
0.745	8.1	20.1	28.2	46.0	-17.8
27.199	9.4	22.5	31.9	50.0	-18.1
0.559	7.8	20.0	27.8	46.0	-18.2
13.981	10.3	21.2	31.5	50.0	-18.5
1.305	6.7	20.2	26.9	46.0	-19.1
0.931	6.2	20.1	26.3	46.0	-19.7
24.236	8.2	22.0	30.2	50.0	-19.8
0.313	9.9	20.1	30.0	49.9	-19.9
0.606	5.7	20.0	25.7	46.0	-20.3
1.863	5.5	20.2	25.7	46.0	-20.3
2.237	4.8	20.3	25.1	46.0	-20.9
2.423	4.7	20.4	25.1	46.0	-20.9
1.311	4.8	20.2	25.0	46.0	-21.0
3.359	4.4	20.4	24.8	46.0	-21.2
3.649	4.3	20.5	24.8	46.0	-21.2
4.273	4.2	20.5	24.7	46.0	-21.3
0.402	6.3	20.0	26.3	47.8	-21.5
18.835	4.7	21.5	26.2	50.0	-23.8
11.311	4.8	21.0	25.8	50.0	-24.2
8.797	4.2	20.8	25.0	50.0	-25.0
0.225	7.4	20.0	27.4	52.6	-25.2

CONCLUSION

Pass

0

Tested By



EUT:	SmartFill Ge	n 3 FMS			Work Order:	FDMT0001
Serial Number:	12374				Date:	2025-01-27
Customer:	Fluid Manag	ement Tech	nnology Pty Ltd		Temperature:	20.5°C
Attendees:	None				Relative Humidity:	42%
Customer Project:	None				Bar. Pressure (PMSL):	1018 mb
Tested By:	Matthew Ng				Job Site:	OC06
Power:	120VAC/60H	z			Configuration:	FDMT0001-2
TEST SPECIF	CATIONS					
Specification:				Method:		
FCC 15.225:2025 ANSI C63.10:2013						
TEST PARAM	ETERS					
Run #: 21		Line:	Neutral		Add. Ext. Attenuation (dB)): 0
COMMENTS						
NFC Board Rev 2	1, LTE module	with 3x ant	ennas			
EUT OPERAT	ING MODES					
Transmitting RFID	13.56 MHz, wit	h LTE Mod	ule and 50 Ohm	Ferminated NFC E	Board Rev 2.1	
DEVIATIONS	FROM TEST	STAND	ARD			
None						





Average Data - vs - Average Limit





RESULTS - Run #21

Quasi Peak Data - vs - Quasi Peak Limit					
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.374	24.0	20.0	44.0	58.4	-14.4
0.187	26.0	20.1	46.1	64.2	-18.1
13.560	20.0	21.1	41.1	60.0	-18.9
0.747	13.7	20.1	33.8	56.0	-22.2
27.102	14.6	22.5	37.1	60.0	-22.9
0.560	13.1	20.0	33.1	56.0	-22.9
0.312	16.8	20.1	36.9	59.9	-23.0
1.308	12.6	20.2	32.8	56.0	-23.2
0.182	20.7	20.1	40.8	64.4	-23.6
0.934	12.3	20.1	32.4	56.0	-23.6
0.481	12.5	20.0	32.5	56.3	-23.8
1.311	11.8	20.2	32.0	56.0	-24.0
1.868	11.6	20.3	31.9	56.0	-24.1
0.628	11.7	20.1	31.8	56.0	-24.2
24.290	13.5	22.0	35.5	60.0	-24.5
2.240	10.9	20.3	31.2	56.0	-24.8
2.428	10.8	20.4	31.2	56.0	-24.8
14.013	13.8	21.2	35.0	60.0	-25.0
2.993	10.5	20.4	30.9	56.0	-25.1
3.775	10.4	20.5	30.9	56.0	-25.1
4.274	10.3	20.5	30.8	56.0	-25.2
20.185	10.4	21.6	32.0	60.0	-28.0
11.375	10.6	21.1	31.7	60.0	-28.3
8.800	10.2	20.8	31.0	60.0	-29.0
5.895	10.2	20.7	30.9	60.0	-29.1

Average Data - vs - Average Limit					
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.374	22.4	20.0	42.4	48.4	-6.0
0.187	24.2	20.1	44.3	54.2	-9.9
13.560	17.4	21.1	38.5	50.0	-11.5
0.182	17.6	20.1	37.7	54.4	-16.7
0.747	8.4	20.1	28.5	46.0	-17.5
27.102	9.9	22.5	32.4	50.0	-17.6
0.560	7.5	20.0	27.5	46.0	-18.5
1.308	7.1	20.2	27.3	46.0	-18.7
24.279	8.6	22.0	30.6	50.0	-19.4
0.934	6.4	20.1	26.5	46.0	-19.5
0.312	10.2	20.1	30.3	49.9	-19.6
1.311	6.1	20.2	26.3	46.0	-19.7
0.489	6.4	20.0	26.4	46.2	-19.8
1.868	5.7	20.3	26.0	46.0	-20.0
13.936	8.6	21.2	29.8	50.0	-20.2
0.614	5.6	20.1	25.7	46.0	-20.3
2.428	4.7	20.4	25.1	46.0	-20.9
2.239	4.7	20.3	25.0	46.0	-21.0
2.990	4.4	20.4	24.8	46.0	-21.2
3.771	4.3	20.5	24.8	46.0	-21.2
4.273	4.2	20.5	24.7	46.0	-21.3
20.173	4.5	21.6	26.1	50.0	-23.9
11.311	4.7	21.0	25.7	50.0	-24.3
8.798	4.2	20.8	25.0	50.0	-25.0
5.872	4.1	20.7	24.8	50.0	-25.2

CONCLUSION

Pass

0

Tested By

EMISSIONS BANDWIDTH (20 DB)



TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

A near-field probe was placed near the transmitter. A low-loss coaxial cable was used to connect the near-field probe to the spectrum analyzer.

As defined in FCC 15.215 Part (c), intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise by specified in the specific rule section under which the equipment operates, is contained within the frequency band designed in the rule section under which the equipment is operated.

The 20 dB bandwidth must be contained within the band 13.110-14.010 MHz. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the emissions bandwidth (EBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto and a peak detector was used.

Per ANSI C63.10a:2024, Clause 6.9.2 b) The nominal IF filter bandwidth shall be within 1-5% of the OBW without going below the values in Clause 6.9.1. In this frequency range (9 kHz – 30 MHz) the minimum RBW is 0.1 kHz.

The spectrum analyzer bandwidth measurement function was used to measure the 20 dB bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4443A	AAR	2024-11-07	2025-11-07
Cable	Micro-Coax	UFD150A-1-0720-200200	OCA	2024-10-02	2025-10-02
Block - DC	Fairview Microwave	SD3379	ANG	2024-10-03	2025-10-03
Attenuator	Fairview Microwave	SA18H-20	UAX	2024-07-11	2025-07-11
Probe - Near Field Set	EMCO	7405	IPI	NCR	NCR

EMISSIONS BANDWIDTH (20 DB)



EUT:	SmartFill Gen 3 FMS	Work Order:	FDMT0001
Serial Number:	12374	Date:	2025-03-12
Customer:	Fluid Management Technology Pty Ltd	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	41.8%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Matthew Ng	Job Site:	OC13
Power:	120VAC/60Hz	Configuration:	FDMT0001-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2025	ANSI C63.10:2013

COMMENTS

NFC Board Rev 2.1, LTE module with 3x antennas

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

			Limit				
		Value	13.110 ≤ f ≤ 14.010	Result			
13.56 MHz RFID, ISO/IEC 14443 Type A							
	Normal Conditions	426.401 kHz	Within	Pass			

EMISSIONS BANDWIDTH (20 DB)





13.56 MHz RFID, ISO/IEC 14443 Type A Normal Conditions



TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

The fundamental carrier of the EUT was maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity. The reference point of the loop antenna was maintained at 1m above the ground plane during the testing.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector PK = Peak Detector AV = RMS Detector

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	EMCO	6502	AZB	2023-09-06	2025-09-06
Cable	Northwest EMC	3kHz - 1GHz RE Cables	OCB	2024-05-15	2025-05-15
Receiver	Rohde & Schwarz	ESCI	ARG	2024-09-19	2025-09-19

FREQUENCY RANGE INVESTIGATED

12.56 MHz TO 14.56 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

FDMT0001-2

MODES INVESTIGATED

Transmitting RFID 13.56 MHz



EUT:	SmartFill Gen 3 FMS	Work Order:	FDMT0001
Serial Number:	12374	Date:	2025-01-14
Customer:	Fluid Management Technology Pty Ltd	Temperature:	21.8°C
Attendees:	None	Relative Humidity:	23.6%
Customer Project:	None	Bar. Pressure (PMSL):	1022 mb
Tested By:	Nolan De Ramos	Job Site:	OC08
Power:	110VAC/60Hz	Configuration:	FDMT0001-2

Test Distance (m): 10

TEST PARAMETERS 12

Run #:

Ant. Height(s) (m): 1(m)

COMMENTS

NFC Board Rev 2.1, LTE Module with 3x antennas

EUT OPERATING MODES

Transmitting RFID 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None





RESULTS - Run #12

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
13.768	24.4	11.7	1.0	97.0	10.0	0.0	Perp to EUT	QP	-19.1	17.0	40.5	-23.5	Tx 13.56 MHz, EUT Vert
13.345	23.0	11.7	1.0	68.0	10.0	0.0	Perp to EUT	QP	-19.1	15.6	40.5	-24.9	Tx 13.56 MHz, EUT Vert
13.642	28.9	11.7	1.0	220.0	10.0	0.0	Perp to EUT	QP	-19.1	21.5	50.5	-29.0	Tx 13.56 MHz, EUT Vert
13.044	5.7	11.7	1.0	333.0	10.0	0.0	Perp to EUT	QP	-19.1	-1.7	29.5	-31.2	Tx 13.56 MHz, EUT Vert
13.561	59.5	11.7	1.0	231.0	10.0	0.0	Perp to EUT	QP	-19.1	52.1	84.0	-31.9	Tx 13.56 MHz, EUT Vert
13.561	59.0	11.7	1.0	187.0	10.0	0.0	Par to GND	QP	-19.1	51.6	84.0	-32.4	Tx 13.56 MHz, EUT Vert
14.044	3.4	11.7	1.0	203.0	10.0	0.0	Perp to EUT	QP	-19.1	-4.0	29.5	-33.5	Tx 13.56 MHz, EUT Vert
13.496	23.8	11.7	1.0	272.0	10.0	0.0	Perp to EUT	QP	-19.1	16.4	50.5	-34.1	Tx 13.56 MHz, EUT Vert
13.560	51.7	11.7	1.0	139.0	10.0	0.0	Par to GND	QP	-19.1	44.3	84.0	-39.7	Tx 13.56 MHz, EUT Horz
13.560	48.3	11.7	1.0	125.0	10.0	0.0	Par to GND	QP	-19.1	40.9	84.0	-43.1	Tx 13.56 MHz, EUT on Side
13.560	47.0	11.7	1.0	123.0	10.0	0.0	Perp to EUT	QP	-19.1	39.6	84.0	-44.4	Tx 13.56 MHz, EUT Horz
13.561	45.8	11.7	1.0	154.0	10.0	0.0	Par to EUT	QP	-19.1	38.4	84.0	-45.6	Tx 13.56 MHz, EUT Horz
13.561	44.2	11.7	1.0	133.0	10.0	0.0	Perp to EUT	QP	-19.1	36.8	84.0	-47.2	Tx 13.56 MHz, EUT on Side
13.560	42.5	11.7	1.0	147.0	10.0	0.0	Par to EUT	QP	-19.1	35.1	84.0	-48.9	Tx 13.56 MHz, EUT on Side

CONCLUSION

Pass

Tested By



PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.





TEST DESCRIPTION

The fundamental carrier of the EUT was maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity. The reference point of the loop antenna was maintained at 1m above the ground plane during the testing.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector

- PK = Peak Detector
- AV = RMS Detector

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	EMCO	6502	AZB	2023-09-06	2025-09-06
Cable	Northwest EMC	3kHz - 1GHz RE Cables	OCB	2024-05-15	2025-05-15
Receiver	Rohde & Schwarz	ESCI	ARG	2024-09-19	2025-09-19

FREQUENCY RANGE INVESTIGATED

12.56 MHz TO 14.56 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

FDMT0001-3

MODES INVESTIGATED

Transmitting RFID 13.56 MHz



EUT:	SmartFill Gen 3 FMS	Work Order:	FDMT0001					
Serial Number:	12374	Date:	2025-01-23					
Customer:	Fluid Management Technology Pty Ltd	Temperature:	24°C					
Attendees:	None	Relative Humidity:	19.9%					
Customer Project:	None	Bar. Pressure (PMSL):	1025 mb					
Tested By:	Matthew Ng	Job Site:	OC08					
Power:	110VAC/60Hz	Configuration:	FDMT0001-3					

Test Distance (m): 10

TEST PARAMETERS 19

Run #:

Ant. Height(s) (m): 1(m)

COMMENTS

NFC Board Rev 2.1, Wi-Fi Module with 1x antennas

EUT OPERATING MODES

Transmitting RFID 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None





RESULTS - Run #19

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
14.078	3.2	11.7	1.0	258.0	10.0	0.0	Par to EUT	QP	-19.1	-4.2	29.5	-33.7	Tx 13.56 MHz, EUT Horz
13.094	3.0	11.7	1.0	256.0	10.0	0.0	Par to EUT	QP	-19.1	-4.4	29.5	-33.9	Tx 13.56 MHz, EUT Horz
13.781	3.8	11.7	1.0	271.0	10.0	0.0	Par to EUT	QP	-19.1	-3.6	40.5	-44.1	Tx 13.56 MHz, EUT Horz
13.343	3.6	11.7	1.0	130.0	10.0	0.0	Par to EUT	QP	-19.1	-3.8	40.5	-44.3	Tx 13.56 MHz, EUT Horz
13.560	41.5	11.7	1.0	243.0	10.0	0.0	Par to GND	QP	-19.1	34.1	84.0	-49.9	Tx 13.56 MHz, EUT Vert
13.560	41.4	11.7	1.0	217.0	10.0	0.0	Perp to EUT	QP	-19.1	34.0	84.0	-50.0	Tx 13.56 MHz, EUT Vert
13.560	39.4	11.7	1.0	206.0	10.0	0.0	Perp to EUT	QP	-19.1	32.0	84.0	-52.0	Tx 13.56 MHz, EUT on Side
13.560	39.4	11.7	1.0	268.0	10.0	0.0	Par to GND	QP	-19.1	32.0	84.0	-52.0	Tx 13.56 MHz, EUT on Side
13.631	5.6	11.7	1.0	120.0	10.0	0.0	Par to EUT	QP	-19.1	-1.8	50.5	-52.3	Tx 13.56 MHz, EUT Horz
13.475	5.1	11.7	1.0	351.0	10.0	0.0	Par to EUT	QP	-19.1	-2.3	50.5	-52.8	Tx 13.56 MHz, EUT Horz
13.561	33.9	11.7	1.0	141.0	10.0	0.0	Perp To EUT	QP	-19.1	26.5	84.0	-57.5	Tx 13.56 MHz, EUT Horz
13.561	33.9	11.7	1.0	132.0	10.0	0.0	Par to GND	QP	-19.1	26.5	84.0	-57.5	Tx 13.56 MHz, EUT Horz
13.560	32.0	11.7	1.0	327.0	10.0	0.0	Par to EUT	QP	-19.1	24.6	84.0	-59.4	Tx 13.56 MHz, EUT Vert
13.560	31.4	11.7	1.0	145.0	10.0	0.0	Par to EUT	QP	-19.1	24.0	84.0	-60.0	Tx 13.56 MHz, EUT Horz
13.560	30.3	11.7	1.0	1.0	10.0	0.0	Par to EUT	QP	-19.1	22.9	84.0	-61.1	Tx 13.56 MHz, EUT on Side

CONCLUSION

Pass

Tested By



PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.





TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). An active loop antenna was used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector PK = Peak Detector AV = RMS Detector

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Rohde & Schwarz	ESCI	ARG	2024-09-19	2025-09-19
Antenna - Loop	EMCO	6502	AZB	2023-09-06	2025-09-06
Cable	Northwest EMC	3kHz - 1GHz RE Cables	OCB	2024-05-15	2025-05-15

FREQUENCY RANGE INVESTIGATED

9 kHz TO 30 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

FDMT0001-2

MODES INVESTIGATED

Transmitting NFC 13.56 MHz, with Cellular Module, with NFC Board Rev 2.1

Test Distance (m):



EUT:	SmartFill Gen 3 FMS	Work Order:	FDMT0001
Serial Number:	12374	Date:	2025-01-16
Customer:	Fluid Management Technology Pty Ltd	Temperature:	21.7°C
Attendees:	None	Relative Humidity:	30.4%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Nolan De Ramos	Job Site:	OC08
Power:	110VAC/60Hz	Configuration:	FDMT0001-2

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TEST PARAMETERS 14

Run #:

Ant. Height(s) (m): 1(m)

COMMENTS

NFC Board Rev 2.1, LTE Module with 3x antennas

EUT OPERATING MODES

Transmitting RFID 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None





RESULTS - Run #14

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
3.394	12.4	10.9	1.0	90.0	10.0	0.0	Perp to EUT	QP	-19.1	4.2	29.5	-25.3	Tx 13.56 MHz, EUT Vert
4.516	10.0	11.1	1.0	259.0	10.0	0.0	Perp to EUT	QP	-19.1	2.0	29.5	-27.5	Tx 13.56 MHz, EUT Vert
6.784	7.0	11.1	1.0	165.0	10.0	0.0	Perp to EUT	QP	-19.1	-1.0	29.5	-30.5	Tx 13.56 MHz, EUT Vert
27.123	7.3	9.8	1.0	183.0	10.0	0.0	Perp to EUT	QP	-19.1	-2.0	29.5	-31.5	Tx 13.56 MHz, EUT Vert
27.123	5.7	9.8	1.0	331.0	10.0	0.0	Perp to EUT	QP	-19.1	-3.6	29.5	-33.1	Tx 13.56 MHz, EUT on Side
27.123	3.7	9.8	1.0	169.0	10.0	0.0	Par to GND	QP	-19.1	-5.6	29.5	-35.1	Tx 13.56 MHz, EUT Vert
27.117	3.2	9.8	1.0	299.0	10.0	0.0	Perp to EUT	QP	-19.1	-6.1	29.5	-35.6	Tx 13.56 MHz, EUT Horz
27.122	3.1	9.8	1.0	5.0	10.0	0.0	Par to GND	QP	-19.1	-6.2	29.5	-35.7	Tx 13.56 MHz, EUT on Side
27.122	3.0	9.8	1.0	335.0	10.0	0.0	Par to EUT	QP	-19.1	-6.3	29.5	-35.8	Tx 13.56 MHz, EUT Horz
27.121	3.0	9.8	1.0	142.0	10.0	0.0	Par to EUT	QP	-19.1	-6.3	29.5	-35.8	Tx 13.56 MHz, EUT on Side
27.121	2.5	9.8	1.0	221.0	10.0	0.0	Par to GND	QP	-19.1	-6.8	29.5	-36.3	Tx 13.56 MHz, EUT Horz
27.122	2.5	9.8	1.0	361.0	10.0	0.0	Par to EUT	QP	-19.1	-6.8	29.5	-36.3	Tx 13.56 MHz, EUT Vert

Pass

Tested By



PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.





TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). An active loop antenna was used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector PK = Peak Detector AV = RMS Detector

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Rohde & Schwarz	ESCI	ARG	2024-09-19	2025-09-19
Antenna - Loop	EMCO	6502	AZB	2023-09-06	2025-09-06
Cable	Northwest EMC	3kHz - 1GHz RE Cables	OCB	2024-05-15	2025-05-15

FREQUENCY RANGE INVESTIGATED

9 kHz TO 30 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

FDMT0001-3

MODES INVESTIGATED

Transmitting RFID 13.56 MHz

Test Distance (m):



EUT:	SmartFill Gen 3 FMS	Work Order:	FDMT0001
Serial Number:	12374	Date:	2025-01-24
Customer:	Fluid Management Technology Pty Ltd	Temperature:	21.5°C
Attendees:	None	Relative Humidity:	21.6%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Matthew Ng	Job Site:	OC08
Power:	110VAC/60Hz	Configuration:	FDMT0001-3

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TEST PARAMETERS 22

Run #:

Ant. Height(s) (m): 1(m)

COMMENTS

NFC Board Rev 2.1, Wi-Fi Module with 1x antennas

EUT OPERATING MODES

Transmitting RFID 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None





RESULTS - Run #22

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
3.339	10.9	0.0	1.0	198.0	10.0	0.0	Perp to EUT	QP	-19.1	-8.2	29.5	-37.7	Tx 13.56 MHz, EUT Horz
4.481	8.7	0.0	1.0	339.0	10.0	0.0	Perp to EUT	QP	-19.1	-10.4	29.5	-39.9	Tx 13.56 MHz, EUT Horz
6.764	6.0	0.0	1.0	135.0	10.0	0.0	Perp to EUT	QP	-19.1	-13.1	29.5	-42.6	Tx 13.56 MHz, EUT Horz
27.147	3.9	0.0	1.0	275.0	10.0	0.0	Perp to EUT	QP	-19.1	-15.2	29.5	-44.7	Tx 13.56 MHz, EUT Horz
27.114	3.6	0.0	1.0	349.0	10.0	0.0	Perp to EUT	QP	-19.1	-15.5	29.5	-45.0	Tx 13.56 MHz, EUT Vert
27.118	3.4	0.0	1.0	301.0	10.0	0.0	Perp to EUT	QP	-19.1	-15.7	29.5	-45.2	Tx 13.56 MHz, EUT on Side
27.123	3.1	0.0	1.0	343.0	10.0	0.0	Par to GND	QP	-19.1	-16.0	29.5	-45.5	Tx 13.56 MHz, EUT Horz
27.171	2.9	0.0	1.0	208.0	10.0	0.0	Par to EUT	QP	-19.1	-16.2	29.5	-45.7	Tx 13.56 MHz, EUT Horz
27.126	2.6	0.0	1.0	0.0	10.0	0.0	Par to GND	QP	-19.1	-16.5	29.5	-46.0	Tx 13.56 MHz, EUT Vert
27.133	2.5	0.0	1.0	319.0	10.0	0.0	Par to EUT	QP	-19.1	-16.6	29.5	-46.1	Tx 13.56 MHz, EUT on Side
27.134	2.5	0.0	1.0	89.0	10.0	0.0	Par to EUT	QP	-19.1	-16.6	29.5	-46.1	Tx 13.56 MHz, EUT Vert
27.081	2.4	0.0	1.0	67.0	10.0	0.0	Par to GND	QP	-19.1	-16.7	29.5	-46.2	Tx 13.56 MHz, EUT on Side

Pass

Tested By



PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.





TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting while set at the operating channel.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector PK = Peak Detector AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Standard Gain	ETS Lindgren	3160-07	AHR	2024-12-03	2025-12-03
Cable	Northwest EMC	8-18GHz RE Cables	000	2024-03-19	2025-03-19
		AMF-6F-08001200-30-			
Amplifier - Pre-Amplifier	Miteq	10P	AOE	2024-03-19	2025-03-19
Analyzer - Spectrum					
Analyzer	Agilent	N9010A	AFJ	2024-02-14	2025-02-14
Antenna - Standard Gain	ETS Lindgren	3160-08	AHT	2024-12-03	2025-12-03
		AMF-6F-12001800-30-			
Amplifier - Pre-Amplifier	Miteq	10P	AOF	2024-03-19	2025-03-19
Antenna - Double Ridge	ETS Lindgren	3115	AIR	2024-07-23	2026-07-23
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	2024-05-08	2025-05-08
Amplifier - Pre-Amplifier	Cernex	CBL01084020-xx	PAX	2024-05-08	2025-05-08
Antenna - Biconilog	Teseq	CBL 6141A	AYE	2023-08-08	2025-08-08
Cable	Northwest EMC	10kHz-1GHz RE Cables	OCH	2024-05-09	2025-05-09
Amplifier - Pre-Amplifier	Miteq	AM-1402	AOZ	2024-05-14	2025-05-14
	Fairview				
Attenuator	Microwave	SA18H-20	TKQ	2024-05-08	2025-05-08

TEST EQUIPMENT



FREQUENCY RANGE INVESTIGATED

30 MHz TO 18 GHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

FDMT0001-2

MODES INVESTIGATED

Transmitting RFID 13.56 MHz



EUT:	SmartFill Gen 3 FMS	Work Order:	FDMT0001
Serial Number:	12374	Date:	2025-01-21
Customer:	Fluid Management Technology Pty Ltd	Temperature:	21.6°C
Attendees:	None	Relative Humidity:	27.5%
Customer Project:	None	Bar. Pressure (PMSL):	1025 mb
Tested By:	Nolan De Ramos	Job Site:	OC10
Power:	110VAC/60Hz	Configuration:	FDMT0001-2

TEST PARAMETERS

Run #: 200	Test Distance (m): 3	Ant. Height(s) (m): 1 to 4(m)						

COMMENTS

NFC Board Rev 2.1, LTE Module with 3x antennas

EUT OPERATING MODES

Transmitting RFID 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None





RESULTS - Run #200

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polaríty/ Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
951.988	23.8	20.0	1.5	127.0	3.0	0.0	Horz	QP	0.0	43.8	46.0	-2.2	Tx 13.56 MHz, EUT On Side
17953.620	26.9	20.3	1.5	164.0	3.0	0.0	Vert	AV	0.0	47.2	54.0	-6.8	Tx 13.56 MHz, EUT On Side
17903.530	27.0	20.0	1.5	223.0	3.0	0.0	Horz	AV	0.0	47.0	54.0	-7.0	Tx 13.56 MHz, EUT On Side
244.093	31.9	3.2	2.4	278.0	3.0	0.0	Horz	QP	0.0	35.1	46.0	-10.9	Tx 13.56 MHz, EUT On Side
41.239	18.9	7.6	1.0	271.0	3.0	0.0	Horz	QP	0.0	26.5	40.0	-13.5	Tx 13.56 MHz, EUT Vert
41.247	18.3	7.6	1.0	270.0	3.0	0.0	Vert	QP	0.0	25.9	40.0	-14.1	Tx 13.56 MHz, EUT Vert
40.794	16.8	7.8	1.0	20.0	3.0	0.0	Horz	QP	0.0	24.6	40.0	-15.4	Tx 13.56 MHz, EUT on Side
40.781	16.8	7.8	1.0	145.0	3.0	0.0	Vert	QP	0.0	24.6	40.0	-15.4	Tx 13.56 MHz, EUT on Side
40.766	16.7	7.8	1.0	256.0	3.0	0.0	Horz	QP	0.0	24.5	40.0	-15.5	Tx 13.56 MHz, EUT Horz
40.781	16.7	7.8	1.0	71.0	3.0	0.0	Vert	QP	0.0	24.5	40.0	-15.5	Tx 13.56 MHz, EUT Horz
17956.680	37.9	20.2	1.5	164.0	3.0	0.0	Vert	PK	0.0	58.1	74.0	-15.9	Tx 13.56 MHz, EUT On Side
17905.240	37.9	20.1	1.5	223.0	3.0	0.0	Horz	PK	0.0	58.0	74.0	-16.0	Tx 13.56 MHz, EUT On Side
54.381	22.1	1.7	1.0	57.0	3.0	0.0	Horz	QP	0.0	23.8	40.0	-16.2	Tx 13.56 MHz, EUT Vert
215.348	21.4	2.7	1.1	355.0	3.0	0.0	Horz	QP	0.0	24.1	43.5	-19.4	Tx 13.56 MHz, EUT On Side
379.693	18.9	6.6	1.5	356.0	3.0	0.0	Horz	QP	0.0	25.5	46.0	-20.5	Tx 13.56 MHz, EUT On Side
65.645	19.9	-1.7	2.4	204.0	3.0	0.0	Horz	QP	0.0	18.2	40.0	-21.8	Tx 13.56 MHz, EUT Vert
1728.133	46.5	-15.6	1.5	360.0	3.0	0.0	Vert	AV	0.0	30.9	54.0	-23.1	Tx 13.56 MHz, EUT On Side
1728.542	46.2	-15.6	1.5	140.0	3.0	0.0	Vert	AV	0.0	30.6	54.0	-23.4	Tx 13.56 MHz, EUT Horz
10232.790	32.8	-4.8	1.5	358.0	3.0	0.0	Horz	AV	0.0	28.0	54.0	-26.0	Tx 13.56 MHz, EUT On Side
1729.408	40.7	-15.6	1.5	133.0	3.0	0.0	Horz	AV	0.0	25.1	54.0	-28.9	Tx 13.56 MHz, EUT Horz
1728.833	40.6	-15.6	1.5	71.0	3.0	0.0	Horz	AV	0.0	25.0	54.0	-29.0	Tx 13.56 MHz, EUT Vert
1728.708	40.5	-15.6	1.5	304.0	3.0	0.0	Horz	AV	0.0	24.9	54.0	-29.1	Tx 13.56 MHz, EUT On Side
1729.342	40.3	-15.6	1.5	338.0	3.0	0.0	Vert	AV	0.0	24.7	54.0	-29.3	Tx 13.56 MHz, EUT Vert
10235.960	44.1	-4.8	1.5	358.0	3.0	0.0	Horz	PK	0.0	39.3	74.0	-34.7	Tx 13.56 MHz, EUT On Side
1726.892	52.4	-15.7	1.5	360.0	3.0	0.0	Vert	PK	0.0	36.7	74.0	-37.3	Tx 13.56 MHz, EUT On Side
1730.367	52.2	-15.6	1.5	140.0	3.0	0.0	Vert	PK	0.0	36.6	74.0	-37.4	Tx 13.56 MHz, EUT Horz
1729.867	52.1	-15.6	1.5	71.0	3.0	0.0	Horz	PK	0.0	36.5	74.0	-37.5	Tx 13.56 MHz, EUT Vert
1728.342	51.3	-15.6	1.5	304.0	3.0	0.0	Horz	PK	0.0	35.7	74.0	-38.3	Tx 13.56 MHz, EUT On Side
1726.867	51.3	-15.7	1.5	133.0	3.0	0.0	Horz	PK	0.0	35.6	74.0	-38.4	Tx 13.56 MHz, EUT Horz
1729.908	51.0	-15.6	1.5	338.0	3.0	0.0	Vert	PK	0.0	35.4	74.0	-38.6	Tx 13.56 MHz, EUT Vert

CONCLUSION

Pass

Tested By



PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.





TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting while set at the operating channel.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector PK = Peak Detector AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Standard Gain	ETS Lindgren	3160-07	AHR	2024-12-03	2025-12-03
Cable	Northwest EMC	8-18GHz RE Cables	000	2024-03-19	2025-03-19
		AMF-6F-08001200-30-			
Amplifier - Pre-Amplifier	Miteq	10P	AOE	2024-03-19	2025-03-19
Analyzer - Spectrum					
Analyzer	Agilent	N9010A	AFJ	2024-02-14	2025-02-14
Antenna - Standard Gain	ETS Lindgren	3160-08	AHT	2024-12-03	2025-12-03
		AMF-6F-12001800-30-			
Amplifier - Pre-Amplifier	Miteq	10P	AOF	2024-03-19	2025-03-19
Antenna - Double Ridge	ETS Lindgren	3115	AIR	2024-07-23	2026-07-23
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	2024-05-08	2025-05-08
Amplifier - Pre-Amplifier	Cernex	CBL01084020-xx	PAX	2024-05-08	2025-05-08
Antenna - Biconilog	Teseq	CBL 6141A	AYE	2023-08-08	2025-08-08
Cable	Northwest EMC	10kHz-1GHz RE Cables	OCH	2024-05-09	2025-05-09
Amplifier - Pre-Amplifier	Miteq	AM-1402	AOZ	2024-05-14	2025-05-14
	Fairview				
Attenuator	Microwave	SA18H-20	TKQ	2024-05-08	2025-05-08

TEST EQUIPMENT



FREQUENCY RANGE INVESTIGATED

30 MHz TO 18 GHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

FDMT0001-3

MODES INVESTIGATED

Transmitting RFID 13.56 MHz



EUT:	SmartFill Gen 3 FMS	Work Order:	FDMT0001
Serial Number:	12374	Date:	2025-01-23
Customer:	Fluid Management Technology Pty Ltd	Temperature:	24.8°C
Attendees:	None	Relative Humidity:	21.8%
Customer Project:	None	Bar. Pressure (PMSL):	1023 mb
Tested By:	Nolan De Ramos	Job Site:	OC10
Power:	110VAC/60Hz	Configuration:	FDMT0001-3

TEST PARAMETERS

Run #:	203	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)				

COMMENTS

NFC Board Rev 2.1, Wi-Fi Module with 1x antennas

EUT OPERATING MODES

Transmitting RFID 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None





RESULTS - Run #203

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Heighl (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
951.996	23.1	20.0	2.7	144.0	3.0	0.0	Vert	QP	0.0	43.1	46.0	-2.9	Tx 13.56 MHz, EUT Vert
190.400	37.7	1.1	1.0	128.0	3.0	0.0	Horz	QP	0.0	38.8	43.5	-4.7	Tx 13.56 MHz, EUT Vert
17997.830	26.9	20.4	1.5	172.0	3.0	0.0	Horz	AV	0.0	47.3	54.0	-6.7	Tx 13.56 MHz, EUT Vert
17950.140	26.9	20.3	1.5	93.0	3.0	0.0	Vert	AV	0.0	47.2	54.0	-6.8	Tx 13.56 MHz, EUT Vert
164.575	34.3	1.8	1.0	360.0	3.0	0.0	Horz	QP	0.0	36.1	43.5	-7.4	Tx 13.56 MHz, EUT Vert
40.682	23.3	7.9	1.0	96.0	3.0	0.0	Horz	QP	0.0	31.2	40.0	-8.8	Tx 13.56 MHz, EUT Vert
40.683	22.4	7.9	1.0	63.0	3.0	0.0	Vert	QP	0.0	30.3	40.0	-9.7	Tx 13.56 MHz, EUT Vert
834.603	14.4	16.8	1.2	247.0	3.0	0.0	Horz	QP	0.0	31.2	46.0	-14.8	Tx 13.56 MHz, EUT Vert
54.380	22.9	1.7	1.0	21.0	3.0	0.0	Horz	QP	0.0	24.6	40.0	-15.4	Tx 13.56 MHz, EUT Vert
17997.830	38.0	20.4	1.5	172.0	3.0	0.0	Horz	PK	0.0	58.4	74.0	-15.6	Tx 13.56 MHz, EUT Vert
17948.960	37.7	20.3	1.5	93.0	3.0	0.0	Vert	PK	0.0	58.0	74.0	-16.0	Tx 13.56 MHz, EUT Vert
42.644	16.4	7.0	1.0	51.0	3.0	0.0	Vert	QP	0.0	23.4	40.0	-16.6	Tx 13.56 MHz, EUT Horz
42.489	15.9	7.1	1.0	347.0	3.0	0.0	Vert	QP	0.0	23.0	40.0	-17.0	Tx 13.56 MHz, EUT on Side
696.692	14.2	13.9	2.0	331.0	3.0	0.0	Horz	QP	0.0	28.1	46.0	-17.9	Tx 13.56 MHz, EUT Vert
379.706	21.3	6.6	3.7	72.0	3.0	0.0	Horz	QP	0.0	27.9	46.0	-18.1	Tx 13.56 MHz, EUT Vert
42.271	14.6	7.2	1.0	18.0	3.0	0.0	Horz	QP	0.0	21.8	40.0	-18.2	Tx 13.56 MHz, EUT Horz
41.717	14.3	7.4	1.0	144.0	3.0	0.0	Horz	QP	0.0	21.7	40.0	-18.3	Tx 13.56 MHz, EUT on Side
67.808	22.2	-2.0	3.3	31.0	3.0	0.0	Horz	QP	0.0	20.2	40.0	-19.8	Tx 13.56 MHz, EUT Vert
57.273	16.8	0.6	2.3	246.0	3.0	0.0	Horz	QP	0.0	17.4	40.0	-22.6	Tx 13.56 MHz, EUT Vert
11559.910	33.0	-4.5	1.5	14.0	3.0	0.0	Horz	AV	0.0	28.5	54.0	-25.5	Tx 13.56 MHz, EUT Vert
1716.117	42.4	-15.7	1.5	158.0	3.0	0.0	Vert	AV	0.0	26.7	54.0	-27.3	Tx 13.56 MHz, EUT Vert
1716.158	42.2	-15.7	2.6	280.0	3.0	0.0	Horz	AV	0.0	26.5	54.0	-27.5	Tx 13.56 MHz, EUT Horz
1719.458	41.1	-15.7	1.5	207.0	3.0	0.0	Horz	AV	0.0	25.4	54.0	-28.6	Tx 13.56 MHz, EUT On Side
1718.192	41.0	-15.7	1.5	231.0	3.0	0.0	Vert	AV	0.0	25.3	54.0	-28.7	Tx 13.56 MHz, EUT On Side
1717.575	40.9	-15.7	2.3	90.0	3.0	0.0	Vert	AV	0.0	25.2	54.0	-28.8	Tx 13.56 MHz, EUT Horz
1716.458	40.7	-15.7	2.5	48.0	3.0	0.0	Horz	AV	0.0	25.0	54.0	-29.0	Tx 13.56 MHz, EUT Vert
11561.930	44.2	-4.5	1.5	14.0	3.0	0.0	Horz	PK	0.0	39.7	74.0	-34.3	Tx 13.56 MHz, EUT Vert
1718.558	52.5	-15.7	1.5	158.0	3.0	0.0	Vert	PK	0.0	36.8	74.0	-37.2	Tx 13.56 MHz, EUT Vert
1719.175	52.2	-15.7	2.6	280.0	3.0	0.0	Horz	PK	0.0	36.5	74.0	-37.5	Tx 13.56 MHz, EUT Horz
1714.783	52.2	-15.7	1.5	207.0	3.0	0.0	Horz	PK	0.0	36.5	74.0	-37.5	Tx 13.56 MHz, EUT On Side
1717.550	51.8	-15.7	2.3	90.0	3.0	0.0	Vert	PK	0.0	36.1	74.0	-37.9	Tx 13.56 MHz, EUT Horz
1719.300	51.8	-15.7	1.5	231.0	3.0	0.0	Vert	PK	0.0	36.1	74.0	-37.9	Tx 13.56 MHz, EUT On Side
1717.017	51.7	-15.7	2.5	48.0	3.0	0.0	Horz	PK	0.0	36.0	74.0	-38.0	Tx 13.56 MHz, EUT Vert

CONCLUSION Pass

Tested By



PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.





TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

A near-field probe was placed near the transmitter. A low-loss coaxial cable was used to connect the near-field probe to the spectrum analyzer.

The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made on the single transmit frequency as called out on the data sheets. Testing was done while the EUT was continuously polling.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage while at ambient temperature. Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range of -20° to $+50^{\circ}$ C and at 10° C intervals.

The requirement of a frequency tolerance of $\pm 0.01\%$ is equivalent to 100 ppm The formula to check for compliance is:

ppm = (Measured Frequency / Measured Nominal Frequency - 1) * 1,000,000

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
				2025-03-	2026-03-
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFJ	03	03
				2023-11-	2026-11-
Generator - Signal	Agilent	E8257D	TGU	08	08
				2024-10-	2025-10-
Cable	Element	None	OC5	02	02
Probe - Near Field Set	EMCO	7405	IPI	NCR	NCR
				2024-11-	2025-11-
Thermometer	Omega Engineering, Inc.	iTHx-SD-5	DVF	11	11
			DVF	2024-11-	2025-11-
Probe - Temperature/Humidity	Omega Engineering, Inc.	iTHP-5-DB9	А	11	11
Chamber -	Cincinnati Sub Zero	ZPHS-32-3.5-			
Temperature/Humidity	(CSZ)	SCT/AC	TBE	NCR	NCR



EUT:	SmartFill Gen 3 FMS	Work Order:	FDMT0001
Serial Number:	12374	Date:	2025-04-03
Customer:	Fluid Management Technology Pty Ltd	Temperature:	21.2°C
Attendees:	None	Relative Humidity:	45.3%
Customer Project:	None	Bar. Pressure (PMSL):	1013 mbar
Tested By:	Matthew Ng	Job Site:	OC13
Power:	110VAC/60Hz	Configuration:	FDMT0001-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2025	ANSI C63.10:2013

COMMENTS

NFC Board Rev 2.1, LTE module with 3x antennas

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.56 MHz RFID, ISO/IEC 14443 Type A					
Normal Conditions (110VAC/60Hz)	13.5680625	13.5680625	0	100	Pass
Extreme Voltage 115% (126.5VAC/60Hz)	13.569375	13.5680625	96.73	100	Pass
Extreme Voltage 85% (93.5VAC/60Hz)	13.56925	13.5680625	87.52	100	Pass
Extreme Temperature +50°C	13.569375	13.5680625	96.73	100	Pass
Extreme Temperature +40°C	13.5693125	13.5680625	92.13	100	Pass
Extreme Temperature +30°C	13.5693125	13.5680625	92.13	100	Pass
Extreme Temperature +20°C	13.568625	13.5680625	41.46	100	Pass
Extreme Temperature +10°C	13.569125	13.5680625	78.31	100	Pass
Extreme Temperature +0°C	13.5684375	13.5680625	27.64	100	Pass
Extreme Temperature -10°C	13.5685625	13.5680625	36.85	100	Pass
Extreme Temperature -20°C	13.5688125	13.5680625	55.28	100	Pass





13.56 MHz RFID, ISO/IEC 14443 Type A Normal Conditions



13.56 MHz RFID, ISO/IEC 14443 Type A Extreme Voltage 85%



13.56 MHz RFID, ISO/IEC 14443 Type A Extreme Temperature +40°C



13.56 MHz RFID, ISO/IEC 14443 Type A Extreme Voltage 115%



13.56 MHz RFID, ISO/IEC 14443 Type A Extreme Temperature +50°C









13.56 MHz RFID, ISO/IEC 14443 Type A Extreme Temperature +20°C



13.56 MHz RFID, ISO/IEC 14443 Type A Extreme Temperature +0°C



13.56 MHz RFID, ISO/IEC 14443 Type A Extreme Temperature -20°C



13.56 MHz RFID, ISO/IEC 14443 Type A Extreme Temperature +10°C



13.56 MHz RFID, ISO/IEC 14443 Type A Extreme Temperature -10°C



End of Test Report