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QMI2569 Conductive Ag Glass Adhesive Qualification Data

QUALIFICATION TEST RESULTS

The following tests have been completed on qualification vehicle devices REF02 (8ld CD Aero), PM139 (14ld CD Aero), OP27 (10ld Cerpack Aero), AD708 (8ld CD Mil-Icom) and OP470 (14ld CD Mil-Icom) using QMI2569 die attach adhesive.

A. IQA Functional Test Results of Raw Materials

VISCOSITY RESULT		
Part name:	QMI2569	
Batch No.:	5397354	
Viscosity Result:		
Viscosity Requirements:	25,000 to 35,000	
Jar#1	Result: 27,154	Passed Visual
Jar#2	Result: 26, 458	Passed Visual

B. In-Line Monitors (Reference: Mil-Std 883G)

Tests Performed	Sample Size	Summary of Results (No. of rejects/Sample size)
Pre-seal Die Shear Test	5 units per device	Passed (REF02 Aero : 0/5) Passed (PM139 Aero : 0/5) Passed (OP27 Aero : 0/5) Passed (AD708 Mil-Icom : 0/5) Passed (OP470 Mil-Icom: 0/5)
Wirepull Test	2 units per device	Passed (REF02 Aero : 0/10) Passed (PM139 Aero : 0/10) Passed (OP27 Aero : 0/10) Passed (AD708 Mil-Icom: 0/9) Passed (OP470 Mil-Icom : 0/14)
Third Optical Inspection	100% inspection	Passed (REF02 Aero: no die-attach material related defect) Passed (PM139 Aero : no die-attach material related defect) Passed (OP27 Aero : no die-attach material related defect) Passed (AD708 Mil-Icom: no die-attach material related defect) Passed (OP470 Mil-Icom : no die-attach material related defect)
Torque Test	3 units per device	Passed (REF02 Aero : 0/3) Passed (PM139 Aero : 0/3) Passed (OP27 Aero : 0/3) Passed (AD708 Mil-Icom : 0/3) Passed (OP470 Mil-Icom : 0/3)
Particle Impact Noise Detection (PIND) Test	100% PIND on Aero Devices 45 units per device on Mil-Icom	Passed (REF02 Aero : 0/170) Passed (PM139 Aero : 0/166) Passed (OP27 Aero : 0/170) Passed (AD708 Mil-Icom: 0/45) Passed (OP470 Mil-Icom : 0/45)

B. In-Line Monitors (Reference: Mil-Std 883G)

Tests Performed	Sample Size	Summary of Results (No. of rejects/Sample size)
Radiographic Inspection	100% Inspection on Aero device 5 units per Mil-Icom device	Passed (REF02 Aero : 1/170 not die attach related reject) Passed (PM139 Aero : 1/165 not die attach related reject) Passed (OP27 Aero : 1/170 not die attach related reject) Passed (AD708 : 0/5) Passed (OP470 : 0/5)
Fine Leak	100% per device	Passed (REF02 Aero : 0 reject) Passed (PM139 Aero : 0 reject) Passed (OP27 Aero : 0 reject) Passed (AD708 : 0 reject) Passed (OP470 : 0 reject)
Gross Leak	100% per device	Passed (REF02 Aero : 0 reject) Passed (PM139 Aero : 0 reject) Passed (OP27 Aero : 0 reject) Passed (AD708 : 0 reject) Passed (OP470 : 0 reject)
Hot Solder Dip (HSD) Visual Inspection	100% Inspection on Aero Device 45 units per Mil-Icom device	Passed (REF02 Aero : 0 reject) Passed (PM139 Aero : 0 reject) Passed (OP27 Aero : 0 reject) Passed (AD708 : 0/45) Passed (OP470 : 0/45)
Solderability Test	5 units per device	Passed (REF02 Aero : 0/5) Passed (PM139 Aero : 0/5) Passed (OP27 Aero : 0/5) Passed (AD708 : 0/5) Passed (OP470 : 0/5)

B. In-Line Monitors (Reference: Mil-Std 883G)

Tests Performed	Sample Size	Summary of Results (No. of rejects/Sample size)
Electrical Test	100% testing per device	Passed (REF02 Aero : obtained more than the minimum test yield requirement) Passed (PM139 Aero : obtained more than the minimum test yield requirement) Passed (OP27 Aero : rejects are product related and not attributed to the new die attach material) Passed (AD708 : higher than the control lot) Passed (OP470 : higher than the control lot)
Residual Gas Analysis	3 units per Aero device 2 units per Mil-Icom device	Passed (REF02 Aero : 0/3 reject) Passed (PM139 Aero : 0/3 reject) Passed (OP27 Aero : 0/3 reject) Passed (AD708 : 0/2 reject) Passed (OP470 : 0/2 reject)

C. Reliability Tests (Reference: Mil-Std 883G)

Sub-group 3 Test Flow Conditions	Sample Size	Summary of Results (No. of rejects/Sample size)
Pre-Electrical Test (25°C)	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Thermal Shock (15 cycles minimum)	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Temp. Cycle (100 cycles)	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Moisture resistance	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Visual Exam	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)

C. Reliability Tests (Reference: Mil-Std 883G)

Sub-group 3 Test Flow Conditions	Sample Size	Summary of Results (No. of rejects/Sample size)
Electrical Test (25°C)	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Fine Leak	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Gross Leak	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)

C. Reliability Tests (Reference: Mil-Std 883G)

Sub-group 4 Test Flow Conditions	Sample Size	Summary of Results (No. of rejects/Sample size)
Pre-Electrical Test (25°C)	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Mechanical Shock (Method 2002 Condition B minimum)	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Vibration Variable Frequency (Method 2007 Condition A minimum) 100 cycles	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Centrifuge	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Fine Leak	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)

C. Reliability Tests (Reference: Mil-Std 883G)

Sub-group 4 Test Flow Conditions	Sample Size	Summary of Results (No. of rejects/Sample size)
Gross Leak	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Visual Exam	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)
Electrical Test (25°C)	17 units per device	Passed (REF02 Aero : 0/17) Passed (PM139 Aero : 0/17) Passed (OP27 Aero : 0/17) Passed (AD708 : 0/17) Passed (OP470 : 0/17)

D. Post-reliability Test Data:

Tests Performed	Sample Size	Summary of Results (No. of rejects/Sample size)
Residual Gas Analysis	3 units per Aero device 2 units per Mil-Icom device	Passed (REF02 Aero : 0/3) Passed (PM139 Aero : 0/3) Passed (OP27 Aero : 0/3) Passed (AD708 : 0/2) Passed (OP470 : 0/2)
Post-seal Die Shear Test	5 units per device	Passed (REF02 Aero : 0/5) Passed (PM139 Aero : 0/5) Passed (OP27 Aero : 0/5) Passed (AD708 : 0/5) Passed (OP470 : 0/5)