

**Espressif**

**Bluetooth Auto Test Report**

**Version 1.0**

# **A2 Report Revision History**

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| --- | --- | --- | --- |
| Table 1 | | | |
| Revision | Date | Changes | Author |
|  |  |  |  |

# Module&Test Information

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| Table 2 | |
| Module Name: |  |
| PCB Version: |  |
| Sample number: |  |
| Test Engineer: |  |
| Test Date: |  |
| Test Place: |  |
| Test Equipment: |  |
| Test Bin |  |
| Cable loss/dB: |  |
| Pi match/s11 smith: |  |
| RF Port: |  |
| Note: | |

# Test Item Summary

**3.1. Static Performance**

### Basic rate TX

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| Table 3 | | |
| No. | Test Items | Pass/Fail |
| 1 | Basic rate TX |  |
| 2 | 2M EDR TX |  |
| 3 | 3M EDR TX |  |
| 4 | BLE TX |  |

### Receiver sensitivity

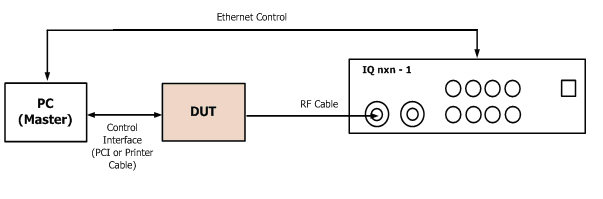
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| Table 4 | | |
| No. | Test Items | Pass/Fail |
| 1 | BR sensitivity |  |
| 2 | 2M EDR sensitivity |  |
| 3 | 3M EDR sensitivity |  |
| 3 | BLE sensitivity |  |

# Test Result

## **4.1. Test setup**

a. Maximum Transmit Power Profile vs. Operation Channel

Test Setup:



**Figure 1: WiFi TX Performance Environment Setup**

Note :

1. Config the instrument setup as above.
2. Select Tx Rate/Channel/BW as tables specified below.
3. Run the Test script and record test results.

## **4.2. Basic rate TX**

Requirement

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| Table 5 | |
| Specification | Requirement |
| Frequency range(MHz) | (2400,2483.5) |
| Output Power(dBm) | (-3, +3) @power\_level=4； |
| Init Freq Error(kHz) | (-75kHz,+75kHz) |
| Bandwidth20dB(kHz) | ≤ 1000kHz |
| deltaF2Max(kHz) | (115kHz ,500kHz)(at least 99%) |
| deltaF2Avg(kHz) | (112kHz, 500kHz) |
| deltaF1Avg(kHz) | (140kH, 175kHz) |

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| Table 6 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(KHz) |  |  |  |  |  |  |  |  |  |
| deltaF2Max(kHz) |  |  |  |  |  |  |  |  |  |
| deltaF2Avg(kHz) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| deltaF2Max by channel |  | | | | | | | | |
| deltaF2Avg by channel |  | | | | | | | | |
| **Note：** |  | | | | | | | | |

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| Table 7 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(KHz) |  |  |  |  |  |  |  |  |  |
| deltaF1Avg(kHz) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| deltaF1Avg by channel |  | | | | | | | | |
| **Note：** |  | | | | | | | | |

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| Table 8 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(KHz) |  |  |  |  |  |  |  |  |  |
| Bandwidth20dB(kHz) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| Bandwidth20dB by channel |  | | | | | | | | |
| **Note：** |  | | | | | | | | |

## **4.3. Enhanced data rate 2M TX**

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| Table 9 | |
| Specification | Requirement |
| Output Power(dBm) | (-3, +3) @power\_level=4； |
| Init Freq Error(kHz) | (-75,+75) |
| OMEGA\_I(kHz) | (-75kHz, +75kHz)，for all packets |
| OMEGA\_O(kHz) | (-10kHz, 10kHz)，for all block |
| OMEGA\_IO(kHz) | (-75kHz, +75kHz)，for all block |
| DEVM Average(%) | (0, 20) @ 2M |
| DEVM Peak(%) | (0, 35) @ 2M |
| EdrprobEVM99pass(%) | (0, 30) @ 2M |
| EdrPowDiffdB(dB) | (-4dBm, 1dBm) |

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| Table 10 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_I(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_O(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_IO(kHz) |  |  |  |  |  |  |  |  |  |
| DEVM Average(%) |  |  |  |  |  |  |  |  |  |
| DEVM Peak(%) |  |  |  |  |  |  |  |  |  |
| EdrprobEVM99pass(%) |  |  |  |  |  |  |  |  |  |
| EdrPowDiffdB(dB) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| DEVM Average(%) by channel |  | | | | | | | | |
| DEVM Peak(%) |  | | | | | | | | |
| EdrPowDiffdB by channel |  | | | | | | | | |
| **Note:** |  | | | | | | | | |

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| Table 11 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_I(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_O(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_IO(kHz) |  |  |  |  |  |  |  |  |  |
| DEVM Average(%) |  |  |  |  |  |  |  |  |  |
| DEVM Peak(%) |  |  |  |  |  |  |  |  |  |
| EdrprobEVM99pass(%) |  |  |  |  |  |  |  |  |  |
| EdrPowDiffdB(dB) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| DEVM Average(%) by channel |  | | | | | | | | |
| DEVM Peak(%) |  | | | | | | | | |
| EdrPowDiffdB by channel |  | | | | | | | | |
| **Note:** |  | | | | | | | | |

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| Table 12 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_I(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_O(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_IO(kHz) |  |  |  |  |  |  |  |  |  |
| DEVM Average(%) |  |  |  |  |  |  |  |  |  |
| DEVM Peak(%) |  |  |  |  |  |  |  |  |  |
| EdrprobEVM99pass(%) |  |  |  |  |  |  |  |  |  |
| EdrPowDiffdB(dB) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| DEVM Average(%) by channel |  | | | | | | | | |
| DEVM Peak(%) |  | | | | | | | | |
| EdrPowDiffdB by channel |  | | | | | | | | |
| **Note:** |  | | | | | | | | |

## **4.4. Enhanced data rate 3M TX**

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| Table 13 | |
| Specification | Requirement |
| Output Power(dBm) | (-3, +3) @power\_level=4； |
| Init Freq Error(kHz) | (-75,+75) |
| OMEGA\_I(kHz) | (-75kHz, +75kHz)，for all packets |
| OMEGA\_O(kHz) | (-10kHz, 10kHz)，for all block |
| OMEGA\_IO(kHz) | (-75kHz, +75kHz)，for all block |
| DEVM Average(%) | (0, 13)@ 3M |
| DEVM Peak(%) | (0, 25)@ 3M |
| EdrprobEVM99pass(%) | (0, 20)@ 3M |
| EdrPowDiffdB(dB) | (-4dBm, 1dBm) |

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| Table 14 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_I(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_O(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_IO(kHz) |  |  |  |  |  |  |  |  |  |
| DEVM Average(%) |  |  |  |  |  |  |  |  |  |
| DEVM Peak(%) |  |  |  |  |  |  |  |  |  |
| EdrprobEVM99pass(%) |  |  |  |  |  |  |  |  |  |
| EdrPowDiffdB(dB) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| DEVM Average(%) by channel |  | | | | | | | | |
| DEVM Peak(%) |  | | | | | | | | |
| EdrPowDiffdB by channel |  | | | | | | | | |
| **Note:** |  | | | | | | | | |

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| Table 15 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_I(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_O(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_IO(kHz) |  |  |  |  |  |  |  |  |  |
| DEVM Average(%) |  |  |  |  |  |  |  |  |  |
| DEVM Peak(%) |  |  |  |  |  |  |  |  |  |
| EdrprobEVM99pass(%) |  |  |  |  |  |  |  |  |  |
| EdrPowDiffdB(dB) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| DEVM Average(%) by channel |  | | | | | | | | |
| DEVM Peak(%) |  | | | | | | | | |
| EdrPowDiffdB by channel |  | | | | | | | | |
| **Note:** |  | | | | | | | | |

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| Table 16 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_I(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_O(kHz) |  |  |  |  |  |  |  |  |  |
| OMEGA\_IO(kHz) |  |  |  |  |  |  |  |  |  |
| DEVM Average(%) |  |  |  |  |  |  |  |  |  |
| DEVM Peak(%) |  |  |  |  |  |  |  |  |  |
| EdrprobEVM99pass(%) |  |  |  |  |  |  |  |  |  |
| EdrPowDiffdB(dB) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| DEVM Average(%) by channel |  | | | | | | | | |
| DEVM Peak(%) |  | | | | | | | | |
| EdrPowDiffdB by channel |  | | | | | | | | |
| **Note:** |  | | | | | | | | |

## **4.5. BLE TX**

Requirement

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| Table 17 | |
| Specification | Requirement |
| Frequency range(MHz) | (2400,2483.5) |
| Output Power(dBm) | (-3, +3) @power\_level=4； |
| Init Freq Error(kHz) | (-150kHz,+150kHz) |
| deltaF2Max(kHz) | (185kHz ,500kHz)(at least 99%) |
| deltaF2Avg(kHz) | (180kHz, 500kHz) |
| deltaF1Avg(kHz) | (225kH, 275kHz) |

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| Table1 18 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(kHz) |  |  |  |  |  |  |  |  |  |
| deltaF2Max(kHz) |  |  |  |  |  |  |  |  |  |
| deltaF2Avg(kHz) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| deltaF2Max by channel |  | | | | | | | | |
| deltaF2Avg by channel |  | | | | | | | | |
| **Note：** |  | | | | | | | | |

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| Table1 19 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(kHz) |  |  |  |  |  |  |  |  |  |
| deltaF1Avg(kHz) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| deltaF1Avg by channel |  | | | | | | | | |
| **Note：** |  | | | | | | | | |

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| Table1 20 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| Output Power(dBm) |  |  |  |  |  |  |  |  |  |
| Init Freq Error(kHz) |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| Power by channel |  | | | | | | | | |
| Init Freq Error by channel |  | | | | | | | | |
| **Note:** |  | | | | | | | | |

## **4.6 .Receiver sensitivity**

Requirement

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| Table 21 | |
| Data rate | Sensitivity |
| BR (dBm) | <-80 dBm @BER=0.1% |
| 2M EDR(dBm) | <-80 dBm @BER=0.01% |
| 3M EDR(dBm) | <-72 dBm @BER=0.01% |
| BLE(dBm) | <-85 dBm @PER=30.8% |

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| Table1 22 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| sens |  |  |  |  |  |  |  |  |  |
| rssi |  |  |  |  |  |  |  |  |  |
| PER |  |  |  |  |  |  |  |  |  |
| BER |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| **Sensitivity by channel** |  | | | | | | | | |
| **Note：** |  | | | | | | | | |

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| Table1 23 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| sens |  |  |  |  |  |  |  |  |  |
| rssi |  |  |  |  |  |  |  |  |  |
| PER |  |  |  |  |  |  |  |  |  |
| BER |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| **Sensitivity by channel** |  | | | | | | | | |
| **Note：** |  | | | | | | | | |

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| Table1 24 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| sens |  |  |  |  |  |  |  |  |  |
| rssi |  |  |  |  |  |  |  |  |  |
| PER |  |  |  |  |  |  |  |  |  |
| BER |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| **Sensitivity by channel** |  | | | | | | | | |
| **Note：** |  | | | | | | | | |

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| Table1 25 | | | | | | | | | |
| Data rate |  | | | | | | | | |
| Channel |  |  |  |  |  |  |  |  |  |
| Frequency |  |  |  |  |  |  |  |  |  |
| sens |  |  |  |  |  |  |  |  |  |
| rssi |  |  |  |  |  |  |  |  |  |
| PER |  |  |  |  |  |  |  |  |  |
| **Pass/Fail** |  |  |  |  |  |  |  |  |  |
| **Sensitivity by channel** |  | | | | | | | | |
| **Note：** |  | | | | | | | | |

# Conclusions

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