

QAD 19-1

Projected Capacitive Touch Sensor Specification

(Controller Board and Chip on Flex Designs with and without Cover Lens)

Dawar Technologies, Inc.

Document Revision History

Revision	Date	Content	Author
A	04-02-12	Released Spec	David Gess
B	08-13-12	Revised 4.1.2 unit under test drawing. Revised 4.4 Opaque optical specification	David Gess
C	11-15-12	Added standard sensor with cover lens type to specification	David Gess
D	06-21-13	Added chip on flex to specification, updated chip and optical inspection, and added cover lens printing spec	David Gess
E	10-02-14	Section 4.4 Segregated L+ W / 2 and added definition for diameter equivalent regarding irregular shapes.	Eric Hoffman

1 Product Features:

- 1.1 Type: Projected Capacitive Touch Screen
- 1.2 Construction: Glass/Glass standard sensor circuits with or without clear (non-Anti-glare) glass cover lens
- 1.3 Input Methods: Bare finger, gloved finger or conductive stylus.
- 1.4 Connector: 0.5mm pitch FPC
- 1.5 Dimensions and other mechanical features per drawing for specific SKU

2 Specifications

2.1 Electrical . Reference controller specification sheet

2.2 Mechanical

2.2.1 Surface Hardness: - 9H, tested on soda lime glass (ASTM D3363-05)

2.3 Optical

2.3.1 Light Transmission: 90% +/- 3% (ASTMD1003)

2.3.2 Haze: m3% +/- 2%

Clarity: - 97%

2.4 Environment & Storage Conditions

2.4.1 Operating Temperature & Humidity: -30°C ~ +70°C, < 90 %RH
non-condensing for the product

2.4.2 Storage Temperature & Humidity: -40°C ~ +70°C, < 90 %RH
non-condensing for the product

2.5 Reliability

2.5.1 No functional degradation from repeated touches.

3 Testing Procedures

3.1 Scope

The standard testing environment is 23°C, 50%RH and 1013 kPa. The testing shall be done at normal temperature (5°C to 30°C) and humidity (35%RH to 65%RH) with normal atmospheric pressure (860kPa to 1060kPa).

Mechanical

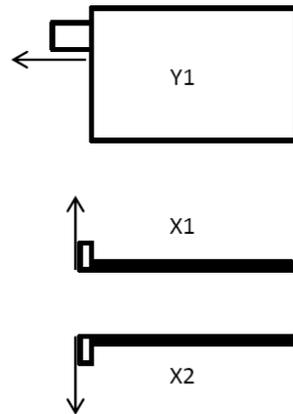
3.1.1 Chemical Resistance

Testing Condition: ASTM F1598-95 1 hour on glass substrate

Household Chemicals
Tea, Coffee, Ketchup, Mustard, Vinegar, Soy sauce, Beer, Red Wine, White Wine, Coca-Cola, Cooking Oil, Laundry Detergent, All Purpose Cleaner, Dishwashing Liquid, Window Cleaners, Hydrogen Peroxide (3%), Lysol
Industrial Chemicals
Hydrogen Peroxide, Isopropyl Alcohol 50 & 70%, Mineral Spirits, Gasoline, Motor Oil, Diesel Fuel, Transmission Fluid, Brake Fluid, Antifreeze, Hydraulic Oil, Bleach, Ethanol, Turpentine, Acetone, Diethylene Glycol Mono Ethyl Ether Acetate, Toluene, Petroleum Ether, Hydrochloric Acid, Glycol Ether Acetate, MEK, Heptane, Sodium Hydroxide

3.1.2 Tail

Pull in the X1, X2 and Y1 position. Tail withstands ~ 3kg of force.



4 Appearance Criteria

4.1 Scope

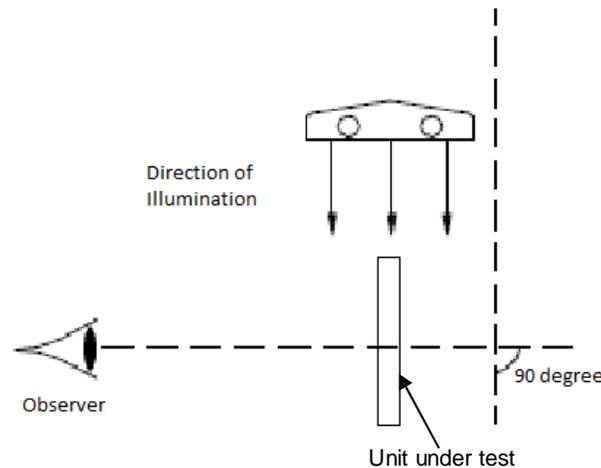
Viewable Area Definition: The viewable area is defined as the see-through area on the product under test. For a touch screen, the viewable area is the viewing area and the active area. All opaque areas are not considered a viewable area. The area outside the viewing area on the touch screen is not considered part of the appearance criteria.

Light Source: The light source used for inspection will be 12-20 watts of light. The inspection occurs in a clean environment. All dust and debris is removed prior to inspection.

4.1.1 Viewing Distance . Viewing of the touch screen under test shall be accomplished at a distance of 18±

4.1.2 Front Surface Inspection . The touch screen under test shall be viewed

using a white and black background. Holding the panel 18+away from the eye, begin viewing the touch screen at a 90 degree angle. The inspector should cover the entire screen. A typical inspection pattern used is shown below. The inspection time is 10-20 seconds total for white and black background.



4.2 Optical Blemishes

4.2.1 Scratch

4.2.2 Opaque Blemish . A light or dark, circular or irregular shaped blemish where light does not shine through. Opaque blemishes shall include but are not limited to fibers and foreign debris.

4.2.3 Translucent Blemish . A light or dark, circular or irregular shaped blemish where light does shine through. Translucent blemishes shall include but are not limited to bubbles and glass chips.

4.3 Measuring Optical Blemishes

If a defect is found using the inspection and viewing procedure, the defect must be measured. In most cases a 5x or 15x glass reticle can be used to provide a general measurement. In some cases, a higher magnification device may be required. For this, a 20x to 150x microscope or camera based inspection system can be used.

4.4 Accept/Reject/Ignore Criteria

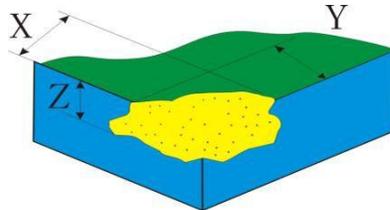
This criteria covers glass/glass sensors with or without clear (non-Anti-glare) glass cover lens. If a blemish is identified using the inspection and viewing procedure, use the following accept/reject criteria:

Blemish Description Criteria (mm) W = Width L = Length Ø = Diameter		Accept/Reject/Ignore
Equivalent Diameter (Øeq) for an irregularly shaped defect is calculated from the longest Length and Width using: Øeq = (L Longest + W Longest) / 2		
Scratch	(1) W ≤ 0.025	Ignore
	(2) 0.025 < W ≤ 0.050 and L ≤ 5.0, total ≤ 5 separated by 25mm.	Accept
	(3) 0.050 < W ≤ 0.200 and L ≤ 6.0, total ≤ 3 separated by 25mm	Accept
	(4) W > 0.200	Reject
Translucent Blemish Glass Chips and Bubbles	(1) Ø ≤ 0.300	Ignore
	(2) 0.300 < Ø ≤ .600, total ≤ 5, separated by 25mm	Accept
	(3) Ø > 0.600	Reject
Opaque Blemish Fibers and Foreign	(1) Ø ≤ 0.250	Ignore
	(2) 0.250 < Ø ≤ .400, total ≤ 5 separated by 25mm	Accept
	(3) Ø > 0.400	Reject
Dig	(1) Ø < 0.508, allowed when not clustered	Ignore
	(2) Single dig at .508 average Ø	Accept
	(3) Ø > .508	Reject

4.5 Chip and Crack (sensor circuits only)

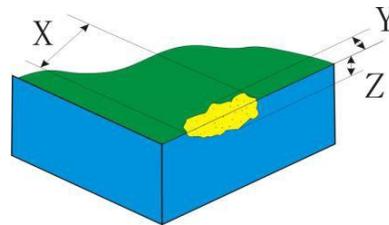
Corner Fragment: X m3.0mm and Y m3.0mm and Z mglass thickness, it is ignored

- 1) Corner fragment on the tail cable area which will seriously affect the product function is regarded as a defect.
- 2) Corner fragment on the circuit which will seriously affect product function is regarded as a defect.
- 3) When measuring the X (Y) length only, any defect beyond .76mm from the edge in the Y (X) direction is considered.

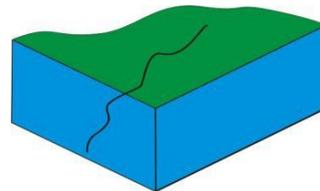


Side Fragment: X m4.0mm and Y m2.0mm and Z mglass thickness, it is ignored

- 1) Side fragment on the tail cable area which will seriously affect the product function is regarded as a defect. All side fragments less than .76mm are ignored.
- 2) Side fragment on the circuit which will seriously affect product function is regarded as a defect.
- 3) When measuring the X length, only defects beyond .76mm from the edge in the Y direction is considered.

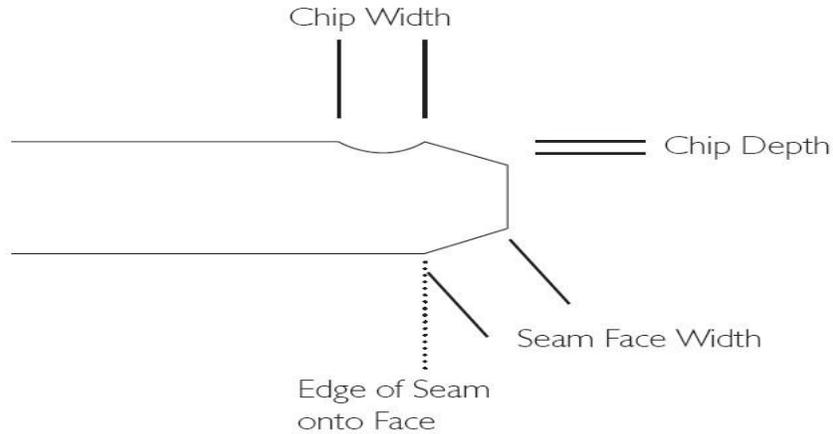


Progressive: Reject



4.6 Chip and Crack (cover lens only)

For a cover lens with cut glass and no seaming or ground edges, reference section 4.5 specification for sensor circuits only. For cover lens with pencil ground edges and seaming, reference the specification below.



Chip width is measured from the edge of the seam on the face; chip length is the distance along the edge. Chip depth typically should not exceed ½ the thickness of the part.

Description	Criteria (mm)			Accept/Reject/Ignore
	W = Width	L = Length	D = Depth	
Chip	(1)	W and L \leq .760		Accept
	(2)	W and L > .760		Reject
	(3)		D > half the thickness of the cover lens material	Reject
	(4)	Progressive Crack		Reject

4.7 Cover Lens Printing

- 4.7.1 Pin Holes - m.25mm ignored >.25 Reject
- 4.7.2 Ink Color (measured from print side) m1.5 delta E
- 4.7.3 Registration to the edge of the glass +/- .38mm
- 4.7.4 Lines and Symbols . Discontinuities not allowed

5 Environmental Testing Procedures

5.1 The Operating requirements in Section 2.4 shall be satisfied after completion of the following:

- 5.1.1 Samples exposed to 250 hours at -30°C. Each sample is tested to

the specifications in sections 2.1 through 2.3 after allowing the samples to acclimate at room temperature and humidity for at least 4 hours.

- 5.1.2 Samples exposed to 250 hours at 70°C/90%RH (non-condensing). Each sample is tested to the specifications in sections 2.1 through 2.3 after allowing the samples to acclimate at room temperature and humidity for at least 4 hours.

5.2 The Storage requirements in Section 2.4 shall be satisfied after completion of the following:

- 5.2.1 Samples exposed to 500 hours at -40°C. Each sample is tested to the specifications in sections 2.1 through 2.3 after allowing the samples to acclimate at room temperature and humidity for at least 4 hours.
- 5.2.2 Samples exposed to 500 hours at +70°C. Each sample is tested to the specifications in sections 2.1 through 2.3 after allowing the samples to acclimate at room temperature and humidity for at least 4 hours.
- 5.2.3 Samples exposed for 250 hours to +70°C/90%RH (non-condensing) each sample is tested to the specifications in sections 2.1 through 2.3 after allowing the samples to acclimate at room temperature and humidity for at least 4 hours.
- 5.2.4 Thermal Cycling: Test samples for 50 cycles with each cycle consisting of the following protocol: The test begins at room temperature (25°C) and ramps to 70°C within 30 minutes and dwells at 70°C for 1 hour, and then ramps back to room temperature within 30 minutes. The test then ramps down to -40°C within 30 minutes and dwells for 1 hour before ramping back to room temperature. Each sample is tested to the specifications in sections 2.1 through 2.3 after allowing the samples to acclimate at room temperature and humidity for at least 4 hours.

6 Handling and Packing

The projected capacitive touch screen is a glass product. The projected capacitive touch screen should be handled with care. Keep touch screen surfaces clean and free of any dust and dirt because small particles could scratch the touch screen. To prevent accidental damage to the product, please follow the instructions below when handling the touch screen. Mishandling product voids the warranty.

6.1 Storage

- 6.1.1 The touch screen should be stored in an environmentally controlled temperature and humidity controlled environment.
- 6.1.2 Please ensure the front surfaces of touch screen are properly protected before stacking them.
- 6.1.3 Do not put heavy objects on the touch screen. Stacking touch screens too high could cause bottom layers to crack.

6.2 Handling

- 6.2.1 Touch screens are glass products. Gloves should be worn when handling the touch screen to avoid injury. Hold the touch screen

outside the viewable area when handling the panel to prevent any fingers prints or stains before installation.

- 6.2.2 Avoid touching the viewing area. Transparency is an important factor for the product. Wear clean finger sacks, gloves and mask to protect the product from fingerprint or stain.
- 6.2.3 Do not hold the product by the tail.
- 6.2.4 Do not apply any force to the tail cable area. Tail cable must not be bent to less than 3.3mm radius when handling and assembling. Do not crease the tail.
- 6.2.5 Use a soft lint-free cloth dampened with isopropyl alcohol to clean any contaminates on the touch screen.

6.3 Operating

- 6.3.1 A finger or conductive stylus must be used to interface with the product. Any sharp instruments or hard objects should not be used.
- 6.3.2 Operate the touch screen in a steady environment. Any abrupt variations in temperature and humidity may cause the touch screen to malfunction.

7 Warranty Periods

Dawar warrants the products produced to this specification from date of shipment for (1) year.

Please reference Dawar's standard terms and conditions for more information.