CHIP724

RF性能报告

## 

版本 1.0

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# PA2G\_CCT\_STG1 寄存器异常

* CHIP724 的 PA2G\_CCT\_STG1 值得变化对 EVM 影响较大。
* CHIP724 的 PA2G\_CCT\_STG1 值得变化对 Power Detect 测量值影响较大

## 对 EVM 的影响

* CHIP724 的 PA2G\_CCT\_STG1 值得变化对 EVM 影响较大。
* CHIP723 影响不大。

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | CHIP724 | | | | CHIP723 | | | |
| data | backoff | power(dBm) | EVM(dB) | evm\_std | backoff | power(dBm) | EVM(dB) | evm\_std |
| 0 | -31 | 12.31 | -16.42 | 0.04 | -22 | 13.78 | -32.2 | 0.92 |
| 1 | -26 | 13.15 | -18.25 | 0.37 | -21 | 14.18 | -32 | 0.67 |
| 2 | -25 | 13.22 | -17.39 | 0.13 | -18 | 13.99 | -32.2 | 0.83 |
| 3 | -18 | 13.75 | -23.57 | 0.34 | -16 | 14.17 | -31.95 | 0.54 |
| 4 | -19 | 12.37 | -17.66 | 0.33 | -13 | 14.01 | -32.11 | 0.71 |
| 5 | -14 | 13.79 | -21.17 | 0.31 | -10 | 13.96 | -32.17 | 0.92 |
| 6 | -12 | 13.72 | -20.28 | 0.25 | -7 | 13.85 | -32.33 | 0.81 |
| **7** | -5 | 14.18 | **-29.96** | 0.97 | -5 | 14.03 | -32.1 | 0.58 |
| 8 | -10 | 12.1 | -17.78 | 0.09 | -3 | 14.01 | -32.29 | 0.54 |
| 9 | -4 | 13.65 | -20.25 | 0.11 | -1 | 14.12 | -32.17 | 0.41 |
| 10 | -3 | 13.69 | -19.1 | 0.11 | 0 | 14.07 | -32.18 | 0.76 |
| **11** | 5 | 13.91 | **-29.91** | 1.34 | 2 | 14.03 | -32.2 | 0.9 |
| 12 | -2 | 14.1 | -17.65 | 0.1 | 2 | 14 | -32.58 | 0.84 |
| **13** | 6 | 13.95 | **-29.44** | 1.16 | 2 | 14.09 | -32.07 | 0.79 |
| **14** | 5 | 13.89 | **-28.56** | 1.35 | 1 | 14.05 | -32.67 | 1.02 |
| **15** | 4 | 14.04 | **-29.5** | 1.12 | 0 | 14.06 | -32.63 | 1.11 |

## 对 Power Detect 的影响

* CHIP724 的 PA2G\_CCT\_STG1 值得变化对 Power Detect 测量值影响较大。
  + 不同的 PA2G\_CCT\_STG1 值，Power Detect 的测量值 SAR\_Code 变化不一致，与 CHIP723 的现象不一样
* CHIP723 PA2G\_CCT\_STG1 值变化对 Power Detect 影响不大

# Power Detect

## Power Detect 的测量不线性

* CHIP724 Power Detect 的测量值随 Power 上升曲线不平滑，难以做到线性测量。
* CHIP723 Power Detect 的测量值随 Power 上升曲线平滑，可以做到线性测量

# TX EVM Floor

对比 CHIP723 和 CHIP724 的EVM floor ，目前的对比结果如下：

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Filter Type | Frequency | CHIP723 | | | CHIP724 | | |
| 4CF4 | 4CFC | 4CEC | Sample1 NO89 | Sample2 NO88 | Sample3 NO90 |
| RC filter | 2430M | -38.4 | -35.44 | -34.5 | -34.18 | -32.33 | -34.91 |
| 2432M | -34 | -33.19 | -32.9 | -30.67 | -29.8 | -30.7 |
| BB filter | 2430M | -38.22 | -37.56 | -37.4 | -35.24 | -32.5 | -34.2 |
| 0x20 | 2432M | -33.91 | -33.95 | -34.6 | -31.79 | -31 | -31.2 |
| 2430M 比2432M @ RC filter | | 4.4 | 2.25 | 1.6 | 3.51 | 2.53 | 4.21 |
| 2430M 比2432M @ BB filter | | 4.31 | 3.61 | 2.8 | 3.45 | 1.5 | 3 |
| BB Filter 比RC @2432M | | 0.09 | -0.76 | -1.7 | -1.12 | -1.2 | -0.5 |
| BB Filter 比RC @2430M | | 0.18 | -2.12 | -2.9 | -1.06 | -0.17 | 0.71 |

从目前的结果看起来，CHIP724 的EVM floor 要比 CHIP723差3dB。

需要进一步查找原因，并优化。

# I2C配置

## 可优化的 I2C寄存器

遍历i2c寄存器，发现新增寄存器dreg\_2p2 可优化 EVM，default 值为7，改为 0，EVM改善0.7dB左右。

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| i2c\_ctrl\_name | i2c\_data | backoff\_qdb | channel | rate | power | evm | evm\_std |
| dreg\_2p2 | **0** | 2 | 1 | mcs7 | 14.04 | **-30.89** | 1.05 |
| dreg\_2p2 | 1 | 2 | 1 | mcs7 | 14.07 | -30.76 | 1.33 |
| dreg\_2p2 | 2 | 2 | 1 | mcs7 | 14.05 | -30.34 | 1.16 |
| dreg\_2p2 | 3 | 2 | 1 | mcs7 | 14.05 | -30.56 | 1.36 |
| dreg\_2p2 | 4 | 2 | 1 | mcs7 | 14.05 | -29.69 | 1.3 |
| dreg\_2p2 | 5 | 2 | 1 | mcs7 | 14.05 | -29.83 | 1.16 |
| dreg\_2p2 | 6 | 2 | 1 | mcs7 | 14.04 | -30.25 | 1.65 |
| dreg\_2p2 | **7** | 2 | 1 | mcs7 | 14.04 | **-30.13** | 1.13 |
| dreg\_2p2 | 8 | 2 | 1 | mcs7 | 14.04 | -29.88 | 0.75 |
| dreg\_2p2 | 9 | 2 | 1 | mcs7 | 14.04 | -29.31 | 1.25 |
| dreg\_2p2 | 10 | 2 | 1 | mcs7 | 14.04 | -29.68 | 1.22 |
| dreg\_2p2 | 11 | 2 | 1 | mcs7 | 14.03 | -29.61 | 1.4 |
| dreg\_2p2 | 12 | 2 | 1 | mcs7 | 14.03 | -29.85 | 1.44 |
| dreg\_2p2 | 13 | 2 | 1 | mcs7 | 14.04 | -29.03 | 1.45 |
| dreg\_2p2 | 14 | 2 | 1 | mcs7 | 14.04 | -29.52 | 1.09 |
| dreg\_2p2 | 15 | 2 | 1 | mcs7 | 14.03 | -29.2 | 1.85 |

PA2G\_ICT\_STG0\_CGM 由 默认2 配置为7 可优化 EVM 近 1 dB，后续要增加 sample 的验证；

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| PA2G\_ICT\_STG0\_CGM | 2 | 0 | 13 | 1 | mcs7 | 13.18 | -27.43 |
| PA2G\_ICT\_STG0\_CGM | 2 | 1 | 14 | 1 | mcs7 | 12.99 | -29.06 |
| PA2G\_ICT\_STG0\_CGM | 2 | 2 | 13 | 1 | mcs7 | 13.05 | -29.27 |
| PA2G\_ICT\_STG0\_CGM | 2 | 3 | 13 | 1 | mcs7 | 13.21 | -29.46 |
| PA2G\_ICT\_STG0\_CGM | 2 | 4 | 13 | 1 | mcs7 | 12.89 | -29.37 |
| PA2G\_ICT\_STG0\_CGM | 2 | 5 | 12 | 1 | mcs7 | 13.04 | -29.7 |
| PA2G\_ICT\_STG0\_CGM | 2 | 6 | 12 | 1 | mcs7 | 12.91 | -30.08 |
| PA2G\_ICT\_STG0\_CGM | 2 | 7 | 12 | 1 | mcs7 | 12.83 | -30.27 |
| PA2G\_ICT\_STG0\_CGM | 2 | 8 | 11 | 1 | mcs7 | 12.98 | -30 |
| PA2G\_ICT\_STG0\_CGM | 2 | 9 | 11 | 1 | mcs7 | 12.9 | -29.94 |
| PA2G\_ICT\_STG0\_CGM | 2 | 10 | 10 | 1 | mcs7 | 13.05 | -29.67 |
| PA2G\_ICT\_STG0\_CGM | 2 | 11 | 10 | 1 | mcs7 | 12.96 | -29.17 |
| PA2G\_ICT\_STG0\_CGM | 2 | 12 | 9 | 1 | mcs7 | 13.09 | -28.98 |
| PA2G\_ICT\_STG0\_CGM | 2 | 13 | 8 | 1 | mcs7 | 13.23 | -28.74 |
| PA2G\_ICT\_STG0\_CGM | 2 | 14 | 9 | 1 | mcs7 | 13.09 | -27.88 |
| PA2G\_ICT\_STG0\_CGM | 2 | 15 | 8 | 1 | mcs7 | 13 | -27.43 |

# RF 匹配

PA2G\_ICT\_STG0\_CGM配置为7 下，调试了3组匹配，测试结果如下。

从目前的调试看还未达到最优，还需要再调试。

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Matching | rftx | bbgain | dig\_atten | channel | rate | power | evm | evm\_std | evm\_max |
| 2.4-1.8-3.0(34+j5) | 0x5f | 0x20 | 12 | 2412 | mcs7 | 15.89 | -28.79 | 0.7 | -27.38 |
| 0x5f | 0x20 | 23 | 2412 | mcs7 | 13.48 | -29.43 | 1.1 | -26.54 |
| 2.7-1.6-3.3(30+j8) | 0x5f | 0x20 | 12 | 2412 | mcs7 | 13.62 | -29.82 | 1.17 | -26.86 |
| 0x5f | 0x20 | 14 | 2412 | mcs7 | 13.58 | -29.83 | 0.97 | -27.4 |
| 3.0-1.6-3.3(29+j6) | 0x5f | 0x20 | 12 | 2412 | mcs7 | 14.22 | -29.55 | 0.91 | -27.25 |
| 0x5f | 0x20 | 15 | 2412 | mcs7 | 13.51 | -30.17 | 0.8 | -28.32 |