

TEST REPORT

Product : WIFI+BT Module
Trade mark : GSD
Model/Type reference : WCT5JM2611
Serial Number : N/A
Report Number : EED32N80695207
Date of Issue : Oct . 12, 2021
Product Class : Item 19-3 of Article 2 Paragraph 1
Test result : PASS

Prepared for:

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Date:

Oct . 12, 2021

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2 Version

Version No.	Date	Description
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4 General Information

4.1 Client Information

Applicant:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of Applicant:	No.2, Jin-da Road, Huinan High-tech Industrial Park, Hui-ao Avenue, Huizhou City, Guangdong, China
Manufacturer:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of Manufacturer:	No.2, Jin-da Road, Huinan High-tech Industrial Park, Hui-ao Avenue, Huizhou City, Guangdong, China
Factory:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of Factory:	No.2, Jin-da Road, Huinan High-tech Industrial Park, Hui-ao Avenue, Huizhou City, Guangdong, China

4.2 General Description of EUT

Product Name:	WIFI+BT Module
Model No.(EUT):	WCT5JM2611
Trade mark:	GSD
EUT Supports Radios application:	2400MHz to 2483.5MHz, 5.150-5.250GHz, 5.250-5.350GHz, 5.470-5.730GHz
Operating Frequency:	2400MHz to 2483.5MHz, 5.150-5.250GHz, 5.250-5.350GHz, 5.470-5.730GHz
Type of Modulation:	IEEE for 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE for 802.11g :OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)
Transmit Data Rate:	IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11b: 1, 2, 5.5, 11M bps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54M bps IEEE 802.11n HT20: up to 288.9Mbps, HT40: up to 600 Mbps IEEE 802.11ac VHT20: up to 346.7 Mbps, VHT40: up to 800 Mbps, VHT80: up to 1733.3 Mbps
Antenna Type:	Integral Antenna
Antenna gain (WCT5J-40):	Ant 1: 3.86dBi; Ant 2: 3.86dBi;
Antenna gain (WCT5H-40):	Ant 1: 3.83dBi; Ant 2: 3.83dBi;
Power Supply:	DC 5V
Sample Received Date:	Aug. 06, 2021
Sample tested Date:	Aug. 06, 2021 to Oct . 12, 2021
Remark:	Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

4.3 EUT test environment range

Temperature:	25°C
Humidity:	56% RH
Atmospheric Pressure:	1010mbar

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Associated equipment name		Manufacture	model	S/N serial number	Supplied by	Certification
A	Netbook	Lenovo	E49	--	Lenovo	MIC
	Router	NEC	AtermWF 1200HP	--	NEC	MIC

4.5 Test Location

The frequency of W56 tests were performed at:

Centre Testing International Group Co., Ltd.

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

The frequency of W53 tests were performed by subcontracted lab:

MRT Technology (Suzhou) Co., Ltd

D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China.

Telephone: +86-512-66308358 Web: www.mrt-cert.com

5 Equipment List

CTI

Equipment	Manufacturer	Model	Serial No.	Cal. Date	Due date	Calibration body	Classification
Spectrum Analyzer	R&S	FSV40	101200	09-02-2020 08-26-2021	09-01-2021 08-25-2022	LISAI	(c)
Spectrum Analyzer	Keysight	N9010A	MY54510339	12-28-2020	12-27-2021	CTIMT	(c)
Temperature/ Humidity Indicator	biaozhi	GM1360	EJ1611459	02-21-2021	02-20-2022	CTIMT	(c)
Signal Generator	Keysight	E8257D	MY53401106	12-28-2020	12-27-2021	CTIMT	(c)
Signal Generator	Keysight	N5182B	MY53051549	12-28-2020	12-27-2021	CTIMT	(c)
Digital multimeter	FLUKE	111	90240138	05-13-2020 05-10-2021	05-12-2021 05-09-2022	CTIMT	(c)
DC Power	Keysight	E3642A	MY54426035	12-28-2020	12-27-2021	CTIMT	(c)

Remark:

- Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
- Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).
- Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
- Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c).

From JRL Article 24-2, paragraph 4, Item 2

6 Transmitter Requirements

6.1 EUT channels and frequencies list

802.11a 20MHz 802.11n 20MHz 802.11ac 20MHz		802.11n 40MHz 802.11ac 40MHz		802.11ac 80MHz	
W52		W52		W52	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230	N/A	N/A
44	5220	N/A	N/A	N/A	N/A
48	5240	N/A	N/A	N/A	N/A
802.11a 20MHz 802.11n 20MHz 802.11ac 20MHz		802.11n 40MHz 802.11ac 40MHz		802.11ac 80MHz	
W53		W53		W53	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270	58	5290
56	5280	62	5310	N/A	N/A
60	5300	N/A	N/A	N/A	N/A
64	5320	N/A	N/A	N/A	N/A
802.11a 20MHz 802.11n 20MHz 802.11ac 20MHz		802.11n 40MHz 802.11ac 40MHz		802.11ac 80MHz	
W56		W56		W56	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590	138	5690
112	5560	126	5630	N/A	N/A
116	5580	134	5670	N/A	N/A
120	5600	142	5710	N/A	N/A
124	5620	N/A	N/A	N/A	N/A
128	5640	N/A	N/A	N/A	N/A
132	5660	N/A	N/A	N/A	N/A
136	5680	N/A	N/A	N/A	N/A
140	5700	N/A	N/A	N/A	N/A
144	5720	N/A	N/A	N/A	N/A

7 Dynamic Frequency Selection (DFS)

7.1 Technical Requirements for DFS

7.1.1 Applicability of DFS Requirements

Requirement	Operational Mode
	Master
Confirming available channels	Yes
Monitoring of operating channel	Yes

7.1.2 DFS Interference Thresholds and Response Requirement

Interference threshold values

Maximum Transmit power (eirp)	Value (see notes)
≥ 200 mW	-64 dBm
< 200 mW	-62 dBm
NOTE : This is the level at the input of the receiver assuming a 0 dBi receive antenna.	

DFS requirement values

Parameter		Value
Confirming available channels		60 s
Monitoring of operating channel	Channel Move Time	10 s
	Channel Closing Transmission Time	260 ms
Non-Occupancy Period		30 minutes

7.2 DFS test signals

7.2.1 Parameters of the DFS test signal in the 5250-5350 MHz band

The radio wave which a radar transmits						Detection probability
Classification	Pulse width		Repetition frequency		Minimum number of consecutive pulses	
	minimum value	maximum value	minimum value	maximum value		
1	0.5 μ S	5 μ S	200 Hz	1000 Hz	10	60% or more
2	0.5 μ S	15 μ S	200 Hz	1600 Hz	15	60% or more
3	0.5 μ S	5 μ S	200 Hz	1000 Hz	"Repetition frequency x 0.026" (Round up to less than 1), or "22", whichever is larger, or "30", whichever is smaller	60% or more
4	0.5 μ S	15 μ S	200 Hz	1600 Hz	"Repetition frequency x 0.026" (Round up to less than 1), or "22", whichever is larger, or "30", whichever is smaller	60% or more
5	0.5 μ S	1.5 μ S	1114 Hz	1118 Hz	30	60% or more
6	0.5 μ S	1.5 μ S	928 Hz	932 Hz	25	60% or more
7	0.5 μ S	1.5 μ S	886 Hz	890 Hz	24	60% or more
8	0.5 μ S	1.5 μ S	738 Hz	742 Hz	20	60% or more

7.2.2 Parameters of the DFS test signal in the 5470-5730 MHz band

A. Fixed pulse radar wave test signals

Test signal	Pulse width [μ s]	Pulse repetition frequency [Hz]	Number of continuous pulses	Repetition cycle [s]
Fixed Pulse 1	0.5	720	18	15.0
Fixed Pulse 2	1.0	700	18	15.0
Fixed Pulse 3	2.0	250	18	15.0

B. Variable pulse radar wave test signals

Test signal	Pulse width [μ s]	Pulse repetition frequency [Hz]	Number of continuous pulses	Repetition cycle [s]
Variable Pulse 4	Width in a range of 1 to 5 μ s in increments of 1 μ s	Any one frequency in a range of 4,347 to 6,667 Hz	Any one integer between 23 and 29	15.0
Variable Pulse 5	Width in a range of 6 to 10 μ s in increments of 1 μ s	Any one frequency in a range of 2,000 to 5,000 Hz	Any one integer between 16 and 18	15.0
Variable Pulse 6	Width in a range of 11 to 20 μ s in increments of 1 μ s	Any one frequency in a range of 2,000 to 5,000 Hz	Any one integer between 12 and 16	15.0

Note: Each item in the table shall consist of any combination of 1.

C. Chirp radar wave test signal

Test signal	Pulse width [μ s]	Pulse repetition frequency [Hz]	Number of continuous pulses	Repetition cycle [s]
Chirp	Width in a range of 50 to 100 μ s in increments of 1 μ s	Any one frequency in a range of 500 to 1,000 Hz	Any one integer between 1 and 3	12.0

Note 1: Bursts shall be transmitted within 12 seconds.

Note 2: The Chirp width shall be a frequency width that ranges from 5 to 20 MHz in increments of 1 MHz.

An individual Chirp width can be any in each burst and Chirp widths within the same burst shall be equal.

Note 3: The number of bursts shall be any integer in a range of 8 to 20 and a burst interval shall be a time period derived from dividing 12 seconds with the number of bursts.

Note 4: If there are multiple pulses within a burst of 1s, the width of each pulse shall be equal and the pulse repetition frequency shall not have any relationships with that for the subsequent pulses of 1.

Note 5: Each item in the table shall consist of any combination of 1.

D. Frequency hopping radar wave test signal

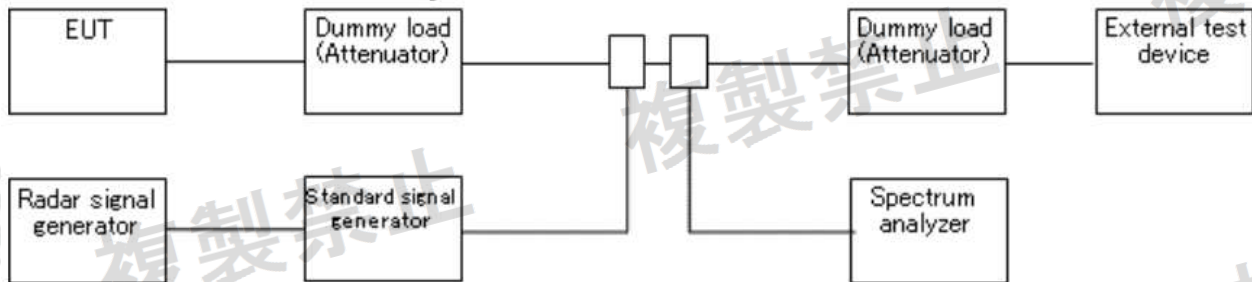
Test signal	Pulse width [μ s]	Pulse repetition frequency [Hz]	Number of continuous pulses	Repetition cycle [s]
Hopping	1.0	3,000	9	10.0

Note 1: The hopping frequency shall be any frequency that ranges from 5,250 to 5,724 MHz in increments of 1 MHz.

Note 2: An individual hopping interval shall be 3 ms and a total of all hopping intervals shall be 300 ms.

Note 3: Burst intervals shall be 3ms.

7.3 DFS Test Setup



7.4 Communication Load

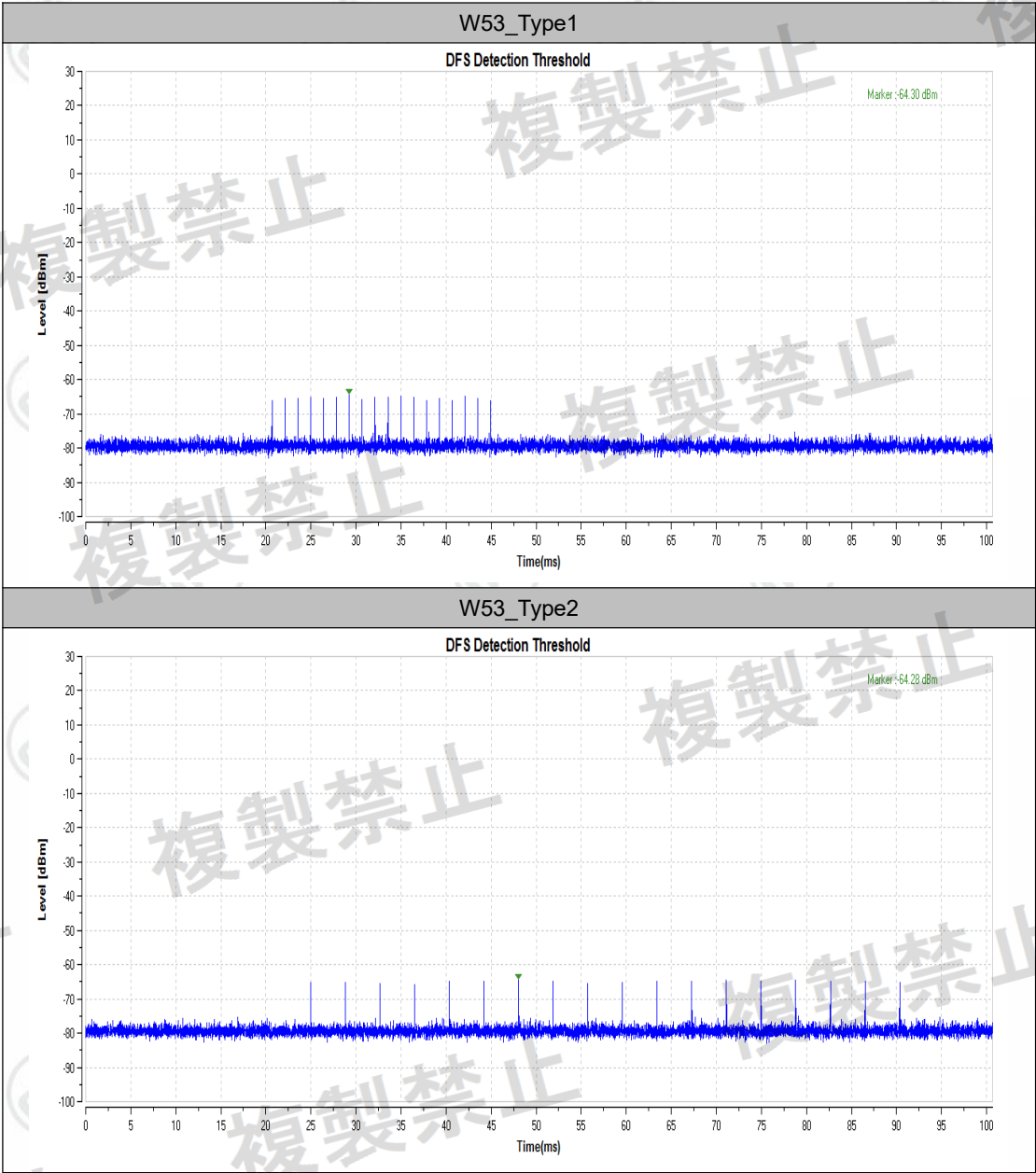
<input checked="" type="checkbox"/>	5250-5350 MHz band: 50% of the maximum signal transmission speed
<input checked="" type="checkbox"/>	5470-5730 MHz Band: 18% of the maximum signal transmission speed

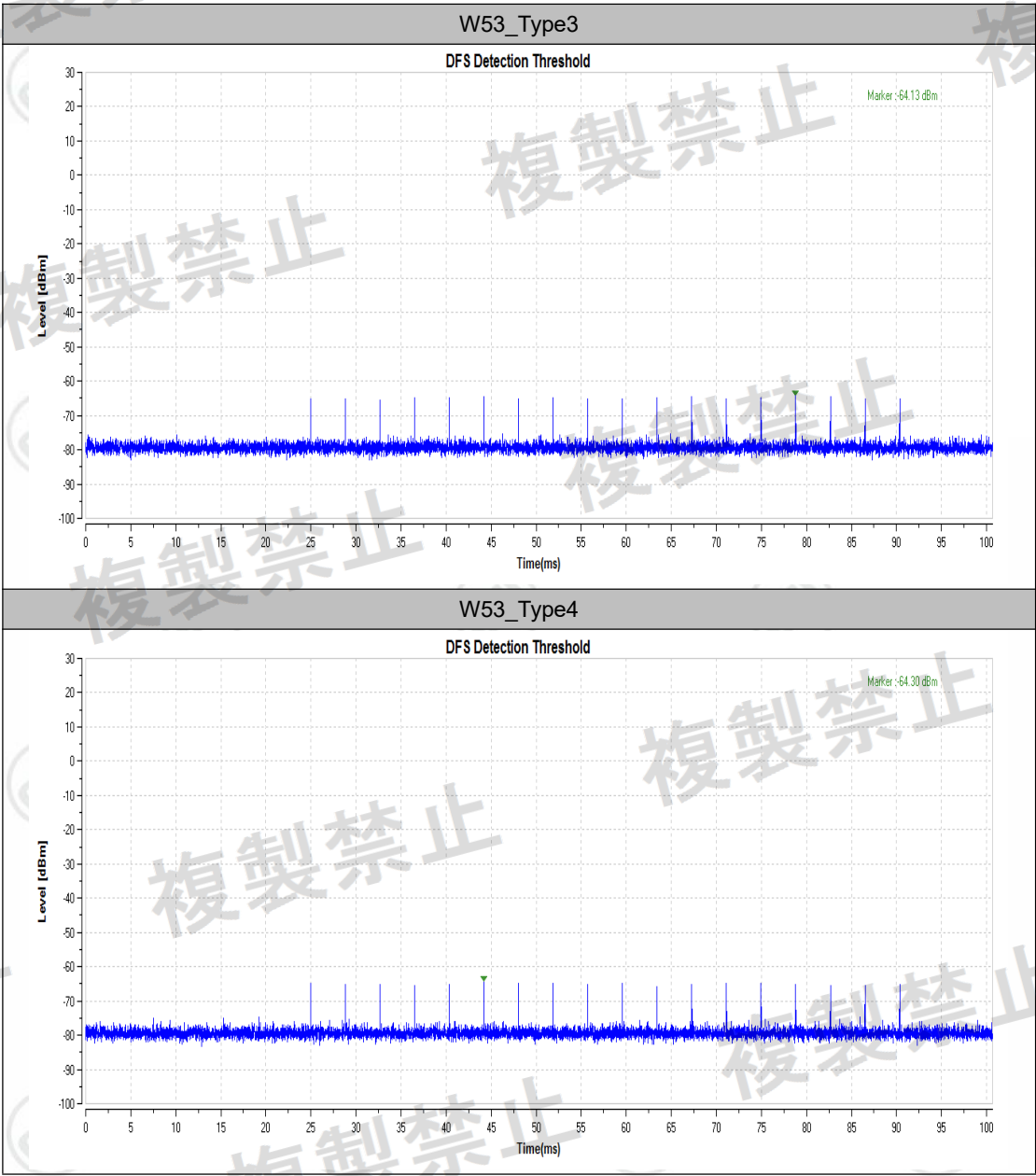
8 DFS test result

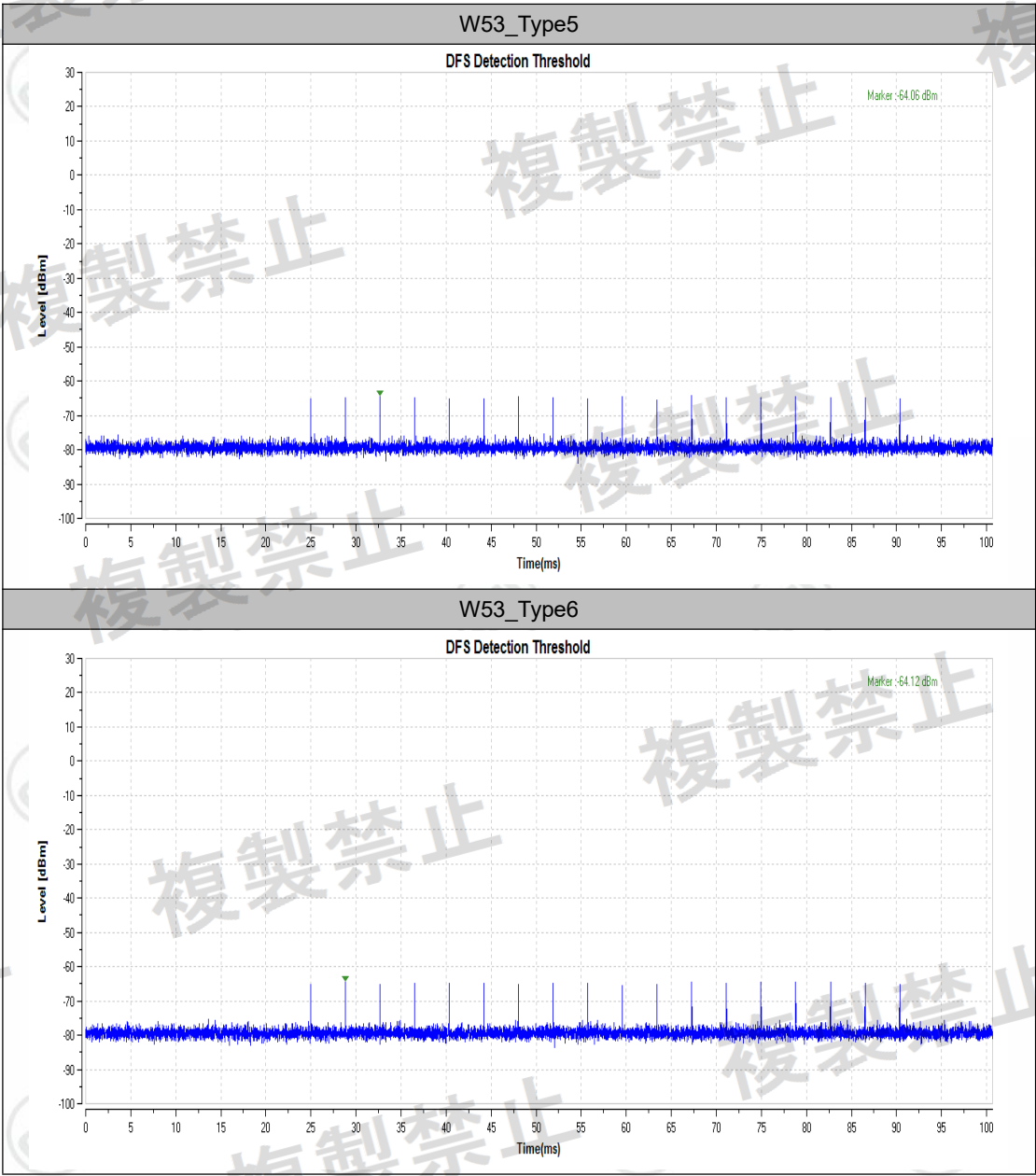
8.1 DFS Detection Threshold levels

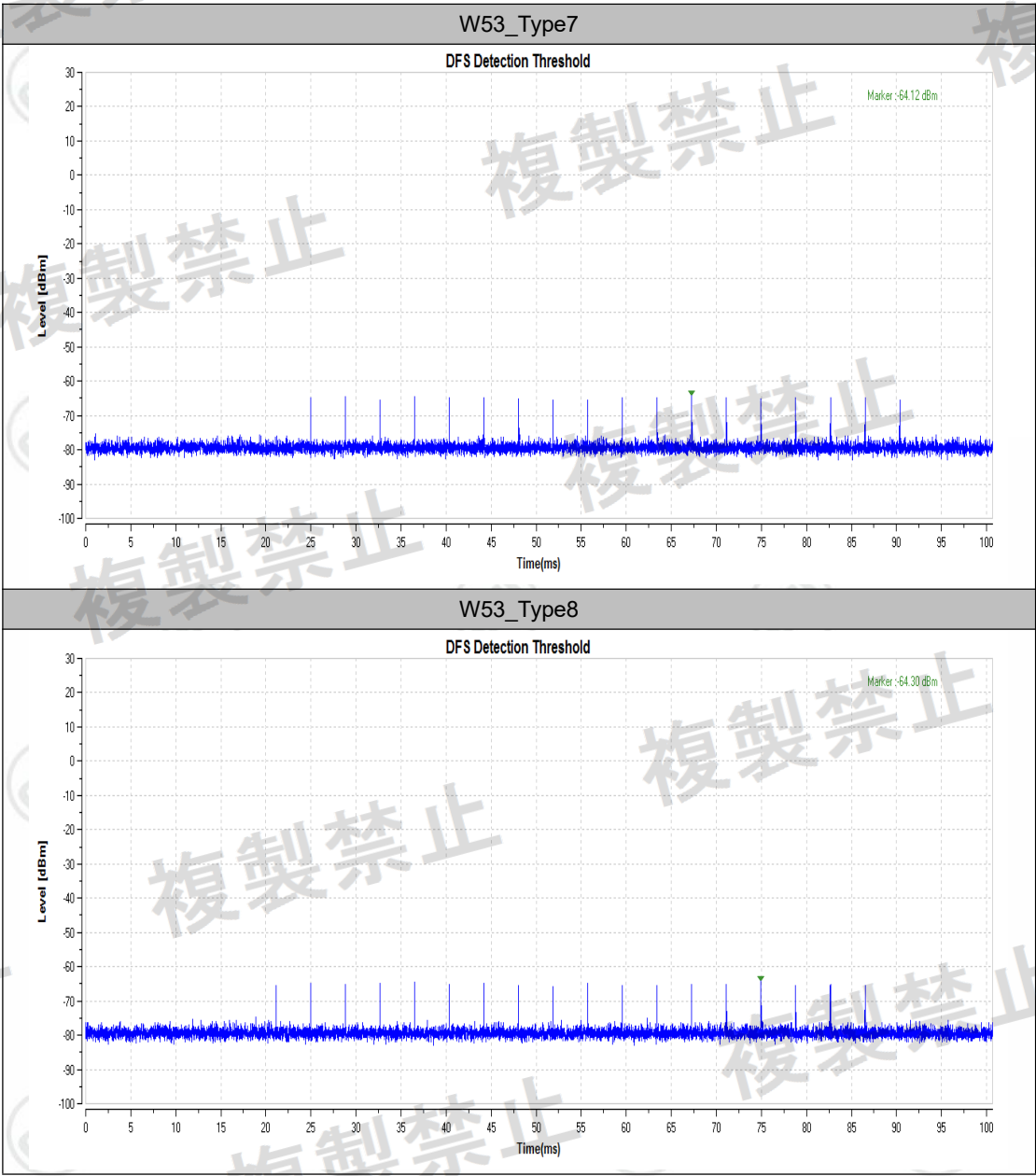
Radar Type	Result	Limit[dbm]	Verdict
W53_Type1	-64.30	N/A	PASS
W53_Type2	-64.28	N/A	PASS
W53_Type3	-64.13	N/A	PASS
W53_Type4	-64.30	N/A	PASS
W53_Type5	-64.06	N/A	PASS
W53_Type6	-64.12	N/A	PASS
W53_Type7	-64.12	N/A	PASS
W53_Type8	-64.30	N/A	PASS
W56_Type1	-64.42	N/A	PASS
W56_Type2	-64.21	N/A	PASS
W56_Type3	-64.36	N/A	PASS
W56_Type4	-64.17	N/A	PASS
W56_Type5	-64.63	N/A	PASS
W56_Type6	-64.61	N/A	PASS
W56_CR	-64.13	N/A	PASS
W56_FH	-64.39	N/A	PASS

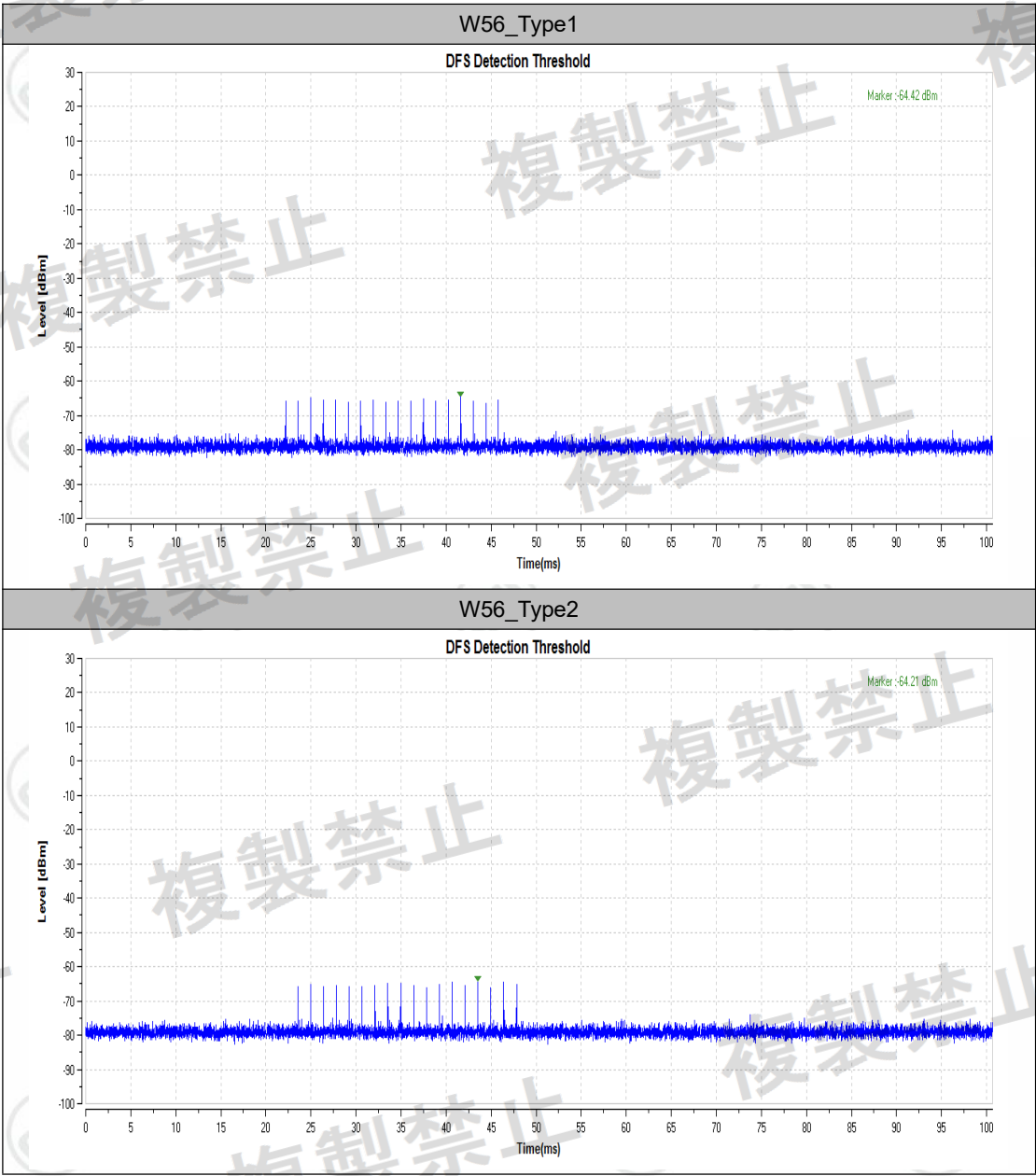
Test Graphs

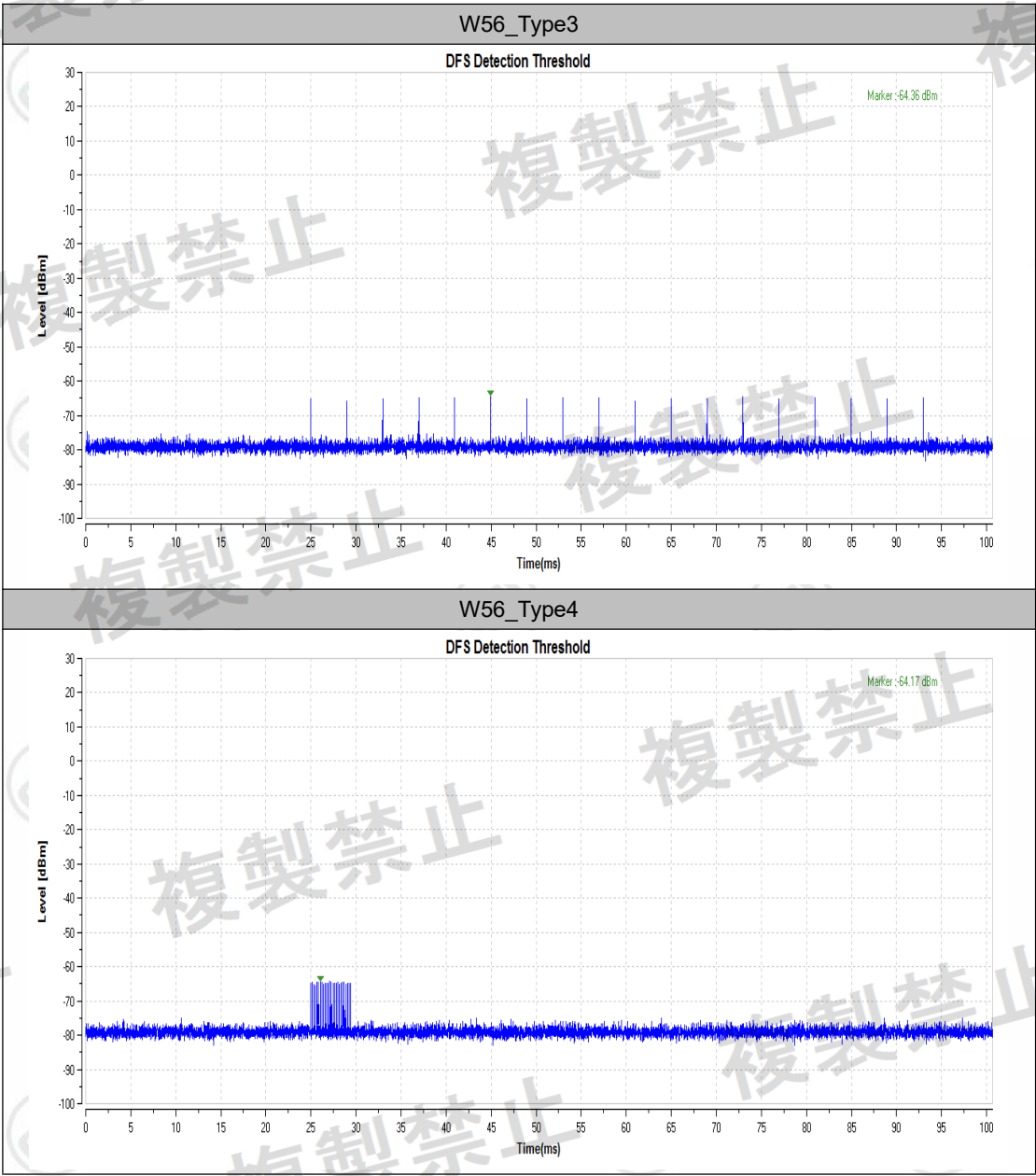


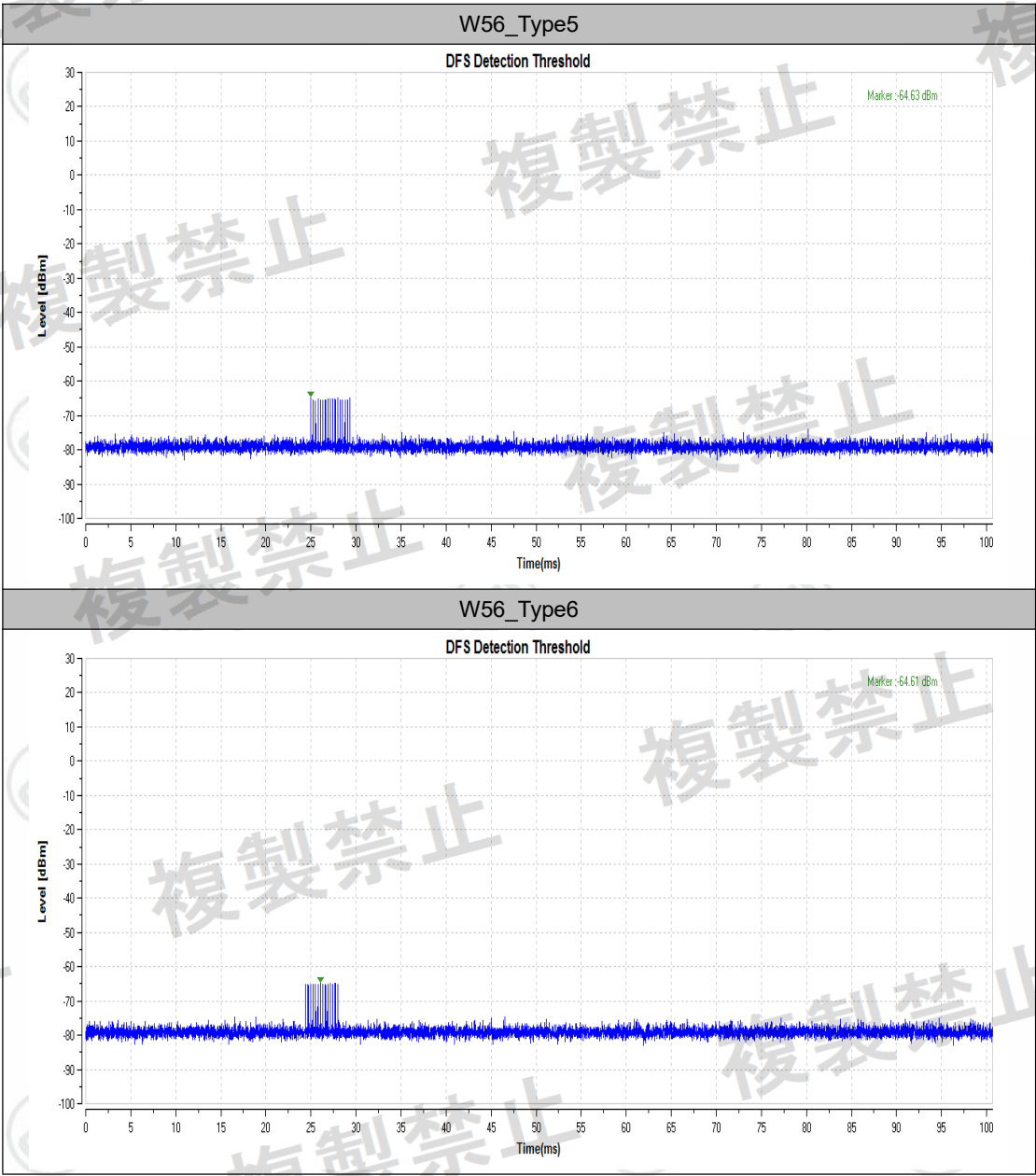


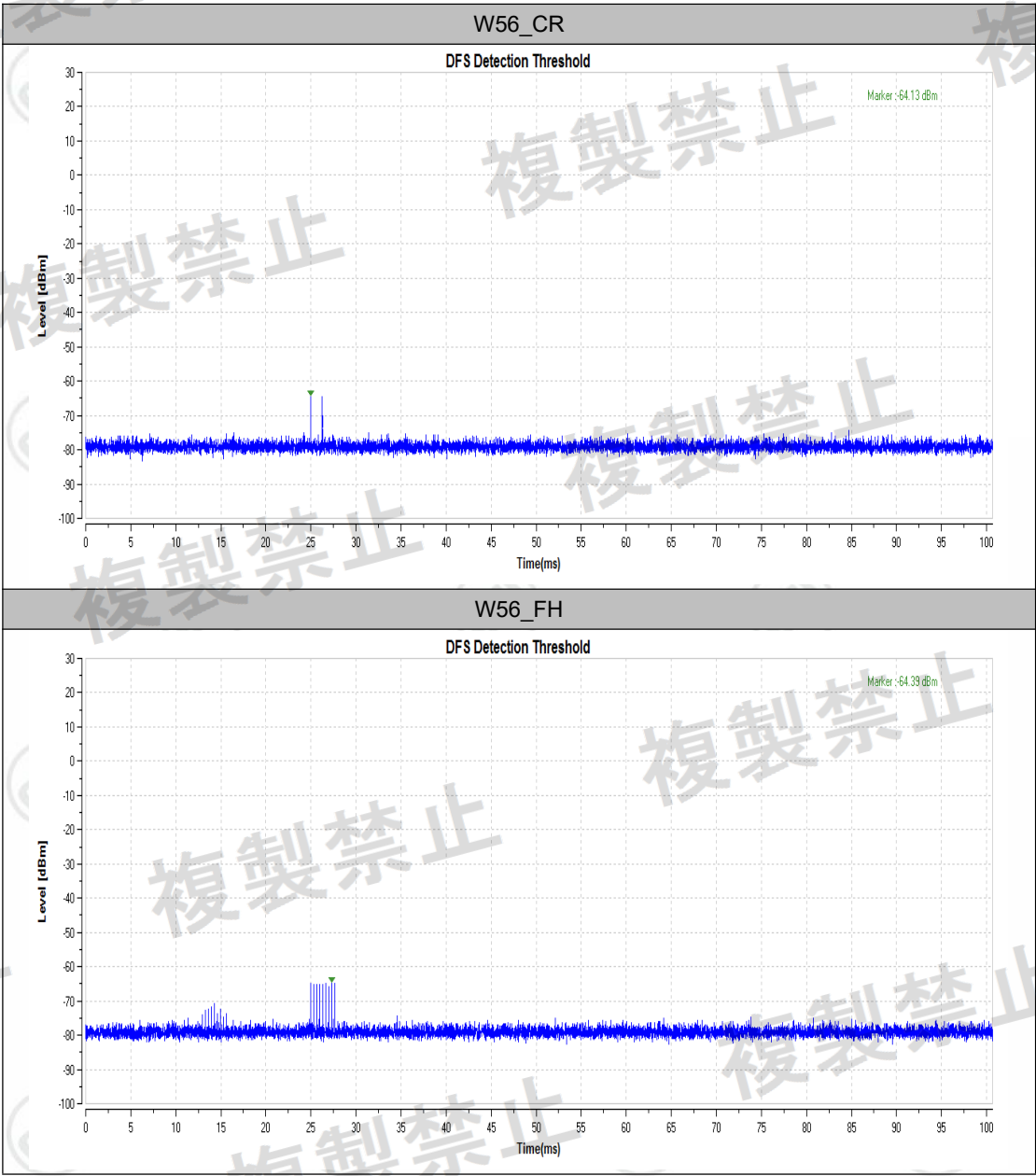












8.2 Monitoring of operating channel

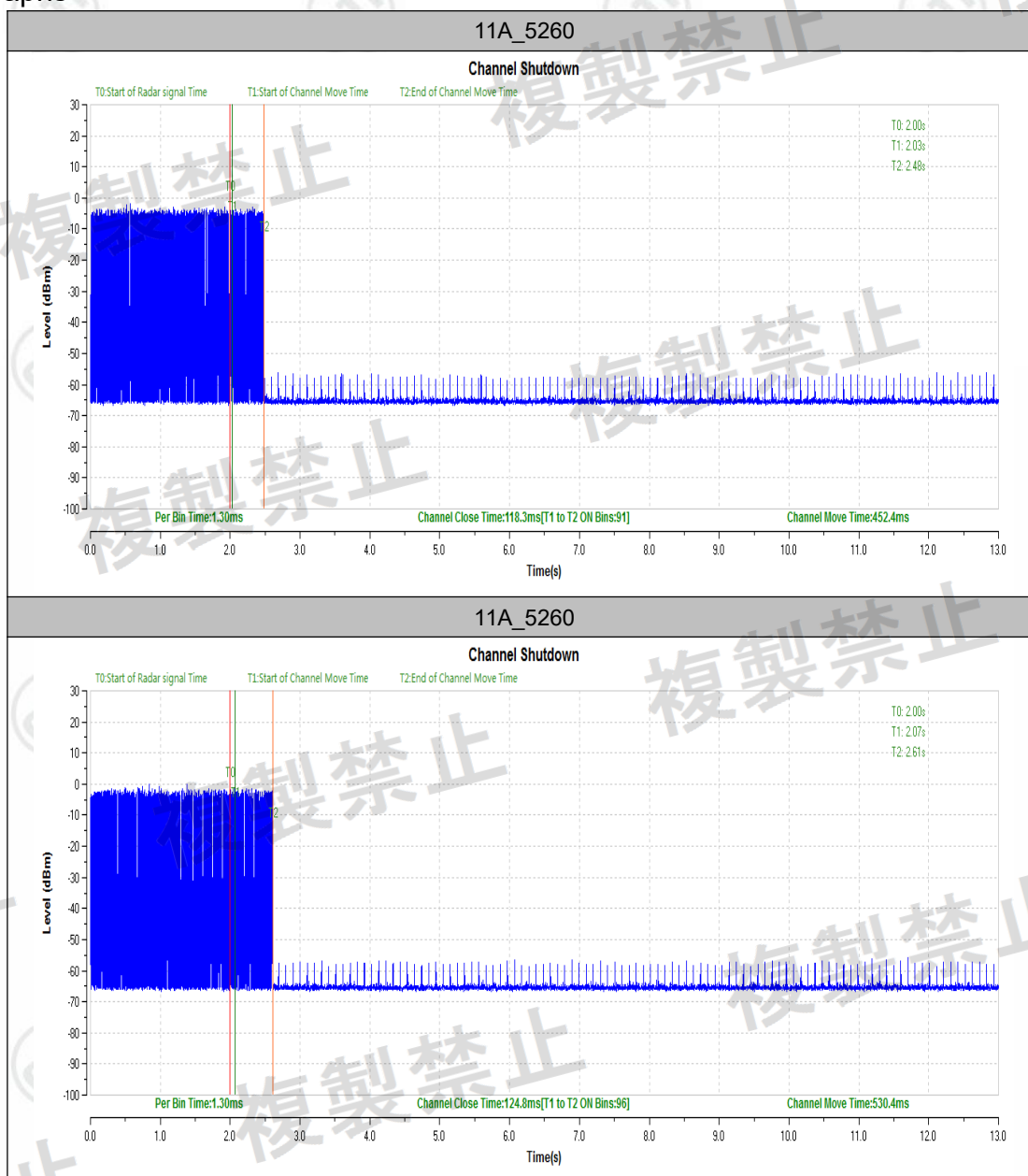
8.2.1 Monitoring of operating channel Limit

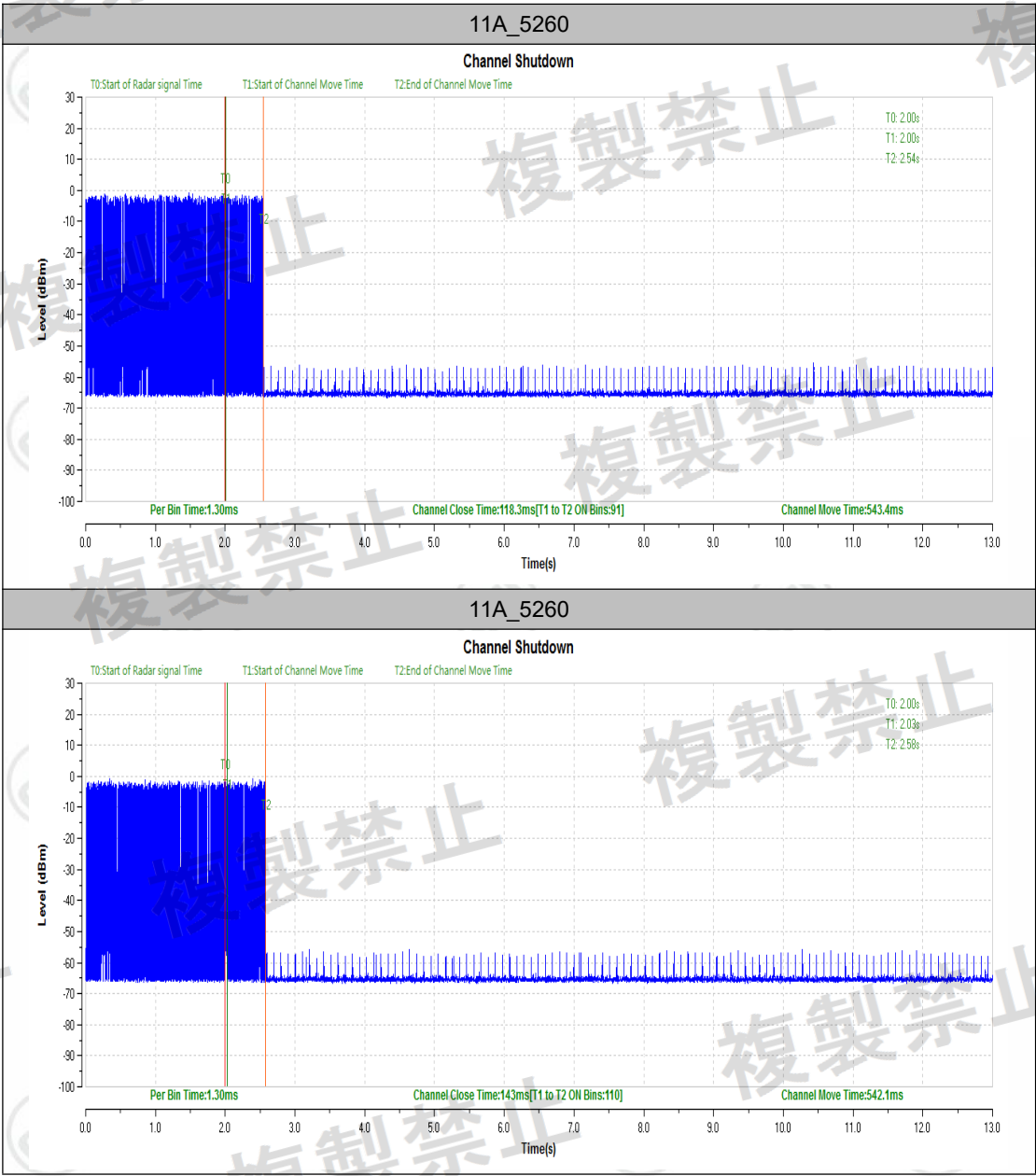
Monitoring of operating channel Limit	
Channel Move Time	10 sec
Channel Closing Transmission Time	260 ms

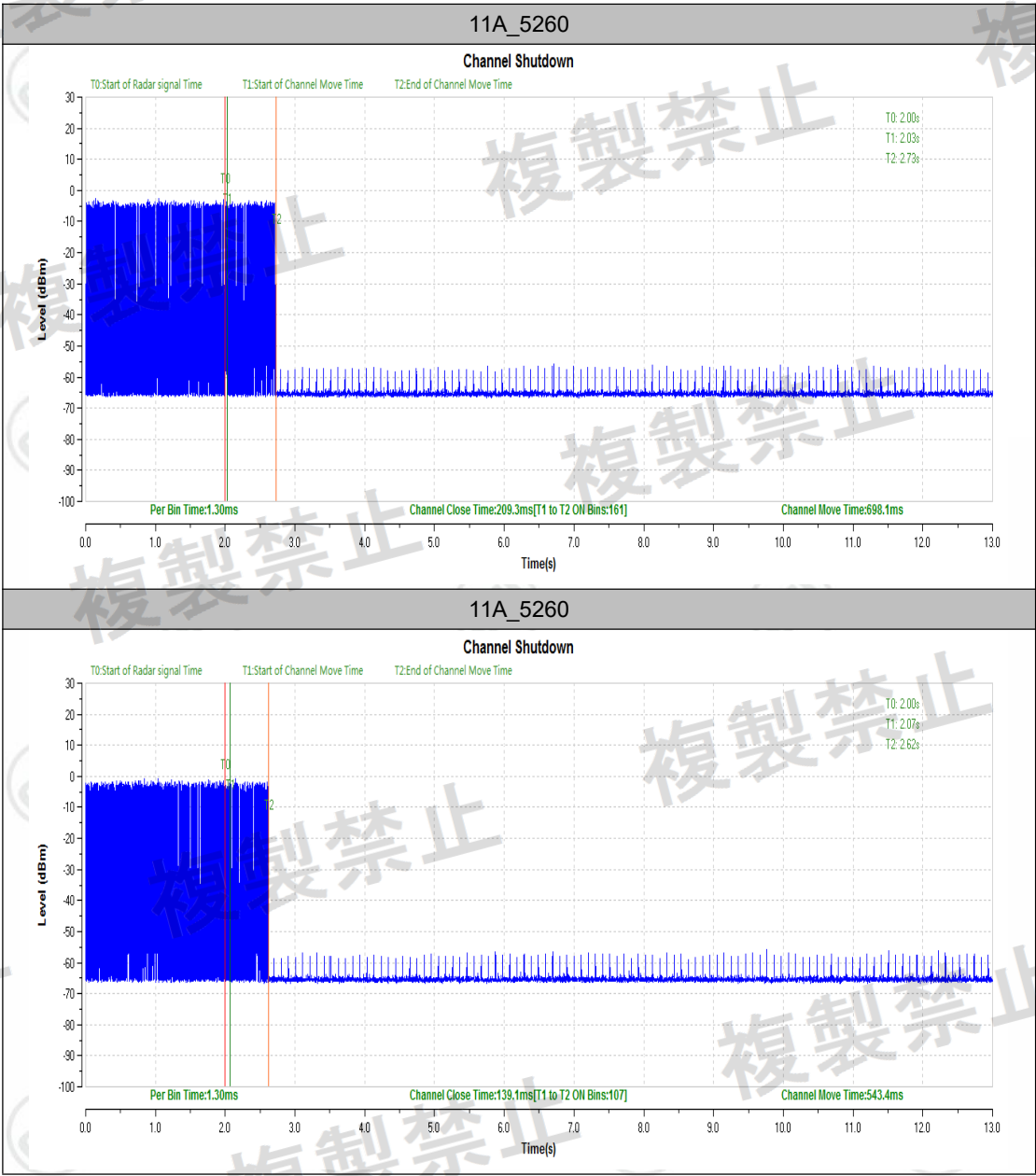
8.2.2 Test Result of Channel Closing Transmission and Channel Move Time

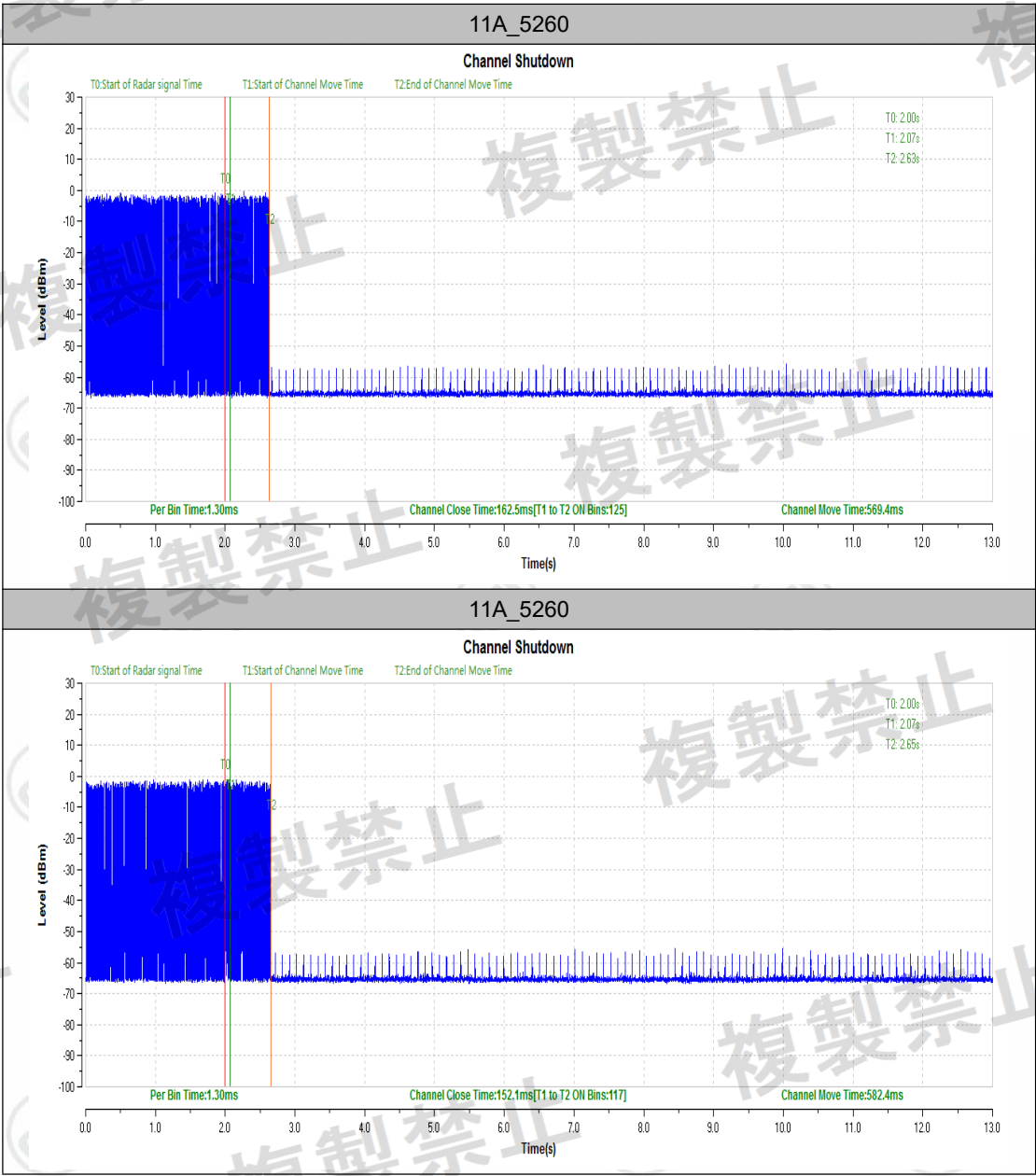
TestMode	Channel	Radar Type	CCT[ms]	Limit[ms]	CMT[ms]	Limit[ms]	Verdict
11A	5260	W53_Type1	118.3	260	452.4	10000	PASS
		W53_Type2	124.8	260	530.4	10000	PASS
		W56_Type5	118.3	260	543.4	10000	PASS
		W53_Type5	143	260	542.1	10000	PASS
		W53_Type7	209.3	260	698.1	10000	PASS
		W53_Type8	139.1	260	543.4	10000	PASS
		W53_Type6	162.5	260	569.4	10000	PASS
		W53_Type4	152.1	260	582.4	10000	PASS
		W53_Type3	131.3	260	504.4	10000	PASS
	5500	W56_Type1	93.6	260	403	10000	PASS
		W56_Type2	131.3	260	581.1	10000	PASS
		W56_Type3	39	260	1397.5	10000	PASS
		W56_Type4	122.2	260	555.1	10000	PASS
		W56_Type5	228.8	260	982.8	10000	PASS
		W56_Type6	131.3	260	607.1	10000	PASS
		W56_CR	0	260	0	10000	PASS
		W56_FH	141.7	260	1098.5	10000	PASS
11AC80SIS O	5290	W53_Type1	137.8	260	646.1	10000	PASS
		W53_Type2	202.8	260	725.4	10000	PASS
		W53_Type8	124.8	260	491.4	10000	PASS
		W53_Type7	175.5	260	621.4	10000	PASS
		W53_Type6	158.6	260	504.4	10000	PASS
		W53_Type5	169	260	1992.9	10000	PASS
		W53_Type4	146.9	260	556.4	10000	PASS
		W53_Type3	167.7	260	634.4	10000	PASS
	5530	W56_Type1	148.2	260	685.1	10000	PASS
		W56_Type2	119.6	260	529.1	10000	PASS
		W56_Type3	122.2	260	556.4	10000	PASS
		W56_Type4	159.9	260	685.1	10000	PASS
		W56_Type5	111.8	260	530.4	10000	PASS
		W56_Type6	144.3	260	646.1	10000	PASS
		W56_CR	0	260	0	10000	PASS
		W56_FH	110.5	260	478.4	10000	PASS

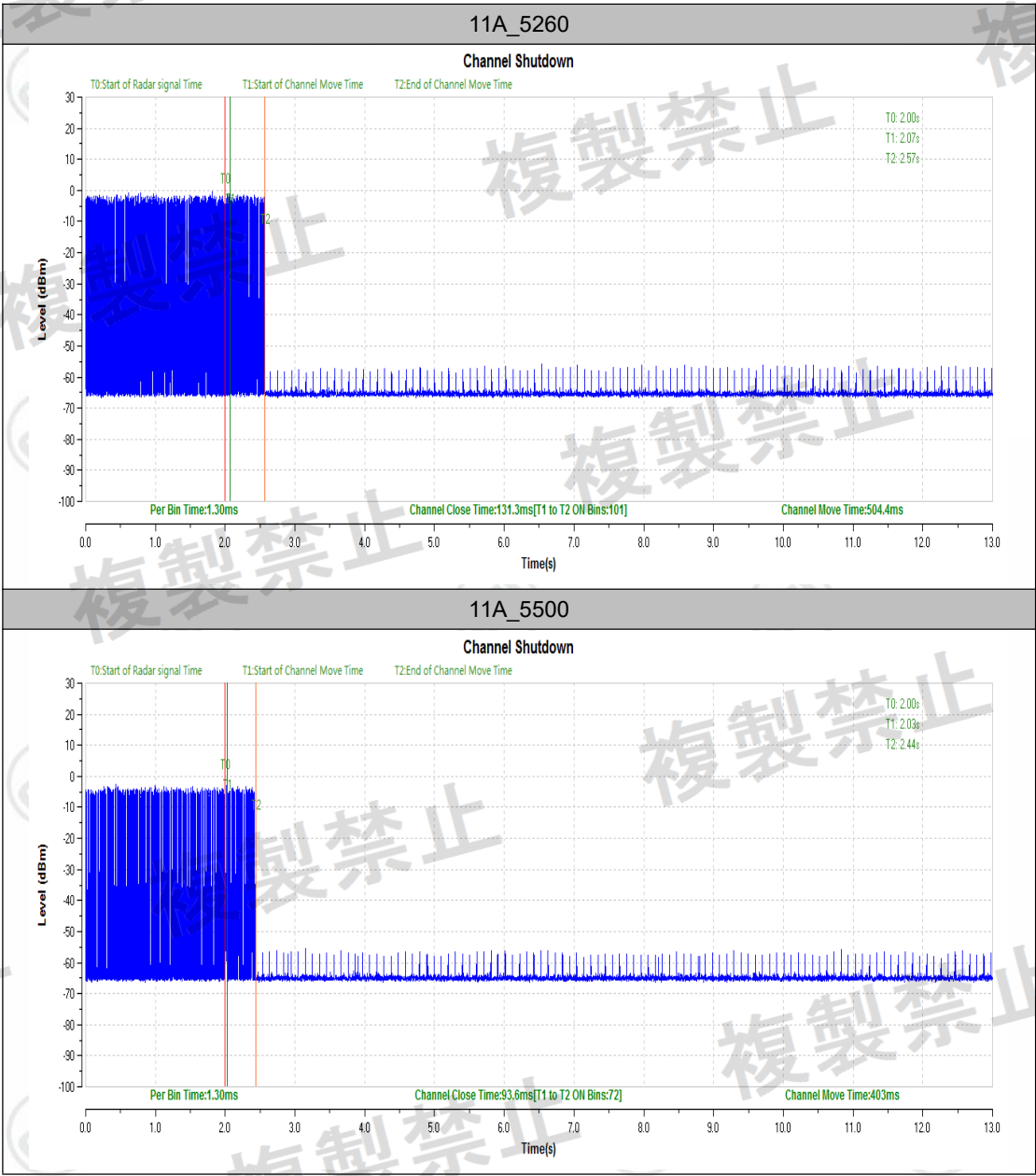
Test Graphs

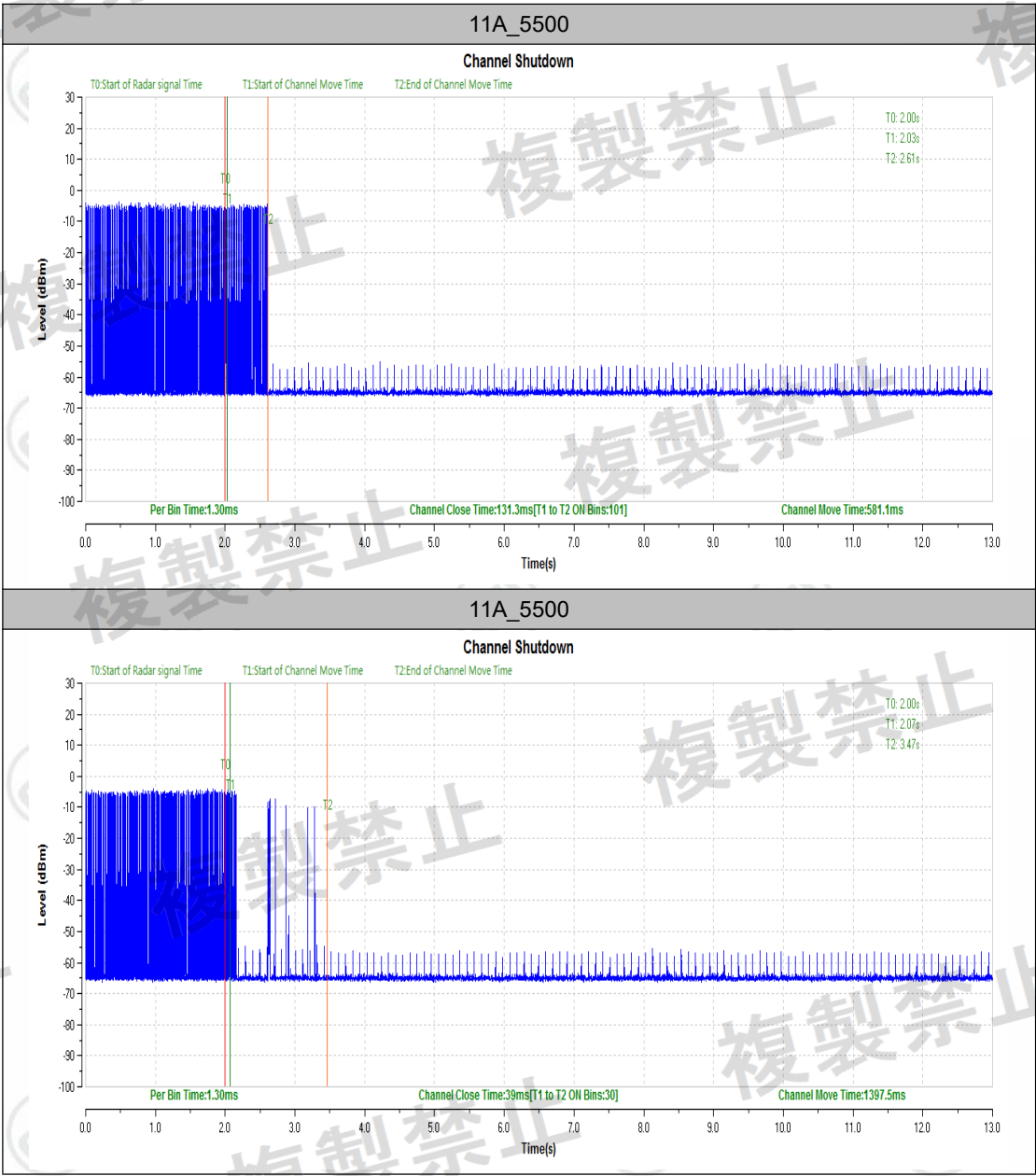


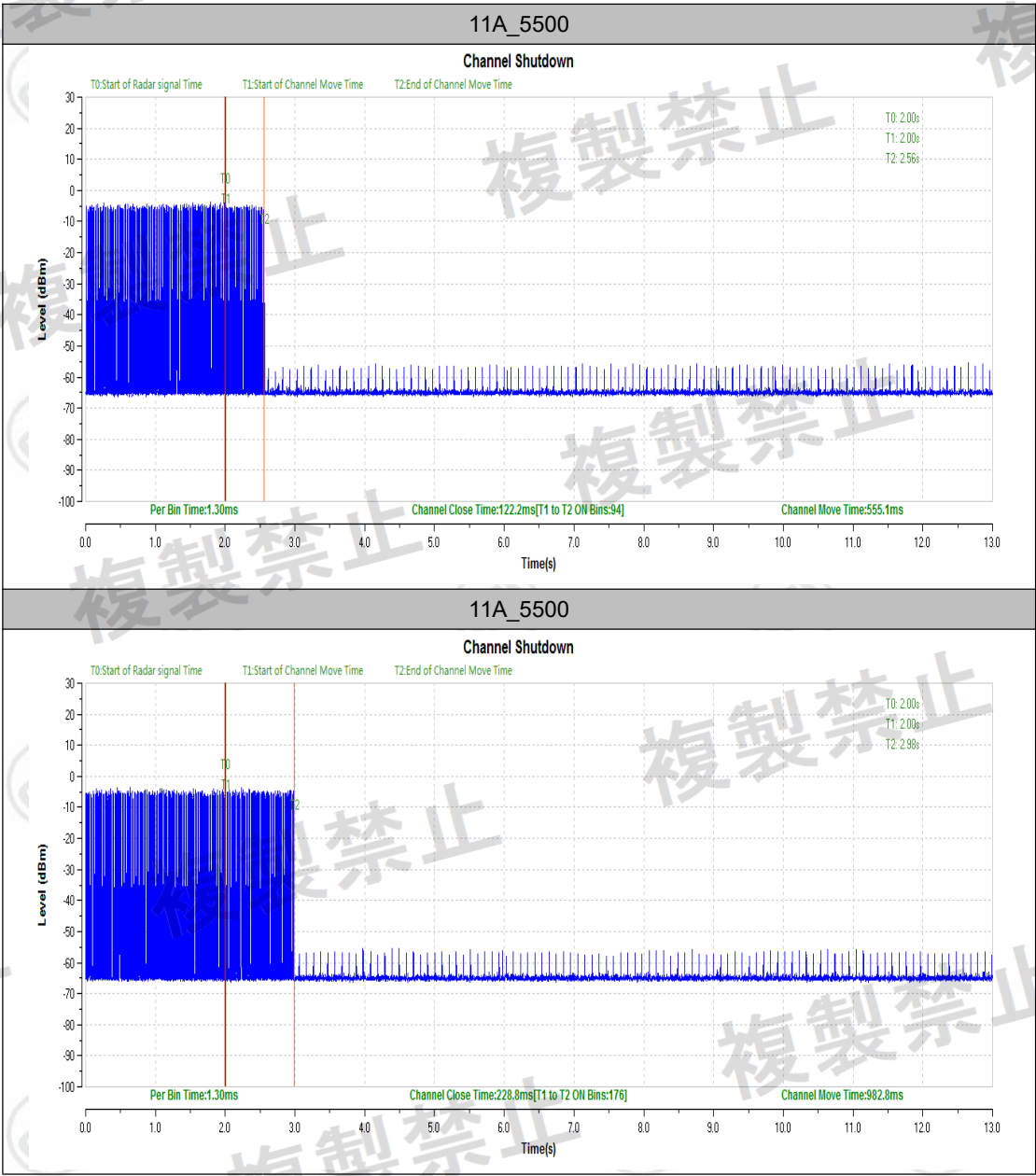


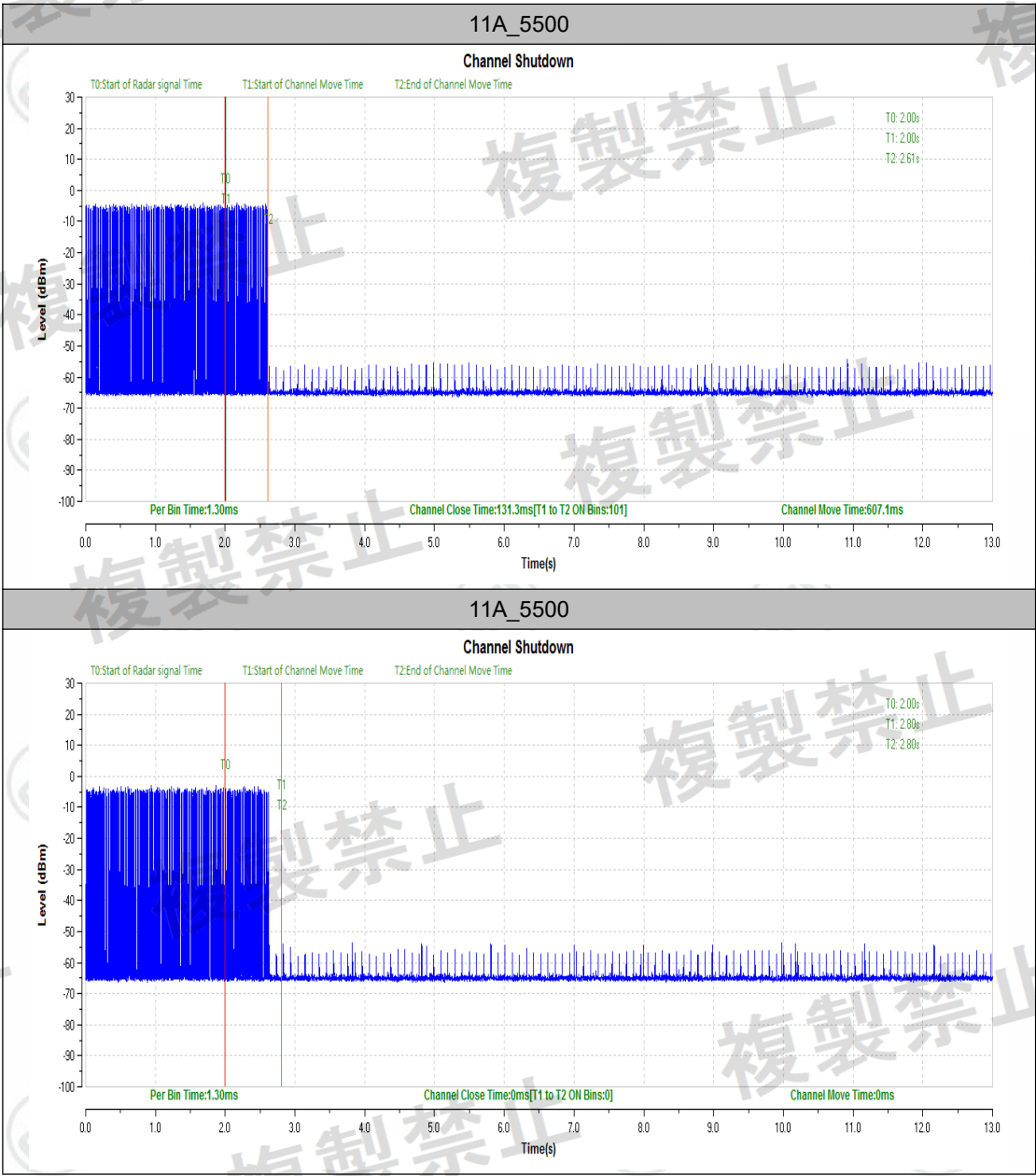


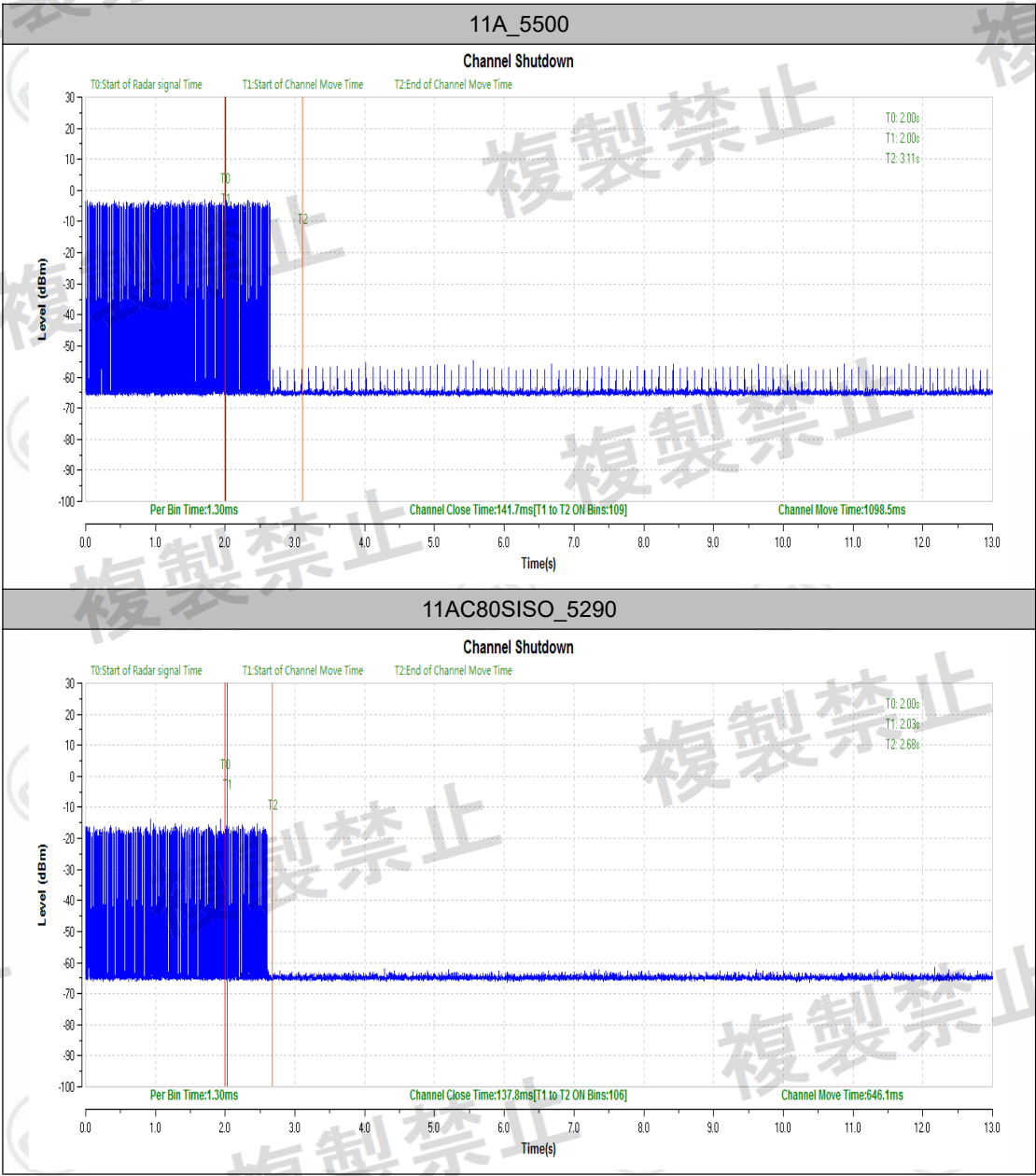


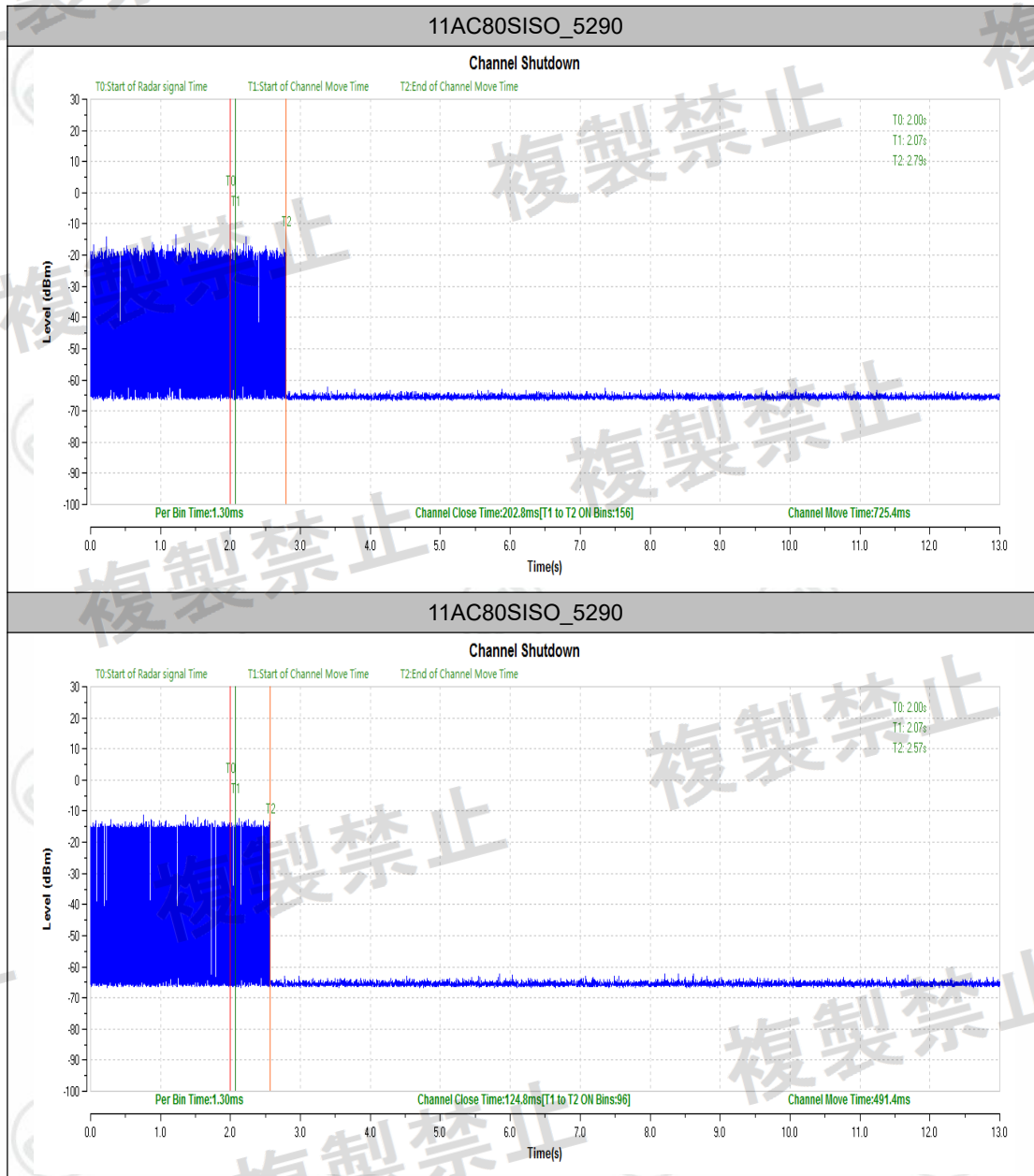


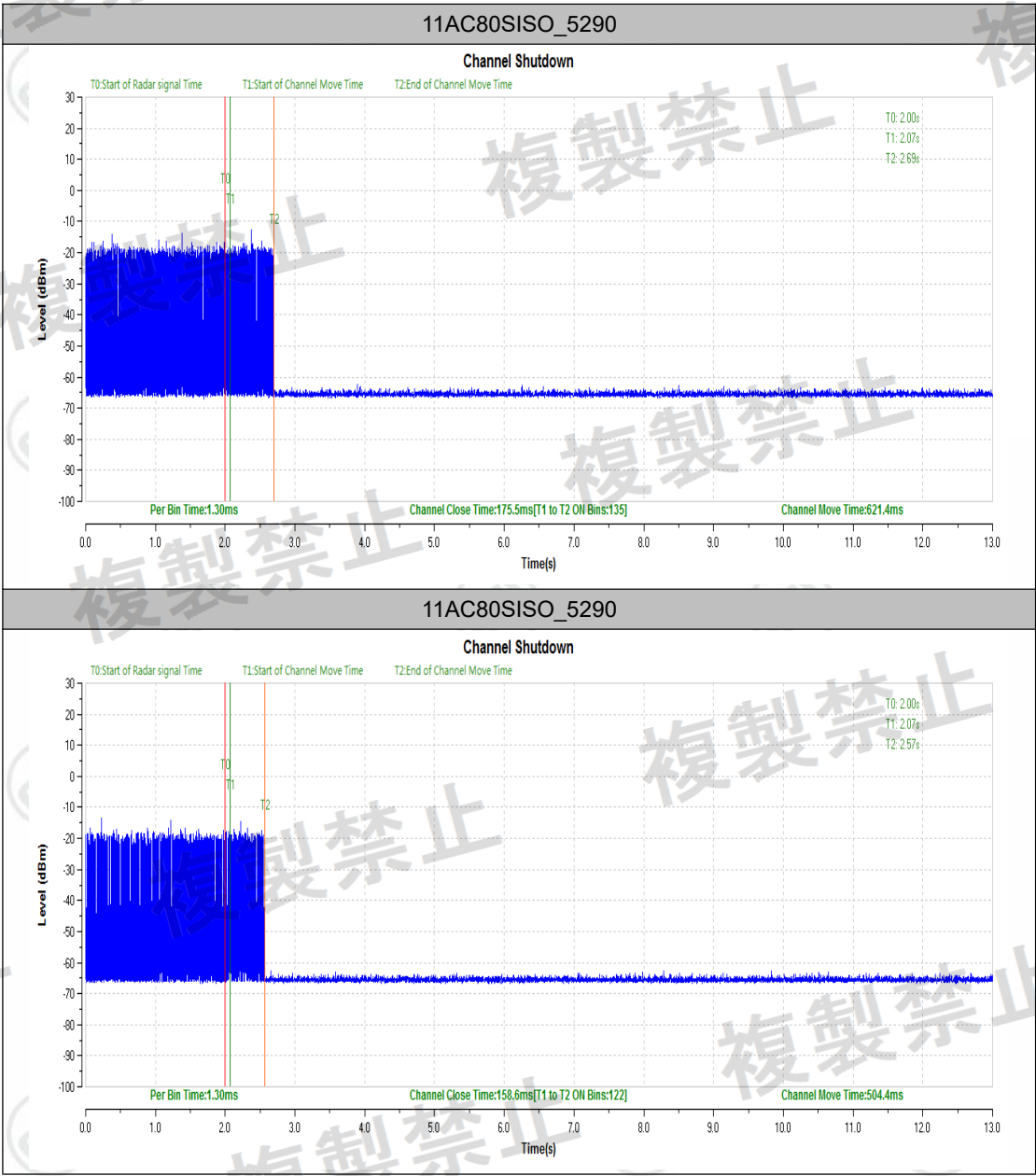


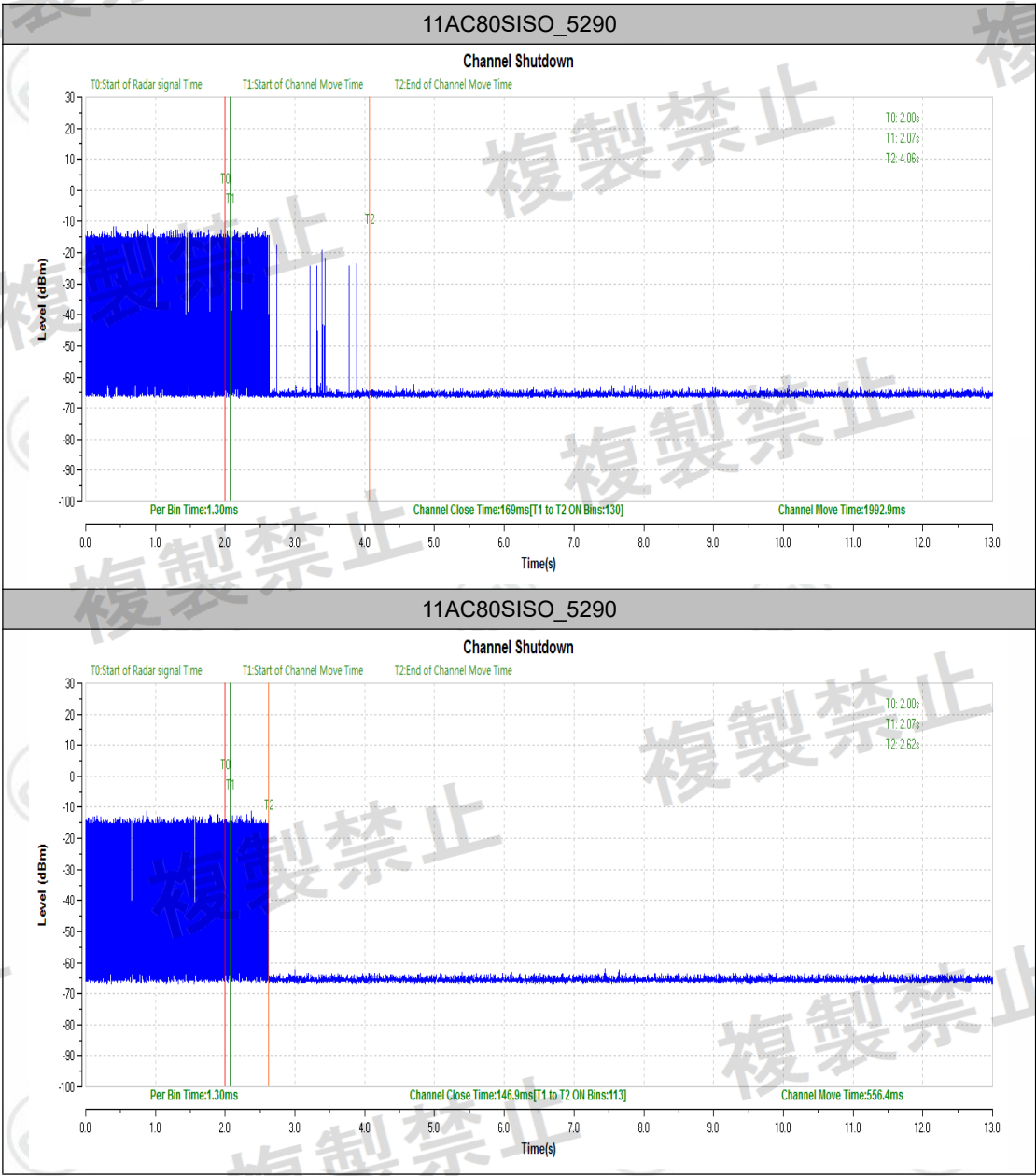


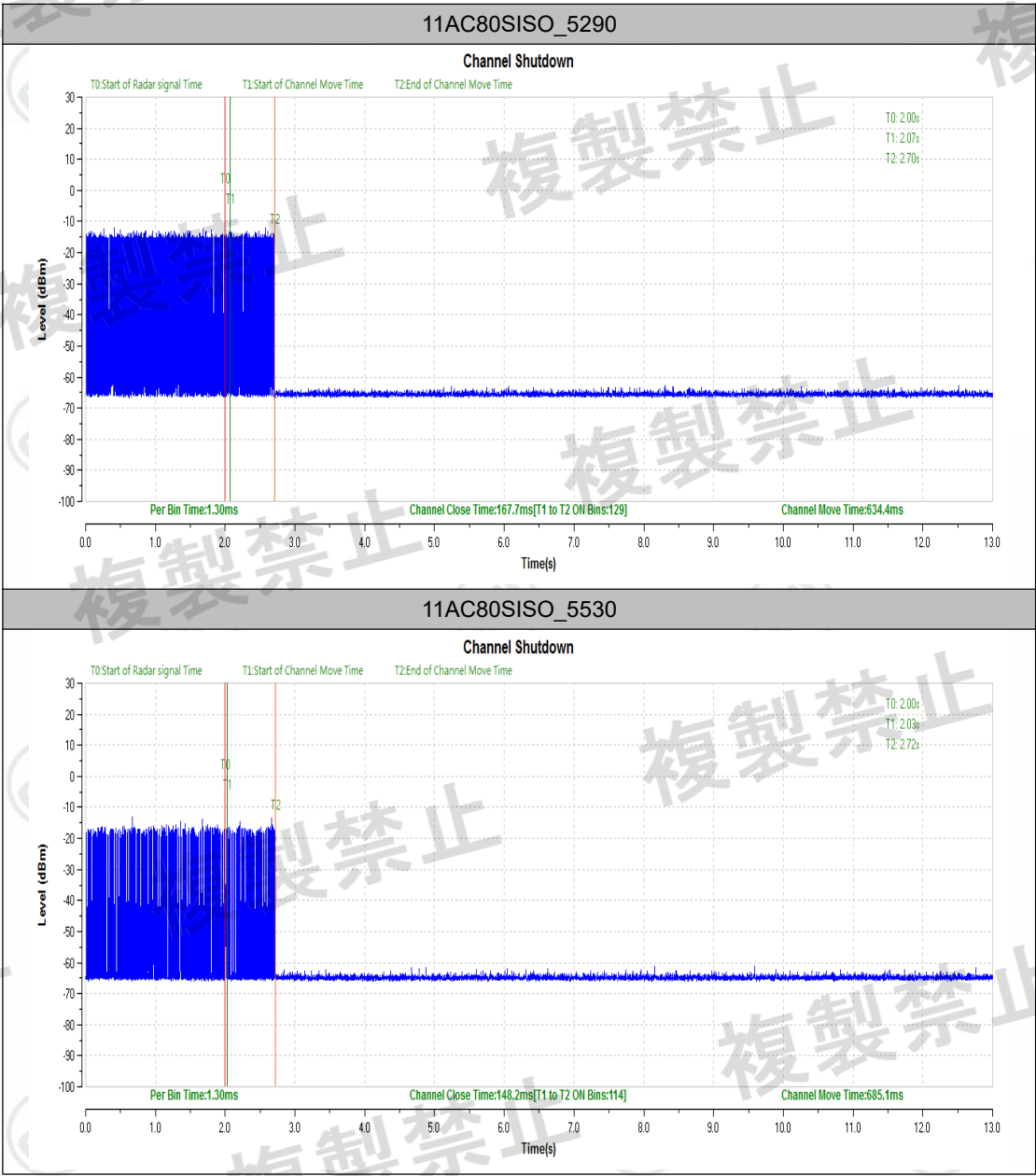


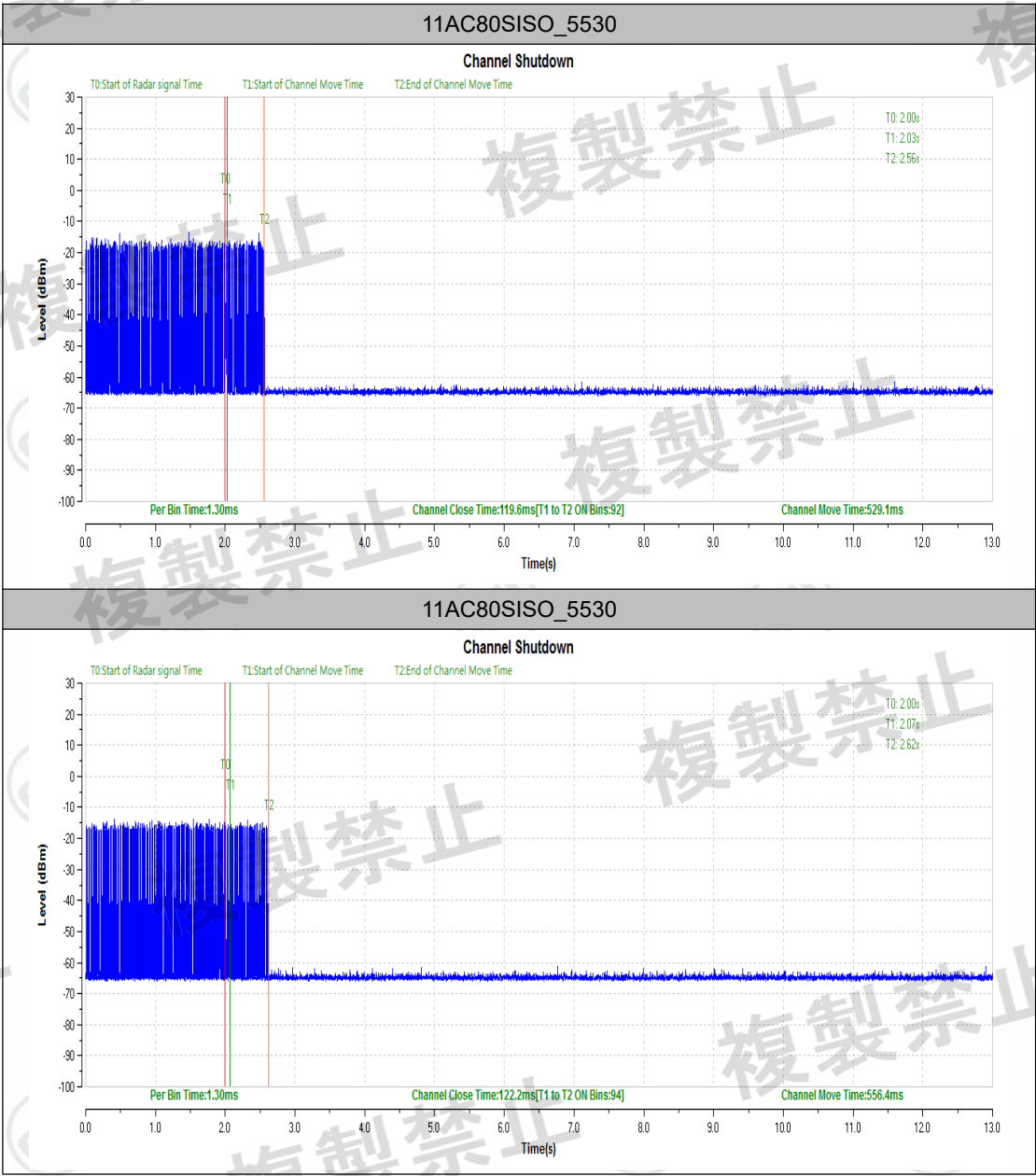


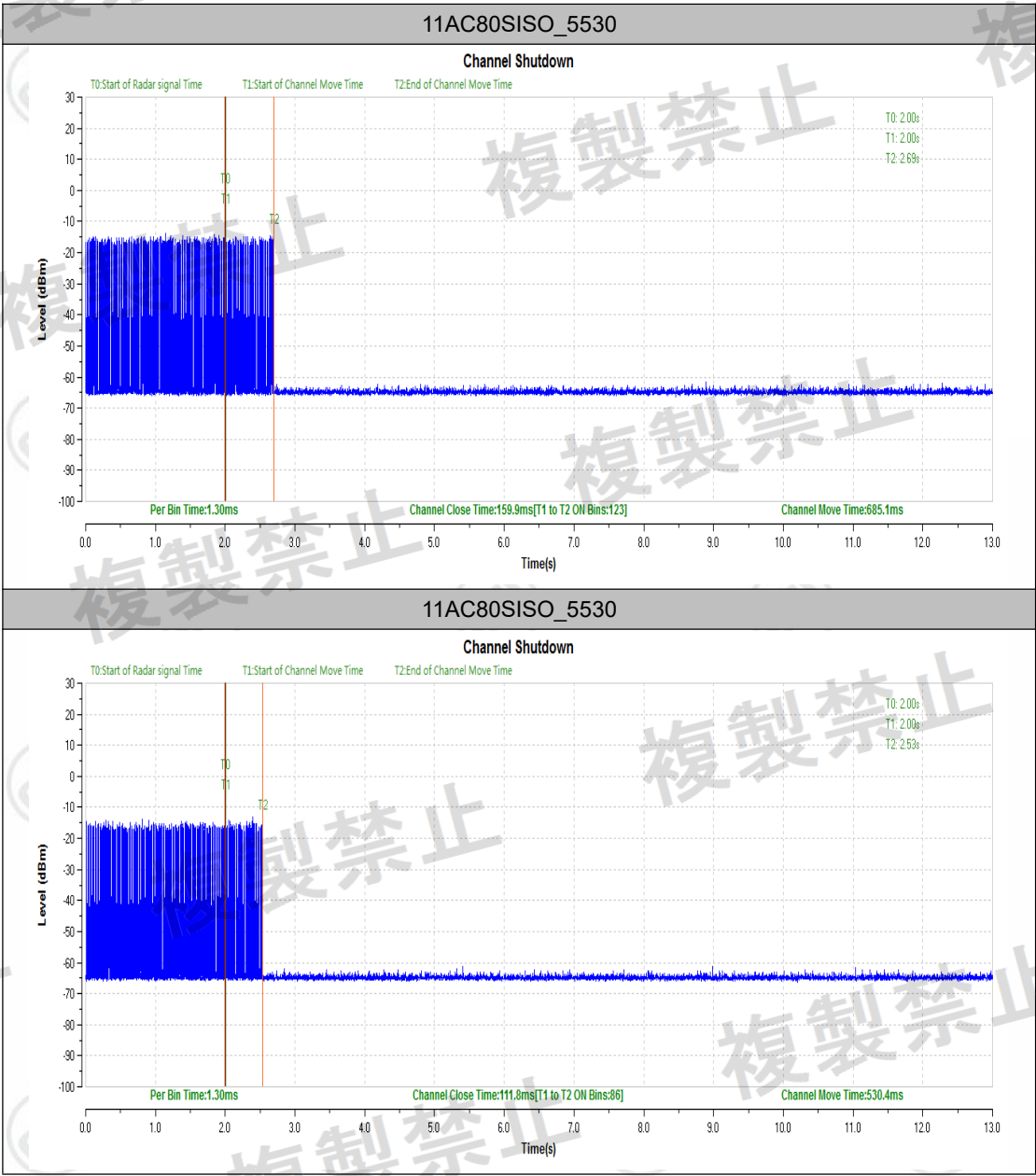


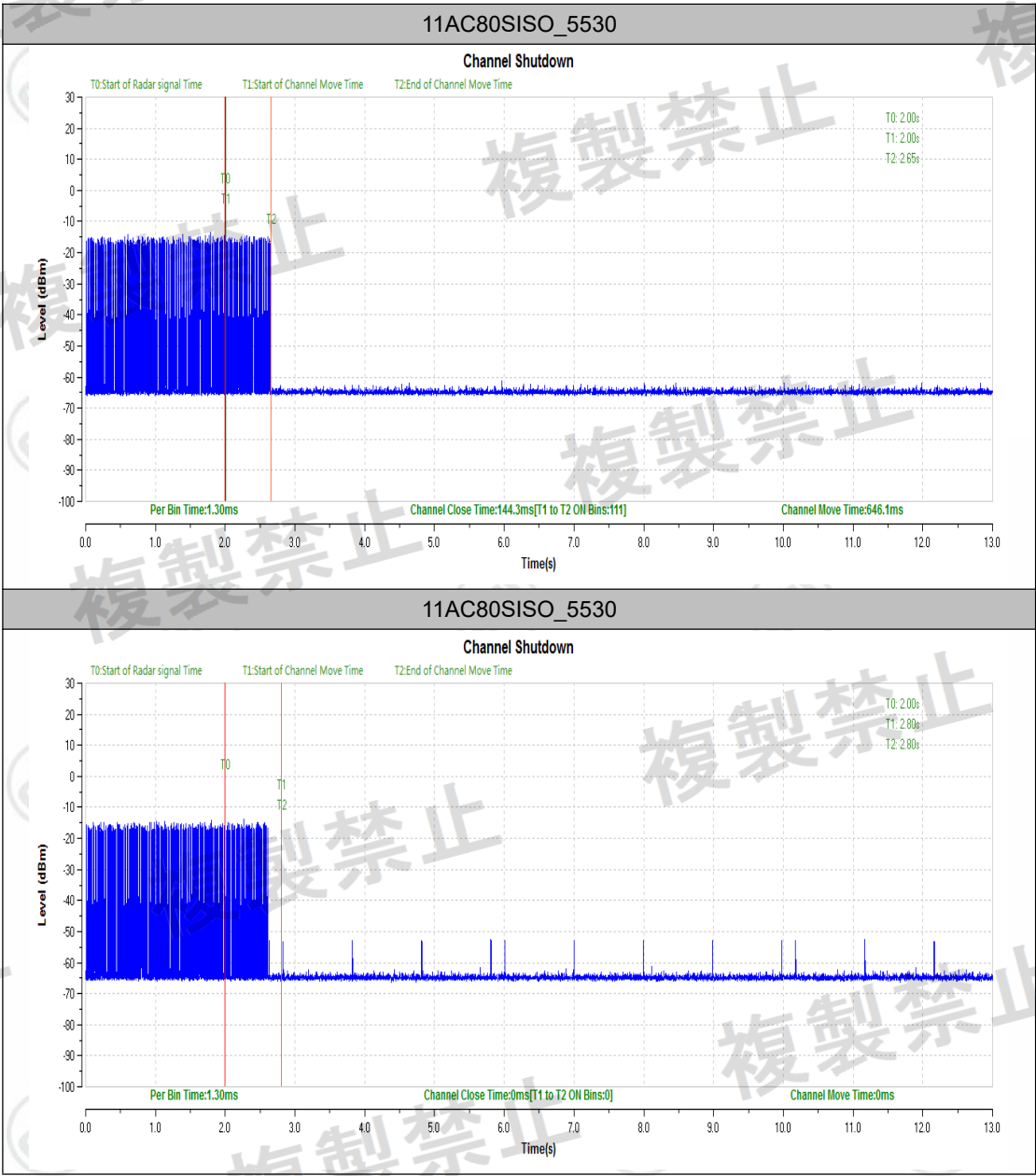


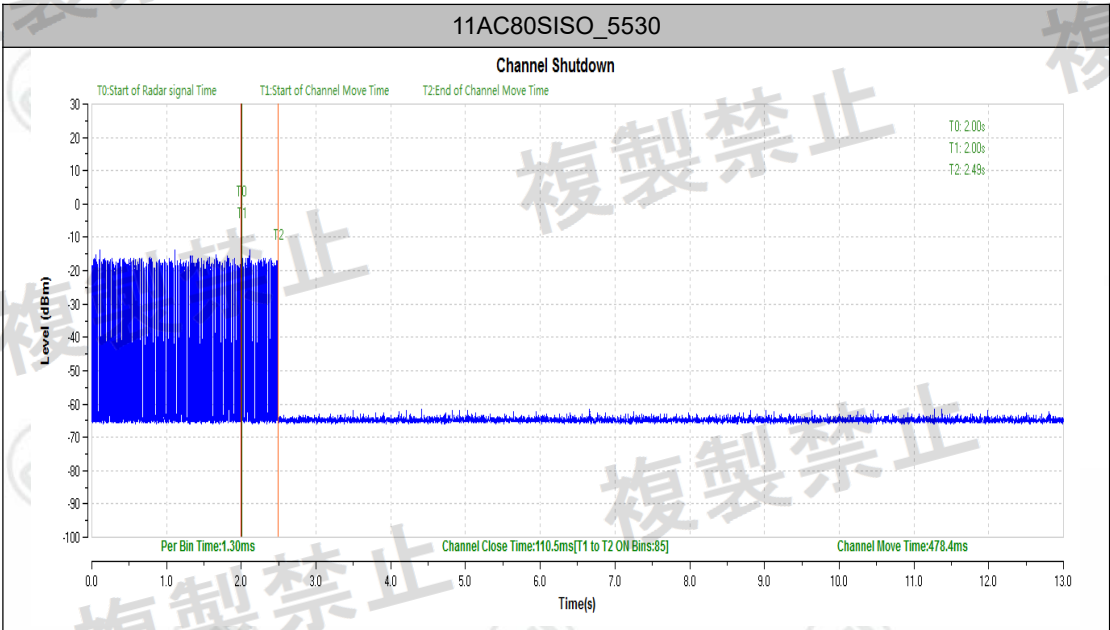












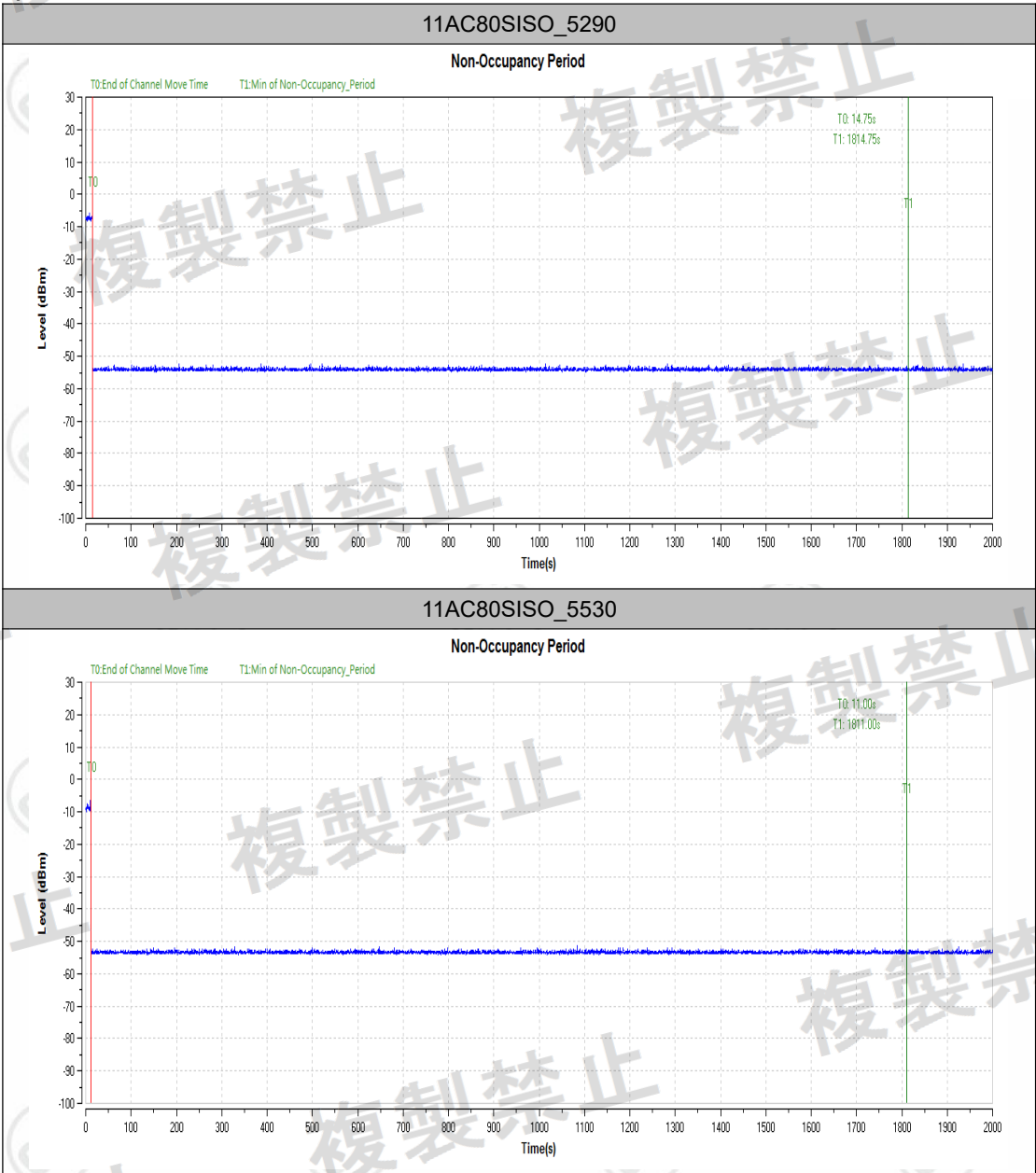
8.3 Non-Occupancy Period

8.2.1 Non-Occupancy Period Limit

Non-Occupancy Period Limit	
Non-Occupancy Period	30 minutes

8.2.2 Test Result of Non-Occupancy Period

Test Graphs



9 Photographs

9.1 EUT Constructional Details

Refer to Report No. EED32N80695201 for EUT external and internal photos.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***