TEST REPORT

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Test Report Number: SKT-RFC-180002

Date of issue: February 19, 2018

Applicant:	**KYUNGWOO SYSTECH, INC.** #401, Daeryung Post Tower 5, 68, Digital-ro 9, Geumcheon-gu, Seoul, South Korea
Manufacturer:	**KYUNGWOO SYSTECH, INC.** #401, Daeryung Post Tower 5, 68, Digital-ro 9, Geumcheon-gu, Seoul, South Korea
Product:	SMART KEY READER
Model:	**A241**
FCC ID:	ZE8-A241
Project number:	SKTEU17-1187
EUT received:	December 6, 2017

Applied standards:	ANSI C63.10-2013 and ANSI C63.4-2014
Rule parts:	FCC Part 15 Subpart C - Intentional radiators
Equipment Class:	**DCD - Part 15 Low Power Transmitter Below 1705kHz**

Remarks to the standards:	None

The above equipment has been tested by SK Tech Co., Ltd., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product or system, which was tested.

Wonsik Ham / **Testing Engineer**

Jongsoo Yoon / **Technical Manager**

Revision History of Test Report

Rev.	Revisions	Effect page	Approved by	Date
-	Initial issue	All	Jongsoo Yoon	Feb. 19, 2018

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1 Summary of test results

Requirement	CFR 47 Section	Result
Antenna Requirement	15.203	Meets the requirements
Radiated Emissions	15.209(a)	Meets the requirements
AC power line Conducted emissions	15.207(a)	N/A

Note: *The EUT is operated from the battery (DC 12 V or DC 24 V) in a vehicle, and therefore the test suites related to AC Mains port were not applicable.*

2 Description of equipment under test (EUT)

Product:	SMART KEY READER
Model:	A241
Serial number:	None (prototype)

Model differences:

Model name	Difference	Tested (checked)
A241	fully tested model that was provided by the applicant	☒

Technical data:

Power source	DC 12 V / DC 24 V (powered from the battery in a vehicle)	
Local Oscillator or X-Tal	8 MHz, 32 MHz	
Transmit Frequency	2405 MHz (1 CH) *	125 kHz RFID
Antenna Type	Integral chip antenna	Integral loop coil antenna
Type of Modulation	OQPSK	ASK
RF Output power	-4.07 dBm (measured conducted RF power)	90.46 dBμV/m(PEAK) (measured @ 3m)

Note: ** The test report for the 2.4 GHz ZigBee was issued with other test report number.*
*** The test report for the compliance with FCC Part 15B as a digital device was issued with other test report number.*

I/O port	Type	Q'ty	Remark
Connector	4-pin connector (DC input, CAN)	2	

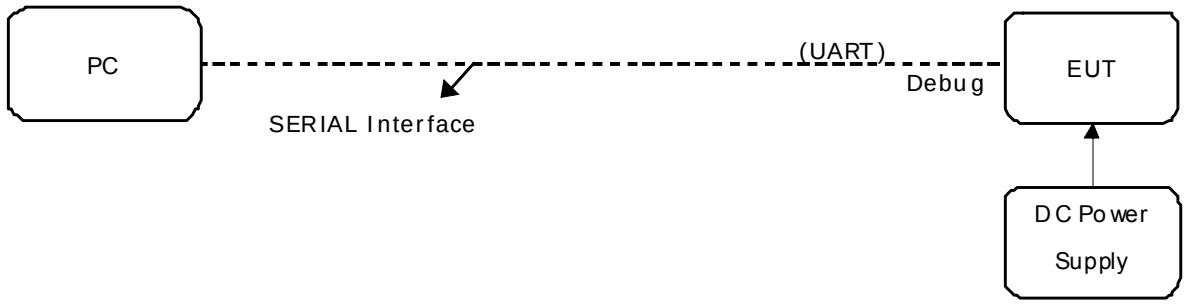
Note: *The two connectors (CN1, CN2) are identical and CN2 connector was used for the tests.*

Modification of EUT during the compliance testing: none

3 Test and measurement conditions

3.1. Test configuration (arrangement of EUT)

The measurements were taken in continuous transmitting mode provided by the applicant.



3.2. Description of support units (accessory equipment)

The following support units or accessories were used to form a representative test configuration during the tests.

#	Equipment	Manufacturer	Model No.	Serial No.
1	PC	Lenovo	Andice_SIT_A75_TW	NA17743689
2	DC Power Supply	HP	6633A	2838A-01000

Note: *For control of the RF module via UART interface at the Debug port in the EUT. For radiated spurious emission measurements, the measurements were performed without PC after setting the radio module to TEST MODE.*

3.3. Interconnection and I/O cables

The following support units or accessories were used to form a representative test configuration during the tests.

#	Start		End		Cable	
	Name	I/O port	Name	I/O port	length (m)	shielded (Y/N)
	EUT	Interface(DC IN)	DC Power Supply	DC OUT	2.0	N

Note: *1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3.4. Measurement Uncertainty (*U*)

Measurement Item	Combined Standard Uncertainty *Uc*	Expanded Uncertainty $U = k \times Uc$ (k = 2)
Conducted RF power	±1.49 dB	±2.98 dB
Conducted emissions	±1.51 dB	±3.02 dB
Radiated emissions (30 MHz to 1000 MHz)	±2.63 dB	±5.26 dB
Radiated emissions (above 1000 MHz)	±2.57 dB	±5.14 dB

3.5. Test date

Date Tested	January 29, 2018 – January 30, 2018

4 Facilities and accreditations

4.1. Facilities

All of the measurements described in this report were performed at SK Tech Co., Ltd
Site I: 88, Geulgaeul-ro 81beon-gil, Wabu-eup, Namyangju-si, Gyeonggi-do, Korea
Site II: 124-8, Geulgaeul-ro, Wabu-eup, Namyangju-si, Gyeonggi-do, Korea

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-4. The sites comply with the Normalized Site Attenuation requirements given in ANSI C63.4, and site VSWR requirements specified in CISPR 16-1-4. The measuring apparatus and ancillary equipment conform to CISPR 16-1 series.

4.2. Accreditations

The laboratory has been also notified to FCC by RRA as a Conformity Assessment Body, and designated to perform compliance testing on equipment subject to Declaration of Conformity (DOC) and Certification under Parts 15 and 18 of the FCC Rules.

Designation No. KR0007

4.3. List of test and measurement instruments

No	Description	Manufacturer	Model	Serial No.	Cal. due	Use
1	Spectrum Analyzer	Agilent	E4405B	US40520856	2018.03.10	
2	Spectrum Analyzer	Agilent	E4440A	MY46186322	2018.07.10	
3	EMI Test Receiver	Rohde&Schwarz	ESR26	101441	2018.09.04	☒
4	EMI Test Receiver	Rohde&Schwarz	ESIB40	100277	2018.05.12	
5	Pre-amplifier (30 MHz - 1 GHz)	TSJ	MLA-10K01-B01-27	2005350	2018.07.07	☒
6	Pre-amplifier (1 GHz - 18 GHz)	MITEQ	AFS44	1116321	2018.07.07	
7	Pre-amplifier (1 GHz - 18 GHz)	TSJ	MLA-100M18-B02-38	1539546	2018.03.06	
8	Pre-amplifier (18 GHz - 26.5 GHz)	TSJ	MLA-18265-J01-35	8490	2018.03.07	
9	Power Meter	Agilent	E4417A	MY45100426	2018.07.27	
10	Power Meter	Agilent	E4418B	US39402176	2018.07.05	
11	Power Sensor	Agilent	E9327A	MY44420696	2018.07.05	
12	Power Sensor	Agilent	8485A	3318A13916	2018.07.07	
13	Attenuator (10dB)	HP	8491B	38072	2018.07.05	
14	High Pass Filter	Wainwright	WHKX3.0/18G	8	2018.07.05	
15	VHF Precision Dipole Antenna (TX/RX)	Schwarzbeck	VHAP	1014 / 1015	2018.09.09	
16	UHF Precision Dipole Antenna (TX/RX)	Schwarzbeck	UHAP	989 / 990	2018.09.09	
17	Loop Antenna	Schwarzbeck	HFH2-Z2	863048/019	2019.12.06	☒
18	Bilog broadband Antenna	Schwarzbeck	VULB9168	9168-230	2018.03.23	☒
19	Horn Antenna (1 GHz - 18 GHz)	Schwarzbeck	BBHA9120D	9120D-816	2018.03.23	
20	Horn Antenna (1 GHz - 18 GHz)	ETS-LINDGREN	3115	00040723	2019.05.25	
21	Horn Antenna (1 GHz - 18 GHz)	ETS-LINDGREN	3115	00056768	2018.03.23	
22	Horn Antenna (15 GHz - 40 GHz)	Schwarzbeck	BBHA9170	BBHA9170318	2019.05.02	
23	Vector Signal Generator	Agilent	E4438C	MY42080359	2018.05.11	
24	PSG analog signal generator	Agilent	E8257D	MY45141255	2018.07.05	
25	DC Power Supply	HP	6633A	2838A-01000	2018.07.05	☒
26	DC Power Supply	HP	6633A	3325A04972	2018.07.05	
27	Hygro/Thermo Graph	Testo	608-H1	-	2018.07.07	☒
28	Temperature/Humidity Chamber	DAE JIN ENG	DJ-THC02	06071	2018.04.11	

5 Test and measurements

5.1. Antenna requirement

5.1.1 Regulation

FCC section 15.203, An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of Part 15C. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31 (d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

5.1.2 Result: PASS

The EUT has an integral loop coil antenna, and meets the requirements of this section.

5.2. Radiated emissions

5.2.1 Regulation

FCC 47CFR15 – 15.209

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength limit (μV/m)	Field strength limit (dBμV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F (kHz) = 266.7 – 4.9	48.5 – 13.8	300
0.490 – 1.705	24000/F (kHz) = 49.0 – 14.1	33.8 – 23.0	30
1.705 – 30.0	30	29.5	30
30 – 88	100	40.0	3
88 – 216	150	43.5	3
216 – 960	200	46.0	3
Above 960	500	54.0	3

* The emission limits shown in the above table are based on measurement instrumentation employing a CISPR quasi-peak detector. For the frequency bands 9 – 90 kHz, 110 – 490 kHz and above 1000 MHz, the radiated emission limits are based on measurements employing an average detector.

* The lower limit shall apply at the transition frequencies.

5.2.2 Measurement Procedure

Radiated Emissions Test, 9 kHz to 30 MHz (Magnetic Field Test)

1. The preliminary radiated measurements were performed to determine the frequency producing the maximum emissions at a distance of 1 meter or 3 meters according to Section 15.31(f)(2).
2. The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table.
3. Emissions from the EUT are maximized by adjusting the orientation of the Loop antenna and rotating the EUT on the turntable. Manipulating the system cables also maximizes EUT emissions if applicable.
4. To obtain the final measurement data, each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.

Radiated Emissions Test, above 30 MHz

1. The preliminary radiated measurements were performed to determine the frequency producing the maximum emissions in an anechoic chamber at a distance of 3 meters.
2. The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360˚.
3. The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 30 to 1000 MHz using the broadband antenna.
4. Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.
6. The EUT is situated in three orthogonal planes (if appropriate)

5.2.3 Calculation of the field strength limits below 30 MHz

1. No special calculation for obtaining the field strength in dBμV/m is necessary, because the EMI receiver and the active loop antenna operate as a system, where the reading gives directly the field strength result (dBμV/m). The antenna factors and cable losses are already taken into consideration.
2. For test distance other than what is specified, but fulfilling the requirements of section 15.31 (f) (2) the field strength is calculated by adding additionally an extrapolation factor of 40dB/decade (inverse linear distance for field strength measurements).
3. All following emission measurements were performed using the test receiver's average, peak, and quasi-peak detector function with specified bandwidth.
4. The basic equation is as follows;

FS= RA + DF

Where

FS = Field strength in dBμV/m

RA = Receiver Amplitude in dBμV/m

DF = Distance Extrapolation Factor in dB

Where DF = 40log(D_{TEST} / D_{SPEC}) where D_{TEST} = Test Distance and D_{SPEC} = Specified Distance

DF = 40log(3m/300m) = -80 dB, for frequency band: 0.009 to 0.490 MHz

DF = 40log(3m/30m) = -40 dB, for frequency band: 0.490 to 30 MHz

5.2.4 Test Results: PASS

Spurious RF radiated emissions were shown in the Figure 1.

Table 1: Field strength below 30 MHz

Frequency [kHz]	RBW [kHz]	Reading [dBμV/m]	AF [dB/m]	Cable Loss [dB]	Actual [dBμV/m]	Limit (at 3m) [dBμV/m]	Margin [dB]	Axis
Emissions Average DATA under 15.209(a)								
(DC 12 V)								
124.98	0.2	57.18	19.90	0.1	77.18	105.7	28.52	X-axis
249.99	9	20.10	19.90	0.1	40.10	99.6	59.50	
374.98	9	18.09	19.86	0.1	38.05	96.1	58.05	
124.98	0.2	35.06	19.90	0.1	55.06	105.7	50.64	Y-axis
249.99	9	5.41	19.90	0.1	25.41	99.6	74.19	
374.98	9	4.16	19.86	0.1	24.12	96.1	71.98	
124.98	0.2	57.20	19.90	0.1	77.20	105.7	28.50	Z-axis
249.99	9	19.85	19.90	0.1	39.85	99.6	59.75	
374.98	9	18.49	19.86	0.1	38.45	96.1	57.65	
(DC 24 V)								
124.98	0.2	57.20	19.90	0.1	77.20	105.7	28.50	X-axis
249.99	9	20.11	19.90	0.1	40.11	99.6	59.49	
374.98	9	18.09	19.86	0.1	38.05	96.1	58.05	
124.98	0.2	35.06	19.90	0.1	55.06	105.7	50.64	Y-axis
249.99	9	5.42	19.90	0.1	25.42	99.6	74.18	
374.98	9	4.17	19.86	0.1	24.13	96.1	71.97	
124.98	0.2	57.29	19.90	0.1	77.29	105.7	28.41	Z-axis
249.99	9	19.85	19.90	0.1	39.85	99.6	59.75	
374.98	9	18.68	19.86	0.1	38.64	96.1	57.46	

Actual (dBμV/m) = Reading + AF + Cable Loss
Margin (dB) = Limit – Actual

Note: *These test results were measured at the 3 m distance.*

Frequency [kHz]	RBW [kHz]	Reading [dBμV/m]	AF [dB/m]	Cable Loss [dB]	Actual [dBμV/m]	Limit (at 3m) [dBμV/m]	Margin [dB]	Axis
Emissions Peak DATA under 15.209(a)								
(DC 12 V)								
124.98	0.2	70.37	19.90	0.1	90.37	125.7	35.33	X-axis
249.99	9	38.19	19.90	0.1	58.19	119.6	61.41	
374.98	9	36.29	19.86	0.1	56.25	116.1	59.85	
124.98	0.2	48.24	19.90	0.1	68.24	125.7	57.46	Y-axis
249.99	9	22.29	19.90	0.1	42.29	119.6	77.31	
374.98	9	21.48	19.86	0.1	41.44	116.1	74.66	
124.98	0.2	70.39	19.90	0.1	90.39	125.7	35.31	Z-axis
249.99	9	37.95	19.90	0.1	57.95	119.6	61.65	
374.98	9	36.68	19.86	0.1	56.64	116.1	59.46	
(DC 24 V)								
124.98	0.2	70.37	19.90	0.1	90.37	125.7	35.33	X-axis
249.99	9	38.21	19.90	0.1	58.21	119.6	61.39	
374.98	9	36.31	19.86	0.1	56.27	116.1	59.83	
124.98	0.2	48.23	19.90	0.1	68.23	125.7	57.47	Y-axis
249.99	9	22.60	19.90	0.1	42.60	119.6	77.00	
374.98	9	21.43	19.86	0.1	41.39	116.1	74.71	
124.98	0.2	70.46	19.90	0.1	90.46	125.7	35.24	Z-axis
249.99	9	38.00	19.90	0.1	58.00	119.6	61.60	
374.98	9	36.85	19.86	0.1	56.81	116.1	59.29	

Actual (dBμV/m) = Reading + AF + Cable Loss
Margin (dB) = Limit – Actual

Note: *These test results were measured at the 3 m distance.*

Frequency [kHz]	RBW [kHz]	Reading [dBμV/m]	AF [dB/m]	Cable Loss [dB]	Actual [dBμV/m]	Limit (at 3m) [dBμV/m]	Margin [dB]	Axis
Emissions Quasi-peak DATA under 15.209(a) Frequency within 90 kHz ~ 110 kHz and above 490 kHz								
(DC 12 V)								
499.97	9	29.27	19.80	0.1	49.17	73.6	24.43	X-axis
625.02	9	22.39	19.80	0.1	42.29	71.7	29.41	
749.99	9	24.78	19.80	0.1	44.68	70.1	25.42	
499.97	9	29.39	19.80	0.1	49.29	73.6	24.31	Z-axis
625.02	9	22.81	19.80	0.1	42.71	71.7	28.99	
749.99	9	25.02	19.80	0.1	44.92	70.1	25.18	
(DC 24 V)								
499.97	9	29.27	19.80	0.1	49.17	73.6	24.43	X-axis
625.02	9	22.30	19.80	0.1	42.20	71.7	29.50	
749.99	9	24.79	19.80	0.1	44.69	70.1	25.41	
499.97	9	11.36	19.80	0.1	31.26	73.6	42.34	Y-axis
625.02	9	6.86	19.80	0.1	26.76	71.7	44.94	
499.97	9	29.39	19.80	0.1	49.29	73.6	24.31	Z-axis
625.02	9	22.82	19.80	0.1	42.72	71.7	28.98	
749.99	9	25.02	19.80	0.1	44.92	70.1	25.18	

Actual (dBμV/m) = Reading + AF + Cable Loss
Margin (dB) = Limit – Actual

Note: *These test results were measured at the 3 m distance.*

Table 2: Measured values of the Field strength (above 30 MHz) – DC 12 V										
Frequency [MHz]	RBW [kHz]	POL [V/H]	ANT [m]	Reading [dBμV]	AMP [dB]	AF [dB/m]	CL [dB]	Actual [dBμV/m]	Limit [dBμV/m]	Margin [dB]
X-axis										
97.83	120	H	1.98	53.0	30.3	8.2	1.3	32.2	43.5	11.3
320.00	120	H	1.00	49.5	30.0	13.8	2.3	35.6	46.0	10.4
336.00	120	H	1.00	48.6	30.0	14.2	2.4	35.2	46.0	10.8
368.00	120	H	1.00	49.4	30.1	15.0	2.5	36.8	46.0	9.2
376.00	120	H	1.00	48.5	30.1	15.2	2.5	36.1	46.0	9.9
384.00	120	V	1.05	51.8	30.1	15.4	2.5	39.6	46.0	6.4
384.00	120	H	1.00	54.7	30.1	15.4	2.5	42.5	46.0	3.5
Y-axis										
97.79	120	V	1.06	49.5	30.3	8.2	1.3	28.7	43.5	14.8
97.86	120	H	2.36	50.5	30.3	8.2	1.3	29.7	43.5	13.8
368.00	120	H	1.00	47.0	30.1	15.0	2.5	34.4	46.0	11.6
368.01	120	V	1.16	46.8	30.1	15.0	2.5	34.2	46.0	11.8
376.00	120	H	1.00	46.7	30.1	15.2	2.5	34.3	46.0	11.7
376.00	120	V	1.12	46.8	30.1	15.2	2.5	34.4	46.0	11.6
384.00	120	H	1.00	54.8	30.1	15.4	2.5	42.6	46.0	3.4
384.00	120	V	1.05	53.6	30.1	15.4	2.5	41.4	46.0	4.6
400.01	120	H	1.00	46.3	30.2	15.8	2.6	34.5	46.0	11.5
Z-axis										
97.85	120	H	3.59	52.1	30.3	8.2	1.3	31.3	43.5	12.2
97.85	120	V	1.95	48.8	30.3	8.2	1.3	28.0	43.5	15.5
320.01	120	H	1.00	50.3	30.0	13.8	2.3	36.4	46.0	9.6
368.00	120	V	1.19	49.4	30.1	15.0	2.5	36.8	46.0	9.2
368.00	120	H	1.00	50.3	30.1	15.0	2.5	37.7	46.0	8.3
375.99	120	H	1.00	47.7	30.1	15.2	2.5	35.3	46.0	10.7
376.00	120	V	1.16	47.7	30.1	15.2	2.5	35.3	46.0	10.7
384.00	120	V	1.12	53.9	30.1	15.4	2.5	41.7	46.0	4.3
384.00	120	H	1.00	53.8	30.1	15.4	2.5	41.6	46.0	4.4

Margin (dB) = Limit – Actual

[Actual = Reading + AF + CL]

1. H = Horizontal, V = Vertical Polarization
2. AF/CL = Antenna Factor and Cable Loss

Note: *1. All emissions not reported were more than 20 dB below the specified limit or in the noise floor.*

2. These test results measured at the 3 m distance.

Table 3: Measured values of the Field strength (above 30 MHz) – DC 24 V										
Frequency [MHz]	RBW [kHz]	POL [V/H]	ANT [m]	Reading [dBμV]	AMP [dB]	AF [dB/m]	CL [dB]	Actual [dBμV/m]	Limit [dBμV/m]	Margin [dB]
X-axis										
125.08	120	V	1.00	45.8	30.1	10.4	1.5	27.6	43.5	15.9
368.00	120	H	1.00	48.7	30.1	15.0	2.5	36.1	46.0	9.9
376.00	120	H	1.00	47.1	30.1	15.2	2.5	34.7	46.0	11.3
384.00	120	H	1.00	54.6	30.1	15.4	2.5	42.4	46.0	3.6
384.01	120	V	1.09	51.4	30.1	15.4	2.5	39.2	46.0	6.8
416.01	120	H	1.00	46.5	30.2	16.1	2.6	35.0	46.0	11.0
Y-axis										
125.30	120	V	1.00	46.3	30.1	10.4	1.5	28.1	43.5	15.4
320.00	120	H	1.00	48.7	30.0	13.8	2.3	34.8	46.0	11.2
384.00	120	H	1.00	54.9	30.1	15.4	2.5	42.7	46.0	3.3
384.00	120	V	1.09	51.9	30.1	15.4	2.5	39.7	46.0	6.3
400.00	120	H	1.00	47.2	30.2	15.8	2.6	35.4	46.0	10.6
416.01	120	H	1.00	48.7	30.2	16.1	2.6	37.2	46.0	8.8
Z-axis										
336.00	120	H	1.00	48.9	30.0	14.2	2.4	35.5	46.0	10.5
367.99	120	V	1.23	48.2	30.1	15.0	2.5	35.6	46.0	10.4
368.00	120	H	1.00	49.7	30.1	15.0	2.5	37.1	46.0	8.9
384.00	120	V	1.19	54.1	30.1	15.4	2.5	41.9	46.0	4.1
384.00	120	H	1.00	54.6	30.1	15.4	2.5	42.4	46.0	3.6
415.99	120	V	1.23	45.2	30.2	16.1	2.6	33.7	46.0	12.3
416.01	120	H	1.00	47.7	30.2	16.1	2.6	36.2	46.0	9.8

Margin (dB) = Limit – Actual

[Actual = Reading + AF + CL]

1. H = Horizontal, V = Vertical Polarization
2. AF/CL = Antenna Factor and Cable Loss

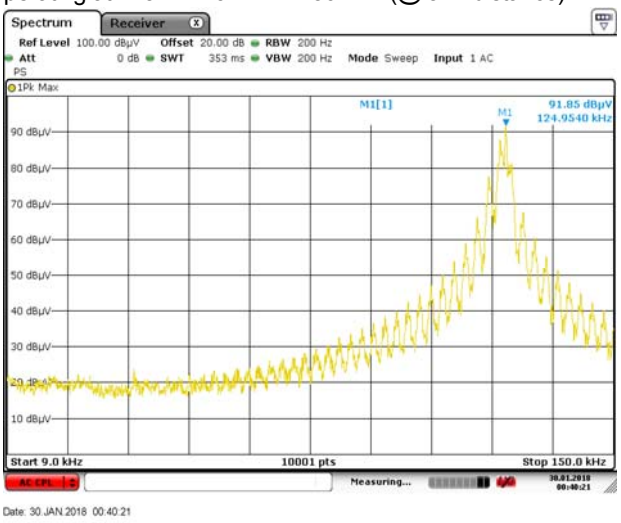
Note: *1. All emissions not reported were more than 20 dB below the specified limit or in the noise floor.*

2. These test results measured at the 3 m distance.

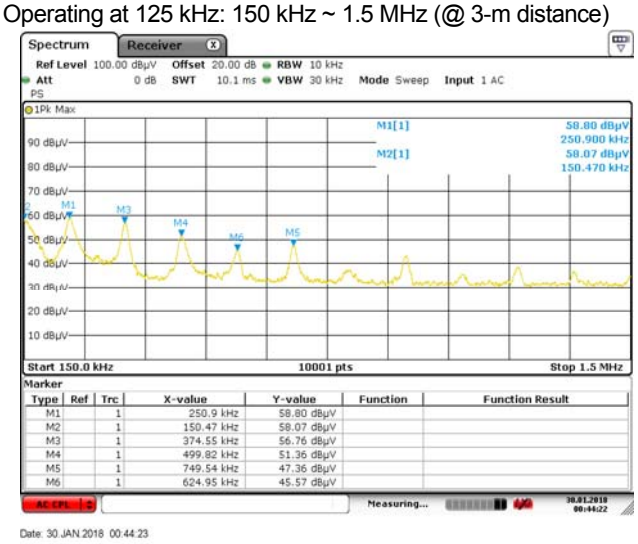
Figure 1. Emission plot for the preliminary radiated measurements

(DC 12 V)

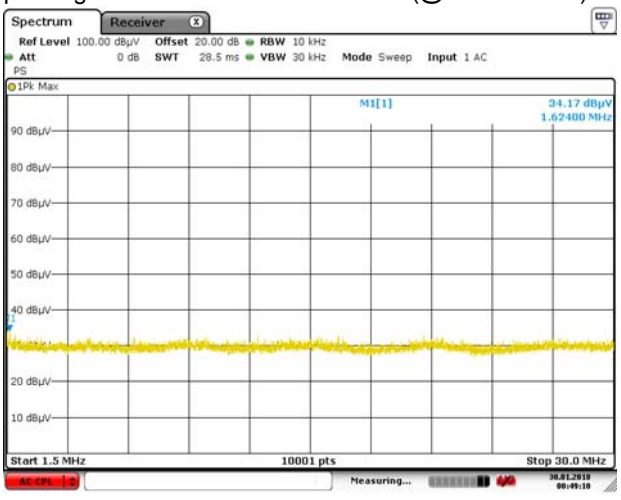
Operating at 125 kHz: 9 kHz ~ 150 kHz (@ 3-m distance)



Operating at 125 kHz: 150 kHz ~ 1.5 MHz (@ 3-m distance)

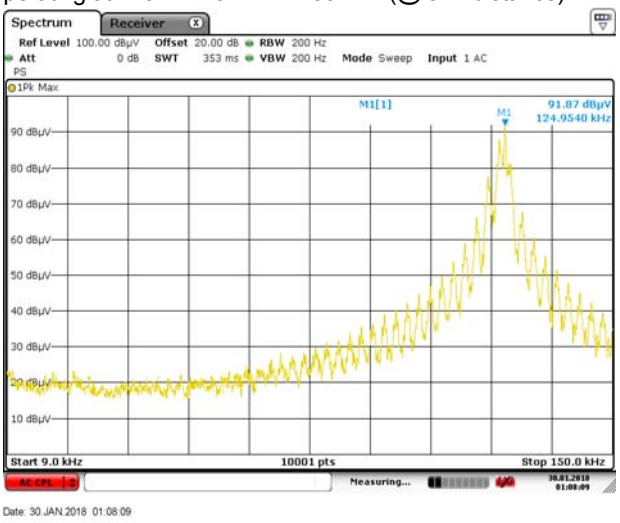


Operating at 125 kHz: 1.5 MHz ~ 30 MHz (@ 3-m distance)

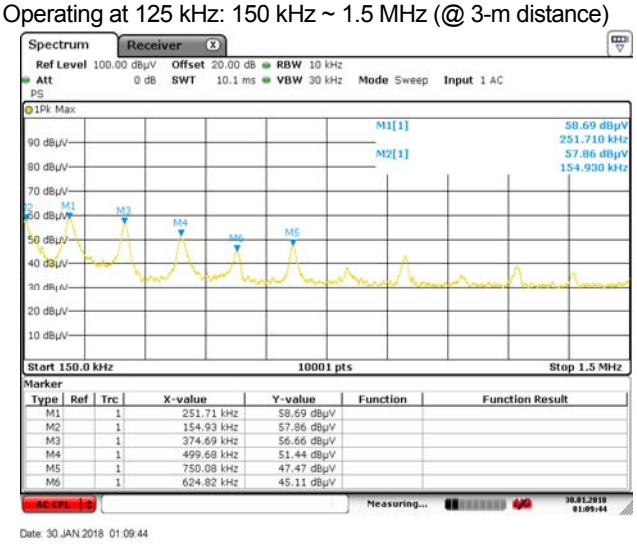


(DC 24 V)

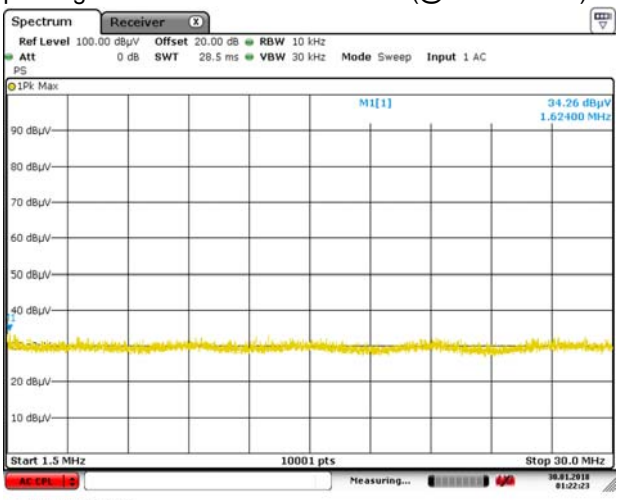
Operating at 125 kHz: 9 kHz ~ 150 kHz (@ 3-m distance)



Operating at 125 kHz: 150 kHz ~ 1.5 MHz (@ 3-m distance)



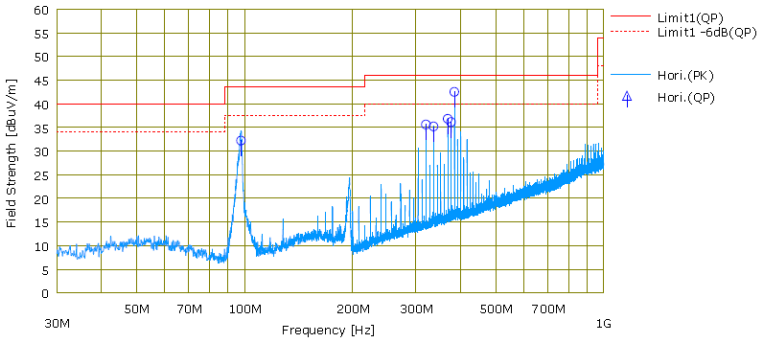
Operating at 125 kHz: 1.5 MHz ~ 30 MHz (@ 3-m distance)

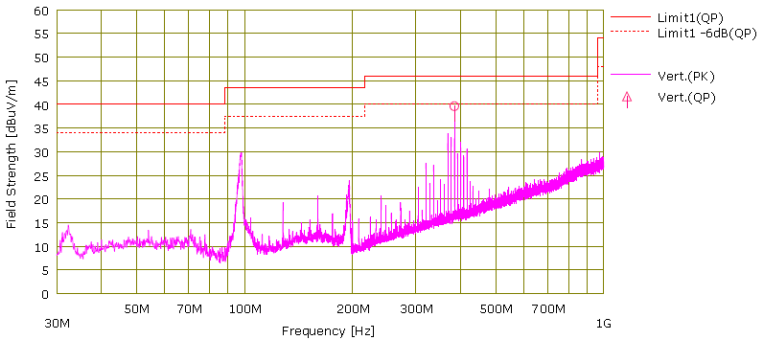


Emission plot for the preliminary radiated measurements *(continued)*

Operating at 125 kHz: 30 MHz ~ 1 GHz (@ 3-m distance)

(DC 12 V)





Operating at 125 kHz: 30 MHz ~ 1 GHz (@ 3-m distance)

(DC 24 V)