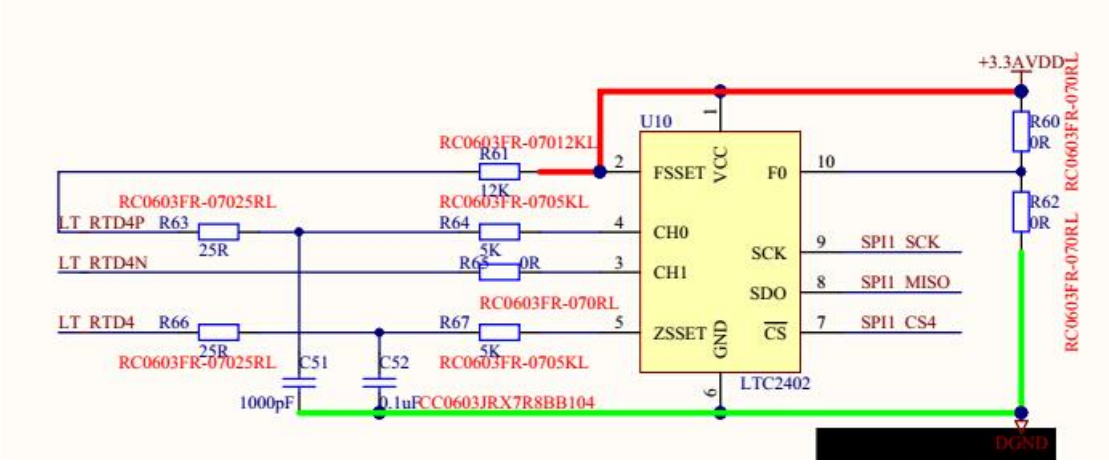
# LTC2402 可用性测试

## 1 概述

## 1.1 目的

本测试报告为 LTC2402 24 位 AD 芯片的可用性测试.

## 1.2 测量电路




注:

1. 实际电路在图中在 R65 添加到地的跳线.
2. 3.3VADD 在电路中实测电压值为 3.298V.
3. R61 应使用高精度电阻, 实测电路中并未使用,万用表测得电阻值为 12060ohm.

## 2.测量内容及方法

## 2.1 测试方法

用万用表测量电阻阻值,然后用 SCT(LTC2402)测量电阻,记录结果.

## 2.2 数据分析

| | 27ohm(0.1%) | 100ohm(0.01%) | 1000ohm(0.1%) | 4120ohm(0.1%) | 56K(0.1%) | 150K(0.1%) | 330K(0.5%) | 499K(0.1%) | 750K(0.1%) | YSI 44005 |
|---|---|---|---|---|---|---|---|---|---|---|
| 万用表测值 | 26.1 | 100 | 998 | 4120 | 56.1K | 149.5K | 324.9k | 500K | 748K | 2784 |
| 测量值1 | 26.199636 | 99.939324 | 999.597038 | 4120.397477 | 56030.63383 | 148226.666 | 318512.0342 | 485608.194 | 713984.0326 | 2784.271 |
| 测量值2 | 26.191333 | 99.936036 | 999.594088 | 4120.500993 | 56030.23283 | 148226.793 | 318503.123 | 485598.401 | 713997.0594 | 2784.1713 |
| 测量值3 | 26.190611 | 99.944075 | 999.601674 | 4120.489347 | 56031.04629 | 148225.841 | 318503.663 | 485614.314 | 714012.6922 | 2784.5901 |
| 测量值4 | 26.196387 | 99.940786 | 999.608839 | 4120.465409 | 56031.13795 | 148227.301 | 318498.5325 | 485611.254 | 713944.9553 | 2784.1033 |
| 测量值5 | 26.201441 | 99.941517 | 999.600831 | 4120.471232 | 56030.75986 | 148226.857 | 318486.112 | 485613.09 | 713967.0987 | 2783.7172 |
| 测量值6 | 26.200358 | 99.934574 | 999.624012 | 4120.460233 | 56030.989 | 148226.095 | 318489.8921 | 485615.538 | 713999.6649 | 2783.8773 |
| 测量值7 | 26.19747 | 99.942248 | 999.613054 | 4120.487406 | 56030.59946 | 148227.111 | 318485.032 | 485609.418 | 713985.3353 | 2783.7945 |
| 测量值8 | 26.199636 | 99.944075 | 999.603781 | 4120.504227 | 56031.29835 | 148226.476 | 318478.8221 | 485603.297 | 713964.4937 | 2784.1033 |
| 测量值9 | 26.197831 | 99.941517 | 999.609682 | 4120.519108 | 56030.92026 | 148227.873 | 318479.902 | 485609.418 | 713991.8487 | 2783.9399 |
| 测量值10 | 26.198914 | 99.940786 | 999.604203 | 4120.50164 | 56031.10358 | 148227.047 | 318476.9322 | 485612.478 | 713978.822 | 2784.3341 |
| 测量值11 | 26.194582 | 99.935305 | 999.602938 | 4120.486759 | 56031.03483 | 148227.809 | 318472.6124 | 485609.418 | 713943.6526 | 2784.1218 |
| 测量值12 | 26.192416 | 99.943344 | 999.601253 | 4120.486759 | 56030.989 | 148228.19 | 318475.0423 | 485623.495 | 714002.2702 | 2784.0063 |
| 测量值13 | 26.197109 | 99.940421 | 999.624012 | 4120.506168 | 56030.57654 | 148226.984 | 318473.1524 | 485606.97 | 713931.9303 | 2784.3358 |
| 测量值14 | 26.205051 | 99.939324 | 999.626119 | 4120.469938 | 56031.22961 | 148229.142 | 318473.6923 | 485608.806 | 713957.9805 | 2784.5993 |
| 测量值15 | 26.201802 | 99.940055 | 999.613897 | 4120.475114 | 56030.75986 | 148228.571 | 318473.6923 | 485611.866 | 713943.6526 | 2784.687 |
| 测量值16 | 26.197109 | 99.936767 | 999.616847 | 4120.478995 | 56030.46197 | 148229.079 | 318473.1524 | 485609.418 | 714002.2707 | 2784.711 |
| 测量值17 | 26.203968 | 99.945536 | 999.605467 | 4120.450529 | 56031.19524 | 148226.158 | 318473.6923 | 485600.849 | 713990.546 | 2784.9816 |
| 测量值18 | 26.198553 | 99.938959 | 999.610946 | 4120.541752 | 56030.56509 | 148225.397 | 318471.5325 | 485621.047 | 713963.1908 | 2785.2349 |
| 测量值19 | 26.20108 | 99.936401 | 999.599145 | 4120.557279 | 56030.9088 | 148227.746 | 318470.4526 | 485603.297 | 713937.1401 | 2784.9811 |
| 测量值20 | 26.19386 | 99.941517 | 999.593245 | 4120.553398 | 56030.71403 | 148228 | 318472.0725 | 485628.392 | 713967.0985 | 2784.9043 |
| 测量平均值 | 26.19795735 | 99.94012835 | 999.6075536 | 4120.490188 | 56030.85782 | 148227.257 | 318482.1569 | 485610.948 | 713973.2868 | 2784.3733 |
| 注:表中只有100ohm,1000ohm,4120ohm为精密电阻,其他均为普通电阻,通电情况下电阻值不能保证 | | | | | | | | | | |

1. 每个测量值都是取 10 次值,忽略 3 个最大 3 个最小后求平均值得到的.
2. 从精密电阻的测量值来看,得出的结果都较为准确.
3. 排除普通电阻稳定性,可认为 LTC2402 在 56K 以内的电阻(0ohm 除外)测量中,可得到较为准确的值.
4. YSI 44005 为振弦传感器热敏电阻阻值.

## 2.3 误差来源

1. R61 采用的是普通电阻.
2. 测量目标大部分是普通,稳定性无法保证.

## 3.测试结果

1. 目前 SCT 板的 LTC2402 电路可测量电阻范围为 1~56K.(**如更换 R61 为精密电阻,理论上应该可以达到更高的精度**).
2. 此电路在大于 56K 的测量中出现较大的误差,有两个方面的原因:

[1]:测量电路为了兼顾小电阻的测量结果,取 R61 为 12K.

[2]:阻值较大的电阻均为普通电阻,不能保证其稳定性.

3. 由于误差来源均为普通电阻引起,后续应更改为精密电阻做测试.