

## TEST REPORT



Applicant	Guangdong Changhong Electronics Co.,Ltd
Address	No.1 North Xingye Rd, Nantou Town, Zhongshan city ,Guangdong Province,China

Manufacturer or Supplier	Guangdong Changhong Electronics Co.,Ltd
Address	No.1 North Xingye Rd, Nantou Town, Zhongshan city ,Guangdong Province, China
Product	LED (backlighting) TV
Brand Name	changhong
Model	UGV40F6000(S1)-ESi
Additional Model & Model Difference	N/A
Date of tests	Jul. 13, 2018 ~ Aug. 01, 2018

The submitted sample of the above equipment has been tested according to the requirements of the following standard:

☒ **EN 303 372-2 V1.1.1 (2016-04)**

**CONCLUSION: The submitted sample was found to COMPLY with the test requirement**

Tested by Madison Luo Supervisor / EMC Department	Approved by Chris Chen Manager / EMC Department
	  Date: Aug. 14, 2018

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Test Report No.: RE180713N042-1

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RE180713N042-1	Original release	Aug. 14, 2018



## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

EN 303 372-2 V1.1.1		
Clause	Test Parameter	Result
6.1	Adjacent channel selectivity	Pass
6.2	Dynamic range	Pass

### 1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

Parameter	Uncertainty
Uncertainty in conducted measurements	$\pm 0.62$ dB
Uncertainty in radiated measurements	$\pm 3.83$ dB
Spurious emissions	See test report of EN 55032

### 1.2 MAXIMUM MEASUREMENT UNCERTAINTY

For the test methods, according to ETSI EN 303 345 standard, the measurement uncertainty figures shall be calculated according to the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor)  $k = 1.96$  or  $k = 2$  (which provide confidence levels of respectively 95 % and 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

#### Maximum measurement uncertainty

Parameter	Uncertainty
Uncertainty in conducted measurements	$\pm 1$ dB
Uncertainty in radiated measurements	$\pm 6$ dB
Spurious emissions	See test report of EN 55032



## 2 General Information

### 2.1 Features of EUT

The tests reported herein were performed according to the method specified by Guangdong Changhong Electronics Co.,Ltd , for detailed feature description, please refer to the manufacturer's specifications or user's manual.

### 2.2 General Description of EUT

Product	LED (backlighting) TV
Brand	changhong
Test Model	UGV40F6000(S1)-ESi
Additional Model	N/A
Sample Status	Engineer sample
Operating Software	N/A
Power Supply Rating	AC 100-240V, 50/60Hz
Accessory Device	N/A
Data Cable Supplied	AC Line: Unshielded, Non-detachable 1.5m
Receiver Frequency Range (MHz)	950 ~ 2150
Symbol Rate (kSps)	4630~29270

#### NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 180713N042) for detailed product photo.



### 2.3 Operating Modes of EUT and Determination of Worst Case Operating Mode

The EUT was tested as the following modes:

Test Item	Test Mode
Adjacent signal selectivity	DVB-S
Dynamic range	DVB-S

All above modes were tested and recorded in this report.

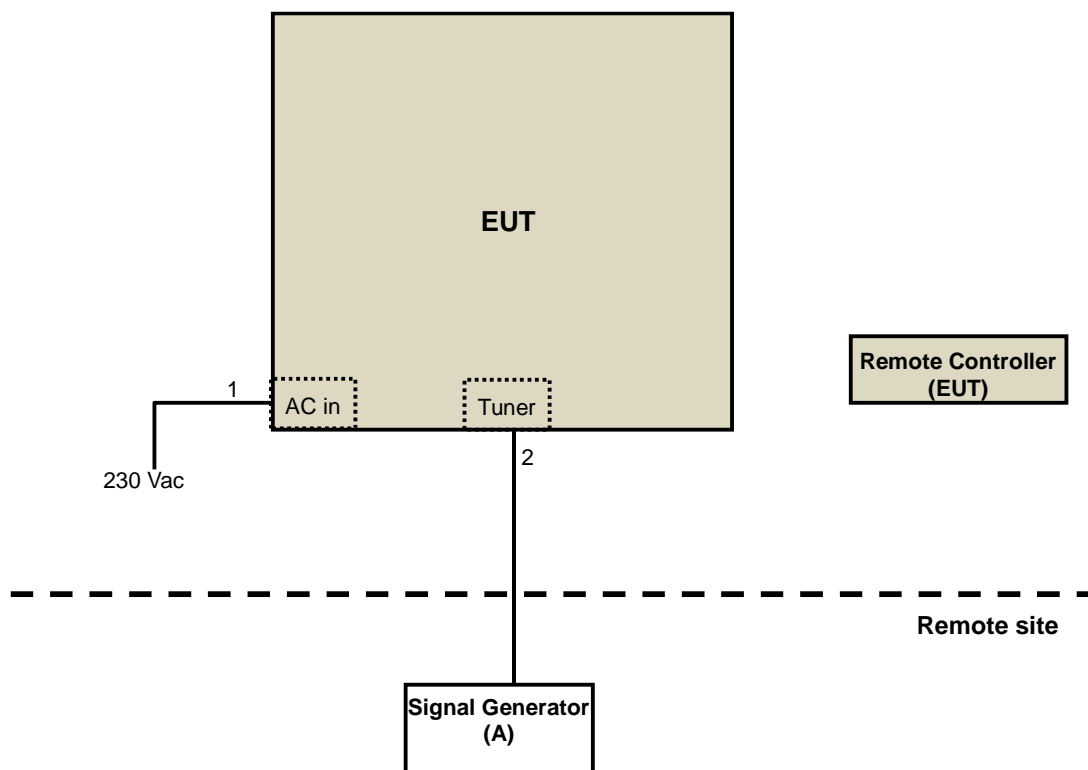
### 2.4 Test Program Used and Operation Description

- a. Turned on the power of all equipment.
- b. Signal Generator sent satellite signal (color bar of 27.5Mbit/s rate, 1 kHz audio signal of 192kbit/s rate, 3/4 code rate and QPSK modulation) to EUT.



### 3 Configuration and Connections with EUT

#### 3.1 Connection Diagram of EUT and Peripheral Devices



#### 3.2 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Signal Generator	Refer to items of test instruments			N/A	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	AC power cord	1	1.5	N	0	Supplied by client
2.	Coaxial cable	1	10	Y	0	Provided by Lab

Note: The core(s) is(are) originally attached to the cable(s).



## 4 Adjacent Signal Selectivity Measurement

### 4.1 Limits

Frequency offset from wanted signal	Power level offset from wanted signal
$-F - 4 \text{ MHz}$	10 dB
$-F - 2 \text{ MHz}$	4 dB
$-F$	0 dB
$F$	0 dB
$F + 2 \text{ MHz}$	4 dB
$F + 4 \text{ MHz}$	10 dB

The required signal to noise ratio in presence of an adjacent signal shall be less than 0.4 dB higher than in absence of adjacent signals.

NOTE 1: In case of amplitude or phase shift keying signals the occupied bandwidth of an ideal signal is  $F = R_s \times (1 + \alpha)$ , where  $R_s$  is the symbol rate and  $\alpha$  is the roll-off.

NOTE 2: The case with frequency offset  $F$  represents carriers sharing a transponder,  
 $F + 2 \text{ MHz}$  represents carriers on adjacent transponders of a satellite,  
 $F + 4 \text{ MHz}$  represents carriers on different satellites.  
Frequency offset is meant between centre frequencies of carriers.

### 4.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Agilent Spectrum Analyzer	E4446A	MY51100050	May 4, 2018	May 3, 2019
BSK RF Signal Generator	SDG-3000	23.46.20.15.08.00.00.31	Mar 17, 2018	Mar 16, 2019
BSK RF Signal Generator	DTV-500	FQC-00725	Mar 17, 2018	Mar 16, 2019
Mini-Circuits Power Splitter	ZFRSC-42-S+	239300718	Dec. 1, 2017	Nov. 31, 2018
Mini-Circuits Combiner	ZFSC-2-2	BF972000417	N/A	N/A

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in TV Test Room.

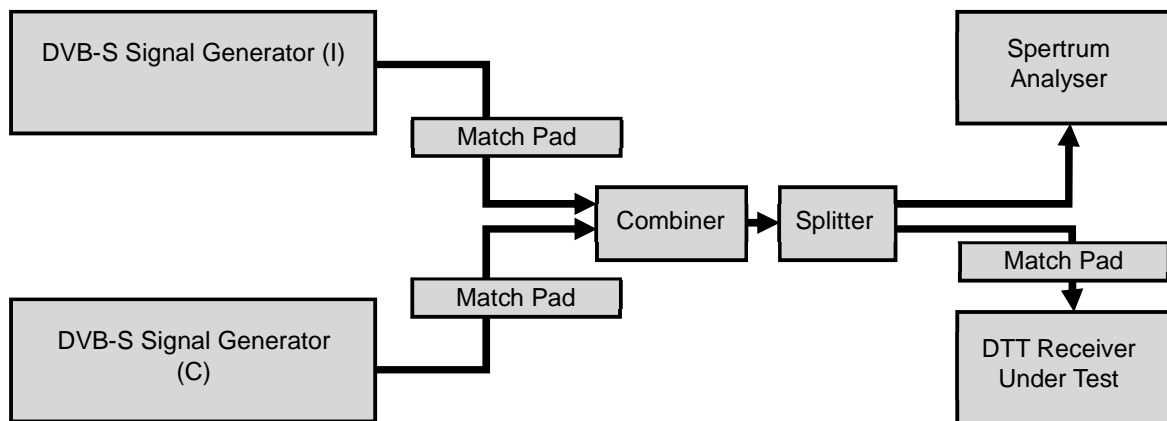




### 4.3 Test Procedure

The steps of the test procedure are given below:

- a) Two test signal generators shall be used. Each signal generator shall generate a modulated signal in the IDU input frequency range and thermal noise.
- b) The signal generators shall be connected to the IDU input through a splitter/combiner.
- c) The symbol rate shall be set to the low end of the IDU's range.
- d) The test signal generators shall be set to the frequencies and levels according to table 1. For each row of the table :
  - a) The IDU shall be set to receiving the signal of the first test signal generator.
  - b) The second test signal generator shall be set to output signal off.
  - c) The noise level (or signal to noise ratio) of the first test signal generator shall be varied in order to determine the threshold for quasi error free reception.
  - d) determine the threshold for quasi error free reception.
  - e) The second signal generator shall be set to output signal on.
  - f) The noise level (or signal to noise ratio) of the first test signal generator shall be varied in order to determine the threshold for quasi error free reception.
  - g) The degradation is equal to the noise level (or signal to noise ratio) determined in step e minus that determined in step c.
- f) Repeat from d) with symbol rate set to the high end of the IDU's range.
- g) The result is the highest degradation found.



### 4.4 Supplementary Information

No deviation



#### 4.5 Test Results

Test Mode	DVB-S			
Environmental Conditions	25 °C, 60% RH, 1011 mbar	Tested by	Cheng Zhong	

Adjacent signal selectivity										
Mode	Frequency (MHz)	Rs	$\alpha$	F-Offset (MHz)	Interfere (MHz)	SNR1 (dB)	SNR2 (dB)	Result (dB)	Limit (dB)	Verdict
DVB_S	1550	45	0.25	-F-4	1489.75	8.96	8.97	-0.01	0.4	PASS
DVB_S	1550	45	0.25	-F-2	1491.75	8.96	8.99	-0.03	0.4	PASS
DVB_S	1550	45	0.25	-F	1493.75	8.96	8.98	-0.02	0.4	PASS
DVB_S	1550	45	0.25	F	1606.25	8.96	8.97	-0.01	0.4	PASS
DVB_S	1550	45	0.25	F+2	1608.25	8.96	8.95	0.01	0.4	PASS
DVB_S	1550	45	0.25	F+4	1610.25	8.96	8.95	0.01	0.4	PASS

Test Mode	DVB-S2			
Environmental Conditions	25 °C, 60% RH, 1011 mbar	Tested by	Cheng Zhong	

Adjacent signal selectivity										
Mode	Frequency (MHz)	Rs	$\alpha$	F-Offset (MHz)	Interfere (MHz)	SNR1 (dB)	SNR2 (dB)	Result (dB)	Limit (dB)	Verdict
DVB_S2	1550	45	0.25	-F-4	1489.75	7.48	7.49	-0.01	0.4	PASS
DVB_S2	1550	45	0.25	-F-2	1491.75	7.48	7.49	-0.01	0.4	PASS
DVB_S2	1550	45	0.25	-F	1493.75	7.48	7.49	-0.01	0.4	PASS
DVB_S2	1550	45	0.25	F	1606.25	7.48	7.48	0.00	0.4	PASS
DVB_S2	1550	45	0.25	F+2	1608.25	7.48	7.49	-0.01	0.4	PASS
DVB_S2	1550	45	0.25	F+4	1610.25	7.48	7.49	-0.01	0.4	PASS

Note:

- 1) "C" means that wanted signal.
- 2) "PASS" is "(Power offset from C Level) – (C Threshold Level)" > "Power offset from C Limit"



## 5 Dynamic Range Measurement

### 5.1 Limits

The IDU shall be able to process without degradation input signals at any level in a range of at least 40 dB.

### 5.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Agilent Spectrum Analyzer	E4446A	MY51100050	May 4, 2018	May 3, 2019
BSK RF Signal Generator	DTV-500	FQC-00725	Mar 17, 2018	Mar 17, 2019
Mini-Circuits Power Splitter	ZFRSC-42-S+	239300718	Dec. 1, 2017	Nov. 31, 2018

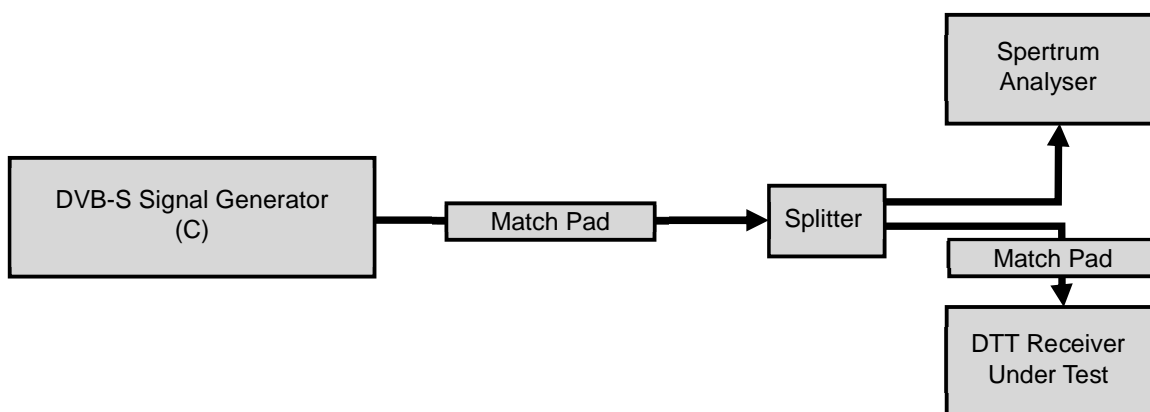
Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. The test was performed in TV(FCC)Test Room.

### 5.3 Test Procedure

The steps of the test procedure are given below:

- a) A test signal generator that generates a modulated signal in the IDU input frequency range shall be used.
- b) The test signal generator shall be connected to the IDU input.
- c) The test signal generator frequency shall be set to the lowest, centre and highest frequency of the IDU input frequency band:
  - a) Set test signal generator level shall be set to lowest, centre and highest level:
    - i) It shall be verified that the IDU demodulates the test modulator signal properly.

Instead of a test modulator, a combination of random bit stream generator, modulator, frequency converter and variable attenuator can be used.





#### 5.4 Supplementary Information

No deviation

#### 5.5 Test Results

Test Mode	DVB-S		
Environmental Conditions	25 °C, 60% RH, 1011 mbar	Tested by	Cheng Zhong

C <sup>1)</sup> centre frequency (MHz)	Level of Receiver (dBm)			Dynamic Range (dB)	Limit (dB)	Result <sup>2)</sup>
	Lowest	Centre	Highest			
950	-88.90	-44.45	0	88.90	>40	Pass
1550	-83.60	-41.80	0	83.60	>40	Pass
2150	-84.60	-42.30	0	84.60	>40	Pass

Note:

- 1) "C" means that wanted signal.  
2) "PASS" is "Dynamic Range"  $\geq$  "Limit".

Test Mode	DVB-S2		
Environmental Conditions	25 °C, 60% RH, 1011 mbar	Tested by	Cheng Zhong

C <sup>1)</sup> centre frequency (MHz)	Level of Receiver (dBm)			Dynamic Range (dB)	Limit (dB)	Result <sup>2)</sup>
	Lowest	Centre	Highest			
950	-90.20	-45.10	0	90.20	>40	Pass
1550	-84.90	-42.45	0	84.90	>40	Pass
2150	-86.40	-43.20	0	86.40	>40	Pass

Note:

- 3) "C" means that wanted signal.  
"PASS" is "Dynamic Range"  $\geq$  "Limit".



**6 Pictures of Test Arrangements**





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## 7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

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