



# Anti-whisker formation of leadfree plating

## 1. The Applicable Product

LM358F-E2

## 2. Evaluation Package

| No | Item                     | Information                          |
|----|--------------------------|--------------------------------------|
| 1  | Subject                  | LSI product of Leadfree plating      |
| 2  | Type of Terminal Plating | Sn                                   |
| 3  | Plating Grain Size       | 2µm to 10µm                          |
| 4  | Bath type                | Alkyl sulfonic acid, Electro plating |
| 5  | Matt or Bright           | Matt                                 |
| 6  | Under Plating            | None                                 |
| 7  | Type of Frame            | Cu Alloy frame                       |

## 3. Compliance standards

Tin Whisker Acceptance Test Requirements (NEMI Tin Whisker Users Group, July 28, 2004)

## 4. Test Flow

| No | Test Flow            | Test Condition  |
|----|----------------------|---|
| 1  | Preparation          | MP. condition   |
| 2  | Pre Inspection       | SEMx250, Top/Side/Forming Section   |
| 3  | Preconditioning-1    | Storage at ambient temp. for 4 weeks  |
| 4  | Preconditioning-2    | 215°C Reflow, 255°C Reflow  |
| 5  | Applying Stress      | 1. 30°C, 70% RH, 4,000hr<br>2. 60°C, 87% RH, 4,000hr<br>3. -55/+85°C, 2,000cyc<br>4. 30°C, 70%, Bias, 4,000hr |
| 6  | Screening Inspection | x50, Top/Side/Forming Section   |
| 7  | Detailed Inspection  | SEMx250, Top/Side/Forming Section   |

## 5. Test Result

Criteria : Not allow, the whisker is larger than 40µm between lead to lead.

| No | Preconditioning-1                          | Preconditioning-2       | Stress Condition        | Result:Pn/n (pcs) |
|----|--|-------------------------|-------------------------|-------------------|
| 1  | Storage at ambient temperature.<br>4 weeks | None                    | 30°C, 70% RH 4,000hr    | 0 / 96            |
| 2  |  |                         | 60°C, 87% RH 4,000hr    | 0 / 96            |
| 3  |  | 215°C Reflow Simulation | 30°C, 70% RH 4,000hr    | 0 / 96            |
| 4  |  |                         | 60°C, 87% RH 4,000hr    | 0 / 96            |
| 5  |  | 255°C Reflow Simulation | 30°C, 70% RH 4,000hr    | 0 / 96            |
| 6  |  |                         | 60°C, 87% RH 4,000hr    | 0 / 96            |
| 7  |  | 215°C Reflow Simulation | -55/+85°C 2,000cyc      | 0 / 96            |
| 8  |  | 255°C Reflow Simulation | -55/+85°C 2,000cyc      | 0 / 96            |
| 9  |  | 215°C Reflow Assembly   | 30°C, 70%, Bias 4,000hr | 0 / 96            |

**Therefore, wisker is no problem.**

02.Nov.2015

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