

# 信賴性試驗成績書

## 90nm Process Technology Product and Package Legacy Fujitsu Reliability Engineering Test Report

Wafer Process : Mie Fujitsu  
Assembly : J-Devices

## Reliability Test 1

Device Type : MCU 1  
Package Type : Plastic LQFP-208 Package

Test Item	Test Condition	Tested Number		Tested Time	Failed Number
High Temperature Operation Life 高温連続動作試験	125 °C V <sub>DD</sub> =Maximum Rating	231 (77x3Lots)	(a)	1000h	0
Temperature Humidity Bias 高温連続動作試験	85 °C / 85% RH V <sub>DD</sub> =Maximum Rating	138 (46x3Lots)	(a)	1000h	0
Low Temperature Operation Life 低温連続動作試験	-55°C V <sub>DD</sub> =Maximum Rating	78 (26x3Lots)	(a)	1000h	0
High Temperature Storage 高温保存試験	150 °C	231 (77x3Lots)	(a)	1000h	0
Temperature Cycling 温度サイクル	-65°C~150°C	231 (77x3Lots)	(a)	500cyc	0
Pressure Cooker Test	130°C, 85%RH: 2.33E5 Pa	231 (77x3Lots)	(a)	96h	0
Pressure Cooker Test with Bias	130°C, 85%RH: 2.33E5 Pa V <sub>DD</sub> =Maximum Rating	99 (33x3Lots)	(a)	96h	0

(a) Pre-condition:

Baking (125°C, 24h) +Moisture Absorption (30°C/70%RH, 192h) +Reflow 260°C Max x3

## Reliability Test 2

Device Type : MCU 2  
Package Type : Plastic LQFP-144 Package

Test Item	Test Condition	Tested Number	Tested Time	Failed Number
High Temperature Storage 高温保存試験	150 °C	231 (77x3Lots)	(b) 1000h	0
Temperature Cycling 温度サイクル	-65°C~150°C	231 (77x3Lots)	(b) 500cyc	0
Pressure Cooker Test	130°C, 85%RH: 2.33E5 Pa	231 (77x3Lots)	(b) 96h	0

(b) Pre-condition:

Baking (125°C, 24h) +Moisture Absorption (30°C/70%RH, 192h) +Reflow 260°C Max. x3

## Reliability Test 3

Device Type : MCU 3 (Custom)  
Package Type : Plastic LQFP-144 Package

Test Item	Test Condition	Tested Number	Tested Time	Failed Number
High Temperature Storage 高温保存試験	150 °C	78 (26x3Lots)	(c) 1000h	0
Temperature Cycling 温度サイクル	-65°C~150°C	78 (26x3Lots)	(c) 500cyc	0
Pressure Cooker Test	130°C, 85%RH: 2.33E5 Pa	78 (26x3Lots)	(c) 96h	0

(c) Pre-condition: Baking (125°C, 24h) +Moisture Absorption (30°C/70%RH, 120h) +Reflow 260°C Max.  
+Moisture Absorption (30°C/70%RH, 96h) +Reflow 260°C Max.

## Reliability Test 4

Device Type : MCU 4  
Package Type : Plastic TEQFP-208 Package

Test Item	Test Condition	Tested Number		Tested Time	Failed Number
High Temperature Operation Life 高温連続動作試験	125 °C V <sub>DD</sub> =Maximum Rating	231 (77x3Lots)	(d)	1000h	0
Temperature Humidity Bias 高温連続動作試験	85 °C / 85% RH V <sub>DD</sub> =Maximum Rating	138 (46x3Lots)	(d)	1000h	0
High Temperature Storage 高温保存試験	150 °C	231 (77x3Lots)	(d)	1000h	0
Temperature Cycling 温度サイクル	-65°C~150°C	231 (77x3Lots)	(d)	500cyc	0
Pressure Cooker Test	130°C, 85%RH: 2.33E5 Pa	231 (77x3Lots)	(d)	96h	0
Pressure Cooker Test with Bias	130°C, 85%RH: 2.33E5 Pa V <sub>DD</sub> =Maximum Rating	99 (33x3Lots)	(d)	96h	0

(d) Pre-condition:

Baking (125°C, 24h) +Moisture Absorption (30°C/70%RH, 192h) +Reflow 260°C Max x3

## Reliability Test 5

Device Type : MCU 5  
Package Type : Plastic FBGA-192 Package

Test Item	Test Condition	Tested Number		Tested Time	Failed Number
High Temperature Operation Life 高温連続動作試験	125 °C V <sub>DD</sub> =Maximum Rating	77	(e)	1000h	0
Temperature Humidity Bias 高温連続動作試験	85 °C / 85% RH V <sub>DD</sub> =Maximum Rating	46	(e)	1000h	0
High Temperature Storage 高温保存試験	150 °C	77	(e)	1000h	0
Temperature Cycling 温度サイクル	-65°C~150°C	77	(e)	500cyc	0
Pressure Cooker Test	110°C, 85%RH: 1.2E5 Pa	77	(e)	264h	0
Pressure Cooker Test with Bias	110°C, 85%RH: 1.2E5 Pa V <sub>DD</sub> =Maximum Rating	33	(e)	264h	0

(e) Pre-condition: Baking (125°C, 24h) +Moisture Absorption (30°C/70%RH, 72h) +Reflow 250°C Max.  
+Moisture Absorption (30°C/70%RH, 48h) +Reflow 250°C Max.

## Reliability Test 6

Device Type : MCU 6  
Package Type : Plastic PBGA-416 Package

Test Item	Test Condition	Tested Number		Tested Time	Failed Number
High Temperature Operation Life 高温連続動作試験	125 °C V <sub>DD</sub> =Maximum Rating	77	(f)	1000h	0
Temperature Humidity Bias 高温連続動作試験	85 °C / 85% RH V <sub>DD</sub> =Maximum Rating	46	(f)	1000h	0
High Temperature Storage 高温保存試験	150 °C	77	(f)	1000h	0
Temperature Cycling 温度サイクル	-65°C~150°C	77	(f)	500cyc	0
Pressure Cooker Test	110°C, 85%RH: 1.2E5 Pa	77	(f)	264h	0
Pressure Cooker Test with Bias	110°C, 85%RH: 1.2E5 Pa V <sub>DD</sub> =Maximum Rating	33	(f)	264h	0

(f) Pre-condition: Baking (125°C, 24h) +Moisture Absorption (30°C/70%RH, 72h) +Reflow 250°C Max.  
+Moisture Absorption (30°C/70%RH, 48h) +Reflow 250°C Max.



## Endurance + Data Retention Test

Device Type : Test Chip  
Package Type : Plastic QFP-100 Package

Test Condition (Ta)	Tested Number	Failed Number
1Kcyc (125°C) + Data Retention Bake : 1344h (150°C)	231 (3Lots)	0
10Kcyc (125°C) + Data Retention Bake : 672h (150°C)	231 (3Lots)	0
100Kcyc (125°C) + Data Retention Bake : 336h (150°C)	231 (3Lots)	0
125°C, 100Kcyc + HTOL : 1000h (125°C)	231 (3Lots)	0



## Document History Page

Document Title: Qualification Report of 90nm technology product with J-Devices Package (CU100F)  
Document Number: 002-19994

Rev.	ECN No.	Orig. of Change	Description of Change
**	5769002	KUMI	Initial release.