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# CT100 AC Controller Test Report

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## 1. Introduction

### 1.1 Sample

No.	Item	Hardware V	Software V
1	CT100EU	V1.2	V1003



Pic 1: Sample Photo

### 1.2 Test Equipment

No	Item	Description	Note
1	Agilent N9020A	Frequency Spectrograph	
2	Rohde & Schwarz SMBV100A	RF Signal Source	
3	KEITHLEY DMM6500	Multimeter	

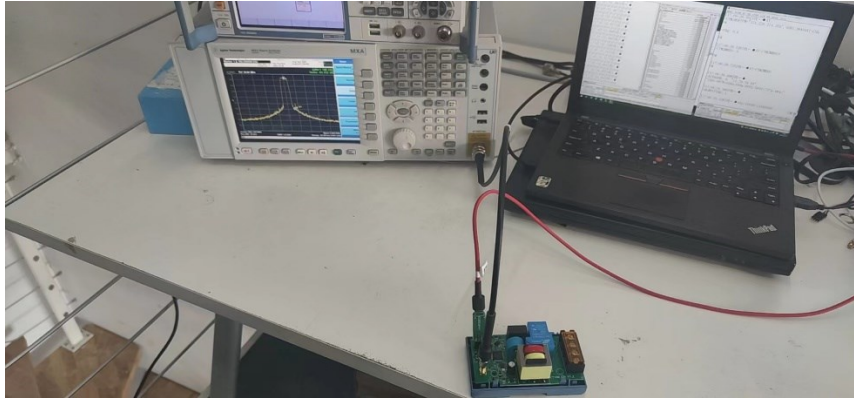
### 1.3 Test Project

No.	Category	Project	Test Result
1	TX	Frequency Deviation	3.945KHz
2		TX Power	21.9dbm
3		Harmonic Test	2rd -26.3dbm 3rd -23dbm
4	RX	RX Sensitivity	-137.4dbm @SF12
5	Power	RX Power (Turn off Relay)	9.02mA
6		RX Power (Turn on Relay)	12.2 mA
7		TX Power (Turn off Relay)	10.06 mA
8		TX Power (Turn on Relay)	17.56 mA

## 2. TX Test

### 2.1 Harmonic Test

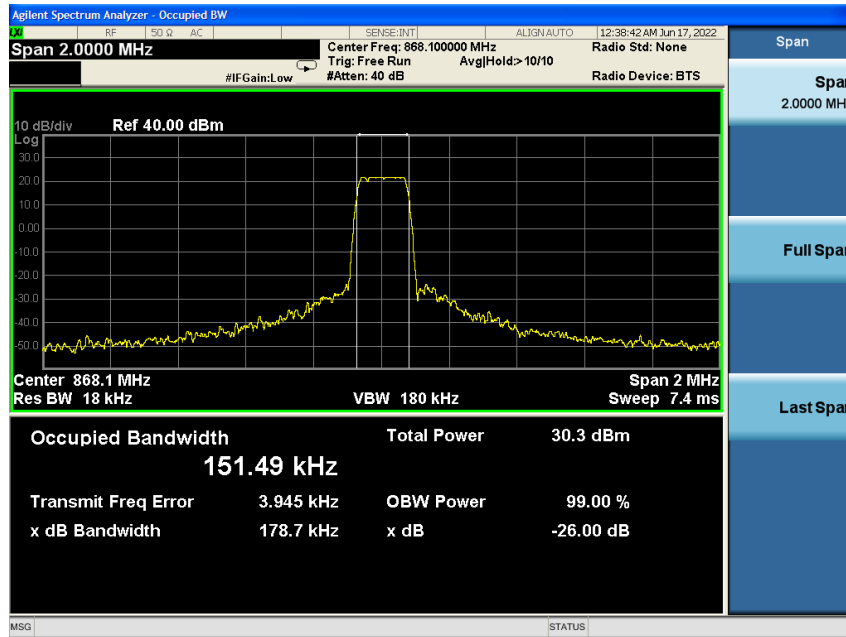
Connect the device to frequency spectrograph



Pic 2:

Test Method:

1. Set CT100EU fixed TX frequency as 868.1MHz
2. TX Power 22dbm
3. Connect device to frequency spectrograph N9020A
4. Frequency spectrograph N9020A set as below



Pic 3: Frequency offset test

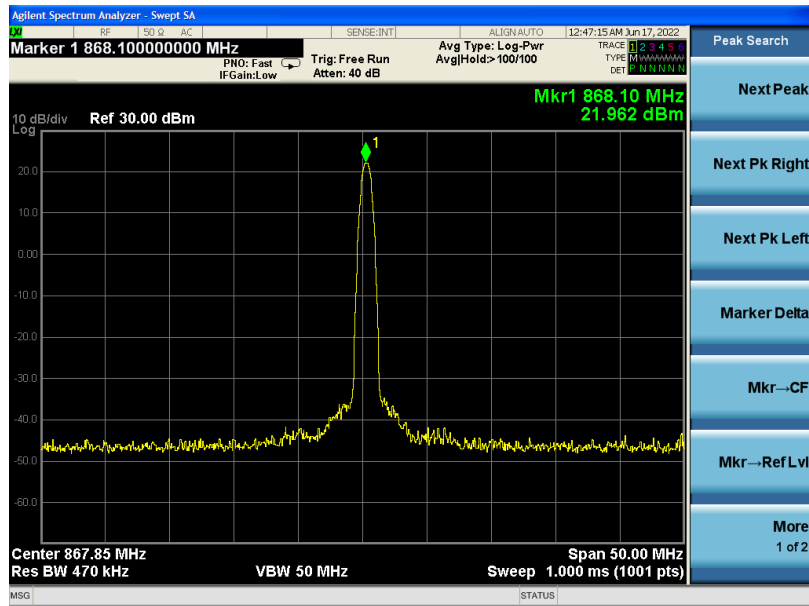
Test Result:

Frequency offset test		
No.	Frequency (MHz)	Frequency Error KHz
1	868.1	3.945

## 2.2 TX Power Test

Test Method:

1. Set CT100EU fixed TX frequency as 868.1MHz
2. TX Power 22dbm
3. Connect device to frequency spectrograph N9020A
4. Frequency spectrograph N9020A set as MAX hold mode



Pic 4: Max TX Power Test

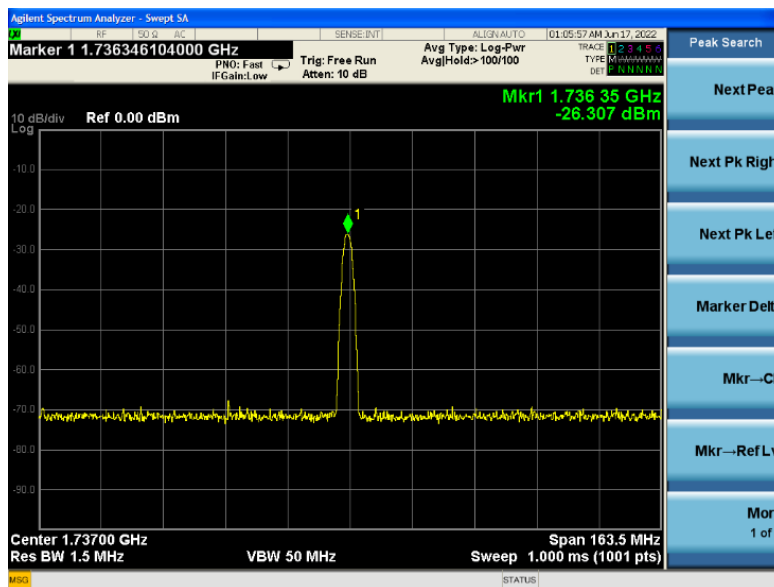
Test Result:

Max TX Power Test			
No	Frequency(MHz)	Set Power dbm	Test Result dbm
1	868.1	22	21.962

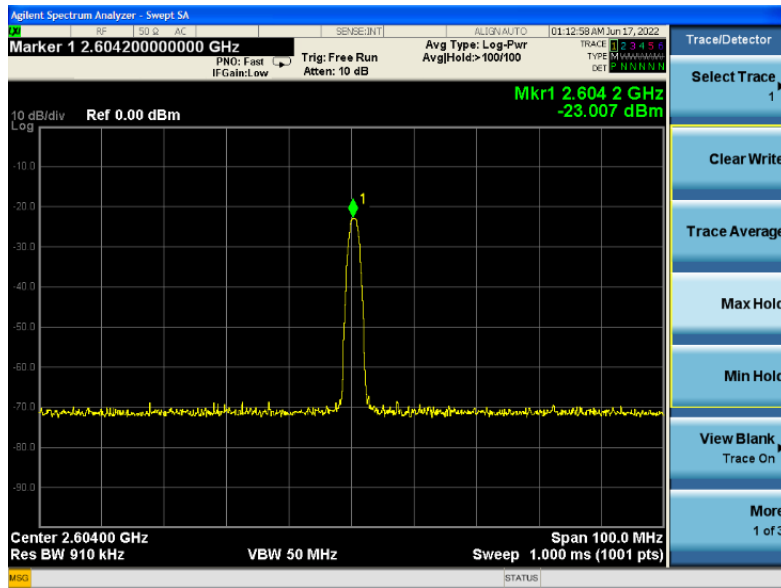
## 2.3 Harmonic power test

Test Method:

1. Set CT100EU fixed TX frequency as 868.1MHz
2. TX Power 22dbm
3. Connect device to frequency spectrograph N9020A
4. Frequency spectrograph N9020A set as MAX hold mode
5. to prevent the main frequency signal from saturating the spectrometer, the test uses a 1.5g high pass filter to filter out the main frequency signal.



Pic 5: 2<sup>nd</sup> Harmonic power test



Pic 6: 3<sup>rd</sup> Harmonic power test

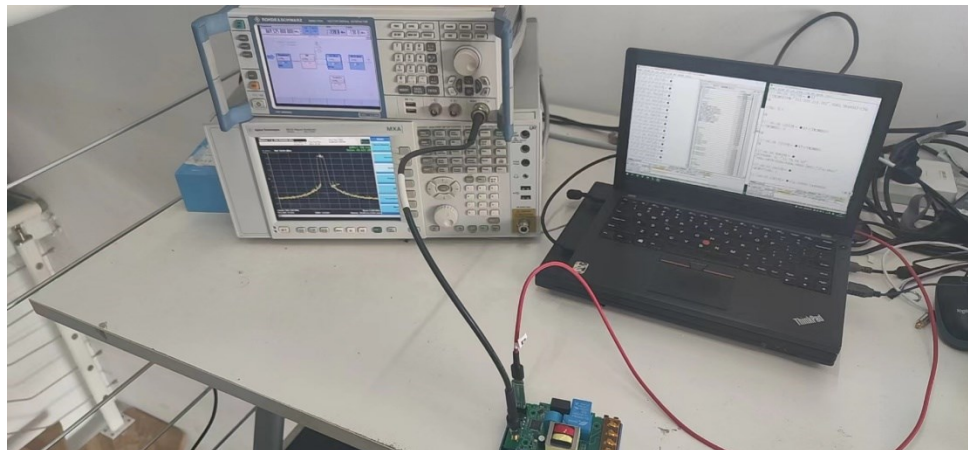
Harmonic power test				
No	Frequency(MHz)	Frequency Power dbm	2rd dbm	3 th dbm
1	868.1	22	-26.3	-23

### 3. RX Test

#### 3.1RX Sensitivity Test

The device connects to an RF signal source SMBV100A, and frequency is 868.1MHz.





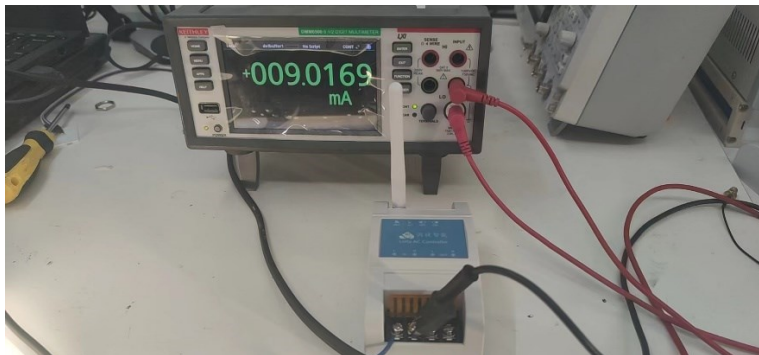
Pic 7: The device connects to an RF signal source

Test result as below:

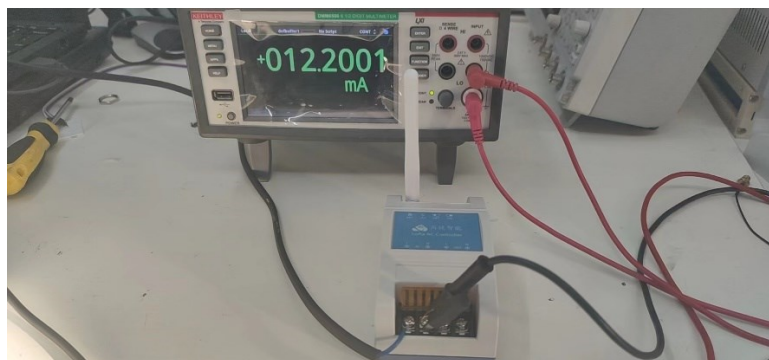
Frequency MHz	SF	BW	RX Sensitivity dbm
868.1	SF=7	125KHZ	-124.6
	SF=8		-126.4
	SF=9		-128.6
	SF=10		-131.5
	SF=11		-134.4
	SF=12		-137.4

## 4. Power Test

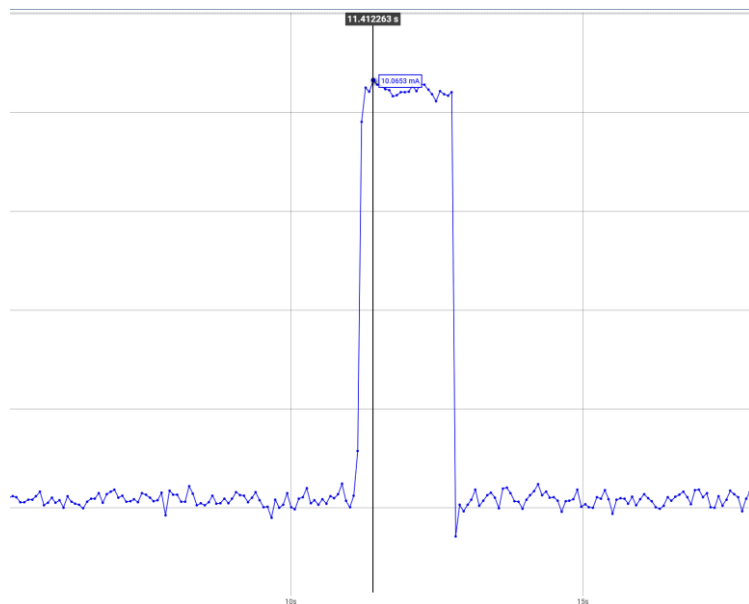
Connect the device to multimeter DMM6500 through 220V AC input, to test the currency under different mode.



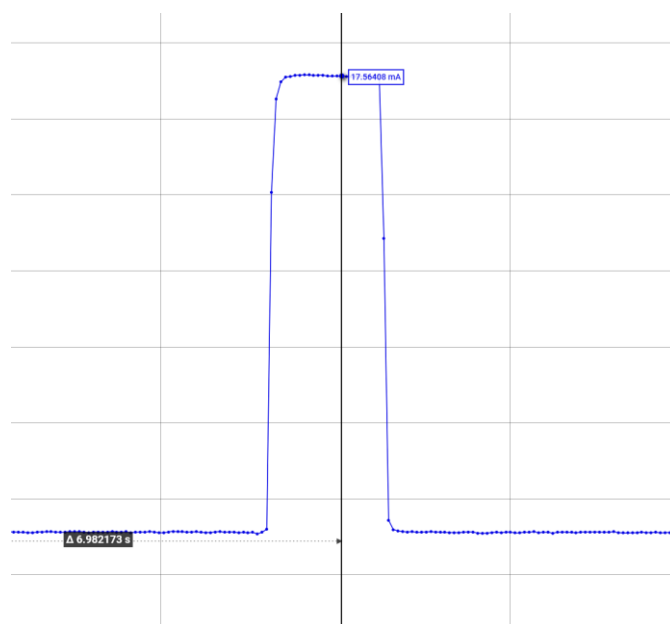
Pic 8: Only RX



Pic 9: Relay turn off under RX



Pic 10: Only TX



Pic 11: Relay works under TX

Power Test				
No	Currency	Mode	AC Currency mA	Note
1		RX	9.02	

<b>2</b>	<b>220V</b>	<b>RX+Relay</b>	<b>12.2</b>	
<b>3</b>		<b>TX</b>	<b>10.06</b>	<b>TX:22dbm</b>
<b>4</b>		<b>TX+Relay</b>	<b>17.56</b>	<b>TX:22dbm</b>