	義隆電子股份有限公司 產品可靠性驗證報告	文件編號	
		頁次/總頁次 1/4	版次 1.0

IC Reliability Test Report

Document No : VMS0220220705-001

Date : 2022/07/05

Customer information

Company :

Address :

Purpose

EKTA0200 high temperature operating life time test, for assessing the span of operating life, indicated by FIT or MTBF.

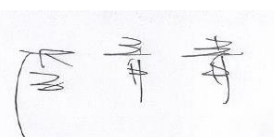
Conclusion

EKTA0200 Reliability Test results : **PASS**


Approved by :



Check by :




Original by :



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1. General information

1.1 Description of Testing Samples

Product No : [EKTA0200](#)

1.2 Execute Laboratory

Experiments are executed by QRA department of ELAN and the qualified unit (YTEC).

1.3 Sampling Plan

The sampling plan is LTPD=5%.

1.4 Pass/Fail Judgment

The final conclusion, 'pass' or 'fail' is judged from the FT test result with LTPD= 5%.

1.5 Test Item

High temperature operating life time test. (HTOL)

1.6 Method

1.HTOL (High Temperature Operation Life Test)

1.1 Sampling plan:


Sample size: 77 EA, based on LTPD= 5%, C= 1 .

1.2 Test Condition:

- Vcc Applied Voltage : [3.6V](#)
- Environment Temperature : [125°C](#)
- TD (Duration) : [1000hrs](#), Test point at 168, 500, 1000hrs.

2. Test Item Summary

項 目 Item		取樣 Sample size	測試條件 Test condition	完成日期 Finish date	實驗結果 Test Result
1	High temperature operating life time test.	77	125°C, 1000hrs.	2022/06/27	Pass

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3. Test Result

3.1 HTOL Data

項 目 Item		取樣 Sample size	時間 Duration	不良數 No. of failure	FR (FIT)	MTBF (Hours)
1	High temperature operating life time test.	77	1000	0	3075	325174

3.2 Calculation for test item 1.

Refer to the appendix 1 equation (5)

$$AF_T = \exp [E_a/K * (1/ T_o - 1/ T_s)] \quad (5)$$

where

$T_o = 85^{\circ}\text{C}$ (358.16K), junction temperature at normal use condition.

$T_s = 125^{\circ}\text{C}$ (398.16K), junction temperature under stress.

$E_a = 0.7\text{eV}$, For defects due to particle

$k = 8.62 \times 10^{-5} \text{ eV/K}$ (the Boltzmann constant).

So the AF_T is 9.7552....

And the predicted total device stressed hours is $No * T_H * AF_T$

where

$No = 77 \text{ ea}$

$T_H = 1000 \text{ hours}$

$AF_T = 9.7552....$

So the predicted total device stressed hours is 751150 (hours)

No device failed ($N = 0$), at confidence level of 90%, $P_n = 2.31$ for $N = 0$, then,

From the appendix 1 equation (7)

$$FR = \frac{P_n(1-CL, 2N+2)}{No * T_H * AF} * 10^9 \quad (7)$$

$$= (2.31 * 10^9) / (375575) = 3075 \text{ (FIT)}$$

and the MTBF = $1/FR = 325174 \text{ (hours)}$