Report on the FCC and IC Testing of the SATcase Limited SATcase. Model: SC01 In accordance with FCC 47 CFR Part 15B and RSS-GEN

Product Service

Choose certainty.
Add value.

Prepared for: SATcase
Baird Lane
Heslington
York
YO10 5GA
United Kingdom

FCC ID: 2AM7Y-SC01
ICES: 23028-SC01

COMMERCIAL-IN-CONFIDENCE

Date: January 2018
Document Number: 75938844-05 | Issue: 01

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Steven White	09 January 2018	
Authorised Signatory	Nic Forsythe	09 January 2018	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT
The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B and RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Graeme Lawler	09 January 2018	

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15B: 2016 and Industry Canada RSS-GEN: Issue 4, November 2014.

TÜV SÜD Product Service
is a trading name of TUV SUD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TUV SUD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

TÜV SÜD Product Service
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom

Product Service

Contents

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	09 January 2018

Table 1

1.2 Introduction

Applicant	SATcase Limited
Manufacturer	SATcase Limited
Model Number(s)	SC01
Serial Number(s)	300125060276200
Hardware Version(s)	V1.1
Software Version(s)	V0.0.190
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2016 Industry Canada RSS-GEN: Issue 4, November 2014
Order Number Date	5612 20-April-2017
Date of Receipt of EUT	25-October-2017
Start of Test	15-November-2017
Finish of Test	15-November-2017
Name of Engineer(s)	Graeme Lawler
Related Document(s)	ANSI C63.4 (2014)

Product Service

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15B and RSS-GEN is shown below.

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 15B	RSS-GEN			
Configuration and Mode: GPS Receiving					
2.1	15.107	8.8	AC Power Line Conducted Emissions	Pass	ANSI C63.4
2.2	15.109	7.1	Radiated Emissions	Pass	ANSI C63.4

Table 2

Product Service

1.4 Application Form

1.1 DECLARATION OF BUILD STATUS

Manufacturer	SATcase LTD (Agent Draw LTD/ DJ Assembly LTD)
Country of origin	England
UK Agent	SATcase LTD
Technical Description	A satellite phone that integrates smartphone technology to make calls, send text messages and SOS requests. This device is Mil810 and IP68.
Model No	SC01
Part No	n/a
Serial No	As per device
Drawing Number	SC01-CASEF001 SC01-CASER001 SC01-PODF001 SC01-PODR001
Build Status	T1 – Final Production Stage
Software Issue	V0.0.190
Hardware Issue	V1.1
Highest Internally Generated Frequency	1625.47 MHz
FCC ID	2AM7Y-SC01
Industry Canada ID	23028-SC01
Signature	Darren Brook
Date	11 Oct 2017
D of B S Serial No	

.

1.5 Product Information

1.5.1 Technical Description

A satellite phone that integrates smartphone technology to make calls, send text messages and SOS requests. This device is Mil810 and IP68.

1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.
The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: 300125060276200			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.8 Test Location

TÜV SÜD Product Service conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: GPS Receiving		
AC Power Line Conducted Emissions	Graeme Lawler	UKAS
Radiated Emissions	Graeme Lawler	UKAS

Table 4

Office Address:

Octagon House
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL
United Kingdom

2 Test Details

2.1 AC Power Line Conducted Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.107
Industry Canada RSS-GEN, Clause 8

2.1.2 Equipment Under Test and Modification State

SC01, S/N: 300125060276200 - Modification State 0

2.1.3 Date of Test

15-November-2017

2.1.4 Test Method

The test was performed in accordance with ANSI C63.4, clause 7.

2.1.5 Environmental Conditions

Ambient Temperature	17.1 °C
Relative Humidity	53.0 %

2.1.6 Test Results

GPS Receiving

Applied supply voltage: 60 Hz
Applied supply frequency: 120 Vac

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.150	34.9	66.0	-31.1	13.8	56.0	-42.2
0.200	32.9	63.6	-30.7	13.8	53.6	-39.8
0.225	27.8	62.6	-34.9	12.9	52.6	-39.8
0.271	23.3	61.1	-37.8	12.8	51.1	-38.3
0.376	16.1	58.4	-42.2	6.8	48.4	-41.5
0.466	11.4	56.6	-45.2	6.8	46.6	-39.8
0.530	18.2	56.0	-37.8	6.1	46.0	-39.9

Table 5 - Live Line Emissions Results

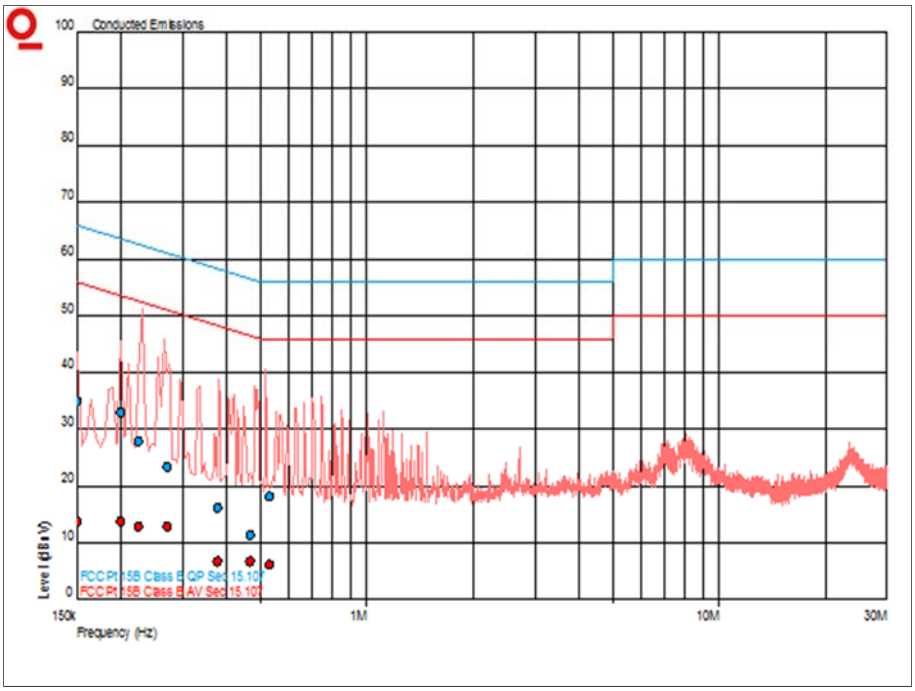

Figure 1 - Live Line - 150 kHz to 30 MHz

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.150	36.4	66.0	-29.6	18.0	56.0	-38.0
0.196	29.1	63.8	-34.7	23.1	53.8	-30.6
0.231	24.0	62.4	-38.4	14.4	52.4	-38.0
0.340	21.6	59.2	-37.6	8.6	49.2	-40.6
0.401	20.7	57.8	-37.2	16.4	47.8	-31.5
0.481	13.2	56.3	-43.1	6.1	46.3	-40.2

Table 6 - Neutral Line Emissions Results

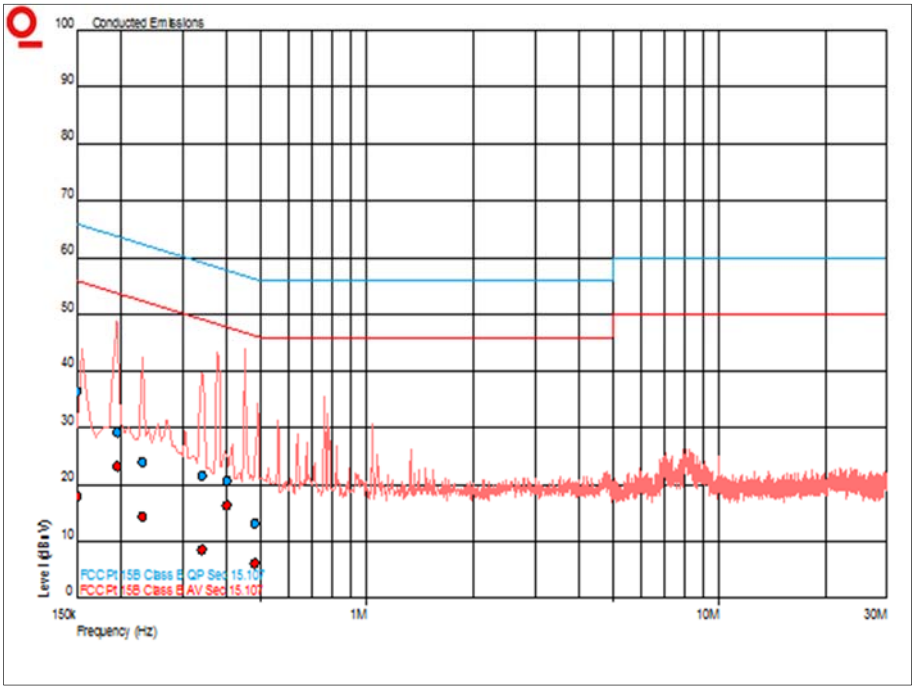

Figure 2 - Neutral Line - 150 kHz to 30 MHz

FCC 47 CFR Part 15, Limit Clause 15.107 and and RSS-GEN, Limit Clause 8.8

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

Table 7

*Decreases with the logarithm of the frequency.

2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Transient Limiter	Hewlett Packard	11947A	15	12	30-May-2018
Test Receiver	Rohde & Schwarz	ESIB26	242	12	19-Jun-2018
LISN (1 Phase)	Chase	MN 2050	336	12	07-Apr-2018
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Hygrometer	Rotronic	HYGROPALM 1	2338	12	24-Oct-2018
Multimeter	Iso-tech	IDM101	2417	12	02-Oct-2018

Table 8

2.2 Radiated Emissions

2.2.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.109
Industry Canada RSS-GEN, Clause 7.

2.2.2 Equipment Under Test and Modification State

SC01, S/N: 300125060276200 - Modification State 0

2.2.3 Date of Test

15-November-2017

2.2.4 Test Method

The test was performed in accordance with ANSI C63.4, clause 8.

2.2.5 Environmental Conditions

Ambient Temperature	17.1 °C
Relative Humidity	53.0 %

2.2.6 Test Results

GPS Receiving

Highest frequency generated or used within the EUT: 1625.47 MHz
Upper frequency test limit: 13 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
34.104	31.0	40.0	-9.0	257	1.00	Vertical
43.290	27.8	40.0	-12.2	264	2.14	Vertical
200.732	29.3	43.5	-14.2	229	1.00	Horizontal
200.836	36.9	43.5	-6.6	302	1.00	Vertical
202.174	38.7	43.5	-4.8	310	1.00	Vertical
603.297	31.1	46.0	-14.9	27	1.17	Horizontal
605.841	31.4	46.0	-14.6	360	1.00	Vertical
713.664	32.9	46.0	-13.1	202	1.00	Vertical

Table 9 - 30 MHz to 1 GHz

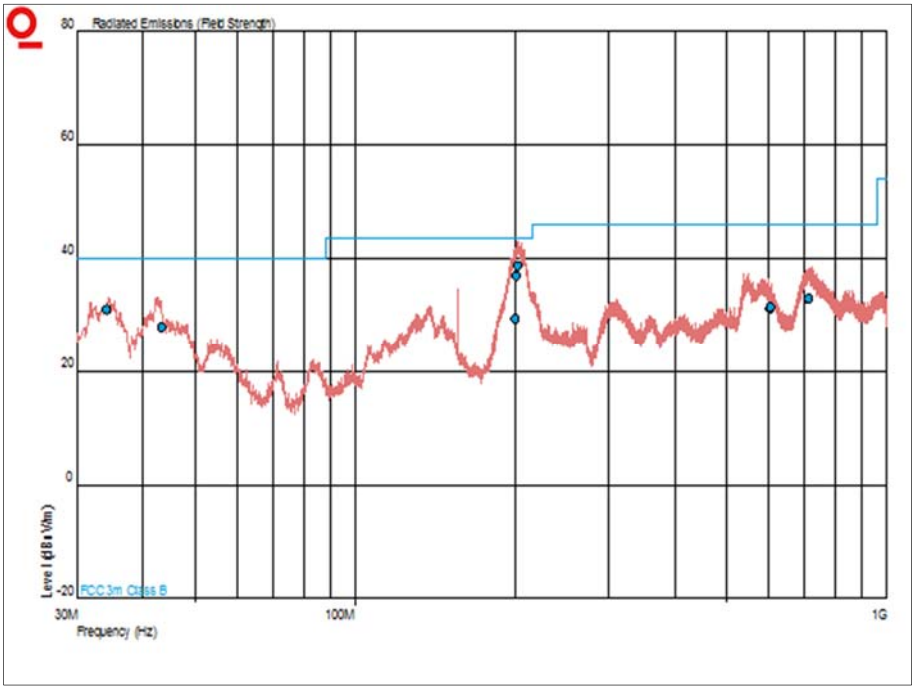

Figure 3 - 30 MHz to 1 GHz - Horizontal and Vertical

Frequency (GHz)	Result (µV/m)		Limit (µV/m)		Margin (µV/m)		Angle (°)	Height (m)	Polarisation
	Peak	Average	Peak	Average	Peak	Average			
2.401923	2200.39	34.11	5000	500	2799.61	465.89	320	1.00	Horizontal
2.426340	2259.44	33.42	5000	500	2740.56	466.58	318	1.00	Horizontal
2.480143	2123.24	34.16	5000	500	2876.76	465.84	306	1.00	Horizontal

Table 10 - 1 GHz to 13 GHz

No other emissions were detected within 10 dB of the limit.

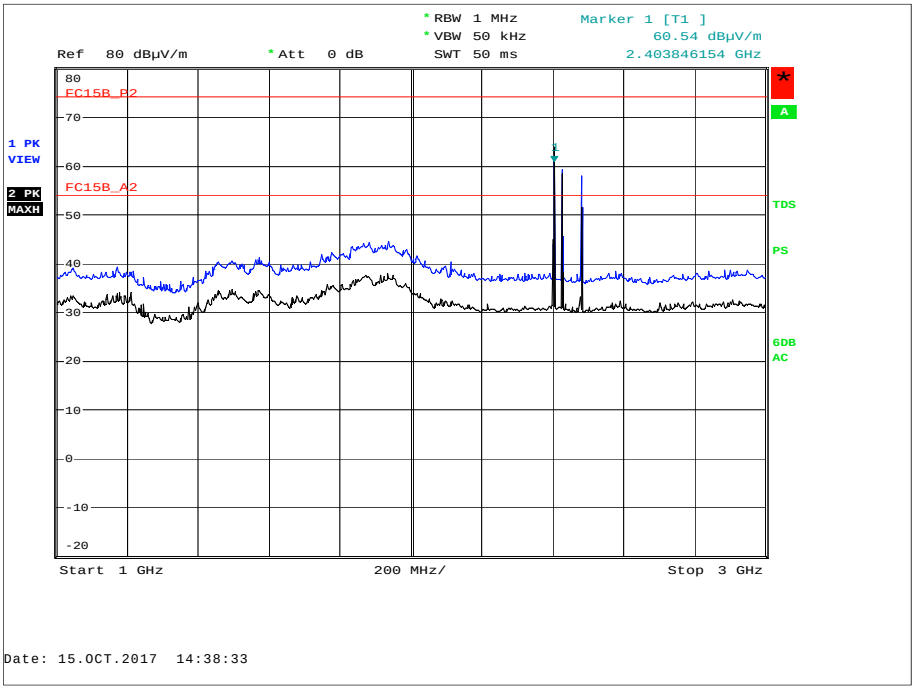

Figure 4 - 1 GHz to 3 GHz - Horizontal and Vertical

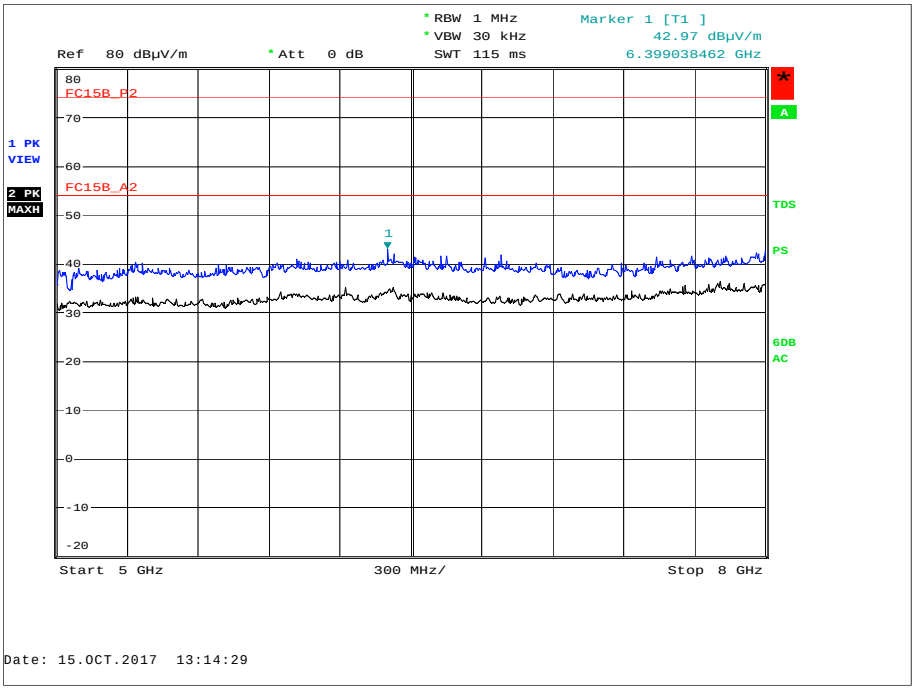

Figure 5 - 3 GHz to 8 GHz - Horizontal and Vertical

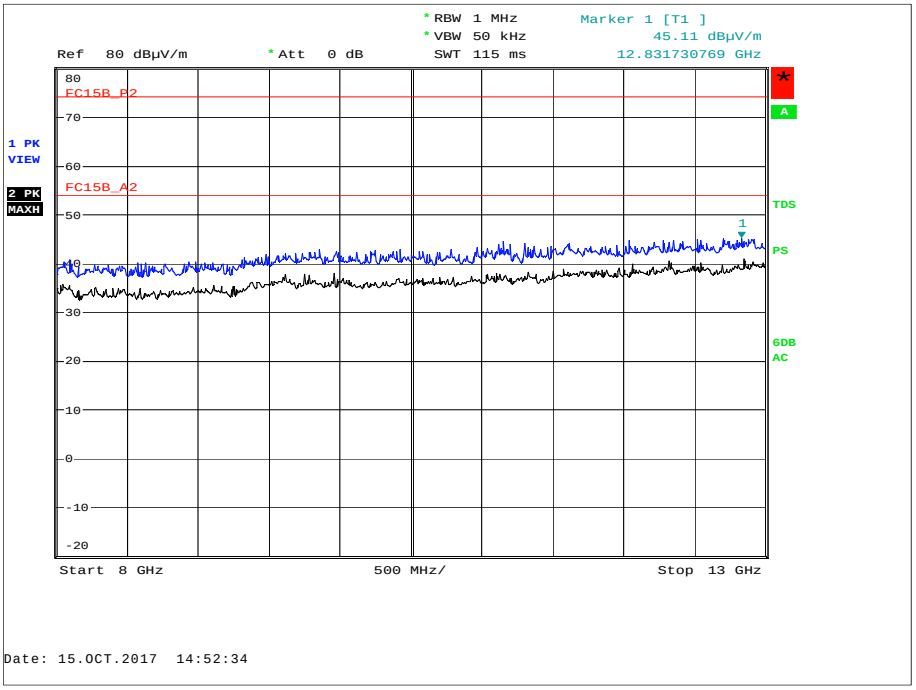

Figure 6 - 8 GHz to 13 GHz - Horizontal and Vertical

FCC 47 CFR Part 15, Limit Clause 15.109 and RSS-GEN, Limit Clause 7.1.2

Frequency of Emission (MHz)	Field Strength (µV/m)
30 to 88	100.0
88 to 216	150.0
216 to 960	200.0
Above 960	500.0

2.2.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Test Receiver	Rohde & Schwarz	ESIB26	242	12	19-Jun-2018
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Apr-2018
Pre-Amplifier	Phase One	PS04-0086	1533	12	31-Jul-2018
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygrometer	Rotronic	HYGROPALM 1	2338	12	24-Oct-2018
Multimeter	Iso-tech	IDM101	2417	12	02-Oct-2018
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	02-May-2018
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
Digital thermo Hygrometer	Radio Spares	1260	4300	12	30-Aug-2018
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	18-Oct-2018
Cable (Yellow, Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4527	6	04-Dec-2017
EMI Receiver	Keysight Technologies	N9038A MXE	4628	12	22-Jun-2018
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	17-Feb-2018

Table 11

TU - Traceability Unscheduled

3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
AC Power Line Conducted Emissions	150 kHz to 30 MHz, LISN, ±3.7 dB
Radiated Emissions	30 MHz to 1 GHz: ±5.2 dB 1 GHz to 40 GHz: ±6.3 dB

Table 12