

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC152236

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FCC Radio Test Report FCC ID: 2ABES-KR1409

Original Grant

Report No. TB-FCC152236

Pathway Innovations and Technologies, Inc. **Applicant**

Equipment Under Test (EUT)

EUT Name Document Camera

Model No. KR1409 Nillo 100, N1300

Serial No. N/A

Brand Name HoverCam

Receipt Date 2017-03-29

2017-03-30 to 2017-04-20 **Test Date**

Issue Date 2017-04-21

FCC Part 15: 2016, Subpart C(15.247) **Standards**

Test Method ANSI C63.10: 2013

Conclusions PASS

In the configuration tested, the EUT complied with the standards specified above,

Test/Witness

Engineer

the report.

Approved& **Authorized**

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in

TB-RF-074-1.0

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1. General Information about EUT

1.1 Client Information

Applicant: Pathway Innovations and Technologies, Inc.

Address : 10211 Pacific Mesa Blvd., #412, San Diego, CA 92121, USA

Manufacturer : ShenZhen KerunVisual Technology Co., Ltd.

Address : 6/F, Building 2, Zone S2, 1213 Liuxian Blvd Honghualing Industrial

Park Nanshan District, Shenzhen City, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name		Document Camera	
Models No.		KR1409 Nillo 100, N130	0
Model Difference	-		ntical in the same PCB layout and electrical e is model name for commercial.
		Operation Frequency:	Bluetooth 4.0(BLE): 2402MHz~2480MHz
		Number of Channel:	Bluetooth 4.0(BLE): 40 channels see note(3)
Product		RF Output Power:	3.329 dBm Conducted Power
Description		Antenna Gain:	4.5 dBi FPC Antenna
	Y	Modulation Type:	GFSK
		Bit Rate of Transmitter:	1Mbps(GFSK)
Power Supply	¥.	AC/DC Adapter (TDX-09 Input: AC 100~240V, 50/ Output: DC 9V, 2.0A.	
Connecting I/O Port(S)	i	Please refer to the User	s Manual

Note:

This Test Report is FCC Part 15.247 for Bluetooth BLE, the test procedure follows the FCC KDB 558074 D01 DTS Means Guidance v04.

- (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (2) Antenna information provided by the applicant.
- (3) Channel List:

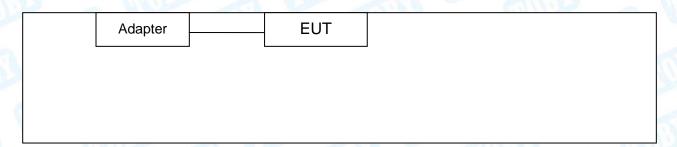


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Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	14	2430	28	2458
01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	19	2440	33	2468
06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	39	2480
12	2426	26	2454		
13	2428	27	2456		

1.3 Block Diagram Showing the Configuration of System Tested

TX Mode



1.4 Description of Support Units

The EUT has been test as an independent unit.



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1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For (Conducted Test
Final Test Mode	Description
Mode 1	TX Mode

For	Radiated Test
Final Test Mode	Description
Mode 2	TX Mode
Mode 3	TX Mode (Channel 00/20/39)

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

BLE Mode: GFSK Modulation Transmitting mode.

- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a fixed unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF setting.

Test Software Version	C. C.	N/A	WOOD IN
Frequency	2402 MHz	2442MHz	2480 MHz
BLE GFSK	DEF	DEF	DEF



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1.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U _{Lab})
N. W.	Level Accuracy:	
Conducted Emission	9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
Dadiated Emission	Level Accuracy:	. 4 CO dD
Radiated Emission	9kHz to 30 MHz	±4.60 dB
Dadiated Emission	Level Accuracy:	. 4. 40 dD
Radiated Emission	30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy:	.4.20 dB
Radiated Emission	Above 1000MHz	±4.20 dB



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1.8 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.



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2. Test Summary

Standard Section		Tool Hom	ludana ant	
FCC	IC	Test Item	Judgment	Remark
15.203		Antenna Requirement	PASS	N/A
15.207(a)	RSS-GEN 7.2.4	Conducted Emission	PASS	N/A
15.205&15.247(d)	RSS-GEN 7.2.2	Band-Edge & Unwanted Emissions into Restricted Frequency	PASS	N/A
15.247(a)(2)	RSS 247 5.2 (1)	6dB Bandwidth	PASS	N/A
15.247(b)(3)	RSS 247 5.4 (4)	Conducted Max Output Power	PASS	N/A
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	PASS	N/A
15.205, 15.209&15.247(d)	RSS 247 5.5	Transmitter Radiated Spurious &Unwanted Emissions into Restricted Frequency	PASS	N/A

Note: N/A is an abbreviation for Not Applicable.



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3. Test Equipment

Conducte	d Emission Te	st			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 22, 2016	Jul. 21, 2017
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 22, 2016	Jul. 21, 2017
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 22, 2016	Jul. 21, 2017
LISN	Rohde & Schwarz	ENV216	101131	Jul. 22, 2016	Jul. 21, 2017
Radiation	Emission Tes	t			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 22, 2016	Jul. 21, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 25, 2017	Mar. 24, 2018
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 25, 2017	Mar. 24, 2018
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 25, 2017	Mar. 24, 2018
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 25, 2017	Mar. 24, 201
Loop Antenna	Laplace instrument	RF300	0701	Mar. 25, 2017	Mar. 24, 201
Pre-amplifier	Sonoma	310N	185903	Mar. 24, 2017	Mar. 23, 201
Pre-amplifier	HP	8449B	3008A00849	Mar. 29, 2017	Mar. 28, 201
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 29, 2017	Mar. 28, 201
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna C	Conducted Em	ission			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul. 22, 2016	Jul. 21, 2017
Power Meter	Anritsu	ML2495A	25406005	Jul. 22, 2016	Jul. 21, 2017
Power Sensor	Anritsu	ML2411B	25406005	Jul. 22, 2016	Jul. 21, 2017



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4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

4.1.2 Test Limit

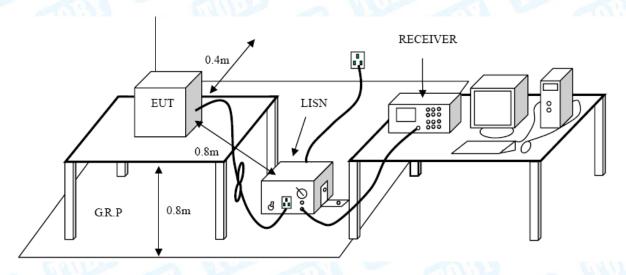
Conducted Emission Test Limit

-0130	Maximum RF Line	e Voltage (dBμV)
Frequency	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.



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I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9 kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Da5ta

Test data please refer the following pages.



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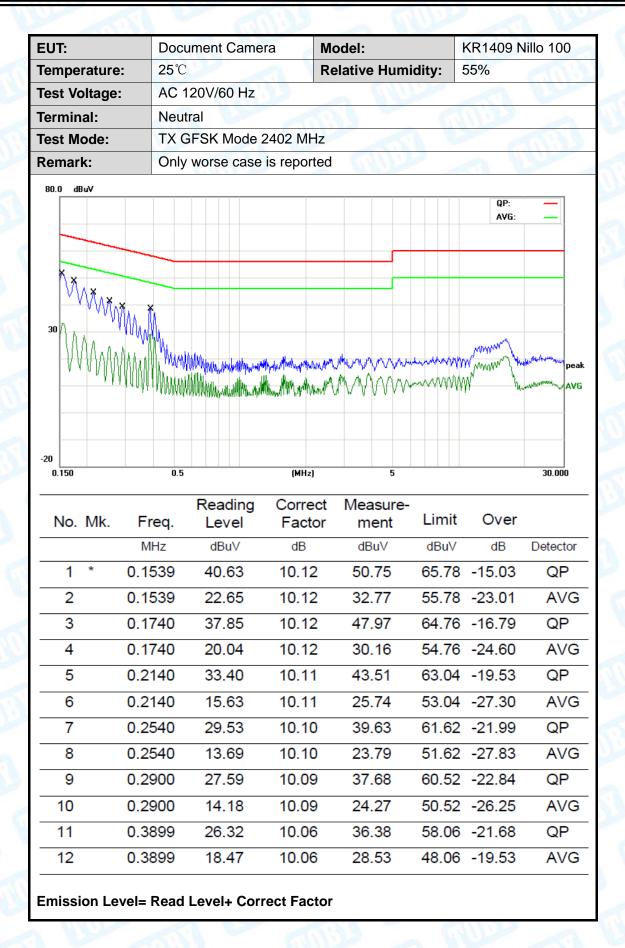


:UT:	Docun	nent Camera	a N	flodel:		KR1409	Nillo 100
emperature:	25℃	Can't	F	Relative Hum	idity:	55%	A TOWN
est Voltage:	AC 12	0V/60 Hz		20	(6)		
erminal:	Line		Allo		1 6		1500
est Mode:	TX GF	SK Mode 2	402 MHz	mile			MAR
Remark:	Only w	vorse case is	s reported	A Comment	600	133	
30 dBuV		Markopologialanin	Marin Holler Control Control		where we will be a second with the second will be a second with th	QP: AVG:	per AVI
0.150	0.5		(MHz)	5			30.000
		Reading	Correct	Measure-	Limit	Over	30.000
0.150 No. Mk.	o.5 Freq.	Reading Level			Limit	Over	30.000 Detector
0.150 No. Mk.	Freq.	Level	Correct Factor	Measure- ment	dBuV		
0.150 No. Mk. I	Freq. MHz	Level dBuV	Correct Factor	Measure- ment	dBu∨ 65.78	dB	Detector
0.150 No. Mk. 1 1 * 0. 2 0.	Freq. MHz 1539	dBuV 40.79	Correct Factor dB	Measure- ment dBuV 50.72	dBuV 65.78 55.78	dB -15.06	Detector QP
0.150 No. Mk. 1 * 0. 2 0. 3 0.	Freq. MHz 1539	dBuV 40.79 22.80	Correct Factor dB 9.93 9.93	Measure- ment dBuV 50.72 32.73	dBuV 65.78 55.78 64.76	dB -15.06 -23.05	Detector QP AVG
0.150 No. Mk. 1 * 0. 2 0. 3 0. 4 0.	Freq. MHz 1539 1539 1740	dBuV 40.79 22.80 37.93	Correct Factor dB 9.93 9.93 9.97	Measure- ment dBuV 50.72 32.73 47.90	dBuV 65.78 55.78 64.76 54.76	dB -15.06 -23.05 -16.86	Detector QP AVG QP
0.150 No. Mk. 1 * 0. 2 0. 3 0. 4 0. 5 0.	Freq. MHz 1539 1539 1740 1740	dBuV 40.79 22.80 37.93 20.11	Correct Factor dB 9.93 9.93 9.97 9.97	Measure- ment dBuV 50.72 32.73 47.90 30.08	dBuV 65.78 55.78 64.76 54.76 63.04	dB -15.06 -23.05 -16.86 -24.68	Detector QP AVG QP AVG
0.150 No. Mk. 1 * 0. 2 0. 3 0. 4 0. 5 0. 6 0.	Freq. MHz 1539 1539 1740 1740 2140	dBuV 40.79 22.80 37.93 20.11 33.47	Correct Factor dB 9.93 9.93 9.97 9.97	Measure- ment dBuV 50.72 32.73 47.90 30.08 43.49	dBuV 65.78 55.78 64.76 54.76 63.04 53.04	dB -15.06 -23.05 -16.86 -24.68 -19.55	Detector QP AVG QP AVG
0.150 No. Mk. 1 * 0. 2 0. 3 0. 4 0. 5 0. 6 0. 7 0.	Freq. MHz 1539 1539 1740 1740 2140	dBuV 40.79 22.80 37.93 20.11 33.47 15.68	Correct Factor dB 9.93 9.93 9.97 9.97 10.02 10.02	Measure- ment dBuV 50.72 32.73 47.90 30.08 43.49 25.70	dBuV 65.78 55.78 64.76 54.76 63.04 53.04 60.99	dB -15.06 -23.05 -16.86 -24.68 -19.55 -27.34	Detector QP AVG QP AVG QP AVG
0.150 No. Mk. 1 * 0. 2 0. 3 0. 4 0. 5 0. 6 0. 7 0. 8 0.	Freq. MHz 1539 1539 1740 1740 2140 2140 2740	Level dBuV 40.79 22.80 37.93 20.11 33.47 15.68 27.34	Correct Factor dB 9.93 9.93 9.97 9.97 10.02 10.02	Measure- ment dBuV 50.72 32.73 47.90 30.08 43.49 25.70 37.36	dBuV 65.78 55.78 64.76 54.76 63.04 53.04 60.99 50.99	dB -15.06 -23.05 -16.86 -24.68 -19.55 -27.34 -23.63	Detector QP AVG QP AVG QP AVG
0.150 No. Mk. 1 * 0. 2 0. 3 0. 4 0. 5 0. 6 0. 7 0. 8 0. 9 0.	Freq. MHz 1539 1539 1740 1740 2140 2140 2740 2740	Level dBuV 40.79 22.80 37.93 20.11 33.47 15.68 27.34 12.83	Correct Factor dB 9.93 9.93 9.97 10.02 10.02 10.02	Measure- ment dBuV 50.72 32.73 47.90 30.08 43.49 25.70 37.36 22.85	dBuV 65.78 55.78 64.76 54.76 63.04 53.04 60.99 50.99 60.45	dB -15.06 -23.05 -16.86 -24.68 -19.55 -27.34 -23.63 -28.14	Detector QP AVG QP AVG QP AVG AVG
0.150 No. Mk. 1 * 0. 2 0. 3 0. 4 0. 5 0. 6 0. 7 0. 8 0. 9 0. 10 0.	Freq. MHz 1539 1539 1740 1740 2140 2140 2740 2740 2924	Level dBuV 40.79 22.80 37.93 20.11 33.47 15.68 27.34 12.83 27.15	Correct Factor dB 9.93 9.93 9.97 10.02 10.02 10.02 10.02	Measure- ment dBuV 50.72 32.73 47.90 30.08 43.49 25.70 37.36 22.85 37.17	dBuV 65.78 55.78 64.76 54.76 63.04 53.04 60.99 50.99 60.45 50.45	dB -15.06 -23.05 -16.86 -24.68 -19.55 -27.34 -23.63 -28.14 -23.28	Detector QP AVG QP AVG QP AVG QP AVG QP AVG



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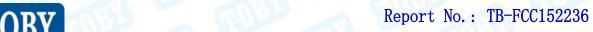




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A		١T	177	
) i	S Y	
1	-	_		

UT:	Docum	ent Camera		Model:		KR1409	Nillo 100
emperature:	25℃	Carrie		Relative Hum	nidity:	55%	118.
est Voltage:	AC 240)V/60 Hz		11	61	11/20	
erminal:	Line		AND			6	MAIL
est Mode:	TX GF	SK Mode 24	102 MHz	MILES		a 1	N. J. Land
emark:	Only w	orse case is	reported	1			
30 dBuV		Mar My Mark Mark Mark Mark Mark Mark Mark Mark			Market and the second	QP: AVG:	pe AV
0.150 No. Mk.	0.5	Reading	(MHz)	Measure-	Limit	Over	30.000
INO. IVIK.	Freq. MHz	Level dBuV	Factor dB	ment dBu∀	dBu∀	dB	Detector
1 * 0	1500	49.86	10.12	59.98	65.99	-6.01	QP
	1500	27.79	10.12	37.91	55.99	-18.08	AVG
	1620	47.57	10.12	57.69	65.36	-7.67	QP
		22.19	10.12			-23.05	
	1620			32.31			AVG
	1900	42.87	10.12	52.99		-11.04	QP
	1900	20.89	10.12	31.01		-23.02	AVG
	.2100	39.25	10.12	49.37		-13.83	QP
	.2100	18.13	10.12	28.25		-24.95	AVG
	.2380	37.32	10.11	47.43		-14.73	QP
10 0.	.2380	15.95	10.11	26.06		-26.10	AVG
	2819	33.16	10.09	43.25	60.76	-17.51	QP
11 0.	.2013						



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_	
П	
L	7 4
	D

EUT:	Docu	ment Came	ra	Model:		KR140	9 Nillo 100
Temperature:	25℃			Relative Hu	midity:	55%	ABOVE
Test Voltage:	AC 2	40V/60 Hz	-	11	61	11/22	
Terminal:	Neut	ral	diffe		16		
Test Mode:	TX G	FSK Mode 2	2402 MHz	WILL DO		1 N	N. D.
Remark:	Only	worse case	is reported	-		35	
30 dBuV 20 0.150	0.5		(MH2)	5	hand property and the same	QP: AVG:	peal AVG
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBu∀	dB	dBu∀	dBuV	dB	Detector
1 *	0.1539	48.69	10.12	58.81	65.78	-6.97	QP
2	0.1539	25.06	10.12	35.18	55.78	-20.60	AVG
3	0.1700	47.21	10.12	57.33	64.96	-7.63	QP
4	0.1700	23.85	10.12	33.97	54.96	-20.99	AVG
5	0.1884	44.88	10.12	55.00	64.10	-9.10	QP
6	0.1884	22.92	10.12	33.04	54.10	-21.06	AVG
	0.2140	40.61	10.12	50.73	63.04	-12.31	QP
	0.2140	18.90	10.12	29.02		-24.02	AVG
	0.2420	38.65	10.11	48.76		-13.26	QP
	0.2420	18.21	10.11	28.32		-23.70	AVG
		35.42	10.11	45.52		-15.47	QP
	n 274n	JJ 4/	10.10	70.02	00.99	-13.47	QF.
11	0.2740 0.2740	17.36	10.10	27.46	50 00	-23.53	AVG



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5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 15.247(d)

5.1.2 Test Limit

Radiated Emission Limits (9kHz~1000MHz)

Frequency (MHz	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Radiated Emission Limit (Above 1000MHz)

Frequency	Distance Meters(at 3m)				
(MHz)	Peak (dBuV/m)	Average (dBuV/m)			
Above 1000	74	54			

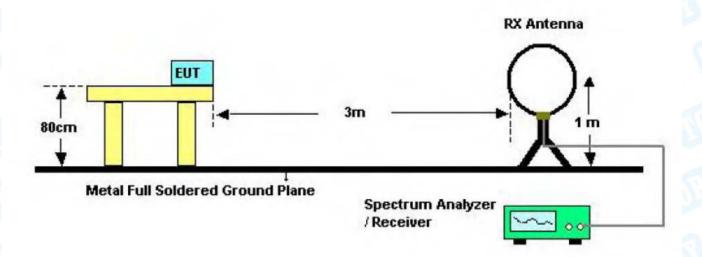
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m)

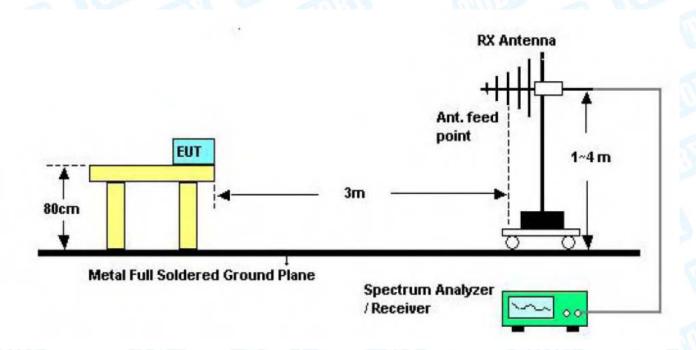


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5.2 Test Setup



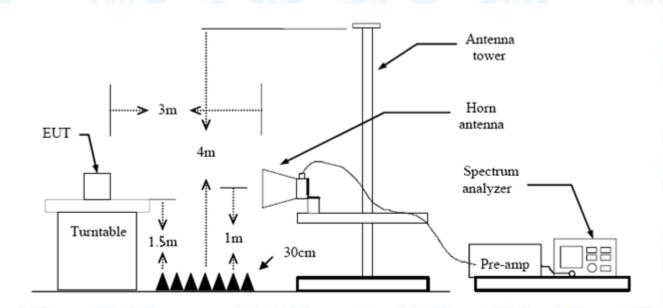
Below 30MHz Test Setup



Below 1000MHz Test Setup



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Above 1GHz Test Setup

5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.



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5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Test data please refer the following pages.



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9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB

below the permissible value has no need to be reported.

30MHz~1GHz

Temperature:		nt Camera	Model:		KR1409	IVIIIO I
	25℃	A CONTRACTOR OF THE PARTY OF TH	Relative Hu	Relative Humidity:		
Test Voltage:	AC 120/6	60Hz		16.35		11
Ant. Pol.	Horizonta	1.5 2.40			HAIR	
Test Mode:		2402 Mode				
Remark:	Only wor	se case is repo	orted	Fr.		1 4
80.0 dBuV/m						
30	Howay was professional to the said		1 2 3 * * * * * * * * * * * * * * * * * * *	(RF)FCC 150	3M Radiation Margin -6 o	118 F
-20 30.000 40 50) (1	MHz) 300		600 700	1000.000
30.000 40 50	R	eading Cor	rrect Measure-		600 700 Over	1000.000
30.000 40 50 No. Mk. F	R	eading Cor Level Fa	rect Measure	-		1000.000
30.000 40 50 No. Mk. F	R Freq. I	eading Cor Level Fa	rrect Measure actor ment	Limit	Over	
No. Mk. F	R Freq. I MHz .2366	eading Cor Level Fa dBuV dB	rrect Measure- actor ment	Limit dBuV/m	Over	Detecto
No. Mk. F 1 167 2 202	Req. 1 MHz .2366 5	eading Cor Level Fa dBuV dB 50.16 -20 49.36 -19	rrect Measure- nctor ment dBuV/m .74 29.42	Limit dBuV/m 43.50	Over dB -14.08	Detector peak
No. Mk. F 1 167 2 202 3 215	Req. I MHz .2366 : .8103 4	eading Cor Level Fa dBuV dB 50.16 -20 49.36 -19	rect Measurement dBuV/m 29.42 29.49 31.26	Limit dBuV/m 43.50 43.50 43.50	Over dB -14.08 -14.01 -12.24	Detector peak peak
No. Mk. F 1 167 2 202 3 215 4 382	Req. I MHz .2366 : .8103 : .2676 :	eading Cor Level Fa dBuV dB 50.16 -20 49.36 -19 50.58 -19	rect Measurement dBuV/m 29.42 29.49 31.26 39.04	Limit dBuV/m 43.50 43.50 43.50 46.00	Over dB -14.08 -14.01 -12.24 -6.96	peak peak peak peak
No. Mk. F 1 167 2 202 3 215 4 382 5 * 742	Req. I MHz .2366 . .8103 . .2676 . .5878 .	eading Cor Level Fa dBuV dB 50.16 -20 49.36 -19 50.58 -19 52.54 -13 45.88 -6.	rect Measurement dBuV/m 29.42 29.49 31.26 39.04	Limit dBuV/m 43.50 43.50 43.50	Over dB -14.08 -14.01 -12.24	Detector peak peak



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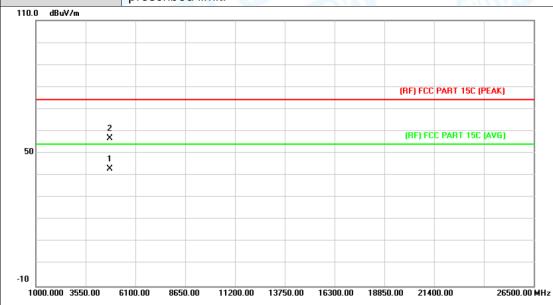
	Document Camera Model:				KR140	09 N	lillo 100				
Temperatu	re:	25℃		TITLE	R	elative Hu	midity		55%		
Test Voltag	je:	AC 1	20/60H	Ηz		10		(fill)	113)	
Ant. Pol.		Vertic	cal		A HO		0	63			181
Test Mode		BLE	TX 240)2 Mod	е				2		Market
Remark:		Only	worse	case is	reported	1			13		
80.0 dBuV/m											
30	~	Lun V	when you willy	1 2 1 2 1 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		5-6 X X	(F	FJFCC 1	5C 3M Rai	diation	
-20 30.000 40) 50	60 7	70 80		(MHz)	30	00 40	00 50	00 600	700	1000.00
	. F	req.	Rea Le	ading	(MHz) Correct Factor	Measure ment	e- Liı	mit	Ov	er	
30.000 40	. F	req.	Rea Le	evel BuV	Correct Factor	Measure ment dBuV/m	Liı	mit uV/m	Ov	er 3	1000.00
30.000 40	. F	req.	Rea Le	vel	Correct Factor	Measure ment	Liı	mit	Ov	er	
30.000 40 No. Mk	. F	req.	Rea Le	evel BuV	Correct Factor	Measure ment dBuV/m	Lii dB	mit uV/m	Ov	er 3	Detect
30.000 40 No. Mk	. F M 102.	req. IHz 0014	Rea Le dE 57	evel BuV 7.03	Correct Factor dB/m -21.85	Measure ment dBuV/m 35.18	Lii dB 43	mit suV/m 3.50	Ov dE -8.	er 3	Detecto
No. Mk	. F M 102. 114. 167.	req. IHz 0014 5146	Rea Le dE 57 55 61	evel BuV 7.03 5.42	Correct Factor dB/m -21.85 -22.12	Measure ment dBuV/m 35.18 33.30	E- Lii dB 43 43	mit uv/m 3.50 3.50	Ov dE -810 -3.	er 3 32	Detector peal
No. Mk	. F 102. 114. 167. 191.	req. IHz 0014 5146 2366	Rea Le 57 55 61	7.03 5.42	Correct Factor dB/m -21.85 -22.12 -20.74	Measure ment dBuV/m 35.18 33.30 40.41	4: 4: 4: 4:	mit 3.50 3.50 3.50	Ov dE -810 -39.	er 32 .20	Detector peal peal



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Above 1GHz

EUT:	Document Camera	Model:	KR1409 Nillo 100					
Temperature:	25℃	Relative Humidity:	55%					
Test Voltage:	AC 120/60Hz		The same of the sa					
Ant. Pol.	Horizontal							
Test Mode:	BLE Mode TX 2402 MHz	The state of the s						
Remark:	No report for the emission	No report for the emission which more than 10 dB below the						
	prescribed limit.							

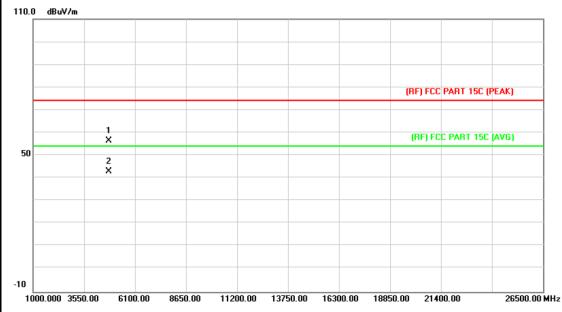


N	lo. I	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	•	4803.379			42.99	54.00	-11.01	AVG
2			4803.835	43.27	13.44	56.71	74.00	-17.29	peak



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EUT:	Document Camera	Model:	KR1409 Nillo 100					
Temperature:	25℃	Relative Humidity:	55%					
Test Voltage:	AC 120/60Hz	AC 120/60Hz						
Ant. Pol.	Vertical							
Test Mode:	BLE Mode TX 2402 MHz	MILLER						
Remark:	No report for the emission	No report for the emission which more than 10 dB below the						
	prescribed limit.							



No	o. Mk	. Freq.			Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4802.512	42.92	13.43	56.35	74.00	-17.65	peak
2	*	4804.930	29.53	13.44	42.97	54.00	-11.03	AVG



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EUT:	Document Camera	Model:	KR1409 Nillo 100				
Temperature:	25℃ Relative Humidity: 55		55%				
Test Voltage:	AC 120/60Hz						
Ant. Pol.	Horizontal	Horizontal					
Test Mode:	BLE Mode TX 2442 MHz	WIII DE	2 110				
Remark:	No report for the emission v	No report for the emission which more than 10 dB below the					
	prescribed limit.						

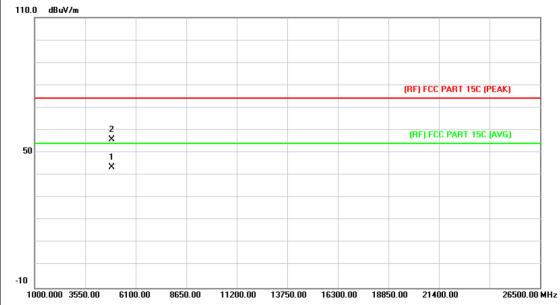


No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4883.196	43.84	13.91	57.75	74.00	-16.25	peak
2	*	4883.340	29.81	13.92	43.73	54.00	-10.27	AVG



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EUT:	Document Camera	Model:	KR1409 Nillo 100					
Temperature:	25℃	Relative Humidity:	55%					
Test Voltage:	AC 120/60Hz	AC 120/60Hz						
Ant. Pol.	Vertical	Vertical						
Test Mode:	BLE Mode TX 2442 MHz		2					
Remark:	No report for the emission	No report for the emission which more than 10 dB below the						
	prescribed limit.							
			Į.					



Ν	lo.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4883.040	29.60	13.91	43.51	54.00	-10.49	AVG
2			4883.598	41.97	13.92	55.89	74.00	-18.11	peak



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EUT:	Document Camera	Model:	KR1409 Nillo 100				
Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	AC 120/60Hz	AC 120/60Hz					
Ant. Pol.	Horizontal	Horizontal					
Test Mode:	BLE Mode TX 2480 MHz		a little				
Remark:	No report for the emission v	No report for the emission which more than 10 dB below the					
	prescribed limit.						
i							

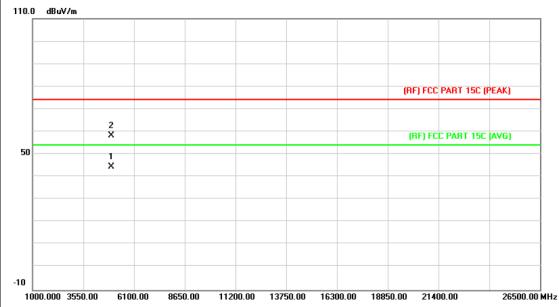


No	o. Mk	Freq.			Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.736	43.84	14.36	58.20	74.00	-15.80	peak
2	*	4960.684	30.05	14.36	44.41	54.00	-9.59	AVG



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EUT:	Document Camera	Model:	KR1409 Nillo 100				
Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	AC 120/60Hz	AC 120/60Hz					
Ant. Pol.	Vertical	Vertical					
Test Mode:	BLE Mode TX 2480 MHz		A WILLIAM				
Remark:	No report for the emission	No report for the emission which more than 10 dB below the					
	prescribed limit.						
i							



	No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4960.360	30.06	14.36	44.42	54.00	-9.58	AVG
2			4960.498	43.74	14.36	58.10	74.00	-15.90	peak



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6. Restricted Bands Requirement

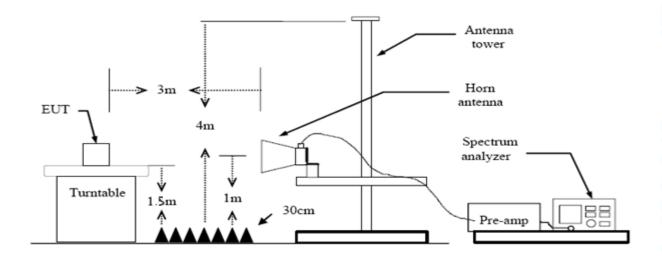
6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.247(d) FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency	Distance Me	eters(at 3m)
Band (MHz)	Peak (dBuV/m)	Average (dBuV/m)
2310 ~2390	74	54
2483.5 ~2500	74	54

6.2 Test Setup



6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector



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mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

6.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

6.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

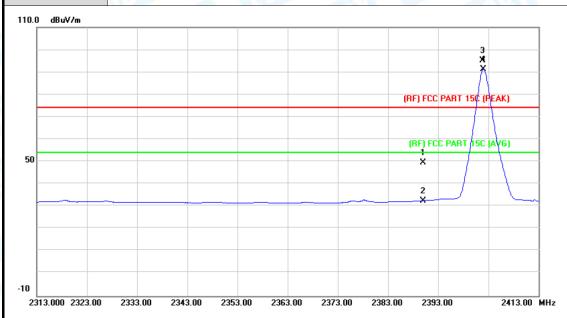
Test data please refer the following pages.



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(1) Radiation Test

EUT:	Document Camera	Model:	KR1409 Nillo 100			
Temperature:	25℃	Relative Humidity:	55%			
Test Voltage:	AC 120/60Hz					
Ant. Pol.	Horizontal		- William			
Test Mode:	BLE Mode TX 2402 MHz					
Remark:	N/A					



No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	48.80	0.77	49.57	74.00	-24.43	peak
2		2390.000	31.83	0.77	32.60	54.00	-21.40	AVG
3	X	2401.800	94.30	0.82	95.12	Fundamental	Frequency	peak
4	*	2402.000	90.50	0.82	91.32	- Fundamental	Frequency	AVG



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EUT:	JT:Document CameraModel:KR1409 Nemperature:25℃Relative Humidity:55%				KR1409 Nillo 100			
Tempe				N. Comment				
Test Vo	oltage:	AC 12	20/60Hz		110	THE	1133	
Ant. Po	ol.	Vertic	al	A THOU		10		TO B
Test Mo	ode:	BLE N	Mode TX 24	02 MHz	MILLE		3 113	1 less
Remark: N/A								
110.0 dB	BuV/m							
							4	
							¥ ×	
							Λ	
						(RF) FCC F	PART 150 (PEAK	g
-						(RF) FCC	PART 15C (AVE	i)
50							_/ \	
					_	2 X		
-10								
	00 2323.00	2333.00	2343.00 23	353.00 2363.0	00 2373.00 23	383.00 2393.	00 2	2413.00 MHz
No.	ML	Freq.	Reading			Limit	Over	
	IVIK.		Level	Factor				<u> </u>
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	23	90.000	50.50	0.77	51.27	74.00	-22.73	peak
	23							

0.82

0.82

92.29

97.23

Fundamental Frequency

Fundamental Frequency

Emission Level= Read Level+ Correct Factor

91.47

96.41

2402.000

2402.100

3

4

Χ

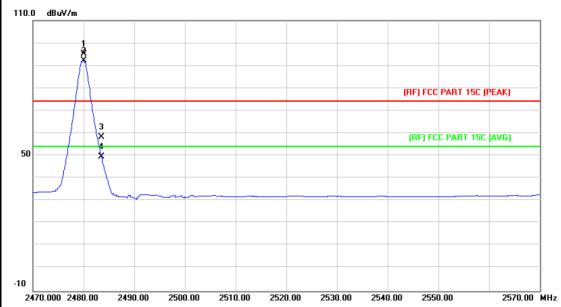
AVG

peak



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Document Camera	Model:	KR1409		
		Nillo 100		
25℃	Relative Humidity:	55%		
AC 120/60Hz				
Horizontal		CHILL		
BLE Mode TX 2480 MHz				
N/A	- W			
	25℃ AC 120/60Hz Horizontal BLE Mode TX 2480 MHz	25°C Relative Humidity: AC 120/60Hz Horizontal BLE Mode TX 2480 MHz		

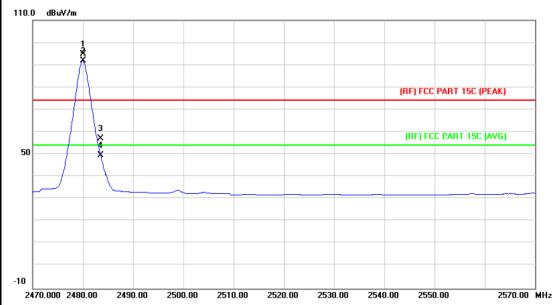


N	lo. M	k.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2	2480.000	93.92	1.15	95.07	Fundamental Frequency		peak
2	*	2	2480.000	91.14	1.15	92.29	- Fundamental	Frequency	AVG
3		2	2483.500	57.04	1.17	58.21	74.00	-15.79	peak
4		2	2483.500	48.41	1.17	49.58	54.00	-4.42	AVG



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EUT:	Document Camera	Model:	KR1409 Nillo 100				
Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	Test Voltage: AC 120/60Hz						
Ant. Pol.	Vertical						
Test Mode:	BLE Mode TX 2480 MHz						
Remark:	N/A		33 _ 6				



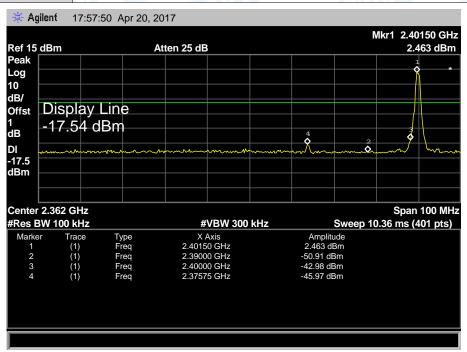
No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2480.000	93.60	1.15	94.75	Fundamental I	Frequency	peak
2	*	2480.000	90.70	1.15	91.85	Fundamental I	Frequency	AVG
3		2483.500	55.97	1.17	57.14	74.00	-16.86	peak
4		2483.500	48.46	1.17	49.63	54.00	-4.37	AVG

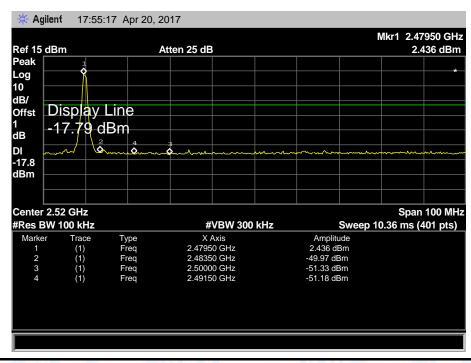


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(2) Conducted Test

EUT:	Document Camera	Model:	KR1409 Nillo 100				
Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	AC 120/60Hz	AC 120/60Hz					
Test Mode:	BLE Mode TX 2402MHz / BLE Mode TX 2480MHz						
Remark: The EUT is programed in continuously transmitting mode							







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7. Bandwidth Test

7.1 Test Standard and Limit

7.1.1 Test Standard FCC Part 15.247 (a)(2)

7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-247						
Test Item	Limit	Frequency Range(MHz)				
Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5				

7.2 Test Setup



7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
- (3)Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:100 kHz, and Video Bandwidth:300 kHz, Detector: Peak, Sweep Time set auto.

7.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.



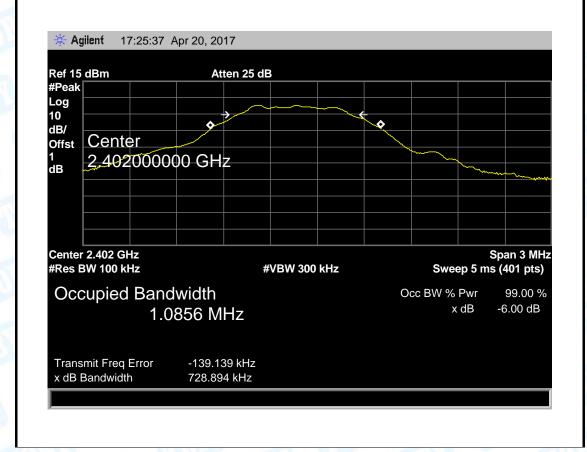
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7.5 Test Data

EUT: Document Camera			Model:	KR1409 Nillo 100			
Temperature:	Temperature: 25°C			55%			
Test Voltage:	AC 1	20/60Hz	WILLIAM	THE REAL PROPERTY OF THE PERTY			
Test Mode:	BLE	TX Mode	and the same	13.12			
Channel frequency		6dB Bandwidth	99% Bandwidth	Limit			
(MHz)		(kHz)	(kHz)	(kHz)			
2402		2402 728.894					
2442	2442 727.829		1083.90	>=500			
2480		723.683	1083.40				

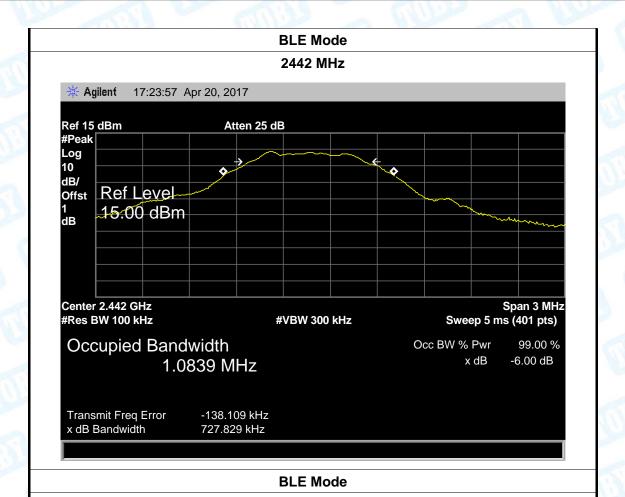
BLE Mode

2402 MHz





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#VBW 300 kHz

Occupied Bandwidth 1.0834 MHz

Center 2.48 GHz

#Res BW 100 kHz

Occ BW % Pwr 99.00 % x dB -6.00 dB

Sweep 5 ms (401 pts)

Span 3 MHz

Transmit Freq Error -139.019 kHz x dB Bandwidth 723.683 kHz



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8. Peak Output Power Test

8.1 Test Standard and Limit

8.1.1 Test Standard FCC Part 15.247 (b)(3)

8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-247						
Test Item	Limit	Frequency Range(MHz)				
Peak Output Power	1 Watt or 30 dBm	2400~2483.5				

8.2 Test Setup



8.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement is according to section 9.1.1 of KDB 558074 D01 DTS Meas Guidance v04.

- (1) Set the RBW≥DTS Bandwidth
- (2) Set VBW≥3*RBW
- (3) Set Span≥3*RBW
- (4) Sweep time=auto
- (5) Detector= peak
- (6) Trace mode= maxhold.
- (7) Allow trace to fully stabilize, and then use peak marker function to determine the peak amplitude level.

8.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

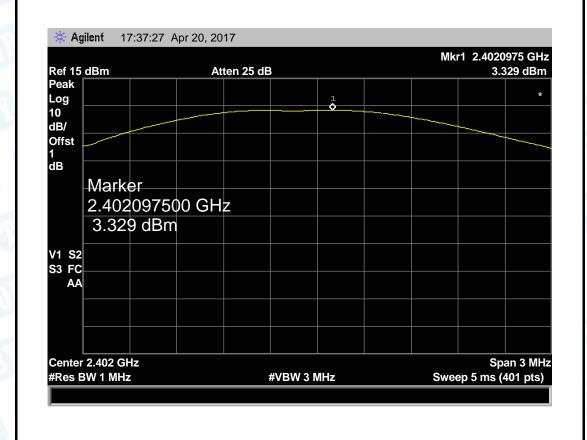


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8.5 Test Data

EUT: Document		t Camera	Model:	KR1409 Nillo 100				
Temperature:	25℃		Relative Humidity:	55%				
Test Voltage:	AC 120/6	0Hz	THUE					
Test Mode:	BLE TX M	1ode		11:33				
Channel frequen	cy (MHz)	Test Result (dBm)		Limit (dBm)				
2402		3.329						
2442		2.839		30				
2480		3.026						
	BLE Mode							

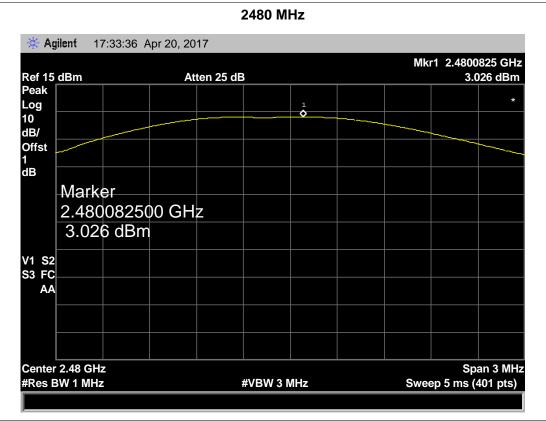
2402 MHz





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9. Power Spectral Density Test

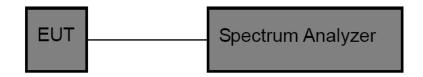
9.1 Test Standard and Limit

9.1.1 Test Standard FCC Part 15.247 (e)

9.1.2 Test Limit

FCC Part 15 Subpart C(15.247)						
Test Item	Limit	Frequency Range(MHz)				
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5				

9.2 Test Setup



9.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v04.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyser center frequency to DTS channel center frequenyc.
- (3) Set the span to 1.5 times the DTS bandwidth.
- (4) Set the RBW to: 3 kHz(5) Set the VBW to: 10 kHz
- (6) Detector: peak(7) Sweep time: auto
- (8) Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

9.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, Midle and high channel for the test.



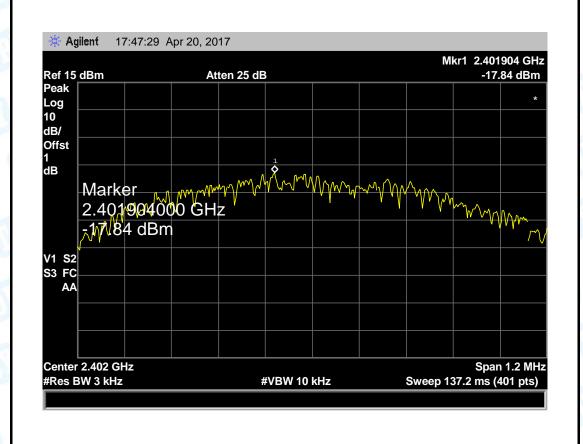
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9.5 Test Data

EUT: Document		t Camera	Model:		KR1409 Nillo 100	
Temperature:	25 ℃		Relative H	Relative Humidity: 5		
Test Voltage:	AC 120/6	AC 120/60Hz			- 0	
Test Mode:	BLE TX M	BLE TX Mode			1	China Control
Channel Frequency	uency	Power Density		Limit		Result
(MHz)		(d	(dBm) (d		າ)	Result
2402		-1	7.84			
2442		-17.17		8		PASS
2480		-1	17.45			

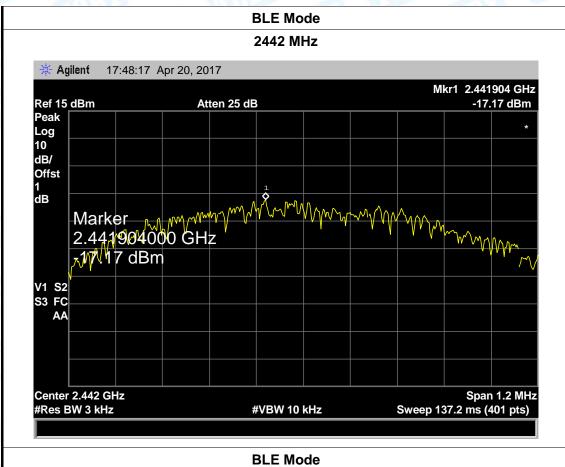
BLE Mode

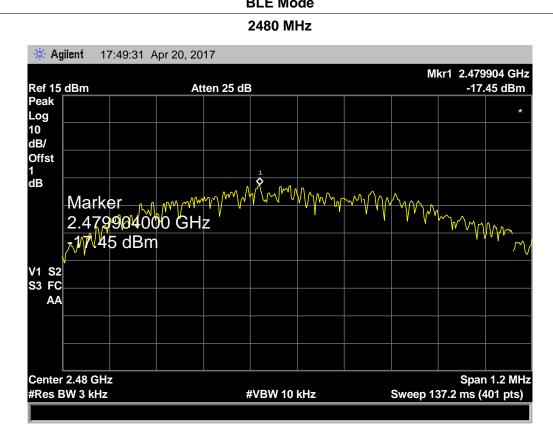
2402 MHz





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10. Antenna Requirement

10.1 Standard Requirement

10.1.1 Standard FCC Part 15.203

10.1.2 Requirement

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 this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 4.5dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

10.3 Result

The EUT antenna is a FPC Antenna. It complies with the standard requirement.

Antenna Type	
	□ Permanent attached antenna
0.00	▼ Unique connector antenna
	□ Professional installation antenna

----END OF REPORT-----