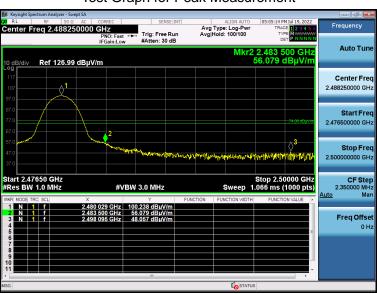


EUT	BDE Bluetooth 5.1 Dual Mode Transceiver Module Based on CC2564C	Model Name	BDE-BD2564CA
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS



Antenna 2: Whip antenna:

EUT	BDE Bluetooth 5.1 Dual Mode Transceiver Module Based on CC2564C	Model Name	BDE-BD2564CN
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement

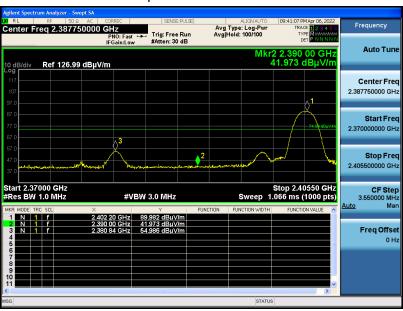


RESULT: PASS

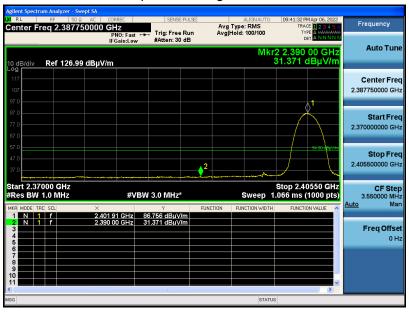


EUT	BDE Bluetooth 5.1 Dual Mode Transceiver Module Based on CC2564C	Model Name	BDE-BD2564CN
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



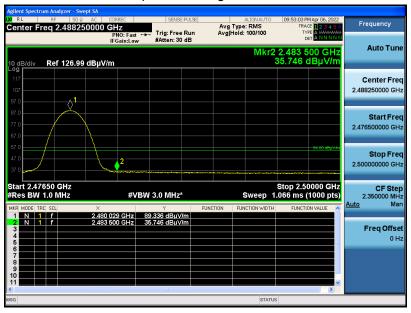


EUT	BDE Bluetooth 5.1 Dual Mode Transceiver Module Based on CC2564C	Model Name	BDE-BD2564CN
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Horizontal

Test Graph for Peak Measurement



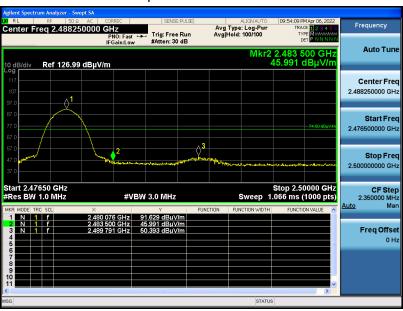
Test Graph for Average Measurement





EUT	BDE Bluetooth 5.1 Dual Mode Transceiver Module Based on CC2564C	Model Name	BDE-BD2564CN
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement

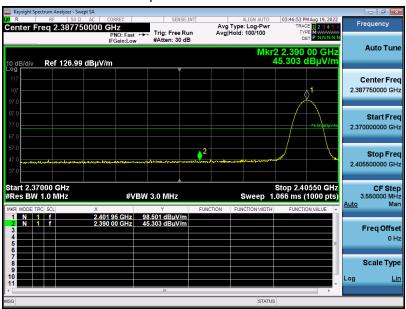




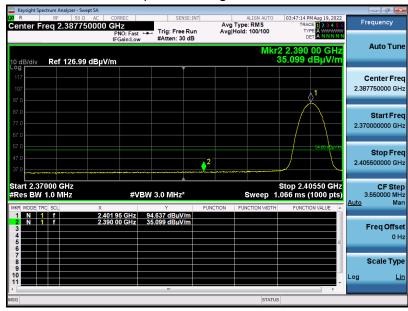
Antenna 3: Chip antenna:

EUT	BDE Bluetooth 5.1 Dual Mode Transceiver Module Based on CC2564C	Model Name	BDE-BD2564CN
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement

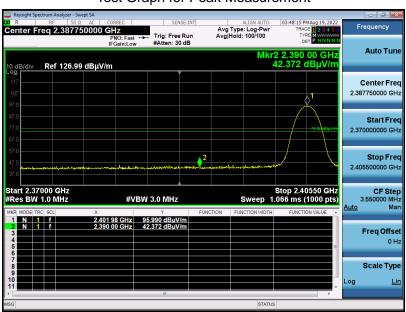


RESULT: PASS

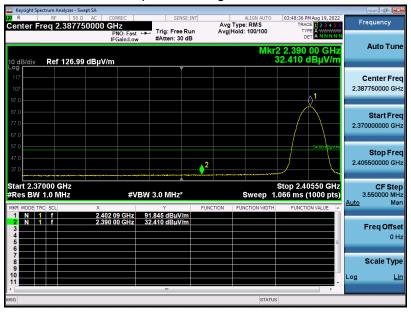


EUT	BDE Bluetooth 5.1 Dual Mode Transceiver Module Based on CC2564C	Model Name	BDE-BD2564CN
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement

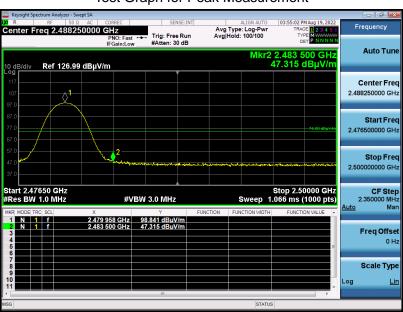


RESULT: PASS

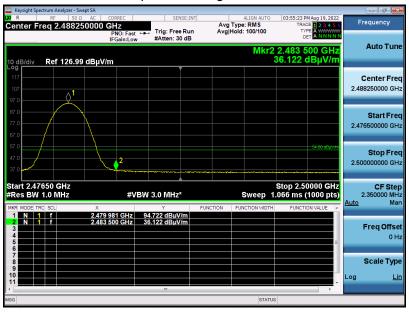


EUT	BDE Bluetooth 5.1 Dual Mode Transceiver Module Based on CC2564C	Model Name	BDE-BD2564CN
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Horizontal

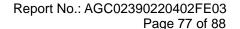
Test Graph for Peak Measurement



Test Graph for Average Measurement



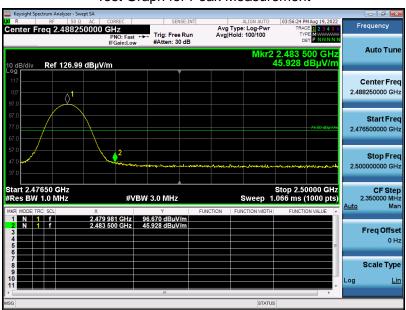
RESULT: PASS



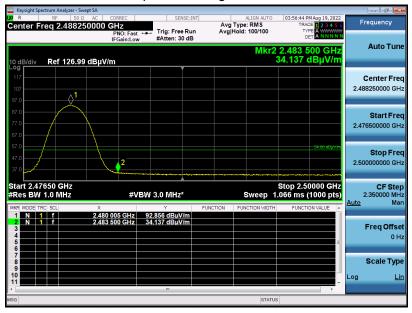


EUT	BDE Bluetooth 5.1 Dual Mode Transceiver Module Based on CC2564C	Model Name	BDE-BD2564CN
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



Note: The factor had been edited in the "Input Correction" of the Spectrum Analyzer. The 8DPSK modulation is the worst case and recorded in the report.



11. NUMBER OF HOPPING FREQUENCY

11.1. MEASUREMENT PROCEDURE

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

- 1. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
- 2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- 3. VBW > RBW. Sweep: Auto. Detector function: Peak. Trace: Max hold.
- 4. Allow the trace to stabilize.

11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

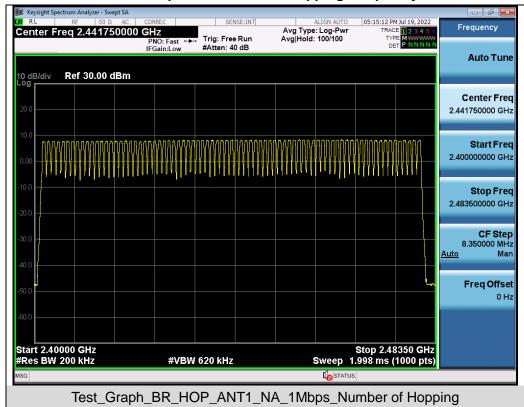
11.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

11.4. LIMITS AND MEASUREMENT RESULT

Test Data of Number of Hopping Frequency				
Test Mode Number of Hopping Frequency Limits Pass or Fail				
GFSK Hopping 79 >=15				

Test Graphs of Number of Hopping Frequency



Note: The GFSK modulation is the worst case and recorded in the report.



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12. TIME OF OCCUPANCY (DWELL TIME)

12.1. MEASUREMENT PROCEDURE

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

- 1. Span: Zero span, centered on a hopping channel.
- 2. RBW shall be ≤channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
- 3. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
- 4. Detector function: Peak. Trace: Max hold.
- 5. Use the marker-delta function to determine the transmit time per hop.
- 6. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer) \times (period specified in the requirements / analyzer sweep time)

7. The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements.

12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

12.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

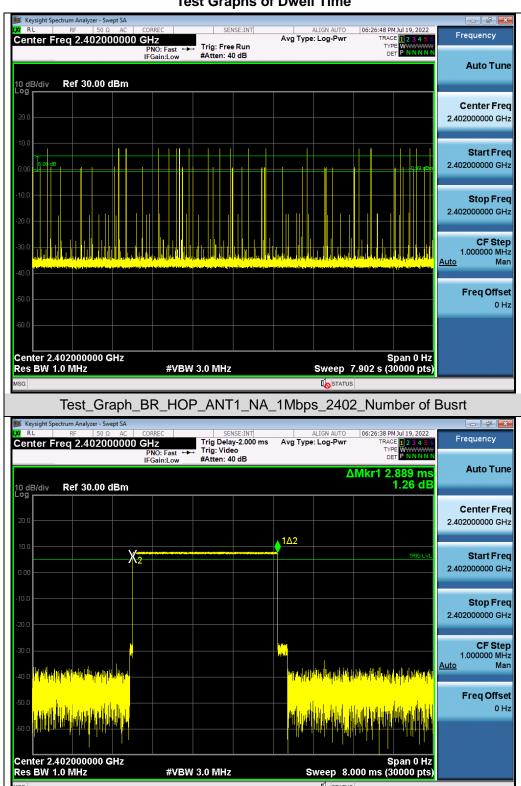
12.4. LIMITS AND MEASUREMENT RESULT

Test Data of Dwell Time					
Channel	Time of Pulse for DH5 (ms)	Number of hops in the period specified in the requirements	Sweep Time (ms)	Limit (ms)	Pass or Fail
2402	2.889	20.0*4	231.120	400	Pass
2441	2.889	26.0*4	300.456	400	Pass
2480	2.889	24.0*4	277.344	400	Pass

Note: The GFSK modulation is the worst case and recorded in the report.



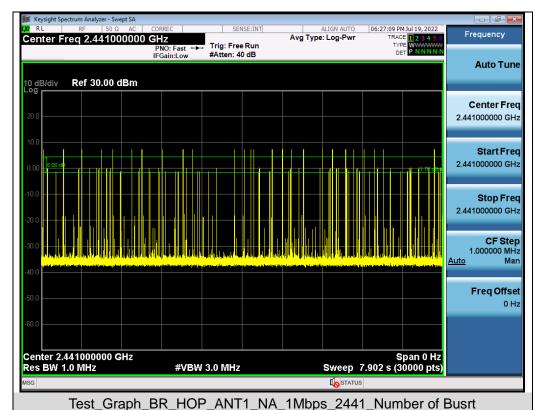
Test Graphs of Dwell Time

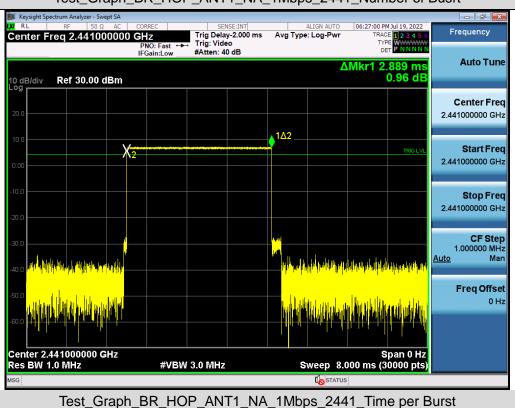


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Test_Graph_BR_HOP_ANT1_NA_1Mbps_2402_Time per Burst



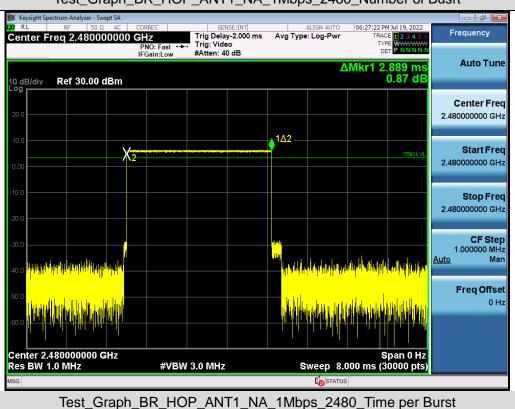




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13. FREQUENCY SEPARATION

13.1. MEASUREMENT PROCEDURE

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

- 1. Span: Wide enough to capture the peaks of two adjacent channels.
- 2. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- 3. Video (or average) bandwidth (VBW) ≥ RBW.
- 4. Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 6.2

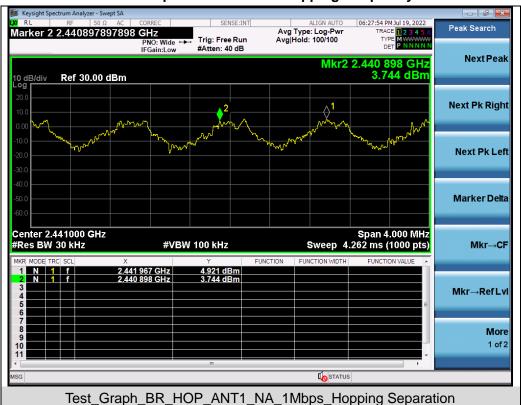
13.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.3

13.4. LIMITS AND MEASUREMENT RESULT

Test Data of Frequency Separation					
Test Mode Channel Separation (MHz) Limits Pass or Fail					
GFSK Hopping 1.069 >= 2/3 -20dB BW Pass					

Test Graphs of Number of Hopping Frequency



Note: The GFSK modulation is the worst case and recorded in the report.



14. LINE CONDUCTED EMISSION TEST

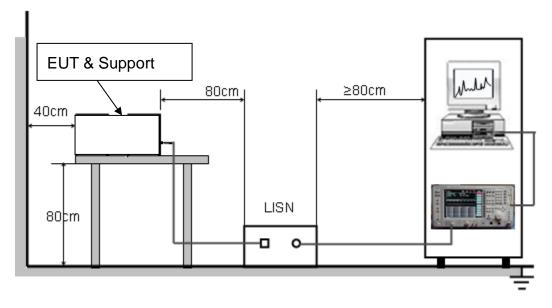
14.1. LIMITS OF LINE CONDUCTED EMISSION TEST

F	Maximum RF Line Voltage				
Frequency	Q.P. (dBμV)	Average (dBμV)			
150kHz~500kHz	66-56	56-46			
500kHz~5MHz	56	46			
5MHz~30MHz	60	50			

Note:

- 1. The lower limit shall apply at the transition frequency.
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

14.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST





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14.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipment received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

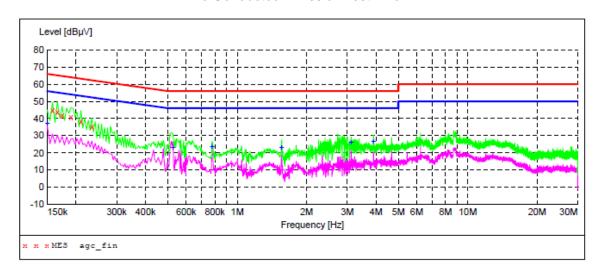
14.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less – 2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case condition(s) was reported on the Summary Data page.



14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L



MEASUREMENT RESULT: "agc_fin"

~	000	10 /40	4 O E E
2	0227	/7/13	19:55

_	D		m1	T	M	D-++	T
	Frequency MHz	dBµV	Transd dB	dBµV	Margin dB	Detector	Line
	0.158000	44.60	6.8	66	21.0	QP	L1
	0.166000	43.80	6.8	65	21.4	QP	L1
	0.174000	41.60	6.7	65	23.2	QP	L1
	0.190000	40.60	6.6	64	23.4	QP	L1
	0.210000	38.30	6.5	63	24.9	QP	L1
	0.234000	35.50	6.3	62	26.8	QP	L1

MEASUREMENT RESULT: "agc fin2"

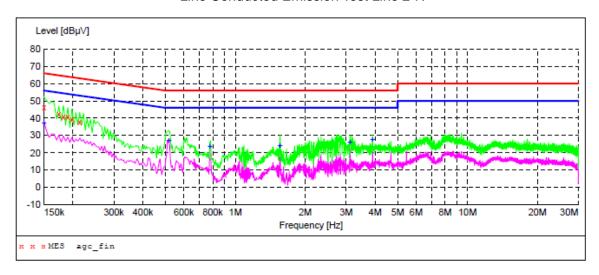
2022/7/13 19:55

2022/1/13 19:	JJ					
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	37.20	6.9	56	18.8	AV	L1
0.526000	23.10	5.4	46	22.9	AV	L1
0.778000	23.70	5.4	46	22.3	AV	L1
1.558000	23.30	6.1	46	22.7	AV	L1
3.118000	26.40	6.5	46	19.6	AV	L1
3.898000	27.00	6.5	46	19.0	AV	L1

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Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "agc_fin"

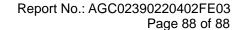
/7/13 19:5 requency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	46.40	6.9	66		QP	N
0.174000	42.50	6.7	65	22.3	QP	N
0.182000	40.80	6.7	64	23.6	QP	N
0.190000	40.60	6.6	64	23.4	QP	N
0.198000	39.40	6.6	64	24.3	QP	N
0.214000	37.70	6.5	63	25.3	QP	N

MEASUREMENT RESULT: "agc fin2"

2022/7/13 19:52 Frequency Level Transd Limit Margin Detector Line								
rre	MHz	dBµV	Transd dB	dBµV	Margin dB	Detector	Line	
0.	150000	37.10	6.9	56	18.9	AV	N	
0.	518000	27.50	5.4	46		AV	N	
0.	778000	23.90	5.4	46	22.1	AV	N	
1.	558000	24.10	6.1	46	21.9	AV	N	
3.	118000	26.30	6.5	46	19.7	AV	N	
3.	898000	27.70	6.5	46	18.3	AV	N	

RESULT: PASS

Note: All test modes had been pre-tested. The mode 8 of antenna 1 is the worst case and recorded in the report.





APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC02390220402AP02

APPENDIX B: PHOTOGRAPHS OF EUT

Refer to the Report No.: AGC02390220402AP03

----END OF REPORT----



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