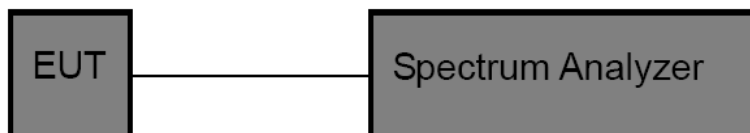


## 6. 20dB Occupy Bandwidth Test

### 6.1. Test Standard

Test Standard	FCC Part15 C Section 15.247 (a)(1)(i)
Limit	Less than 250KHz

### 6.2. Test Setup



### 6.3. Test Procedure

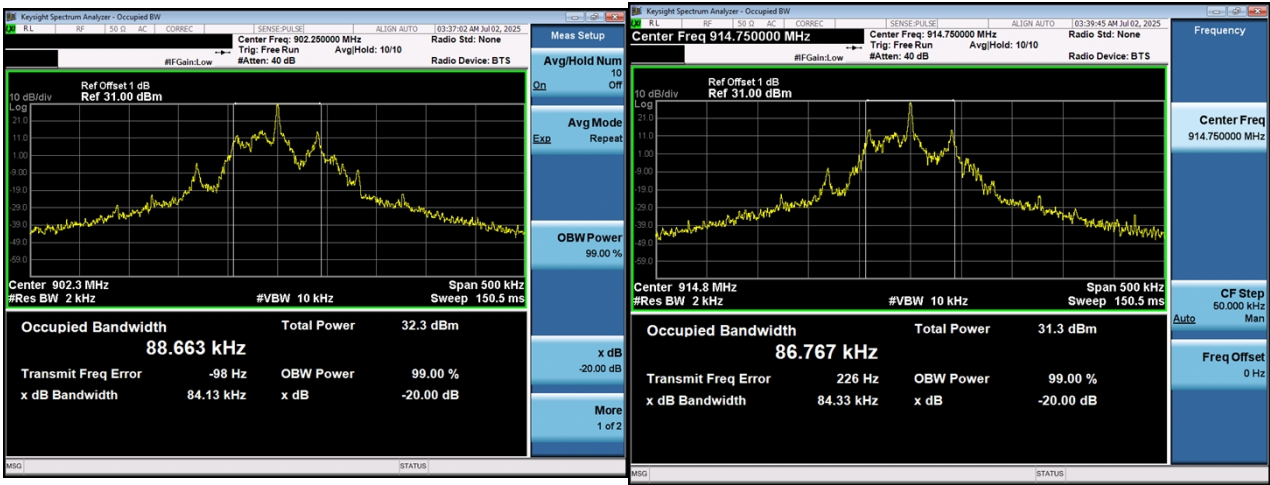
Using the following spectrum analyzer settings:

1. Span= approximately 2 to 5 times the OBW.
2. Set the RBW =1%~5% of the OBW.
3. Set the VBW  $\geq$ RBW.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

### 6.4. Test Data

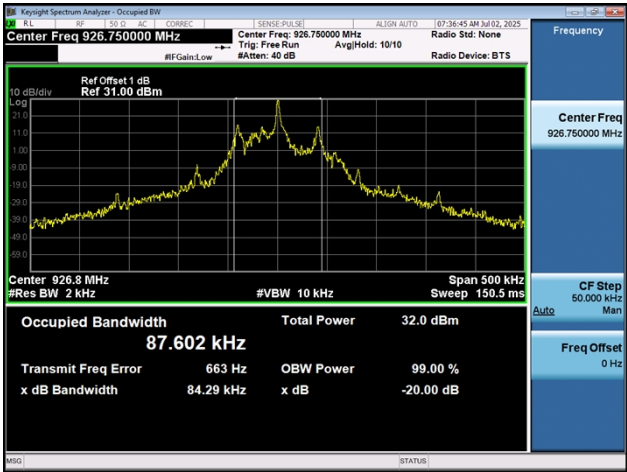
Temperature:	25.3 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa
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Test Channel	Bandwidth (kHz)	Limit (kHz)	Results
Low	84.13	$\leq 250$	PASS
Middle	84.33	$\leq 250$	PASS
High	84.29	$\leq 250$	PASS



Low Channel

Mid Channel



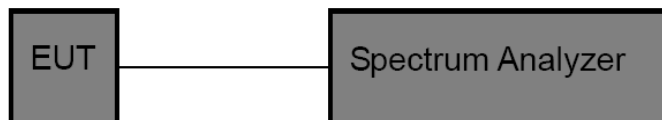
High Channel

## 7. Carrier Frequency Separation Test

### 7.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	> 25 kHz or the 20 dB bandwidth whichever is greater.

### 7.2. Test Setup



### 7.3. Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer settings:

1. Span= Wide enough to capture the peaks of two adjacent channels
2. Set the RBW =approximately 30% of the channel spacing.
3. Set the VBW  $\geq$  RBW.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

### 7.4. 7.4. Test Data

Temperature:	25.3 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa
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Mode	Frequency (MHz)	Separation Read Value (kHz)	Limit (kHz)	Result
Hopping	914.75	500	42.91	PASS



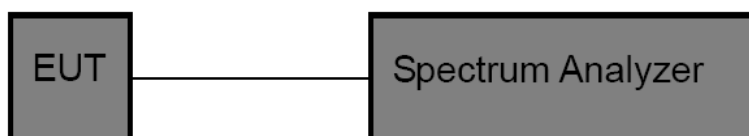
Hopping

## 8. Number of Hopping Channel Test

### 8.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247(a)(1)(i)
Test Limit	$\geq 50$ channels for 20 dB bandwidth less than 250KHz $\geq 25$ channels for 20 dB bandwidth greater than 250KHz

### 8.2. Test Setup



### 8.3. Test Procedure

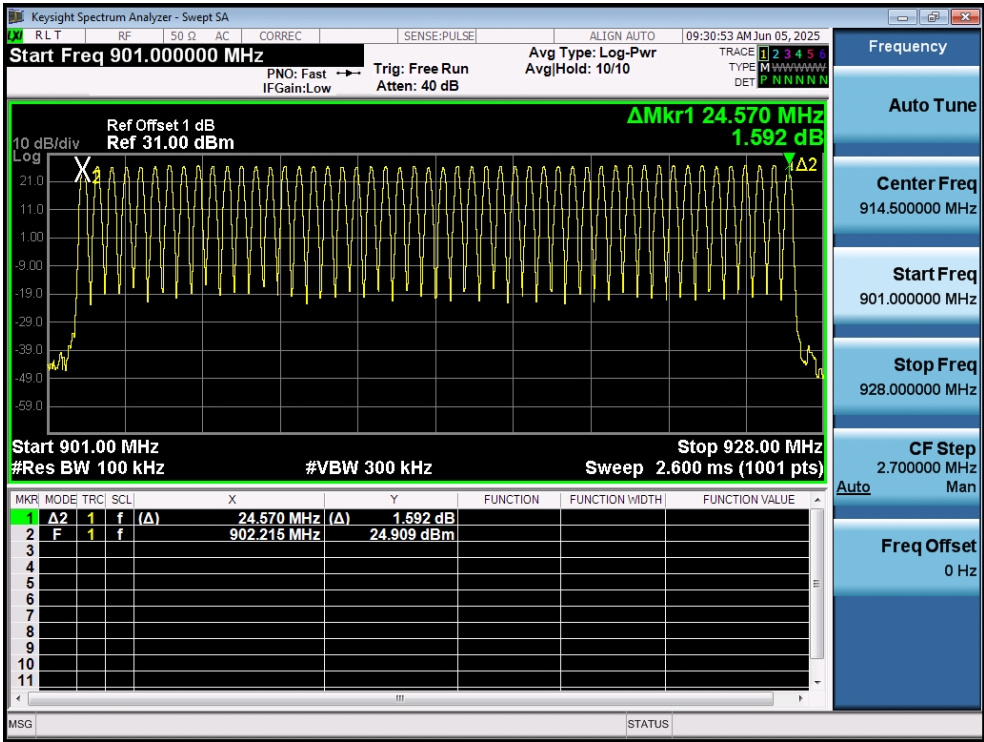
The EUT must have its hopping function enabled. Using the following spectrum analyzer setting:

1. Span= the frequency band of operation
2. Set the RBW = less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. Set the VBW  $\geq$  RBW.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

### 8.4. Test Data

Temperature:	25.3 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa
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Hopping Channel Frequency Range	Quantity of Hopping Channel	Quantity of Hopping Channel
902-928MHz	50	$\geq 50$



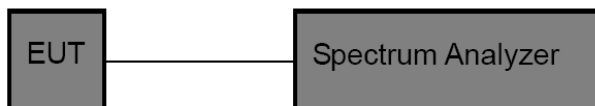
Hopping

## 9. Dwell Time Test

### 9.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247(a)(1)(i), 15.247(f)
Test Limit	<p>15.247(a)(1)(i): if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.</p> <p>15.247(f): For the purposes of this section, hybrid systems are those that employ a combination of both frequency hopping and digital modulation techniques. The frequency hopping operation of the hybrid system, with the direct sequence or digital modulation operation turned-off, shall have an average time of occupancy on any frequency not to exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4</p>

### 9.2. Test Setup



### 9.3. Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

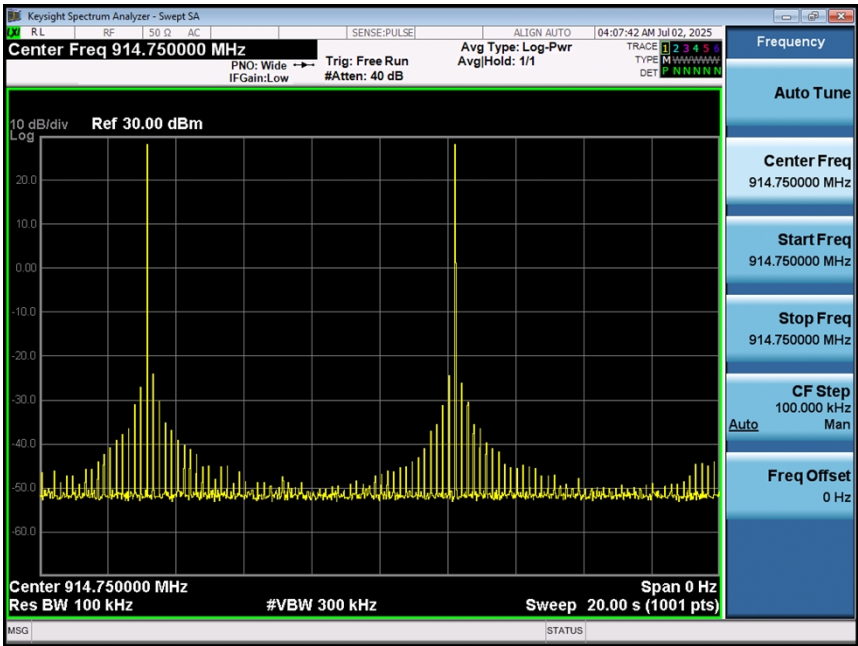
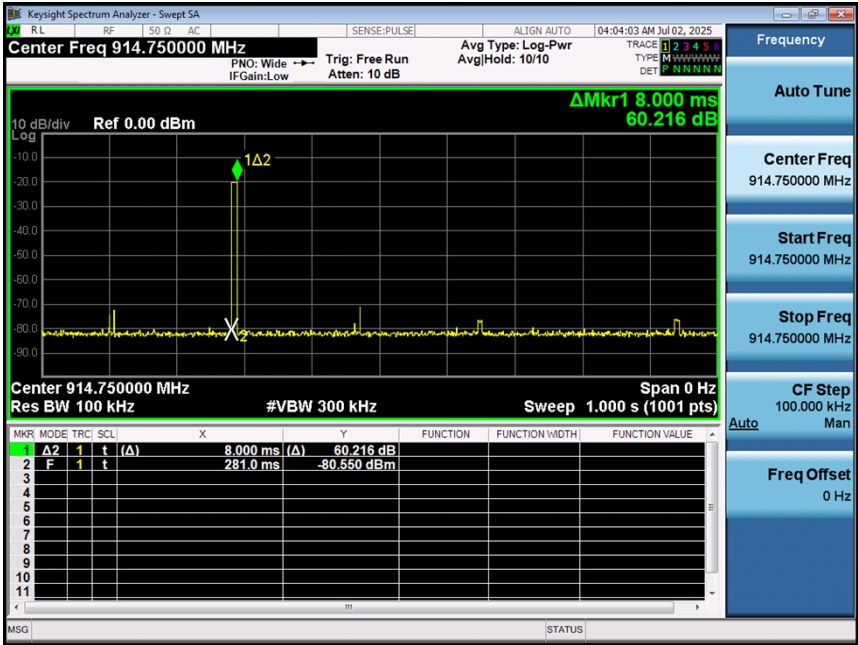
1. Span= zero span, centered on a hopping channel
2. Set the RBW = 100 KHz.
3. Set the VBW = 300 KHz.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = clear write.

### 9.4. Test Data

Temperature:	25.3 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa
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Requirement	Pulse width (ms)	Observe Period(s)	TotalHops [Num]	Dwell time (ms)	Limit (s)	Result
15.247(a)(1)(i) 15.247(f)	8	1	13	8	0.40	PASS



Hopping

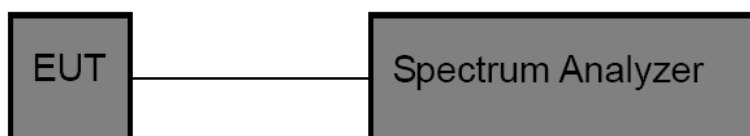


## 10. 100kHz Bandwidth of Frequency Band Edge Requirement

### 10.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

### 10.2. Test Setup



### 10.3. Test Procedure

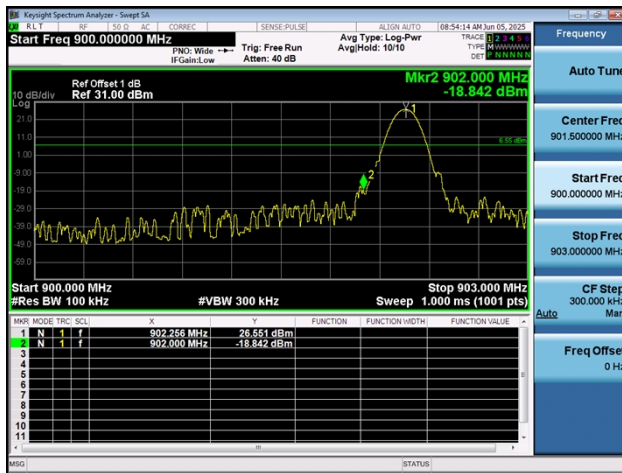
The EUT must have its hopping/Non-hopping function enabled. Using the following spectrum analyzer setting:

1. Set the RBW = 100kHz.
2. Set the VBW = 300kHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

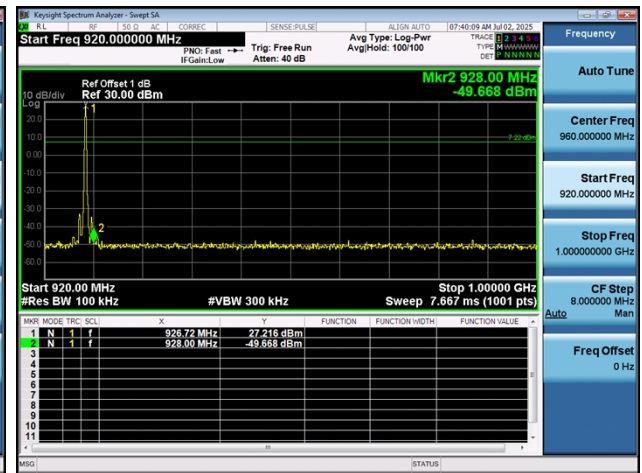
### 10.4. Test Data

Temperature:	25.3 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa
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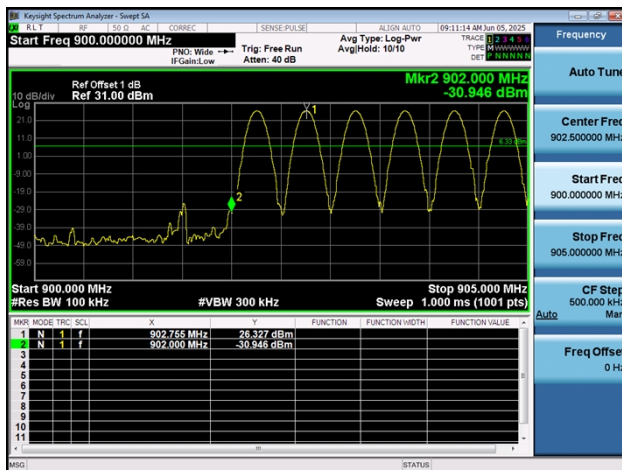
## Band edge measurements



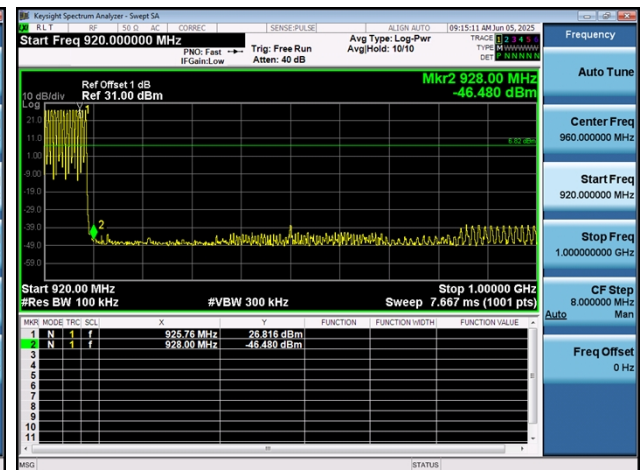
For Low channel Non-Hopping Mode



For High channel Non-Hopping Mode

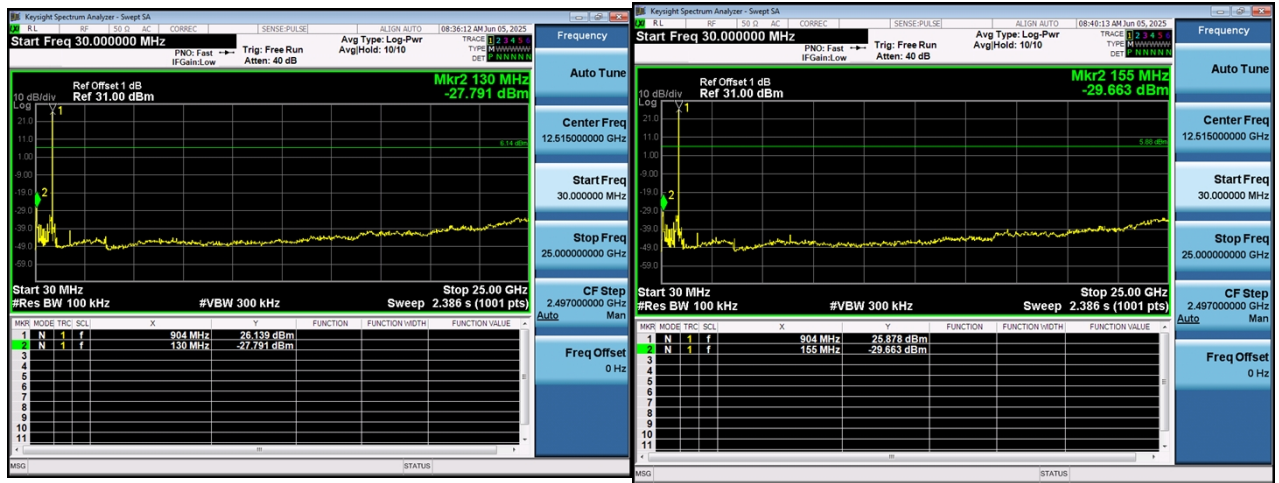


For Low channel Hopping Mode



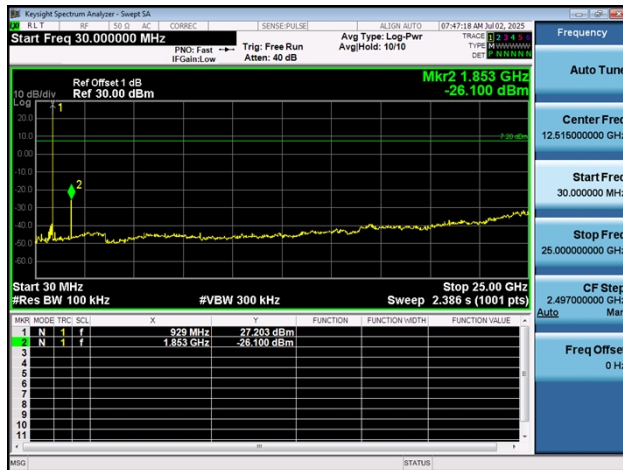
For High channel Hopping Mode

## Conducted Emission Method



Low Channel

Mid Channel



High Channel

## 11. Antenna Requirement

### 11.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	<p>1) 15.203 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, 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.</p> <p>2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.</p>

### 11.2. Antenna Connected Construction

The antenna is External Antenna which permanently attached, and the best case gain of the antenna is 2dBi. It complies with the standard requirement.

## **APPENDIX I -- TEST SETUP PHOTOGRAPH**

Please refer to separated files Appendix I -- Test Setup Photograph\_RF

## **APPENDIX II -- EXTERNAL PHOTOGRAPH**

Please refer to separated files Appendix II -- External Photograph

## **APPENDIX III -- INTERNAL PHOTOGRAPH**

Please refer to separated files Appendix III -- Internal Photograph

----- End of Report -----