

CL4 Test Item & Criteria

Test Description		Reference Standard	Common Test Specification	Reference Standard	Torture Test Specification	Criteria
1. Basic Function Tests						
1	Touchscreen					
2	Wireless					
3	Head phone Jack					
4	Internal Speaker					
5	Micro Input Jack					
6	Internal mono Mic					
7	Camera					
8	USB					
9	External SD card					
10	HDMI					
11	Accelerometer					
12	Power Button					
13	Outdoor Light Sensor					
14	Camera/Mic LED					
			Unless otherwise specified, a battery must be present and no external power should be provided to the laptop.			Mechanical damage includes change in color, dents, cracking, deformation, and oxidation of exterior metal part or contacts. Mold/mildew is acceptable as long as it does not impact the display or functionality.
2. Environmental Reliability Tests						
1 High Temperature Operation Test						
			1. Laptop state: Unpacked, open, power on, executing runin test (w. battery test disabled) 2. 24VDC external power provided 3. Temperature: 50C 4. Duration: 24hrs		Same as Common Test, except: 3. Temperature: increase to fail 4. Duration: 4hrs for each temperature 5. Temperature Step: 5C	1. No function error during the test, except a failure to charge battery in Torture Test 2. No electrical, mechanical, or cosmetic damage
2 Low Temperature Operation Test						
			1. Laptop state: Unpacked, open, power on, executing runin tests 2. 12VDC external power provided 3. Temperature: 0C 4. Duration: 24hrs		Same as Common Test, except: 3. Temperature: decrease to fail 4. Duration: 4hrs for each temperature 5. Temperature Step: -5C	1. No function error during the test 2. No electrical, mechanical, or cosmetic damage
3 Extreme Temperature Operation Test						
			1. Laptop state: Unpacked, open, power on, executing runin tests 2. 13.5VDC external power provided 3. Test Profile: 25C/10% R.H. (30min) ->(30min, ramp) ->0C/non-condensing (12hr) ->(2hr ramp) ->50C/30% R.H.(8hr) ->50C/70% R.H.(8hr) ->25C/50% R.H.(ramp over 30min) 4. Duration: Three (31.5hr) cycles		Same as Common Test, except: 3. Decrease min. test temp. from 0C to lowest temp. passing torture test #2. Increase max. temp. from 50C to highest temp. passing torture test #1. 4. Cycle until fail, or ten cycles (31.5 hrs total)	1. No function error during the test 2. No electrical, mechanical, or cosmetic damage
4 High Temperature Storage Test						
			1. Laptop state : Unpacked, closed, power off 2. Temperature :65C 3. Duration: 24hrs		Same as Common Test, except: 2. Temperature : increase to fail 3. Duration: 4hrs for each temperature 4. Temperature Step: 5C	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
5 Low Temperature Storage Test						
			1. Laptop state : Unpacked, closed, power off 2. Temperature : -40C 3. Duration: 24hrs		Same as Common Test, except: 2. Temperature : decrease to fail 3. Duration: 4hrs for each temperature 4. Temperature Step: 5C	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
6 Humidity Storage Test						
			1. Laptop state: Unpacked, open, power off 2. Test Profile : 30C/7% R.H. (3hrs) -> 60C/5% R.H. (6 hrs) -> 30C/95% R.H. (7 hrs) -> 60C/ 95% (8 hrs) 3. Duration: 5 cycles		Same as Common Test, except: 3. Duration: cycle to fail or 15 cycles (360 hrs)	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
7 Thermal Shock Test						
			1. Laptop state: Unpacked, open, power off 2. Temperature extremes: -20C and 60C 3. 20-minute dwell time 4. Duration: 50 cycles 5. Temperature ramp rates : 40C/min or greater		Same as Common Test, except: 4. Duration: Test to fail or 200 cycles	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
8 Thermal Profile Test						
			1. Laptop state: Unpacked, open, power on 2. Test at ambient temperature of 45C and 50C 3. Components to test must include: U14 (SoC), U25 (EC), U21 (SDRAM), U24 (SDRAM), U3 (Audio Codec), U15 (eMMC), PU9 (Batt. Charger), PU6 (Vcore), PU4 (+5V), PU9 (Batt. Charger), PL3 (+5V), Batt. Pack 4. A fully discharged (less than 10% SOC) battery should be charging 5. 24VDC external power provided 6. 2.5W dummy load in each USB port 7. Test program: runin with battery tests disabled 8. Run programs for twenty minutes before starting measurements		Same as Common Test, except: 2. Test at ambient temperatures of 55C and 60C	No component temperature should exceed component specifications
9 Altitude Operation Test						
			1. Laptop state: Unpacked, open, power on, executing runin tests 2. 13.5VDC external power provided 3. Temperature: 40C 4. Altitude: 5500m 5. Duration: 24hrs		Same as Common Test, except: 4. Increase altitude from 5000m until fail 5. Dwell time per step: 4hrs 6. Altitude step: 500m	1. No function error during the test 2. No electrical, mechanical, or cosmetic damage

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3. Electrical Environment Tests					
1 ESD Test, w. adapter	IEC 61000-4-2 level III	1. Laptop state: Unpacked, closed, power off 2. Temperature: 0°C 3. Altitude: 10000m 4. Duration: 48hrs		Same as Common Test, except: 4. Duration: 144hrs	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
2 ESD Test	IEC 61000-4-2 level III	1. Laptop state: Unpacked, open, power on, executing runin 2. No external power 3. Contact: ±6 kV/±8 kV; Air: ±10 kV/±12 kV 3. + polarity: 10 times; -polarity: 10 times 4. Ambient temperature: 15 to 35°C 5. Relative humidity: 30 to 50%		Same as Common Test, except: 3. + polarity: 100 times; -polarity: 100 times 2. Temperature: 50C	1. No change in functionality shall be accepted for 6KV Contact/10KV Air. 2. No electrical damage shall be accepted for ±10KV Contact, ±12KV Air, but a transient effect on functionality is allowed. 3. Power draw from DC Input should not exceed design spec (24W)
3 Battery Verification Test		1. Laptop state: Unpacked, open, power on 2. Executing runin, without battery test 3. 13.5VDC external power provided 4. Battery fully charged 5. Nothing connected to laptop USB ports		Same as Common Test, except: 2. Executing runin and playing loud music ? 4. A 2.5W load attached to each USB port	1. In Common Test, DC power input not to exceed design spec (8W) 2. In Torture test, DC power input not to exceed design spec (24W)
4 Power Consumption Measurement		1. Laptop state: Unpacked, open, power on 2. Executing runin, without battery tests 3. Battery fully charged 4. Temperature: 45C 5. 11/13.5/24VDC external power provided 6. Test duration: 12hrs at each input voltage		None	1. No function error during the test 2. No electrical, mechanical, or cosmetic damage. 3. Power draw from DC Input should not exceed design spec (24W)
5 Operating DC Input		1. Laptop state: Unpacked, closed, power off 2. Temperature: 45C 3. -40/5/40VDC external power provided 6. Test duration: 24hrs at each input voltage		None	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage 3. Current on external DC Input not to exceed 5 mA
6 Non-Operating DC Input		1. Laptop state: Unpacked, open, power on 2. 12VDC external power provided 3. Temperature: 0C 4. On the HDMI port, short +5V directly to ground 5. Test duration: 1 hour		Same as Common Test, except: 4. On HDMI port, short +5V to ground using a 4 ohm, 10W resistor	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
7 HDMI Port Short		1. Laptop state: Unpacked, open 2. 13.5VDC external power provided 3. System ON Time : 1 min 30sec 4. System OFF Time : 20 sec 5. ON/OFF Cycle : 400 times 6. Temperature: 0, 25, and 50C		None	1. Successfully boot to Sugar at each power on cycle 2. No function error during the test 3. No electrical, mechanical, or cosmetic damage
8 Power On/Off Test	Quanta	1. Laptop state: Unpacked, open, with power on and power off 2. 13.5VDC external power provided 3. Temperature: 45C 4. -9VDC/+9VDC (up to 2A) applied to both channels of external microphone input 5. Test duration: 3 hours each voltage/state		Same as Common Test, except: 3. -12VDC/+12VDC applied to both channels of external microphone input	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage 3. Current on external microphone input not to exceed 100 mA
9 Input Mic Overvoltage		1. Laptop state: Unpacked, open, with power on and power off. 2. 13.5VDC external power provided 3. Temperature: 45C 4. If laptop is on, play audio at full volume 5. -9VDC/+9VDC (up to 2A) applied to both channels of external headphone output 6. Test duration: 3 hours each voltage/state		Same as Common Test, except: 3. -10VDC/+10VDC applied to both channels of external headphone output	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage 3. Current on external headphone output not to exceed 300 mA 4. Powering off of unit under test is acceptable
10 Headphone Overvoltage					

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Test Description	Common Test Specification	Reference Standard	Torture Test Specification	Reference Standard	Criteria
11 Headphone Short	<ol style="list-style-type: none"> Laptop state: Unpacked, open, power on 1.3.SVDC external power provided Temperature: 45C Play loud audio at full volume Short each channel of external headphone jack to ground using a 1 ohm resistor Test duration: 3 hours 		None		<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
12 USB Port Short	<ol style="list-style-type: none"> Laptop state: Unpacked, open, power on 1.3.SVDC external power provided Temperature: 45C On each USB port, short +5V to ground using a 1 ohm resistor Test duration: 1 hour 		None		<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
4. Mechanical Environment Tests					
1 Sand and Dust Test		IEC 60529	None		<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage Any accumulation of talcum dust inside the laptop does not interfere w. safe operation. No erosion of the laptop surfaces
2 Water Test		IEC 60529 IP X4	None		<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage If any water has entered the laptop, it shall not interfere with safe operation of the device.
3 Spill Test, closed		OLPC	None		<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage If any liquid has entered the laptop, it shall not interfere with safe operation of the device.
4 Spill Test, open		OLPC	None		<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage If any liquid has entered the laptop, it shall not interfere with safe operation of the device.
5 Operating Vibration Test		Quanta	Same as Common Test, except: 3. Grms = 0.75		<ol style="list-style-type: none"> No function error during the test No electrical, mechanical, or cosmetic damage
6 Non-Operating Vibration Test		Quanta	Same as Common Test, except: 2. Grms = 2.5		<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
7 Package Vibration Test		Quanta	None		<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
8 Operating Shock Test		Quanta, but w. increased force	Same as Common Test, except: 6. Repeat until failure or 1000 shocks per side		<ol style="list-style-type: none"> No function error during the test No electrical, mechanical, or cosmetic damage
9 Non-Operating Shock Test		Quanta	Same as Common Test, except: 3. 122G / 5ms Square wave 5. Repeat until failure or 1000 shocks per side		<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage

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Test Description	Common Test Specification	Torture Test Specification	Criteria
11 Package Storage Test	<p>Reference Standard: Quanta</p> <p>0~4.54 KG / 0~10 lb 4.54~9.07 KG / 10~20 lb 9.07~22.68 KG / 20~50 lb 22.68~45.36 KG / 50~100 lb 45.36~113.4 KG / 100~250 lb 113.4 KG~ / 250 lb~</p> <p>10 drops : 1 corner, 3 edges and 6 surfaces</p> <p>1. Laptop state: Packed, battery not present 2. Test Profile: 25°C/5% R.H. (30min) -> 30min, ramp) -> 0°C/5% R.H. (12hr) -> (2hr ramp) -> 50°C/30% R.H.(8hr) -> 50°C/70% R.H. (8hr) -> 25°C/50% R.H. (ramp over 30min) 4. Duration: Three (31.5hr) cycles</p>	<p>Reference Standard: MIL-STD 810E</p> <p>0~45.4 KG / 0~100 lb 45.4~90.8 KG/100~200 lb</p> <p>122cm 10 Drops 76cm 10 Drops</p> <p>10 drops: 1 corner, 3 edges and 6 surfaces</p> <p>1. 85°C/95% R.H. 96hr 2. -25°C/<5% R.H. 96hr</p>	<p>1. No function error after the test 2. No electrical, mechanical, or cosmetic damage 3. No damage or warping of box 4. No peeling of box labelling</p>
12 Desk Slide Drop Test	<p>Reference Standard: Quanta</p> <p>0~4.54 KG / 0~10 lb 4.54~9.07 KG / 10~20 lb 9.07~22.68 KG / 20~50 lb 22.68~45.36 KG / 50~100 lb 45.36~113.4 KG / 100~250 lb 113.4 KG~ / 250 lb~</p> <p>10 drops : 1 corner, 3 edges and 6 surfaces</p> <p>1. Laptop state: Unpacked, fully open (135 deg.), power on 2. Laptop should be slid off of a surface slanted at 25 deg., in four orientations (each of four sides dropping first) 3. Drop Surface: 18mm thick plywood placed on flat concrete floor. 4. Drop Height: 65cm 5. Actual impact surface may vary 6. Cycles: 2 in each orientation 7. Temperature: 20C</p>	<p>Reference Standard: MIL-STD 810E</p> <p>0~45.4 KG / 0~100 lb 45.4~90.8 KG/100~200 lb</p> <p>122cm 10 Drops 76cm 10 Drops</p> <p>10 drops: 1 corner, 3 edges and 6 surfaces</p> <p>1. 85°C/95% R.H. 96hr 2. -25°C/<5% R.H. 96hr</p>	<p>1. No function error after the test 2. No electrical, mechanical, or cosmetic damage 3. No damage or warping of box 4. No peeling of box labelling</p>
13 Free Drop Test, Wood	<p>Reference Standard: Quanta</p> <p>0~4.54 KG / 0~10 lb 4.54~9.07 KG / 10~20 lb 9.07~22.68 KG / 20~50 lb 22.68~45.36 KG / 50~100 lb 45.36~113.4 KG / 100~250 lb 113.4 KG~ / 250 lb~</p> <p>10 drops : 1 corner, 3 edges and 6 surfaces</p> <p>1. Laptop state: Unpacked, fully open (135 deg.), power off 2. Drop Surface: 18mm thick plywood placed on flat concrete floor. 3. Drop Height: 45cm 4. Impact Surface: All six laptop sides and four corners 5. Cycles: 2 on each impact surface 6. Temperature: 20C</p>	<p>Reference Standard: MIL-STD 810E</p> <p>0~45.4 KG / 0~100 lb 45.4~90.8 KG/100~200 lb</p> <p>122cm 10 Drops 76cm 10 Drops</p> <p>10 drops: 1 corner, 3 edges and 6 surfaces</p> <p>1. 85°C/95% R.H. 96hr 2. -25°C/<5% R.H. 96hr</p>	<p>1. No function error during the test 2. No electrical or mechanical damage 3. Minor cosmetic damage (scuffs and abrasions) of laptop exterior allowed</p>
14 Free Drop Test, Carpet	<p>Reference Standard: Quanta</p> <p>0~4.54 KG / 0~10 lb 4.54~9.07 KG / 10~20 lb 9.07~22.68 KG / 20~50 lb 22.68~45.36 KG / 50~100 lb 45.36~113.4 KG / 100~250 lb 113.4 KG~ / 250 lb~</p> <p>10 drops : 1 corner, 3 edges and 6 surfaces</p> <p>1. Laptop state: Unpacked, fully open (135 deg.), power off 2. Drop Surface: 18mm thick plywood placed on flat concrete floor. 3. Drop Height: 85cm 4. Impact Surface: All six laptop sides and four corners 5. Cycles: 2 on each impact surface 6. Temperature: 20C</p>	<p>Reference Standard: MIL-STD 810E</p> <p>0~45.4 KG / 0~100 lb 45.4~90.8 KG/100~200 lb</p> <p>122cm 10 Drops 76cm 10 Drops</p> <p>10 drops: 1 corner, 3 edges and 6 surfaces</p> <p>1. 85°C/95% R.H. 96hr 2. -25°C/<5% R.H. 96hr</p>	<p>1. No function error during the test 2. No electrical or mechanical damage 3. Minor cosmetic damage (scuffs and abrasions) of laptop exterior allowed</p>
15 Tilt Drop Test	<p>Reference Standard: Quanta</p> <p>0~4.54 KG / 0~10 lb 4.54~9.07 KG / 10~20 lb 9.07~22.68 KG / 20~50 lb 22.68~45.36 KG / 50~100 lb 45.36~113.4 KG / 100~250 lb 113.4 KG~ / 250 lb~</p> <p>10 drops : 1 corner, 3 edges and 6 surfaces</p> <p>1. Laptop state: Unpacked, fully open (135 deg.), powered on 2. Drop Height: 15cm 3. Drop Surface: 18mm thick plywood placed on flat concrete floor. 4. Impact Surface: Front, Back, Right, and Left --- the opposite surface is left in contact with the drop surface. 5. Cycles: 100 on each impact surface</p>	<p>Reference Standard: MIL-STD 810E</p> <p>0~45.4 KG / 0~100 lb 45.4~90.8 KG/100~200 lb</p> <p>122cm 10 Drops 76cm 10 Drops</p> <p>10 drops: 1 corner, 3 edges and 6 surfaces</p> <p>1. 85°C/95% R.H. 96hr 2. -25°C/<5% R.H. 96hr</p>	<p>1. No function error during the test 2. No electrical, mechanical, or cosmetic damage</p>
16 Base Unit Static Pressure Test	<p>Reference Standard: Quanta</p> <p>0~4.54 KG / 0~10 lb 4.54~9.07 KG / 10~20 lb 9.07~22.68 KG / 20~50 lb 22.68~45.36 KG / 50~100 lb 45.36~113.4 KG / 100~250 lb 113.4 KG~ / 250 lb~</p> <p>10 drops : 1 corner, 3 edges and 6 surfaces</p> <p>1. Laptop state: Unpacked, power off, open unless indicated 2. Temperature: 20C 3. Apply the specified pressure with a probe of the specified diameter to each test point for the indicated number of times: (a.) twelve pts on laptop bottom (w/ laptop closed): 10kg, 12mm, 10 times (b.) left and right palmrests: 10kg, 25mm, 5,000 times (c.) touchpad center: 5kg, 12mm, 5,000 times. (d.) touchpad center: 10kg, 12mm, 100 times. 4. Duration per point: 2 sec</p>	<p>Reference Standard: MIL-STD 810E</p> <p>0~45.4 KG / 0~100 lb 45.4~90.8 KG/100~200 lb</p> <p>122cm 10 Drops 76cm 10 Drops</p> <p>10 drops: 1 corner, 3 edges and 6 surfaces</p> <p>1. 85°C/95% R.H. 96hr 2. -25°C/<5% R.H. 96hr</p>	<p>1. No function error after the test 2. No electrical, mechanical, or cosmetic damage</p>
17 Upper Unit Static Pressure Test	<p>Reference Standard: Quanta</p> <p>0~4.54 KG / 0~10 lb 4.54~9.07 KG / 10~20 lb 9.07~22.68 KG / 20~50 lb 22.68~45.36 KG / 50~100 lb 45.36~113.4 KG / 100~250 lb 113.4 KG~ / 250 lb~</p> <p>10 drops : 1 corner, 3 edges and 6 surfaces</p> <p>1. Laptop state: Unpacked, power off, closed unless indicated 2. Temperature: 20C 3. Apply the specified pressure with a probe of the specified diameter to each test point for the indicated number of times: (a.) center of back: 50kg, 100mm, 10 times (b.) twelve points on back: 30kg, 100mm, 10 times (c.) nine points on back: 10kg, 25mm, 5,000 times (d.) center of bezel below display (open): 5kg, 12mm, 5,000 times (e.) microphone and camera (open): 5kg, 12mm, 5,000 times 4. Duration per point: 2 sec</p>	<p>Reference Standard: MIL-STD 810E</p> <p>0~45.4 KG / 0~100 lb 45.4~90.8 KG/100~200 lb</p> <p>122cm 10 Drops 76cm 10 Drops</p> <p>10 drops: 1 corner, 3 edges and 6 surfaces</p> <p>1. 85°C/95% R.H. 96hr 2. -25°C/<5% R.H. 96hr</p>	<p>1. No function error after the test 2. No electrical, mechanical, or cosmetic damage</p>
18 Static Pressure Vibration Test	<p>Reference Standard: Quanta</p> <p>0~4.54 KG / 0~10 lb 4.54~9.07 KG / 10~20 lb 9.07~22.68 KG / 20~50 lb 22.68~45.36 KG / 50~100 lb 45.36~113.4 KG / 100~250 lb 113.4 KG~ / 250 lb~</p> <p>10 drops : 1 corner, 3 edges and 6 surfaces</p> <p>1. Laptop state: Unpacked, closed, power off 2. Test mass: 10 kg (an Aluminum plate plus extra weights) 3. Frequency : 1~200Hz 4. PSD: G/Hz: 0.0001~0.001 5. Axes: Z only 6. Duration: 30 minutes 7. Temperature: 20C</p>	<p>Reference Standard: MIL-STD 810E</p> <p>0~45.4 KG / 0~100 lb 45.4~90.8 KG/100~200 lb</p> <p>122cm 10 Drops 76cm 10 Drops</p> <p>10 drops: 1 corner, 3 edges and 6 surfaces</p> <p>1. 85°C/95% R.H. 96hr 2. -25°C/<5% R.H. 96hr</p>	<p>1. No function error after the test 2. No electrical, mechanical, or cosmetic damage</p>

CL4 Test Item & Criteria

Test Description		Reference Standard	Common Test Specification	Reference Standard	Torture Test Specification	Criteria
18	Switch Pressure Test		<ol style="list-style-type: none"> Laptop state: Unpacked, open, power off Apply pressure to all switches (power, rotate, gamepad, game buttons, and both touchpad buttons) Force: 5 Kg Diameter: Circle of 7.5mm in diameter Duration: 1 sec Repeat 100 times 		None	<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
19	Switch Protection Test		<ol style="list-style-type: none"> Laptop state: Unpacked, open, power off Apply pressure to four places adjacent to each switch (power, rotate, gamepad, game buttons, and both touchpad buttons) Force: 10 Kg Diameter: Circle of 8mm in diameter Duration: 5 sec at each position 		None	<ol style="list-style-type: none"> No switch action is recognized during test No damage is found on mechanical components after test
20	LCD Twist Test		<ol style="list-style-type: none"> Laptop state: Unpacked, fully open (135 deg), power on screen Secure base unit, and apply force to right & left upper corner of LCD Diameter: 25mm Force: 5 Kg Duration: 5 sec 10 cycles each side 		None	<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
21	USB Reverse Install - simulating a child mistakenly inserting a USB device upside down		<ol style="list-style-type: none"> Laptop state: unpacked, open, power off Attempt to insert USB device (Type A female) upside down into USB connector Test force: 3.5 Kg Test duration: 10 sec. 		Same as Common Test, except: 3. Test force: 8 Kg	<ol style="list-style-type: none"> No mechanical damage to USB port
22	Connector Shear Test		<ol style="list-style-type: none"> Laptop state: Unpacked, power off Connectors: USB, HDMI, Microphone, Headphone Pressure force: 3 Kg Direction: 4 axes orthogonal to connector insertion Duration: 500 times 		Same as Common Test, except: 5. Repeat until failure	<ol style="list-style-type: none"> No damage is found on mechanical parts No problem is seen in component soldering or motherboard pads
23	Adapter Cable Bending Test		<ol style="list-style-type: none"> Extension Angle: 0~180 deg Duration: 4,000 cycles Tension force: 0.5lbs (227 grams) 0 deg. (1 sec stop) => 180 deg. during 1 sec (1 sec stop) 180 deg. (1 sec stop) => 0 deg. during 2 sec (1 sec stop) For the first 2,000 cycles, stop the tester every 1,000 cycles 		Same as Common Test, except: 3. 12G / 5ms Square wave 5. Repeat until failure or 1000 shocks per side	<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
24	Adapter Non-Operating Shock Test		<ol style="list-style-type: none"> Power adapter state: Unpacked, unpowered 240G / 2ms Half-Sine wave 100G / 5ms Square wave Five shocks per side on all six sides 		Same as Common Test, except: 1. Laptop state: Unpacked, open, power off 2. Free drop steel ball with 17.5mm in diameter and weight of 300g from 150cm 3. Impact point: on center of LCD panel	<ol style="list-style-type: none"> No cracking of the LCD display
25	Free Drop Steel Ball Test		None		Quanta	
5. Durability Tests						
1	Power Button		<ol style="list-style-type: none"> 20,000 cycle Force: 350g 2~3 cycle/sec 		Same as Common Test, except: 1. Test to fail	<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
2	Control Buttons		<ol style="list-style-type: none"> 500,000 cycle Force: 210g 2~3 cycle/sec 		Same as Common Test, except: 1. Test to fail	<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
3	Touchpad Buttons		<ol style="list-style-type: none"> 1,000,000 cycles Force: 210g 2~3 cycle/sec Force applied to part of button near center of touchpad 		Same as Common Test, except: 1. Test to fail	<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
4	USB Ports		<ol style="list-style-type: none"> Both USB ports should be tested Insertion force: 3.5kg Extraction force: 1.02kg 5,000 cycle 20 cycles/Min. or less 		Same as Common Test, except: 4. Test to fail	<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage
5	DC-In Jack Mechanical Life Test		<ol style="list-style-type: none"> Battery discharged to 5% SOC 8,000 cycles with no power on DC Jack 2,000 cycles with 24VDC on DC Jack Insertion/Extraction Force: 1~3kg 10 cycles/Min. or less 		Same as Common Test, except: 1. Test to fail	<ol style="list-style-type: none"> No function error after the test No electrical, mechanical, or cosmetic damage

C14 Test Item & Criteria					
Test Description	Reference Standard	Common Test Specification	Reference Standard	Torture Test Specification	Criteria
6 Headphone Output Jack	Quanta	1. 5,000 cycles 2. Insertion/Extraction Force: 0.3~4kg 3. 20 cycles/Min. or less		Same as Common Test, except: 1. Test to fail	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
7 Microphone Input Jack	Quanta	1. 5,000 cycles 2. Insertion/Extraction Force: 0.3~4kg 3. 20 cycles/Min. or less		Same as Common Test, except: 1. Test to fail	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
8 Battery Latches	Quanta	1. 5,000 cycles 2. Force: 500g 3. 1 cycle/sec or less		Same as Common Test, except: 1. Test to fail	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
9 Hinge Open/Close	Quanta	1. Open angle: closed to fully open (maximum) 2. Speed: 8 cycles/min. or less 3. Duration: 10,000 cycles applying force at center; 5,000 cycles applying force at left side; 5,000 cycles applying force at right side		Same as Common Test, except: 3. Test to fail	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
10 Hinge Rotation	Quanta	1. Laptop screen open to 90 deg. from closed position. 2. Rotate LCD from 0 to +180 deg., and from 0 to -180 deg. 3. Duration: 5,000 cycles in each direction (+180, -180) 4. 8 cycles/min. or less.		Same as Common Test, except: 3. Test to fail	1. No function error after the test 2. No electrical, mechanical, or cosmetic damage
11 Keyboard Life Test	Quanta	Membrane Keyboard 1. 10 Million cycle 2. Force: 55g 3. 4 cycle/sec Traditional Keyboard 1. 5 Million cycle 2. Force: 55g 3. 4 cycle/sec		Same as Common Test, except: 1. Test to fail	1. No function error after the test (test after every 1,000,000 cycles) 2. Cosmetic damage is acceptable
12 Wireless Antenna	Quanta	1. 5,000 cycle 2. One cycle is defined as 300 deg. Rotation		Same as Common Test, except: 1. Test to fail	1. No function error or degradation in transmitted signal strength after the test 2. No electrical, mechanical, or cosmetic damage
13 SD Card	Quanta	1. 10,000 cycles of insertion/extraction		Same as Common Test, except: 1. Test to fail	1. No function error after the test (test after every 1,000 cycles) 2. No electrical, mechanical, or cosmetic damage
14 HDMI Connector	Quanta	1. 2,000 cycles 2. Insertion/Extraction Force: 0.3~4kg 3. 20 cycles/Min. or less		None	1. No function error after the test (test after every 1,000 cycles) 2. No electrical, mechanical, or cosmetic damage
6. Special Environment Tests					
1 Solar Radiation Test	IEC 60068-2-5	1. Laptop state : Unpacked, power on 2. 13.5 VDC external power provided 3. One cycle is 24hrs irradiance 4. The total is twelve cycles. 5. Irradiance : 8.96 kWh/m ² 6. Irradiance Temperature: 55°C		Same as Common Test, except: 4. Test to fail 3. Step duration: 72 hrs	1. No function error during the test 2. No electrical, mechanical, or cosmetic damage 3. No fading of fabric and plastic color 4. ΔE < 3 and no crack or painting
2 Highly Accelerated Lifetime Test (HALT)	None	None	Quanta	1. Thermal Step/Stress 2. Vibration Step/Stress 3. Combination Test	For FA reference