



## **QUALIFICATION REPORT SUMMARY**

### **RELIABILITY LABORATORY**

**PCN#: CAAN-14MIYU858**

Date:  
May 5, 2017

**Qualification of MMT as an additional assembly site and implement marking changes for selected Atmel products available in 14L SOIC package. The qualification of palladium coated copper with gold flash (CuPdAu) as a new bond wire material for ATTINY102F-SSF, ATTINY102F-SSFR, ATTINY102F-SSN, ATTINY102F-SSNR, ATTINY102-SSF, ATTINY102-SSFR, ATTINY102-SSN, ATTINY102-SSNR, ATTINY104-SSF, ATTINY104-SSFR, ATTINY104-SSN and ATTINY104-SSNR catalog part numbers (CPN) available in 14L SOIC (.150in) package assembled at MMT site will qualify by similarity (QBS).**



## **MICROCHIP**

### **PACKAGE QUALIFICATION REPORT**

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Purpose</b>             | Qualification of MMT as an additional assembly site and implement marking changes for selected Atmel products available in 14L SOIC package. The qualification of palladium coated copper with gold flash (CuPdAu) as a new bond wire material for ATTINY102F-SSF, ATTINY102F-SSFR, ATTINY102F-SSN, ATTINY102F-SSNR, ATTINY102-SSF, ATTINY102-SSFR, ATTINY102-SSN, ATTINY102-SSNR, ATTINY104-SSF, ATTINY104-SSFR, ATTINY104-SSN and ATTINY104-SSNR catalog part numbers (CPN) available in 14L SOIC (.150in) package assembled at MMT site will qualify by similarity (QBS). |
| <b>CN</b>                  | ES090904-18972                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>QUAL ID</b>             | QTP2900 Rev. A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>MP CODE</b>             | 355B27D3XC03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Part No.</b>            | ATTINY84-20SSU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Bonding No.</b>         | BDM-001250 rev B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>CCB No.</b>             | 2831 and 8217                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b><u>Package</u></b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Type</b>                | 14L SOIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Package size</b>        | 150 mils                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b><u>Lead Frame</u></b>   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Paddle size</b>         | 104x150 mils                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Material</b>            | A194                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Surface</b>             | Bare Cu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Process</b>             | Etched                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Lead Lock</b>           | No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Part Number</b>         | 10101413                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Treatment</b>           | BOT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b><u>Material</u></b>     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Epoxy</b>               | 8390A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Wire</b>                | CuPdAu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Mold Compound</b>       | G600V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Plating Composition</b> | Matte Tin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |



## MICROCHIP PACKAGE QUALIFICATION REPORT

### Manufacturing Information

| Assembly Lot No.  | Wafer Lot No.        | Date Code |
|-------------------|----------------------|-----------|
| MMT-174600763.000 | MCSO517450071.000    | 1706KKA   |
| MMT-174600764.000 | MCSO 517 4500 71.000 | 1706KKB   |
| MMT-174600765.000 | MCSO517450071.000    | 1706KKC   |

### Result

☒ Pass ☐ Fail ☐ \_\_\_\_\_

14L SOIC (.150") assembled by MMT (ALPH) pass reliability test per QCI-39000 which was conducted at MPHL rel lab. This package was qualified the Moisture/Reflow Sensitivity Classification Level 1 at 260°C reflow temperature per IPC/JEDEC J-STD-020D standard.

# PACKAGE QUALIFICATION REPORT

| Test Number<br>(Reference)                                                                                              | Test Condition                                                                                  | Standard/<br>Method  | Qty.<br>(Acc.) | Def/SS | Result | Remarks                                 |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------|----------------|--------|--------|-----------------------------------------|
| <b><u>Precondition</u></b><br><b><u>Prior Perform</u></b><br><b><u>Reliability Tests</u></b><br><b>(At MSL Level 1)</b> | <b>Electrical Test :+85°C</b><br>System: MT9320<br>Handler:0202                                 | JESD22-A113          | 846(0)         | 846    |        | Good Devices                            |
|                                                                                                                         | Bake 150°C, 24 hrs<br>System: HERAEUS                                                           |                      |                | 846    |        |                                         |
|                                                                                                                         | 85°C/85%RH Moisture Soak 168 hrs.<br>System: Climats Excal 5423-HE                              | IPC/JEDEC J-STD-020D |                | 846    |        |                                         |
|                                                                                                                         | 3x Convection-Reflow 265°C max<br>System: Mancorp CR.5000F                                      |                      |                | 846    |        |                                         |
|                                                                                                                         | <b>Electrical Test :+85°C</b><br>System: MT9320 Handler:0202                                    |                      |                | 0/846  | Pass   |                                         |
| Temp Cycle                                                                                                              | <b>Stress Condition:</b> (Standard)<br>65°C to +150°C, 500 Cycles<br>System : VOTSCH VT 7012 S2 | JESD22-A104          |                | 240    |        | Parts had been pre-conditioned at 260°C |
|                                                                                                                         | <b>Electrical Test:</b> + 85°C<br>System: MT9320 Handler:0202                                   |                      | 248(0)         | 0/248  | Pass   |                                         |
|                                                                                                                         | <b>Bond Strength:</b><br>Wire Pull (> 2.50 grams)<br>Bond Shear (>15.00 grams)                  |                      | 15(0)          | 0/15   | Pass   |                                         |

# PACKAGE QUALIFICATION REPORT

| Test Number<br>(Reference) | Test Condition                                                                                                                                                                                    | Standard/<br>Method | Qty.<br>(Acc.) | Def/SS.          | Result | Remarks                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------|------------------|--------|-----------------------------------------|
| <b>UNBIASED-<br/>HAST</b>  | <b>Stress Condition:</b> (Standard)<br>+130°C/85%RH, 96 hrs.<br>System: HIRAYAMA HASTEST PC-422R8<br><br><b>Electrical Test:</b> +85°C<br>System: MT9320 Handler: 0202                            | JESD22-A118         | 252(0)         | 252<br><br>0/252 | Pass   | Parts had been pre-conditioned at 260°C |
| <b>HAST</b>                | <b>Stress Condition:</b> (Standard)<br>+130°C/85%RH, 96 hrs. <b>Bias Volt:</b> 5.5 Volts<br>System: HIRAYAMA HASTEST PC-422R8<br><br><b>Electrical Test:</b> +85°C<br>System: MT9320 Handler:0202 | JESD22-A110         | 240(0)         | 240<br><br>0/240 | Pass   | Parts had been pre-conditioned at 260°C |

# PACKAGE QUALIFICATION REPORT

| Test Number<br>(Reference)           | Test Condition                                                                                                                                                                                                     | Standard/<br>Method        | Qty.<br>(Acc.)                   | Def/SS.          | Result | Remarks           |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------|------------------|--------|-------------------|
| <b>High Temperature Storage Life</b> | <b>Stress Condition:</b><br>Bake 175°C, 504 hrs<br>System: HERAEUS<br><br><b>Electrical Test :+85°C</b><br>System: MT9320 Handler:0202                                                                             | JESD22-A103                | 45(0)                            | 45<br>0/45       | Pass   | 45 units          |
| <b>Solderability Temp 215°C</b>      | <b>Steam Aging:</b> Temp 93°C,8Hrs<br>System: SAS-3000<br>Solder Dipping: Solder Temp.215°C<br>Solder material: SnPb Sn63,Pb37<br>System: ERS RA 2200D<br>Visual Inspection: External Visual Inspection            | JESD22B-102E               | 22 (0)                           | 22<br>22<br>0/22 | Pass   | Performed at MTAI |
| <b>Solderability Temp 245°C</b>      | <b>Steam Aging:</b> Temp 93°C,8Hrs<br>System: SAS-3000<br>Solder Dipping: Solder Temp.245°C<br>Solder material: Pb Free Sn 95.5Ag3.9Cu0.6<br>System: ERS RA 2200D<br>Visual Inspection: External Visual Inspection | JESD22B-102E               | 22 (0)                           | 22<br>22<br>0/22 | Pass   | Performed at MTAI |
| <b>Physical Dimensions</b>           | Physical Dimension,<br>30 units from 1 lot                                                                                                                                                                         | JESD22-B100/B108           | 30(0) Units                      | 0/30             | Pass   | Performed at MTAI |
| <b>Bond Strength Data Assembly</b>   | Wire Pull (> 2.50 grams)<br><br><br>Bond Shear (>15.00 grams)                                                                                                                                                      | M2011.8<br><br>MIL-STD-883 | 30 (0) Wires<br><br>30 (0) bonds | 0/30<br><br>0/30 |        |                   |