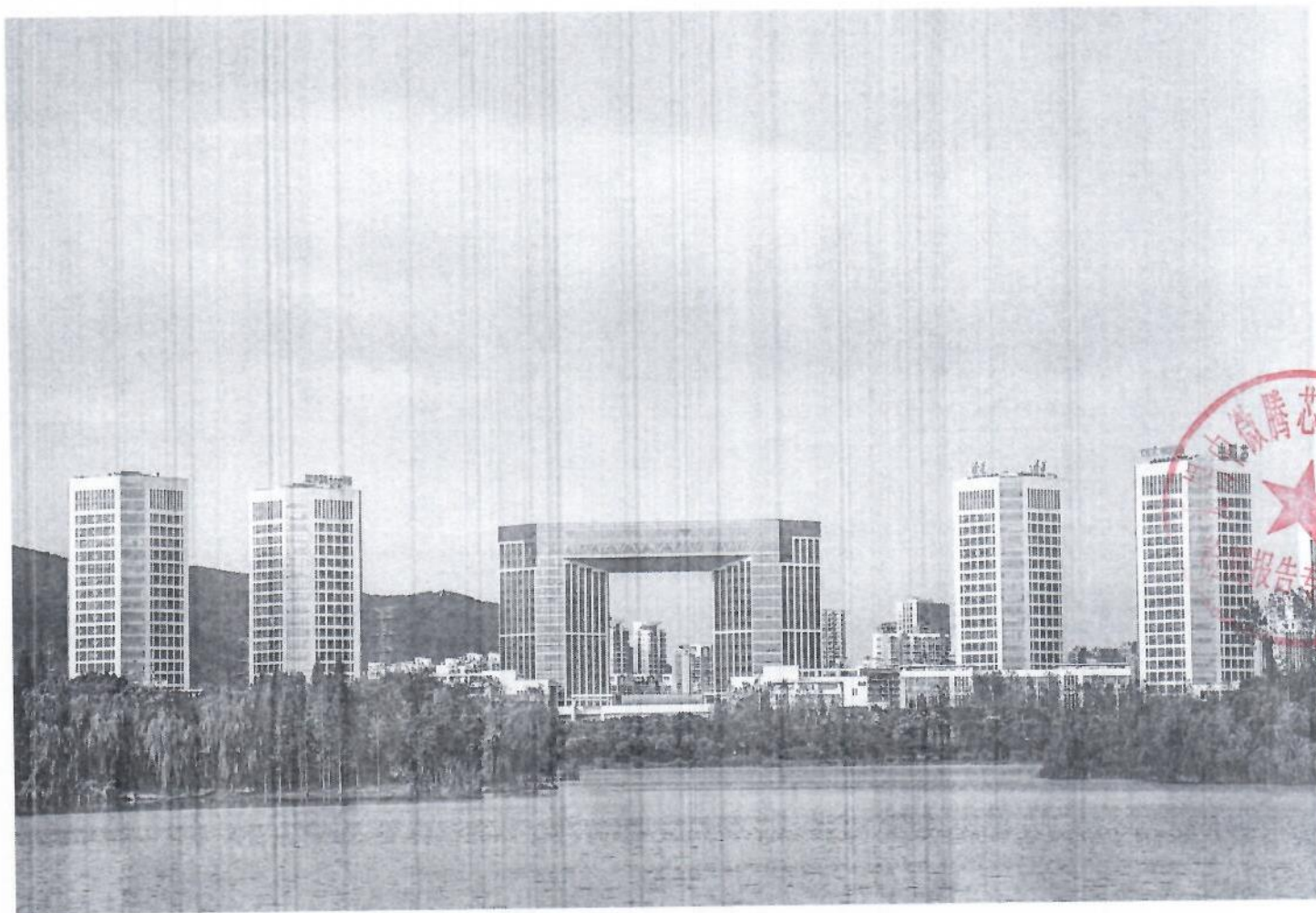


中微腾芯

WUXI CMC ELECTRONICS CO., LTD



企业愿景：成为国内集成电路检测行业的领航者

企业使命：科技创新 融合发展 追求卓越

企业价值观：诚信、品质、奋进、共赢



AEC-Q100 RELIABILITY TEST REPORT

QR-TC-09-02-A

Device Name : Integrared circuit
Sample Model : FM33LG045A (FM33LG025A)
Batch Number : C4B38N1G/C4B38N2G/C4B38N3G
Manufacturer : Shanghai Fudan Microelectronics Group Co.,Ltd
Certification Grade : Grade 2: -40°C~105°C

WE HEREBY CERTIFY THAT:

The test(s) shown in the attachment were conducted according to the indicating procedures. We assume full responsibility for the accuracy and completeness of these tests and vouch for the qualifications of all personnel performing them.

Post	Name	Signature	Data
Testing Engineer	Zhijing Xu		2022/05/20
Inspection Engineer	Yongjun XU		2022/05/20

Wuxi CMC Electronics CO.,Ltd



DECLARATION

1. The report is invalid without seal;
2. The report is invalid without signatures ;
3. The report is invalid with any scrawl;
4. Incomplete reprography is unallowed;
5. If tested devices come from customer sampling, results could explain the quality of samples.
6. If you have any objection to the test results, please submit a complaint to our center within one month from the date of receipt of the report, and attach the original report, otherwise it will not be accepted.

ADDR: No.5 Huihe Road,Binhu District,Wuxi,Jiangsu Province,CN

ZIP CODE: 214035

TEL: +86510-85866683

FAX: +86510-85819710


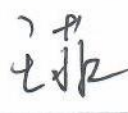
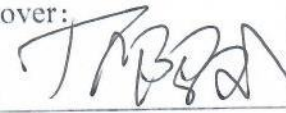
E-Mail: service@cmctest.com



Catalogue

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1. Test Report

Device Name	Integrared circuit	Sample Model	FM33LG045A (FM33LG025A)
Package Type	LQFP48	Sample Batch Number	C4B38N1G C4B38N2G C4B38N3G
Manufacturer	Shanghai Fudan Microelectronics Group Co.,Ltd		
Test Category	AEC Q100 Reliability Test	Sample Source	Customer sample delivery
Test Start Date	2022/04/04	Test End Date	2022/05/18
Inspection Standard	AEC Q100-Rev-H-2014 JEDEC MIL-STD-883-2-2019		
Results and Conclusions	The test samples were carried out according to the entrusted test scheme with reference to AEC-Q100-Rev-H-2014 as shown in Table 3, and the test progress is normal. The result : PASS.		
Comment	/		
Sign	Editor: 	Examiner: 	Approver: 
	Date: 2022.5.27	Date: 2022.5.27	Date: 2022.5.27

2. Reliability test summary

2.1 Sample Information

Table 1: Sample Information

Lot#	Batch Number	Supplier Wafer Fabrication	Supplier Wafer Test	Supplier Assembly Site	Supplier Final Test Site
1	C4B38N1G	Samsung Electronics CO.,Ltd	Wuxi CMC Electronics CO.,Ltd	Tongfu Microelectronics Co.,Ltd	Wuxi CMC Electronics CO.,Ltd
2	C4B38N2G				
3	C4B38N3G				

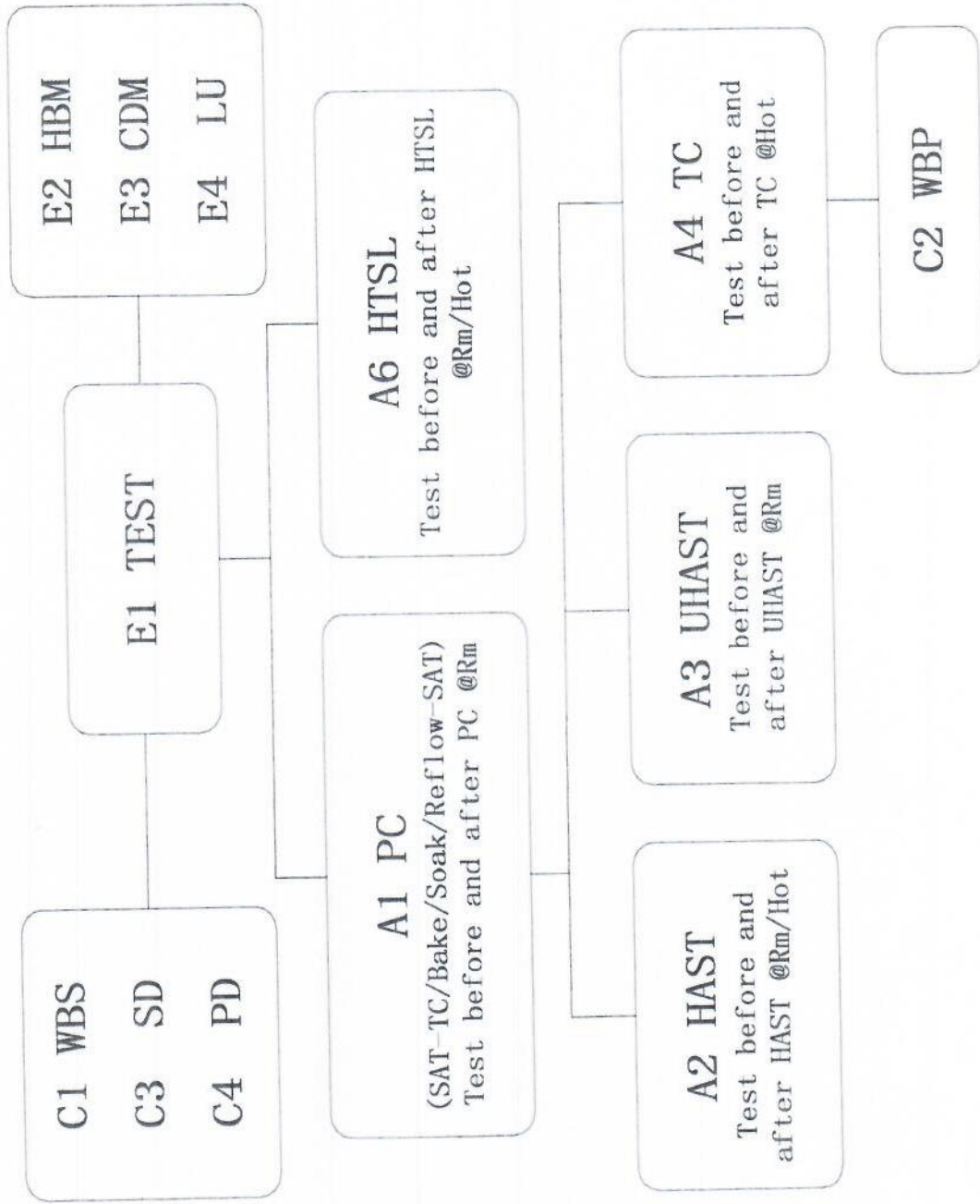
Item	Vendor	Material type
Lead Frame	SHS	C7025 173x173mil
Molding Compound	SHOWA DENKO	CEL-8240HF10-CWK
Wrire	Nippon	Φ 20 μ m EXIP
Epoxy/DAF	Sumitomo	CRM-1076WA-B

2.2 Description of Product

Table 2: Description of Product

Product Model	Package Type	Operating temperature range	Mosiure sensitivity Level	Automotive Temperature Grade
FM33LG045A (FM33LG025A)	LQFP48	-40℃~105℃	MSL=3	Grade 2

2.3 Test Flow



2.4 Test Result Summary

Table 3: Test Result Summary

TEST GROUP A-ACCELERATED ENVIRONMENT STRESS TESTS									
Group	Test Description	ABV	Test Method	Test Condition	#Lots	Total # Units	Result	Conclusion	Remark
A1	Pre-conditioning	PC	JESD22-A113 JEDEC J-STD-020	SAT-TC/Bake/Soak/Reflow-SA T	3	3*231	0/693	Pass	/
A2	Biased HAST	HAST	JESD22-A110	Ta=130°C,85%RH, Vd= 5.5V,96hrs	3	3*77	0/231	Pass	/
A3	Unbiased HAST	UHAST	JESD22-A118	Ta=130°C,85%RH, 96hrs	3	3*77	0/231	Pass	/
A4	Temperature Cycling	TC	JESD22-A104	Ta=-50°C to +150°C,500 cycles,	3	3*77	0/231	Pass	/
A6	High Temperature Storage Life	HTSL	JESD22-A103	Ta=150°C, 500hrs	1	1*45	0/45	Pass	/

TEST GROUP C-PACKAGE ASSEMBLY INTEGRITY TESTS

Group	Test Description	ABV	Test Method	Test Condition	#Lots	Total # Units	Result	Conclusion	Remark
C1	Wire Bond Shear	WBS	AEC-Q100-001	Bond 2.3mil	1	5	0/5	Pass	/
C2	Wire Bond Pull	WBP	MIL-STD-883 Method2011	Wire Cu 20um (0.8mil)	1	5	0/5	Pass	/
C3	Solderability	SD	JESD22-B102	8 hour water vapor aging prior to test Ta=245 ± 5 °C, Infiltration time 5 ± 0.5s	1	15	0/15	Pass	>95% Lead coverage
C4	Physical Deminsion	PD	JESD22-B100 JESD22-B108	Test to spec	3	3*10	0/30	Pass	/

TEST GROUP E-ELECTRICAL VERIFICATION TESTS

Group	Test Description	ABV	Test Method	Test Condition	#Lots	Total # Units	Result	Conclusion	Remark
E1	Pre and post stress electrical test	Test	Test to spec	Test to spec	3	All	0/all	Pass	/
E2	Electrostatic Discharge Human Body Model	HBM	AEC Q100-002	±2000V	1	3	0/3	Pass	/
E3	Electrostatic Discharge Charged Device Model	CDM	AEC Q100-011	All pins:±500V; Corner pins:±750V	1	3	0/3	Pass	/
E4	Latch-Up	LU	AEC Q100-004	±100mA;5V	1	6	0/6	Pass	/

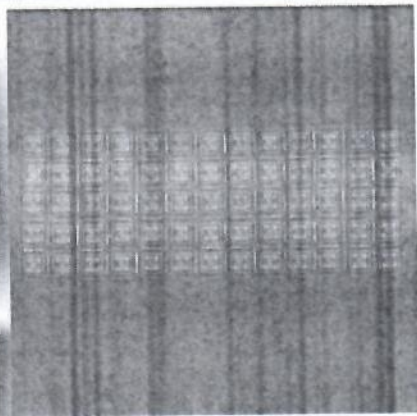
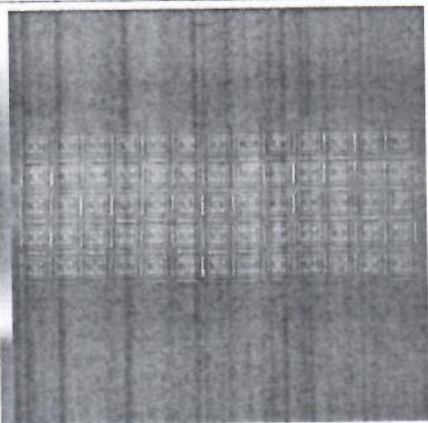
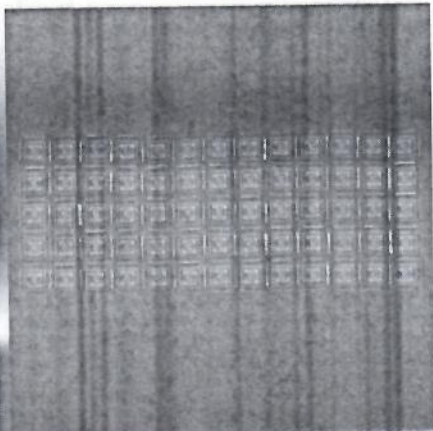
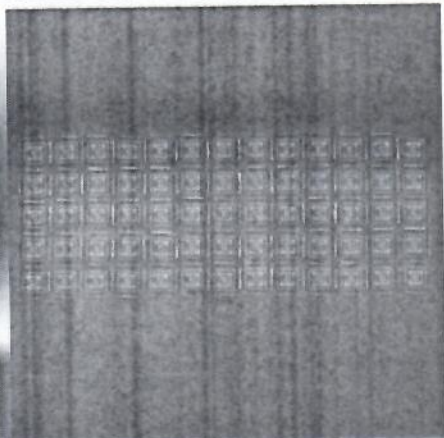
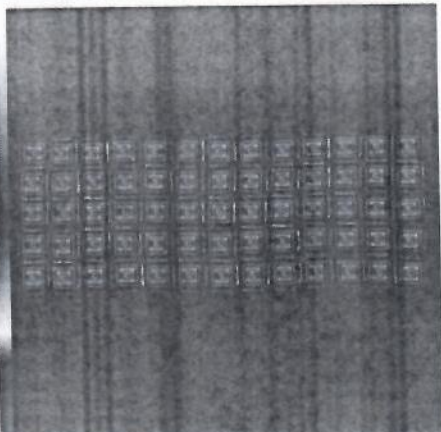
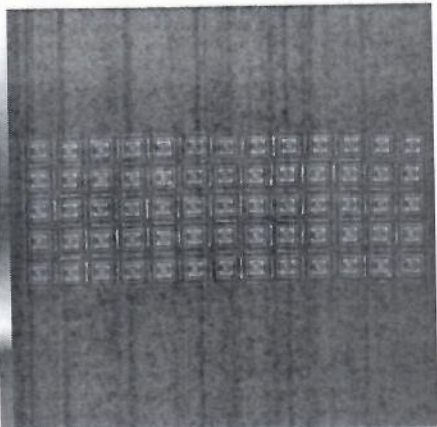
3. Test Equipment

Table 4: Test Equipment Information

No.	Equipment Nr.	Equipment Name	Model Nr.	Effective period of measurement
1	0030-003157	High temperature test chamber	GPH-20	2021.11.08 – 2022.11.07
2	0030-003158	High temperature test chamber	GPH-20	2021.11.08 – 2022.11.07
3	7824	Reflow soldering machine	TNV25-308EN-P	2021.04.26 – 2022.04.25
4	58566244680010	Fast temperature change test chamber	VT ³ 7012S2	2021.07.05 – 2022.07.04
5	58566270950010	Fast temperature change test chamber	VT ³ 7012S2	2021.07.12 – 2022.07.11
6	8112180014	Humidity Chamber	SETH-A-100L	2021.04.19 – 2022.04.18
7	1807768445	Strong acceleration humidity box	PC-422R8D	2021.08.15 – 2022.08.14
8	2006770978	Strong acceleration humidity box	PC-422R8D	2021.08.15 – 2022.08.14
9	800543013757410006	DC power supply	I16952A	2021.11.01 – 2022.10.31
10	800543013757310102	DC power supply	I16952A	2021.10.25 – 2022.10.24
11	745499001	Tensile shear force tester	Dage-4000	2021.09.06 – 2022.09.05
12	743302001	Three dimensional measuring microscope	107JPCV	2021.09.26 – 2022.09.25
13	19124170	Electronic digital calliper	DL3944	2021.06.18 – 2022.06.17
14	653421101	Solderability tester	ST88	2022.03.14 – 2023.03.13
15	742215101	Electrostatic discharge and lock-in effect test system	MK.2 SE	2022.04.27 – 2023.04.26
16	1504205	CDM electrostatic discharge tester	Orion2-IIR	2022.04.28 – 2023.04.27
17	14180	Ultrasonic microscope	D9600Z	/

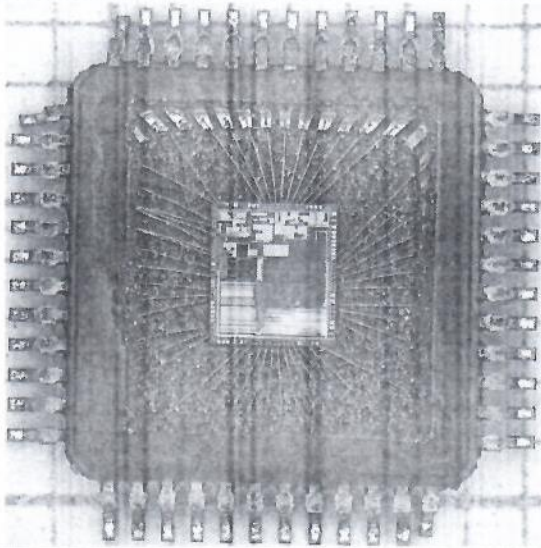
4. Test process photos

Table 5: Test process photos

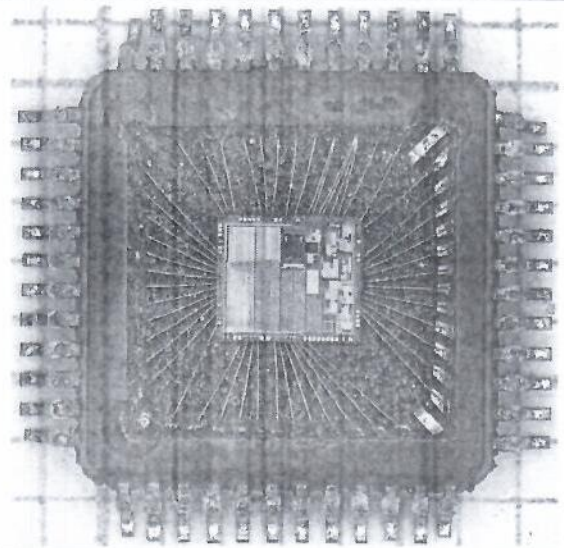
SAT	
C4B38N1G _SAT before PC	C4B38N1G _SAT after PC
	
C4B38N2G _SAT before PC	C4B38N2G _SAT after PC
	
C4B38N3G _SAT before PC	C4B38N3G _SAT after PC
	

Decap

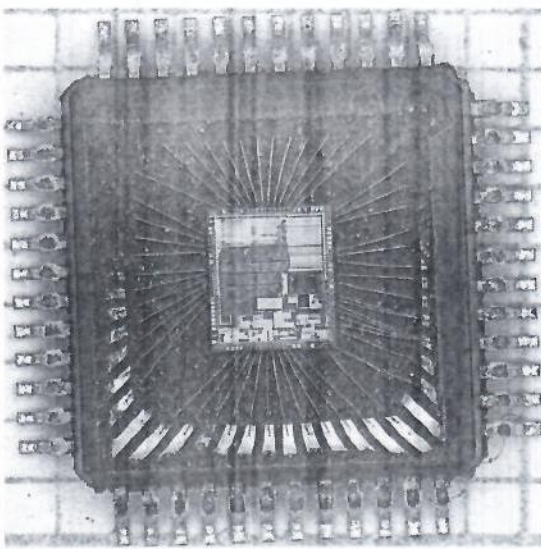
Graph 1



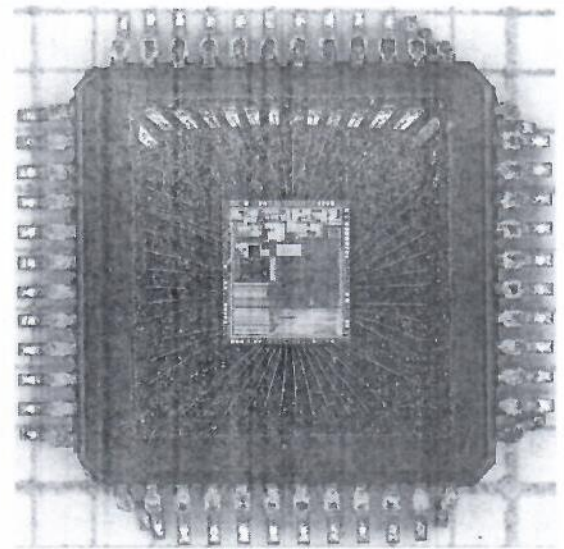
Graph 2



Graph 3

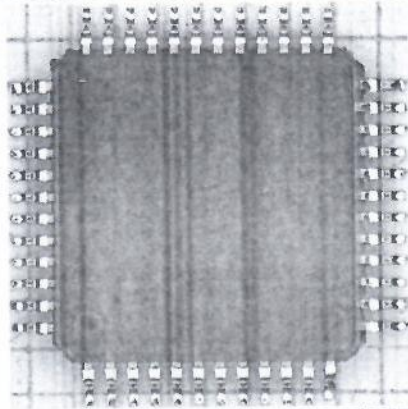


Graph 4

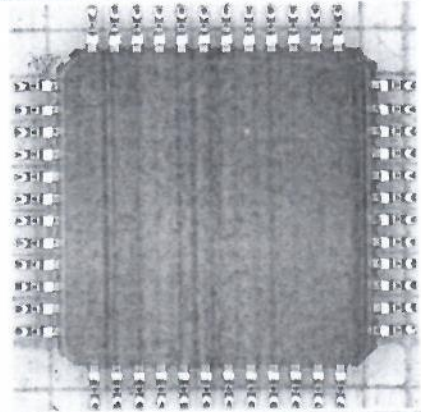


Solderability

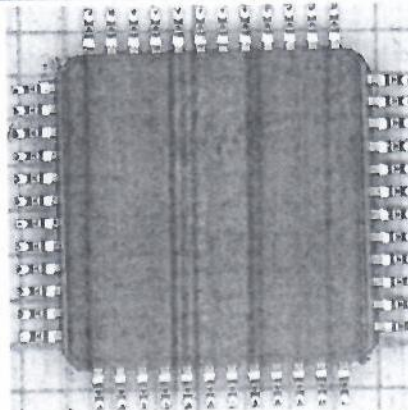
Graph 1



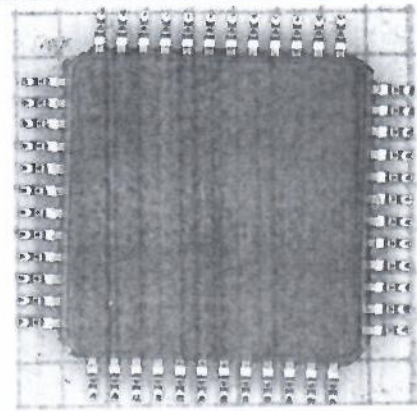
Graph 2



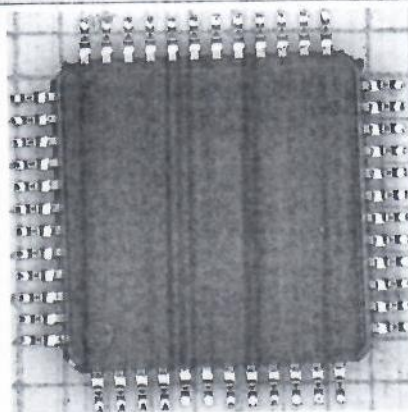
Graph 3



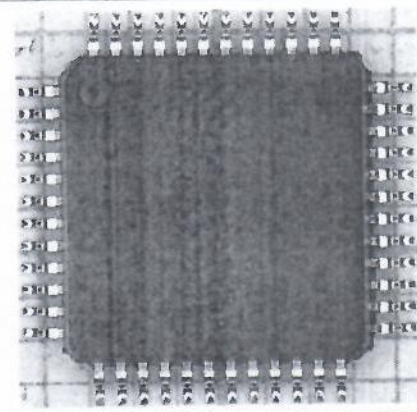
Graph 4



Graph 3



Graph 4



5. Test raw data

Test data sent by email.

6. Appendix

By email.

___END___