CERTIFICATE of EMC Compliance

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Report No:	EMC-FCC-1263
Type of equipment:	NETWORK CAMERA
Model Name:	SNV-5080RN
Applicant:	SAMSUNG TECHWIN CO., LTD.
Address:	#42 Seongju-Dong, Changwon-Shi, Kyungsangnam-Do, Korea
Manufacturer#1 :	SAMSUNG TECHWIN CO., LTD.
Address:	#42 Seongju-Dong, Changwon-Shi, Kyungsangnam-Do, Korea
Manufacturer#2 :	TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD
Address:	No.11 Weiliu Road. Micro-Electronic Industrial Park Jingang Road Tianjin 300385, China
Test standards :	FCC part 15 subpart B, Class A
Classification :	Verification

The above equipment was tested by EMC compliance Testing Laboratory for with the requirements of FCC Rules and Regulations. The results of testing in this report apply to the product / system which was tested only.
These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

Yeom, Han-Seok / Manager

Laboratory

EMC compliance Ltd.
480-5 Sin-dong, Yeongtong-gu,
Suwon-city, Gyeonggi-do, 443-390, Korea

Tel : 82 31 336 9919
Fax : 82 31 336 4767

EMI TEST REPORT

Test report No.:	**EMC-FCC-1263**
Type of Equipment:	**NETWORK CAMERA**
Model Name:	**SNV-5080RN**
Applicant:	**SAMSUNG TECHWIN CO., LTD.** **#42 Seongju-Dong, Changwon-Shi,** **Kyungsangnam-Do, Korea**
Manufacturer#1:	**SAMSUNG TECHWIN CO., LTD.** **#42 Seongju-Dong, Changwon-Shi,** **Kyungsangnam-Do, Korea**
Manufacturer#2:	**TIANJIN SAMSUNG TECHWIN** **OPTO-ELECTRONIC CO., LTD** **No.11 Weiliu Road. Micro-Electronic Industrial** **Park Jingang Road Tianjin 300385, China**
Test standards:	**FCC part 15 subpart B, Class A**
Test Procedure and Items	
- Radiated Emissions Measurement : ANSI C63.4-2009	
Testing Laboratory:	**EMC Compliance Ltd.**
Test result:	**Complied**

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC Rules and Regulations. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

Date of receipt: 2011. 03. 29

Date of testing: 2011. 04. 01

Issued date: 2011. 04. 06

Tested by: KIM, IN-HO

Approved by: YEOM, HAN-SEOK

Contents

1. Applicant information

Applicant:	SAMSUNG TECHWIN CO., LTD.
Address:	#42 Seongju-Dong, Changwon-Shi,
	Kyungsangnam-Do, Korea
Telephone:	+82-31-277-3695
Fax:	+82-31-277-2784
E-mail:	js2002.kang@samsung.com
Contact name:	**Kang Jei Soon**

Manufacturer#1:	SAMSUNG TECHWIN CO., LTD.
Address:	#42 Seongju-Dong, Changwon-Shi,
	Kyungsangnam-Do, Korea
Telephone:	+82-31-277-3695
Fax:	+82-31-277-2784
E-mail:	js2002.kang@samsung.com
Contact name:	**Kang Jei Soon**

Manufacturer#2:	TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD
Address:	No.11 Weiliu Road. Micro-Electronic Industrial Park
	Jingang Road Tianjin 300385, China

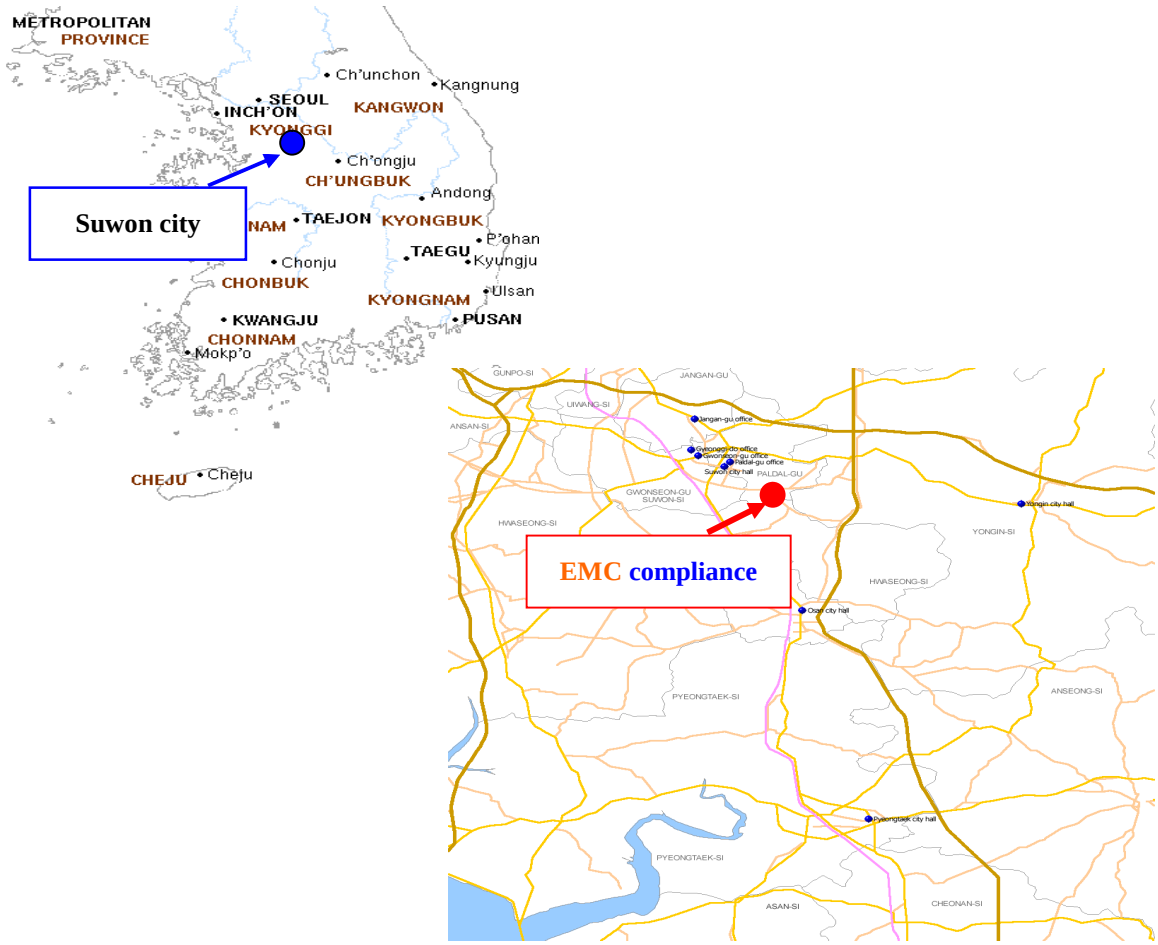
2. Laboratory information

Address

EMC compliance Ltd.
480-5 Sin-dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, 443-390, Korea
Telephone Number: 82 31 336 9919
Facsimile Number: 82 31 336 4767

FCC CAB.: KR0040
VCCI Registration No. : R-3327, G-198, C-3706, T-1849
Industry Canada Registration No. : 8035A
KOLAS NO.: 231

SITE MAP



3. Test system configuration

3.1 Operation environment

	Temperature	Humidity	Pressure
Chamber(10 m) :	25 °C	30 % R.H.	-

Test site

These testing items were performed following locations;

Chamber (10 m) : Radiated Emission

3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are test receiver, cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability. Based on CISPR 16-4-2, the measurement uncertainty level with a 95 % confidence level was applied.

Radiated Emission measurement :(k = 2, 95 %)

30 ㎒ ~ 300 ㎒: 3 m: ± 4.3 [㏈]
10 m: ± 4.3 [㏈]

300 ㎒ ~ 1 000 ㎒: 3 m: ± 4.4 [㏈]
10 m: ± 4.3 [㏈]

4. Description of E.U.T.

4.1 General information

Video	
Imaging Device	1/3" 1.3M PS CMOS
Total Pixels	1,384(H) x 1,076(V)
Effective Pixels	1,329(H) x 1,049(V)
Scanning System	Progressive
Min. Illumination	Color : 0.3 Lux (F1.2, 50IRE), 0.005 Lux (Sens up 60X) B/W : 0Lux (F1.2, 50IRE, IR LED ON)
S / N Ratio	50dB
Video Out	DIP Connector Type, 704x480(N), 704x576(P), checking for connecting status
Lens	
Focal Length (Zoom Ratio)	3~8.5mm (2.8X) Motorized Vari-focal
Max. Aperture Ratio	F1.2
Angular Field of View	H: 100°(Wide)~35.3°(Tele), V: 74.6°(Wide)~26°(Tele)
Focus Control	Remote control via network (Manual, One-shot AF)
Lens Type	DC Auto Iris
Mount Type	Board-in type
Pan / Tilt / Rotate	
Pan Range	0°~355°
Pan Speed	-
Tilt Range	0°~90°
Tilt Speed	-
Rotate Range	0°~355°
Preset	-
Preset Accuracy	-
Auto Tracking	-
Operational	
IR LED	15 ea
Viewable Length	10m (TBD)
Camera Title	Off / On (Displayed up to 15 characters)
Day & Night	Auto (ICR) / Color / B/W
Backlight Compensation	Off / BLC / HLC
Wide Dynamic Range	-
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNRIII (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	-
Motion Detection	-
Privacy Masking	Off / On (12 programmable zones)
Sens-up (Frame Integration)	Off / Auto (2X ~ 60X)
Gain Control	Off / Low / Medium / High / Manual
White Balance	ATW / AWC / Manual / Indoor / Outdoor
Electronic Shutter Speed	Auto / A.FLK / Manual (1/30 ~ 30,000sec)
Digital Zoom	-
Flip / Mirror	Off / On
Intelligent Video Analytics	Scene Change, Virtual Line, Enter/Exit, Appear / Disappear
Alarm I/O	Input 1ea / Output 1ea (Relay)
Remote Control Interface	-
RS-485 Protocol	-

Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264, MPEG4, MJPEG
Resolution	1280x1024, 1280x720P(HD),1024x768, 800x600, 640x480, 320x240
Max. Framerate	22fps(1,280 x 960), 30fps(1280x720P,1024x768, 800x600, 640x480, 320x240)
Video Quality Adjustment	H.264/MPEG4 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate Control Method	H.264/MPEG4 : CBR or VBR MJPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio I/O	Line in / Line out
Audio Compression Format	G.711 u-law
Audio Communication	2-Way
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log
Streaming Method	Unicast / Multicast
Max. User Access	10 users at Unicast Mode
Memory Slot	SD/SDHC Memory Slot
ONVIF Conformance	Yes
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Denish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek
Web Viewer	Supported OS : Windows XP / VISTA / 7, MAC OS Supported Browser : Internet Explorer 6.0 or Higher, Firefox Google Chrome, Apple Safari
Central Management Software	NET-i viewer
Environmental	
Operating Temperature / Humidity	-40°C ~ +50°C (-40°F ~ +122°F) / ~ 90% RH
Ingress Protection	IP66 Grade (Waterproof)
Electrical	
Input Voltage / Current	24V AC, 12V DC, PoE(802.3af)
Power Consumption	Max. 8W (Heater Off), Max. 11W (Heater On) ?
Mechanical	
Color / Material	Body : Ivory / Aluminum
Dimension (WxHxD)	H134.5 x Ø160mm
Weight	TBD

4.2 Product description

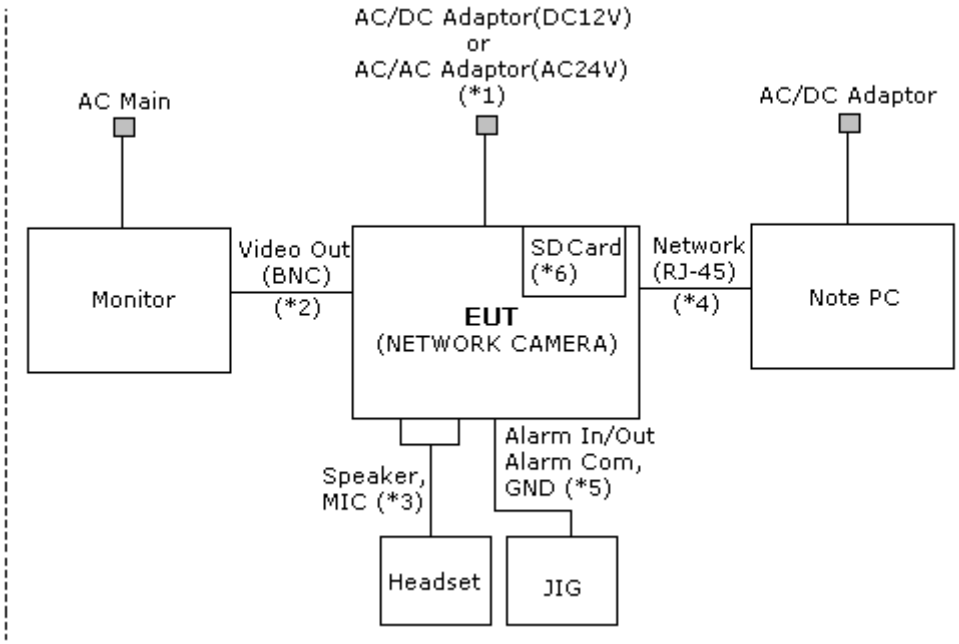
Type of product	NETWORK CAMERA
Model name (Basic)	SNV-5080RN
Model name (Variant)	N/A
Difference	-
Serial no	Engineering Sample
Testing voltage	DC 12 Ⅴ, AC 24 Ⅴ, PoE
Product rating	DC 12 Ⅴ, AC 24 Ⅴ, PoE
Internal clock ferquence	27 ㎒
Note	* AC/DC adaptor, AC/AC adaptor, PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	C1321	472680432036	FUJITSU
Monitor	GCM-1014SA-D	26090901003	Honeywell
Headset	ES-303	-	inkel
JIG	-	-	-
SD Card(2GB)	-	-	SANDISK
AC/DC Adaptor(DC 12V)	DSA-60W-12	-	Dee Van Electronics
AC/AC Adaptor(AC 24V)	STA-230	-	Dream Electronics
PoE Switch	FS108P	1DL2093R00C1C	NETGEAR

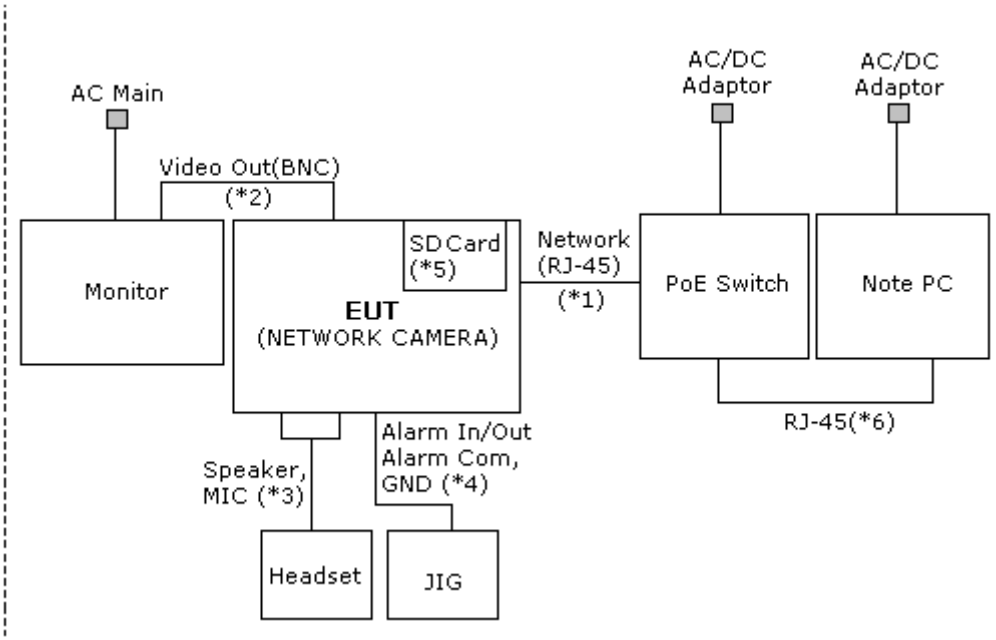
4.4 Test configuration

* DC 12 Ⅴ, AC 24 Ⅴ



Note	Start		End		Cable	
*	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	**EUT** (NETWORK CAMERA)	Power	AC/DC Adaptor or AC/AC Adaptor	Power	1.5	Non-Shield
2		Video Out(BNC)	Monitor	Video In(BNC)	3.0	Shield
3		Speaker, MIC	Headset	Speaker, MIC	2.0	Non-Shield
4		Network(RJ-45)	Note PC	RJ-45	3.0	Non-Shield
5		Alarm In/Out Alarm Com, GND	JIG	Alarm In/Out Alarm Com, GND	3.0	Non-Shield
6		SD Card	SD Card	SD Card	Direct	-

* PoE



Power supplied from PoE Switch

Note	Start		End		Cable	
*	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	**EUT** (NETWORK CAMERA)	Network(RJ-45)	PoE Switch	Network(RJ-45)	3.0	Non-Shield
2		Video Out(BNC)	Monitor	Video In(BNC)	3.0	Shield
3		Speaker, MIC	Headset	Speaker, MIC	2.0	Non-Shield
4		Alarm In/Out Alarm Com, GND	JIG	Alarm In/Out Alarm Com, GND	3.0	Non-Shield
5		SD Card	SD Card	SD Card	Direct	-
6	PoE Switch	RJ-45	Note PC	RJ-45	3.0	Non-Shield

4.5 Operating conditions

The EUT was configured as normal intended use.

This test was done at worst case.

Test mode	Normal operating
1	Web view mode.
	Monitoring mode.
	Alarm operating mode.

* Note: 3 types of powers are available for the product, that are AC/DC adaptor (DC 12 Ⅴ),
AC/AC adaptor (AC 24 Ⅴ), PoE switch. Therefore, tests were performed for 2 different types of powers.

5. Summary of test results

In the above configuration tested, The EUT complied with the requirement of the specification

5.1 Modification to the E.U.T.

None

5.2 Summary of EMI emission test results

FCC Part 15 Subpart B (Class A)

ANSI C63.4 – 2009

Application	Test method	Test result
Conducted emission	ANSI C63.4 – 2009	N/A
Radiated emission - DC 12 Ⅴ, AC 24 Ⅴ, PoE	ANSI C63.4 – 2009	Complied

6. Test results

6.1 Radiated Emission

Test specification	FCC Part 15, Section 15.109(g), Class A		
Test mode	Operating mode.		
Date	2011. 04. 01		
Testing voltage	DC 12 Ⅴ, AC 24 Ⅴ, PoE		
Test facility	10 m Chamber		
Temperature (°C)	25 °C	Humidity (% R.H.)	30 % R.H.
Remarks	Complied Minimum limit margin is 6.2 dB at 107.454 ㎒. (DC 12 Ⅴ) Minimum limit margin is 8.0 dB at 117.875 ㎒. (AC 24 Ⅴ) Minimum limit margin is 4.0 dB at 121.447 ㎒. (PoE)		

6.1.1 Limits of radiated emission measurement

Frequency [㎒]	Class A (dB(㎶/m)) @ 10 m	Class B (dB(㎶/m)) @ 3 m
30-88	39	40
88-216	43.5	43.5
216-960	46.4	46
Above 960	49.5	54

*** Note- Alternative standard: CISPR, Pub. 22 ***

6.1.2 Measurement procedure

The test was done at a 10 m chamber with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane.
Cables were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane. Cables connected to EUT were fixed to cause maximum emission.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.1.3 Used equipments

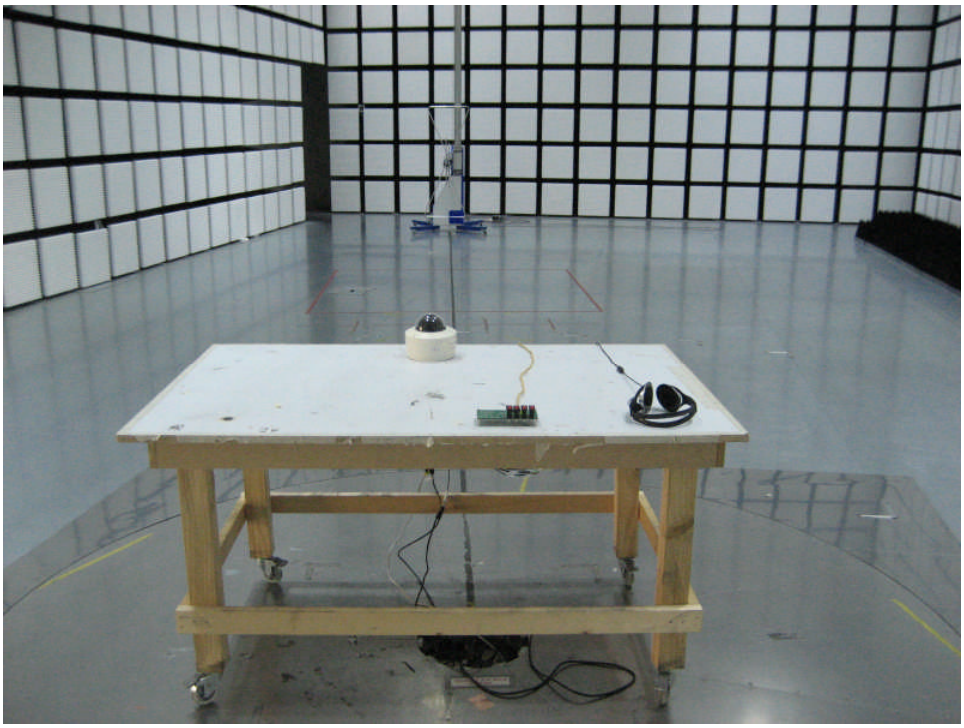
Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test Receiver	ESCI	100001	R&S	11.08.17	☒
Bi-Log Antenna	VULB 9168	375	SCHWARZBECK	11.11.30	☒
Amplifier	310N	284608	SONOMA INSTRUMENT	11.07.08	☒
3 dB Attenuator	8491A	16861	HP	12.01.13	☒
Antenna Mast	AM4.0	079/3440509	MATURO	-	☒
Turn Table	CO2000-SOFT	-	MATURO	-	☒

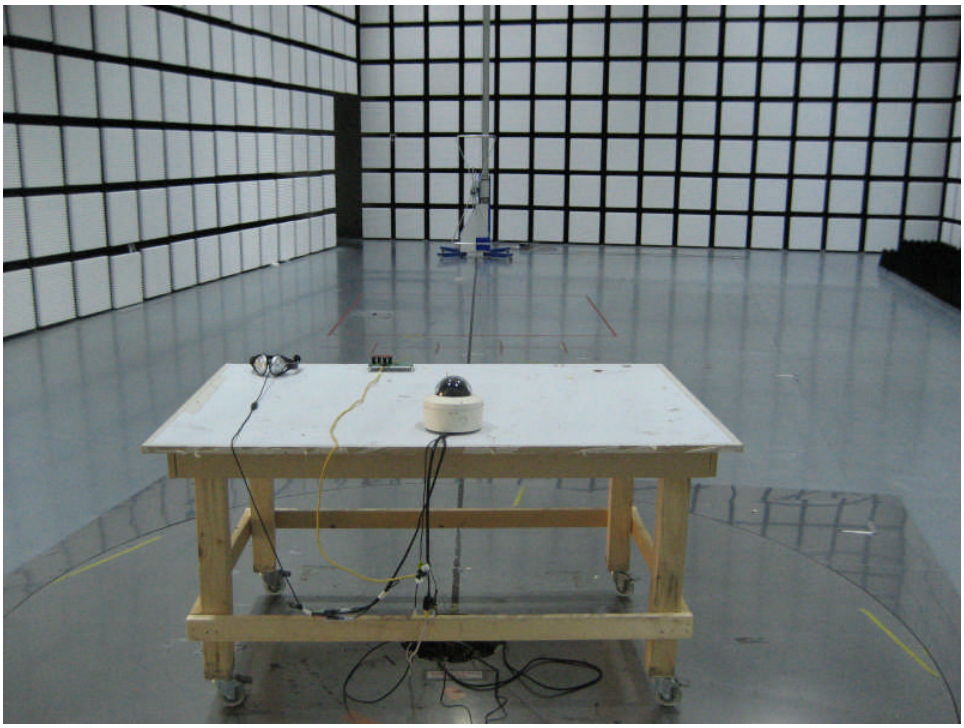
6.1.4 Sample calculation

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.
The sample calculation is as follow:
Result = M.R + C.F(A.F + C.L +3 dB Att – A.G)
M.R = Meter Reading
C.F = Correction Factor
A.F = Antenna Factor
C.L = Cable Loss
A.G= Amplifier Gain
3 dB Att = 3 dB Attenuator
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB
The result is 30 + 12 + 5 + 3 – 35 = 15 dB(μV/m)

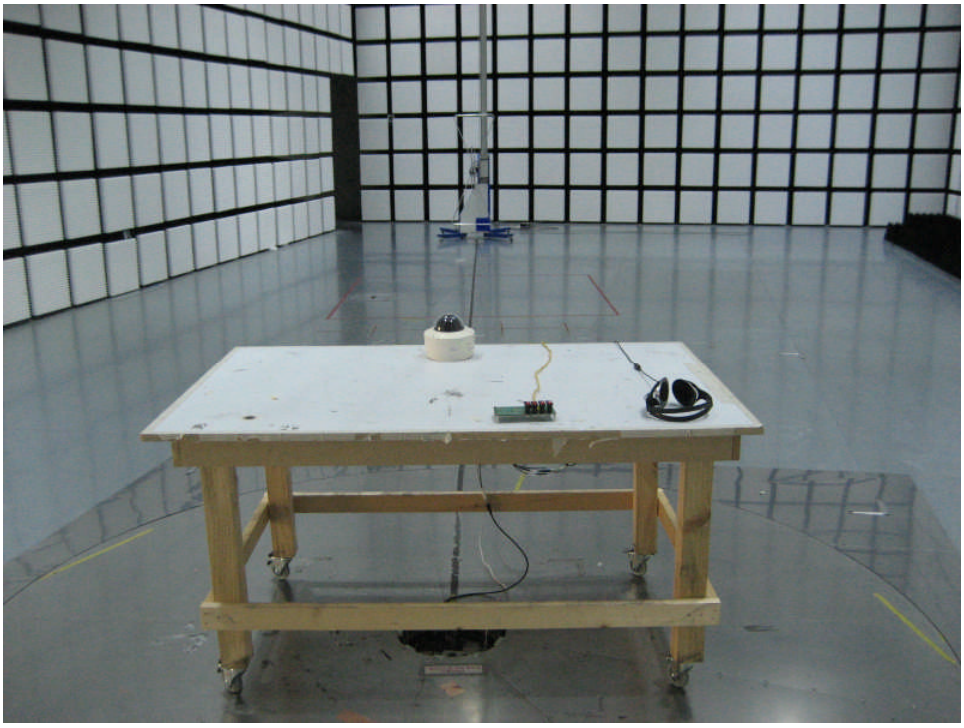
6.1.5 Photographs of test setup

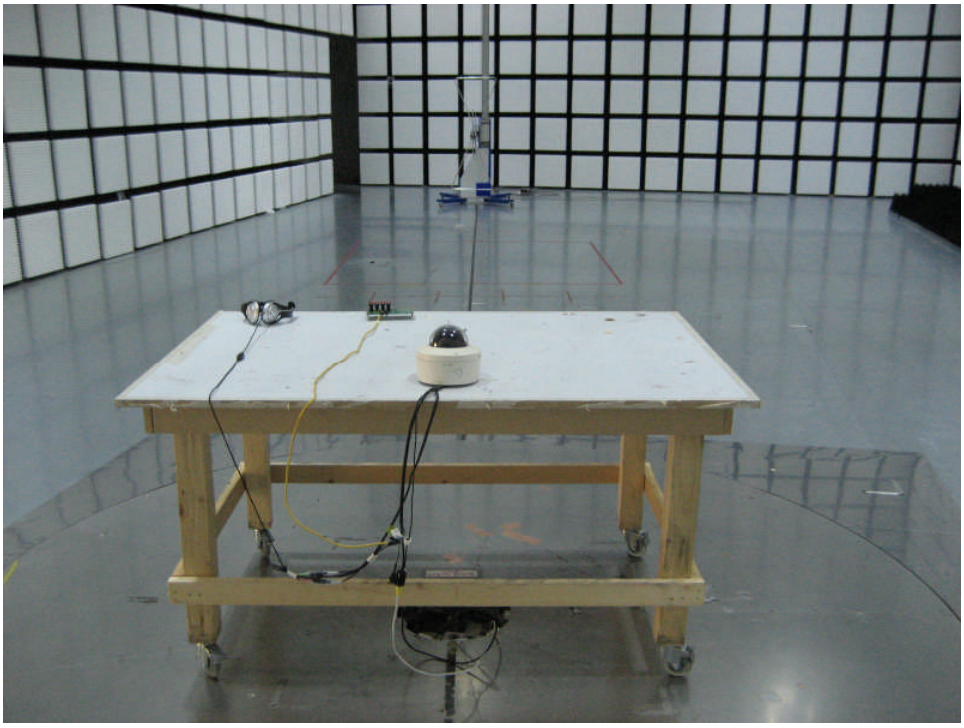
* DC 12 Ⅴ, AC 24 Ⅴ





* PoE

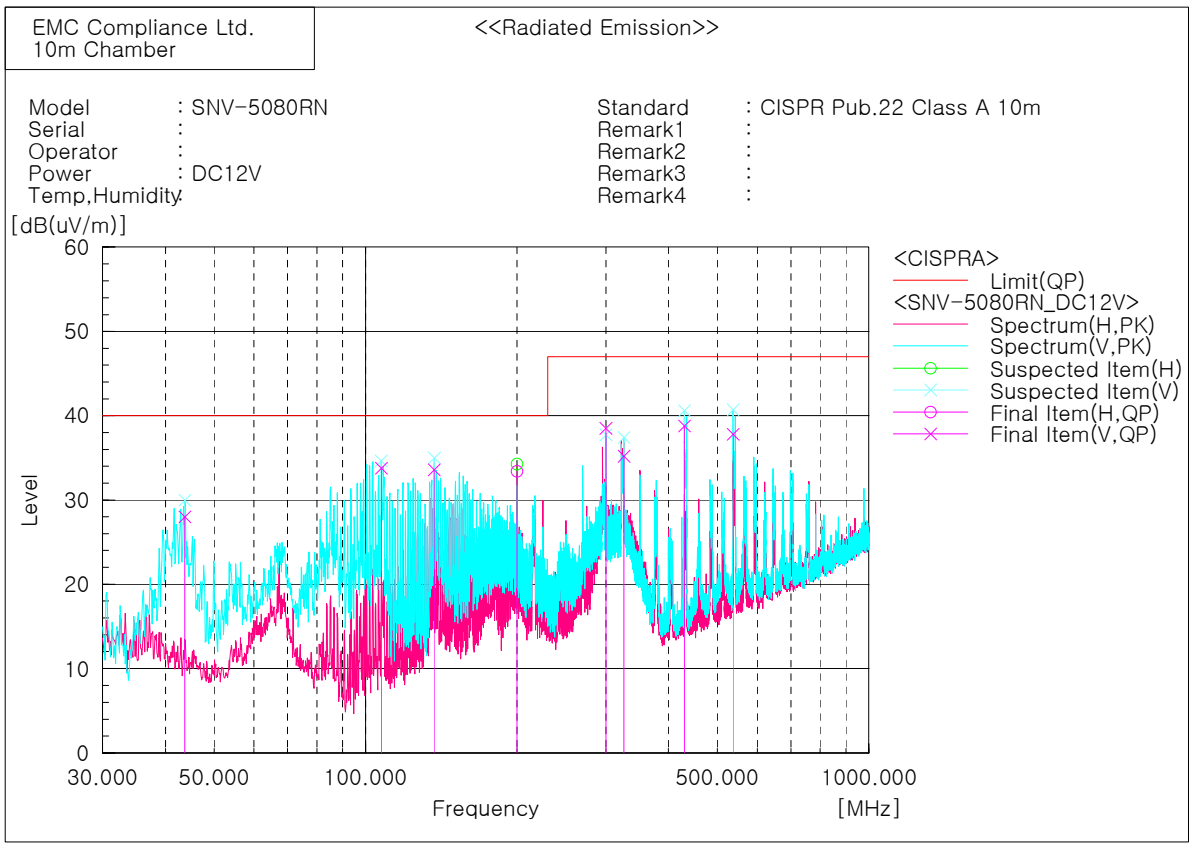




6.1.6 Radiated emission measurement result

*** Graph and Data**

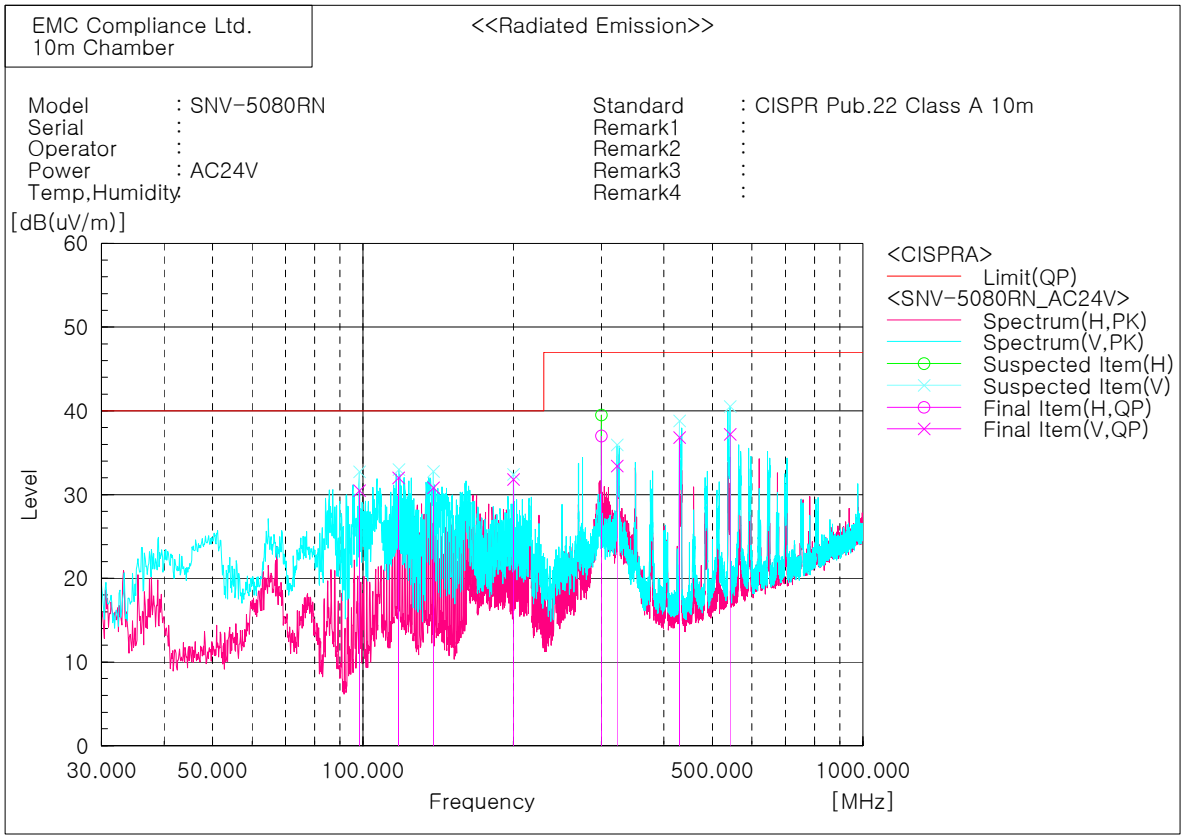
* DC 12 V



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	43.701	V	44.6	-16.6	28.0	40.0	12.0	100.0	193.3
2	107.454	V	51.7	-17.9	33.8	40.0	6.2	201.0	91.2
3	136.650	V	49.2	-15.6	33.6	40.0	6.4	100.0	223.2
4	200.013	H	51.6	-18.2	33.4	40.0	6.6	400.0	41.0
5	300.007	V	52.5	-14.0	38.5	47.0	8.5	400.0	333.9
6	325.729	V	48.5	-13.3	35.2	47.0	11.8	100.0	245.7
7	429.728	V	49.5	-10.7	38.8	47.0	8.2	100.0	331.2
8	537.133	V	45.9	-8.1	37.8	47.0	9.2	400.0	34.2

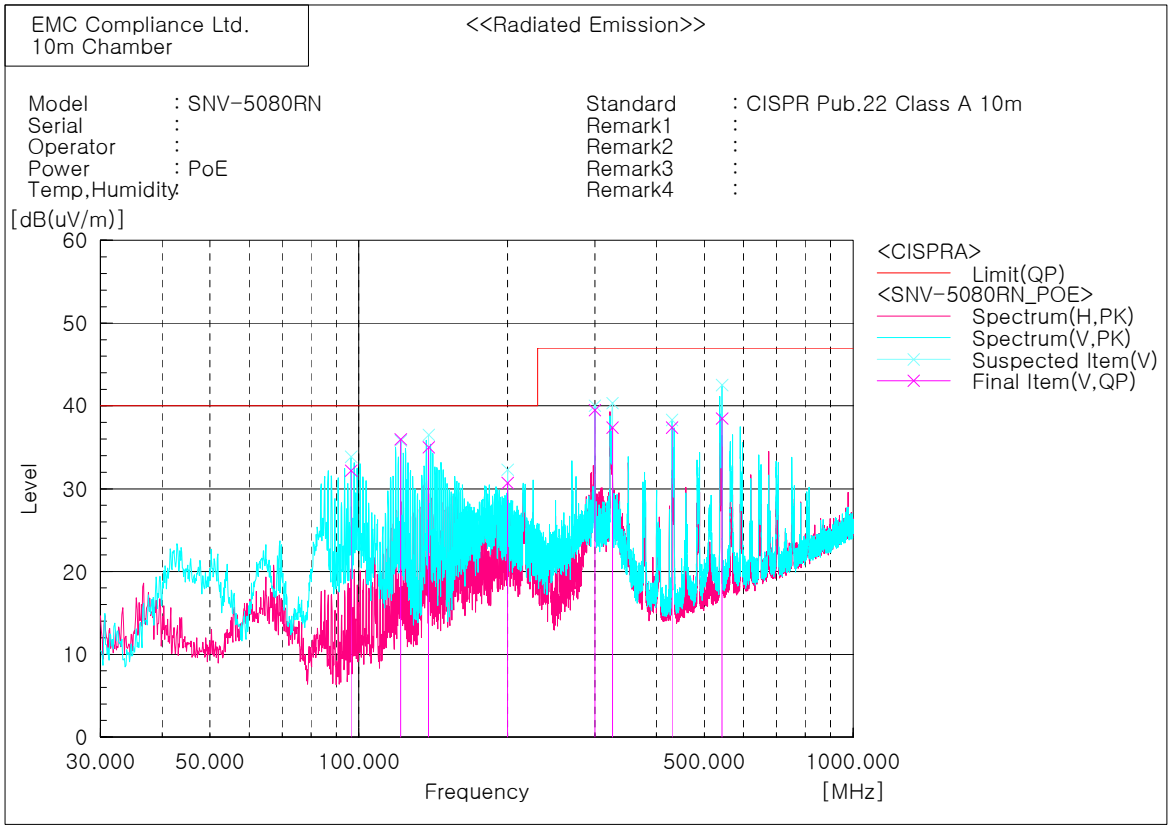
* AC 24 V



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	98.385	V	50.1	-19.6	30.5	40.0	9.5	198.0	282.5
2	117.875	V	48.9	-16.9	32.0	40.0	8.0	100.0	69.9
3	138.398	V	46.3	-15.5	30.8	40.0	9.2	100.0	204.8
4	200.017	V	50.0	-18.2	31.8	40.0	8.2	100.0	347.2
5	300.017	H	51.0	-14.0	37.0	47.0	10.0	301.0	359.3
6	322.334	V	46.8	-13.4	33.4	47.0	13.6	100.0	303.6
7	429.640	V	47.5	-10.7	36.8	47.0	10.2	100.0	317.1
8	542.913	V	45.2	-8.0	37.2	47.0	9.8	298.0	182.2

* PoE



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	96.445	V	52.3	-20.1	32.2	40.0	7.8	199.0	280.4
2	121.447	V	52.6	-16.6	36.0	40.0	4.0	100.0	142.4
3	138.364	V	50.5	-15.5	35.0	40.0	5.0	100.0	349.4
4	199.993	V	48.9	-18.2	30.7	40.0	9.3	100.0	154.3
5	300.013	V	53.5	-14.0	39.5	47.0	7.5	100.0	7.7
6	325.736	V	50.7	-13.3	37.4	47.0	9.6	100.0	232.4
7	429.761	V	48.1	-10.7	37.4	47.0	9.6	100.0	8.9
8	542.911	V	46.5	-8.0	38.5	47.0	8.5	299.0	71.1

7. E.U.T. photographs

Front View

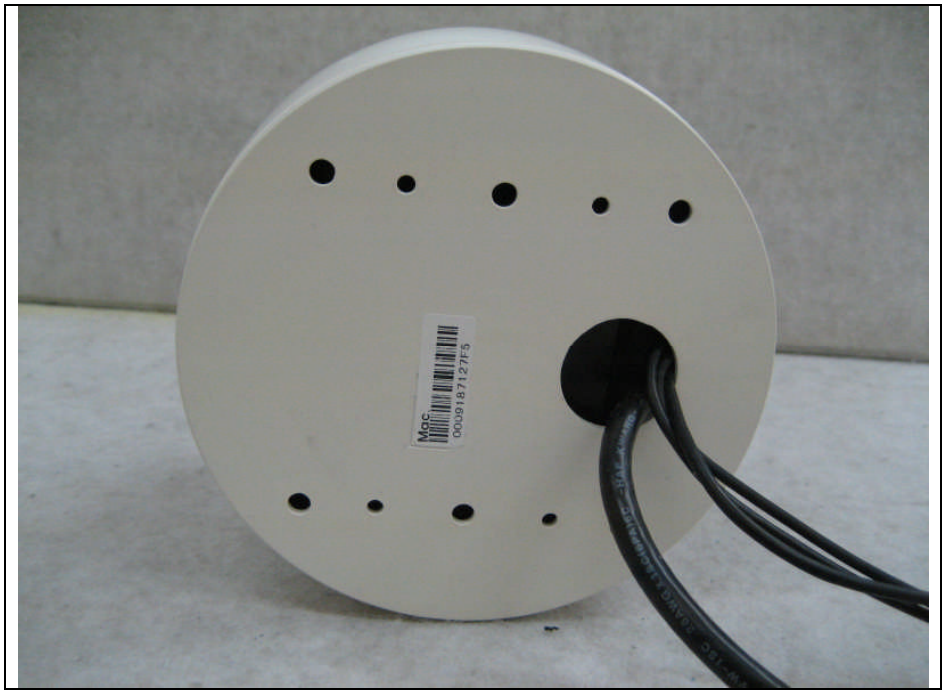
Rear View

Left View

Right View

Top View

Bottom View



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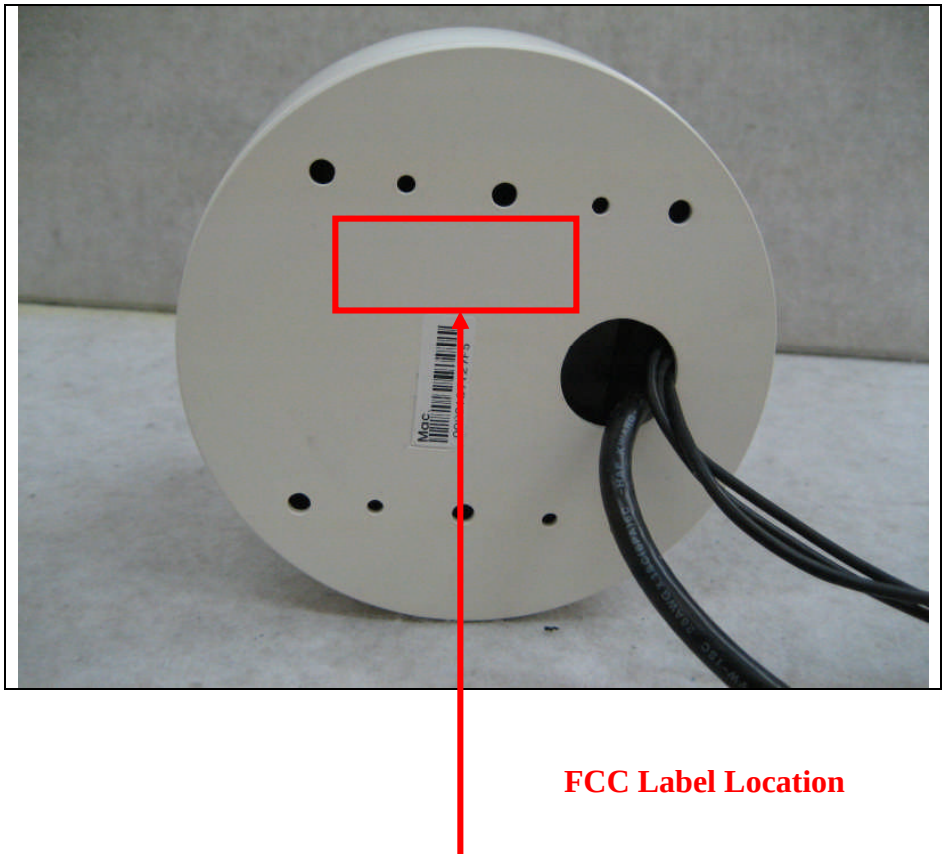
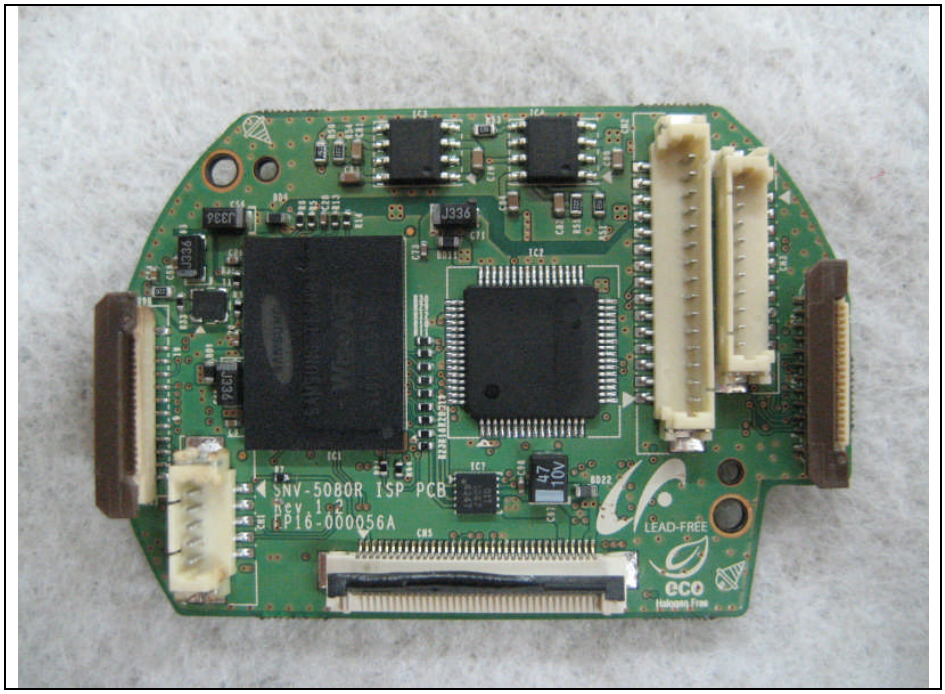


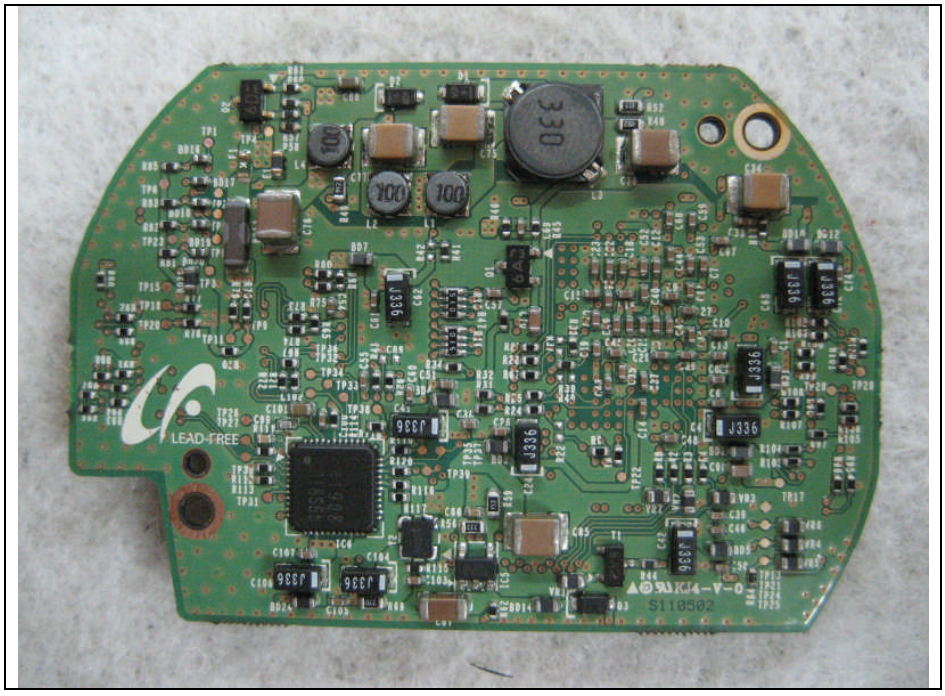
FCC Label Location

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

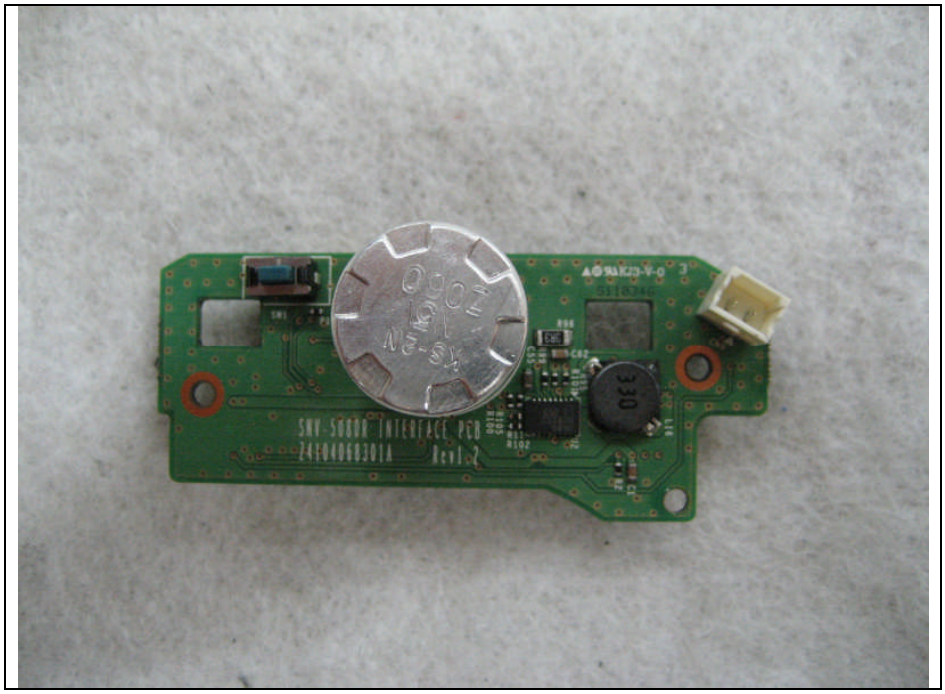
Inside

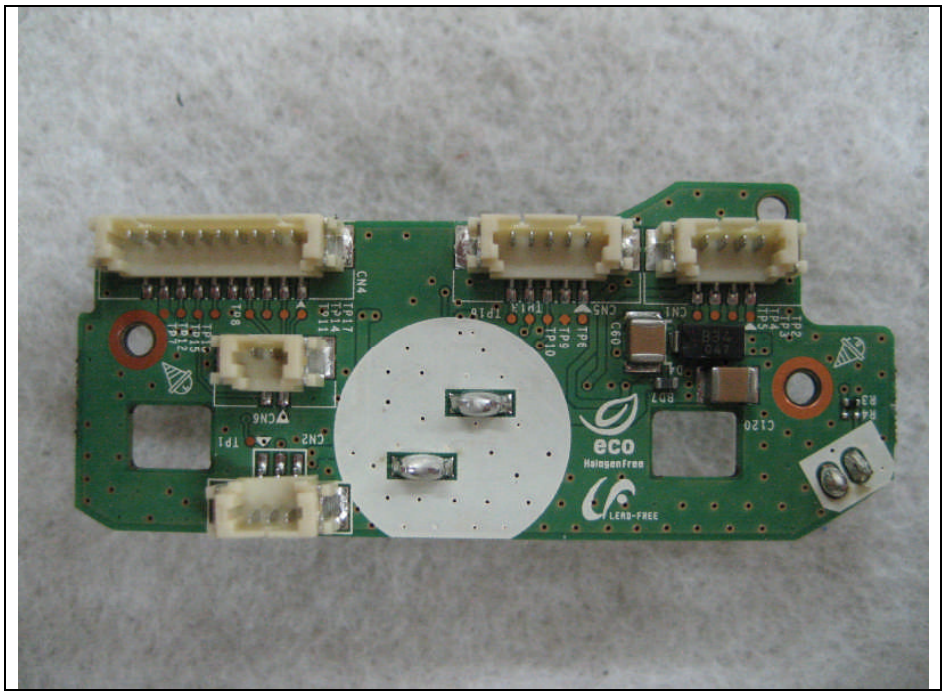
ISP Board



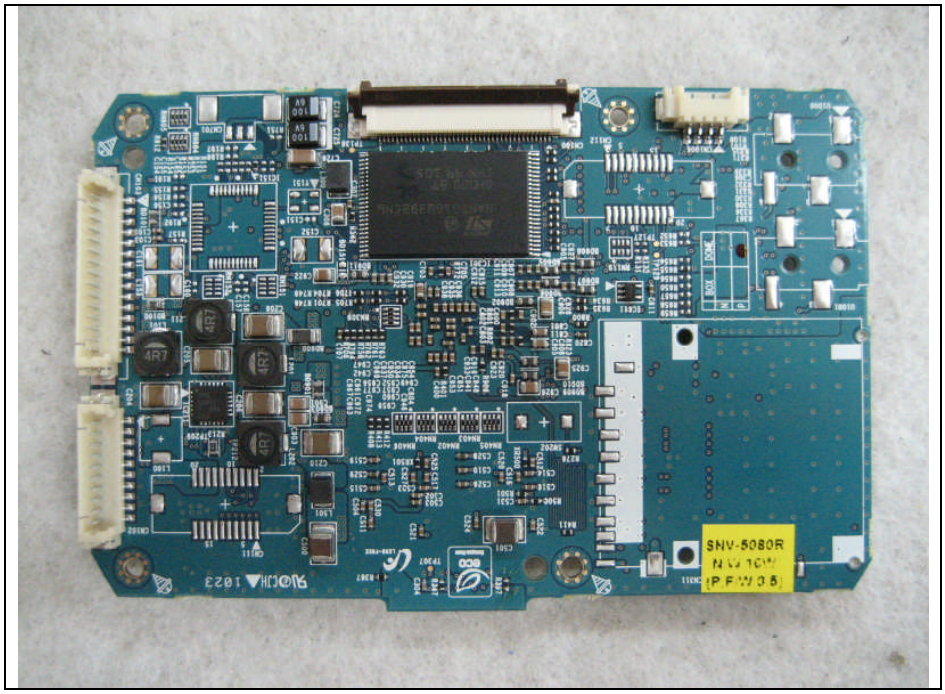


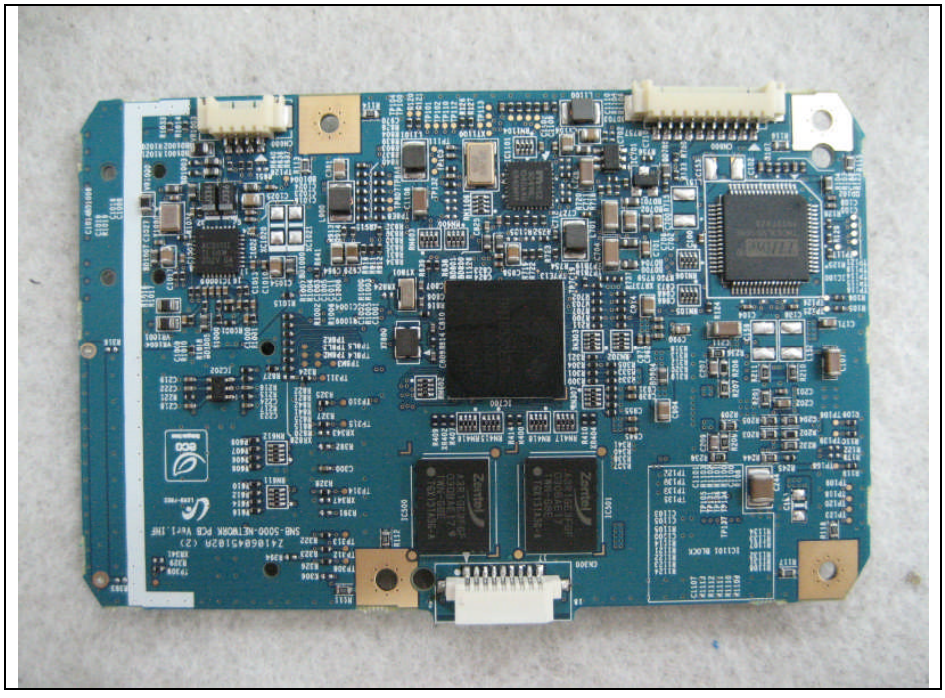
Interface Board



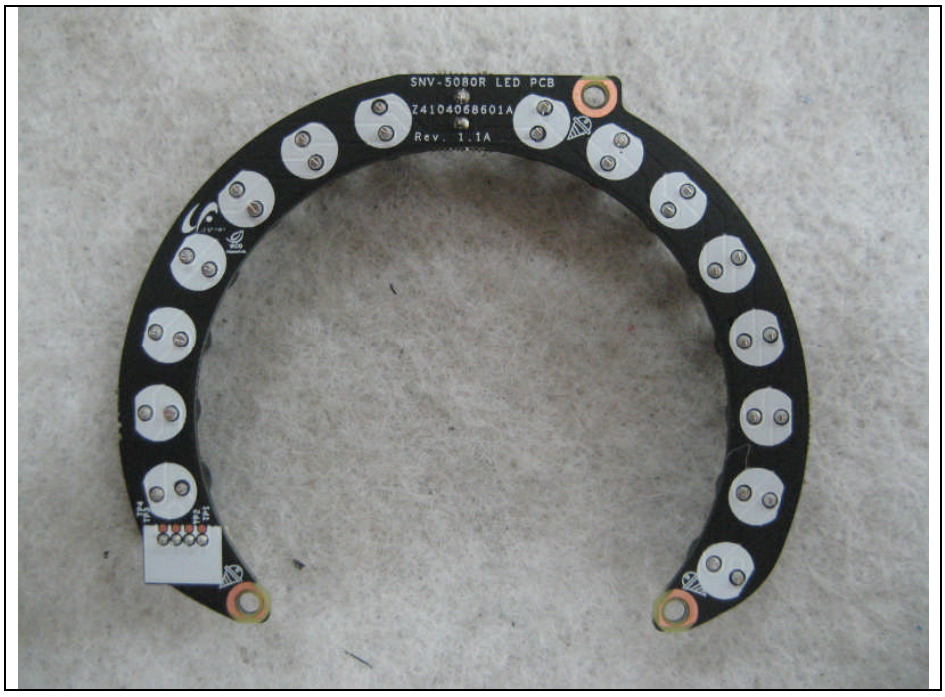


Network Card

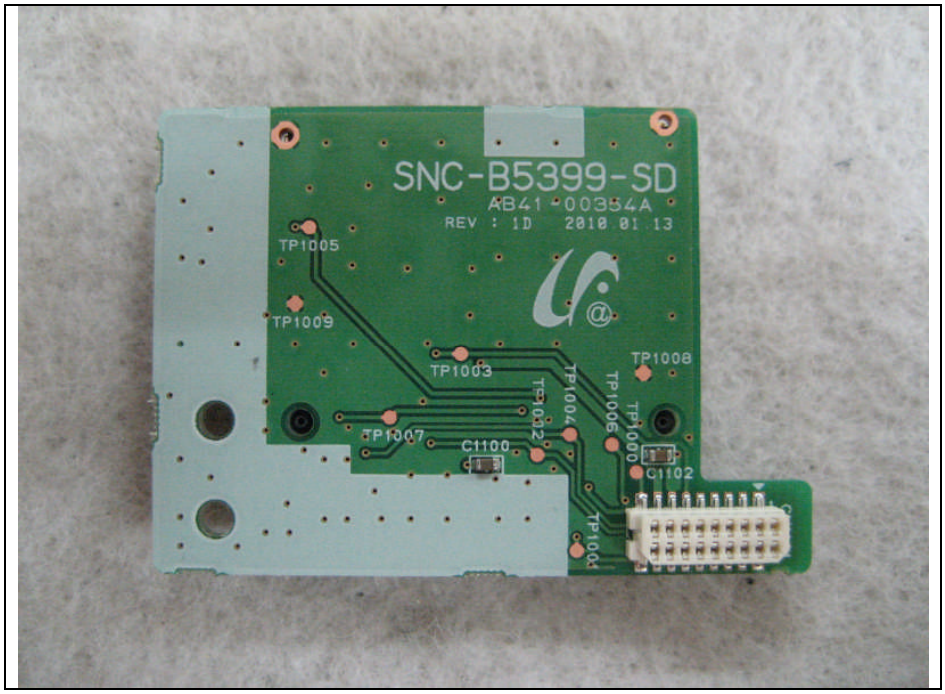


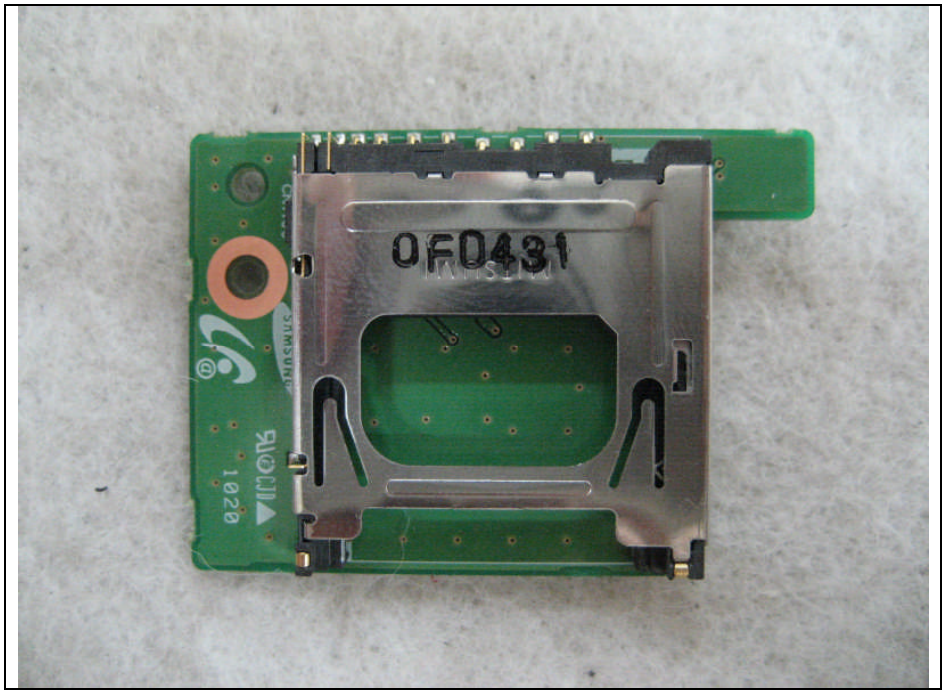


LED Board

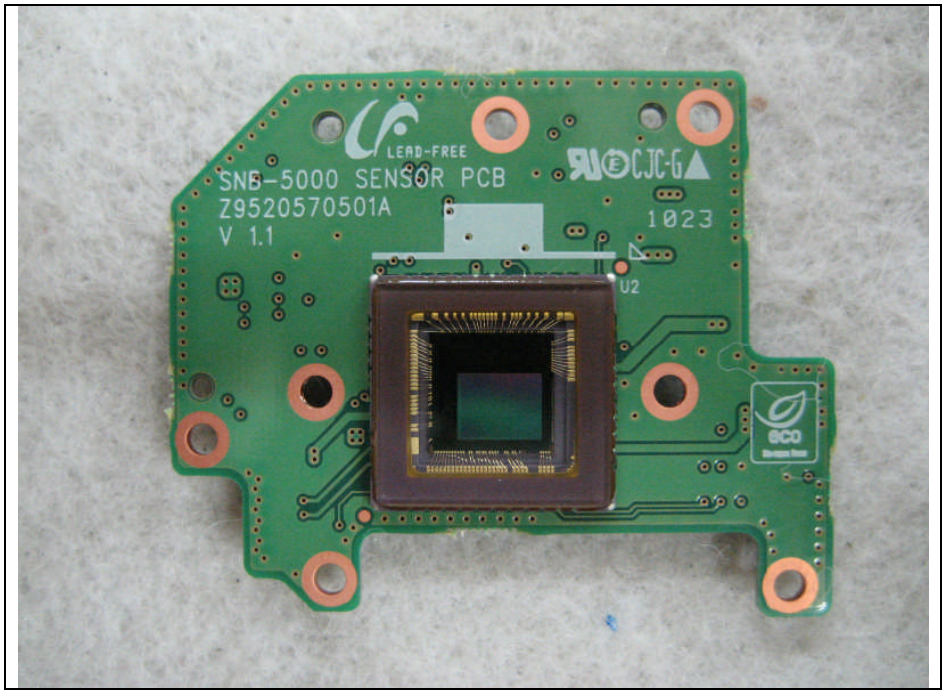


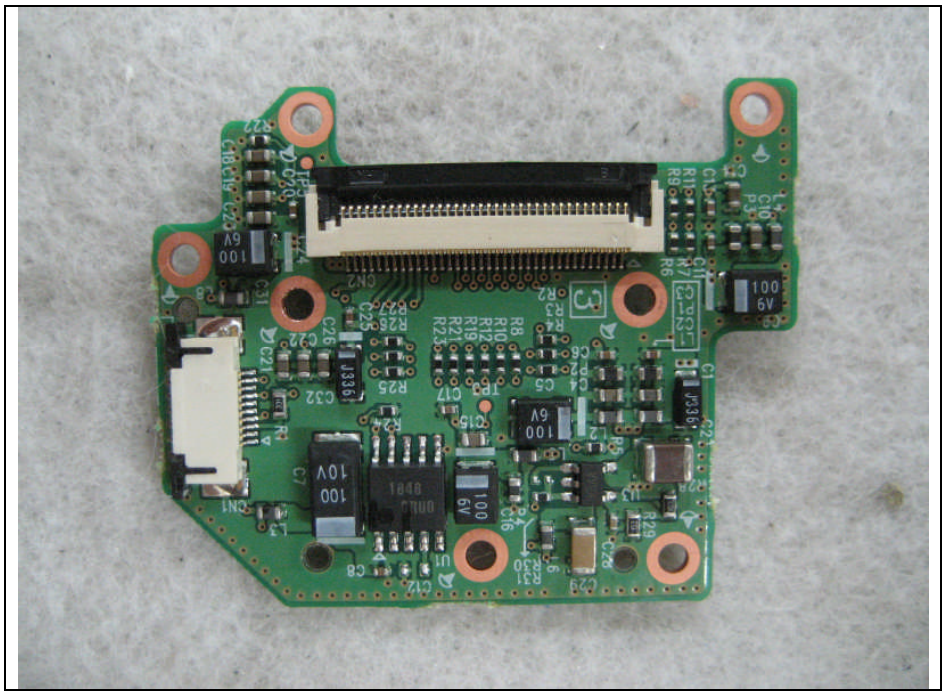
SD Card Board





Sensor Board





Power Board