

## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $55 + 10 \log_{10}(P)$  dB. The limit of emission is equal to -25 dBm.

### 4.7.2 Test Procedure

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
- d. E.R.P power can be calculated from E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15 dBi.

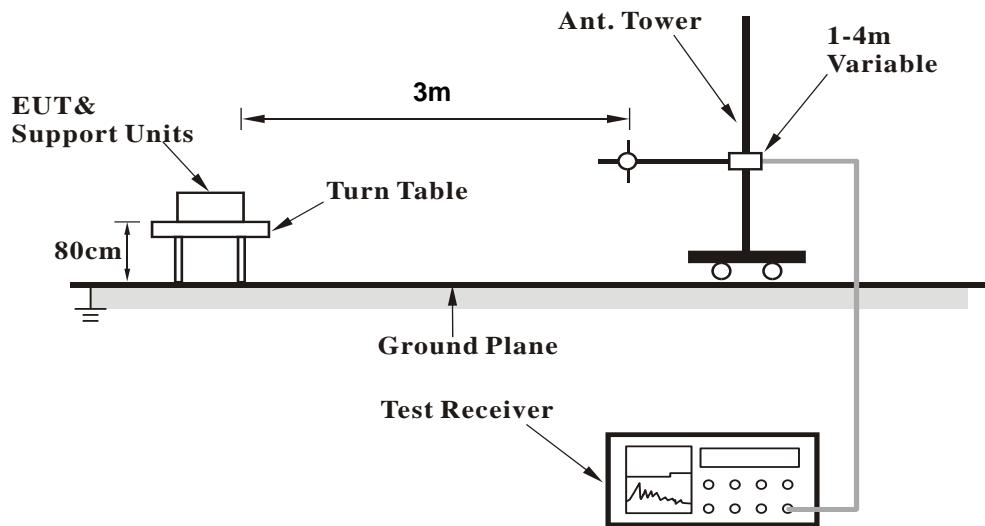
**NOTE:** The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

### 4.7.3 Deviation from Test Standard

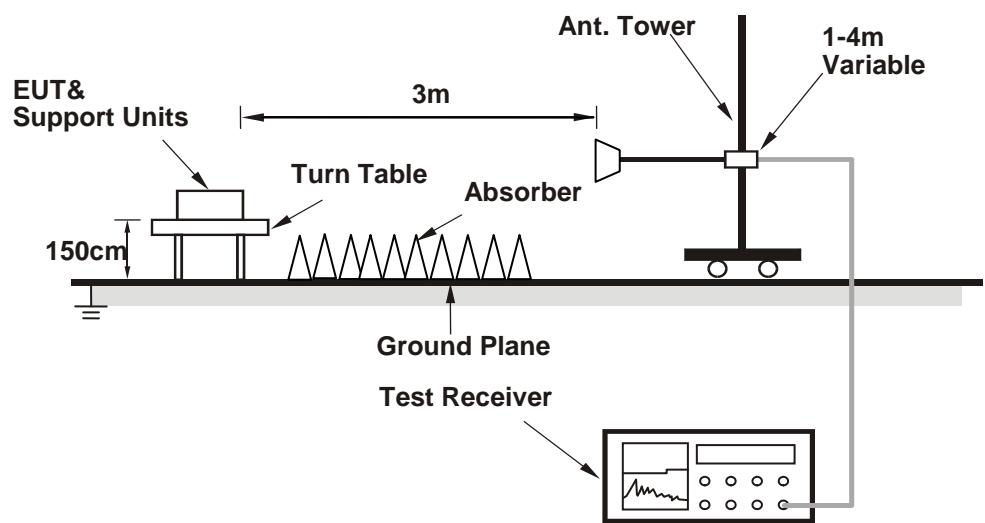
No deviation.

#### 4.7.4 Test Setup

##### <Radiated Emission below or equal 1 GHz>



##### <Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.7.5 Test Results

##### LTE Band 7

Channel Bandwidth: 20 MHz / QPSK

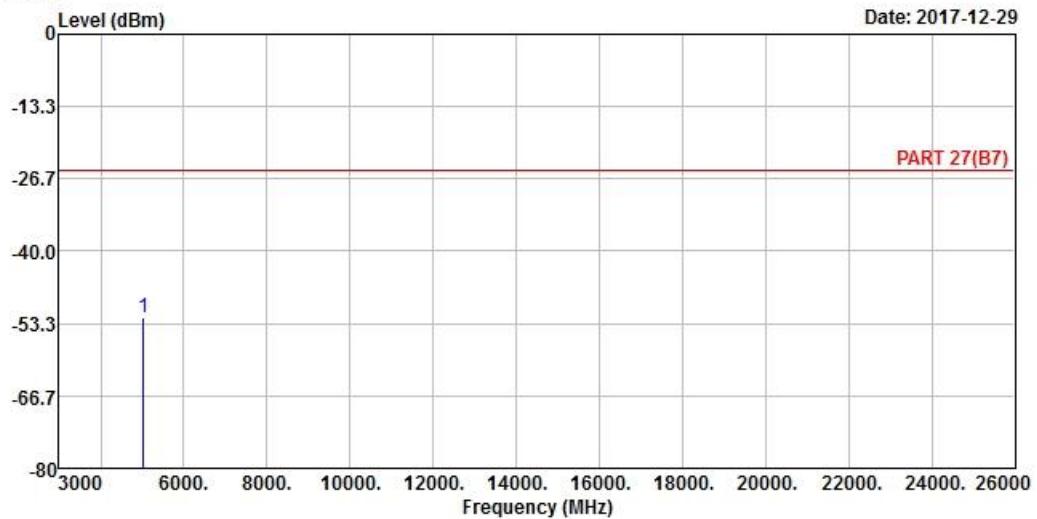
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B7) HORIZONTAL

Remak : LTE Band 7 QPSK\_20M Link\_L-CH

Tested by: Jisyong Wang

Freq	Read Level	Limit Level	Over Line	Limit Factor	Remark
MHz	dBm	dBm	dBm	dB	dB

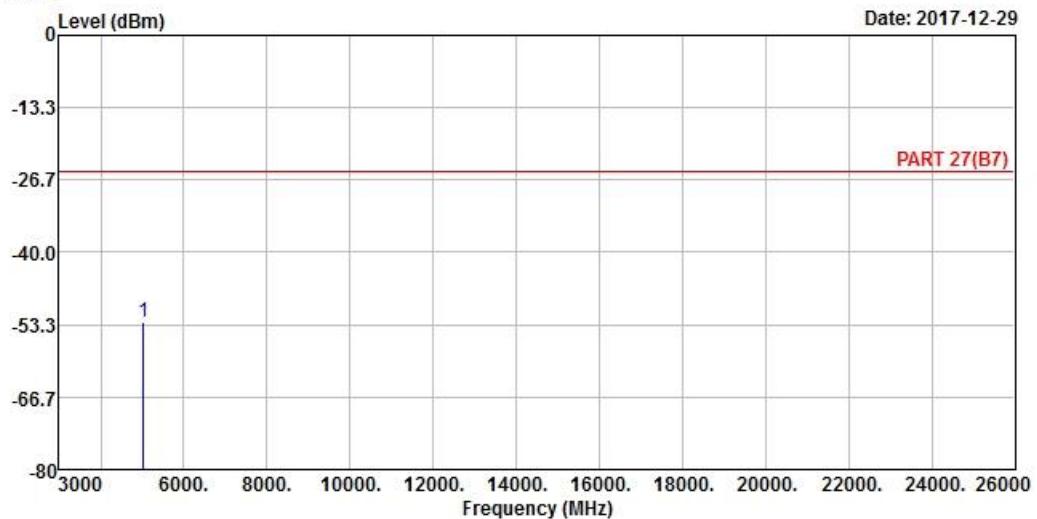
1 pp 5020.00 -52.34 -49.11 -25.00 -27.34 -3.23 Peak



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A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B7) VERTICAL

Remak : LTE Band 7 QPSK\_20M Link\_L-CH

Tested by: Jisyong Wang

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	
1 pp	5020.00	-52.97	-49.74	-25.00	-27.97	-3.23 Peak

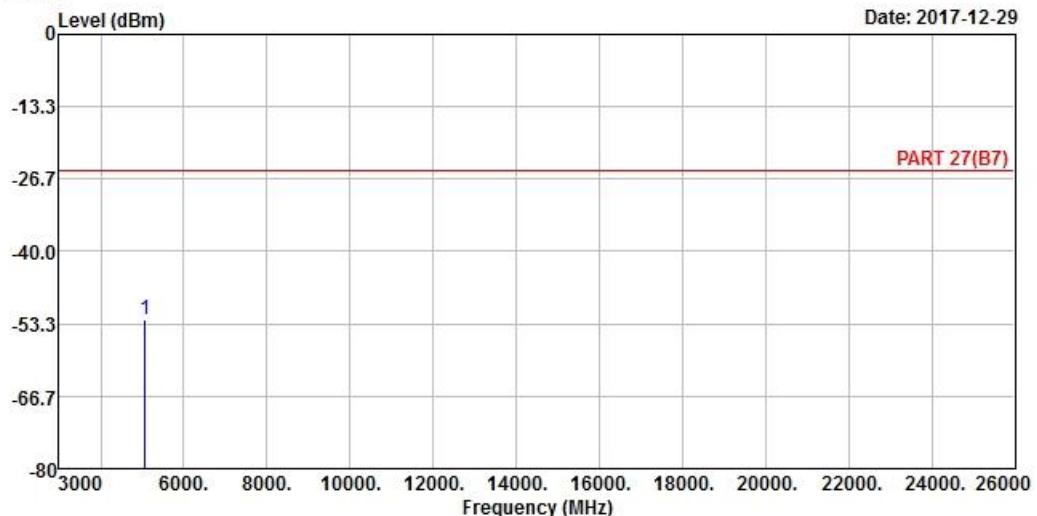
## Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B7) HORIZONTAL

Remak : LTE Band 7 QPSK\_20M Link\_M-CH

Tested by: Jisyong Wang

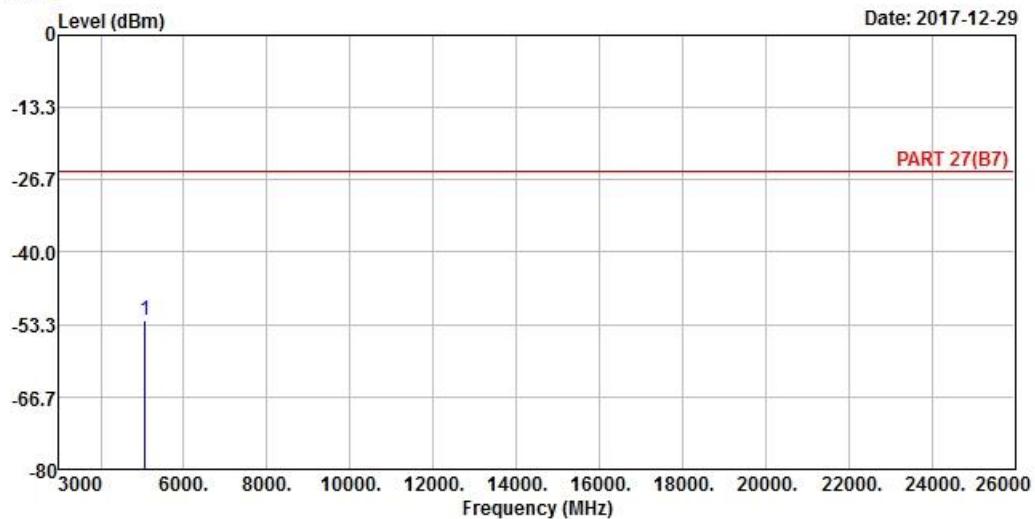
	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp	5070.00	-52.41	-49.29	-25.00	-27.41	-3.12 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B7) VERTICAL

Remak : LTE Band 7 QPSK\_20M Link\_M-CH

Tested by: Jisyong Wang

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp	5070.00	-52.45	-49.33	-25.00	-27.45	-3.12 Peak

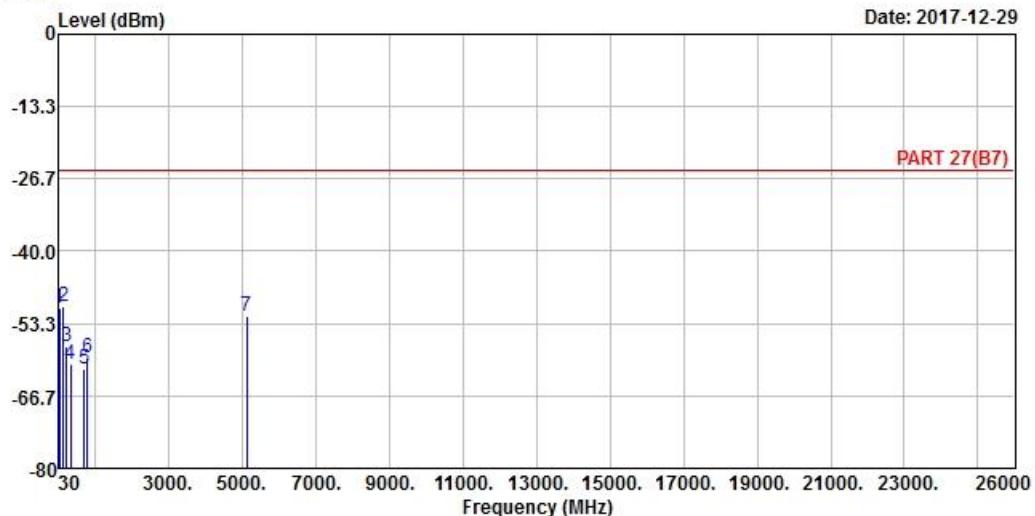
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7



Site : 966 Chamber 5

Condition: PART 27(B7) HORIZONTAL

Remak : LTE Band 7 QPSK\_20M Link\_H-CH

Tested by: Jisyong Wang

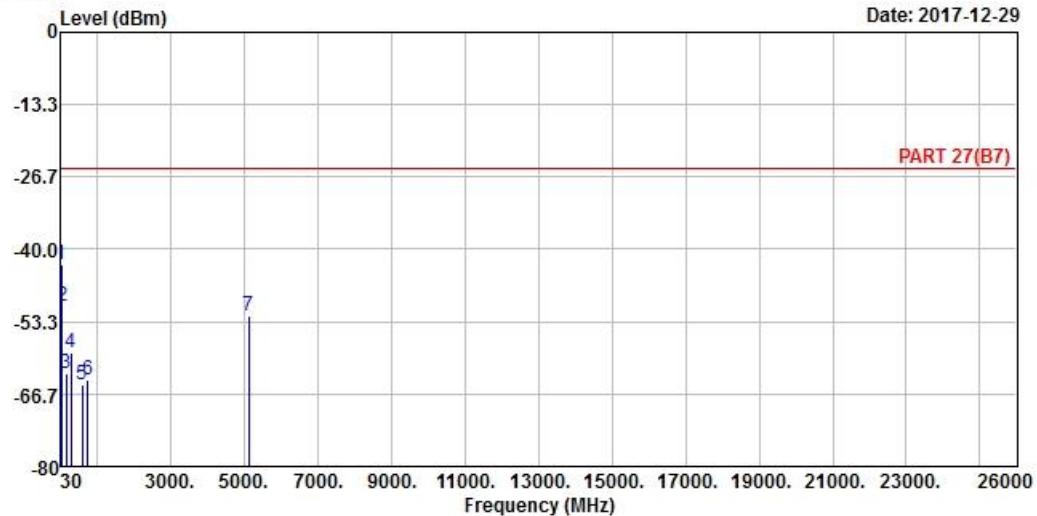
	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1	42.69	-50.49	-49.55	-25.00	-25.49	-0.94 Peak
2 pp	138.81	-50.18	-41.52	-25.00	-25.18	-8.66 Peak
3	224.40	-57.55	-50.50	-25.00	-32.55	-7.05 Peak
4	350.40	-60.78	-54.54	-25.00	-35.78	-6.24 Peak
5	716.50	-61.70	-61.93	-25.00	-36.70	0.23 Peak
6	800.50	-59.56	-60.30	-25.00	-34.56	0.74 Peak
7	5120.00	-51.96	-48.95	-25.00	-26.96	-3.01 Peak



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A D T

Data: 8



Site : 966 Chamber 5

Condition: PART 27(B7) VERTICAL

Remak : LTE Band 7 QPSK\_20M Link\_H-CH

Tested by: Jisyong Wang

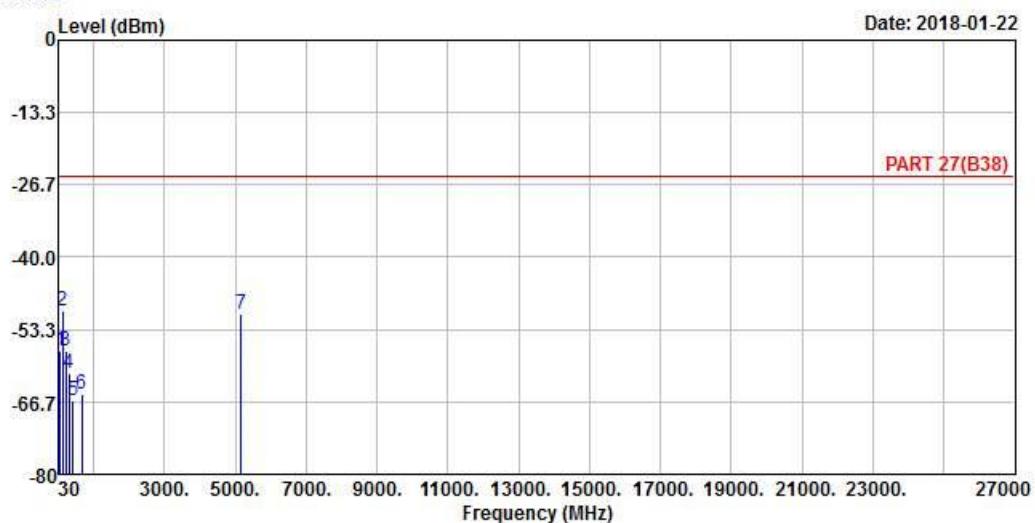
Freq	Read		Limit	Over	Factor	Remark
	Level	Level	Line	Line		
	MHz	dBm	dBm	dBm	dB	dB
1 pp	42.96	-42.88	-41.94	-25.00	-17.88	-0.94 Peak
2	60.51	-50.60	-42.94	-25.00	-25.60	-7.66 Peak
3	169.59	-62.91	-57.38	-25.00	-37.91	-5.53 Peak
4	300.00	-59.02	-52.01	-25.00	-34.02	-7.01 Peak
5	610.10	-64.86	-64.08	-25.00	-39.86	-0.78 Peak
6	750.10	-64.20	-65.08	-25.00	-39.20	0.88 Peak
7	5120.00	-52.14	-49.13	-25.00	-27.14	-3.01 Peak

**LTE Band 38**
**Channel Bandwidth: 20 MHz / QPSK**
**Low Channel**


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 Chamber 5

Condition: PART 27(B38) HORIZONTAL

Remak : LTE Band 38 QPSK\_20M \_L-CH

Tested by: Getaz Yang

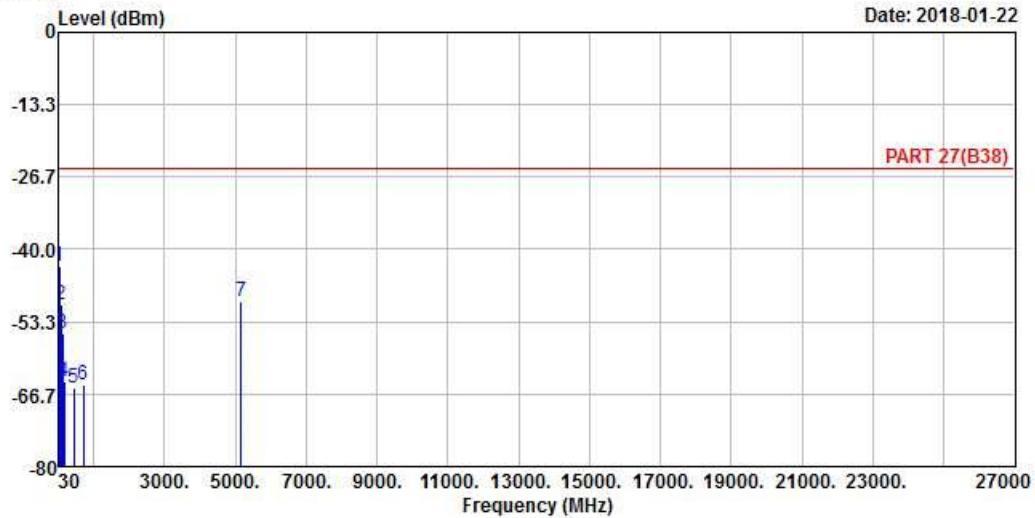
Freq	Level	Read	Limit	Over	Remark
		Level	Line	Limit Factor	
MHz	dBm	dBm	dBm	dB	dB
1	52.31	-57.18	442.82	-25.00	-32.18-500.00 Peak
2 pp	137.67	-49.81	450.19	-25.00	-24.81-500.00 Peak
3	224.97	-57.29	442.71	-25.00	-32.29-500.00 Peak
4	302.57	-61.49	438.51	-25.00	-36.49-500.00 Peak
5	421.88	-66.39	433.61	-25.00	-41.39-500.00 Peak
6	680.87	-65.10	434.90	-25.00	-40.10-500.00 Peak
7	5160.00	-50.60	-47.67	-25.00	-25.60 -2.93 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 Chamber 5

Condition: PART 27(B38) VERTICAL

Remak : LTE Band 38 QPSK\_20M \_L-CH

Tested by: Getaz Yang

Freq	Read		Limit	Over	Factor	Remark
	MHz	dBm	dBm	dBm		
1 pp	34.85	-42.96	457.04	-25.00	-17.96-500.00	Peak
2	79.47	-50.31	449.69	-25.00	-25.31-500.00	Peak
3	137.67	-55.56	444.44	-25.00	-30.56-500.00	Peak
4	170.65	-64.37	435.63	-25.00	-39.37-500.00	Peak
5	440.31	-65.50	434.50	-25.00	-40.50-500.00	Peak
6	710.94	-64.93	435.07	-25.00	-39.93-500.00	Peak
7	5160.00	-49.65	-46.72	-25.00	-24.65	-2.93 Peak

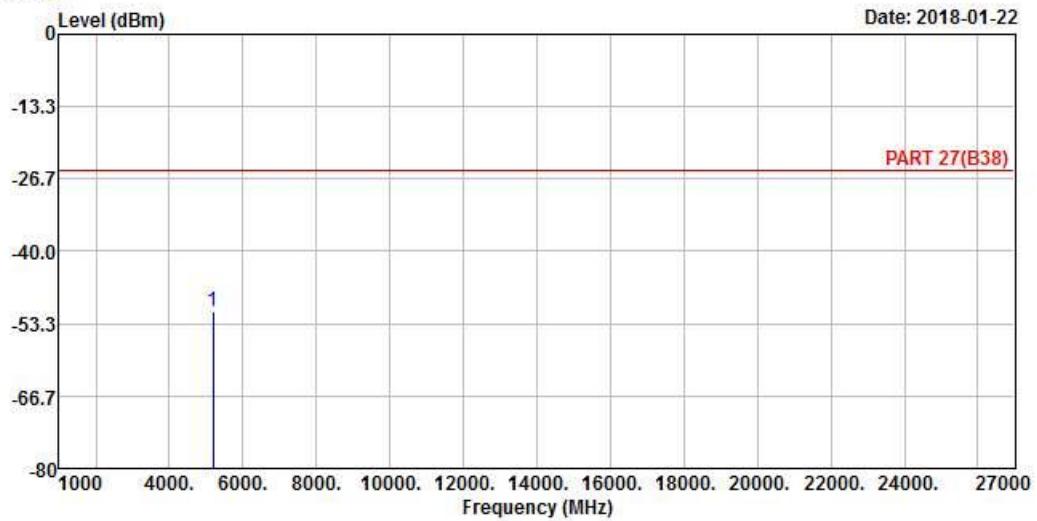
## Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B38) HORIZONTAL

Remak : LTE Band 38 QPSK\_20M\_M-CH

Tested by: Getaz Yang

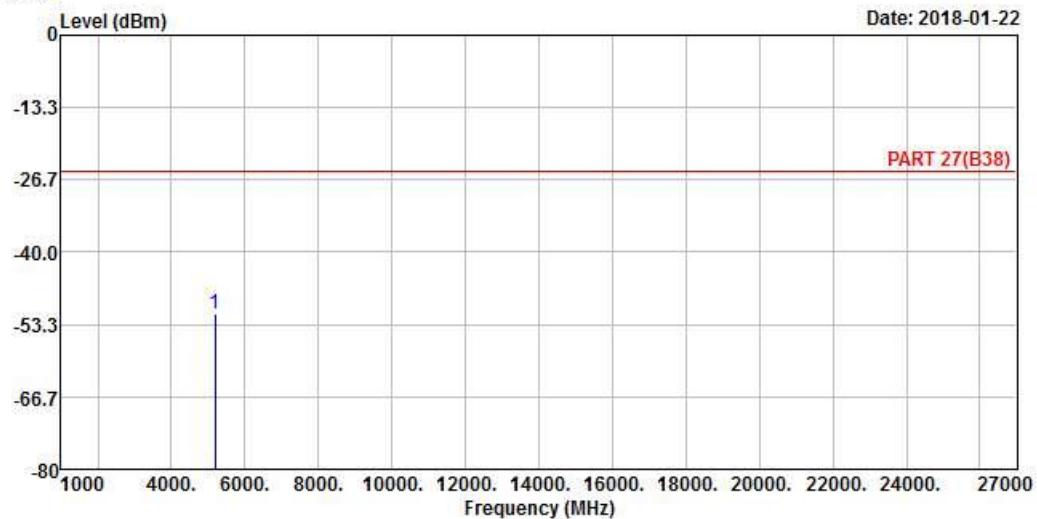
Freq	Level	Read	Limit	Over	Factor	Remark
		MHz	dBm	dBm		
1 pp	5190.00	-51.18	-48.32	-25.00	-26.18	-2.86 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B38) VERTICAL

Remak : LTE Band 38 QPSK\_20M\_M-CH

Tested by: Getaz Yang

Freq	Read	Limit	Over	Factor	Remark
	Level	Level	Line		
MHz	dBm	dBm	dBm	dB	dB
1 pp	5190.00	-51.32	-48.46	-25.00	-26.32 -2.86 Peak

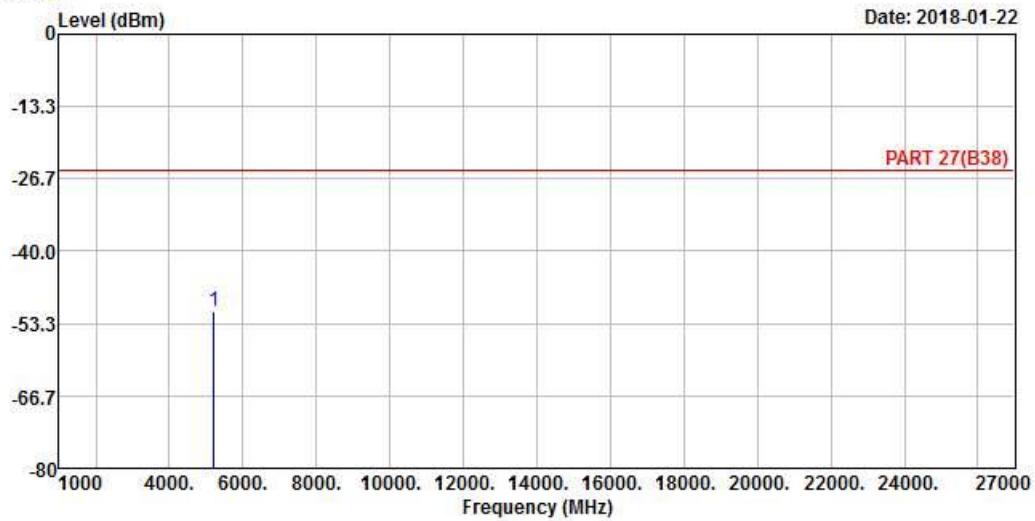
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B38) HORIZONTAL

Remak : LTE Band 38 QPSK\_20M\_H-CH

Tested by: Getaz Yang

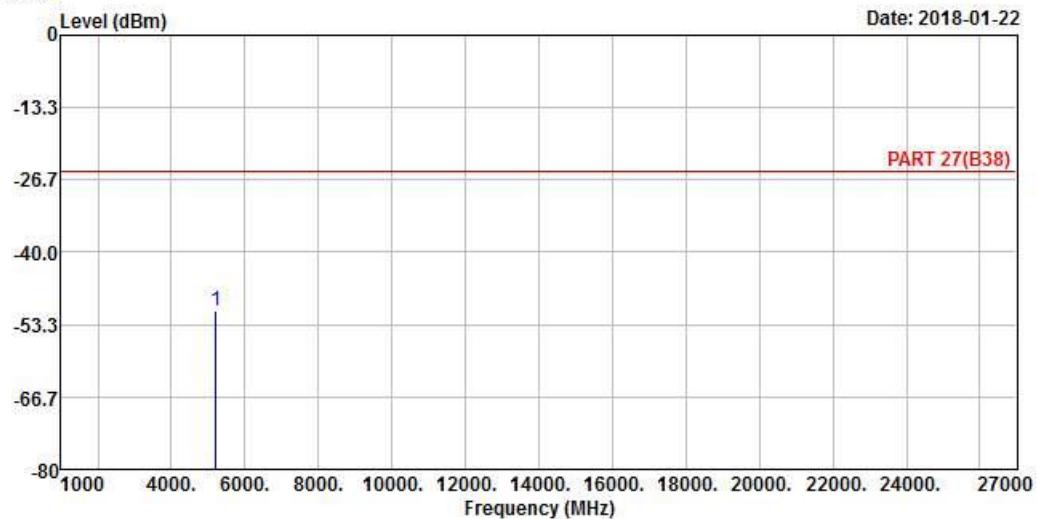
	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp	5220.00	-51.16	-48.40	-25.00	-26.16	-2.76 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B38) VERTICAL

Remak : LTE Band 38 QPSK\_20M\_H-CH

Tested by: Getaz Yang

Freq	Read Level	Limit Level	Over Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB		

1 pp 5220.00 -50.85 -48.09 -25.00 -25.85 -2.76 Peak

LTE Band 41

Channel Bandwidth: 20 MHz / QPSK

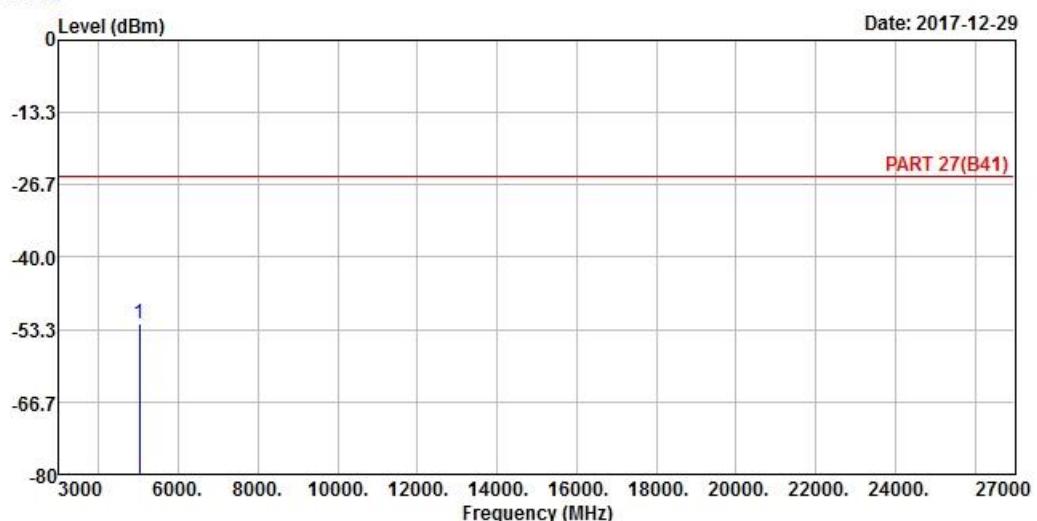
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B41) HORIZONTAL

Remak : LTE Band 41 QPSK\_20M \_L-CH

Tested by: Jisyong Wang

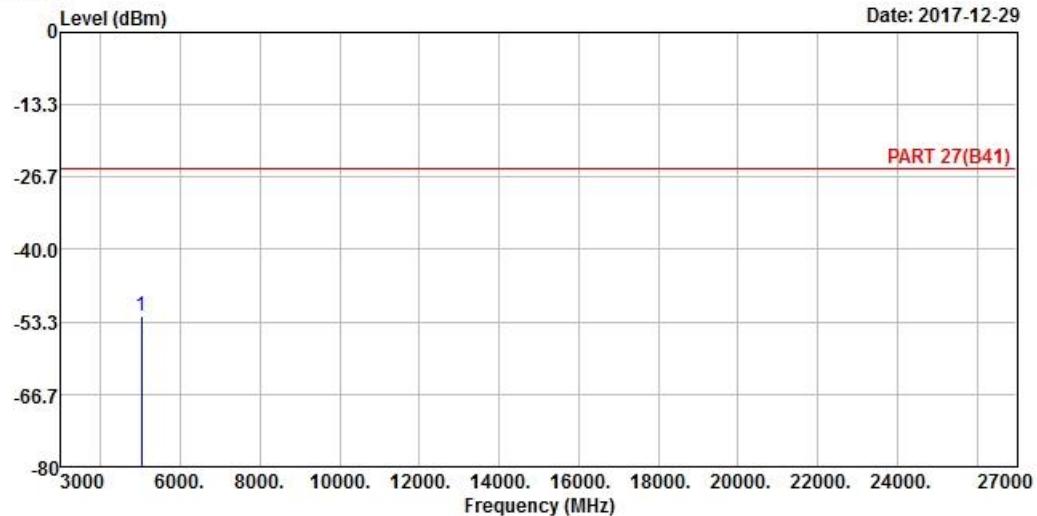
Freq	Level	Read	Limit	Over	Remark
		Line	Limit	Factor	
MHz	dBm	dBm	dBm	dB	
1 pp	5012.00	-52.35	-49.12	-25.00	-27.35 -3.23 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B41) VERTICAL

Remak : LTE Band 41 QPSK\_20M \_L-CH

Tested by: Jisyong Wang

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB		

1 pp 5012.00 -52.15 -48.92 -25.00 -27.15 -3.23 Peak

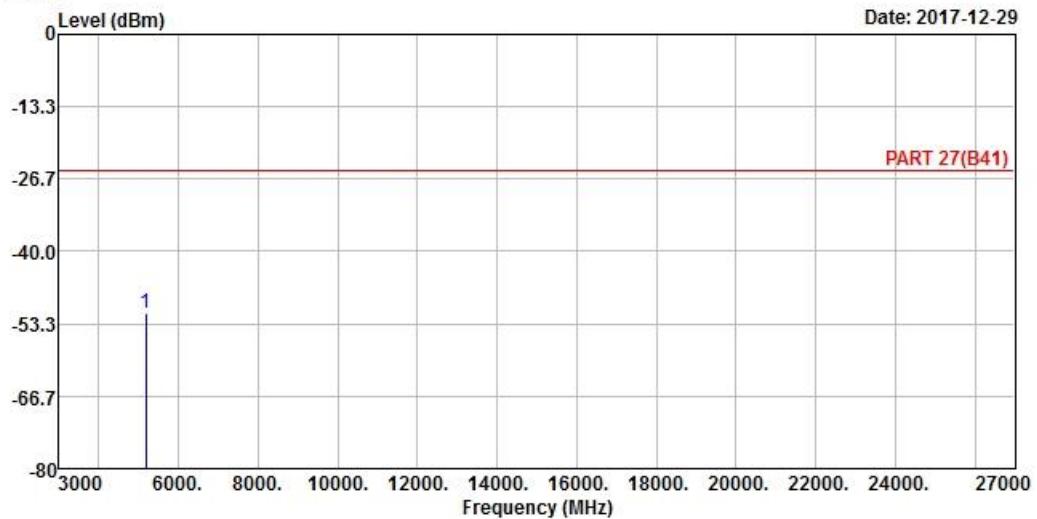
## Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B41) HORIZONTAL

Remak : LTE Band 41 QPSK\_20M \_M-CH

Tested by: Jisyong Wang

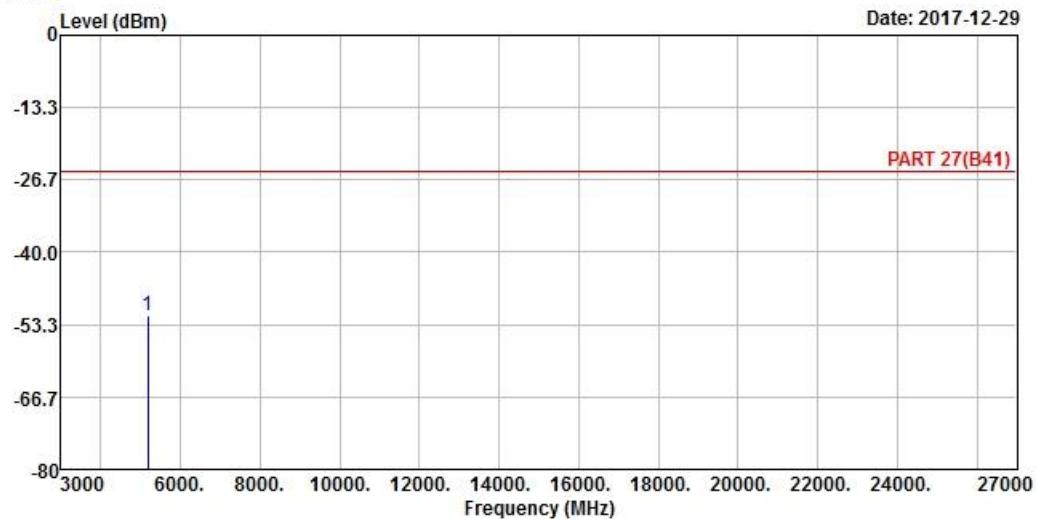
Freq	Read	Limit	Over			
	Level	Level	Line	Limit	Factor	
MHz	dBm	dBm	dBm	dB	dB	
1 pp	5186.00	-51.30	-48.44	-25.00	-26.30	-2.86 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B41) VERTICAL

Remak : LTE Band 41 QPSK\_20M \_M-CH

Tested by: Jisyong Wang

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	
1 pp	5186.00	-51.57	-48.71	-25.00	-26.57	-2.86 Peak

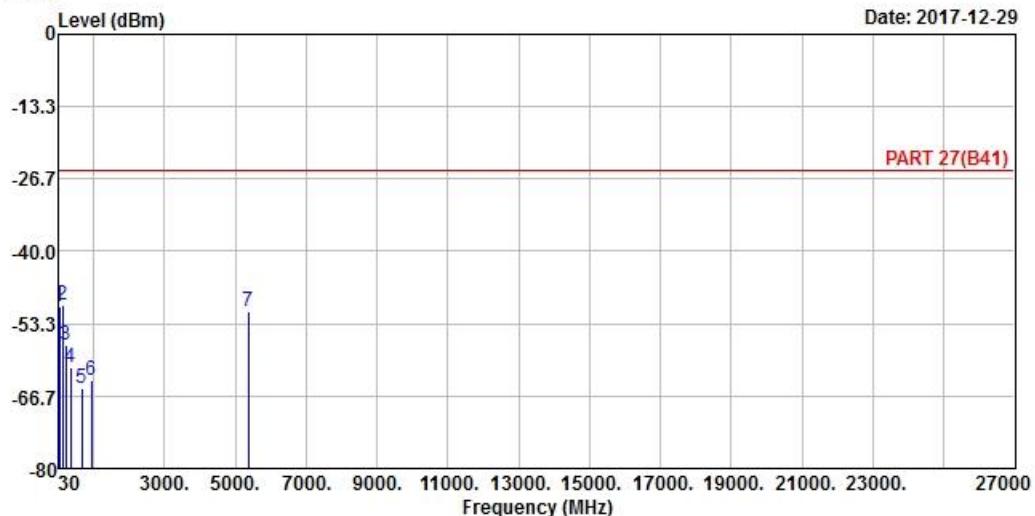
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 Chamber 5

Condition: PART 27(B41) HORIZONTAL

Remak : LTE Band 41 QPSK\_20M \_H-CH

Tested by: Jisyong Wang

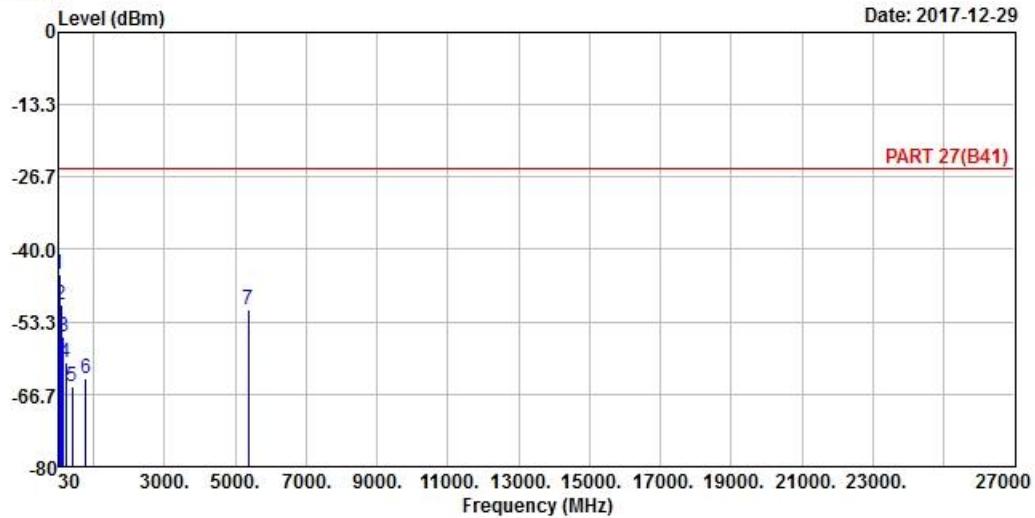
	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1	42.61	-50.18	-49.24	-13.00	-37.18	-0.94 Peak
2	137.67	-49.81	-41.15	-13.00	-36.81	-8.66 Peak
3	224.97	-57.29	-50.28	-13.00	-44.29	-7.01 Peak
4	350.10	-61.54	-55.30	-13.00	-48.54	-6.24 Peak
5	680.87	-65.10	-64.70	-13.00	-52.10	-0.40 Peak
6	936.95	-63.78	-65.27	-13.00	-50.78	1.49 Peak
7 pp	5360.00	-50.95	-48.95	-25.00	-25.95	-2.00 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 Chamber 5

Condition: PART 27(B41) VERTICAL

Remak : LTE Band 41 QPSK\_20M \_H-CH

Tested by: Jisyong Wang

Freq	Read		Limit	Over	Factor	Remark
	MHz	dBm	Level	Line		
1	42.61	-44.47	-43.53	-13.00	-31.47	-0.94 Peak
2	79.47	-50.31	-39.65	-13.00	-37.31	-10.66 Peak
3	139.61	-55.94	-47.29	-13.00	-42.94	-8.65 Peak
4	226.91	-60.77	-53.84	-13.00	-47.77	-6.93 Peak
5	400.54	-65.38	-59.44	-13.00	-52.38	-5.94 Peak
6	787.57	-63.74	-64.51	-13.00	-50.74	0.77 Peak
7 pp	5360.00	-51.13	-49.13	-25.00	-26.13	-2.00 Peak

## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

## Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab**

Tel: 886-2-26052180  
Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**

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**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

The address and road map of all our labs can be found in our web site also.

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