

## Si4432 COMPLIANCE TEST RESULTS IN CHINESE AMR BAND

### 1. Introduction

This document provides AMR compliance results for the Si4432 when operated from 470 to 510 MHz. The results demonstrate full compliance in the Chinese AMR band. All tests are performed using an ISMDK3 kit with a 4432-T-B1-D-470 TX/RX Direct Tie test card. The Wireless Development Suite (WDS) is used to control the test card. The results can be duplicated by using the same configuration and scripts available on the Silicon Labs website and referenced in the EZRadioPRO® Quick-Start Guide.

All settings were used directly from the Excel Register Calculator worksheet provided on the Silicon Labs website. For measurement results with different RF parameters, contact customer support.

### 2. Relevant Measurements to Comply with AMR

AMR compliance in China only pertains to effective radiated power, occupied bandwidth, frequency error, spurious emissions and band edge. There are no receiver sensitivity, selectivity or blocking measurements to comply with AMR. The maximum output power under Chinese AMR is +17 dBm.

### 3. AMR Compliance Results

Silicon Labs has tested the Si4432 chip and 4432-T-B1-D-470 TX/RX Direct Tie test card for AMR compliance in the 470–510 MHz frequency band at an output power level of +17 dBm. These AMR compliance tests were performed by HTW Labs, an AMR certified electromagnetic compatibility (EMC) test house.

#### 3.1. Test Conditions

Temperature: 15–35 °C  
 Humidity: 30–60 %  
 Atmospheric pressure: 950–1050 mbar  
 Test voltage: DC 3.3 V

#### 3.2. Test Items and Results

The test items and results (the EUT passed all tests) are shown in the following sections.

##### 3.2.1. Effective Radiated Power

The effective radiated power is the power radiated in the direction of the maximum field strength under specified conditions of measurements for any condition of modulation. Its limit is 17 dBm. The EUT passed the test.

Test Mode: Tx mode	Measurement method: <input checked="" type="checkbox"/> ERP(Radiated) <input type="checkbox"/> Conducted				
Frequency	Test Result				
	Read Level (dBm)	Factor (dBm)	Measured Power (dBm)	ERP Limit (dBm)	Margin (dBm)
471MHz	-9.82	26.80	16.98	17	0.02
490MHz	-11.10	27.70	16.60	17	0.40
509MHz	-14.46	28.10	13.64	17	3.36
Test Result	Pass				

## 3.2.2. Occupied Bandwidth

Occupied bandwidth is the bandwidth which includes 99% of the radiated power. The EUT was modulated with PN9 sequence, 38.4 kbps data rate, and  $\pm 50$  kHz FSK deviation, modulation mode GFSK. Its limit is 200 kHz. The EUT passed the test.

Nominal Frequency (MHz)	EUT Operating Condition		Occupied Bandwidth (kHz)	Limit (kHz)	Result
	Frequency Deviation (kHz)	Data Rate (kbps)			
471	50	38.4	140.281	200	PASS
490	50	38.4	155.311	200	PASS
509	50	38.4	144.289	200	PASS

## 3.2.3. Frequency Error

Frequency error is the difference, under normal and extreme conditions, between the measured unmodulated carrier frequency and the nominal frequency as stated by the manufacturer. Its limit is 100 ppm. The EUT passed the test.

Nominal Frequency (MHz)	Measurement Frequency (MHz)	Frequency Error (ppm)	Limit (ppm)	Result
471	471.001	21.23	100	PASS
490	490.001	20.41	100	PASS
509	508.997	58.94	100	PASS

### 3.2.4. Spurious Emissions

Spurious emissions are unwanted emissions at frequencies other than those of the desired carrier frequency and its sidebands associated with normal test modulation.

For frequencies below 1 GHz, the limit is -36 dBm.

For frequencies above 1 GHz, the limit is -30 dBm.

The EUT passed the test.

CH1 471MHz						
Frequency (MHz)	Pol./Ant	Read Level (dBm)	Factor (dBm)	Measurement ERP (dBm)	Limit (dBm)	Margin (dB)
942	H	-96.20	33.88	-62.32	-36	26.32
942	V	-85.75	33.88	-51.87	-36	15.87
1413	V	-63.16	3.84	-59.32	-30	29.32
1413	H	-55.18	5.76	-49.42	-30	19.42
CH2 490MHz						
Frequency (MHz)	Pol./Ant	Read Level (dBm)	Factor (dBm)	Measurement ERP (dBm)	Limit (dBm)	Margin (dB)
980	V	-91.59	34.16	-57.43	-36	21.43
980	H	-96.03	34.16	-61.87	-36	25.87
1470	V	-53.44	3.91	-49.53	-30	19.53
1470	H	-63.03	5.76	-57.27	-30	27.27
CH3 509 MHz						
Frequency (MHz)	Pol./Ant	Read Level (dBm)	Factor (dBm)	Measurement ERP (dBm)	Limit (dBm)	Margin (dB)
--	--	--	--	--	-36	--
1527	V	-49.98	3.88	-46.10	-30	16.10
1527	H	-62.36	3.88	-58.48	-30	28.48
Result		Pass				

#### Notes:

1. Measurement ERP = Read Level + Factor.
2. With the result above, the effective radiated power was calculated on the basis of the reference value.
3. Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.

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## 3.2.5. Band Edge

All emissions within the frequency range from the band edge above or below the band edge shall not exceed an ERP of -30 dBm. The EUT passed the test.

Frequency (MHz)	Read Level (dBm)	Factor (dBm)	Measurement ERP (dBm)	Limit (dBm)	Result
470	-68.11	26.80	-44.70	-30	PASS
510	-68.13	28.10	-40.74	-30	PASS

## NOTES:

## Simplicity Studio

One-click access to MCU tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!

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