

CT/Mini CT Series Appearance Criteria

1. Scope

This document clarifies how acceptable visual quality of mechanical parts is defined and controlled within TE.

2. Purpose

2.1 The visual standards in this document apply to CT/Mini CT series.

2.2 It can be referenced internally and used during discussions or agreements with both customers and suppliers.

3. Classification

The accept / reject criteria differs for each Class and is defined within the Quality Standards using these rules. Typical examples are shown below:

Class I : Surfaces which are visible in the fully assembled product in normal use and require best visual quality.

Class II : Surfaces which are not visible in normal use but require good visual quality, surface only visible when ending customer change the accessory. e.g. change battery, ink box.

Class III : Inner Surfaces which are never visible to customer in final product and do not require good visual quality.

CT/Mini CT Series is design for internal board to board and wire to board connection.
Product defined as **Class III** usage.

4. Inspection Conditions

Visual inspection must be carried out under the following conditions:

Inspection Distance : 500 mm + / - 50mm.

Viewing Time : 5 + / - 2 seconds for one part (all surfaces).

Illumination : 1000 + / - 200 Lux (direct overhead lighting).

Light Type : D65 – CIE Standard illuminant ISO10526:1999(E).

5. 3F definitions

Form:

The shape, size, dimensions, mass and/or other visual parameters which uniquely characterize an item. This defines the 'look' of the part or item. Sometimes weight, balance and center of mass are considerations in 'form'. Color is not generally considered in 'form', except when it has a specific functional meaning.

Fit:

The ability of an item to physically interface or interconnect with or become an integral part of another item or assembly. This relates to the associativity of the part in relation to the assembly, or to other parts, and includes tolerances.

Function:

The action[s] that an item is designed to perform.

6. Contents

- a. Surface definition
- b. Housing short shot
- c. Flash
- d. Color and inclusion
- e. Dent mark
- f. Pin & contact scratch
- g. Metal fiber, metal burr
- h. Plastic burr

a. Surface definition

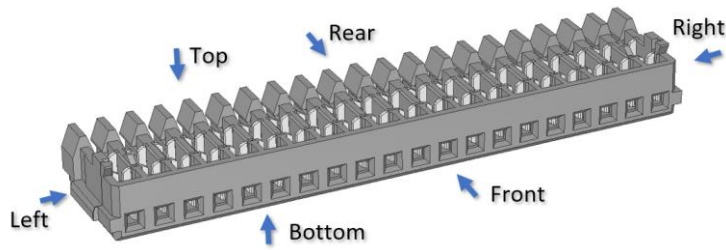


Fig a.1

Receptacle connector
Surface defines. Fig a.1

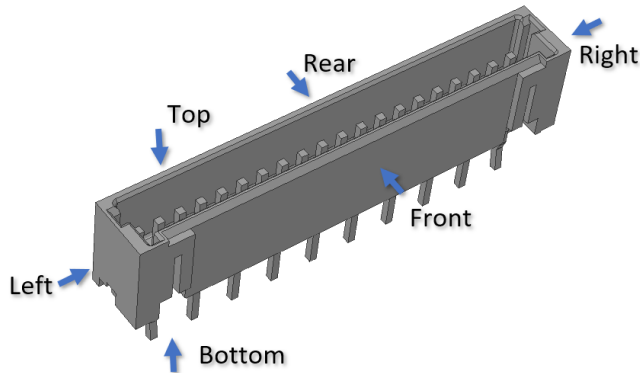


Fig a.2

Header connector
Surface defines. Fig a.2

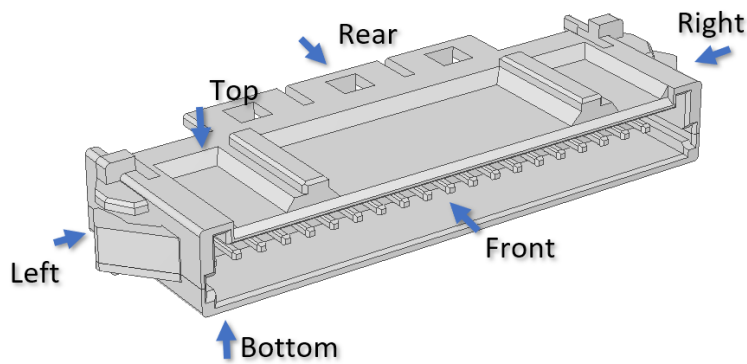


Fig a.3

Bridge relay
Surface defines. Fig a.3

b. Housing Short shot

Definition:

Resin flowability in molding process impact by product structure, result to the incomplete fill.

General acceptance criteria

Class II: short shot area $< 3\text{mm}^2$

Class III: NOT affect to 3F

Below figure illustrated not fully included

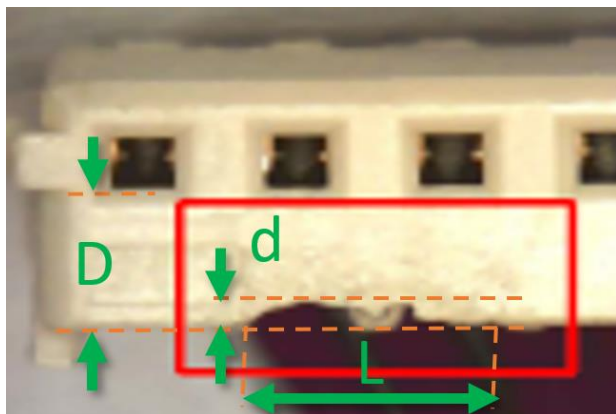


Fig b.1

Receptacle connector
Front surface

Front wall short shot

Acceptable criteria

short shot depth = d
short shot length = L
top surface to window = D

$$d \leq 1/3D$$

$$L \leq 3\text{mm}$$

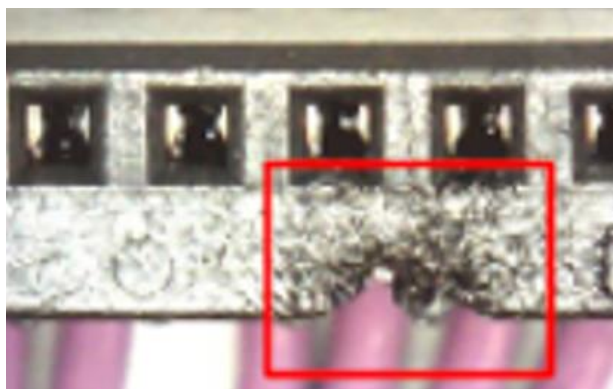


Fig b.2

Receptacle connector
Front surface

Front wall short shot

Not acceptable

$$d > 1/3D$$

$$L > 3\text{mm}$$

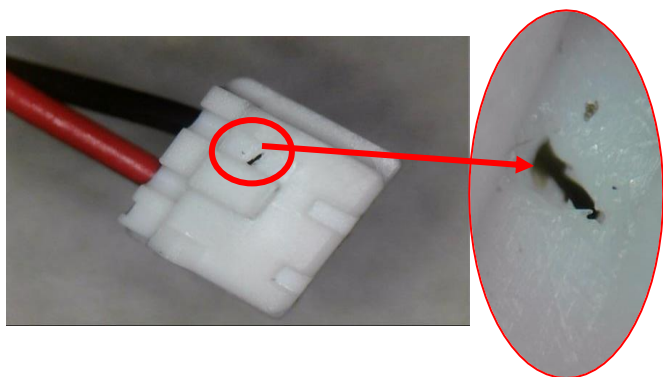


Fig b.3

Receptacle connector
Front surface

wall short shot
Acceptable

$$\text{Area} \leq 3\text{mm}^2$$

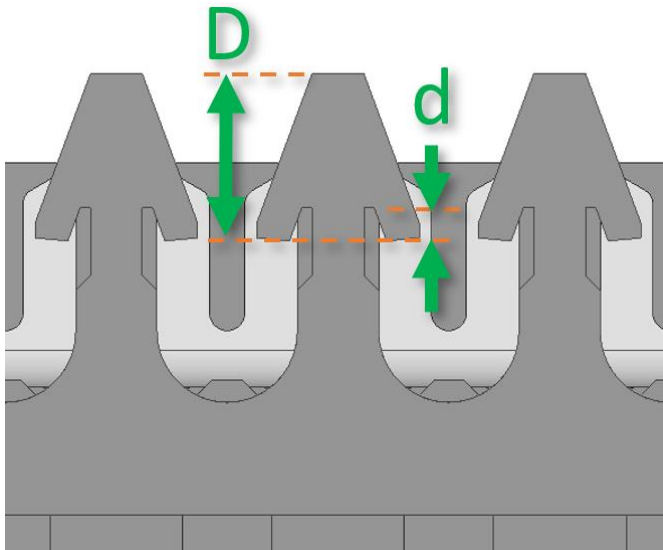


Fig b.4

Receptacle connector
Rear surface

Arrow short shot

Acceptable criteria

Short shot depth = d

Arrow height = D

$$d \leq 1/4D$$

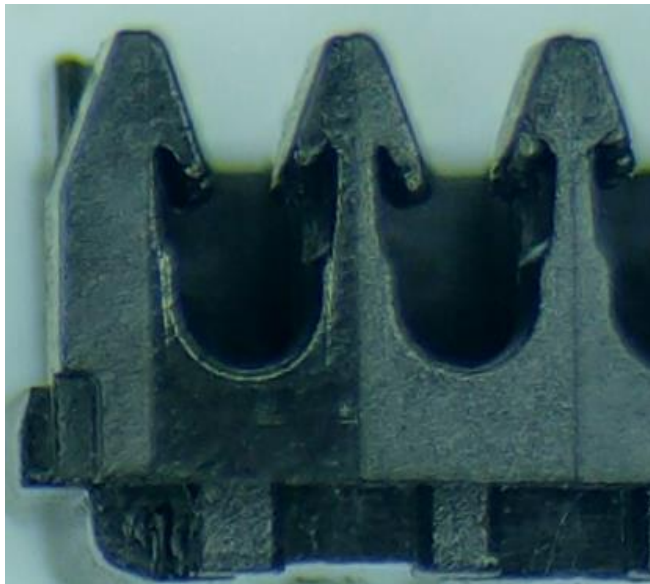


Fig b.5

Receptacle connector
Rear surface

Arrow short shot

Acceptable

$$d \leq 1/4D$$

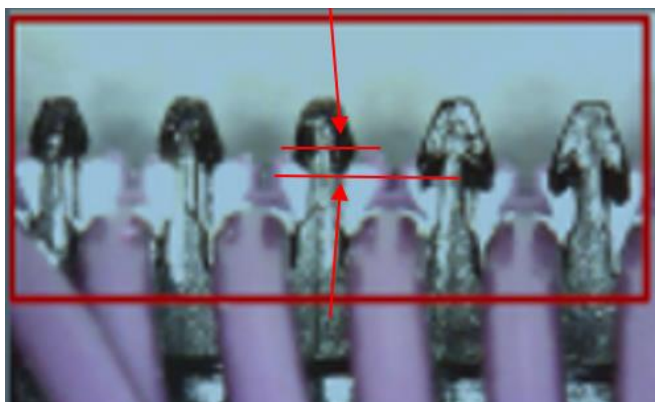


Fig b.6

Receptacle connector
Rear surface

Arrow short shot

Not acceptable

$$d > 1/4D$$

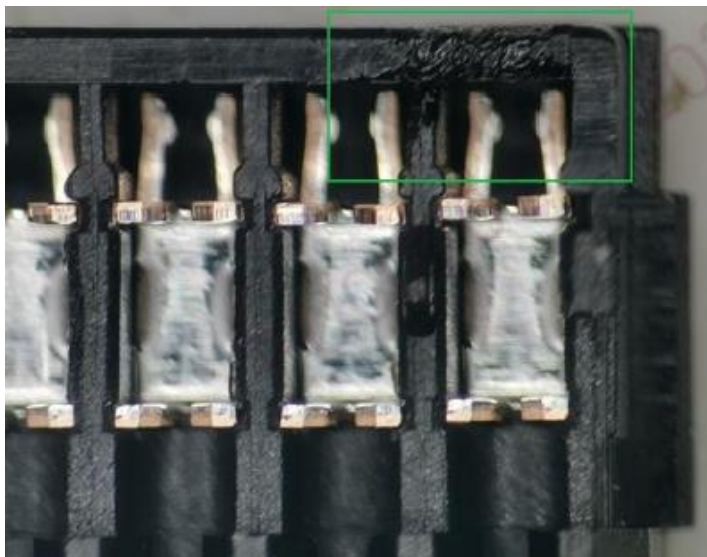


Fig b.7

Receptacle connector
Top surface

Wall short shot
Acceptable

$L \leq 3\text{mm}$

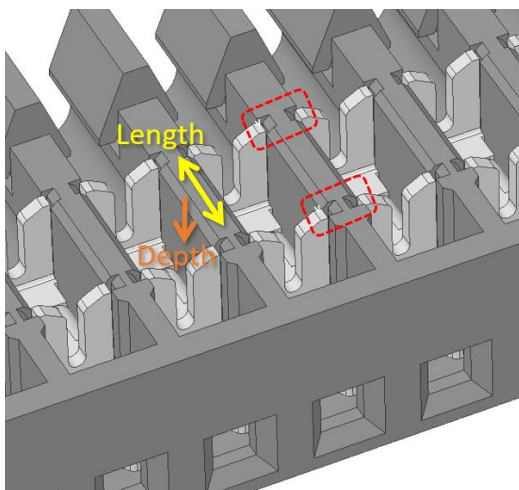


Fig b.8

Receptacle connector
Top surface

Rib short shot
Acceptable criteria

- Rib plastic between contact, show in red square indicate. Short shot depth $\leq 0.2\text{mm}$
- Other area on rib
Length $\leq 2\text{mm}$
Depth $\leq 1\text{mm}$

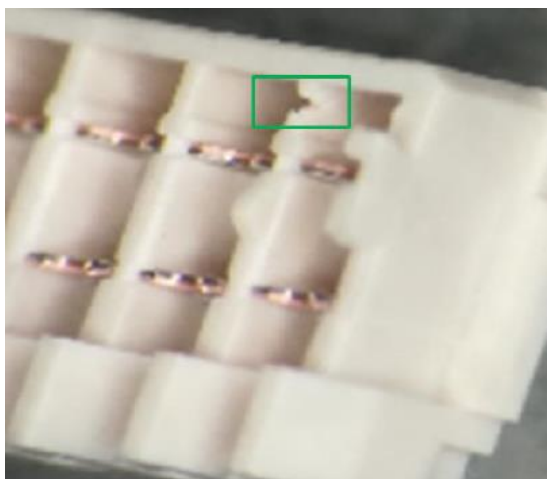


Fig b.9

Receptacle connector
Top surface

Rib short shot
Acceptable

$D \leq 1\text{mm}$

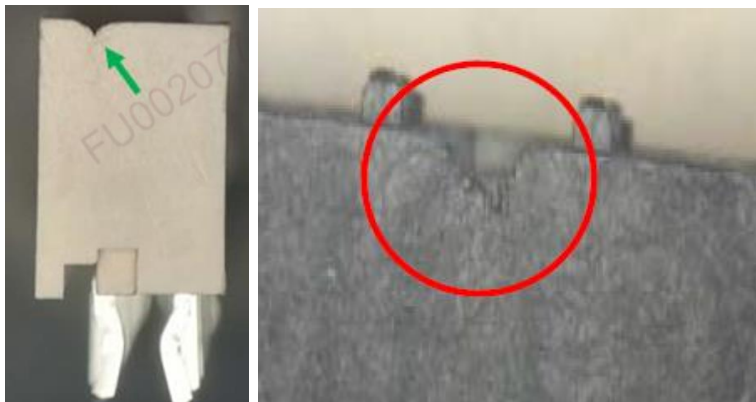


Fig b.10

Header connector
Left/Right, front/rear surface

Wall short shot
Acceptable

Area $\leq 3\text{mm}^2$

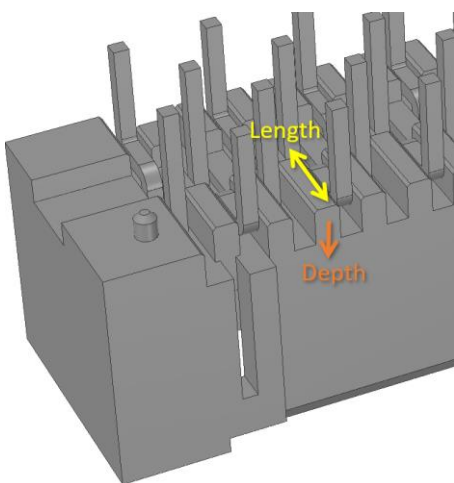


Fig b.11

Header connector
Bottom surface

Rib short shot
Acceptable criteria

Length $\leq 3\text{mm}$

Depth $\leq 1/3$ of Rib height

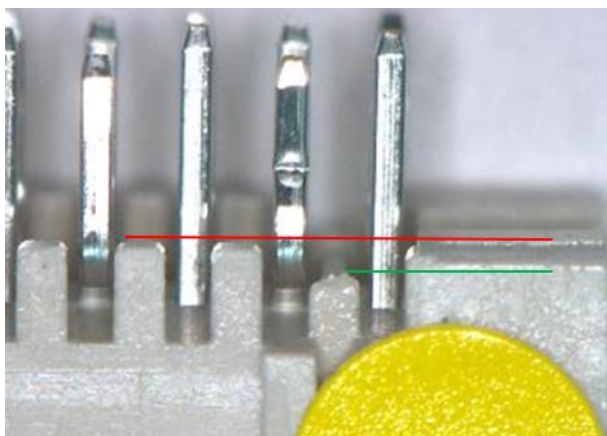


Fig b.12

Header connector
Bottom surface

Rib short shot
Acceptable

Depth $\leq 1/3$ of Rib height



Fig b.13

Bridge relay
Side

Latch short shot
Acceptable criteria

Area $\leq 3\text{mm}^2$

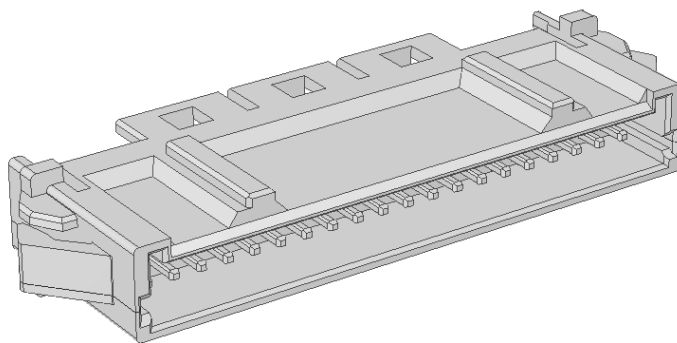


Fig b.14

Bridge relay
all surface

wall short shot
Acceptable criteria

Length $\leq 3\text{mm}$
Area $\leq 3\text{mm}^2$

reference to Header connector

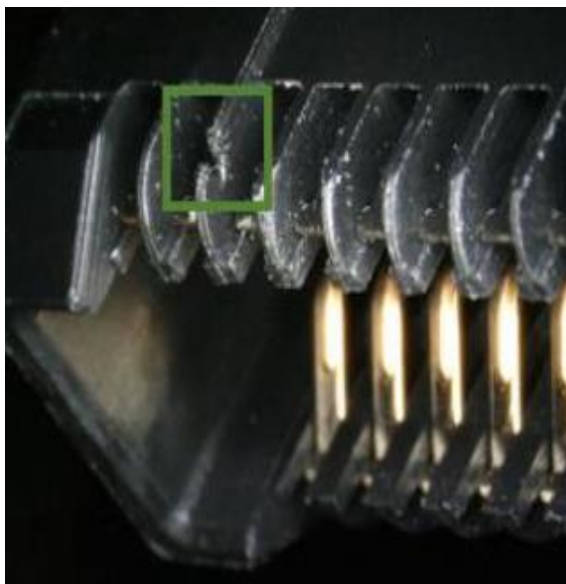


Fig b.15

Drawer
Rear surface

Rib short shot

Acceptable criteria

Area $\leq 3\text{mm}^2$

c. Flash

Definition:

A thin film of material formed on a molded part where material is forced between the mating faces of the mold sections.

General acceptance criteria

- Flash thickness <0.08mm
- External flash projection <0.4mm
- External flash length no limitation

- Internal flash projection < 30% of feature size
- Internal flash length no limitation

Below figure illustrated not fully included



Fig c.1

Receptacle connector
front

Internal flash
Acceptable criteria

- Thickness $\leq 0.08\text{mm}$
- Projection $\leq 30\%$ of feature size

Not impact to 3F, flash will not drop off during mating

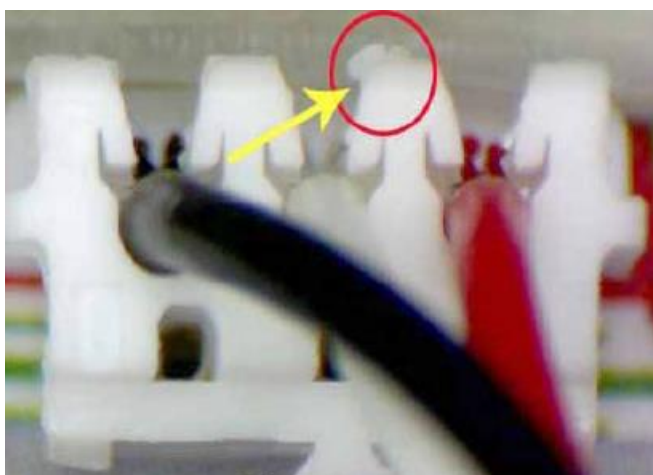


Fig c.2

Receptacle connector
Rear

External flash - arrow
Acceptable criteria

- Thickness $\leq 0.08\text{mm}$
- Projection $\leq 0.4\text{mm}$

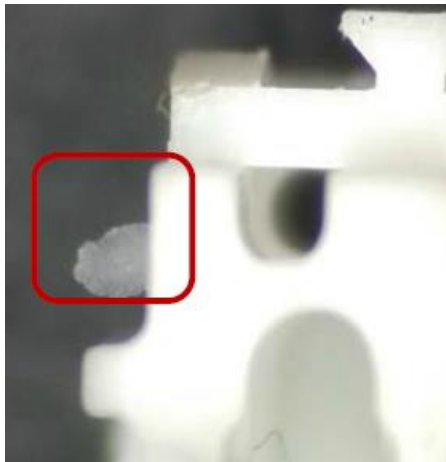


Fig c.3

Receptacle connector
front

External flash
Acceptable

Thickness $\leq 0.08\text{mm}$
Projection $\leq 0.4\text{mm}$

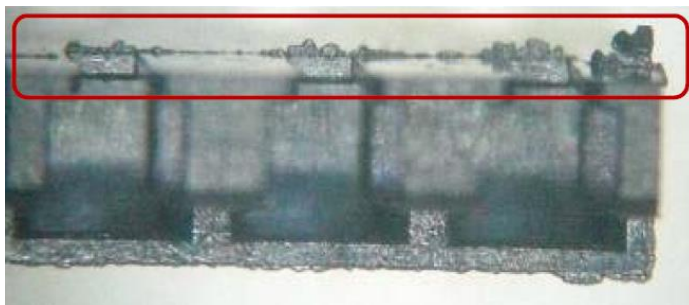


Fig c.2

Header connector
Side

External flash – wall
Acceptable

Thickness $\leq 0.08\text{mm}$
Projection $\leq 0.4\text{mm}$

d. Color and inclusion

Definition:

Color difference on plastic, metal contact. Different color material that has become embedded in the part

General acceptance criteria

Inclusion: Metallic inclusion is not permit.

Plastic inclusion < 3mm² or < 10*0.3mm²

Below figure illustrated not fully included

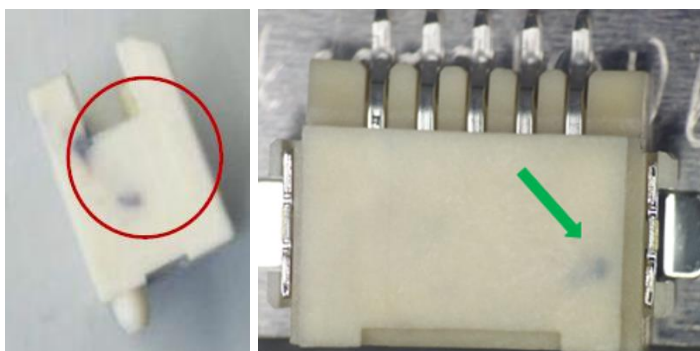


Fig d.1

Header connector
All surface

Inclusion - Plastic
Acceptable

≤ 3mm²
≤ 10*0.3mm²

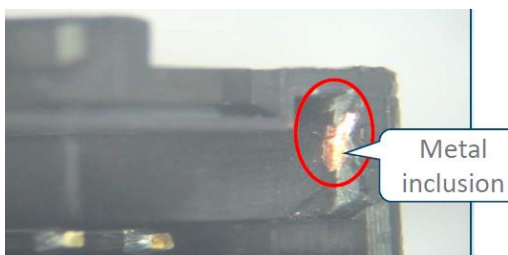


Fig d.2

Header connector
All surface

Inclusion - metallic
NOT acceptable



Natural color of Nylon product with different appearance.

Fig d.3

Color – Nature, White, Yellow, Green

Acceptable

Nylon hygroscopic character
Nature color will become green or yellow.
Not affect to 3F



Fig d.4

Color

Acceptable

White injection flow mark embedded.

Most happen on black plastic housing.

Not impact to 3F



Fig d.5

Blackish

Acceptable criteria

Area \leq 10mm X 5mm

Housing move in guide rail, friction lead to blackish

Not impact to 3F

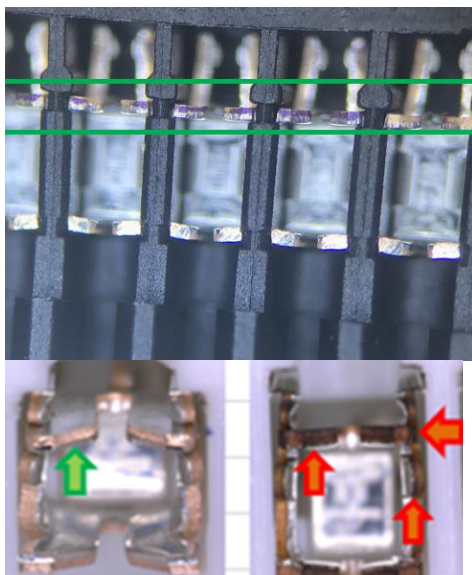


Fig d.6

Contact discolors

Acceptable

Contact cut edge, no plating on this area.

Not impact to function After wire IDC (Insulation Displacement Connection)

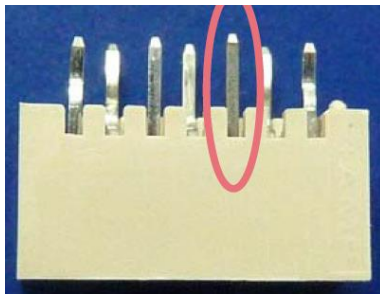


Fig d.7



Fig d.8

Color difference

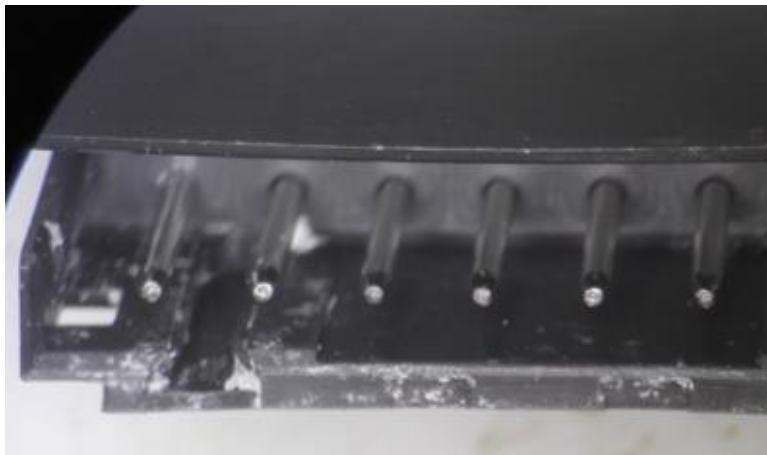
Acceptable

Pin color difference, matt tin or bright tin appearance, or blackish appearance.

Pin insertion and kinking will result to plating surface texture change.

Not impact to thickness.

Not impact to solderability



White Powder on plastic surface

Acceptable

The white powder appear on the mold part surface is the compound of the Plastic Nylon itself.

Compound use for flame retardant

Not impact to function.

Not impact to structure strength

Flame retard performance Not degrade

Short time storage

Room temperature and humidity storage will mitigate the white powder happen.

e. Dent mark

Definition:

A hollow in the surface of something which has been caused by hitting or pressing in the package during transportation.

General acceptance criteria

Dent do not impact on product's Form, Fit and Function is accept.

Dent < 3mm² is accept

Below figure illustrated not fully included

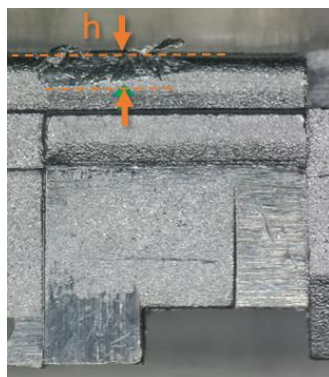
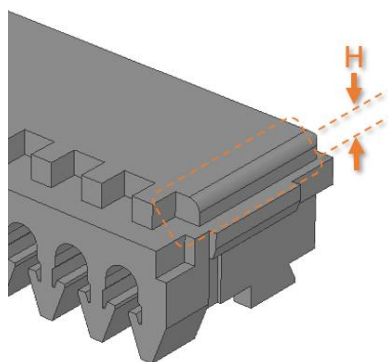


Fig e.1

Dent on edge

Acceptable

$$h \leq 2/3 H$$

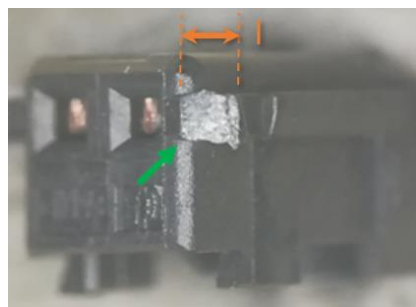
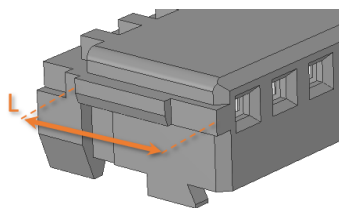


Fig e.2

Dent on edge

Acceptable

$$L \leq 1/3 L$$

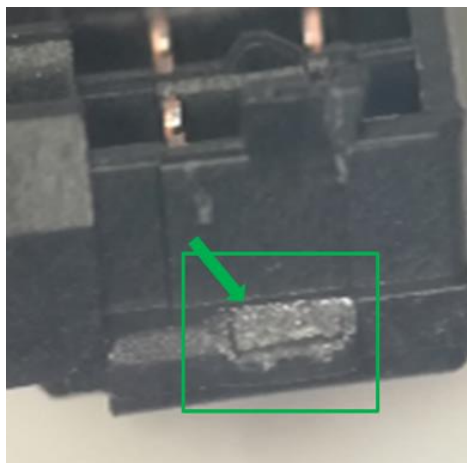


Fig e.3

Dent on edge

Acceptable

$$L \leq 1/3 L$$

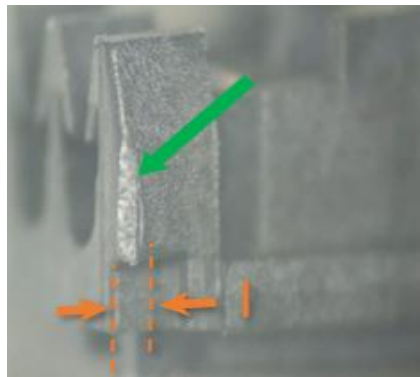
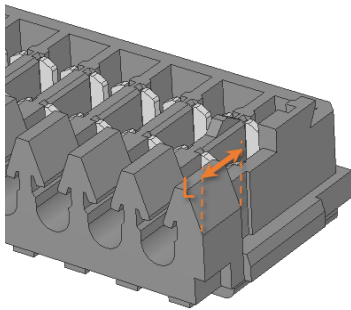


Fig e.4

Dent on edge

Acceptable

$$l \leq 1/3 L$$

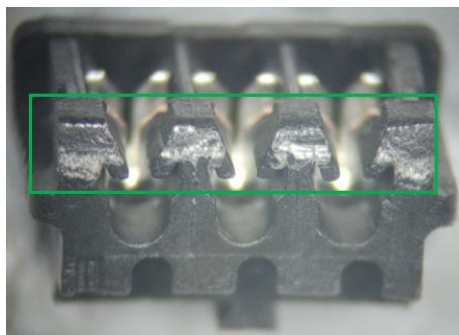
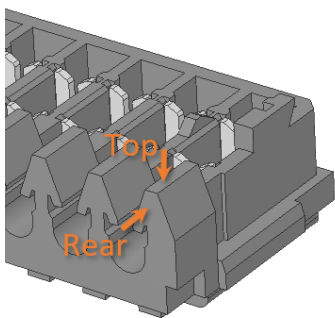


Fig e.5

Dent on arrow rear

Acceptable

No function impacts

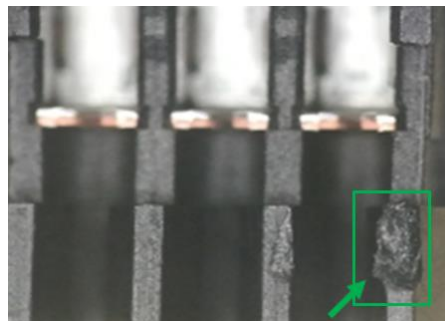
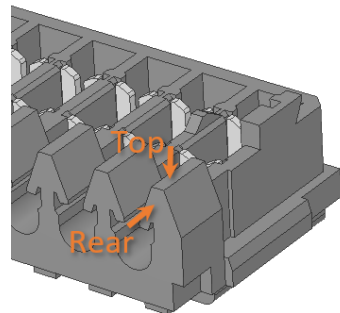


Fig e.6

Dent on arrow top

Acceptable

No function impacts

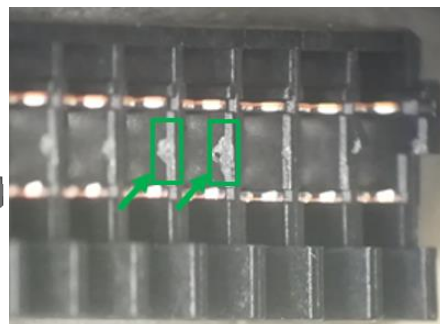
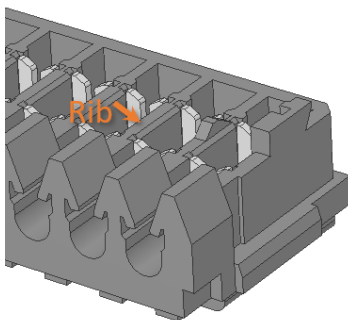


Fig e.7

Dent on arrow top

Acceptable

No function impacts

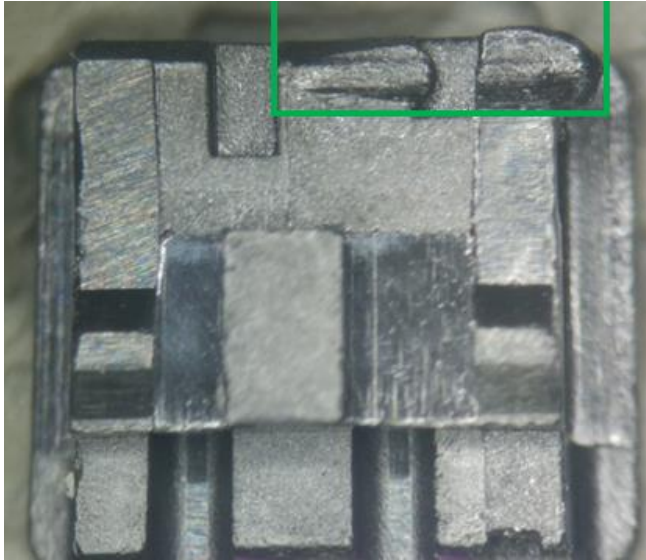


Fig e.8

Dent on edge

Acceptable

No function impacts

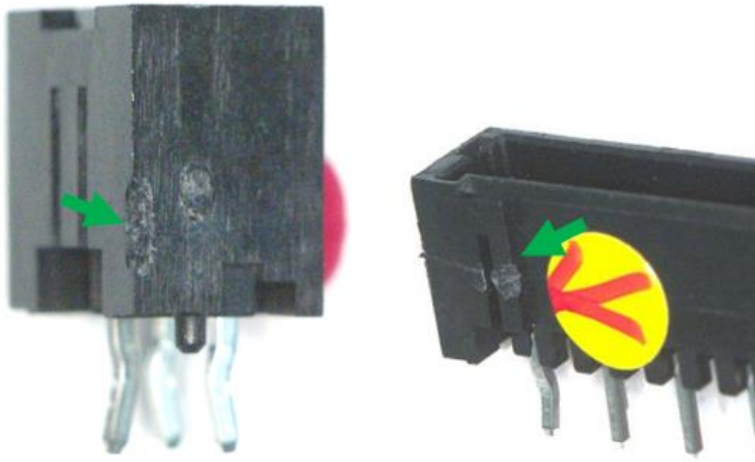
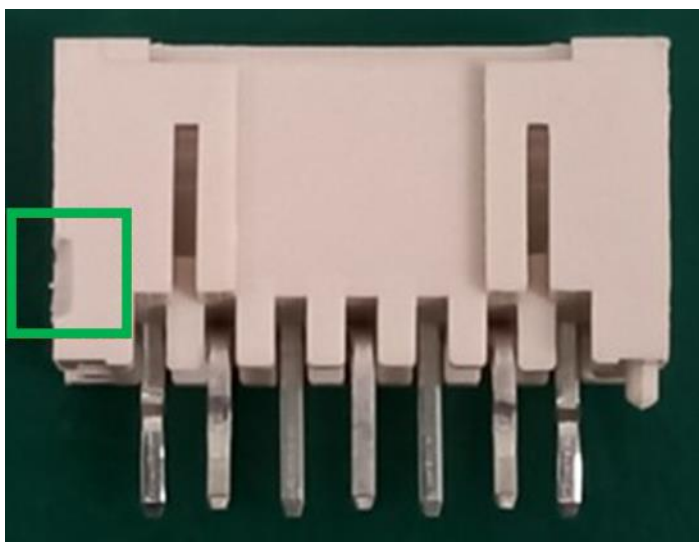


Fig e.9

Dent on corner

Acceptable

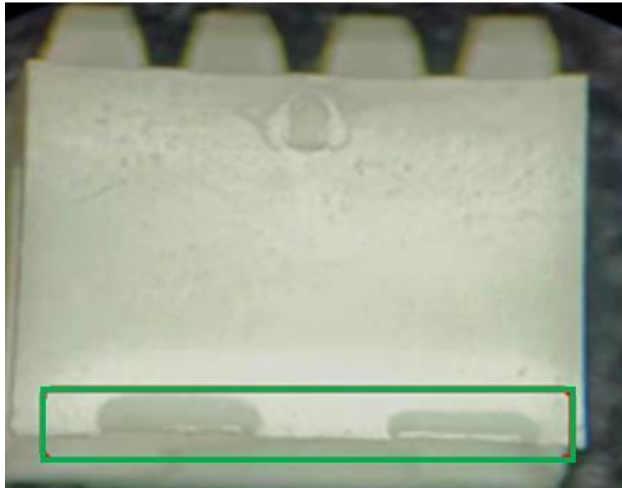
No function impact



Dent on corner

Acceptable

No function impact



Dent on corner

Acceptable

No function impact

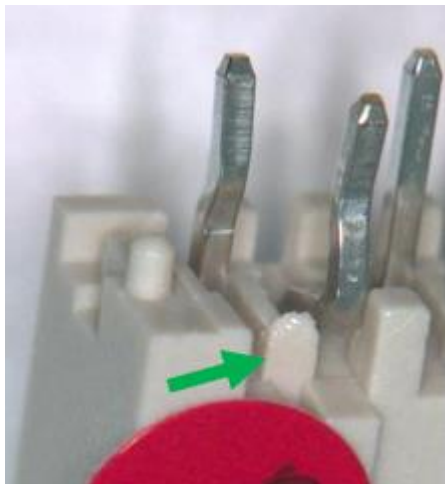


Dent on edge

NOT Acceptable

Burr remained

Fig e.10



Dent on rib

Acceptable

No function impact

Fig e.11



Fig e.12

Dent inside

Acceptable

Burr $L * H \leq 2 * 0.5\text{mm}$

No function impact

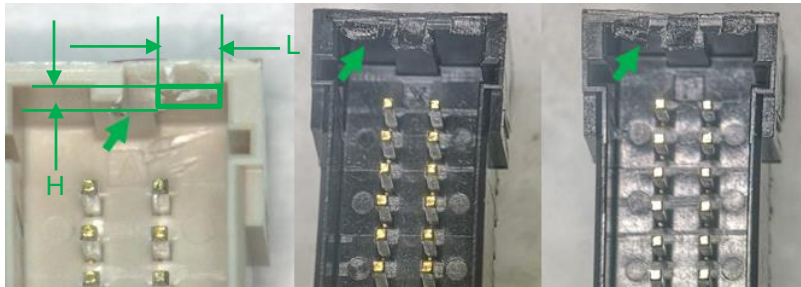


Fig e.13

Dent inside

Acceptable

Burr $L * H \leq 2 * 0.5\text{mm}$

No function impact

f. Pin & Contact scratch

Definition:

Abrasion, groove or cut in or on the surface

General acceptance criteria

Metal component: scratch do not with base material exposed.

Plastic component: scratch do not affect to assembly, functionality is allowed.

Below figure illustrated not fully included



Fig f.1

Scratch on pin

Acceptable

No base material exposed



Fig f.2

Scratch on plastic

Acceptable

No function impacts

g. Metal fiber, Metal burr

Definition:

A slender and elongated solid metal. Come from interference fitting between contact and housing hole.

A tiny metal scrap from fitting insertion between contact and housing hole.

General acceptance criteria

Metal fiber length < 0.4mm is acceptable

Metal fiber length < 1/3 of pitch is acceptable

Metal burr < 0.4mm or < 0.2mm²

Below figure illustrated not fully included

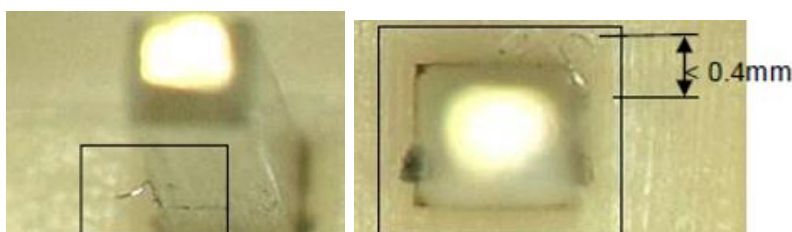


Fig g.1

Metal fiber on pin

Acceptable

Metal fiber length ≤ 0.4mm

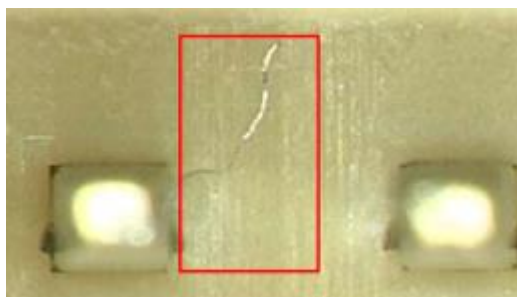


Fig g.2

Metal fiber on pin

NOT Acceptable

Metal fiber length > 0.4mm

Metal fiber length > 1/3 pitch

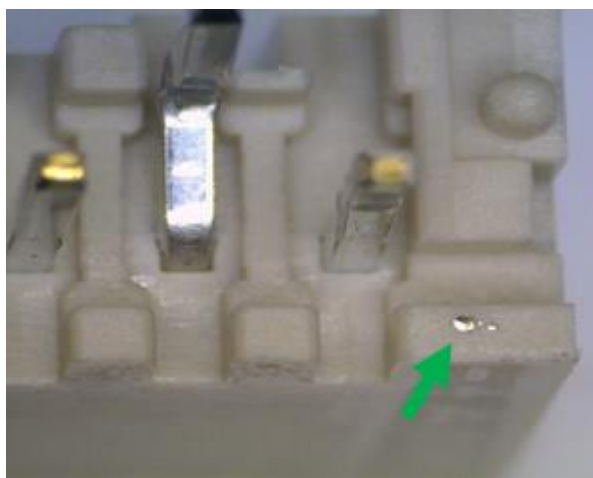


Fig g.3

Metal burr

Acceptable

Metal burr ≤ 0.2mm²

h. Plastic burr

Definition:

Plastic scratch during insertion, leave on tip of contact

General acceptance criteria

Not affect to assembly function is allow.



Fig g.1

Burr on tip

Acceptable

Not impact to function