

CBP function test result

1. Description

The product complies with the requirements of an unrestricted contention based protocol. It employs spectrum sensing to determine if other devices are transmitting based on thresholds which can be configured by the operator. When the CBP function is enabled, transmission will be disabled when detected interference levels is above the threshold; similarly transmission will be enabled when detected interference levels is below the threshold. This test is to verify the CBP function of product.

2. Test Summary

2.1 Technical Requirement

Specification Reference	§90.7 of US FCC rules
Specification Description of Contention Based Protocol(CBP)	A protocol that allows multiple users to share the same spectrum by defining the events that must occur when two or more transmitters attempt to simultaneously access the same channel and establishing rules by which a transmitter provides reasonable opportunities for other transmitters to operate. Such a protocol may consist of procedures for initiating new transmissions, Procedures for determining the state of the channel (available or unavailable), and procedures for managing retransmissions in the event of a busy channel.

2.2 Summary of Test Result

Reference	Part	Measurement	Result
§90.7 of US FCC rules	90	Verification of Unrestricted Contention Based Protocol operation	PASS

2.3 Product Specification

Total Weight: 19kg

Volume: 19L

Dimensions (H*W*D): 425 mm x300 mm x 150 mm

Input voltage: -48VDC (-57VDC to -37VDC)

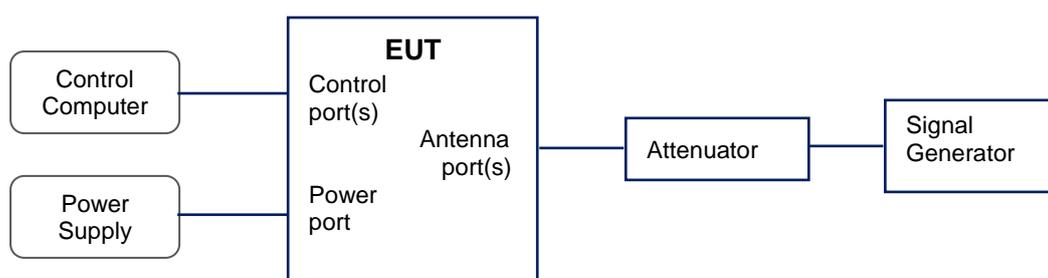
Frequency range: 3650MHz~3700 MHz

Carrier and bandwidth: 1 carrier, 20MHz; 3 carriers, 20+20+10MHz

Max RF output power: 100mW for 1 carrier 20MHz; 250mW for 3 carriers 20+20+10MHz

3. Configuration of test

3.1 Test Setup



3.2 Test Procedure

All tests were performed as conducted measurements.

- 1) Power on EUT, set Interference detection switch ON and set interference detection threshold (this threshold can be configured by operator);
- 2) Adjust frequency and output power of signal generator to act as an interference at the antenna port;
- 3) Monitor EUT state on the control computer;
- 4) Set Interference detection switch OFF;
- 5) Repeat step 2)-3).

4. Test Results

P_i : interference power level

P: interference detection threshold

DL: down link

RRU work band: 3650~3700MHz

Outside the lower band: 3640MHz

In band low end: 3660MHz

In mid band: 3675MHz

In band high end: 3695MHz

Outside the higher band: 3710MHz

Wanted signal bandwidth (MHz)	Wanted signal Frequency (MHz)	Interference detection switch	Interference detection threshold P (dBm)	Interference signal location	Test Result
20	3650-3670	ON	-80	outside the lower band	Pi>P:DL ON Pi<P:DL ON
20	3650-3670	ON	-80	in band low end	Pi>P:DL OFF Pi<P:DL ON
20	3650-3670	ON	-80	in mid band	Pi>P:DL ON Pi<P:DL ON
20	3650-3670	ON	-80	in band high end	Pi>P:DL ON Pi<P:DL ON
20	3650-3670	ON	-80	outside the higher band	Pi>P:DL ON Pi<P:DL ON
20	3650-3670	OFF	-80	outside the lower band	Pi>P:DL ON Pi<P:DL ON
20	3650-3670	OFF	-80	in band low end	Pi>P:DL ON Pi<P:DL ON
20	3650-3670	OFF	-80	in mid band	Pi>P:DL ON Pi<P:DL ON
20	3650-3670	OFF	-80	in band high end	Pi>P:DL ON Pi<P:DL ON
20	3650-3670	OFF	-80	outside the higher band	Pi>P:DL ON Pi<P:DL ON
20	3665-3685	ON	-80	outside the lower band	Pi>P:DL ON Pi<P:DL ON
20	3665-3685	ON	-80	in band low end	Pi>P:DL ON Pi<P:DL ON
20	3665-3685	ON	-80	in mid band	Pi>P:DL OFF Pi<P:DL ON
20	3665-3685	ON	-80	in band high end	Pi>P:DL ON Pi<P:DL ON
20	3665-3685	ON	-80	outside the higher band	Pi>P:DL ON Pi<P:DL ON
20	3665-3685	OFF	-80	outside the lower band	Pi>P:DL ON Pi<P:DL ON
20	3665-3685	OFF	-80	in band low end	Pi>P:DL ON

Wanted signal bandwidth (MHz)	Wanted signal Frequency (MHz)	Interference detection switch	Interference detection threshold P (dBm)	Interference signal location	Test Result
					Pi<P:DL ON
20	3665-3685	OFF	-80	in mid band	Pi>P:DL ON Pi<P:DL ON
20	3665-3685	OFF	-80	in band high end	Pi>P:DL ON Pi<P:DL ON
20	3665-3685	OFF	-80	outside the higher band	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	ON	-80	outside the lower band	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	ON	-80	in band low end	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	ON	-80	in mid band	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	ON	-80	in band high end	Pi>P:DL OFF Pi<P:DL ON
20	3680-3700	ON	-80	outside the higher band	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	OFF	-80	outside the lower band	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	OFF	-80	in band low end	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	OFF	-80	in mid band	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	OFF	-80	in band high end	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	OFF	-80	outside the higher band	Pi>P:DL ON Pi<P:DL ON
20	3680-3700	OFF	-80	mid band	Pi>P:DL ON Pi<P:DL ON
20+20+10	3650-3700	ON	-80	outside the lower band	Pi>P:DL OFF Pi<P:DL ON
20+20+10	3650-3700	ON	-80	in band low end	Pi>P:DL OFF Pi<P:DL ON
20+20+10	3650-3700	ON	-80	in mid band	Pi>P:DL OFF Pi<P:DL ON
20+20+10	3650-3700	ON	-80	in band low end	Pi>P:DL OFF Pi<P:DL ON
20+20+10	3650-3700	ON	-80	outside the higher band	Pi>P:DL OFF Pi<P:DL ON

Wanted signal bandwidth (MHz)	Wanted signal Frequency (MHz)	Interference detection switch	Interference detection threshold P (dBm)	Interference signal location	Test Result
20+20+10	3650-3700	OFF	-80	outside the lower band	Pi>P:DL ON Pi<P:DL ON
20+20+10	3650-3700	OFF	-80	in band low end	Pi>P:DL ON Pi<P:DL ON
20+20+10	3650-3700	OFF	-80	in mid band	Pi>P:DL ON Pi<P:DL ON
20+20+10	3650-3700	OFF	-80	in band low end	Pi>P:DL ON Pi<P:DL ON
20+20+10	3650-3700	OFF	-80	outside the higher band	Pi>P:DL ON Pi<P:DL ON

Notes:

CW signal was used as an interference signal for unlike systems;

Interference power level at antenna port can be detected by EUT and observed on the control computer.