**Q103-002 Certification of Design and Construction**

Supplier Name:       Date:

The following information is required to identify a device that has met the requirements of AEC-Q103-002. Submission of the required data in the format shown below is optional. **All entries must be completed; if a particular item does not apply, enter "Not Applicable".** This template can be downloaded from the AEC website at http://www.aecouncil.com.

**This template is available as a stand-alone document.**

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| **Item Name** | **Supplier Response** |
| 1. User’s Part Number: |       |
| 2. Supplier’s Part Number/Data Sheet: |       |
| 3. Device Description: |       |
| 4.1. Control Wafer/Die Fab Location & Process ID:a. Facility name/plant #:b. Street address:c. Country: |                      |
| 4.2. MEMS Wafer/Die Fab Location & Process ID:a. Facility name/plant #:b. Street address:c. Country: |                      |
| 4.3. Cap Wafer/Die Fab Location & Process ID:a. Facility name/plant #:b. Street address:c. Country: |                      |
| 4.4. Cap Wafer to MEMS Wafer Bonding Location & Process ID:a. Facility name/plant #:b. Street address:c. Country: |                      |
| 5.1. Control Wafer Probe Location:a. Facility name/plant #:b. Street address:c. Country: |                      |
| 5.2. MEMS Wafer Probe Location:a. Facility name/plant #:b. Street address:c. Country: |                      |
| 5.3. Bonded Wafer Probe Location:a. Facility name/plant #:b. Street address:c. Country: |                      |
| 6. Assembly Location & Process ID:a. Facility name/plant #:b. Street address:c. Country: |                      |
| 7. Final Quality Control A (Test) Location:a. Facility name/plant #:b. Street address:c. Country: |                      |
| 8.1. Control Wafer/Die:a. Wafer size:b. Die family:c. Die mask set revision & name:d. Die photo: |                     See attached [ ]  Not available [ ]  |
| 8.2. MEMS Wafer/Die:a. Wafer size:b. Die family:c. Die mask set revision & name:d. Die photo: |                     See attached [ ]  Not available [ ]  |
| 9.1. Control Wafer/Die Technology Description:a. Wafer/Die process technology:b. Die channel length:c. Die gate length:d. Die supplier process ID (Mask #):e. Number of transistors or gates:f. Number of mask steps: |                                     |
| 9.2. MEMS Wafer/Die Technology Description:a. Wafer/Die process technology:b. Sensor length x width x depth:c. Sensor anti-stiction coating:d. Die supplier process ID (Mask #):e. Number of sensor detection elements (e.g., comb/fingers cells, pressure-sensing cells, thermal cells, etc.):f. Number of mask steps: |                                          |
| 9.3. Cap to MEMS Wafer Bonding Technology Description:a. Bonding process technology:b. MEMS cavity gas atmosphere after bonding:c. MEMS cavity pressure range after bonding: |                      |
| 10.1. Die Dimensions:a. Die width:b. Die length:c. Die thickness (finished):d. Membrane Thickness: | Control Die                     | MEMS Die                     | Cap Die                     |
| 10.2. Capped MEMS Thickness:a. After bonding:b. Bonded wafer thinning process description:c. Finished Capped MEMS die thickness: | Capped MEMS Wafer                |
| 11. Die Metallization:a. Die metallization material(s):b. Number of layers:c. Thickness (per layer):d. % of alloys (if present): | Control Die                     | MEMS Die                     | Cap Die                     |
| 12. Die Passivation:a. Number of passivation layers:b. Die passivation material(s):c. Thickness(es) & tolerances:d. MEMS Anti-stiction Coating: | Control Die                     | MEMS Die                     | Cap Die                     |
| 13.1. Die Overcoat Material (e.g., Polyimide) or Capped MEMS Die (e.g., Gel):  | Control Die      | MEMS Die      |
| 14. Die Cross-Section Photo/Drawing: | Control DieSee attached [ ] Not available [ ]  | MEMS DieSee attached [ ] Not available [ ]  | Cap DieSee attached [ ] Not available [ ]  |
| 15. Die Prep Backside:a. Die prep method:b. Die metallization:c. Thickness(es) & tolerances: | Control Die                | MEMS Die                | Cap Die                |
| 16. Die Separation Method:a. Kerf width (μm):b. Kerf depth (if not 100% saw):c. Saw method: | Control Die               Single[ ]  Dual[ ]  | MEMS Die               Single[ ]  Dual[ ]  | Bonded MEMS Die          Single[ ]  Dual[ ]  |
| 17. Die Attach:a. Die attach material ID:b. Die attach method:c. Die placement diagram: | Control Die          See attached [ ] Not available [ ]  | MEMS Die          See attached [ ] Not available [ ]  |
| 18. Package:a. Type of package (e.g., plastic, ceramic, unpackaged):b. Ball/lead count:c. JEDEC designation (e.g., MS029, MS034, etc.):d. Lead (Pb) free (< 0.1% homogenous material):e. Package outline drawing: |                Yes [ ]  No [ ] See attached [ ]  Not available [ ]  |
| 19.1. Mold Compound:a. Mold compound supplier & ID:b. Mold compound type:1. Flammability rating:

d. Fire Retardant type/composition: e. Tg (glass transition temperature)(°C):f. CTE (above & below Tg)(ppm/°C): |                UL 94 V1 [ ]  UL 94 V0 [ ]           CTE1 (below Tg) =       CTE2 (above Tg) =       |
| 19.2. Package Material Used Before or After Mold Over MEMS or Capped MEMS Die:a. Material type and ID:b. Minimum material coverage:c. Maximum material coverage: | Supplier for items b and c shall supply MEMS material coverage drawing with dimensions.           See attached [ ]  Not available [ ]       See attached [ ]  Not available [ ]  |
| 20.1. Die to Leadframe Wire Bond:a. Wire bond material:b. Wire bond diameter (mils): c. Type of wire bond at die:d. Type of wire bond at leadframe:e. Wire bonding diagram: |                     See attached [ ]  Not available [ ]  |
| 20.2. Die to Die Wire Bond:a. Wire bond material:b. Wire bond diameter (mils): c. Type of wire bond at Control die:d. Type of wire bond at MEMS die:e. Wire bonding diagram: |                     See attached [ ]  Not available [ ]  |
| 21. Leadframe (if applicable):a. Paddle/flag material:b. Paddle/flag width (mils):c. Paddle/flag length (mils):d. Paddle/flag plating composition:e. Paddle/flag plating thickness (μinch):f. Leadframe material:g. Leadframe bonding plating composition:h. Leadframe bonding plating thickness (μinch):i. External lead plating composition:j. External lead plating thickness (μinch): | Control Die                                                        | MEMS Die                                                        |
| 22. Substrate (if applicable):a. Substrate material (e.g., FR5, BT, etc.):b. Substrate thickness (mm):c. Number of substrate metal layers:d. Plating composition of ball solderable surface:e. Panel singulation method:f. Solder ball composition:g. Solder ball diameter (mils): |                                          |
| 23. Unpackaged Die (if not packaged):a. Under Bump Metallurgy (UBM) composition:b. Thickness of UBM metal:c. Bump composition:d. Bump size: |                      |
| 24. Header Material (if applicable): |       |
| 25. Thermal Resistance:a. JA °C/W (approx):b. JC °C/W (approx):c. Special thermal dissipation construction techniques: |                 |
| 26. Test circuits, bias levels, & operational conditions imposed during the supplier’s life and environmental tests: | See attached [ ]  Not available [ ]  |

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| 27. Fault Grade Coverage (%) |       % Not digital circuitry [ ]  |
| 28. Maximum Process Exposure Conditions:a. MSL @ rated SnPb temperature:b. MSL @ rated Pb-free temperature:c. Maximum dwell time @ maximum process temperature: | *\* Note: Temperatures are as measured on the center of the plastic package body top surface.*      at       °C (SnPb)      at       °C (Pb-free)      |
| Attachments: | Requirements: |
| Die Photo | [ ]  | 1. A separate Certification of Design, Construction & Qualification must be submitted for each P/N, wafer fab, and assembly location. |
| Package Outline Drawing | [ ]  |
| Die Cross-Section Photo/Drawing | [ ]  |
| Wire Bonding Diagram | [ ]  | 2. Design, Construction & Qualification shall be signed by the responsible individual at the supplier who can verify the above information is accurate and complete. Type name and sign below. |
| Die Placement Diagram | [ ]  |  |
| MEMS material coverage drawing with dimensions | [ ]  |  |
| Test Circuits, Bias Levels, & Conditions | [ ]  |
| Completed by:       | Date: |       | Certified by:       | Date: |       |
| Typed or Printed: |       |       |
| Signature: |  |  |
| Title: |       |       |