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A decorative graphic consisting of three overlapping, light gray, L-shaped outlines that form a larger, irregular shape. The outlines are thick and have rounded corners.

Operation about MIC audio test

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CONTENT

一、 REVISION RECORDS	错误!未定义书签。
二、 PREFACE INTRODUCTION.....	4
三、 HARDWARE INTRODUCTION.....	5
3.1 12V POWER INTERFACE.....	5
3.2 NETWORK PORT	5
3.3 DIGITAL MIC MEASUREMENT INTERFACE	6
3.4 DIAL SWITCH.....	6
3.5 AUDIO OUTPUT INTERFACE	7
3.6 ANALOG MIC TEST INTERFACE.....	8
四、 SOFTWARE INTERFACE	8
4.1 ADD TEST STEPS	8
4.2 CONFIGURATION VOLTAGE.....	8
4.3 CONNECT THE AUDIO TEST MODULE	9
4.4 ANALOG AUDIO OUTPUT	9
4.5 ENABLE CONTROL.....	10
4.6 MIC MEASUREMENT	10
4.7 END OF TEST.....	12
4.8 SELF-CHECK :	12
五、 MATTERS NEEDING ATTENTION	12
六、 END	13

二、Preface introduction

The audio comprehensive tester can test consumer audio, automotive electronics and other audio products, such as mobile phones, headphones, speakers, players, power



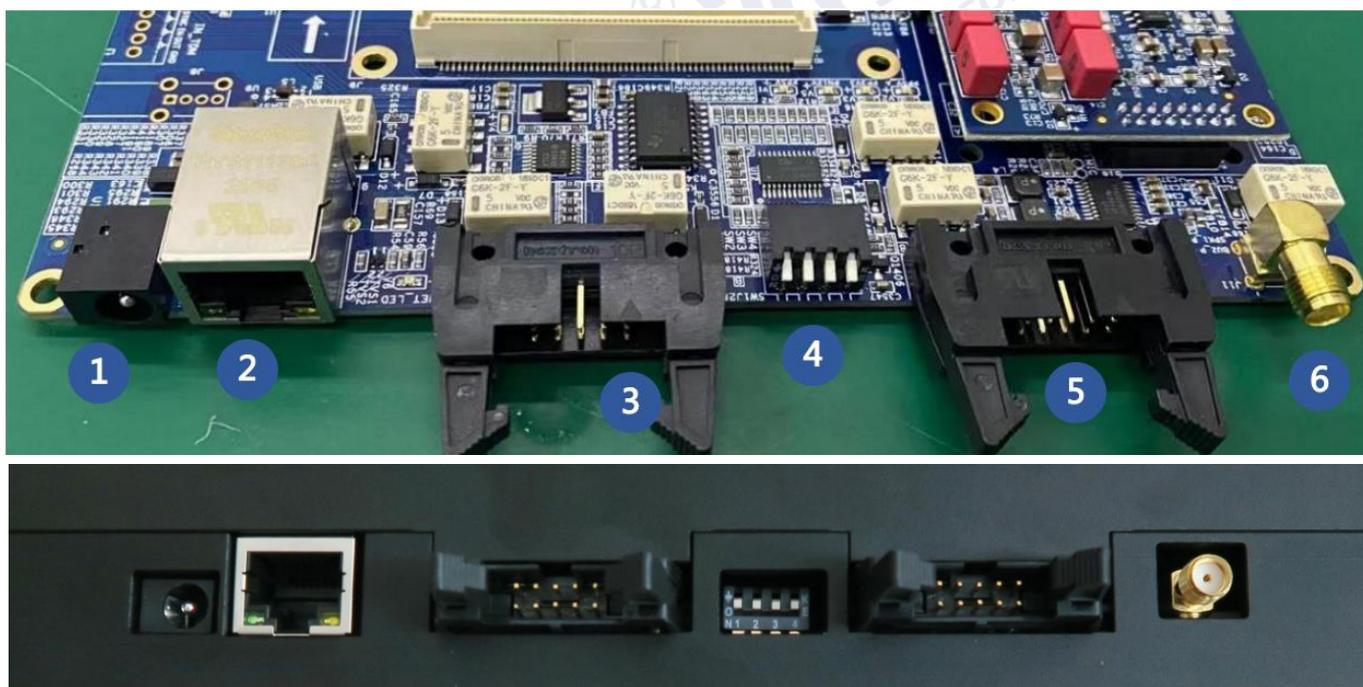
amplifiers, home cinemas, televisions, set-top boxes, automotive multimedia hosts, etc. It is suitable for rapid testing of production line and R & D testing.

It can realize fast audio, simple and convenient operation, and support automatic testing. Support analog / digital input and analog output, up to 192K digital sampling rate, and multiple test functions, including audio output, signal acquisition, audio file analysis, etc.

Basic	
Analog input	2 Channel audio signal input
Analog output	1 Channel audio signal output
Data output format	I2S
Digital audio PDM	1 Channel PDM input
Analyzer performance (analog input)	
Input impedance	Hi-Z
Input range	0-2Vrms
Input bandwidth	20kHz
sampling rate	≤192kHz
ADC resolving power	24 bits
THD measure	-105dB (2Vrms@1kHz sine wave)
THD+N measure	-99 dB (2Vrms@1kHz sine wave)
Digital audio PDM THD+N measure	-106dB (@1kHz sine wave)
Frequency measurement accuracy	±3ppm
Signal generator performance (analog output)	
Sinusoidal frequency range	20Hz~10kHz

Output range	0-2.3Vrms (without DC offset)
DAC sampling rate	≤192kHz
DAC resolving power	24Bit
Output THD	-107.3dB (3Vpp@1kHz)
Output THD+N	-102.1 dB (2Vpp@1kHz)
Amplitude accuracy	(1KHz) ±1%dB (+15°C至+30°C)
Output frequency accuracy	±3ppm
PDM	
PDM Data rate	6.144MHz

三、Hardware introduction



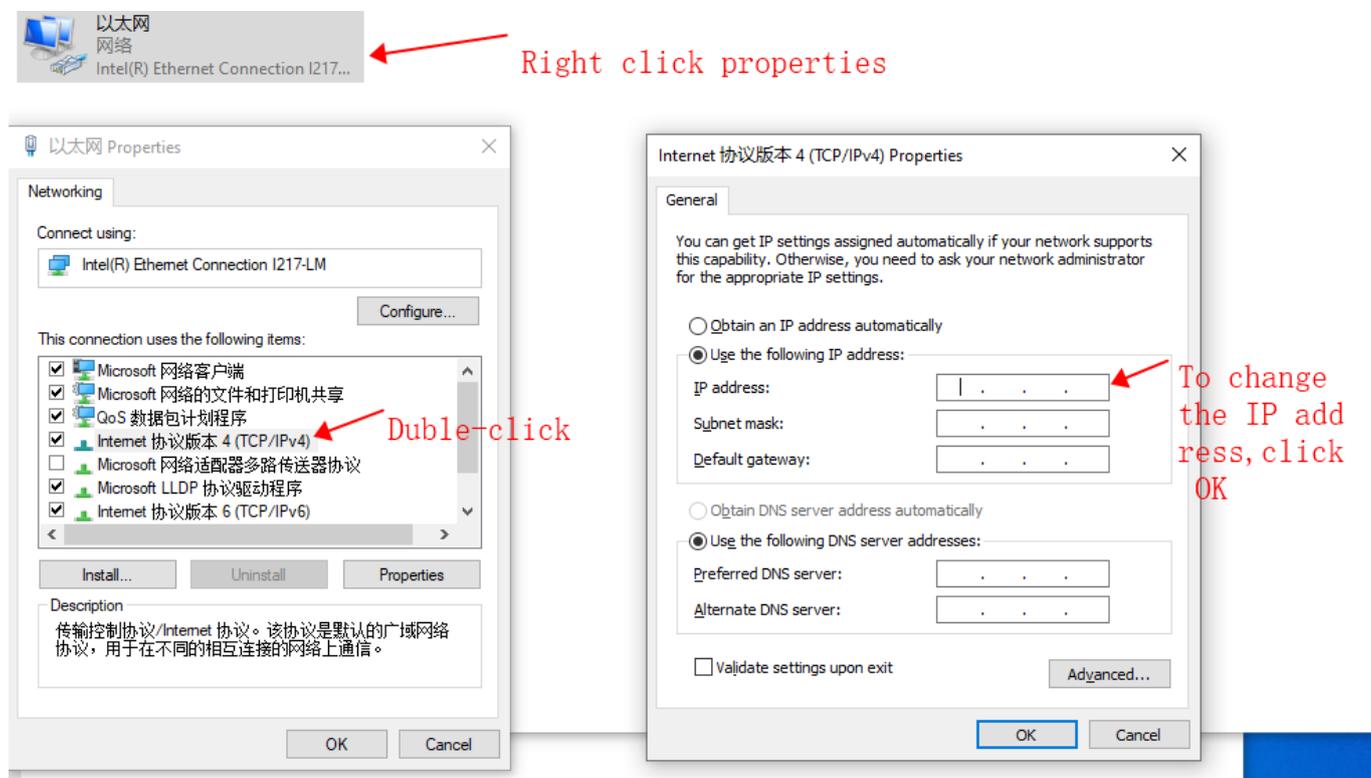
3.1 12V power interface

The module adopts 12V power supply, and the interface is facing its own direction (Note: the old version is left negative and right positive, and the new version is directly inserted).

3.2 Network port

The network interface communication is adopted between the module and the computer. Therefore, before the test, it is necessary to configure the network parameters, connect the other end of the network cable to the computer, and set the local IP of the

computer in the same network segment as the tester (169.254.1 × ×) , As shown in the figure below:



3.3 Digital mic measurement interface

Signal	CLK	GND	SDA	Vocal tract	VCC
Pin serial number	1	3	5	7(Left vocal tract)	9
Pin serial number	2	4	6	8(Right)	10

3.4 Dial switch

The module adopts network port communication. The position of the dial switch corresponds to the physical address of the board. When all the four digit dial codes are turned down, the IP address of the board is 169.254.1.32 (0 when turned down and 1

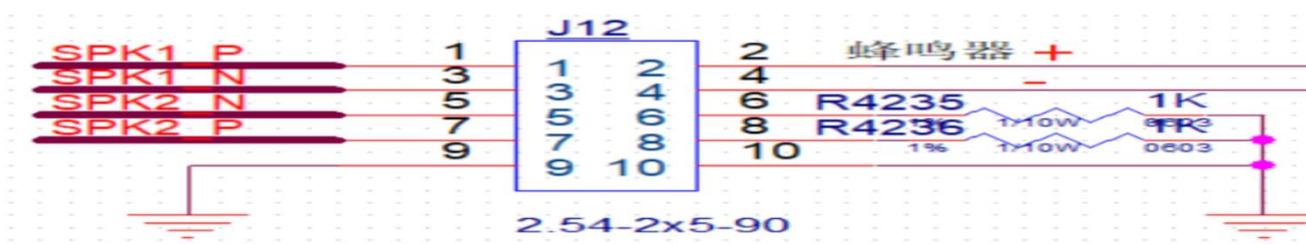
when turned up). Power on again after changing the dial code every time. The remote box needs to input the corresponding IP address after changing and connect again.

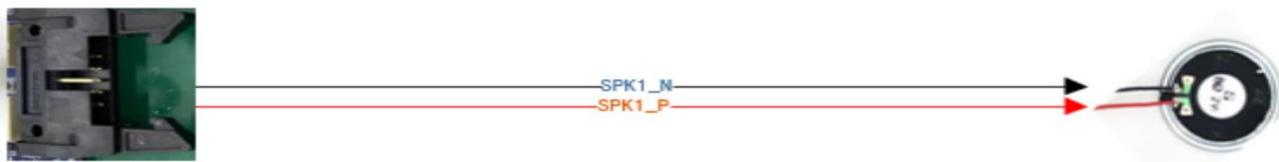
Position and corresponding address of dial switch on board:

4 位	3 位	2 位	1 位	IP
0	0	0	0	169.254.1.32
0	0	0	1	169.254.1.33
0	0	1	0	169.254.1.34
0	0	1	1	169.254.1.35
0	1	0	0	169.254.1.36
0	1	0	1	169.254.1.37
0	1	1	0	169.254.1.38
0	1	1	1	169.254.1.39
1	0	0	0	169.254.1.40
1	0	0	1	169.254.1.41
1	0	1	0	169.254.1.42
1	0	1	1	169.254.1.43
1	1	0	0	169.254.1.44
1	1	0	1	169.254.1.45
1	1	1	0	169.254.1.46
1	1	1	1	169.254.1.47

3.5 Audio output interface

Pin serial number	1	2	3	4	5
Definition	SPK1-P	SPK1-N	SPK2-N	SPK2-P	GND
Pin serial number	6	7	8	9	10
Definition	Buzzer positive	Buzzer negative	GND	GND	GND





3.6 Analog mic test interface

Adu_ P: Simulate out of MIC;

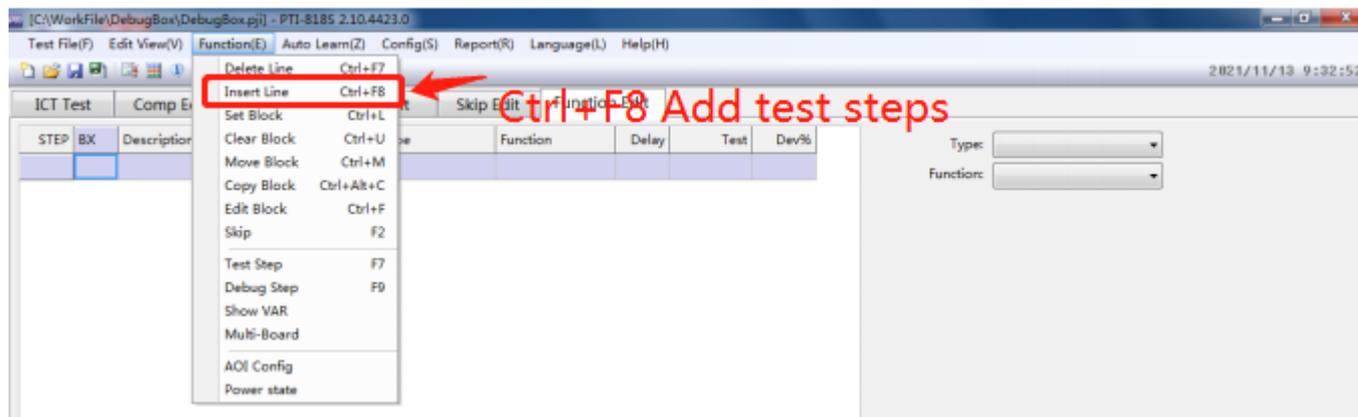
Adu_ N: Simulate the GND of MIC.



四、 software interface

4.1 Add test steps

When the program in the function editing interface cannot be used as a fixture, it will be generated automatically. When it needs to be debugged, add it manually. Enter the function and press Ctrl + F8.



4.2 Configuration voltage

Configure the voltage XV1 mode for MIC operation. The 0-20V mode is adjustable. The power supply is supplied by DTM board. It is generally used for analog mic power supply.

The voltage of digital mic interface does not need to be connected separately (for details of voltage configuration, refer to the instructions for use of pti818s power module).

STEP	BX	Description	Module	Type	Function	Delay	Test	Dev%
1	B1	Turn on the relay	Digital module	GPIO	write	0		
2	B1	Configure mic opera	Power module	configure	XV1	0		
3	B1	Power on	Power module	power on	XV1	0		
4	B1	Connect mic test box	FD_Audio	WaveTest	Connect	0		
5	B1	Set gain resistance	FD_Audio	WaveTest	Gain	0		
6	B1	Set analog audio out	FD_Audio	WaveTest	AnalogControl	0		
7	B1	Set speaker output	FD_Audio	WaveTest	Output	0		
8	B1	Analog mic measure	FD_Audio	WaveTest	MicMes	0		
9	B1	Speaker stop output	FD_Audio	WaveTest	OutStop	0		
10	B1	Close analog mic	FD_Audio	WaveTest	AnalogControl	0		
11	B1	Close mic	FD_Audio	WaveTest	Close	0		
12	B1	power off	Power module	power off	XV1	0		
13	B1	Turn off the relay	Digital module	GPIO	write	0		

Edit MIC power on procedure

Type:
 Function:
 Chnl:
 Connect to ATM:
 Vol(V):
 Cur(mA):
 Std Val:
 Edit MIC supply Vol and Cur
 +%:
 -%:
 Delay:
 FN Ri:

4.3 Connect the audio test module

There is a group of dial switches on the audio test module, which can select up to 16 addresses. Connect according to the address you set. After editing, you can click test to confirm whether the connection is successful. Do not connect immediately after power on. Wait 1-2 minutes and click to test whether the connection is OK. It takes a certain time to initialize the module after power on.

STEP	BX	Description	Module	Type	Function	Delay	Test	Dev%
1	B1	Turn on the relay	Digital module	GPIO	write	0		
2	B1	Configure mic opera	Power module	configure	XV1	0		
3	B1	Power on	Power module	power on	XV1	0		
4	B1	Connect mic test box	FD_Audio	WaveTest	Connect	0		
5	B1	Set gain resistance	FD_Audio	WaveTest	Gain	0		
6	B1	Set analog audio out	FD_Audio	WaveTest	AnalogControl	0		
7	B1	Set speaker output	FD_Audio	WaveTest	Output	0		
8	B1	Analog mic measure	FD_Audio	WaveTest	MicMes	0		
9	B1	Speaker stop output	FD_Audio	WaveTest	OutStop	0		
10	B1	Close analog mic	FD_Audio	WaveTest	AnalogControl	0		
11	B1	Close mic	FD_Audio	WaveTest	Close	0		
12	B1	power off	Power module	power off	XV1	0		
13	B1	Turn off the relay	Digital module	GPIO	write	0		

Type:
 Function:
 Device:
 Addr(IP:port):
 Connect Test: Edit MIC physical address
 Delay(ms):

4.4 Analog audio output

The mic analog audio output interface is used to control the audio output (using

speakers), the output frequency is 20Hz ~ 10000hz programmable, and the voltage is 0-2300mv programmable. Select the audio output channel according to the hardware wiring, or select the buzzer as the sound source signal output.

STEP	BX	Description	Module	Type	Function	Delay	Test	Dev%
1	B1	Turn on the relay	Digital module	GPIO	write	0		
2	B1	Configure mic opera	Power module	configure	XV1	0		
3	B1	Power on	Power module	power on	XV1	0		
4	B1	Connect mic test box	FD_Audio	WaveTest	Connect	0		
5	B1	Set gain resistance	FD_Audio	WaveTest	Gain	0		
6	B1	Set analog audio out	FD_Audio	WaveTest	AnalogControl	0		
7	B1	Set speaker output	FD_Audio	WaveTest	Output	0		
8	B1	Analog mic measure	FD_Audio	WaveTest	MicMes	0		
9	B1	Speaker stop output	FD_Audio	WaveTest	OutStop	0		
10	B1	Close analog mic	FD_Audio	WaveTest	AnalogControl	0		
11	B1	Close mic	FD_Audio	WaveTest	Close	0		
12	B1	power off	Power module	power off	XV1	0		
13	B1	Turn off the relay	Digital module	GPIO	write	0		

Type: WaveTest

Function: Output

Device: 1

Chl: spk1

Cabrtn: off

Freq(Hz): 3000

Vrms(mV): 1800

Delay(ms): 0

Configure the analog audio output frequency , and configure the output frequency and voltage

4.5 Enable control

Control audio test and audio output enable. At present, enable switches are required for analog mic test interface, digital mic test interface and analog audio output interface.

STEP	BX	Description	Module	Type	Function	Delay	Test	Dev%
1	B1	Turn on the relay	Digital module	GPIO	write	0		
2	B1	Configure mic opera	Power module	configure	XV1	0		
3	B1	Power on	Power module	power on	XV1	0		
4	B1	Connect mic test box	FD_Audio	WaveTest	Connect	0		
5	B1	Set gain resistance	FD_Audio	WaveTest	Gain	0		
6	B1	Set analog audio out	FD_Audio	WaveTest	AnalogControl	0		
7	B1	Set speaker output	FD_Audio	WaveTest	Output	0		
8	B1	Analog mic measure	FD_Audio	WaveTest	MicMes	0		
9	B1	Speaker stop output	FD_Audio	WaveTest	OutStop	0		
10	B1	Close analog mic	FD_Audio	WaveTest	AnalogControl	0		
11	B1	Close mic	FD_Audio	WaveTest	Close	0		
12	B1	power off	Power module	power off	XV1	0		
13	B1	Turn off the relay	Digital module	GPIO	write	0		

Type: WaveTest

Function: AnalogControl

Device: 1

Analog audio output enable

Analog audio output channel 1

Analog audio output channel 2

Analog audio test enable on

Analog audio test enable off

Delay(ms): 0

Enable options

4.6 Mic measurement

Mic measurement is divided into analog mic measurement and digital mic measurement, which can be selected according to their own mic type.

Retest of defects: the number of retests after defects is mainly to improve the pass through rate. After triggering the test, the acquisition time of the module is 100ms. Other

signals may be collected within 100ms, resulting in test misjudgment. Therefore, increasing the number of retests and improving the test pass through rate.

Frequency standard: the frequency of the sound generating device collected by mic.

VPP: amplitude.

Voltage: voltage.

Thd: total harmonic distortion.

Thd-n: noise.

Set according to test conditions and requirements.

The test parameters of digital mic are the same as those of analog mic, but the difference is that the interface used to test analog mic and digital MIC is different. In the parameter setting, set the left and right channels according to the wiring. Other parameters can be left blank by default. In addition, the output voltage of the digital mic needs to be set. The output voltage of the digital MIC is on the 10PIN interface, and the output level of 3.3V or 1.8V can be selected.

STEP	BX	Description	Module	Type	Function	Delay	Test	Dev%
1	B1	Turn on the relay	Digital module	GPIO	write	0		
2	B1	Configure mic opera	Power module	configure	XV1	0		
3	B1	Power on	Power module	power on	XV1	0		
4	B1	Connect mic test box	FD_Audio	WaveTest	Connect	0		
5	B1	Set gain resistance	FD_Audio	WaveTest	Gain	0		
6	B1	Set analog audio out	FD_Audio	WaveTest	AnalogControl	0		
7	B1	Set speaker output	FD_Audio	WaveTest	Output	0		
8	B1	Analog mic measure	FD_Audio	WaveTest	MicMes	0		
9	B1	Speaker stop output	FD_Audio	WaveTest	OutStop	0		
10	B1	Close analog mic	FD_Audio	WaveTest	AnalogControl	0		
11	B1	Close mic	FD_Audio	WaveTest	Close	0		
12	B1	power off	Power module	power off	XV1	0		
13	B1	Turn off the relay	Digital module	GPIO	write	0		

Type: WaveTest

Function: MicMes

Device: 1

Cabrtn: off

Retry: 0

Freq(Hz): 3000

FreqTest(Hz): 3000

FreqPst(%): 10

VPP(mV): 186

VppTest(mV): 184

VppPst(%): 20

Rms(mV): 65.75

RmsTest(mV): 65.04

RmsPst(%): 20

ThdTest(dB): -26.22

ThdMax(dB): -20

ThdnTest(dB): -26.13

ThdnMax(dB): -20

Delay(ms): 0

4.7 End of test

Stop audio output, turn off enable, disconnect module and power off.

STEP	BX	Description	Module	Type	Function	Delay	Test	Dev%
1	B1	Turn on the relay	Digital module	GPIO	write	0		
2	B1	Configure mic opera	Power module	configure	XV1	0		
3	B1	Power on	Power module	power on	XV1	0		
4	B1	Connect mic test box	FD_Audio	WaveTest	Connect	0		
5	B1	Set gain resistance	FD_Audio	WaveTest	Gain	0		
6	B1	Set analog audio out	FD_Audio	WaveTest	AnalogControl	0		
7	B1	Set speaker output	FD_Audio	WaveTest	Output	0		
8	B1	Analog mic measurei	FD_Audio	WaveTest	MicMes	0		
9	B1	Speaker stop output	FD_Audio	WaveTest	OutStop	0		
10	B1	Close analog mic	FD_Audio	WaveTest	AnalogControl	0		
11	B1	Close mic	FD_Audio	WaveTest	Close	0		
12	B1	power off	Power module	power off	XV1	0		
13	B1	Turn off the relay	Digital module	GPIO	write	0		

Type: WaveTest

Function: AnalogControl

Device: 1

Analog audio output enable

Analog audio output channel 1

Analog audio output channel 2

Analog audio test enable on

Analog audio test enable off

Delay(ms): 0 Turn off analog audio test

4.8 Self-check :

In case of abnormal conditions in the test, the module can be self checked after connecting the module.

STEP	BX	Description	Module	Type	Function	Delay	Test	Dev%
1	B1	Turn on the relay	Digital module	GPIO	write	0		
2	B1	Configure mic opera	Power module	configure	XV1	0		
3	B1	Power on	Power module	power on	XV1	0		
4	B1	Connect mic test box	FD_Audio	WaveTest	Connect	0		
5	B1	Set gain resistance	FD_Audio	WaveTest	Gain	0		
6	B1	Set analog audio out	FD_Audio	WaveTest	AnalogControl	0		
7	B1	Set speaker output	FD_Audio	WaveTest	Output	0		
8	B1	Analog mic measurei	FD_Audio	WaveTest	MicMes	0		
9	B1	Speaker stop output	FD_Audio	WaveTest	OutStop	0		
10	B1	Close analog mic	FD_Audio	WaveTest	AnalogControl	0		
11	B1	Module self test	FD_Audio	WaveTest	SelfCheck	0		
12	B1	Close mic	FD_Audio	WaveTest	Close	0		
13	B1	power off	Power module	power off	XV1	0		
14	B1	Turn off the relay	Digital module	GPIO	write	0		

Type: WaveTest

Function: SelfCheck

Device: 1

analog channel 1 self test

analog channel 2 self test

digital channel 1(left) self test

digital channel 2(right) self test

Delay(ms): 0 Select the channel to be detected

五、 matters needing attention

Due to different test environments and different customer requirements, this module can test thd and thd-n. testing these two parameters requires a relatively quiet workshop environment. If it is noisy and the two parameters cannot be tested

accurately, testing these two parameters requires a relatively high sensitivity of the module, which will also lead to frequency, inaccurate VPP test or even less than the value. Therefore, for different environments, the module needs to have the function of adjusting sensitivity. Reducing the sensitivity will test stability, so as to test whether the product works normally, while thd and thd-n tests are meaningless. In short, if you want to test all functions, the workshop environment requires high requirements. You just want to verify whether the product works normally. You can reduce the sensitivity. Customers can choose according to their own situation.

1. Gain resistance: 0-20000 adjustable. Do not set it to a maximum of 20000. The greater the gain resistance, the lower the sensitivity.

ICT Test		Comp Edit	SPG Edit	IC Edit	Skip Edit	Function Edit		
STEP	BX	Description	Module	Type	Function	Delay	Test	Dev%
1	B1	Turn on the relay	Digital module	GPIO	write	0		
2	B1	Configure mic opera	Power module	configure	XV1	0		
3	B1	Power on	Power module	power on	XV1	0		
4	B1	Connect mic test box	FD_Audio	WaveTest	Connect	0		
5	B1	Set gain resistance	FD_Audio	WaveTest	Gain	0		
6	B1	Set analog audio out	FD_Audio	WaveTest	AnalogControl	0		
7	B1	Set speaker output	FD_Audio	WaveTest	Output	0		
8	B1	Analog mic measure	FD_Audio	WaveTest	MicMes	0		
9	B1	Speaker stop output	FD_Audio	WaveTest	OutStop	0		
10	B1	Close analog mic	FD_Audio	WaveTest	AnalogControl	0		
11	B1	Module self test	FD_Audio	WaveTest	SelfCheck	0		
12	B1	Close mic	FD_Audio	WaveTest	Close	0		
13	B1	power off	Power module	power off	XV1	0		
14	B1	Turn off the relay	Digital module	GPIO	write	0		

Type: WaveTest

Function: Gain

Device: 1

GainR: 90000

Delay(ms): 0

Set the value of gain resistance

六、 END

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