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信頼性試験成績書

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 ℃ V_{DD}=Maximum Rating	231 (77x3Lots)	(a)	1000h	0
Temperature Humidity Bias 高湿連続動作試験	85 ℃ / 85% RH V_{DD}=Maximum Rating	138 (46x3Lots)	(a)	1000h	0
Low Temperature Operation Life 低温連続動作試験	-55℃ V_{DD}=Maximum Rating	78 (26x3Lots)	(a)	1000h	0
High Temperature Storage 高温保存試験	150 ℃	231 (77x3Lots)	(a)	1000h	0
Temperature Cycling 温度サイクル	-65℃～150℃	231 (77x3Lots)	(a)	500cyc	0
Pressure Cooker Test	130℃, 85%RH: 2.33E5 Pa	231 (77x3Lots)	(a)	96h	0
Pressure Cooker Test with Bias	130℃, 85%RH: 2.33E5 Pa V_{DD}=Maximum Rating	99 (33x3Lots)	(a)	96h	0

(a) Pre-condition:

Baking (125℃, 24h) +Moisture Absorption (30℃/70%RH, 192h) +Reflow 260℃ 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 ℃	231 (77x3Lots)	(b)	1000h	0
Temperature Cycling 温度サイクル	-65℃～150℃	231 (77x3Lots)	(b)	500cyc	0
Pressure Cooker Test	130℃, 85%RH: 2.33E5 Pa	231 (77x3Lots)	(b)	96h	0

(b) Pre-condition:

Baking (125℃, 24h) +Moisture Absorption (30℃/70%RH, 192h) +Reflow 260℃ 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 ℃	78 (26x3Lots)	(c)	1000h	0
Temperature Cycling 温度サイクル	-65℃～150℃	78 (26x3Lots)	(c)	500cyc	0
Pressure Cooker Test	130℃, 85%RH: 2.33E5 Pa	78 (26x3Lots)	(c)	96h	0

(c) Pre-condition: Baking (125℃, 24h) +Moisture Absorption (30℃/70%RH, 120h) +Reflow 260℃ Max.
+Moisture Absorption (30℃/70%RH, 96h) +Reflow 260℃ 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 ℃** **V_{DD}=Maximum Rating**	**231 (77x3Lots)**	**(d)**	**1000h**	**0**
Temperature Humidity Bias **高湿連続動作試験**	**85 ℃ / 85% RH** **V_{DD}=Maximum Rating**	**138 (46x3Lots)**	**(d)**	**1000h**	**0**
High Temperature Storage **高温保存試験**	**150 ℃**	**231 (77x3Lots)**	**(d)**	**1000h**	**0**
Temperature Cycling **温度サイクル**	**-65℃～150℃**	**231 (77x3Lots)**	**(d)**	**500cyc**	**0**
Pressure Cooker Test	**130℃, 85%RH: 2.33E5 Pa**	**231 (77x3Lots)**	**(d)**	**96h**	**0**
Pressure Cooker Test with Bias	**130℃, 85%RH: 2.33E5 Pa** **V_{DD}=Maximum Rating**	**99 (33x3Lots)**	**(d)**	**96h**	**0**

(d) Pre-condition:

Baking (125℃, 24h) +Moisture Absorption (30℃/70%RH, 192h) +Reflow 260℃ 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 ℃ V_{DD}=Maximum Rating	77	(e)	1000h	0
Temperature Humidity Bias 高湿連続動作試験	85 ℃ / 85% RH V_{DD}=Maximum Rating	46	(e)	1000h	0
High Temperature Storage 高温保存試験	150 ℃	77	(e)	1000h	0
Temperature Cycling 温度サイクル	-65℃～150℃	77	(e)	500cyc	0
Pressure Cooker Test	110℃, 85%RH: 1.2E5 Pa	77	(e)	264h	0
Pressure Cooker Test with Bias	110℃, 85%RH: 1.2E5 Pa V_{DD}=Maximum Rating	33	(e)	264h	0

(e) Pre-condition: Baking (125℃, 24h) +Moisture Absorption (30℃/70%RH, 72h) +Reflow 250℃ Max.
+Moisture Absorption (30℃/70%RH, 48h) +Reflow 250℃ 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 ℃ V_{DD}=Maximum Rating	77	(f)	1000h	0
Temperature Humidity Bias 高湿連続動作試験	85 ℃ / 85% RH V_{DD}=Maximum Rating	46	(f)	1000h	0
High Temperature Storage 高温保存試験	150 ℃	77	(f)	1000h	0
Temperature Cycling 温度サイクル	-65℃～150℃	77	(f)	500cyc	0
Pressure Cooker Test	110℃, 85%RH: 1.2E5 Pa	77	(f)	264h	0
Pressure Cooker Test with Bias	110℃, 85%RH: 1.2E5 Pa V_{DD}=Maximum Rating	33	(f)	264h	0

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

Endurance + Data Retention Test

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

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

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