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EMC TEST REPORT

TEST STANDARD(S)	:	ETSI EN 301 489-1: V2.1.1 (2017-02) DMR EMC Requirements
CLIENT / APPLICANT	:	Advanced Comms (Pty) Ltd.
TEST SAMPLE (EUT)	:	Kutta Medium frequency radio & Charger
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T0812

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ABBREVIATIONS

AAN	Asymmetric Artificial Network
AC	Associated Equipment
AM	Amplitude Modulation
AMN	Artificial Mains Network
AVE	Average
CDN	Coupling/ Decoupling Network
CISPR	International special committee on radio interference
CSIR	Council for Scientific and Industrial Research
E-Fields	Electric Fields
EFT	Electrical Fast Transients
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
ESD	Electrostatic Discharge
EUT	Equipment Under Test
FAR	Fully Anechoic Room
H	Horizontal
HCP	Horizontal Coupling Plane
LAN	Local Area Network
MME	Multimedia Equipment
NIST	National Institute of Science and Technology
NMISA	National Metrology Institute of South Africa
NSA	Normalized Site Attenuation
OATS	Open Area Test Site
PC	Personal Computer
QP	Quasi-Peak
RGP	Reference Ground Plane
RF	Radio Frequency
SANAS	South African National Accreditation System
UHF	Ultra-High Frequency
V	Vertical
VCP	Vertical Coupling Plane

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1. INTRODUCTION

This report details the results of tests performed on the Kutta Medium frequency radio & charger, henceforth referred to as Equipment Under Test (**EUT**). The EUT was tested between 20 – 24 November 2017 according to the following standards:

2. STANDARDS APPLIED

- DMR requirements for safety critical equipment as listed in Government Gazette 32885 of January 22, 2010
- ETSI EN 301 489-1 V2.1.1 (2017-02) '*Electromagnetic compatibility and Radio Spectrum Matters (ERM)*
- SANS 211 (2011) / CISPR 11 (2010 +A1:2010): 'Industrial, scientific and Medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement'

3. SUMMARY OF TEST RESULTS

Table 4.1-1: Emissions results

EMISSIONS:		
Standard	Test Type	Results
SANS 211 / CISPR 11	Radiated emissions	Pass
	Conducted emissions input power	Pass
SANS / IEC 61000-3-2	Harmonic current emissions	Less than 75W - N/A
SANS / IEC 61000-3-3	Voltage fluctuation & flicker	Pass

Table 4.1-2: Immunity results

IMMUNITY:			
Standard	Test Type	DMR	ETSI EN 301 489-1
SANS / IEC 61000-4-2	Electrostatic discharge immunity test	Pass	Pass
SANS / IEC 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test	Pass	Pass
SANS / IEC 61000-4-4	Immunity to Electrical Fast Transient	Pass	Pass
SANS / IEC 61000-4-5	Immunity to Surges	Pass	Pass
SANS / IEC 61000-4-6	Immunity to Conducted Disturbances	Pass	Pass
SANS / IEC 61000-4-8	Power frequency magnetic immunity test	Pass	N/A
SANS / IEC 61000-4-9	Pulse magnetic field immunity test	Pass	N/A
SANS / IEC 61000-4-11	Voltage dips	Pass	Pass
SANS / IEC 61000-4-11	Voltage interruptions	Pass	Pass

- The EUT meets all the requirements of the standards applied

4. EMISSION CLASSES AND IMMUNITY CRITERIA

4.1 EMISSIONS

CISPR 11 Separation into groups

Group 1 equipment: group 1 contains all equipment in the scope of this standard which is not classified as group 2 equipment.

Group 2 equipment: group 2 equipment contains all ISM RF equipment in which radio-frequency energy in the frequency range 9 kHz to 400 GHz is intentionally generated and used or only used, in the form of electromagnetic radiation, inductive and / or capacitive coupling, for the treatment of material or inspection / analysis purposes

Division into classes

Class A ISM equipment is equipment suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

Class A equipment shall meet class A limits.

Warning:

This equipment is compliant with Class A of SANS 211 / CISPR 11. In a residential environment this equipment may cause interference

Class B ISM equipment is equipment suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

Class B equipment shall meet class B limits.

4.2 IMMUNITY CRITERIA

4.2.1 Immunity

The Criteria set-out above are defined as follows:

Criteria A: normal performance within limits specified by the manufacturer, requestor or purchaser;

Criteria B: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention;

Criteria C: temporary loss of function or degradation of performance, the correction of which requires operator intervention;

5. ENVIRONMENTAL CONDITIONS DURING ESD TEST:

- Temperature: 22 - 23°C
- Relative Humidity: 45 - 53%

6. CALIBRATION OF TEST EQUIPMENT

The computer controlled EMI Measuring system is checked for amplitude and frequency accuracy with a signal generator (calibrated by a SANAS accredited laboratory and is traceable to the national standards maintained by NMISA) on a monthly basis. The calibration of the equipment is performed by Coral-I, Precision Measurements and Enterprise, University of Pretoria. All equipment Calibration Certificates are available on request.

7. MEASUREMENT OF UNCERTAINTY

ISO / IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions results be included in the test report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor of $k = 2$)

Measurement Uncertainty		
Test Item	Frequency	Uncertainty
Conducted Emissions from the AC mains power ports	150kHz – 30MHz	± 3.40
Radiated emissions	30 – 1GHz	± 5.16
	Above 1GHz	± 4.06

8. EQUIPMENT UNDER TEST

8.1 EUT IDENTIFICATION

EUT name:	Kutta Medium frequency radio
Serial number:	-
Model number:	DRUM 100 RCP

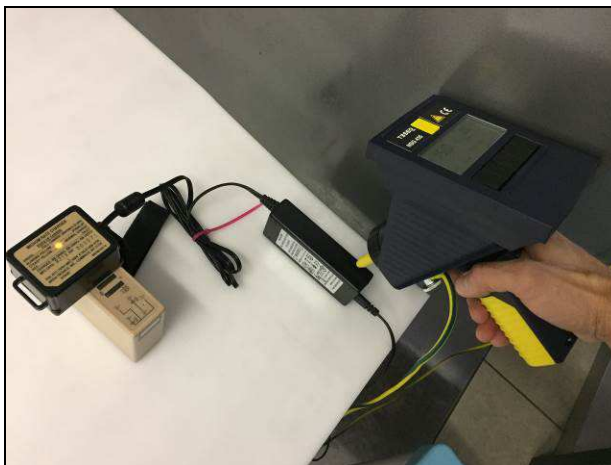
8.2 EUT TEST SETUP DETAIL:

The specific test methodology will be discussed under each relevant test if different to the general set-up guidelines below.

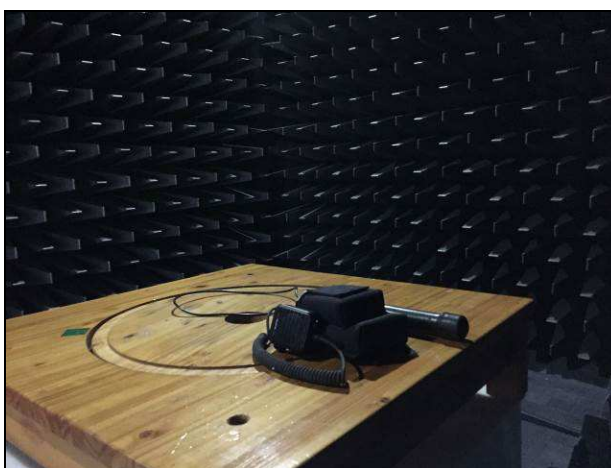
- The EUT was switched on and operated in accordance with the manufacturer instructions.
- Tests were performed while the device was fully operational.
- A second Kutta radio was used to verify continuous operation and voice quality.
- The EUT was connected to a Drum rod antenna
- Deviations from the above set-up will be noted in each specific case.



8.3 SETUP IMAGES



SANS / IEC 61000-4-2: ESD immunity test set-up



SANS / IEC 61000-4-3: Radiated immunity test set-up



SANS / IEC 61000-4-8: Power frequency magnetic immunity test set-up

9. EMISSIONS

9.1 RADIATED EMISSIONS:

Method: Measurements were made in an 8-meter fully anechoic chamber that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meters. The limit line was adjusted accordingly. The EUT was rotated 360° about its azimuth with the receive antenna located at a fixed height in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360°. All frequencies within 6 dB of the limit were investigated in both horizontal and vertical antenna polarity, where applicable.

9.2 TEST SET-UP

- The EUT was switched on and operated in accordance with the manufacturer instructions.
- Automated scans in the frequency band 30MHz to 6000MHz (radiated emissions) were done in order to determine compliance emission results for the EUT.

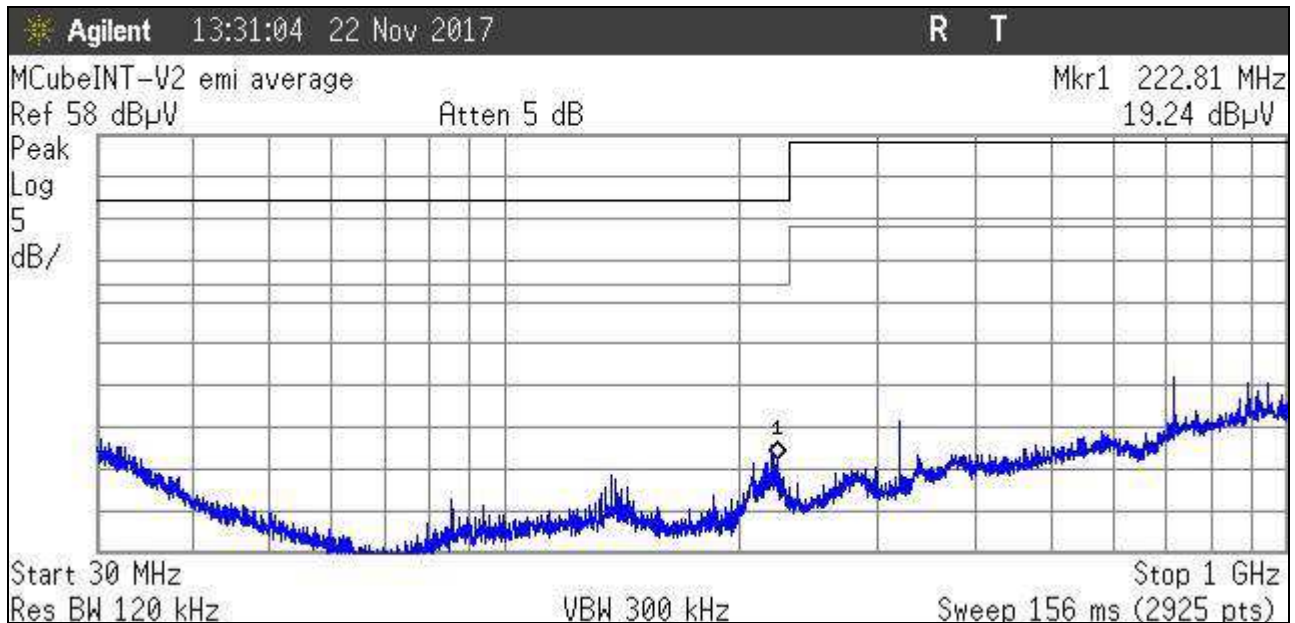
Table 9.2-1: Test equipment used for Radiated emission measurements

EQUIPMENT	SERIAL NUMBERS
Agilent E7405AEMC Spectrum analyser	MY45116923
Combilog Antenna AC-200	061128
AH Systems SAS-571	2455

9.3 RADIATED EMISSIONS RESULTS: RADIO

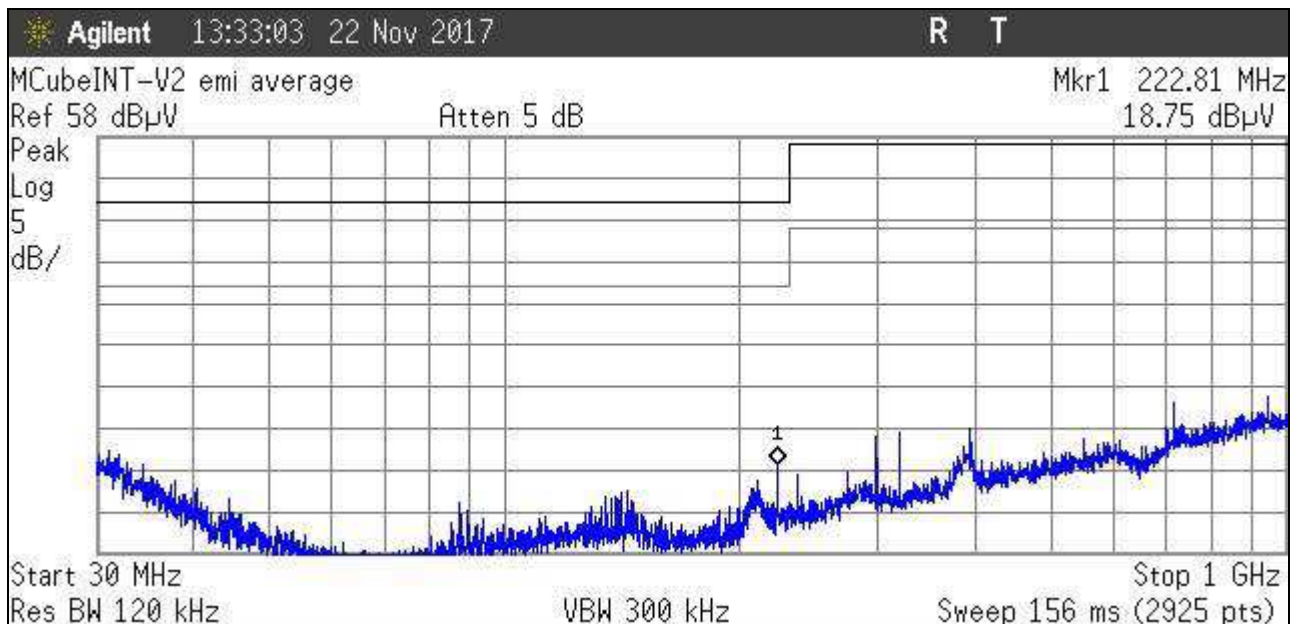
9.3.1 Radiated Emission: 30 MHz – 1000MHz (Horizontal)

Graph 1: Represents radiated emissions measured from the EUT. Peak results were below the required limit.



9.3.2 Radiated Emission: 30 MHz – 1000MHz (Vertical)

Graph 2: Represents radiated emissions measured from the EUT. Peak results were below the required limit.

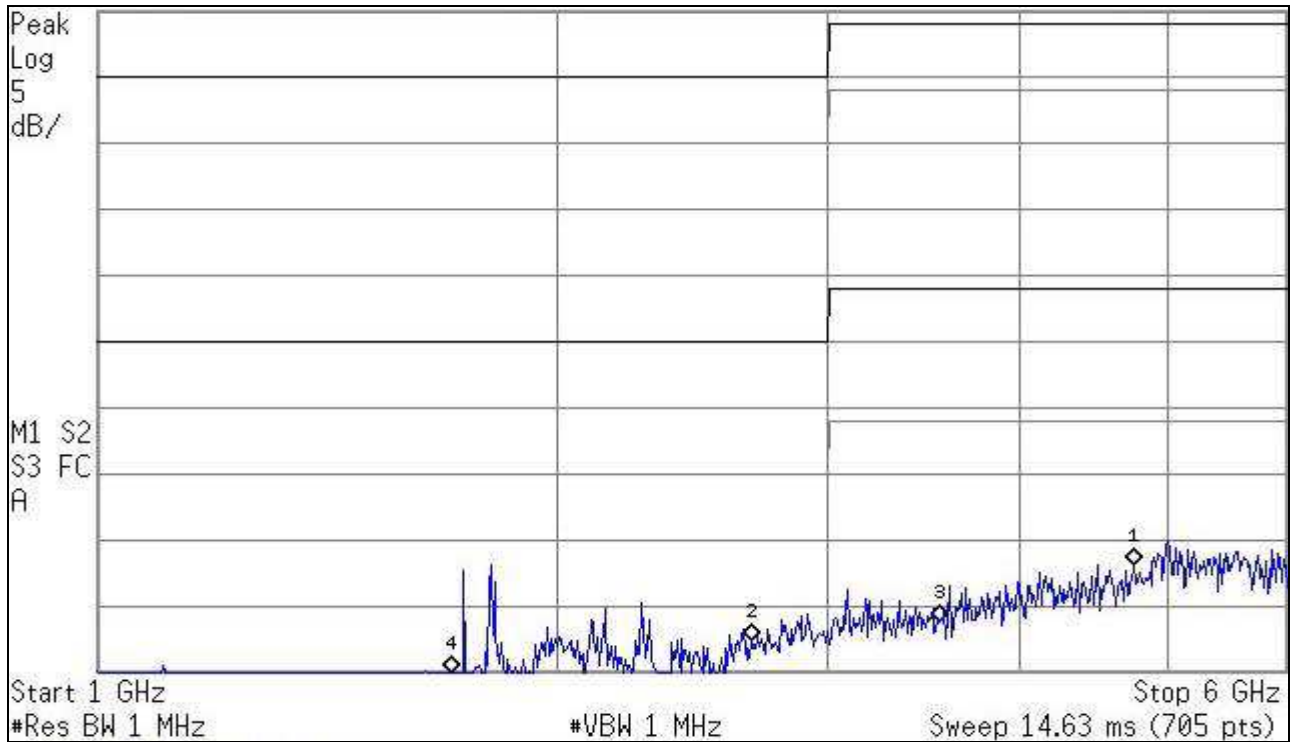


9.3.3 Conclusion

- The EUT complies with the radiated emissions requirements of SANS 211 / CISPR 11

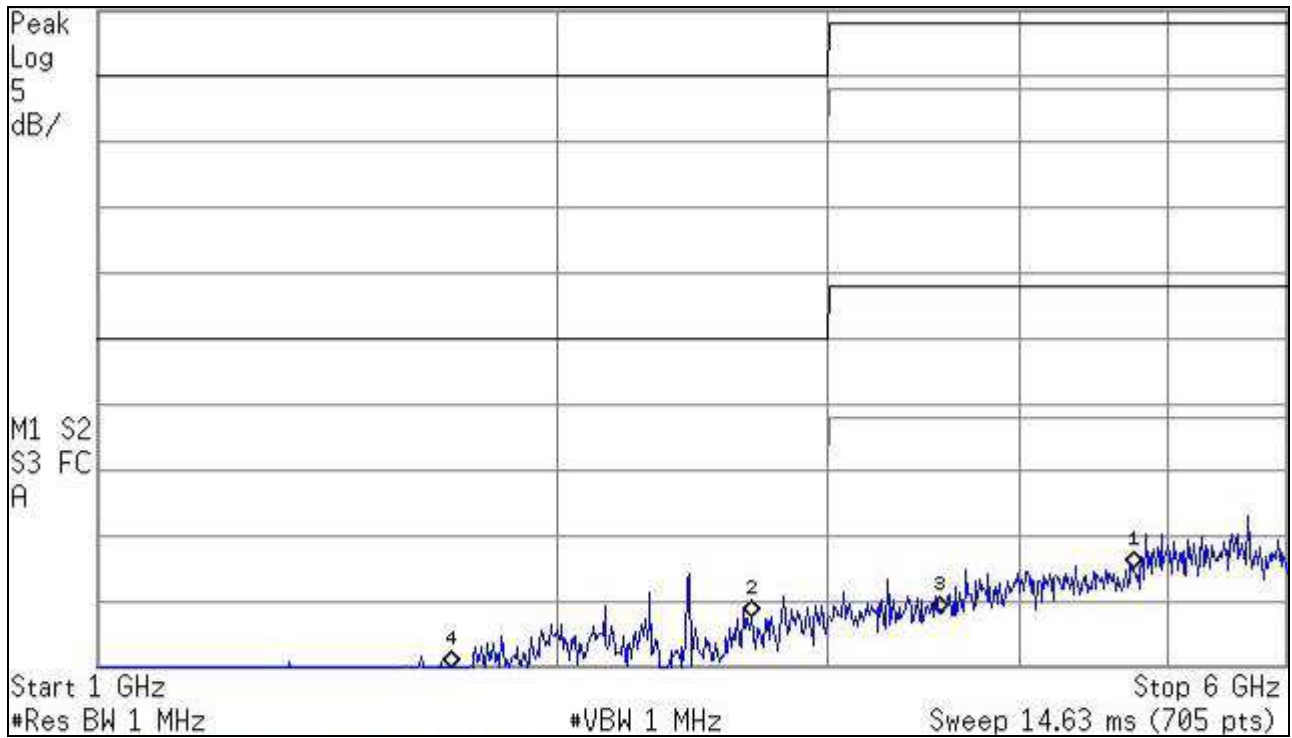
9.3.4 Radiated Emission: 1000MHz – 6000MHz (Horizontal)

Graph 3: Represents peak and average radiated emissions measured from the EUT.



9.3.5 Radiated Emission: 1000 MHz – 6000 MHz (Vertical)

Graph 4: Represents peak and average radiated emissions measured from the EUT.



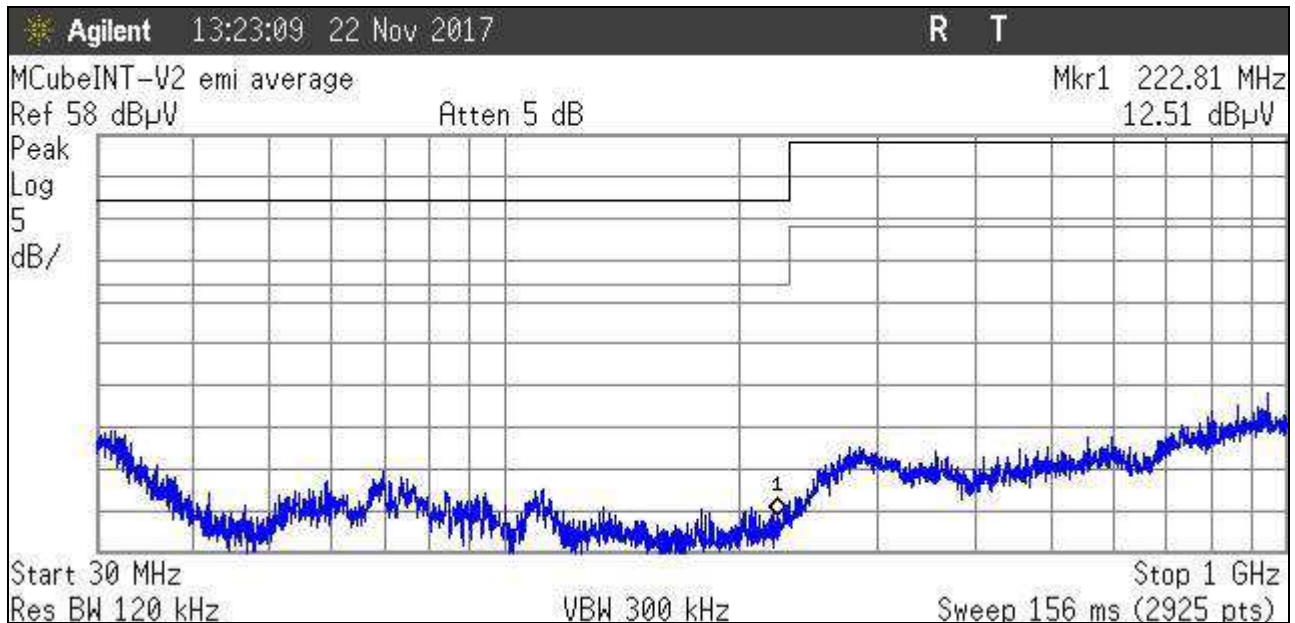
9.3.6 Conclusion

- The EUT complies with the radiated emissions requirements of SANS 222 / CISPR 22 class A

9.4 RADIATED EMISSIONS RESULTS: CHARGER

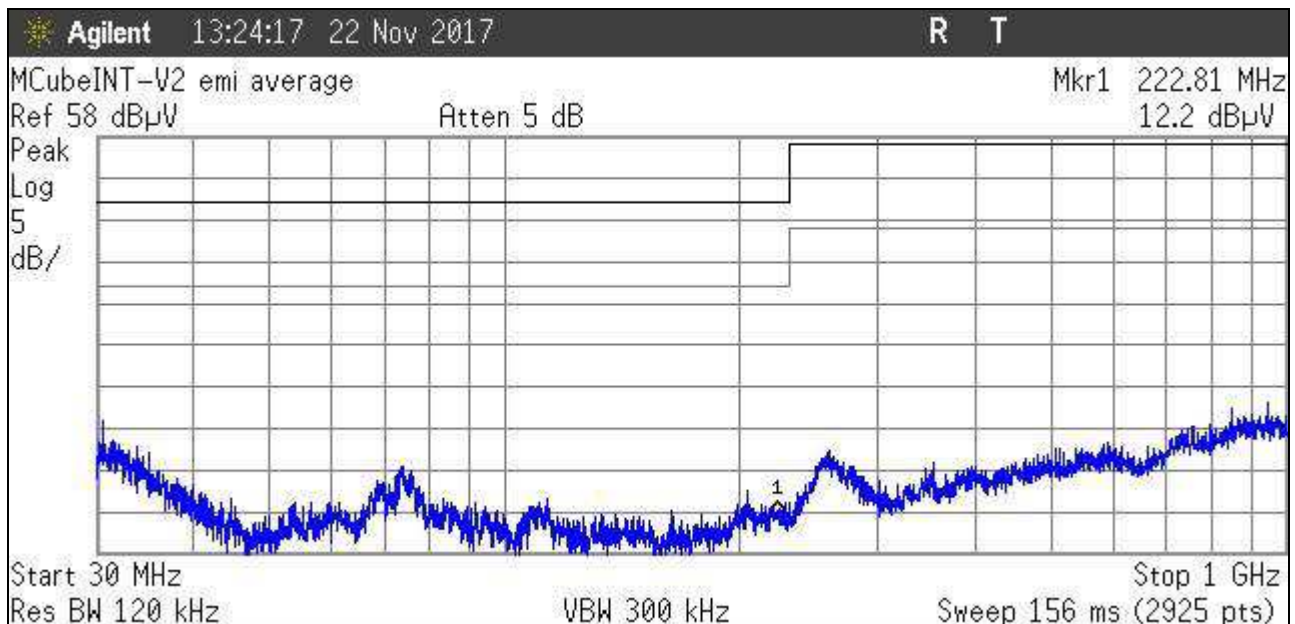
9.4.1 Radiated Emission: 30 MHz– 1000MHz (Horizontal)

Graph 5: Represents radiated emissions measured from the EUT. Peak results were below the required limit.



9.4.2 Radiated Emission: 30 MHz – 1000MHz (Vertical)

Graph 6: Represents radiated emissions measured from the EUT. Peak results were below the required limit.

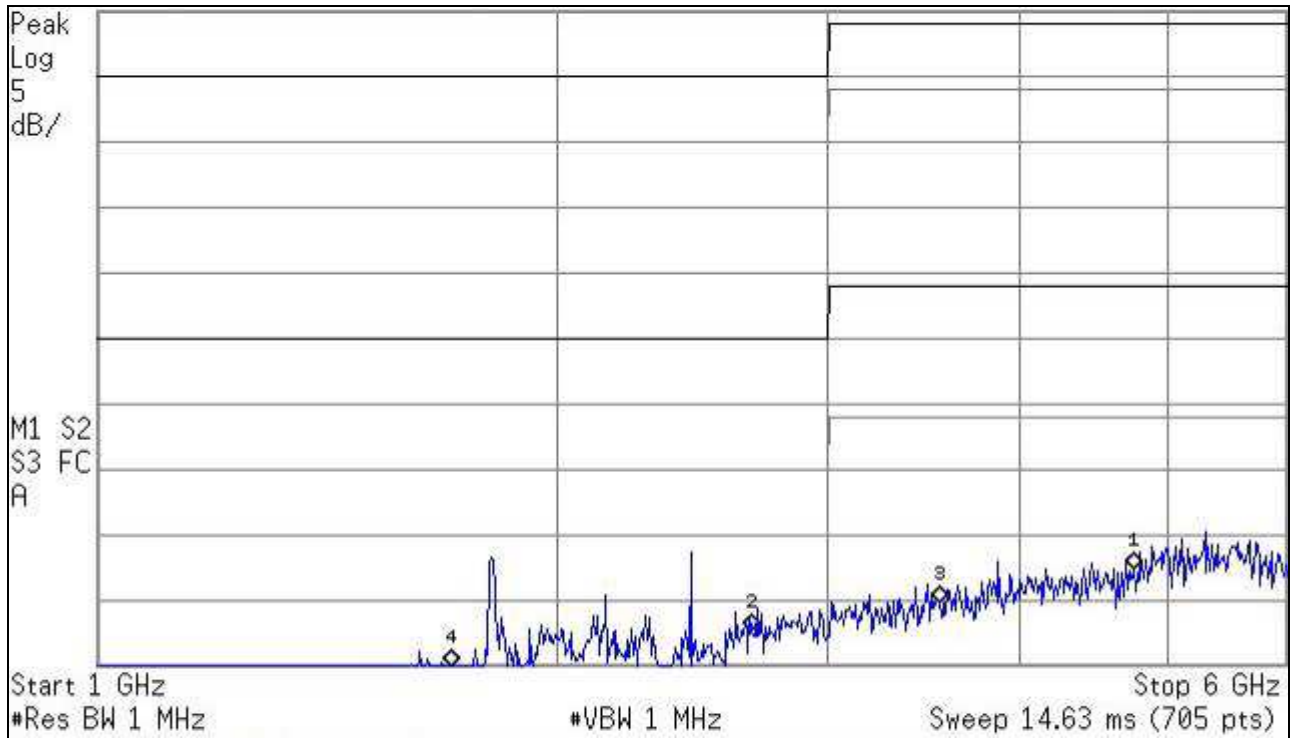


9.4.3 Conclusion

- The EUT complies with the radiated emissions requirements of SANS 211 / CISPR 11

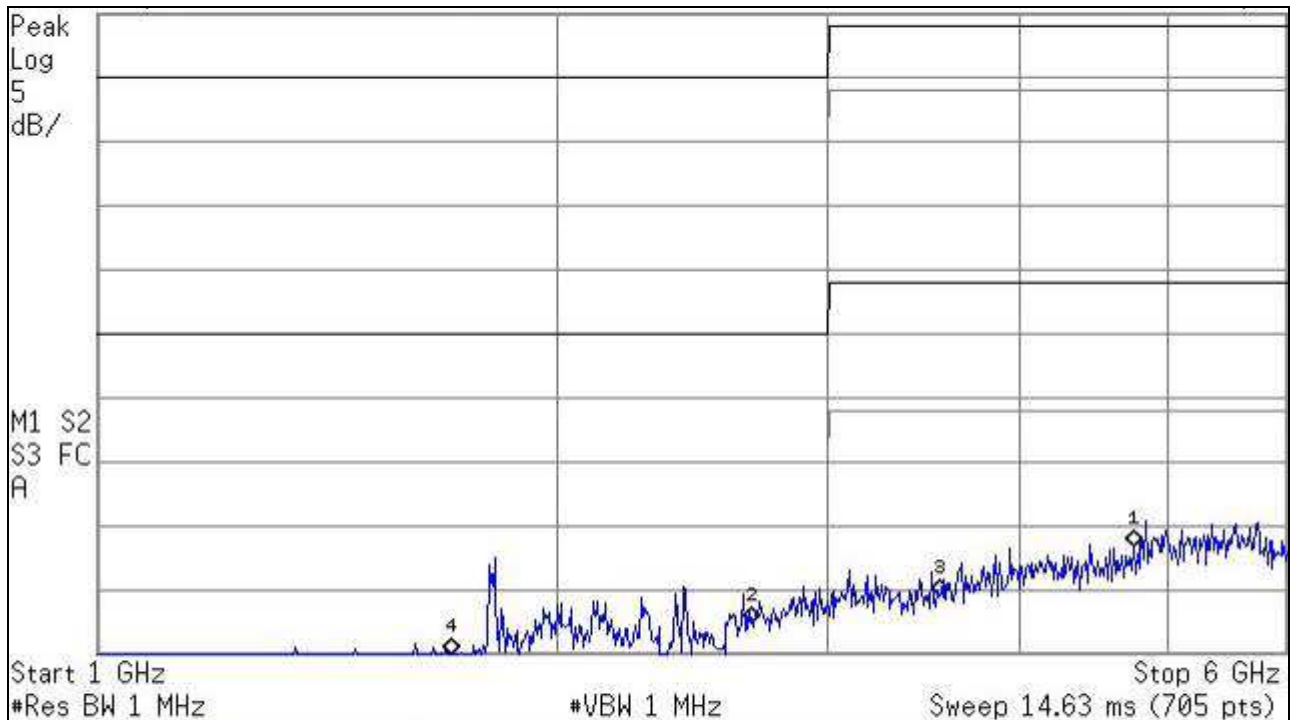
9.4.4 Radiated Emission: 1000MHz – 6000MHz (Horizontal)

Graph 7: Represents peak and average radiated emissions measured from the EUT.



9.4.5 Radiated Emission: 1000 MHz – 6000 MHz (Vertical)

Graph 8: Represents peak and average radiated emissions measured from the EUT.



9.4.6 Conclusion

- The EUT complies with the radiated emissions requirements of SANS 222 / CISPR 22 class A

9.5 CONDUCTED EMISSIONS: CHARGER

9.5.1 TEST SET-UP

- The EUT was switched on and operated in accordance with the manufacturer instructions.
- Automated scans in the frequency band 150kHz to 30MHz were done in order to determine compliance emissions results for the EUT.
- Conducted emissions were tested while supplied with an AC/DC power supply

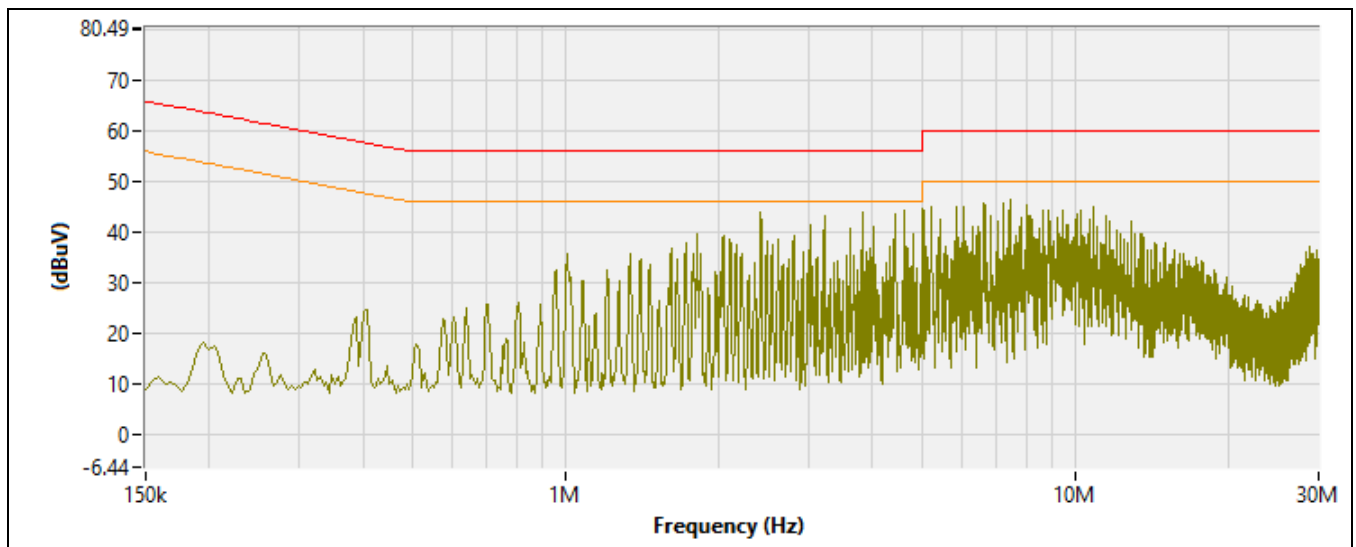
Table 9.5-1: Test equipment used for Conducted emission measurements

EQUIPMENT	SERIAL NUMBERS
Agilent E7405A EMC Spectrum analyser	MY45116923
EMCO 3810/2 single phase LISN	00069452
Impulse limiter Agilent	100732

9.6 CONDUCTED EMISSIONS RESULTS

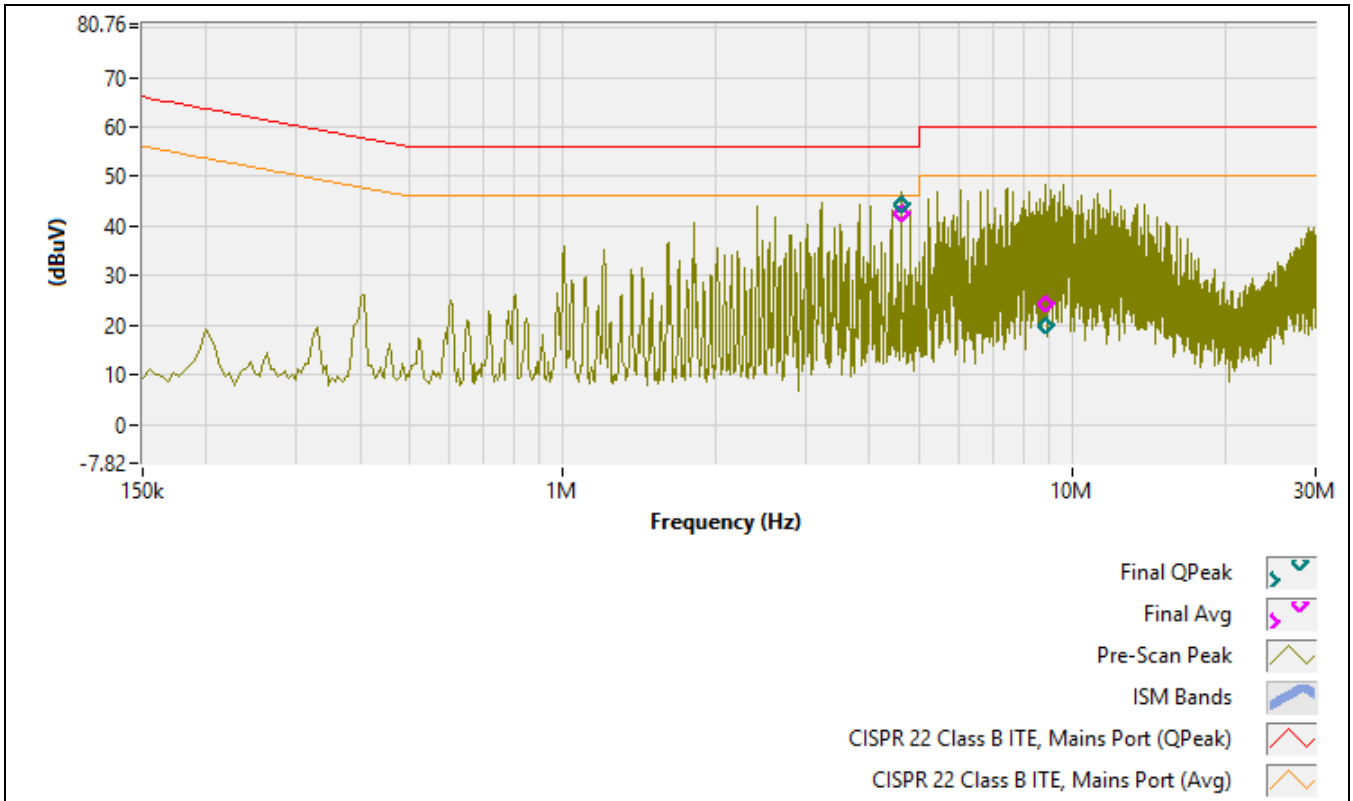
9.6.1 AC Input – Live

Graph CE1: Peak and average Conducted emissions measured on the Live lead of the EUT was below the Class B quasi peak and average limit.



9.6.2 AC Input – Neutral

Graph CE2: Quasi peak and average Conducted emissions measured on the Neutral lead of the EUT was below the Class B quasi peak and average limit.



9.6.3 Conclusion

- The EUT complies with the conducted emissions requirements of SANS 211 / CISPR 11.

9.7 SANS / IEC 61000-3-3 VOLTAGE FLUCTUATIONS & FLICKER

Method: The test circuit consists of a test supply voltage, reference impedance, the equipment under test and a flicker meter compliant with IEC-60868. The equipment was tested in the condition in which the manufacturer supplied it.

Table 9.7-1 Test equipment used for Voltage Fluctuations & Flicker test results

EQUIPMENT	SERIAL NUMBERS
California Instruments Model 4503L AC Power system	HK50775
Thurlby Thandar HA1600A Power & harmonics analyzer	479560

9.8 TEST SET-UP

- The EUT was switched on and operated in accordance with the manufacturer instructions.
- The EUT was observed for 12 integration periods (2 hours) while operating continuously. One power cycle was performed. The unit complied with the Pst and Plt requirements.

9.8.1 Results

1. d_{max} – 0.25%
2. p_{max} – 6 watts
3. Power factor – 0.497

9.8.2 Conclusion

- The EUT complies with the voltage fluctuations and flicker requirements of SANS / IEC 61000-3-3

10. IMMUNITY

10.1 SANS / IEC 61000-4-2 ESD IMMUNITY

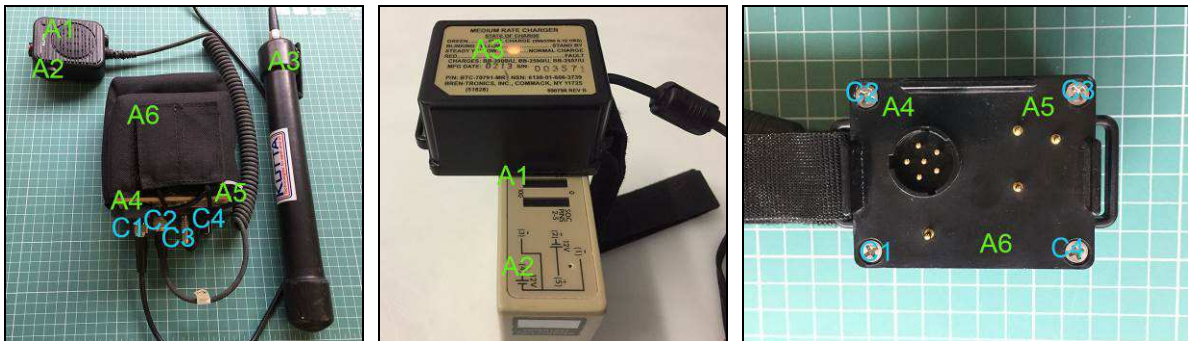
Method: The test is intended to demonstrate the immunity of equipment subjected to static electricity discharges from operators directly and to adjacent objects. The table top equipment under test is placed on a wooden table, 0.8 m high, standing on the ground reference plane. A horizontal coupling plane (HCP), 1.6 x 0.8 m, is placed on the table. The EUT and the cables are isolated from the coupling plane by an insulating support 0.5 mm thick. The floor standing equipment is isolated from the ground reference plane by an insulating support about 0.1 m thick. The vertical coupling plane (VCP) of dimensions 0.5 m x 0.5 m is placed parallel to, and positioned at a distance of 0.1 m from, the EUT.

Table 10.1-1 Test equipment used for ESD

EQUIPMENT	SERIAL NUMBER
TESEQ NSG 3040	6074
TESEQ NSG 435 ESD gun	7184
Contact discharge tip	None
Vertical Coupling Plane	None
Air discharge tip	None

10.1.1 Set-up

- The EUT was switched on and operated in accordance with the manufacturer instructions.
- The EUT was tested as tabletop equipment.
- 10 positive and 10 negative contact discharges were applied to the VCP and HCP respectively.
- 10 positive and 10 negative air discharges were made to the following points on the EUT.



10.1.2 Results

Table 10.1-2 Results of ESD Contact discharge

POSITION ON EUT	VOLTAGE	NUMBER OF DISCHARGES	RESULT	VERDICT
HCP (Horizontal)	± 8kV	10	Not Susceptible	Comply (A)
VCP (Vertical)	± 8kV	10	Not Susceptible	Comply (A)
Radio C1 – C4	± 8kV	10	Not Susceptible	Comply (A)
Charger C1 – C4	± 8kV	10	Not Susceptible	Comply (A)

Table 10.1-3 Results of ESD Air discharge

POSITION ON EUT	VOLTAGE	NUMBER OF DISCHARGES	RESULT	VERDICT
Radio A1 – A5	± 15kV	10	Not Susceptible	Comply (A)
Charger A1 – A6	± 15kV	10	Not Susceptible	Comply (A)

10.1.3 Conclusion

- The EUT complies with criterion A of SANS / IEC 61000-4-2

Criterion A: normal performance within limits specified by the manufacturer, requestor or purchaser

10.2 SANS / IEC 61000-4-3 RADIATED IMMUNITY

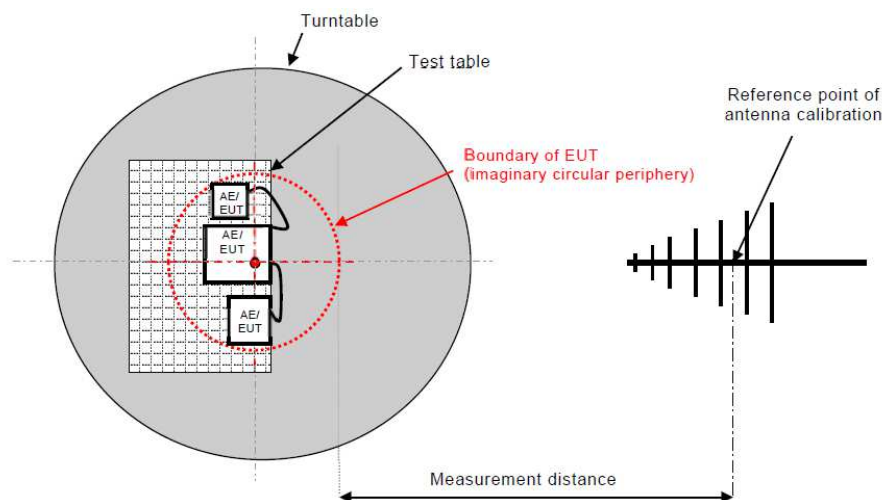
Method: The test allows estimating of the radiated immunity of electrical and electronic equipment to electromagnetic disturbances coming from intended radio-frequency (RF) transmitters in the frequency range 80MHz to 6000MHz. The interference is applied on the enclosure of the equipment by using transmitting antennas.

Table 10.2-1 Test equipment used for Radiated Immunity.

EQUIPMENT	SERIAL NUMBER
ASUS Laptop with AR EMCWare software	X541NA-GQ279T
Agilent 83620B Signal Generator	98091
Combilog Antenna AC-200	061128
AH Systems SAS-571	2455
Narda EP-600 Electric Field probe	611WX70397

10.2.1 Set-up

- The EUT was switched on and operated in accordance with the manufacturer instructions.
- The test was performed in a full anechoic chamber in the frequency band 80 MHz to 6000 MHz with 80 % AM 1kHz, at a level of 3 and 10 V/m (un-modulated) according to SANS / IEC 61000-4-3 Clause 8 (Frequency step and dwell method).
- The antenna was positioned at a distance of 3 meters from the EUT.
- The EUT was tested in both Horizontal and Vertical polarizations.



10.2.2 Results

Frequency Band	Field level	Modulation	Result
80 – 1000MHz	10V/m	1kHz 80% AM	No effect
1 – 6GHz	3V/m	1kHz 80% AM	No effect

10.2.3 Conclusion

- The EUT complies with criterion A of SANS / IEC 61000-4-3

Criterion A: normal performance within limits specified by the manufacturer, requestor or purchaser

10.3 SANS / IEC 61000-4-4 FAST TRANSIENT IMMUNITY

Method: Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). I/O lines were tested in a Capacitive Coupling Clamp. One of each unique interface was tested for a period of one (1) minute per polarity.

Table 10.3-1 Test equipment used for Electrical Fast Transients

EQUIPMENT	SERIAL NUMBER
TESEQ NSG 3040	6074
TESEQ CDN 3425 Capacitive clamp	3082

10.3.1 Set-up and levels

- The EUT was supplied with the required voltage and subjected to a direct injected 5 kHz repetition rate 5/50nS wave interference signal.
- The charger was tested as table top equipment.

AC Power Port

Injection Method	Voltage	Repetition rate	Result
Live to Neutral	+4kV	5kHz	No Effect
	-4kV	5kHz	No Effect
Live and Neutral to Ground reference	+4kV	5kHz	No Effect
	-4kV	5kHz	No Effect

10.3.2 Conclusion:

- The EUT was resilient to the applied fast transients
- The EUT complies with criterion A of SANS / IEC 61000-4-4

Criterion A: normal performance within limits specified by the manufacturer, requestor or purchaser

10.4 SANS / IEC 61000-4-5 SURGES

Method: Mains power tests were conducted with the product connected to a Coupling/ Decoupling Network (CDN). The test voltage was increased from the lowest indicated level up to the maximum level. Five (5) positive surges and five (5) negative surges were applied at each of phases of the AC waveform: 0°, 90°, 180° and 270°. Each surge was applied 60 seconds after the previous surge. Where applicable signal and telecommunications ports were subject to five (5) positive and five (negative) surges applied through the appropriate Coupling/Decoupling Network (CDN).

Table 10.4-1 Test equipment used for Surges

EQUIPMENT	SERIAL NUMBER
TESEQ NSG 3040	6074

10.4.1 Set-up and Test Levels

- The EUT was supplied with the required voltage.
- The pulses were applied in the following sequence:

AC Power Port

Injection Method	Voltage	Phase	Result
Live to Neutral	+2kV	0°, 90°, 180° and 270°	No Effect
	-2kV	0°, 90°, 180° and 270°	No Effect

10.4.2 Conclusion

- The EUT was resilient to the surges applied
- The EUT complies with Criterion A of SANS / IEC 61000-4-5

Criterion A: normal performance within limits specified by the manufacturer, requestor or purchaser
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10.5 SANS / IEC 61000-4-6 CONDUCTED IMMUNITY

Method: Measurements were made on a ground plane that extends at least 0.5-meter minimum beyond all sides of the system under test. The EUT was located 10cm above the reference ground plane and any associated I/O cables attached to the EUT were located between 30mm and 50mm above the ground plane. The indicated field was pre-calibrated prior to placement of the system under test.

Table 10.5-1 Test equipment used for Conducted Immunity.

EQUIPMENT	SERIAL NUMBER
Agilant 83620B Signal Generator	98091
RF Current Injection Probe	561383
Kalmus 757LC 75Watt Amplifier	561383
M2 & M3 CDN-M325E	521169
Telecommunications CDN-T8SE	511434

10.5.1 Set-up and Test Levels

- The EUT was switched on and operated in accordance with the manufacturer instructions.
- The test was performed in the iSERT laboratory in the frequency band 150kHz to 80 MHz with 80 % AM 1kHz, at a level of 10 V (un-modulated) on the input of the Kutta charger and Rod antenna cable according to SANS / IEC 61000-4-6.

10.5.2 Results

Line	Injection method	Voltage	Modulation	Frequency Band	Result
AC / DC power input	CDN (M2)	10Vrms	1kHz, 80% AM	150kHz to 80MHz	No effect
Drum Rod antenna cable	BCI clamp	10Vrms	1kHz, 80% AM	150kHz to 80MHz	No effect

10.5.3 Conclusion

- The EUT complies with criterion A of the relevant section of SANS / IEC 61000-4-6

Criterion A: normal performance within limits specified by the manufacturer, requestor or purchaser)

10.6 SANS / IEC 61000-4-8 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

Method: Measurements were made on a ground plane that extends 1-meter minimum beyond sides of the system under test. Table top EUT is located 80cm above the reference and floor-standing EUT is located 10cm above the reference ground plane. The indicated field was pre-calibrated prior to placement of the EUT under test.

Table 10.6-1 Test equipment used for Power frequency magnetic Immunity.

EQUIPMENT	SERIAL NUMBER
Variac Yokoyama Electric Works	3772
Step down transformer	None
Fluke 115 Multimeter	72081177
RS Clamp Meter	None
AC Helmholtz Coil	iSERT001

10.6.1 Set-up

- The EUT was switched on and operated in accordance with the manufacturer instructions.
- The test was performed with a single Helmholtz Coil, at a level of 30 A/m according to SANS / IEC 61000-4-8.

10.6.2 Results

Axes	Field Strength (A/m)	Frequency (Hz)	Result
X-Axis	30	50	No effect
Y-Axis	30	50	No effect
Z-Axis	30	50	No effect

10.6.3 Conclusion

- The EUT was resilient to the 50 Hz signal applied at a level of 3 A/m.

Criterion A: normal performance within limits specified by the manufacturer, requestor or purchaser
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10.7 SANS / IEC 61000-4-9 PULSE MAGNETIC FIELD IMMUNITY TEST

Method: Measurements were made on a ground plane that extends 1-meter minimum beyond sides of the system under test. Table top EUT is located 80cm above the reference and floor-standing EUT is located 10cm above the reference ground plane. The indicated field was pre-calibrated prior to placement of the EUT under test.

Table 10.7-1 Test equipment used for Pulse magnetic field Immunity.

EQUIPMENT	SERIAL NUMBER
TESEQ NSG 3040	6074
TESEQ INA 752	-
AC Helmholtz Coil	iSERT001

10.7.1 Set-up

- The EUT was switched on and operated in accordance with the manufacturer instructions.
- The test was performed with a single Helmholtz Coil, at a level of 300 A/m according to SANS / IEC 61000-4-9.

10.7.2 Results

Axes	Field Strength (A/m)	Result
X-Axis	300	No effect
Y-Axis	300	No effect
Z-Axis	300	No effect

10.7.3 Conclusion

- The EUT was resilient to the applied pulses at 300A/m

Criterion A: normal performance within limits specified by the manufacturer, requestor or purchaser)

10.8 SANS / IEC 61000-4-11 VOLTAGE DIPS AND INTERRUPTIONS

Method: The product was subjected to voltage dips and interruptions. Testing was performed with the product connected directly to a generator capable of simulating the voltage drops and interrupts as described.

Table 10.8-1 Test equipment used for Voltage Dips and Interruptions

EQUIPMENT	SERIAL NUMBER
TESEQ NSG 3040	6074

10.8.1 Set-up and Test Levels

- The EUT was switched on and operated in accordance with the manufacturer instructions.
- The EUT was subjected to the following voltage dips and interruptions applied to the AC power port of the EUT:

Test Level (% Ut)	Test Duration (cycles)	Result
100	0.5	No effect
40	10	No effect
70	25	No effect
100	250	* Note 1

10.8.2 Results

- Note 1: The EUT stopped to charge during application of the 100% reduction for 250 cycles. The EUT resumed its charging operation after application of the supply reduction.

10.8.3 Conclusion

- The EUT complies with Criterion B of the relevant sections of SANS / IEC 61000-4-11

Criterion B: Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention

11. CONCLUSION

The Kutta Medium frequency radio & charger (In the configuration tested), meets the requirements of the following standards:

- DMR requirements for safety critical equipment as listed in Government Gazette 32885 of January 22, 2010
- ETSI EN 301 489-1 V2.1.1 (2017-02) '*Electromagnetic compatibility and Radio Spectrum Matters (ERM)*'
- SANS 211 (2011) / CISPR 11 (2010 +A1:2010): '*Industrial, scientific and Medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement*'
- SANS 222 (2009) / CISPR 22 (2008): '*Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement*'
 - SANS 61000-3-3 (2009) / IEC 61000-3-3 (2008): Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems – Equipment with rated current ≤ 16 A per phase
 - SANS 61000-4-2 (2009) / IEC 61000-4-2 (2008): Testing and measurement techniques – Electrostatic discharge immunity test
 - SANS 61000-4-3 (2008) / IEC 61000-4-3 (2010): Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test
 - SANS 61000-4-4 (2011) / IEC 61000-4-4 (2011): Testing and measurement techniques – Electrical Fast Transient / Burst
 - SANS 61000-4-5 (2006) / IEC 61000-4-5 (2005): Testing and measurement techniques – Surge immunity test
 - SANS 61000-4-6 (2009) / IEC 61000-4-6 (2008): Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields
 - SANS 61000-4-8 (2009) / IEC 61000-4-8 (2009): Testing and measurement techniques- Power Frequency Electric Field Immunity Test
 - SANS 61000-4-11 (2005) / IEC 61000-4-11(2004): Testing and measurement techniques – Voltage Dips, Short Interruptions and voltage variations immunity test.

11.1 COMPLIANCE STATEMENT

The EUT complies with the requirements of the specifications listed in 11 above.