0161800004 显示板测试说明书

0161800004 Display Board Test Manual

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一、概述 summary

本产品为商用工业洗衣机用 7 寸屏显示板，专用号为 0161800004，额定电压为 12V DC，WIFI 频段为 2.4GHz。

This product is a 7-inch screen display board for commercial industrial washing machines, with the special number 0161800004. The rated voltage is 12V DC and the WIFI frequency band is 2.4GHz.

1.1 测试工具 test tools

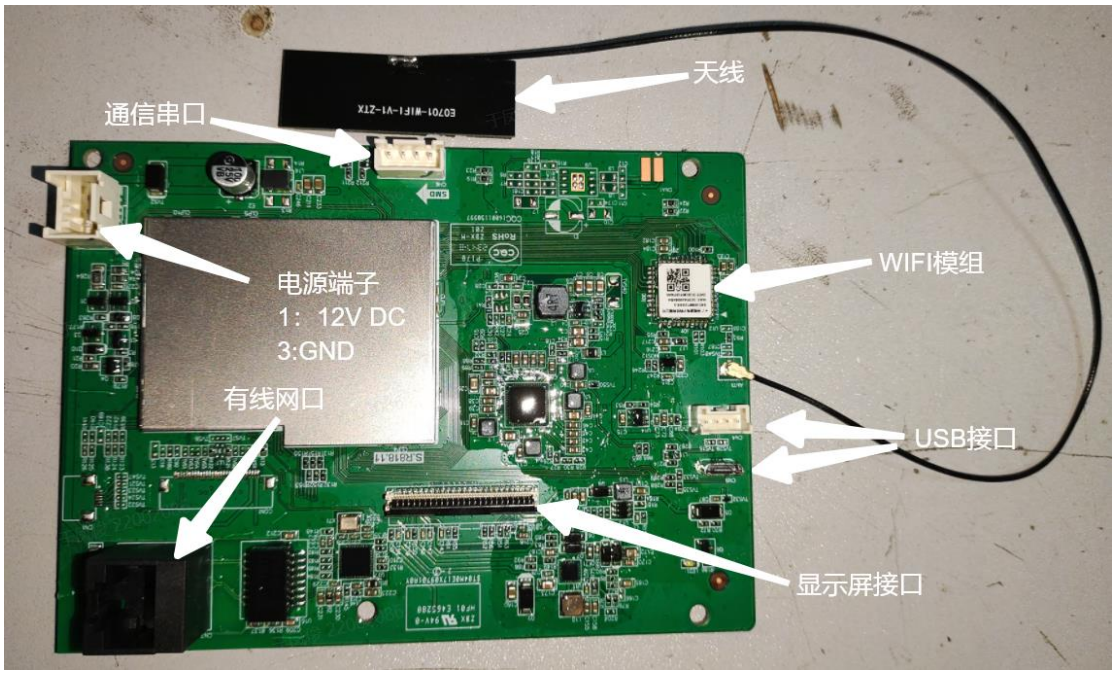
1）电路板一套（包含 PCB 天线）

A set of circuit boards (including PCB antennas)

2）USB 转串口数据线

USB to serial data cable

1.2 外观及接口说明 Appearance and Interface Description



1.3 开机 Power on

给电路板通电 12V DC 后即可开机。

After powering on the circuit board with 12V DC, it can be turned on.

二、WIFI 测试工具 WIFI testing tool

rtwpriv

1、需把文件拷入主板对应路径：

把上面文件放入 U 盘根目录，接入板卡，串口进入 U 盘根目录，输入如下指令：

To copy the file to the corresponding path on the motherboard:
Put the above file into the root directory of the USB drive, connect it to the board, and use the serial port to enter the root directory of the USB drive. Enter the following command:

cp ./rtwpriv /system/bin
chmod 777 /system/bin/./rtwpriv

提示只读文件时，可尝试如下授权指令（授权指令也不行时，可拷入 data 路径下）
When prompted for a read-only file, you can try the following authorization instructions (if the authorization instructions do not work, you can copy them into the data path)

mount -o remount,rw /
mount -o remount,rw /system

当 /system/bin 路径无法拷入时，可拷入 data 路径下：
When the/system/bin path cannot be copied, it can be copied to the data path:

cp ./rtwpriv /data
chmod 777 /data/./rtwpriv
(CCK 1M=2,CCK 11M=22,OFDM 6M=12 ,OFDM 54M=108 ,MCS0=128 ,MCS7=135,MCS15=143
ac 模式 MCS0=160 MCS8=168 MCS9=169)

注：拷入成功后，即可输入对应定频命令。
Note: After successful copying, you can enter the corresponding fixed frequency command.

(CCK 1M=2,CCK 11M=22,OFDM 6M=12 ,OFDM 54M=108 ,MCS0=128 ,MCS7=135,MCS15=143
ac 模式 MCS0=160 MCS8=168 MCS9=169)

注：进入 U 盘根目录方法：先输入 df，查看 U 盘的路径，然后输入 cd /mnt/XXX/xxx 进入 U 盘根目录。
Note: To enter the root directory of a USB drive, first enter df to view the path of the USB drive, and then enter cd/mnt/XXX/xxx to enter the root directory of the USB drive.

三、WIFI 测试指令 WIFI test instruction

3.1 TX 定频 TX fixed frequency：
拷贝到 system 下，输入如下定频指令：
Copy to the system and input the following fixed frequency command:

ifconfig wlan0 up

./rtwpriv wlan0 mp_start
./rtwpriv wlan0 mp_channel 42
./rtwpriv wlan0 mp_bandwidth 40M=2,shortGI=0
./rtwpriv wlan0 mp_ant_tx a

./rtwpriv wlan0 mp_rate 169
./rtwpriv wlan0 mp_get_txpower
./rtwpriv wlan0 mp_ctx background,pkt
./rtwpriv wlan0 mp_pwrctldm start

注：#设置信道
Note: # Set Channel

5G：
CH36:5180MHz
CH48:5240MHz
CH46:5230MHz
CH100:5500MHz
CH165:5825MHz
CH38:5190MHz
CH102:5510MHz
CH149:5745MHz
CH151:5755MHz
CH159:5795MHz
CH42:5210MHz
CH106:5530MHz
CH155:5775MHz
CH165:5825MHz

注：mp_bandwidth 40M=0 代表带宽，0 为 20M，1 为 40M，2 为 80M
mp_ant_tx a 代表天线类型，a 为主天线，b 为副天线
Note: mp'bandwidth 40M=0 represents bandwidth, 0 is 20M, 1 is 40M, and 2 is 80M
Mp-ant_tx a represents the antenna type, where a is the main antenna and b is the secondary antenna

注：mp_rate 2 代表速度，按照如下原则填写：
Note: mp_rate 2 represents speed, fill in according to the following principles:

(CCK 1M=2,CCK 11M=22,OFDM 6M=12 ,OFDM 54M=108 ,MCS0=128 ,MCS7=135,MCS15=143
ac 模式 MCS0=160 MCS8=168 MCS9=169)

拷入 data 路径下输入如下定频指令：
Copy the data path and input the following fixed frequency command:

ifconfig wlan0 up

./rtwpriv wlan0 mp_ctx stop
./rtwpriv wlan0 mp_start
./rtwpriv wlan0 mp_channel 7

./rtwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
./rtwpriv wlan0 mp_ant_tx a
./rtwpriv wlan0 mp_rate 135
./rtwpriv wlan0 mp_get_txpower
./rtwpriv wlan0 mp_ctx background,pkt
./rtwpriv wlan0 mp_pwrctldm start

3.2 TX，停止定频 TX, stop fixed frequency
./rtwpriv wlan0 mp_ctx stop

rtwpriv wlan0 mp_ctx stop

3.3 RX 定频 RX fixed frequency
ifconfig wlan0 up

./rtwpriv wlan0 mp_arx stop
./rtwpriv wlan0 mp_reset_stats
./rtwpriv wlan0 mp_stop
./rtwpriv wlan0 mp_start
./rtwpriv wlan0 mp_channel 1
./rtwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
./rtwpriv wlan0 mp_ant_rx a
./rtwpriv wlan0 mp_arx start
./rtwpriv wlan0 mp_arx phy

./rtwpriv wlan0 mp_arx stop
./rtwpriv wlan0 mp_reset_stats
./rtwpriv wlan0 mp_stop
./rtwpriv wlan0 mp_start
./rtwpriv wlan0 mp_channel 7
./rtwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
./rtwpriv wlan0 mp_ant_rx a
./rtwpriv wlan0 mp_arx start
./rtwpriv wlan0 mp_arx phy

./rtwpriv wlan0 mp_arx stop
./rtwpriv wlan0 mp_reset_stats
./rtwpriv wlan0 mp_stop
./rtwpriv wlan0 mp_start
./rtwpriv wlan0 mp_channel 13
./rtwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
./rtwpriv wlan0 mp_ant_rx a
./rtwpriv wlan0 mp_arx start
./rtwpriv wlan0 mp_arx phy

rtwpriv wlan0 mp_arx stop
rtwpriv wlan0 mp_reset_stats
rtwpriv wlan0 mp_stop
rtwpriv wlan0 mp_start
rtwpriv wlan0 mp_channel 1
rtwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
rtwpriv wlan0 mp_ant_rx a
rtwpriv wlan0 mp_arx start

RX 统计收包数：
RX statistics of packet received:

./rtwpriv wlan0 mp_arx phy
rtwpriv wlan0 mp_arx phy

wpa_cli -i wlan0
scan
scan_results
remove_network 0
add_network
set_network 0 ssid "CMW-AP"
set_network 0 key_mgmt NONE
select_network 0

scan
scan_results
remove_network 0
add_network
set_network 0 ssid "CMW-AP"
set_network 0 psk "12345678"
select_network 0

wpa_cli -i wlan0
scan
scan_results
remove_network 0
add_network
set_network 0 ssid "CVT_IoT"
set_network 0 psk "12345678"
select_network 0

3.4 TX 定频（SRRC 认证单载波测试项）：

TX fixed frequency (SRRC certified single carrier test item)：

ifconfig wlan0 up
./rtwpriv wlan0 mp_start
./rtwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
./rtwpriv wlan0 mp_channel 1
./rtwpriv wlan0 mp_ant_tx a
./rtwpriv wlan0 mp_rate 2
./rtwpriv wlan0 mp_pwrctldm start
./rtwpriv wlan0 mp_ctx background,stone

//SRRC 认证单载波测试项，6022 没发调试，不用测试，所有 RTK 都按照这个来，如果不行需安装 APK 测试
//SRRC certification single carrier test item, 6022 has not been sent for debugging, there is no need for testing. All RTKs are tested according to this, and if not, APK testing needs to be installed

备注：就是 TX 发包指令的最后一行./rtwpriv wlan0 mp_ctx background,pkt 换成./rtwpriv wlan0 mp_ctx background,stone
Note: This is the last line of the TX contract instruction/ Rtwpriv wlan0 mp_ctx background, pkt changed to/ Rtwpriv wlan0 mp_ctx background, stone

3.5、查功率因子：Check power factor
ifconfig wlan0 up
./rtwpriv wlan0 mp_start
./rtwpriv wlan0 mp_bandwidth 40M=1,shortGI=0
./rtwpriv wlan0 mp_channel 11
./rtwpriv wlan0 mp_ant_tx a
./rtwpriv wlan0 mp_rate 135
./rtwpriv wlan0 mp_get_txpower 0

rtwpriv wlan0 mp_start
rtwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
rtwpriv wlan0 mp_channel
rtwpriv wlan0 mp_ant_tx a
rtwpriv wlan0 mp_rate 22
rtwpriv wlan0 mp_get_txpower 0

(CCK 1M=2,CCK 11M=22,OFDM 6M=12 ,OFDM 54M=108 ,MCS0=128 ,MCS7=135,MCS15=143
Ac MODE MCS0=160 MCS8=168 MCS9=169)

查 IP: ifconfig
Check IP: ifconfig

打开无线： svc wifi enable

Turn on wireless: svc wifi enable

关闭无线：svc wifi disable
Turn off wireless: svc wifi disable

四、WIFI 模组参数 WIFI module parameters

4.1 IEEE 802.11b Section

Items	**Contents**				
Specification	IEEE802.11b				
Mode	CCK				
Channel	CH1 to CH13				
Data rate	1, 2, 5.5, 11Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels(Calibrated)					
1) For antenna port	15	17	19	dBm	1Mbs
	14	16	18	dBm	11Mbs
2. Spectrum Mask @ target power					
1) fc +/-11MHz to +/-22MHz			-30	dBr	
2) fc > +/-22MHz			-50	dBr	
3 Constellation Error(EVM)@ target power					
1) 1Mbps			-10	dB	
2) 2Mbps			-10	dB	
3) 5.5Mbps			-10	dB	
4) 11Mbps			-10	dB	
4. Frequency Error	-15		-15	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	Remark
5 Minimum Input Level Sensitivity (each chain)					
1) 1Mbps (FER ≦8%)			-91	dBm	
2) 2Mbps (FER ≦8%)			-89	dBm	
3) 5.5Mbps (FER ≦8%)			-87	dBm	
4) 11Mbps (FER ≦8%)			-85	dBm	
6 Maximum Input Level (FER ≦8%)	-8			dBm	

4.2 IEEE 802.11g Section

Items	**Contents**				
Specification	IEEE802.11g				
Mode	OFDM				
Channel	CH1 to CH13				
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels(Calibrated)					
1) For antenna port	15	17	19	dBm	6Mbs

	12	14	16	dBm	54Mbs
2. Spectrum Mask @ target power					
1) at fc +/-11MHz			-20	dBr	
2) at fc +/-20MHz			-28	dBr	
3) at fc > +/-30MHz			-40	dBr	
3 Constellation Error(EVM)@ target power					
1) 6Mbps			-5	dB	
2) 9Mbps			-8	dB	
3) 12Mbps			-11	dB	
4) 18Mbps			-14	dB	
5) 24Mbps			-17	dB	
6) 36Mbps			-20	dB	
7) 48Mbps			-23	dB	
8) 54Mbps			-25	dB	
4. Frequency Error	-15		-15	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	Remark
5 Minimum Input Level Sensitivity (each chain)					
1) 6Mbps			-87	dBm	
2) 9Mbps			-86	dBm	
3) 12Mbps			-84	dBm	
4) 18Mbps			-82	dBm	
5) 24Mbps			-79	dBm	
6) 36Mbps			-75	dBm	
7) 48Mbps			-71	dBm	
8) 54Mbps			-70	dBm	
6 Maximum Input Level (FER ≦8%)	-20			dBm	

4.3 IEEE 802.11n HT20 Section

Items	**Contents**				
Specification	IEEE802.11n HT20 @ 2.4GHz				
Mode	OFDM				
Channel	CH1 to CH13				
Data rate	MCS0/1/2/3/4/5/6/7				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels					
1) For antenna port	15	17	19	dBm	MCS0
	11	13	15	dBm	MCS7
2. Spectrum Mask @ target power					
1) at fc +/-11MHz			-20	dBr	
2) at fc +/-20MHz			-28	dBr	
3) at fc > +/-30MHz			-45	dBr	
3 Constellation Error(EVM)@ target power					

1) MCS0			-14	dB	
2) MCS1			-16	dB	
3) MCS2			-18	dB	
4) MCS3			-20	dB	
5) MCS4			-22	dB	
6) MCS5			-24	dB	
7) MCS6			-26	dB	
8) MCS7			-28	dB	
4. Frequency Error	-15		-15	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	Remark
5 Minimum Input Level Sensitivity (each chain)					
1) MCS0(PER ≦10%)			-87	dBm	
2) MCS1(PER ≦10%)			-84	dBm	
3) MCS2(PER ≦10%)			-82	dBm	
4) MCS3(PER ≦10%)			-79	dBm	
5) MCS4(PER ≦10%)			-75	dBm	
6) MCS5(PER ≦10%)			-71	dBm	
7) MCS6(PER ≦10%)			-70	dBm	
8) MCS7(PER ≦10%)			-69	dBm	
6 Maximum Input Level (FER ≦8%)	-20			dBm	

4.4 IEEE 802. .11n HT40 Section

Items	**Contents**				
Specification	IEEE802.11n HT40 @ 2.4GHz				
Mode	OFDM				
Channel	CH3 to CH11				
Data rate	MCS0/1/2/3/4/5/6/7				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels					
1) For antenna port	15	17	19	dBm	MCS0
	11	13	15	dBm	MCS7
2. Spectrum Mask @ target power					
1) at fc +/-22MHz			-20	dBr	
2) at fc +/-40MHz			-28	dBr	
3) at fc > +/-60MHz			-45	dBr	
3 Constellation Error(EVM)@ target power					
1) MCS0			-14	dB	
2) MCS1			-16	dB	
3) MCS2			-18	dB	
4) MCS3			-20	dB	
5) MCS4			-22	dB	
6) MCS5			-24	dB	

7) MCS6			-26	dB	
8) MCS7			-28	dB	
4. Frequency Error	-15		-15	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	Remark
5 Minimum Input Level Sensitivity (each chain)					
1) MCS0(PER ≦10%)			-84	dBm	
2) MCS1(PER ≦10%)			-81	dBm	
3) MCS2(PER ≦10%)			-79	dBm	
4) MCS3(PER ≦10%)			-76	dBm	
5) MCS4(PER ≦10%)			-72	dBm	
6) MCS5(PER ≦10%)			-68	dBm	
7) MCS6(PER ≦10%)			-67	dBm	
8) MCS7(PER ≦10%)			-66	dBm	
6 Maximum Input Level (FER ≦8%)	-20			dBm	

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device.

FCC Radiation Exposure Statement
This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

KDB 996369 D03 statements

2.2 List of applicable FCC rules:

The module complies with FCC Part 15.247.

FCC ID: 2BE4X-WSTR25 on User manual and on the external of the packaging.

2.3 Summarize the specific operational use conditions

The module has been certified for mobile applications. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

2.4 Limited module procedures

The module is not a limited module.

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

This equipment complies with FCC's RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must not be collocated or operating
in conjunction with any other antenna or transmitter.

2.7 Antennas

Antenna Type: PIFA Antenna

Antenna gain: 4.43 dBi

Nominal Impedance:50Ω

Dimensions-mm: 57.0*22.6*1.0mm

2.8 Label and compliance information

The host system using this module, should have label in a visible area indicated the following texts: "Contains Transmitter Module FCC ID: 2BE4X-WSTR25 Or Contains FCC ID: 2BE4X-WSTR25"

2.9 Information on test modes and additional testing requirements

When testing host product, the host manufacture should follow FCC KDB Publication 996369 D04 Module Integration Guide for testing the host products. The host manufacturer may operate their product during the measurements. In setting up the configurations, if the pairing and call box options for testing does not work, then the host product manufacturer should coordinate with the module manufacturer for access to test mode software.

2.10 Additional testing, Part 15 Subpart B disclaimer

The module without unintentional-radiator digital circuity, so the module does not require an evaluation by FCC Part 15 Subpart B. The host shoule be evaluated by the FCC Subpart B.

2.11 Note EMI Considerations

host manufacture is recommended to use D04 Module Integration Guide recommending as
"best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties

2.12 How to make changes

This module is stand-alone modular. If the end product will involve the Multiple simultaneously
transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system. According to the KDB 996369 D02 Q&A Q12, that a host manufacture only needs to do an evaluation (i.e., no C2PC required when no emission exceeds the limit of any individual device (including unintentional radiators) as a composite. The host manufacturer must fix any failure.