

Page 1 of 78

# **FCC Test Report**

Report No.: AGC11563210101FE03

FCC ID	: GSS-VS18518
APPLICATION PURPOSE	: Original Equipment
PRODUCT DESIGNATION	: VB-CAM-201
BRAND NAME	: ViewSonic
MODEL NAME	: VS18518
APPLICANT	: ViewSonic Corporation
DATE OF ISSUE	: Feb. 04, 2021
STANDARD(S)	: FCC Part 15.247
REPORT VERSION	: V1.0



nplianc



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# **REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	© /	Feb. 04, 2021	Valid	Initial Release

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# **1. VERIFICATION OF CONFORMITY**

Applicant	ViewSonic Corporation		
Address	10 Pointe Drive, Suite 200, Brea, CA 92821, United States		
Manufacturer	ViewSonic Corporation		
Address	10 Pointe Drive, Suite 200, Brea, CA 92821, United States		
Factory	ValueHD Corporation		
Address	2-3/F, No. 2, 1F, 2F, 9F, No.1, Honghui Industrial Park, Xin'an Street, Bao'an District, Shenzhen		
Product Designation	VB-CAM-201		
Brand Name	ViewSonic		
Test Model	VS18518		
Date of test	Jan. 18, 2021 to Feb. 04, 2021		
Deviation	No any deviation from the test method		
Condition of Test Sample	Normal		
Test Result	Pass		
Report Template	AGCRT-US-BR/RF		

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC PART 15.247.

Prepared By

**Reviewed By** 

John Zerry

John Zeng (Project Engineer)

Feb. 04, 2021

Max Zhan

Max Zhang (Reviewer)

Feb. 04, 2021

Approved By

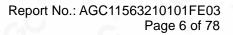
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Forrest Lei (Authorized Officer)

Feb. 04, 2021

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# 2. GENERAL INFORMATION

# 2.1. PRODUCT DESCRIPTION

The EUT is designed as "VB-CAM-201". It is designed by way of utilizing the GFSK, Pi/4 DQPSK and 8DPSK technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency 2.402 GHz to 2.480 GHz		
RF Output Power     4.179dBm (Max)		
Bluetooth Version V5.0		
Modulation         BR ⊠GFSK, EDR ⊠π /4-DQPSK, ⊠8DPSK           BLE □GFSK 1Mbps □GFSK 2Mbps		
Number of channels	79	
Hardware Version 1.0		
Software Version	10.	
Antenna Designation	Dipole Antenna (Comply with requirements of the FCC part 15.203)	
Antenna Gain	3dBi	
Power Supply(By adapter)	Model: ICP20-120-1500D INPUT: 100-240V~50/60Hz 0.6A OUTPUT: 12V 1.5A 18.0W	
Note: The EUT doesn't support	BLE.	

# 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
	0	2402 MHz
		2403 MHz
	38	2440 MHz
2402~2480MHz	39	2441 MHz
	40	2442 MHz
De loc		
	77	2479 MHz
	78	2480 MHz

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# 2.3. RECEIVER INPUT BANDWIDTH

The input bandwidth of the receiver is 1.3MHz, in every connection one Bluetooth device is the master and the other one is slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally, the type of connection (e.g. single of multi slot packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also, the slave of the connection will use these settings. Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

#### 2.4. EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE

Example of a hopping sequence in data mode: 40, 21, 44, 23, 04, 15, 66, 56, 19, 78, 07, 28, 69, 55, 36, 45, 05, 13, 43, 74, 57, 35, 67, 76, 02, 34, 54, 63, 42, 11, 30, 06, 64, 25, 75, 48, 17, 33, 58, 01, 29, 14, 51, 72, 03, 31, 50, 61, 77, 18, 10, 47, 12, 68, 08, 49, 20, 00, 73, 09, 16, 60, 71, 41, 24, 53, 38, 26, 46, 37, 65, 32, 70, 52, 27, 59, 22, 62, 39

#### 2.5. EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR

The generation of the hopping sequence in connection mode depends essentially on two input values:

1. LAP/UAP of the master of the connection.

2. Internal master clock.

The LAP (lower address part) are the 24 LSB's of the 48 BD\_ADDRESS. The BD\_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24MSB's of the 48BD\_ADDRESS

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For behavior action with other units only offset is used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5us. The clock has a cycle of about one day(23h30). In most case it is implemented as 28 bits counter. For the deriving of the hopping sequence the entire. LAP (24 bits),4LSB's(4bits) (Input 1) and the 27MSB's of the clock (Input 2) are used. With this input values different mathematical procedures (permutations, additions, XOR-operations) are performed to generate the Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following behavior:

The first connection between the two devices is established, a hopping sequence was generated. For Transmitting the wanted data the complete hopping sequence was not used. The connection ended.

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The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value, because the period between the two transmission is longer (and it Cannot be shorter) than the minimum resolution of the clock(312.5us). The hopping sequence will always differ from the first one.

# 2.6. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: GSS-VS18518 filing to comply with the FCC PART 15.247 requirements.

# 2.7. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

#### 2.8. SPECIAL ACCESSORIES

Refer to section 5.2.

# 2.9. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

#### 2.10. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device. For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

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# **3. 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%.

- Uncertainty of Conducted Emission, Uc = ±3.1 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±4.0 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of total RF power, conducted,  $Uc = \pm 0.8$ dB
- Uncertainty of spurious emissions, conducted, Uc = ±2.7dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %
- Uncertainty of Dwell Time:  $Uc = \pm 2\%$
- Uncertainty of Frequency:  $Uc = \pm 2 \%$

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# 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK
4	Low channel π/4-DQPSK
5	Middle channel π/4-DQPSK
6	High channel π/4-DQPSK
7	Low channel 8DPSK
8	Middle channel 8DPSK
9	High channel 8DPSK
10	Hopping mode GFSK
11	Hopping mode π/4-DQPSK
12	Hopping mode 8DPSK

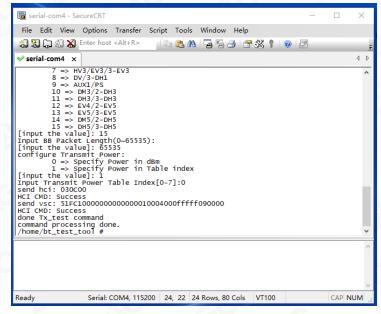
Note:

1. Only the result of the worst case was recorded in the report, if no other cases.

2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

3. For Conducted Test method, a temporary antenna connector is provided by the manufacture.

Software Setting



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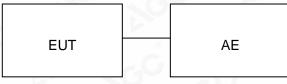
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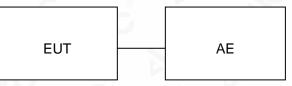
# **5. SYSTEM TEST CONFIGURATION**

**5.1. CONFIGURATION OF EUT SYSTEM** 

Radiated Emission Configure:



Conducted Emission Configure:



# 5.2. EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	VB-CAM-201	VS18518	GSS-VS18518	EUT
2	Control Box	N/A	USB-TTL	AE
3	Adapter	ICP20-120-1500D	1.7m unshielded	Accessory
4	USB Cable	N/A	2m unshielded	Accessory

#### **5.3. SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	<b>RESULT</b> Compliant	
15.247 (b)(1)	Peak Output Power		
15.247 (a)(1)	20 dB Bandwidth	Compliant	
15.247 (d)	Conducted Spurious Emission	Compliant	
15.209	Radiated Emission	Compliant	
15.247 (a)(1)(iii)	Number of Hopping Frequency	Compliant	
15.247 (a)(1)(iii)	Time of Occupancy	Compliant	
15.247 (a)(1)	Frequency Separation	Compliant	
15.207	Conducted Emission	Compliant	

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# 6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd		
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China		
Designation Number	CN1259		
FCC Test Firm Registration Number	975832		
A2LA Cert. No.	5054.02		
Description	Attestation of Global Compliance (Shenzhen) Co., Ltd is accredited by A2LA		

#### TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2020	May 14, 2021
LISN	R&S	ESH2-Z5	100086	Jul. 03, 2020	Jul. 02, 2021
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

# TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
2.4GHz Filter	EM Electronics	2400-2500MHz	N/A	Mar. 23, 2020	Mar. 22, 2022
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 21, 2019	Sep. 20, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2021	Jan. 07, 2023
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

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# 7. PEAK OUTPUT POWER

# 7.1. MEASUREMENT PROCEDURE

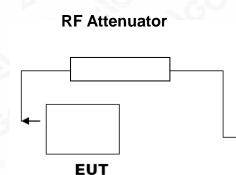
For peak power test:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- 3. RBW > 20 dB bandwidth of the emission being measured.
- 4. VBW  $\geq$ RBW.
- 5. Sweep: Auto.
- 6. Detector function: Peak.
- 7. Trace: Max hold.

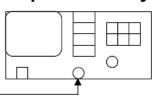
Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

# 7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

# PEAK POWER TEST SETUP



# Spectrum Analyzer



**RF** Cable

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#### 7.3. LIMITS AND MEASUREMENT RESULT

PEAK OUTPUT POWER MEASUREMENT RESULT FOR GFSK MOUDULATION				
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail	
2.402	2.882	21	Pass	
2.441	3.508	21	Pass	
2.480	4.179	21	Pass	

#### CH0



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CH39



CH78

🔰 Keysight Spectrum Analyzer - Swept SA				- <u>-</u>	
RL RF 50 Ω AC Center Freq 2.480000000	GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	06:55:28 PM Jan 20, 2021 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dBm	PNO: East	Trig: Free Run Atten: 30 dB	Avg Hold: 100/100	2.480 155 GHz 4.179 dBm	Auto Tuno
10.0		\$ <sup>1</sup>			<b>Center Fre</b> 2.480000000 GH
0.00					<b>Start Fre</b> 2.477500000 GH
20.0					<b>Stop Fre</b> 2.482500000 GH
40.0					CF Ste 500.000 kH <u>Auto</u> Ma
60.0					Freq Offso 0 ⊦
Center 2,480000 GHz				Span 5.000 MHz	
#Res BW 1.5 MHz	#VBW 5.		Sweep 1	.000 ms (1001 pts)	

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PEAK OUTPUT POWER MEASUREMENT RESULT FOR Π/4-DQPSK MODULATION					
Frequency (GHz)	Peak Power Applicable Lim (dBm) (dBm)		Pass or Fail		
2.402	2.389	21	Pass		
2.441	2.021	21	Pass		
2.480	2.269	21	Pass		



CH0

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#### Report No.: AGC11563210101FE03 Page 17 of 78



NSE:INT Avg Type: Log-Pwr Avg|Hold: 100/100 Frequency Center Freq 2.441000000 GHz Trig: Free Run Atten: 30 dB PNO: Fast IFGain:Low Auto Tune Mkr1 2.441 120 GHz 2.021 dBm Ref 20.00 dBm 10 dB/div **Center Freq** 2.441000000 GHz 1 Start Freq 2.438500000 GHz Stop Freq 2.443500000 GHz CF Step 500.000 kHz <u>Auto</u> Ма **Freq Offset** 0 Hz Center 2.441000 GHz #Res BW 1.5 MHz Span 5.000 MHz Sweep 1.000 ms (1001 pts) #VBW 5.0 MHz STATUS

#### **CH39**

CH78

Keysight Spectrum Analyzer - Swept SA				
M RL RF 50Ω AC Center Freq 2.480000000	CORREC SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	07:05:14 PM Jan 20, 2021 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast +++ Trig: Free Run IFGain:Low Atten: 30 dB	Avg Hold: 100/100	TYPE MWWWW DET PNNNN	
10 dB/div Ref 20.00 dBm		Mkr1 :	2.480 120 GHz 2.269 dBm	Auto Tune
10.0				Center Free 2.480000000 GH
0.00				
-10.0				Start Free 2.477500000 GH
-20.0				<b>Stop Fre</b> 2.482500000 GH
40.0				<b>CF Ste</b> 500.000 k⊢
-50.0				<u>Auto</u> Ma
-60.0				Freq Offse
-70.0				
			Onen 5 000 Mille	
Center 2.480000 GHz #Res BW 1.5 MHz	#VBW 5.0 MHz	Sweep 1.0	Span 5.000 MHz 000 ms (1001 pts)	
MSG		STATUS		

Compliances Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Perton Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issues of the requiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com. g/Inspection The test results Bf he test report.

PEAK OUTPUT POWER MEASUREMENT RESULT					
FOR 8-DPSK MODULATION       Frequency (GHz)     Peak Power (dBm)     Applicable Limits (dBm)     Pass or Fail					
2.402	2.216	21	Pass		
2.441	2.259	21	Pass		
2.480	2.601	21	Pass		



CH0

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#### Report No.: AGC11563210101FE03 Page 19 of 78



**CH39** Avg Type: Log-Pwr Avg|Hold: 100/100 Frequency Center Freq 2.441000000 GHz Trig: Free Run Atten: 30 dB PNO: Fast IFGain:Low Auto Tune Mkr1 2.440 920 GHz 2.259 dBm Ref 20.00 dBm 10 dB/div **Center Freq** 2.441000000 GHz **♦**<sup>1</sup> Start Freq 2.438500000 GHz Stop Freq 2.443500000 GHz CF Step 500.000 kHz <u>Auto</u> Ма **Freq Offset** 0 Hz Center 2.441000 GHz #Res BW 1.5 MHz Span 5.000 MHz Sweep 1.000 ms (1001 pts) #VBW 5.0 MHz STATUS

CH78

#Res BW	1.5 MHz	#VB\	V 5.0 MHz	Sweep 1	.000 ms (1001 pts)	
	480000 GHz				Span 5.000 MHz	
-70.0						
-60.0						Freq Offs
-50.0						
						500.000 kł <u>Auto</u> Ma
-40.0						CF Ste
30.0						2.482500000 Gi
20.0						Stop Fre 2.482500000 GF
-10.0						2.477500000 GH
0.00						Start Fre
10.0			<b>↓</b> 1			2.480000000 GH
						Center Fre
10 dB/div Log	Ref 20.00 dB	m			2.601 dBm	
		IFGain:Low	Atten: 30 dB	Mkr1	2.479 975 GHz	Auto Tu
Center F	req 2.480000	000 GHz PNO: Fast ↔	🛏 Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Frequency
X/RL	RF 50 Ω /	AC CORREC	SENSE:INT	ALIGN AUTO	07:11:43 PM Jan 20, 2021	-

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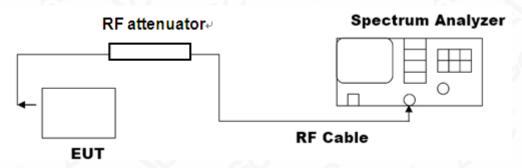


# 8. 20DB BANDWIDTH

#### **8.1. MEASUREMENT PROCEDURE**

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hoping channel The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

#### 8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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 E-mail: agc@agc-cert.com



#### 8.3. LIMITS AND MEASUREMENT RESULTS

MEASUREMENT RESULT FOR GFSK MOUDULATION				
Appliachte Limite	Measurement Result			
Applicable Limits	Test Data (MHz)		Criteria	
	Low Channel	0.953	PASS	
N/A	Middle Channel	0.952	PASS	
	High Channel	0.972	PASS	

#### 06:47:27 PM Jan 20, 2021 SENSE:INT Center Freq: 2.402000000 GHz Trig: Free Run Avg|Hol #Atten: 30 dB Frequency Radio Std: None 102000000 GHz Avg|Hold: 100/100 #IFGain:Low Radio Device: BTS Ref 20.00 dBm **Center Freq** 2.402000000 GHz Center 2.402 GHz #Res BW 30 kHz Span 3 MHz Sweep 3.2 ms CF Step 300.000 kHz #VBW 100 kHz <u>Auto</u> 11.0 dBm **Occupied Bandwidth Total Power** 883.87 kHz Freq Offset 0 Hz 4.898 kHz **Transmit Freq Error OBW Power** 99.00 % x dB Bandwidth 953.1 kHz x dB -20.00 dB

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

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#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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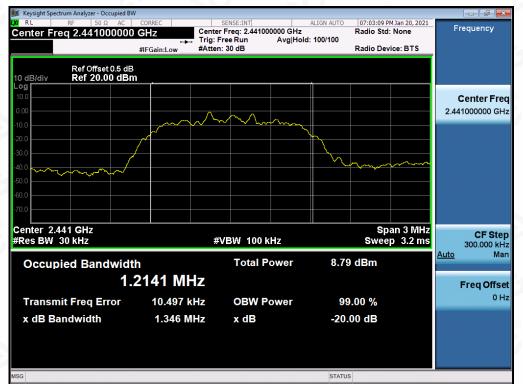
MEASUREMENT RESULT FOR II /4-DQPSK MODULATION				
Annicable Limite	Measurement Result			
Applicable Limits	Test Data	Test Data (MHz)		
	Low Channel	1.344	PASS	
N/A	Middle Channel	1.346	PASS	
	High Channel	1.345	PASS	

#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



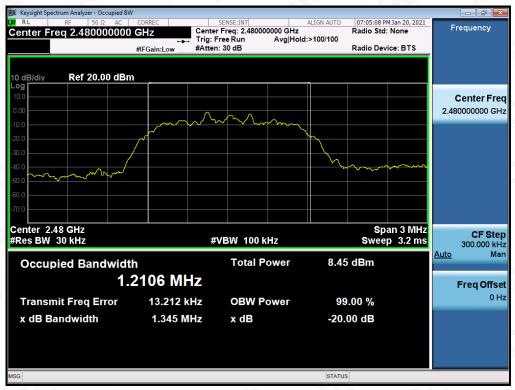
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the strend in the stamp of the test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15day after the issue of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc~cert.com.





#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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MEASUREMENT RESULT FOR 8-DPSK MODULATION				
Applicable Limita	Applicable Limite Measurement Result			
Applicable Limits	Test Data	Test Data (MHz)		
	Low Channel	1.317	PASS	
N/A	Middle Channel	1.319	PASS	
	High Channel	1.319	PASS	

#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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# 9. CONDUCTED SPURIOUS EMISSION

# 9.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the Middle and the bottom operation frequency individually.
- Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
   RBW = 100 kHz; VBW= 300 kHz; Sweep = auto; Detector function = peak.
- 4. Set SPA Trace 1 Max hold, then View.

#### 9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2

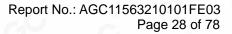
#### 9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

#### 9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEA	SUREMENT RESULT		
Annlinghla Limita	Measurement Result		
Applicable Limits	Test Data	Criteria	
In any 100 kHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS	
power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation 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))	At least -20dBc than the limit Specified on the TOP Channel	PASS	

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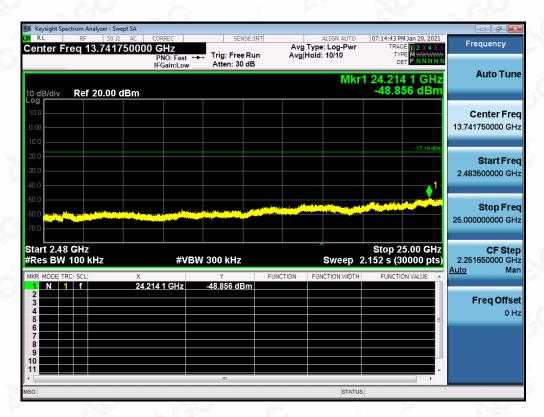
# TEST RESULT FOR ENTIRE FREQUENCY RANGE TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF GFSK MODULATION IN LOW CHANNEL



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#### Report No.: AGC11563210101FE03 Page 29 of 78





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 E-mail: agc@agc-cert.com

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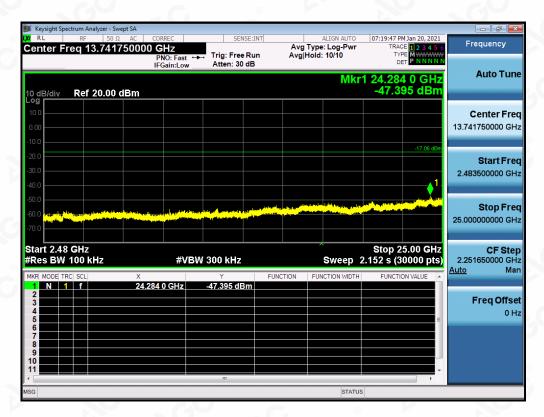
鱦 Keysight Spectrum Analyzer - Swept	t SA				
	AC CORREC	SENSE:INT	Avg Type: Log-Pwr	07:19:13 PM Jan 20, 2021 TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide ↔ IFGain:Low	<ul> <li>Trig: Free Run Atten: 30 dB</li> </ul>	Avg Hold: 10/10	DET P NNNN	
10 dB/div Ref 20.00 dB			Mkr1 2.4	40 844 5 GHz 2.943 dBm	Auto Tune
10.0		1			Center Fred 2.441000000 GHz
-10.0					Start Free
-40.0	prrv.			M William and a	2.439500000 GHz
-50.0					<b>Stop Fred</b> 2.442500000 GH2
Center 2.441000 GHz #Res BW 100 kHz	#VBW	300 kHz	Sweep 2.00	Span 3.000 MHz 0 ms (30000 pts)	CF Step 300.000 kHz
MKR MODE TRC SCL	Х		NCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar
1 N 1 f 2 2 3 4 4 5 5	2.440 844 5 GHz	2.943 dBm		в	Freq Offse 0 Ha
6 7 8 9					
10					
< ISG			STATUS	•	
			514105		
📕 Keysight Spectrum Analyzer - Swept 📜 R L 🔋 RF 50 Ω	AC CORREC	SENSE:INT		07:19:22 PM Jan 20, 2021	Frequency
Center Freq 1.215000	PNO: Fast ++	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE 123456 TYPE MWWWWW DET P NNNNN	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
10 dB/div Ref 20.00 dE	IFGain:Low	Atten: 30 dB	Mkr1	2.191 35 GHz -57.210 dBm	Auto Tune
10.0					Center Fred 1.215000000 GHz
-10.0					1.215000000 GH2
-20.0				-17.06 dBm	Start Fred
-30.0					30.000000 MH;
-40.0				1	Stop Free
-40.0 -50.0 -60.0		a de par par a sua de parte par a sua de parte de la sua de parte de la sua de la sua de la sua de la sua de la	ing provide trademic land of the provide state of the state		
-40.0 -50.0 -60.0 -70.0		e Trypper gaar gantan oo oo boorg bagaa da	l ang ganang ak di sa pang kang sa pang sa ng sa kang sa kang sa		2.400000000 GH:
-40.0 -50.0 -60.0 -70.0 Start 30 MHz	#VBW	diuse data and the second s	Sweep 228.	1 Stop 2.400 GHz 0 ms (30000 pts)	2.400000000 GH; CF Step 237.000000 MH;
-40.0 -50.0 -60.0 -60.0 -70.0 -50.0 -70.0 -50.0	X	Y FU	Sweep 228.	1 Stop 2.400 GHz 0 ms (30000 pts)	2.400000000 GH; CF Step 237.000000 MH;
-40.0 -50.0			-	0 ms (30000 pts) FUNCTION VALUE	2.40000000 GH: CF Step 237.000000 MH: <u>Auto</u> Mar Freq Offset
40.0         50.0           -60.0         Match // Just server and an 100 Mit of the server an 100 Mit of the server and an 100 Mit of the server an 100	X	Y FU	-	0 ms (30000 pts)	Stop Free 2.400000000 GH: CF Step 237.000000 MH; Auto Mar Freq Offset 0 H;
-40.0 -50.0 -60.0 -7	X	Y FU	-	0 ms (30000 pts) FUNCTION VALUE	2.40000000 GH: CF Step 237.000000 MH: <u>Auto</u> Mar Freq Offset

#### TEST PLOT OF OUT OF BAND EMISSIONS OF GFSK MODULATION IN MIDDLE CHANNEL

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#### Report No.: AGC11563210101FE03 Page 31 of 78





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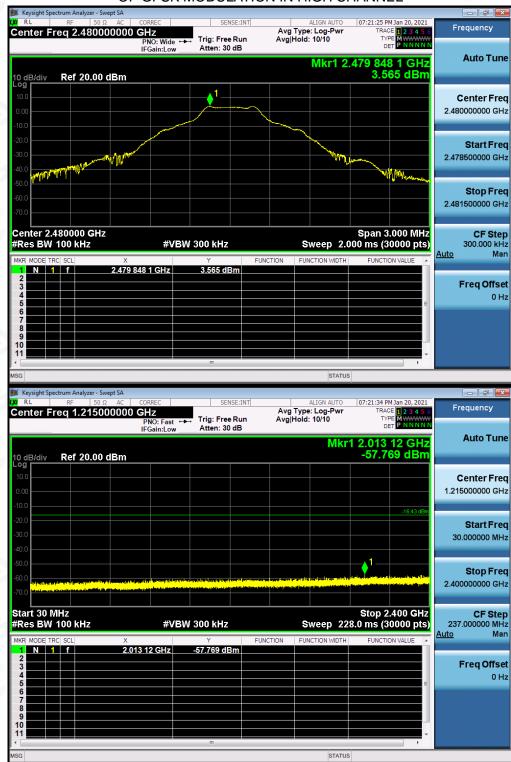
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#### TEST PLOT OF OUT OF BAND EMISSIONS OF GFSK MODULATION IN HIGH CHANNEL

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#### Report No.: AGC11563210101FE03 Page 33 of 78



	ht Spect										🔰 Keysight Spectrum Analyzer - Swept SA 👘 🏹													
(XI RL Cente		RF		Ω AC			SEN	NSE:INT		ALIGN AUTO		M Jan 20, 2021 CE <b>1 2 3 4 5</b> 6	F	requency										
Cente	enter Freq 13.75000000			PNO: F	0: Fast 🛶 Trig: Free Run			Avg Hold: 10/10		TYPE MWWWWW DET P N N N N N														
		_			IFGain:	Low	Atten: 30	) dB						Auto Tune										
	Mkr1 24.873 2 GHz 0 dB/div Ref 20.00 dBm -48.452 dBm																							
10 dB/d Log																								
10.0														Center Freq										
0.00														60000000 GHz										
-10.0 —																								
-20.0												-16.43 dBm												
-30.0													0.50	Start Freq										
-40.0												1.	2.50	0000000 GHz										
-50.0								and an address of						Stop Freq										
-60.0 aver						and the second second							25.00	0000000 GHz										
-70.0 —																								
Start 2	2.50	GHz							<u> </u>		Stop 2	5.00 GHz		CF Step										
	#Res BW 100 kHz #VBW 300 kHz Sweep 2.152 s (30000 pts)										0000 pts)		50000000 GHz											
MKR MOD		SCL		Х	_		Y	FUN	CTION FU	NCTION WIDTH		DN VALUE	<u>Auto</u>	Man										
1 N	1				4.873 2 GH	Iz	-48.452 dE																	
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5 6																								
7																								
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MSG										STATUS	;													

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

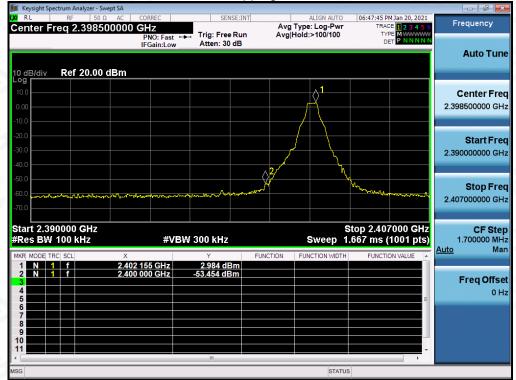
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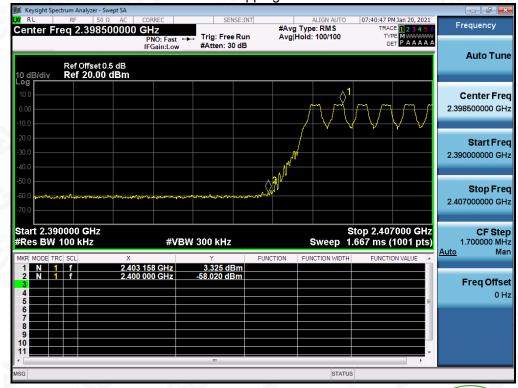
#### TEST RESULT FOR BAND EDGE

#### GFSK MODULATION IN LOW CHANNEL

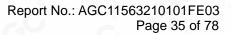
Hopping off



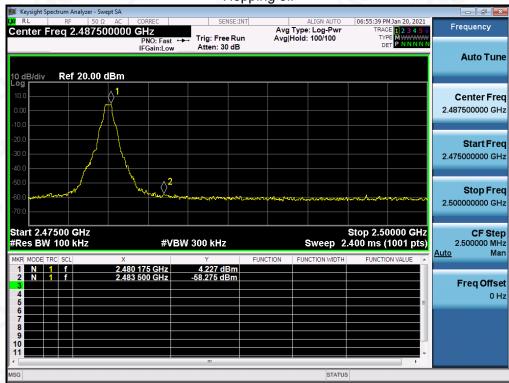
Hopping on



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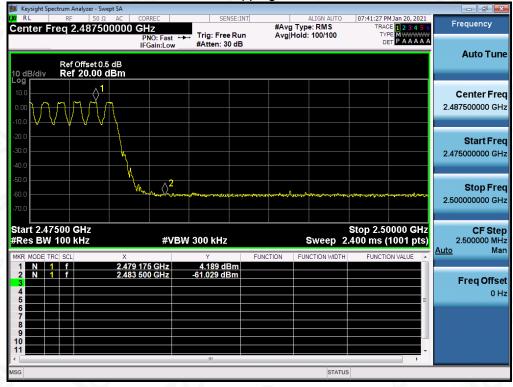




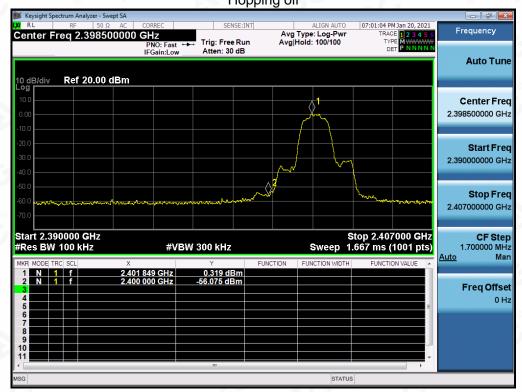
# GFSK MODULATION IN HIGH CHANNEL

Hopping off

Hopping on

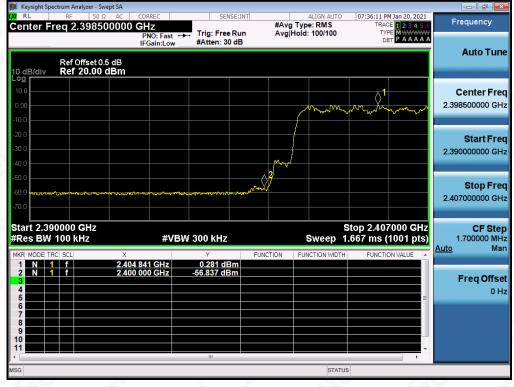


Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the solution of the stamp o



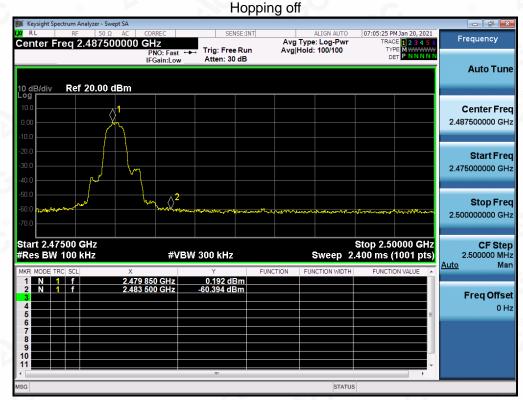
# $\pi$ /4-DQPSK MODULATION IN LOW CHANNEL Hopping off

Hopping on



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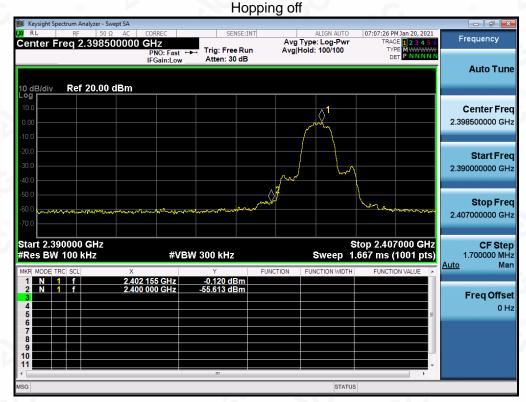
# $\pi$ /4-DQPSK MODULATION IN HIGH CHANNEL

Hopping on



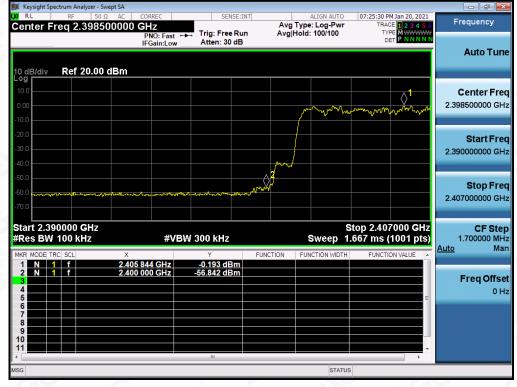
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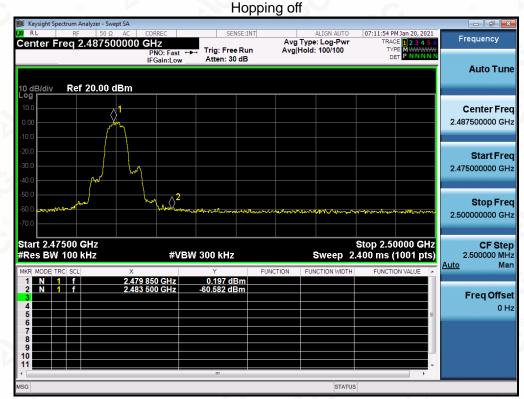
# 8-DPSK MODULATION IN LOW CHANNEL

Hopping on



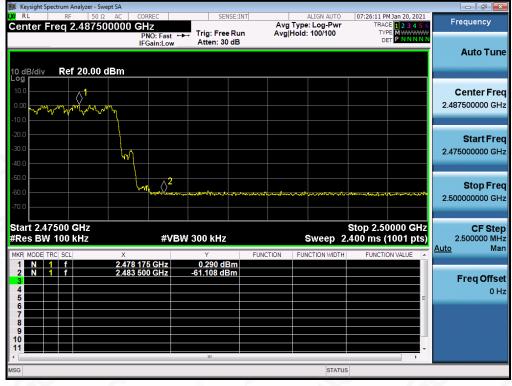
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the bedicated resting/inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written approver, between the test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15day after the issuence of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc~cert.com.





# 8-DPSK MODULATION IN HIGH CHANNEL

Hopping on



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## **10. RADIATED EMISSION**

### **10.1. MEASUREMENT PROCEDURE**

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

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The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/3MHz for Peak, 1MHz/3MHz for Average

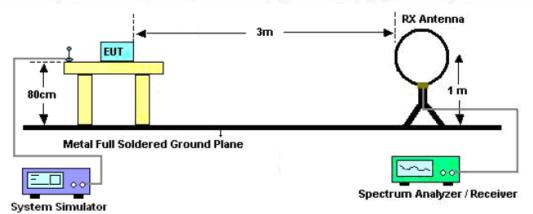
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

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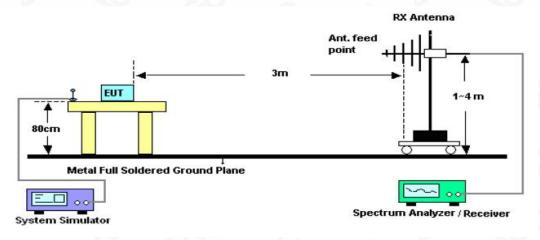


### 10.2. TEST SETUP

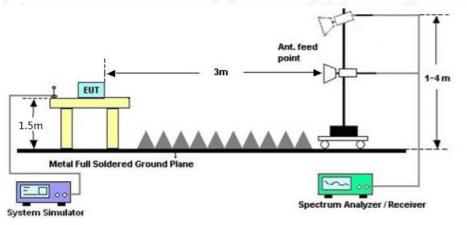
Radiated Emission Test-Setup Frequency Below 30MHz



## RADIATED EMISSION TEST SETUP 30MHz-1000MHz



### RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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#### **10.3. LIMITS AND MEASUREMENT RESULT**

#### 15.209 Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (microvolts/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

Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.

## **10.4. TEST RESULT**

### **RADIATED EMISSION BELOW 30MHz**

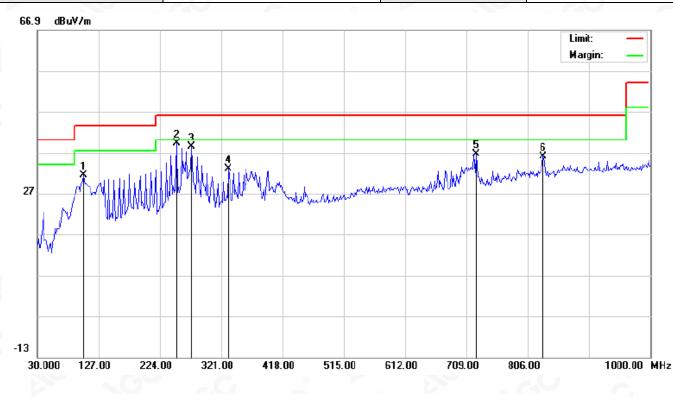
The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

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#### **RADIATED EMISSION BELOW 1GHz**

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		102.7500	15.16	16.28	31.44	43.50	-12.06	peak
2	*	249.8667	20.72	18.49	39.21	46.00	-6.79	peak
3	2	274.1166	18.95	19.46	38.41	46.00	-7.59	peak
4		332.3167	12.49	20.60	33.09	46.00	-12.91	peak
5	1	723.5499	8.00	28.68	36.68	46.00	-9.32	peak
6	8	330.2500	5.14	30.80	35.94	46.00	-10.06	peak

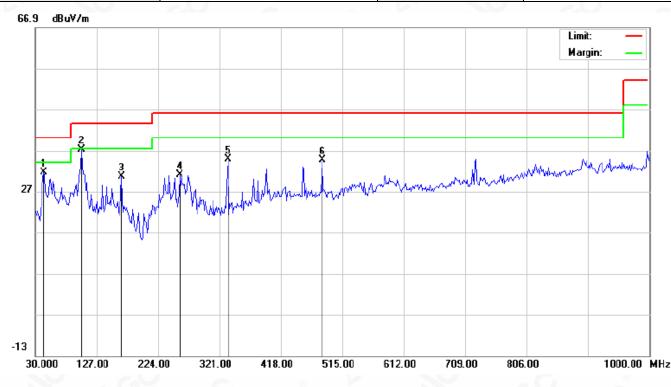
### **RESULT: PASS**

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#### Report No.: AGC11563210101FE03 Page 45 of 78

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		42.9333	16.90	14.69	31.59	40.00	-8.41	peak
2	*	102.7500	20.89	16.28	37.17	43.50	-6.33	peak
3		165.8000	11.95	18.59	30.54	43.50	-12.96	peak
4		257.9500	12.68	18.35	31.03	46.00	-14.97	peak
5		333.9333	14.19	20.66	34.85	46.00	-11.15	peak
6		482.6667	9.96	24.64	34.60	46.00	-11.40	peak

### **RESULT: PASS**

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. All test modes had been pre-tested. The mode 3 is the worst case and recorded in the report.

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#### Report No.: AGC11563210101FE03 Page 46 of 78

## **RADIATED EMISSION ABOVE 1GHz**

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	45.33	0.08	45.41	74	-28.59	peak 💿
4804.000	37.68	0.08	37.76	54	-16.24	AVG
7206.000	40.51	2.21	42.72	74	-31.28	peak
7206.000	32.75	2.21	34.96	54	-19.04	AVG
	<u> </u>				60	
emark:			0			CAV .
actor = Anter	na Factor + Cable	Loss – Pre-	amplifier.	0		

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	44.24	0.08	44.32	74	-29.68	peak
4804.000	36.31	0.08	36.39	54	-17.61	AVG
7206.000	39.86	2.21	42.07	74	-31.93	peak
7206.000	30.54	2.21	32.75	54	-21.25	AVG
	0				8	
				2		
emark:						
actor = Anter	na Factor + Cabl	e Loss – Pre-	amplifier			

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#### Report No.: AGC11563210101FE03 Page 47 of 78

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4882.000	45.87	0.14	46.01	74	-27.99	peak
4882.000	38.91	0.14	39.05	54	-14.95	AVG
7323.000	42.69	2.36	45.05	74	-28.95	peak
7323.000	34.25	2.36	36.61	54	-17.39	AVG
3			g de de de	8	8	
emark:	- 6	8			- 6	0
	na Factor + Cable	Loss – Pre-	amplifier			- 61

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Vertical

- Value Type peak
peak
O AVG
peak
AVG

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#### Report No.: AGC11563210101FE03 Page 48 of 78

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	46.14	0.22	46.36	74	-27.64	peak
4960.000	38.42	0.22	38.64	54	-15.36	AVG
7440.000	41.57	2.64	44.21	74	-29.79	peak
7440.000	32.11	2.64	34.75	54	-19.25	AVG
	0		e C	8	8	
emark:						
ctor = Anter	na Factor + Cable	Loss – Pre-	amplifier.			- 6

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

			Limits	Margin	<ul> <li>Value Type</li> </ul>
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
45.67	0.22	45.89	74	-28.11	peak
38.42	0.22	38.64	54	-15.36	AVG
42.08	2.64	44.72	74	-29.28	peak
33.41	2.64	36.05	54	-17.95	AVG
	10 <sup>0</sup>		© P		
	45.67 38.42 42.08	45.67         0.22           38.42         0.22           42.08         2.64	45.67         0.22         45.89           38.42         0.22         38.64           42.08         2.64         44.72	45.67         0.22         45.89         74           38.42         0.22         38.64         54           42.08         2.64         44.72         74	45.67         0.22         45.89         74         -28.11           38.42         0.22         38.64         54         -15.36           42.08         2.64         44.72         74         -29.28

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

## **RESULT: PASS**

Note:

The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The "Factor" value can be calculated automatically by software of measurement system.

All test modes had been tested. The GFSK modulation is the worst case and recorded in the report.

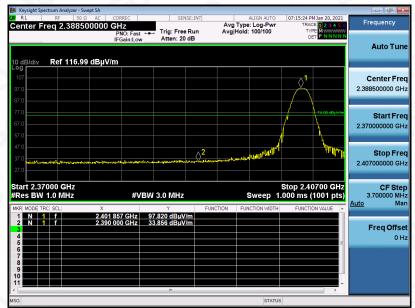
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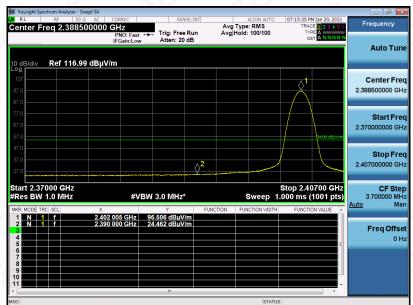
#### TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

ΡK



AV



#### **RESULT: PASS**

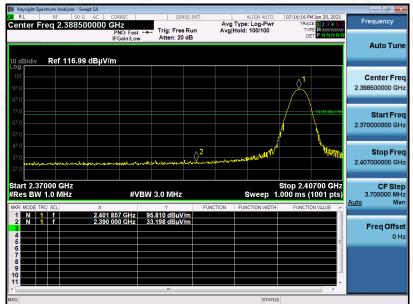
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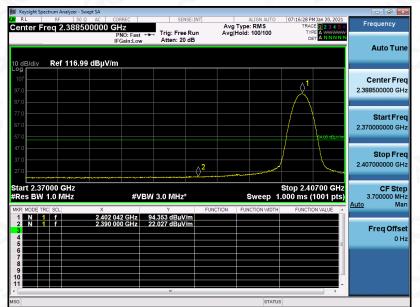
#### Report No.: AGC11563210101FE03 Page 50 of 78

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

PK



AV



**RESULT: PASS** 

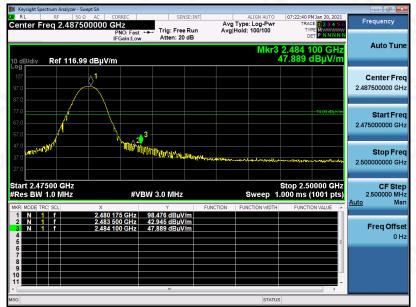
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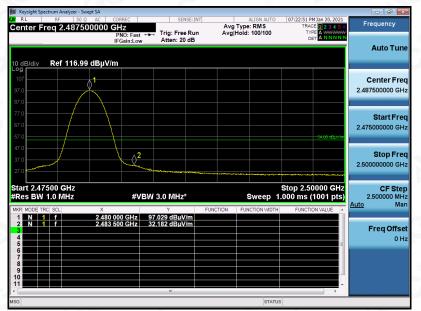
#### Report No.: AGC11563210101FE03 Page 51 of 78

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

PK



AV



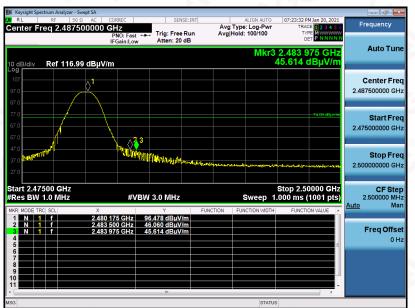
**RESULT: PASS** 

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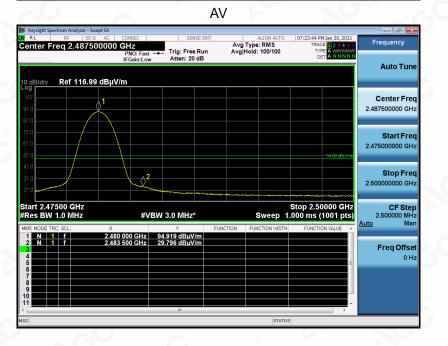


#### Report No.: AGC11563210101FE03 Page 52 of 78

EUT	VB-CAM-201	Model Name	VS18518
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical



PK



# RESULT: PASS

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

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# **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  $\geq$  RBW. Sweep: Auto. Detector function: Peak. Trace: Max hold.

4. Allow the trace to stabilize.

### 11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

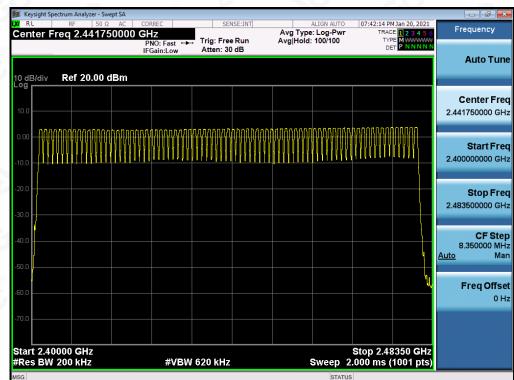
Same as described in section 8.2

### **11.3. MEASUREMENT EQUIPMENT USED**

The same as described in section 6

### **11.4. LIMITS AND MEASUREMENT RESULT**

TOTAL NO. OF HOPPING CHANNEL	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
	>=15	79	PASS



## TEST PLOT FOR NO. OF TOTAL CHANNELS

## 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  $\leq$  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**

Channel	Time of Pulse for DH5 (ms)	Number of hops in the period specified in the requirements	Sweep Time (ms)	Limit (ms)
Low	2.887	31*4	357.988	400
Middle	2.887	28*4	323.344	400
High	2.887	26*4	300.248	400

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#### Keysight Spectrum Analyz 07:42:24 PM I Trig Delay-2.000 ms Trig: Video Atten: 30 dB Frequency Center Freq 2.402000000 GHz Avg Type: Log-Pwr PNO: Fast IFGain:Low Auto Tune Mkr1 2.005 ms 2.82 dBm Ref 20.00 dBm 10 dB/div Center Frea 2.402000000 GHz -3.00 dB 2.887 ms Start Freq 2.402000000 GHz Stop Freq 2.402000000 GHz CF Step 1.000000 MHz <u>Auto</u> Mar la kana alaa ahaa dad and the state of the Freq Offset 0 Hz Center 2.402000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 8.000 ms (30000 pts) #VBW 3.0 MHz G 😳 Points changed; all traces cleared STATUS 07:42:34 PM Jan 20, 2021 RACE TYPE DE1 Frequency Center Freq 2.402000000 GHz Avg Type: Log-Pwr Trig: Free Run PNO: Fast IFGain:Low Atten: 30 dB Auto Tune 10 dB/div Ref 20.00 dBm **Center Freq** 2.402000000 GHz Start Freq 2.402000000 GHz Stop Freq 2.402000000 GHz CF Step 1.000000 MHz <u>Auto</u> Mar Freq Offset 0 Hz Center 2.402000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 7.902 s (30000 pts) #VBW 3.0 MHz File <image.png> saved

## TEST PLOT OF LOW CHANNEL

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