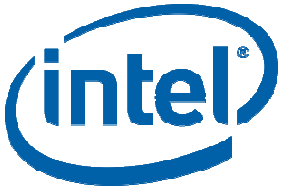

Intel® Centrino® Advanced-N 6235

Quality and Reliability Validation Test Report

Revision 2.0

March 12, 2012

Notices & Disclaimers

Document Revision History

Document Revision Number	Date	Comments
1.0	November 11, 2011	Initial Test Report
2.0	February 28, 2012	Added Low Profile Intel® Centrino® Advanced-N 6235 Form Factor

Contents

1 Introduction and Test Summary

This report covers the data collected to fulfill Production Qualification (PRQ) requirements for the Intel® Centrino® Ultimate-N 6235 half-mini wireless modules using a low profile. The Intel® Centrino® Ultimate-N 6235 half-mini and mini wireless modules have passed all Production Qualification Quality Reliability Validation requirements set forth in the Intel Product Qualification Specification, 25-GS3000.

2 Product Description

Intel® Centrino® Ultimate-N 6235 is a Wireless LAN (WiFi) & Bluetooth (BT) combination dual chip solution based on Intel® Centrino Advanced-N 6230 supporting both 2.4GHz and 5GHz bands. It shall operate on a 40MHz wide channel, reaching PHY rates of up to 300Mbps. Intel® Centrino® Ultimate-N 6235 supports BT 4.0 standard including BT Classic, BLE, and BT 3.0 High Speed (HS). The Intel® Centrino® Ultimate-N 6235 offers a cost effective solution for corporate and consumer market segments in a mobile form factor.

The Intel® Centrino® Ultimate-N 6235 is available as follows:

- Standard PCI-express Half Mini Card (HMC) form factor and mechanical interface. The host interface is PCI Express for the Wireless LAN and USB2.0 Full-Speed for the Bluetooth. In addition, C-Link support communication for Wireless AMT. The standard form dimensions are 26.80 mm x 30.00 mm x 2.4 mm Max (Top Side) / 1.35 mm Max (Bottom Side),
- Low Profile Form Factor for the thinnest notebook systems. This new lower z-height form factor provides the performance and reliability of the standard version while allowing more aggressive system designs. The low profile form dimensions are 26.80 mm x 30.00 mm x 1.5 mm Max (Top Side) / 0.6 mm Max (Bottom Side).

3 Quality & Reliability Validation (QRV)

This report is designed to provide a description of the methods used to verify that the Intel® Centrino® Ultimate-N 6235 meets or exceeds Intel's quality and reliability assessments stated in Intel's Product Qualification Specification (25-GS3000). Each test is described and the results are presented. The reliability of the device is generally defined as the probability that the device will perform the intended function under the specified operating conditions throughout its life. To determine device reliability, Intel subjects sample lots of the Module to a variety of stress tests. The test results include both standard and low profile form factor.

4 Summary of QRV Results

4.1 Intel® Centrino® Advanced-N 6235 – Manufacturing Quality

Operating Reliability	Qualification Stresses Conditions	Reference	Results Pass/Fail	Notes
Functional Outgoing Quality Monitor (FOQM)	Production build data 100% First Pass	Acceptance (FPA)	**Pass**	
Visual Outgoing Quality Monitor (VOQM)	Production build data 98.7% First Pass	Acceptance (FPA)	**Pass**	

4.2 Intel® Centrino® Advanced-N 6235 – Qualification Test Summary

Qualification Stresses	Conditions/Reference	PRQ Requirements	Results PASS /FAIL	Notes
Temperature Cycle Non Operational	Non-operating temperature limits: TCT profile: -40°C & +100°C thermal stress at ramp rate limits of 8° to 10°C per minute. Total of 370 cycles	Pass Functional Test and post temp cycle cross section	**Pass**	
Unpackaged Shock Non Operational	"Half Sin" shock 2mSec 163G pick	Meets 25-GS0009	**Pass**	
Vibration Operational	Random profile: 5 Hz @0.01 g2 /Hz to 20 Hz @0.025 g2 /Hz (slope up). 20 Hz to 500 Hz @ 0.025g2 /Hz (flat). Input acceleration is 3.5g RMS. 10 minutes per axis for all 3 axes on all samples. Random control limit tolerance is ± 3 dB. Note: Repeat Test for a, b, g, n modes	Meets 25-GS0009	**Pass**	
Biased Humidity Non Operational	Relative Humidity: 50% to 85% non-condensing, Rate ≤ 18% At temperatures of 25° to 70°C Rate ≤ 23C/hour Total test: 208h (200h at Tmax and RHmax)	Meets 25-GS0009	**Pass**	

Qualification Stresses	Conditions/Reference	PRQ Requirements	Results PASS /FAIL	Notes
Bake Temperature Non-Operational	Non-operating temperature at limits:+75°C @24h to -45°C @24h (non-operating) Total of 48 hours	Meets 25-GS0009	**Pass**	
High/Low Temperature Operational	Operating at high Temperature limit at +80°C for 10 hours and low temp limits 0°C for 10 hours	Meets 25-GS0009	**Pass**	
Temperature and Voltage	0-70°C / 3.0-3.6v testing at corners	Meets 25-GS0009	**Pass**	
MTBF	Telcordia (SR-332) Issue 2, Method III, Case 1, Ground, Mobile. Calculations should be done at 45°C, 55°C and 65°C.	>500,000 hours MTBF	**Pass**	
ROHS/HF Compliance	ROHS/HF Grind / SDOC	Cl and Br < 900ppm or 1500ppm total	**Pass**	

4.3 Intel® Centrino® Advanced-N 6235 – Regulatory Report/Certification

Condition/Reference	PRQ Requirements	Results Pass/Fail	Notes
European Union Certification [CE]	Tested, Approved, and Certified	**Pass**	
US Safety Certification [UL 1950]	Tested, Approved, and Certified	**Pass**	