

TEST REPORT

REPORT NUMBER: 4788623965.3-11

COMPANY NAME: ASUSTek Computer Inc.

EUT DESCRIPTION: LED Projector

MODEL: S2

SERIAL NUMBER: 028

ISSUE DATE: 12-Oct-18

DATE TESTED: 20-Aug-18 to 2-Sep-18

APPLICABLE STANDARDS: JAPAN RADIO LAW RADIO EQUIPMENT REGULATIONS

TEST METHOD: Notice 88 of Ordinance Concerning Technical Regulations Conformity Certification of Specified Radio Equipment


Place of Testing: UL Verification Services (Guangzhou) Co., Ltd., Song Shan Lake Branch
Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech
Development Zone Dongguan, People's Republic of China

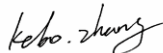
Test Result: Pass

Classification of Specified Radio Equipment: Article 2 Clause 1 Item 19-3

Type of radio wave, Frequency and antenna power: G1D, D1D 5270-5310MHz (Interval of 40MHz 2ch) 0.001102W/MHz

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services (Guangzhou) Co., Ltd., Song Shan Lake Branch and all revisions are duly noted

Approved & Released By: Stephen


Tested By: Kebo


Engineer Full Name: Stephen Guo
Engineer Title: Laboratory Manager
UL Verification Services (Guangzhou) Co., LTD.
Songshan Lake Branch

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Engineer Title: Engineer
UL Verification Services (Guangzhou) Co., LTD.
Songshan Lake Branch

1. EUT Information

Report No. : 4788623965.3-11
Applicant : ASUSTek Computer Inc.
Equipment Description: LED Projector
Model No. : S2
SerialNo. : 028
Series Model : S2E, S2C,S2M,S2Z
Model Difference : The schematic and structure of each model is same, the only difference is that the name of the model is different, but it will not affect the test result.
The number of Tx Antenna : 1
Max Antenna Gain : 3.40dBi
Mode : IEEE802.11n HT40
Type of Radio wave : G1D, D1D

Supply Voltage <input checked="" type="radio"/> DC <input checked="" type="radio"/> AC 100.00V	Modulation <input checked="" type="radio"/> OFDM (OBW<19MHz) <input type="radio"/> OFDM (OBW<19~38MHz) <input type="radio"/> QSS (OBW<18MHz) <input type="radio"/> Other Modulation (OBW<18MHz)
Voltage Condition <input checked="" type="radio"/> Non-Extreme <input type="radio"/> Extreme Normal AC100V Normal-10% - Normal+10% -	EUT has <input checked="" type="radio"/> ANT Connector distance - <input type="radio"/> No ANT Connector
Band <input checked="" type="radio"/> W52 <input type="radio"/> W53	TEUT has <input checked="" type="radio"/> TPC Function <input type="radio"/> No TPC Function

The worst-case data rate for each mode is determined to be as follows, based on preliminary test of the chipset utilized in this radio.
All final tests were made at the Lowest Rate.

Factors

	[MHz]	Other than for Power and ACP		For Power	
		Cable Loss [dB]	ATT/ [dB]	Cable Loss [dB]	ATT/ [dB]
Low Channel (Tx1)	5270	1.50	10.00	1.50	10.00
High Channel (Tx3)	5310	1.50	10.00	1.50	10.00

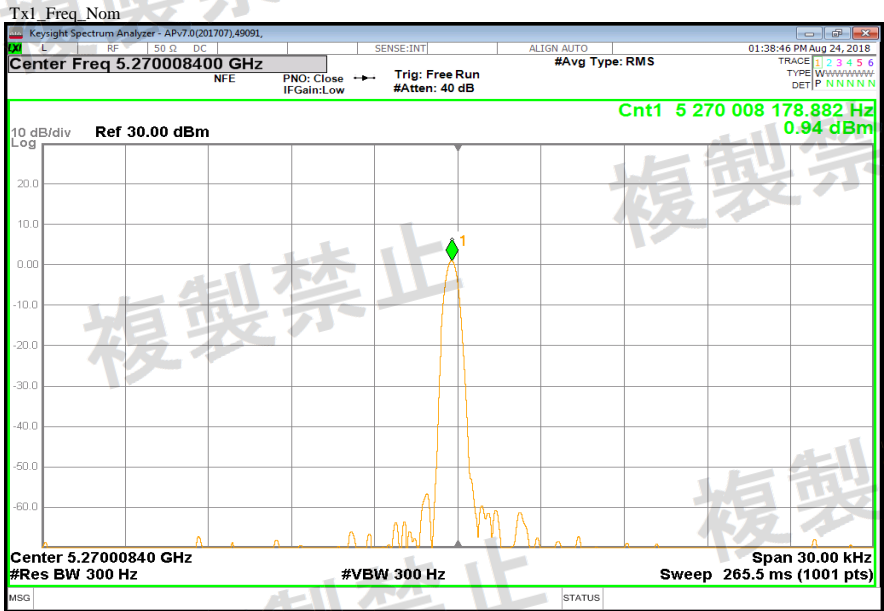
* Cable loss and ATT are not taken into account for ACP.

2.TEST Result

2.1. Frequency Tolerance

Job No.	4788623965.3-11
Remark1	
Remark2	

[DATA]					
Voltage	Freq. [MHz]	Result [MHz]	Tolerance [kHz]	Tolerance [ppm]	Limit [ppm]
AC100V	5270	5270.0082	8.2000	1.56	±20.0
	5310	5310.0084	8.4000	1.58	±20.0





2.2. Occupied Bandwidth

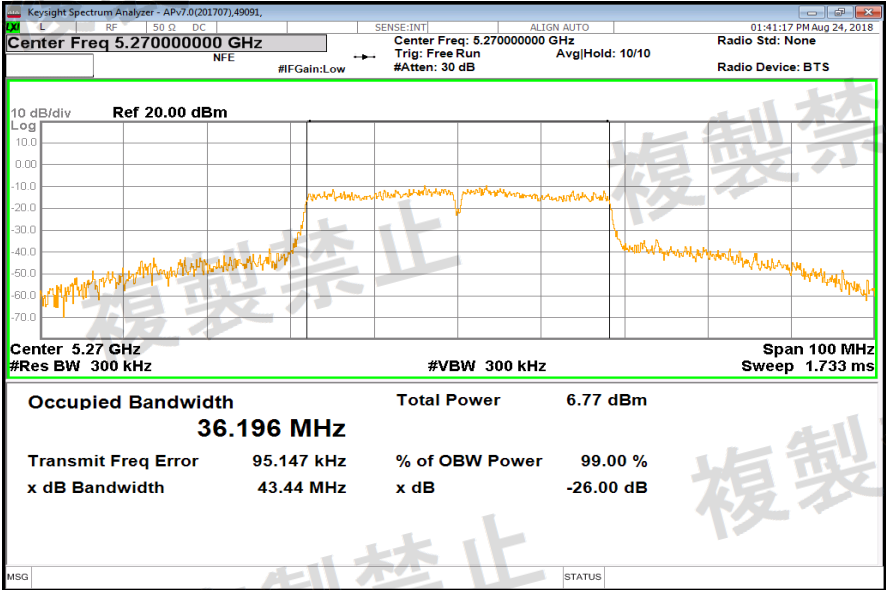
Job No.	4788623965.3-11
Remark1	
Remark2	

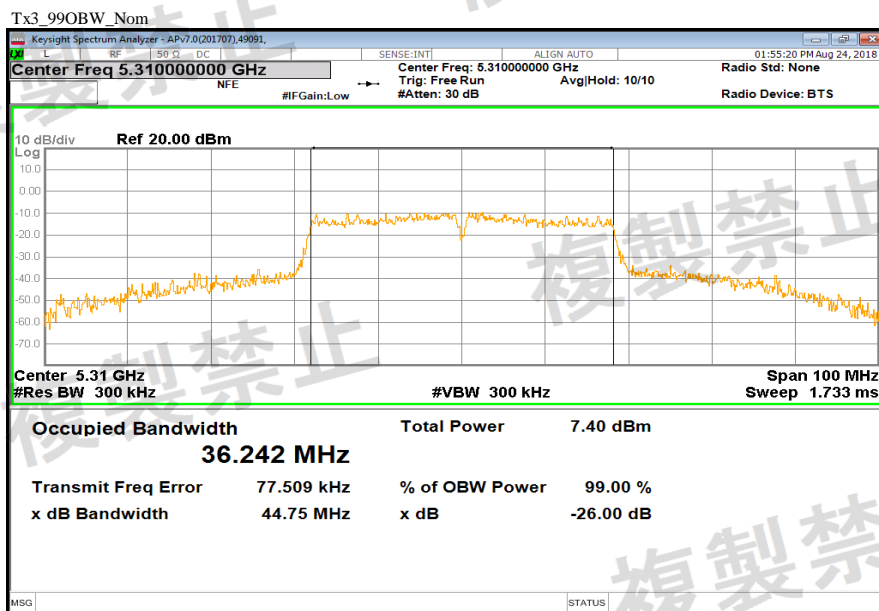
[DATA]

99% Occupied Frequency Bandwidth

Voltage	Freq. [MHz]	Result [MHz]	Limit [MHz]
AC100V	5270	36.1960	38
	5310	36.2420	38

Tx1_99OBW_Nom





2.3.Unwanted Emission Strength (Normal Voltage)

Job No. 4788623965.3-11

Remark1

Remark2

[DATA]

Voltage	Freq.	Freq.	S/A Reading	Cable Loss	Atten. Loss	Result	Result	Limit	Remark
	[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[uW]	[uW]	
AC100V	5270	886.00	-61.52	1.50	10.00	-50.02	0.010	2,500	◆1
		3860.00	-57.01	1.50	10.00	-45.51	0.028	2,500	◆1
		6008.00	-57.17	1.50	10.00	-45.67	0.027	2,500	◆2
		8225.00	-57.75	1.50	10.00	-46.25	0.024	2,500	◆2
		13729.00	-57.11	1.50	10.00	-45.61	0.027	2,500	◆2
		19342.00	-55.86	1.50	10.00	-44.36	0.037	2,500	◆2
	5310	25640.00	-54.20	1.50	10.00	-42.70	0.054	2,500	◆2
		914.30	-60.88	1.50	10.00	-49.38	0.012	2,500	◆1
		3843.00	-57.38	1.50	10.00	-45.88	0.026	2,500	◆1
		5371.00	-53.66	1.50	10.00	-42.16	0.061	2,500	◆1
		5375.00	-53.78	1.50	10.00	-42.28	0.059	2,500	◆1
		13913.00	-58.16	1.50	10.00	-46.66	0.022	2,500	◆2
		19996.00	-56.83	1.50	10.00	-45.33	0.029	2,500	◆2
		25610.00	-53.93	1.50	10.00	-42.43	0.057	2,500	◆2

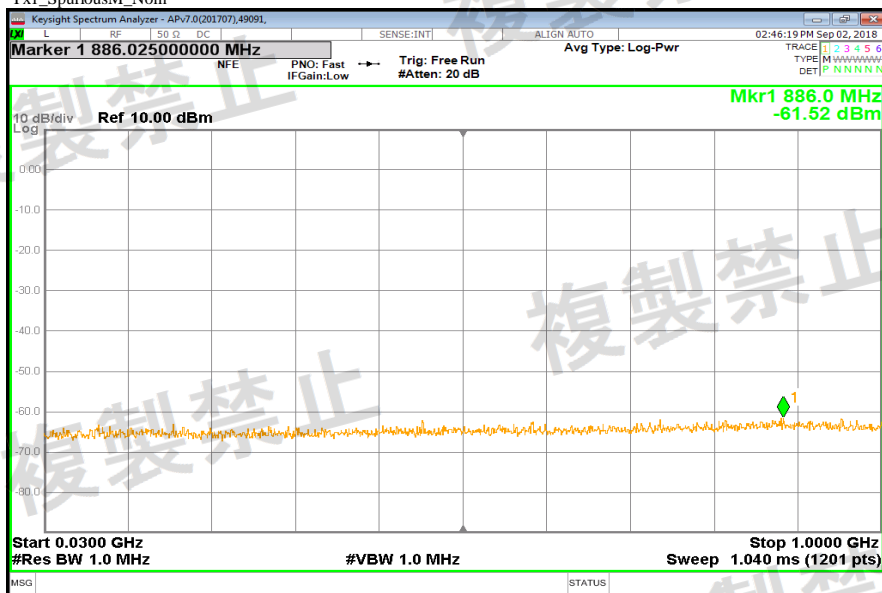
Sample Calculation :

Result = Reading + Cable Loss + Attenuator

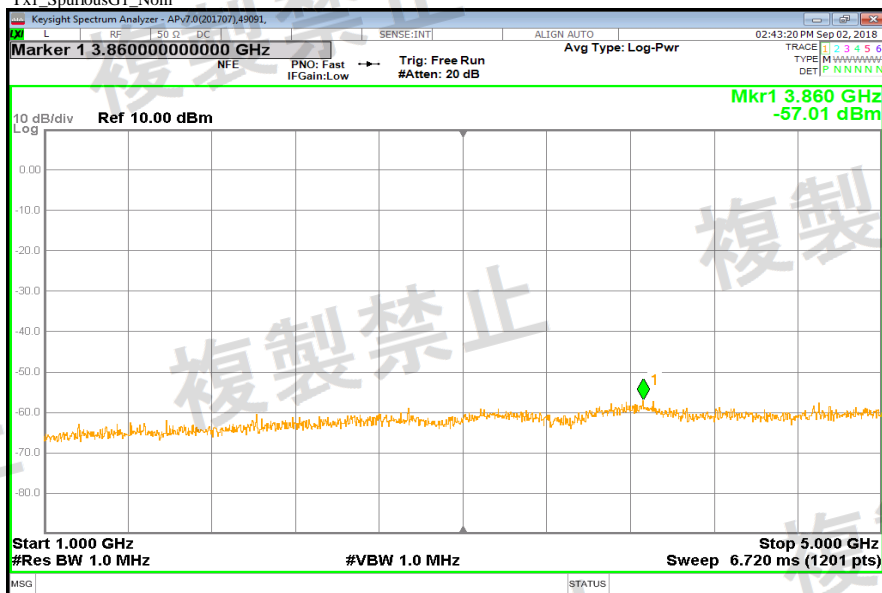
◆1:Freq Range1 (< 5,100MHz)

◆2:Freq Range2 (> 5,400MHz)

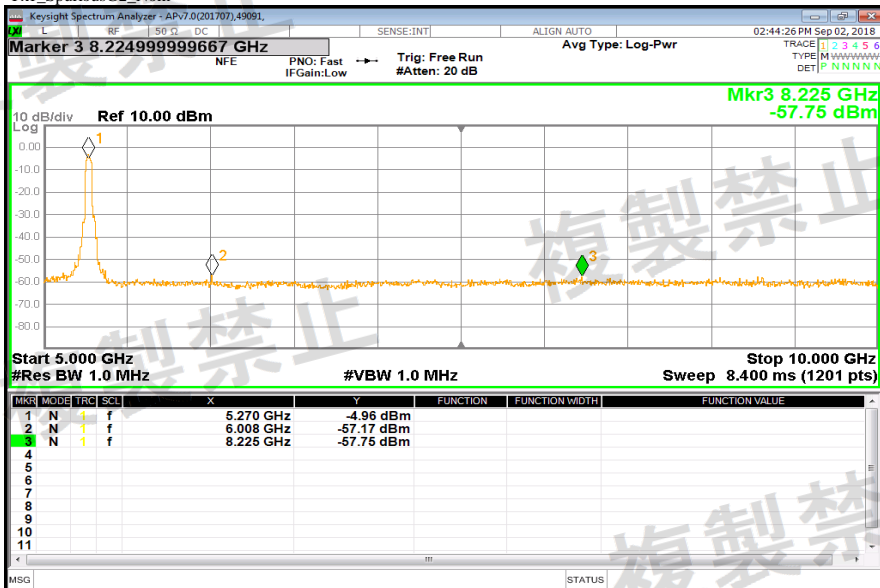
Tx1_SpuriousM_Nom



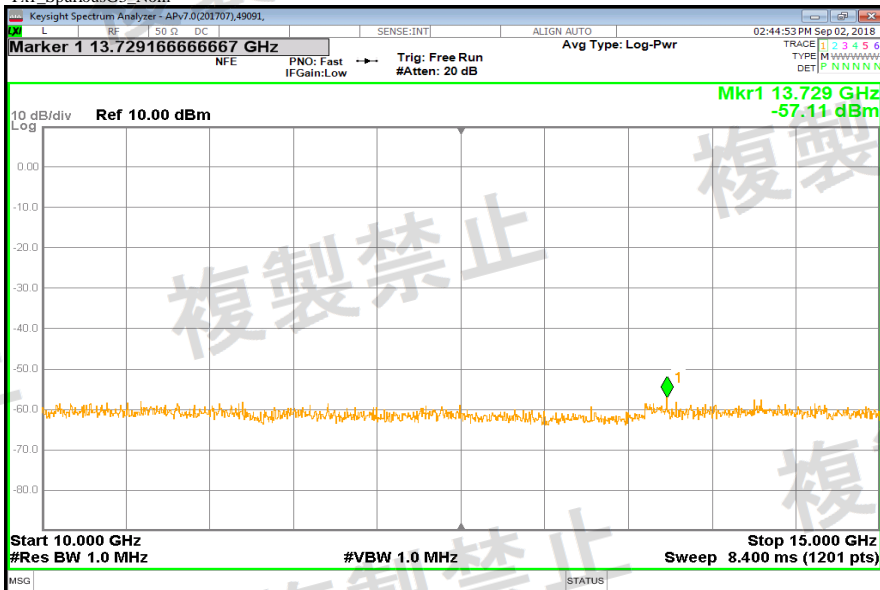
Tx1_SpuriousG1_Nom



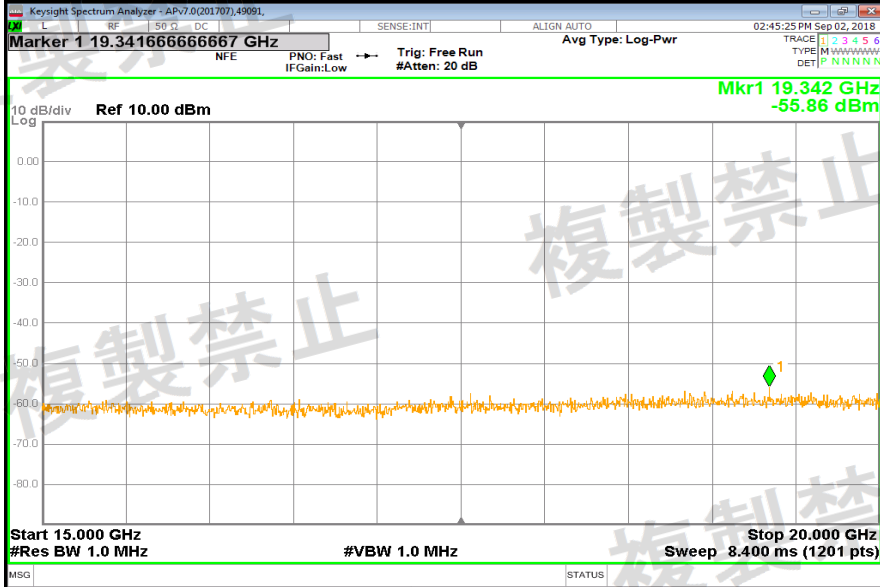
Tx1_SpuriousG2_Nom



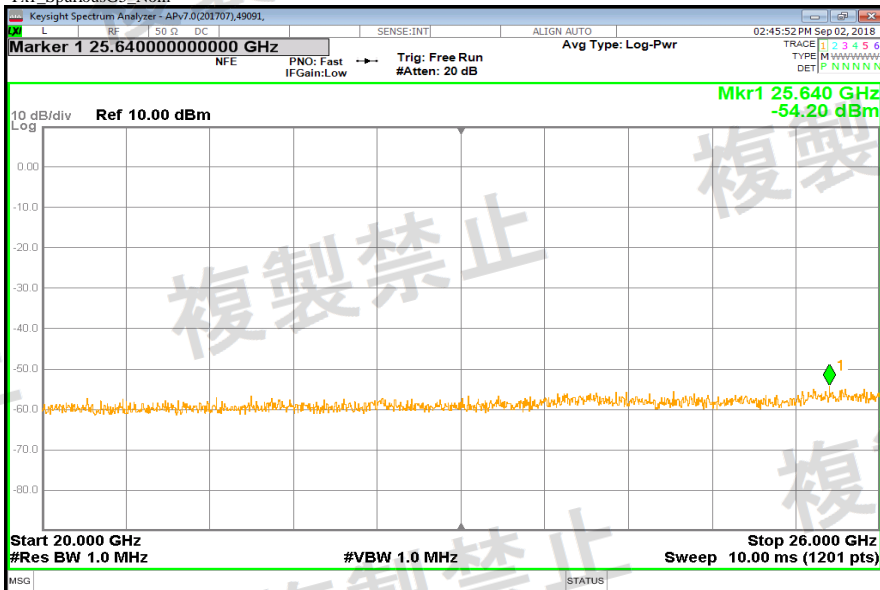
Tx1_SpuriousG3_Nom



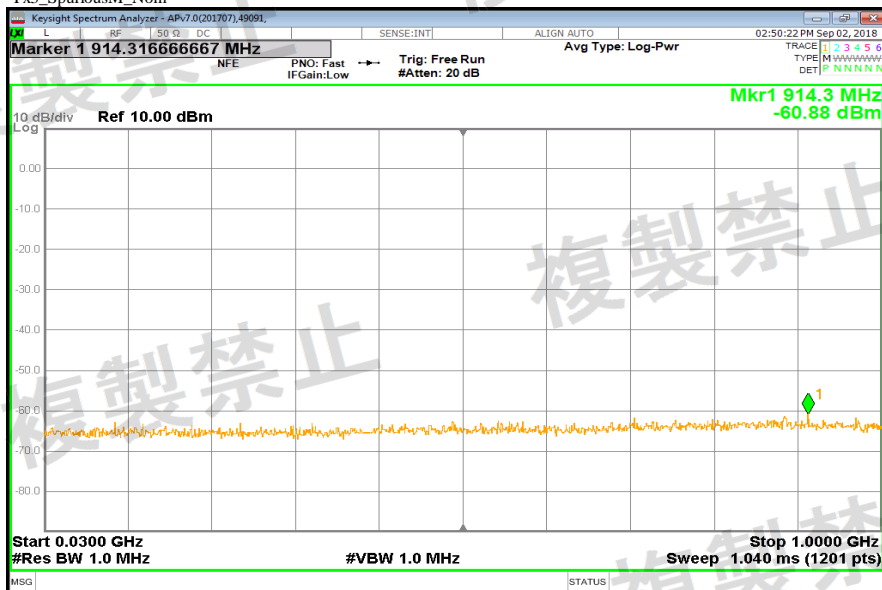
Tx1_SpuriousG4_Nom



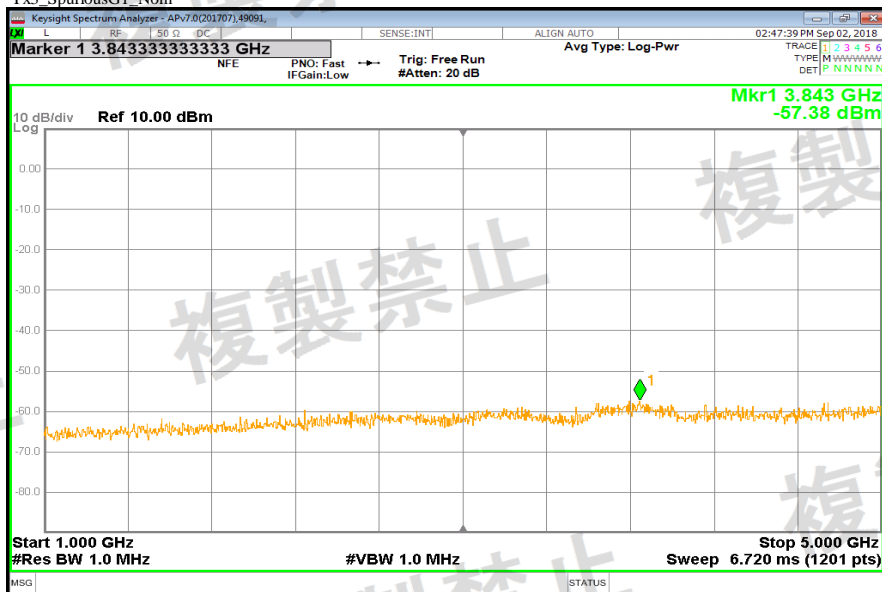
Tx1_SpuriousG5_Nom



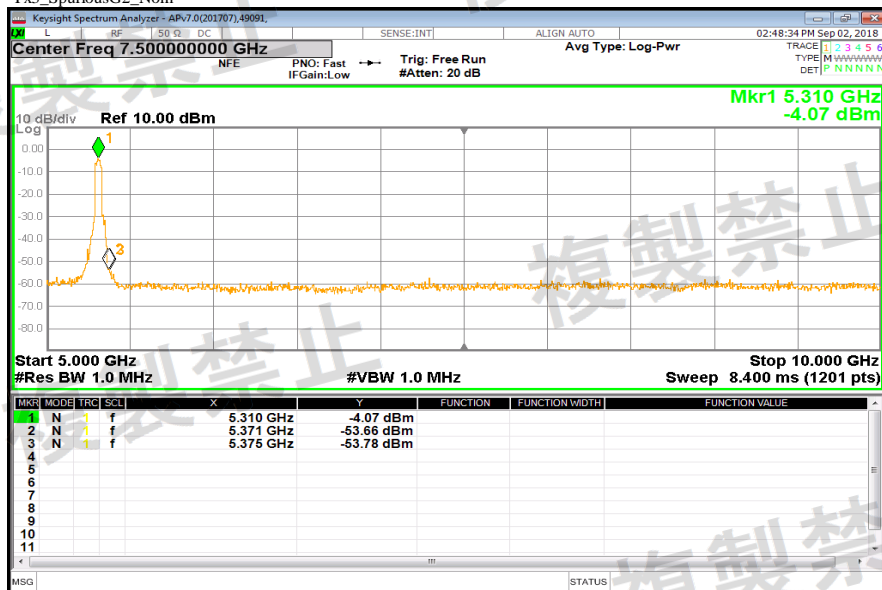
Tx3_SpuriousM_Nom



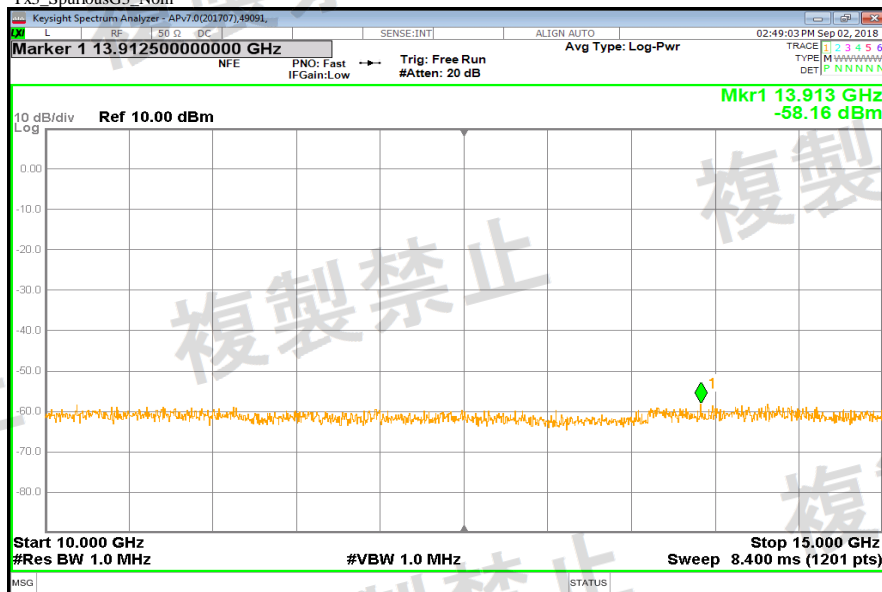
Tx3_SpuriousG1_Nom



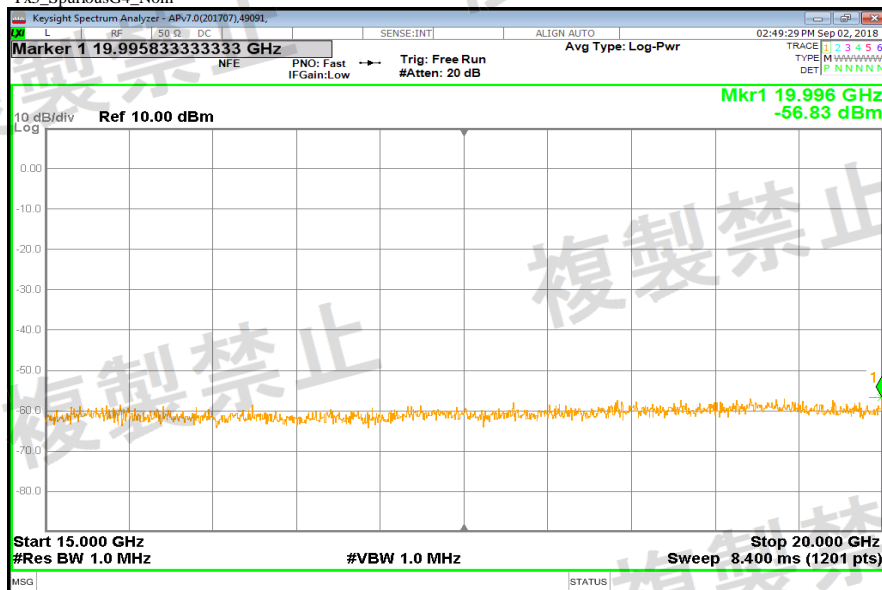
Tx3_SpuriousG2_Nom



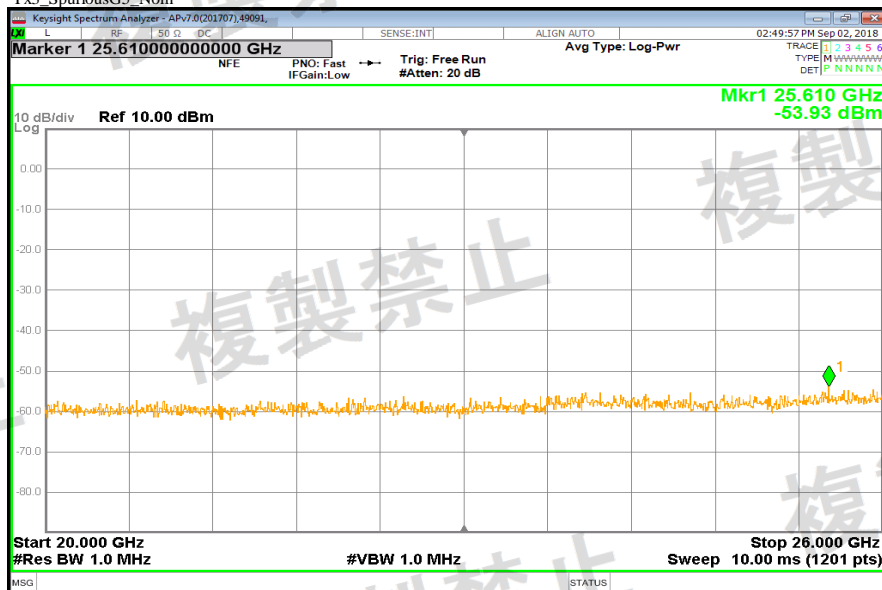
Tx3_SpuriousG3_Nom



Tx3_SpuriousG4_Nom



Tx3_SpuriousG5_Nom



2.4. Output Power/ E.I.R.P

Job No. 4788623965.3-11

Remark1

Remark2

[DATA]

Voltage	Port No.	Freq.	Reading	Cable Loss	Atten. Loss	Burst Rate	Output Power	Antenna Gain	E.I.R.P.
		[MHz]	[dBm]	[dB]	[dB]		(A) [W/MHz]	[dBi]	(A) [W/MHz]
AC100V	0	5270	-11.96	1.50	10.00	1.11	0.000996	3.40	0.002179
		5310	-11.49	1.50	10.00	1.11	0.001110	3.40	0.002428

Sample Calculation :

Output Power (A) = { Reading + Cable Loss + Atten. Loss } * Burst Rate

E.I.R.P. (A) = Output Power (A) * 10^{^(Antenna Gain[dBi]/10)}

[Total Power / Result and Limit]

Voltage	Freq.	Output Power				E.I.R.P.	
		Result (B) [W/MHz]	Tolerance Result [%]	Limit [W/MHz]	Tolerance Limit [%]	Result (B) [W/MHz]	Limit [W/MHz]
AC100V	5270	0.000996	-9.6	0.005000	+20 ~ -80	0.002179	0.002500
	5220	0.001107	0.5	0.005000	+20 ~ -80	0.002422	0.002500
	5310	0.001110	0.7	0.005000	+20 ~ -80	0.002428	0.002500

Sample Calculation :

Tolerance = Output Power Result (B) / Declared Output Power * 100 - 100.

[Declared Output Power]

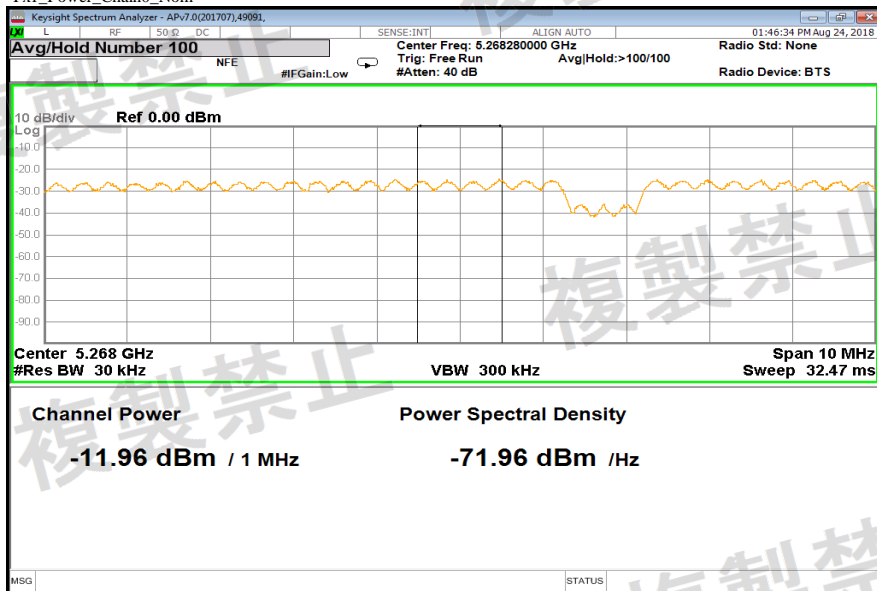
Average of Output Power Result (B)	0.001071	W/MHz	Average of E.I.R.P. Result(B)	0.002343	W/MHz
Declared Output Power	0.001102	W/MHz	E.I.R.P. for Declared Output Power	0.002410	W/MHz
+20	0.001322	W/MHz			
Middle (Declared Output Power -30%)	0.000771	W/MHz			
-80	0.000220	W/MHz			

Sample Calculation :

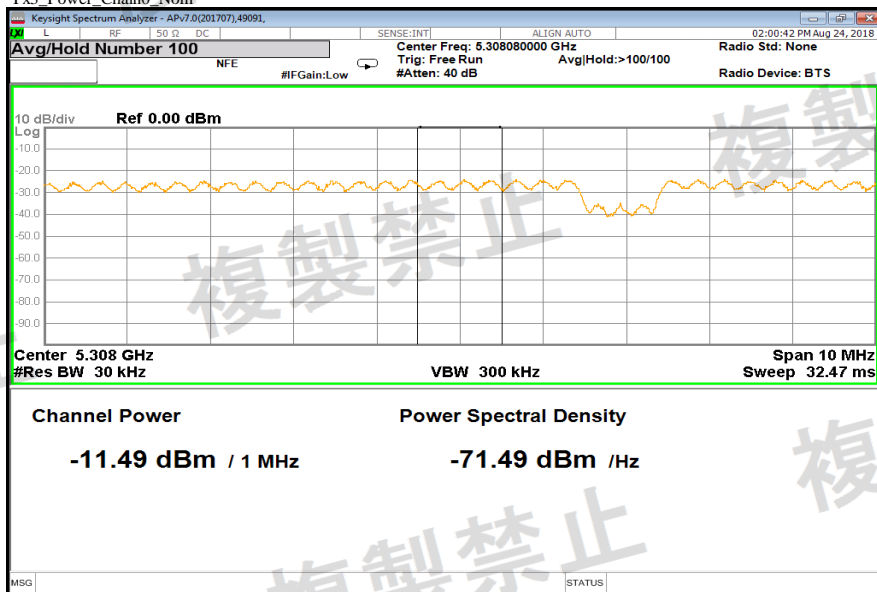
E.I.R.P. for Declared Output Power

= Average of E.I.R.P. Result (B) * (Declared Output Power / Average of Output Power Result (B))

Tx1_Power_Chain0_Nom



Tx3_Power_Chain0_Nom



2.5.Secondary Radiated Emission Strength(Normal Voltage)

Job No. 4788623965.3-11

Remark1

Remark2

[DATA]

Voltage	Freq.	Freq.	S/A Reading	Cable Loss	Atten. Loss	Result	Result	Limit	Remark
[V]	[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[nW]	[nW]	
AC100V	5220	911.9	-82.11	1.50	0.00	-80.61	0.009	4.000	♦10
		3533.0	-62.57	1.50	0.00	-61.07	0.782	20.000	♦11
		5300.0	-65.93	1.50	0.00	-64.43	0.361	20.000	♦11
		14696.0	-77.75	1.50	0.00	-76.25	0.024	20.000	♦11
		19642.0	-76.40	1.50	0.00	-74.90	0.032	20.000	♦11
		25930.0	-74.58	1.50	0.00	-73.08	0.049	20.000	♦11

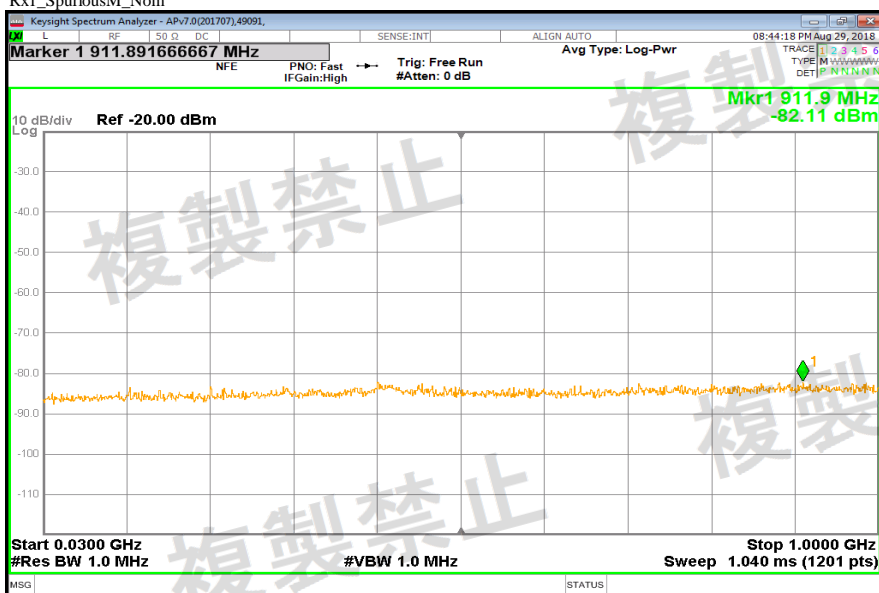
Sample Calculation :

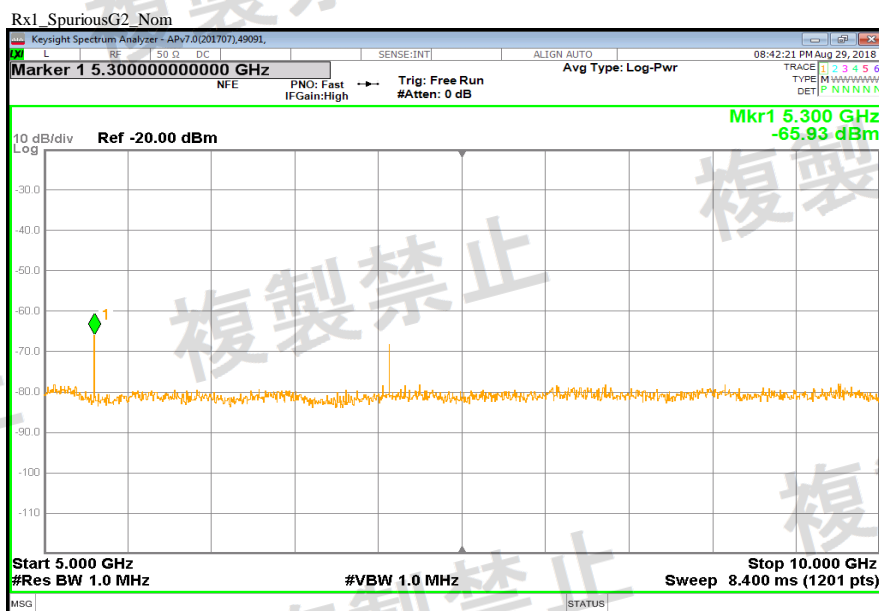
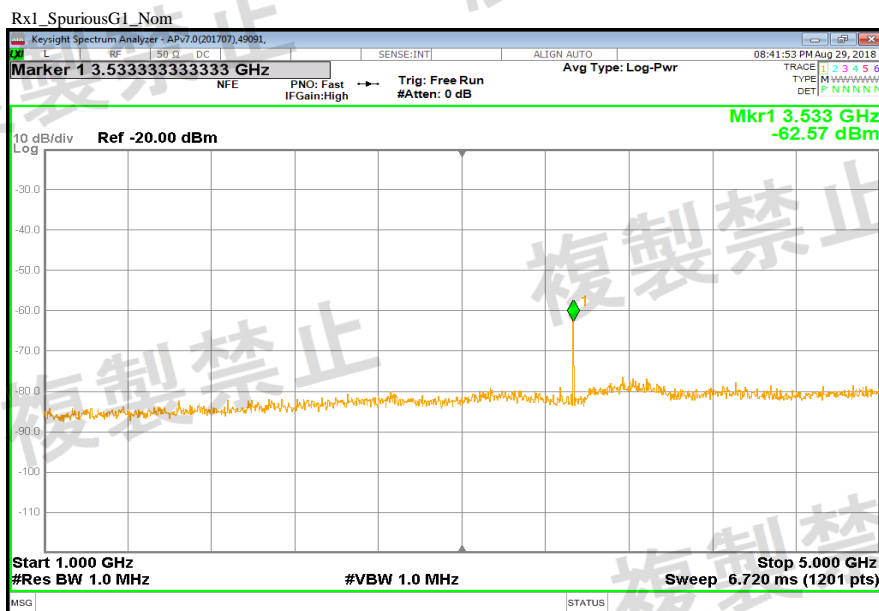
Result = Reading + Cable Loss

♦10:Freq Range10 (< 1GHz)

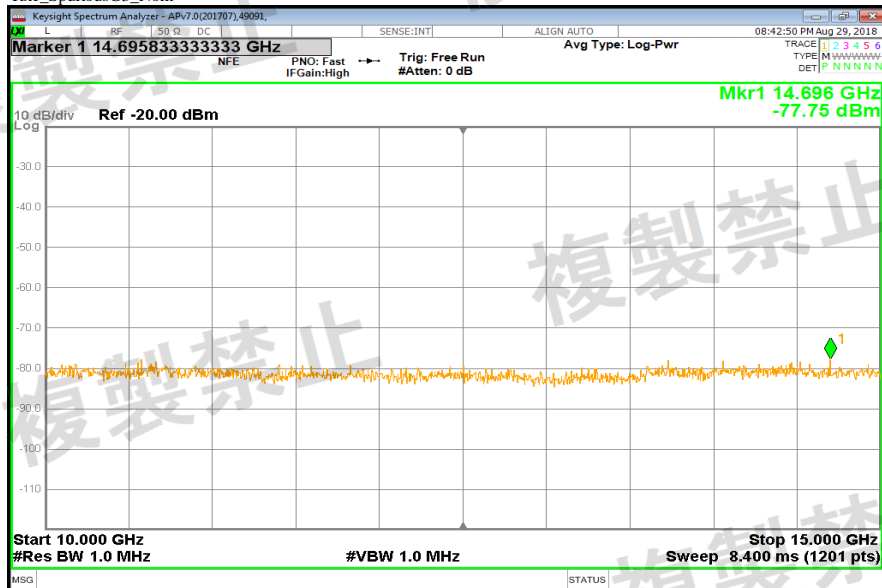
♦11:Freq Range11 (≥ 1GHz)

Rx1_SpuriousM_Nom

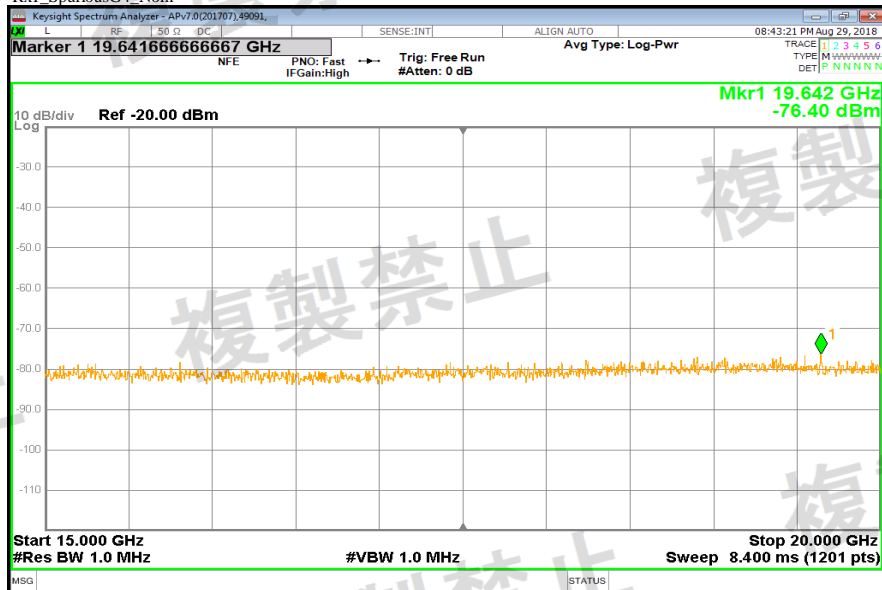


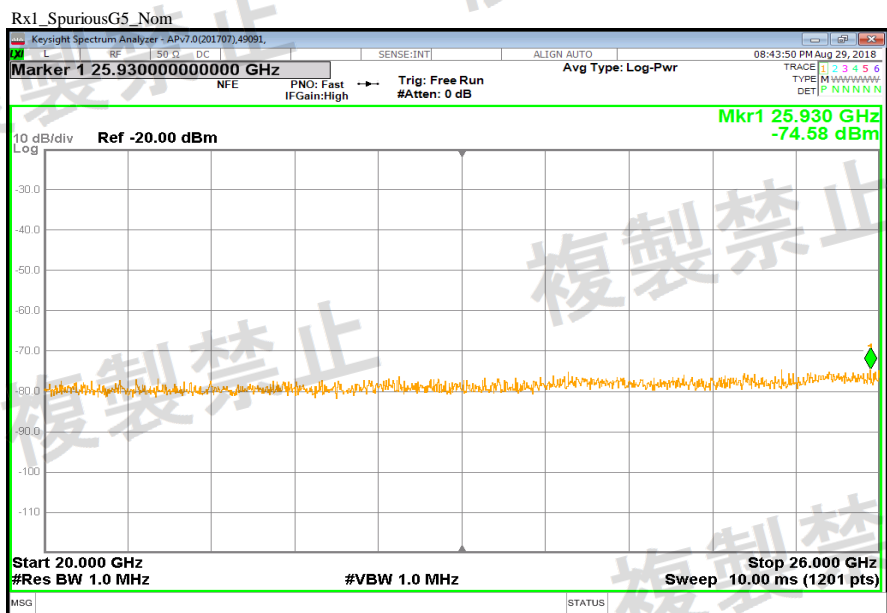


Rx1_SpuriousG3_Nom



Rx1_SpuriousG4_Nom



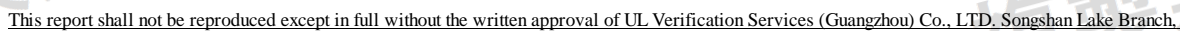


Job No. 4788623965.3-11

Remark 1

Remark2

Voltage	Freq.	On Time	Period	Result (Duty)	Result (Burst Rate)	Limit
[V]	[MHz]	[msec]	[msec]	[%]		[msec]
AC100V	5220	0.941	1.042	90.3	1.107	4

$$\text{Result(Burst Rate)} = \text{Period} / \text{On Time}$$


Tel:+86 769 3381 7100

2.7. Adjacent Channel Power

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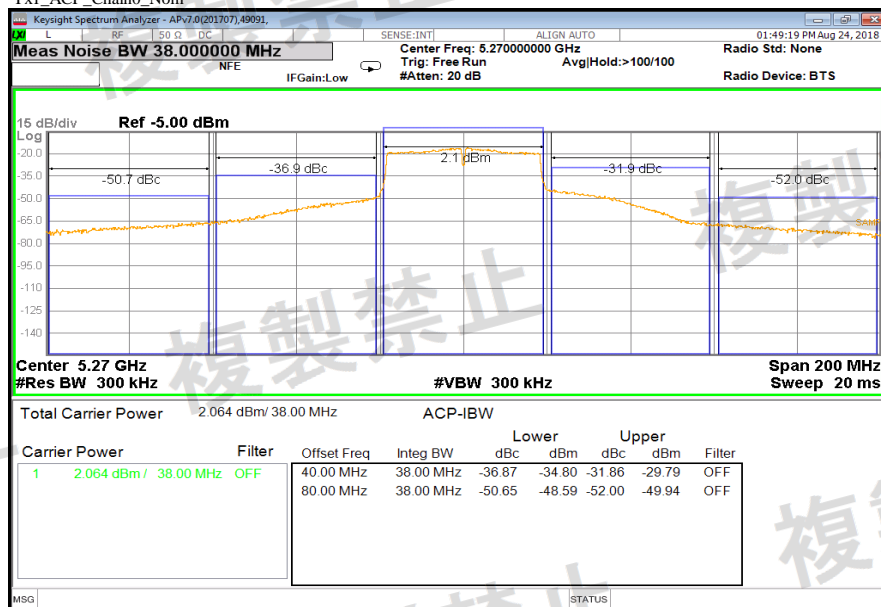
Remark1

Remark2

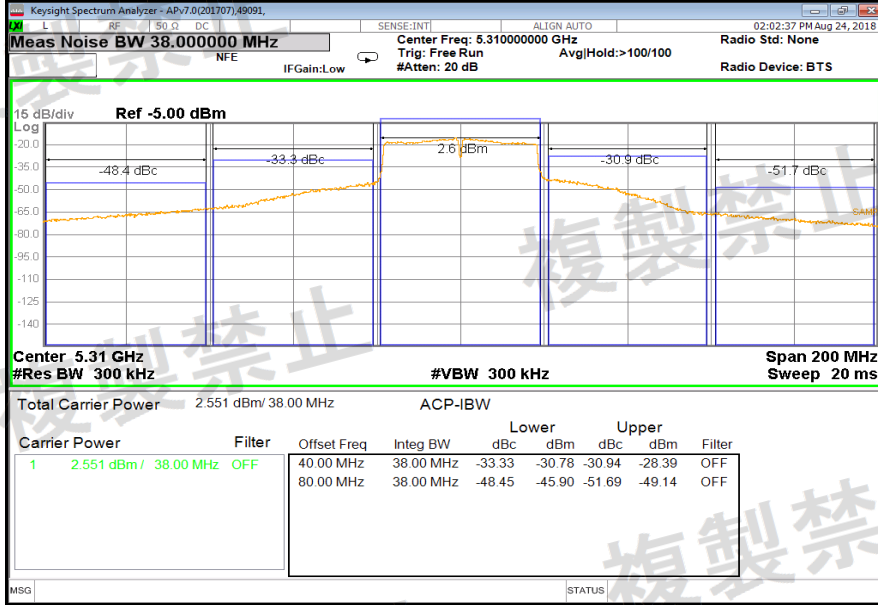
[DATA]

Voltage	Freq.	Separation	Lower Side Result	Upper Side Result	Limit	Remark
[V]	[MHz]	[MHz]	[dBc]	[dBc]	[dBc]	
AC100V	5270	40	-36.87	-31.86	-25.00	
		80	-50.65	-52.00	-40.00	
	5310	40	-33.33	-30.94	-25.00	
		80	-48.45	-51.69	-40.00	

Tx1_ACP_Chain0_Nom



Tx3_ACP_Chain0_Nom



2.8. Outband Leakage Power Strength (Normal Voltage)

Job No. 4788623965.3-11

Remark1

Remark2

[DATA]

Voltage	Freq.	Freq.	S/A Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	Result	Limit	Remark
[V]	[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[uW/MHz]	[uW/MHz]	
AC100V	5270	5207.62	-45.35	1.50	10.00	3.40	-30.45	0.902	2.500	◆3
		5221.60	-57.82	1.50	10.00	3.40	-42.92	0.051	2.500	◆4
		5229.59	-53.28	1.50	10.00	3.40	-38.38	0.145	7.488	◆5
		5247.77	-45.63	1.50	10.00	3.40	-30.73	0.845	44.379	◆6
		5249.98	-22.96	1.50	10.00	3.40	-8.06	156.315	477.496	◆7
		5350.03	-47.81	1.50	10.00	3.40	-32.91	0.512	15.000	◆8
	5310	5359.44	-55.41	1.50	10.00	3.40	-40.51	0.089	2.500	◆9

Sample Calculation :

Result = Reading + Cable Loss + Attenuator+Antenna Gain

◆3:Freq Range3 ($\geq 5,100\text{MHz}$, $\leq 5,210\text{MHz}$)

◆4:Freq Range4 ($> 5,210\text{MHz}$, $\leq 5,221.6\text{MHz}$)

◆5:Freq Range5 ($> 5,221.6\text{MHz}$, $\leq 5,230\text{MHz}$)

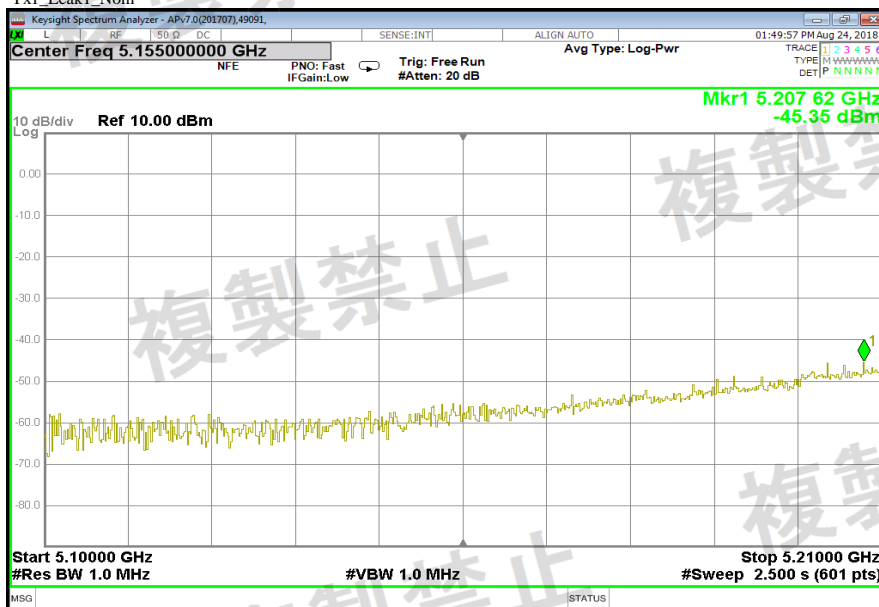
◆6:Freq Range6 ($> 5,230\text{MHz}$, $\leq 5,249\text{MHz}$)

◆7:Freq Range7 ($> 5,249\text{MHz}$, $\leq 5,250\text{MHz}$)

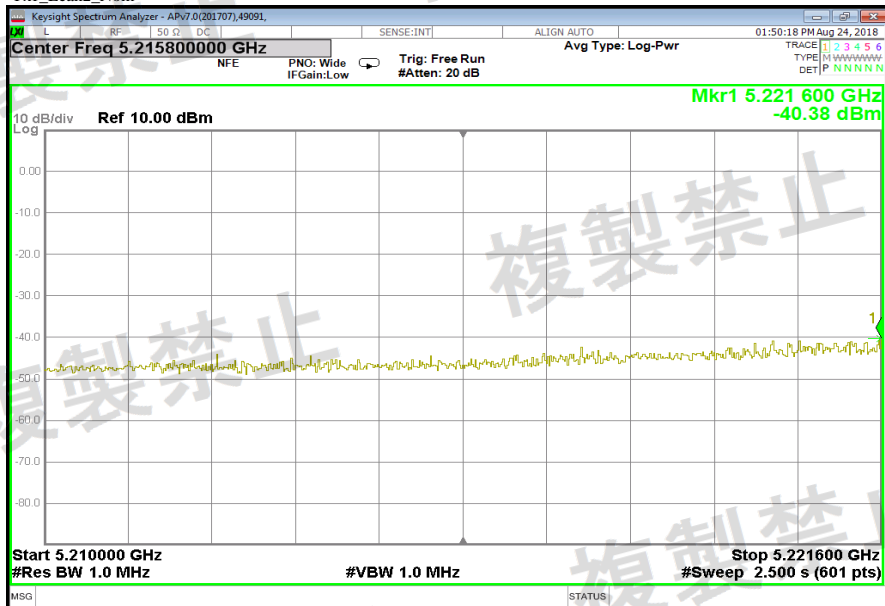
◆8:Freq Range8 ($\geq 5,350\text{MHz}$, $\leq 5,358.4\text{MHz}$)

◆9:Freq Range9 ($\geq 5358.4\text{MHz}$, $\leq 5,400\text{MHz}$)

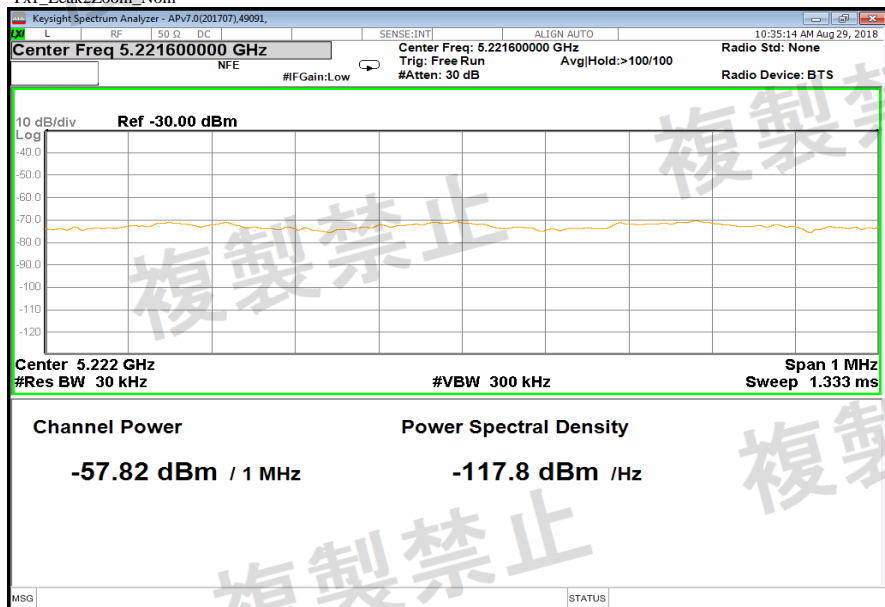
Tx1_Leak1_Nom



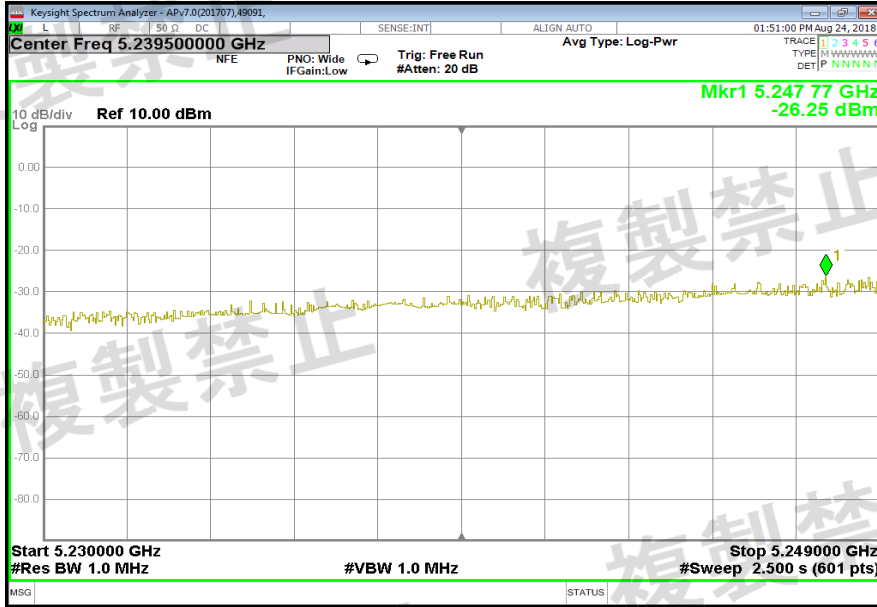
Tx1_Leak2_Nom



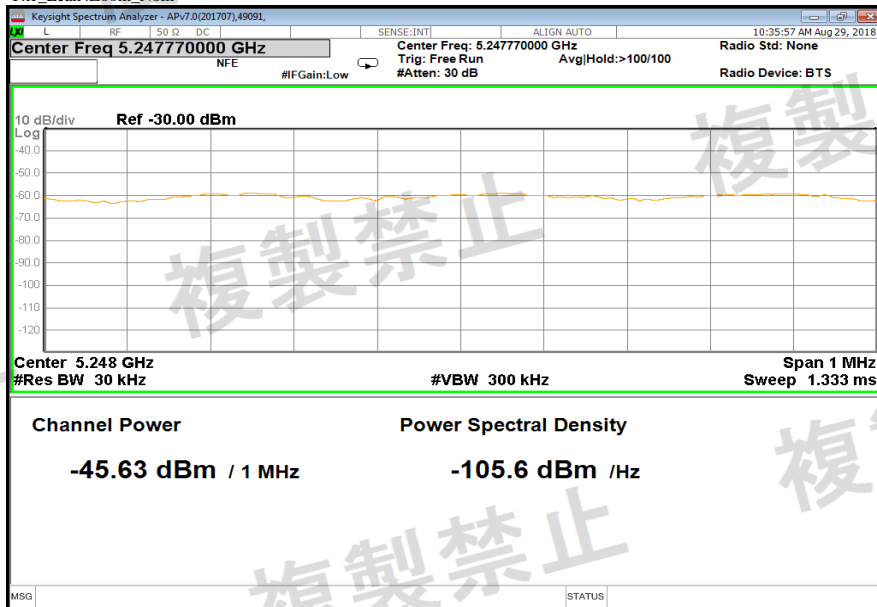
Tx1_Leak2Zoom_Nom



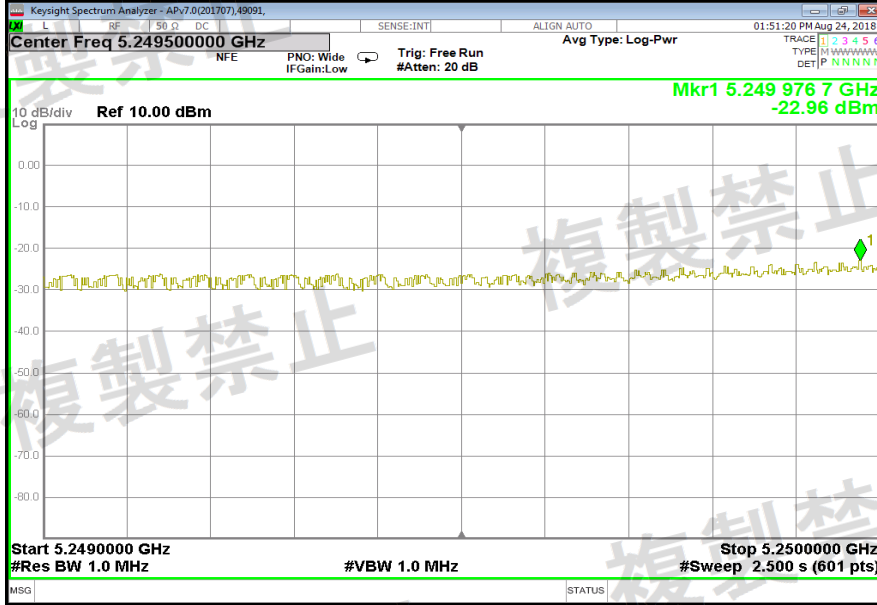
Tx1_Leak4_Nom



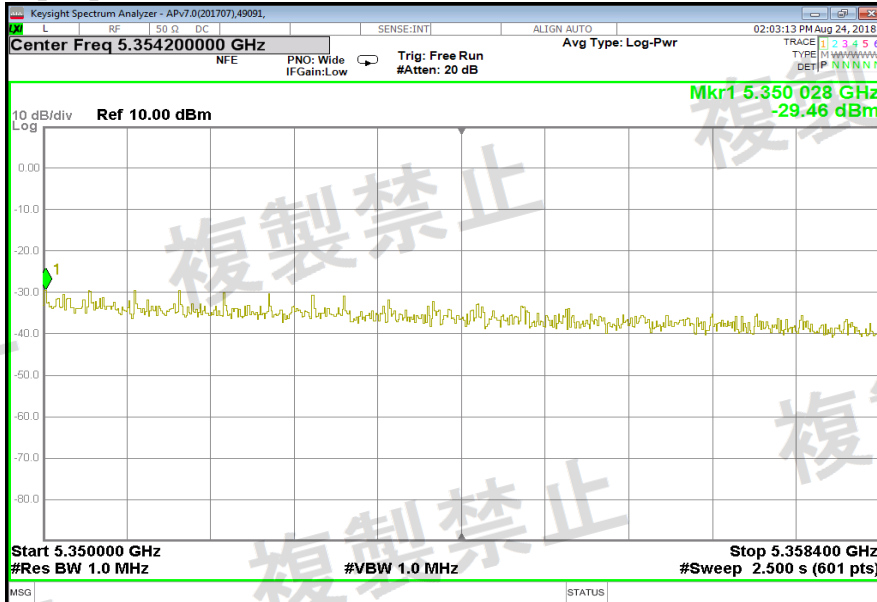
Tx1_Leak4Zoom_Nom



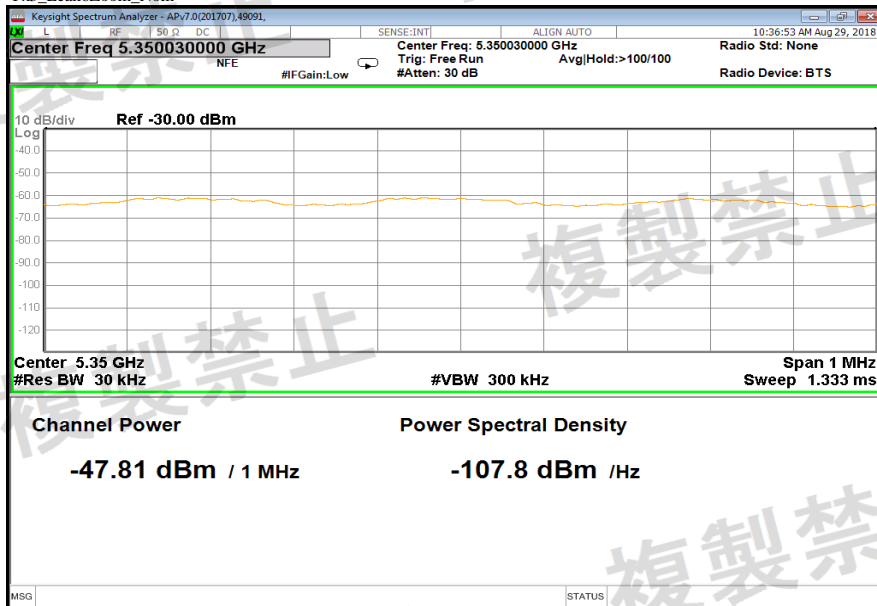
Tx1_Leak5_Nom



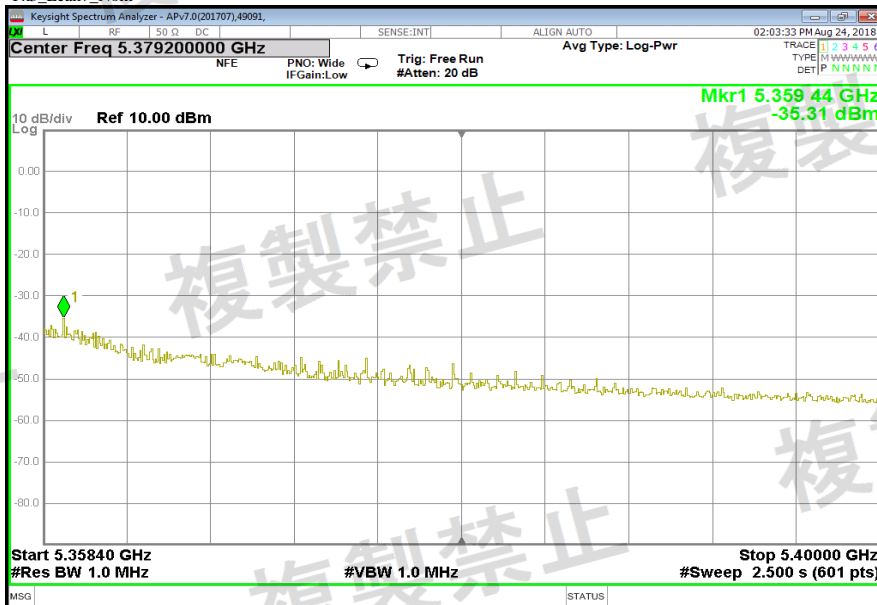
Tx3_Leak6_Nom



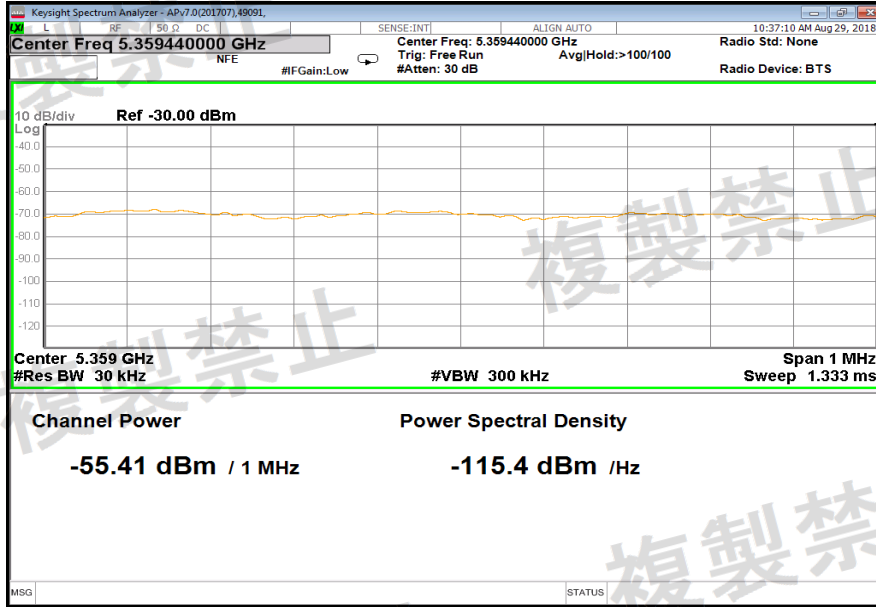
Tx3_Leak6Zoom_Nom



Tx3_Leak7_Nom



Tx3_Leak7Zoom_Nom



3. Measurement Equipment

Use	Int. No.	Kind of Equipment	Model No.	Manufacturer	Serial No.	Calibration Authority	Calibration Date	Remark
X	0	PXA signal analyzer	N9030A	Keysight	MY55410512	CEPREI	12-Dec-17	Note1
	0	Horn Antenna	HRN-0118	TDK	130939	CEPREI	17-Sep-18	Note2
	0	Horn Antenna	HRN-0118	TDK	130940	CEPREI	11-Aug-18	Note2
	0	Signal Generator	SMB100A	R&S	178553	CEPREI	12-Dec-17	Note1

- Note :
1. The calibration of measurement equipment is valid for a one year period.
 2. The calibration of measurement equipment is valid for a three years period.
 3. "X" used equipment.
 4. All equipment is calibrated and traceable to ISO17025

4. Test Condition

Test Item	Date	Temp	Hum	Engineer	Test Room
Frequency Tolerance	20-Aug-2018	23.5°C	54%	Kebo	Shielding Room A
Occupied Bandwidth	20-Aug-2018	23.5°C	54%	Kebo	Shielding Room A
Unwanted Emission Strength	2-Sep-2018	23.3°C	52%	Kebo	Shielding Room A
Output Power/ E.I.R.P	20-Aug-2018	23.5°C	54%	Kebo	Shielding Room A
Secondary Radiated Emission Strength	29-Aug-2018	24.3°C	50%	Kebo	Shielding Room A
Burst Length / Duty	20-Aug-2018	23.5°C	54%	Kebo	Shielding Room A
Adjacent Channel Power	20-Aug-2018	23.5°C	54%	Kebo	Shielding Room A
Outband Leakage Power Strength	20-Aug-2018	23.5°C	54%	Kebo	Shielding Room A

5. TEST CONFIGURATION

PHOTO

