# 1.01 工作电压

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1. 测试仪器：直流稳压电源（IT6932A）；高低温交变湿热试验箱（501565）；
2. 测试工具：CS2110 下载器，CS2110 MPA DEMO VER1.2
3. 上位机下载软件及烧写程序：CS2110 3.0.0



1. 测试方法：烧录各时钟最低工作电压和最低启动电压目录下程序，通过示波器观察PWM1输出，测试不同主频下时钟最低工作电压和最低启动电压(附加温漂测试）；
2. 要求工作电压（V）：VDD在2V~5.5V范围内，芯片可以正常工作。
3. 测试数据：

#1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 时钟 | PWM1频率 | 最低工作电压 | 最低启动电压 | 单位:V |
| 8K | 1.013K | 1.92 | 1.96 |  |
| 32K | 1.003K | 1.92 | 1.95 |  |
| 910K | 1.000K | 1.92 | 1.95 |  |
| 4M | 99.76K | 1.92 | 1.95 |  |
| 8M | 198.15K | 2.14 | 2.4 |  |
| 16M | 410.858K | 3.45 | 5.19 |  |

#2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 时钟 | PWM1频率 | 最低工作电压 | 最低启动电压 | 单位:V |
| 8K | 1.008K | 1.94 | 1.98 |  |
| 32K | 1.007K | 1.94 | 1.97 |  |
| 910K | 1.002K | 1.94 | 1.97 |  |
| 4M | 100K | 1.94 | 1.97 |  |
| 8M | 198.445K | 2.15 | 2.24 |  |
| 16M | 409.637K | 3.31 | 4.89 |  |

#3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 时钟 | PWM1频率 | 最低工作电压 | 最低启动电压 | 单位:V |
| 8K | 99.1 | 1.91 | 1.95 |  |
| 32K | 1.002K | 1.91 | 1.94 |  |
| 910K | 1.001K | 1.91 | 1.94 |  |
| 4M | 100.14K | 1.91 | 1.94 |  |
| 8M | 198.61K | 2.1 | 2.5 |  |
| 16M | 410.252K | 3.36 | 5.14 |  |

最低启动电压温漂：

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 16M | | | 8M | | | 4M | | | 910K | | | 32K | | | 14K | | |
|  | 1# | 2# | 3# | 1# | 2# | 3# | 1# | 2# | 3# | 1# | 2# | 3# | 1# | 2# | 3# | 1# | 2# | 3# |
| -40 | 3.75 | 3.89 | 3.75 | 2.33 | 2.41 | 2.29 | 2.33 | 2.38 | 2.41 | 2.33 | 2.41 | 2.31 | 2.41 | 2.38 | 2.34 | 2.34 | 2.44 | 2.3 |
| -30 | 4.02 | 4.12 | 4.04 | 2.29 | 2.35 | 2.24 | 2.28 | 2.33 | 2.36 | 2.30 | 2.46 | 2.26 | 2.28 | 2.33 | 2.36 | 2.31 | 2.38 | 2.26 |
| -20 | 4.19 | 4.39 | 4.27 | 2.23 | 2.28 | 2.32 | 2.23 | 2.30 | 2.20 | 2.24 | 2.31 | 2.20 | 2.24 | 2.29 | 2.32 | 2.25 | 2.32 | 2.22 |
| -10 | 4.33 | 4.56 | 4.14 | 2.25 | 2.24 | 2.26 | 2.19 | 2.25 | 2.15 | 2.19 | 2.25 | 2.15 | 2.2 | 2.23 | 2.26 | 2.21 | 2.28 | 2.18 |
| 0 | 4.49 | 4.78 | 4.64 | 2.34 | 2.35 | 2.29 | 2.14 | 2.20 | 2.10 | 2.14 | 2.20 | 2.10 | 2.14 | 2.19 | 2.21 | 2.16 | 2.22 | 2.12 |
| 20 |  |  |  | 2.04 | 2.10 | 2.00 | 2.48 | 2.53 | 2.48 | 2.04 | 2.02 | 2.01 | 2.07 | 2.09 | 2.14 | 2.05 | 2.12 | 2.04 |
| 40 |  |  |  | 1.95 | 2.02 | 1.91 | 2.69 | 2.75 | 2.66 | 1.95 | 1.93 | 1.91 | 1.96 | 2.02 | 1.93 | 1.97 | 2.08 | 2.02 |
| 60 |  |  |  | 1.84 | 1.90 | 1.82 | 2.87 | 2.94 | 2.83 | 1.85 | 1.82 | 1.81 | 1.86 | 1.89 | 1.92 | 1.87 | 1.91 | 1.82 |
| 80 |  |  |  | 1.74 | 1.80 | 1.74 | 2.99 | 3.13 | 3.03 | 1.74 | 1.71 | 1.71 | 1.77 | 1.79 | 1.82 | 1.77 | 1.83 | 1.75 |

1. 测试结果：根据测试结果表明，8M以下，最低启动电压<2V，8M以上，最低启动电压在5V左右。
2. CS2110 MPA DEMO VER1.2原理图：



