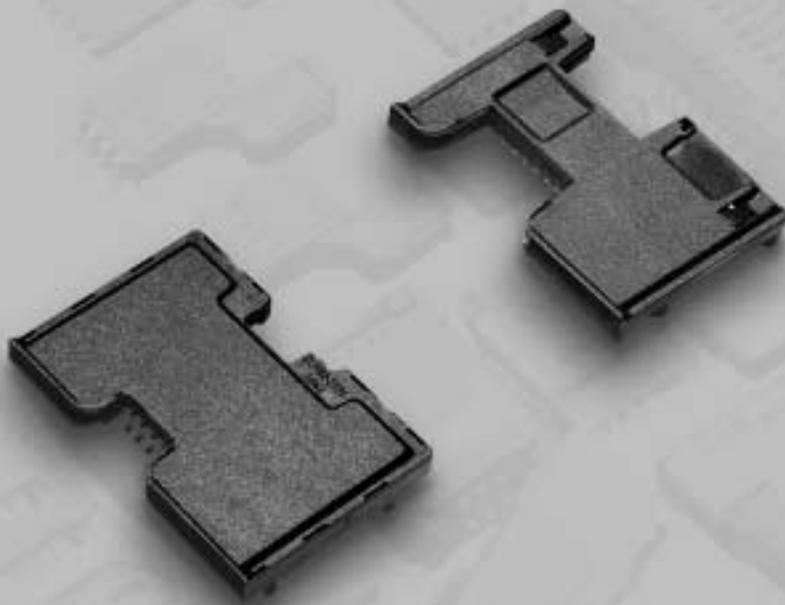


2000

Smart Card Connectors



Cannon



ITT Industries
Engineered for life

Smart Card Connectors

Company Data

Manufacturing facilities of ITT Industries, Cannon Switch Products division are pictured below.

The world headquarters are in Meaux near Paris, France.

Worldwide Sales Organization

Cannon offers its products through sales offices and distributors worldwide. For the location closest to you see the last pages of this catalog.

FRANCE

ITT Industries, Cannon Switch Products

2, Av. des Sablons Bouillants B.P. 133
F-77109 Meaux Cedex
Tel. 33 (0) 1 60 24 51 51
FAX 33 (0) 1 64 33 16 82



Headquarters in Meaux/France

ITT Industries, Cannon Switch Products

BP. 359
F-39105 Dole Cedex
Tel. 33 (0) 3 84 72 81 12
FAX 33 (0) 3 84 79 04 09



Factory in Dole/France

GERMANY

ITT Industries, Cannon Switch Products

Tegel · Holzhauser Straße 26-32
D-13509 Berlin
Tel. 49 (30) 43 9990
FAX 49 (30) 43 999203



Factory in Berlin/Germany

USA

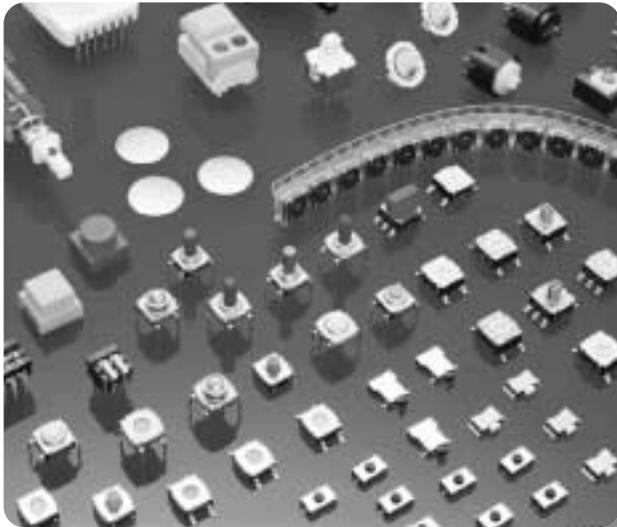
ITT Industries, Cannon Switch Products

8081 Wallace Road
Eden Prairie, Minnesota 55344
Tel. 1.612.934.4400
FAX 1.612.934.9121

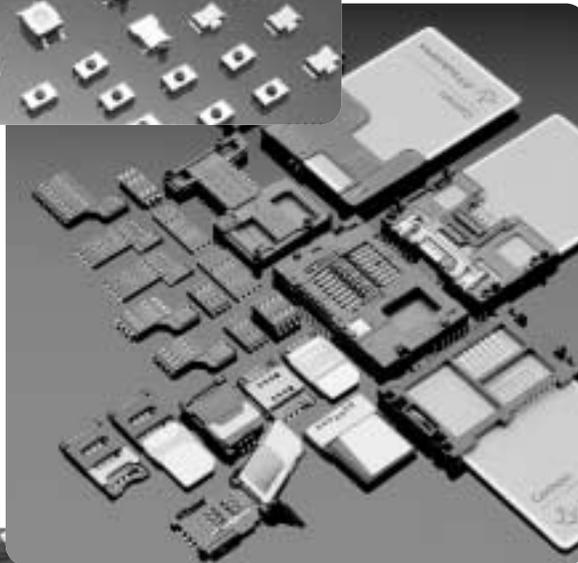


Factory in Minneapolis/USA

Introduction - Products and Services



Switch Products



Smart Card Connectors



Assemblies and panels

ITT Industries, Cannon switch products manufactures a complete range of smart card connectors, electromechanical switches, panel assemblies and control systems.

This catalog features the full line of smart card connectors. For information on all other products or to request a full-line catalog, visit our website at www.ittcannon.com.

Smart Card Connectors

A complete range of full card and SIM/SAM connectors.

Switch Product Range

Surface mount and through-hole tact switches, domes, key, push-button and mains/power switches, conductive rubber switchpads, rotary and coded switches, slide switches.

Custom Designed Panels and Keyboards

Complete, professional panels and keyboards custom designed to suit individual specifications.

Panels with Discrete Switches, Domes, Overlays or Rubber Keypads

These switching systems can be designed with discrete switches or with flat graphic overlays and rubber keypads.

You will find the following new products in this catalog.

New Products

CCM02 MK II

Full card SMT or through-hole landing type connector with inlay finished contacts for up to 500,000 insertion cycles.

CCM04 MKIII

Space saving economy priced full or SIM/SAM Card Connector.

CCM05 High cycle life host connector designed to accept the MultiMediaCard memory module.

Introduction - Research and Development

Global Engineering and Integrated Product Development speeds time to market

Cannon's experienced engineering teams located throughout the globe work hand-in-hand with customers to advance projects from initial product concepts to final design and into full production. Our global teams have experience with international, national and local standards and work hard to develop and maintain fast turnaround and time-to-market response.

Our teams are experts in computer-based design, modeling and analysis to assure robust product designs. We are also well-versed in performance simulation, as well as verification of mechanical and electrical properties. Cannon utilizes Pro/ENGINEER® from Parametric Technology Corporation. Pro/ENGINEER facilitates our development of products and manufacturing processes concurrently, and more simple evaluation of multiple design alternatives. This means better designed products, produced faster and at a lower cost.

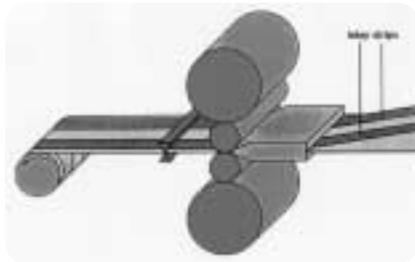
Equipped with these powerful CAD systems, we work closely with our other research and development centers in the United States, UK, Germany, France and Japan. They have the capabilities of electronic file transfer of drawings and specifications directly with customer CAD systems. Other important capabilities of our design engineering teams include:

- Electromechanical design
- Software and electronic design
- Application support and follow-up
- Rapid prototyping services and testing
- Local technical support

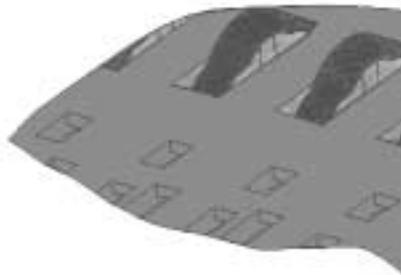


CCM Family of Smart Card Connectors

ITT Industries, Cannon division has a successful track record of manufacturing innovative connector designs, with a strong emphasis on reliability and flexibility. As a long established supplier of connectors for Smart Cards in a wide range of applications, we have extensive experience matching performance with the need to remain competitive. We consider the true cost of the connector to be a function not just of price, but also the ease with which the connector can be integrated into the customer's production process and the performance of the connector in the field. In designing our "MK II" connectors, we have built in a number of features which set our products apart from those of our competitors, features such as:



Inlay contact finish - a means of applying precious metal to the contact area utilizing pressure as opposed to conventional plating. We have found this to be the most durable finish available without compromising the electrical performance of the contact. Where we state the life of the precious metal this is intended to be "worst case", because the test has been made using the most abrasive smart card that we can find on the market (given that the equipment maker can rarely control which smart cards are used). Our research has shown that our inlay finish lasts over 10 times as long as standard gold plating. Note that the inlay finish is silver in color, being an alloy of gold, silver, and palladium.



Contact design - the geometry of the contact has an important bearing on its electrical performance. Our contacts are designed to give an efficient wiping action and to maximize the stress between contact and card, so minimizing the contact resistance. The "spooned" contact area is also shaped so as to protect it from damage during card insertion.



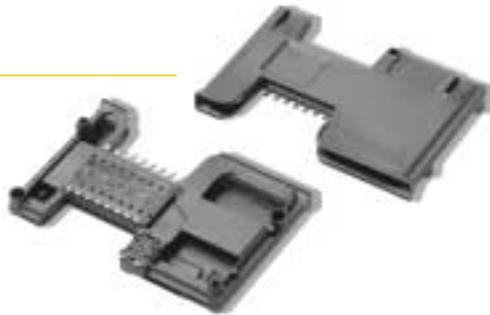
Card detection switches - As a manufacturer of switches as well as connectors, we have been able to integrate high performance dome switches into many of our connectors. These are variants of switch products which are already in high volume production as standalone components.

Materials - the contact material has been chosen because of its resistance to atmospheric pollution, its solderability and its performance over time in giving a consistent normal force. Since all of our new connectors are designed for surface mounting, the plastic materials used must withstand high temperature soldering processes without deforming or adversely affecting the performance of the connector.

CCM Smart Card Connectors

CCM01

In addition to the MK I connector design with blade switches, we also offer the MK II series. These connectors have a sealed card detection switch and an improved contact design for a more reliable connection. They are designed to be surface mounted and they are pick-and-place compatible, all this in a compact package which offers PCB space savings.



CCM02

These connectors have a landing contact action that extends the life of the card and the connector by giving only a minimal contact wiping action. The MK II series has an improved landing mechanism that increases the life of the connector to over 500,000 cycles; again the surface mount version can be automatically pick-and-placed.



CCM03

Designed specifically for SIM/SAM cards, the compact form of the MK II connector series minimizes the amount of PCB space required to mount them. The MK I connectors have a stand-off option to allow components to be mounted underneath the connector.



CCM04

For those applications where the card guidance is built into the equipment to maximize space savings, we offer a wide range of surface mount connectors with different contact configurations, different heights and optional card detection switches. With all the benefits of the MK II series, the CCM04 connectors are packaged in tape and reel for automated pick-and-place in high volume production environments.



CCM Smart Card Connectors Selector Guide and Index

NEW

NEW NEW

	CCM01 MK I	CCM01 MK II	CCM02 MK I	CCM02 MK II	CCM03 MK I	CCM03 MK II	CCM04 MK II	CCM04 MK II Low Profile	CCM04 MK III	CCM05
Designed for ISO Card (85.6mm x 54mm)	✓	✓	✓	✓			✓	✓	✓	
Designed for Micro SIM/SAM Card (25 mm x 15mm)					✓	✓	✓ (w/o switch)	✓ (w/o switch)	✓ (w/o switch)	
Designed for Multimedia memory card										✓
Blade switch versions	✓				✓					
Sealed switch versions		✓	✓	✓			✓	✓		
Fixed contacts	✓	✓			✓	✓	✓	✓		✓
Landing contacts			✓	✓						
Through hole versions	✓		✓	✓						
Surface mount versions		✓	✓	✓	✓	✓	✓	✓	✓	✓
N° of contacts	8 & 16	8 & 16	8 & 16	8	6	6 & 8	6, 8 & 16	6 & 8	6	7
Inlay contact finish		✓		✓		✓	✓	✓	✓	✓
TABLE OF CONTENTS										
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Worldwide Sales Representatives	P. 33-35									

CCM MultiMediaCard Connectors

NEW



CCM05

The CCM05 connector has been developed for the MultiMediaCard, which is a new standard for miniature memory cards. The connector has 7 contacts, 2 of which are set forward to allow "hot" insertion of the card.

CCM01 MK I



CCM01 MK I connectors have fixed contacts and a blade card detection switch (not sealed).

These connectors are intended for applications where the card usage is relatively low and the environment is benign.

Features

- Available with 8 or 16 through hole contacts.
- A normally closed blade switch detects when the card is fully inserted.
- Snap in boardlocks hold the connector in place prior to soldering.

Construction

Contacts	Copper alloy
Plating	Contact area : Gold over nickel Terminals : Tin lead (2μ min)
Moldings	Thermoplastic UL 94V-0 rated
Card detection switch	Copper alloy

Mechanical data

Number of Contacts	8 or 16
Mechanical life	10,000 cycles min
Card insertion force	10 N max
Card extraction force	1 N min / 10N max
Contact force	0.20 N min / 0.60 N max
Vibration	Frequency 10 to 500 Hz. Acceleration 50m/s ² Duration 6 hours - amplitude 0.35 mm (0.014) Max electrical discontinuity 1μs
Shock	Peak value 500 m/s ² – Duration 11 ms 3 shocks in each direction of each axis Max electrical discontinuity 1 μs

Electrical data

Insulation resistance	1,000 MΩ min
Contact resistance max	100 mΩ max
Switching current	10 μA min / 1 A max
Dielectric strength	750 Vrms min
Card detection switch	Normally closed
Rc card detection switch	100 mΩ max
Dielectric strength card detection switch	250 Vrms min
Switch current rating	1 mA min / 10 mA max
Maximum switch power	0.2 VA

Environmental data

Operating temperature	-40°C to +85°C
Soldering temperature	Wave : 260°C / 5 sec
Damp heat	IEC 512 test number 11c (10 days)
Salt mist	IEC 512 test number 11f (96 hours)
Card detection switch	Not sealed blade switch

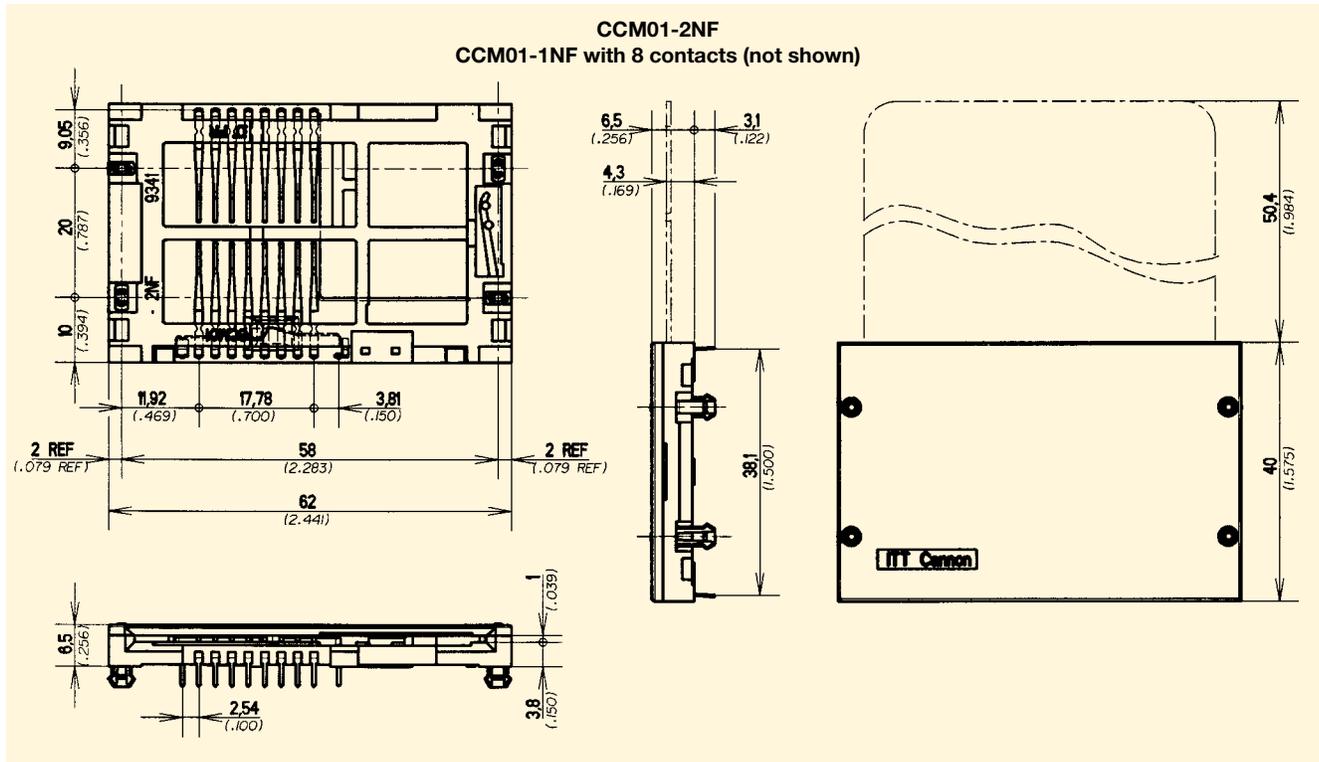
Ordering code

Part Number	N° of Contacts	Packaging Multiple
CCM01-1NF	8	200
CCM01-2NF	16	200

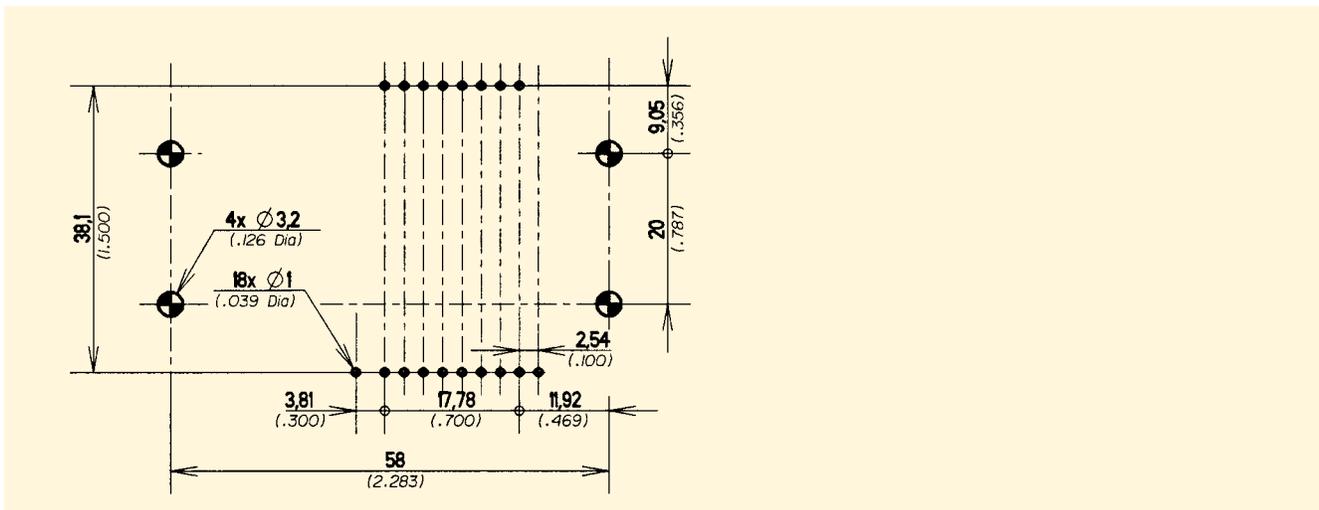
Packaging

20 per tray, 10 trays per box.
Order multiple 200

Dimensional Drawings



PCB Layout



CCM01 MK II



The CCM01 MK II connectors with fixed contacts have been developed for applications where a landing contact mechanism is not required but performance and reliability are still key considerations.

Features

- Available with 8 or 16 contacts which are designed to give a consistently reliable normal force over the life of the connector.
- For added reliability, the card detection switch (which is normally open) is sealed against dust and debris.
- Available with surface mount contacts, the lightweight design means that the connector can be automatically pick-and-placed.
- The moldings are made from high temperature thermoplastics suited for infrared and convection soldering processes.
- Plastic springs in the cover give a positive feel as the card is fully inserted. In case of special version with low card insertions and withdrawal, then the CCM connector is supplied without this spring effect.
- The reduced size of the contact base saves PCB space, makes the connector more stable during soldering and creates an air gap between the contacts and card entry slot, so reducing the risk of an electrostatic transfer to the PCB.
- By using an inlay finish in the contact area, the life of the precious metal is extended by more than 10 times that of standard gold plating.
- A chamfered opening to the card entry slot improves the card guidance into the connector.
- The contact area is spooned to reduce the risk of accidental (or deliberate) damage and to optimize the electrical connection with the card.
- Robustly formed printed circuit tails allow a coplanarity of ± 0.05 mm (0.002) to be maintained.

Construction

Contacts	Copper alloy
Plating	Contact area : Gold alloy inlay Terminals : Tin lead (2 μ min)
Moldings	High temp. thermoplastic UL 94V-0 rated
Card detection switch	Stainless steel and copper alloy

Mechanical data

Number of Contacts	8 or 16
Mechanical life	100,000 cycles min
Durability of inlay	5,000 cycles min (see note 1)
Card insertion force	10 N max
Card extraction force	1 N min / 10N max
Contact force	0.25 N min / 0.50 N max
Card detection switch actuation force (stop)	0.8 N max for actuation (end travel switch actuates when card is 0.9 mm (0.35) from card stop) 1.8 N max for complete depression
Vibration	Frequency 10 to 500 Hz. Acceleration 50m/s ² Duration 6 hours - amplitude 0.35 mm (0.014) Max electrical discontinuity 1 μ s
Shock	Peak value 500 m/s ² – Duration 11 ms 3 shocks in each direction of each axis Max electrical discontinuity 1 μ s

Electrical data

Insulation resistance	1,000 M Ω min
Contact resistance max	100 m Ω max
Switching current	10 μ A min / 1 A max
Dielectric strength	750 Vrms min
Card detection switch	Normally open
Rc card detection switch	100 m Ω max
Dielectric strength card detection switch	250 Vrms min
Switch current rating	1 mA min / 10 mA max
Maximum switch power	0.2 VA

Environmental data

Operating temperature	-40°C to +85°C
Soldering temperature	Temperature/time profile acc. to CECC00802 para. 6.1, Fig. 3 with peak temperature 250°C
Damp heat	IEC 512 test number 11c (10 days)
Salt mist	IEC 512 test number 11f (96 hours)
Card detection switch	Sealed IP 54

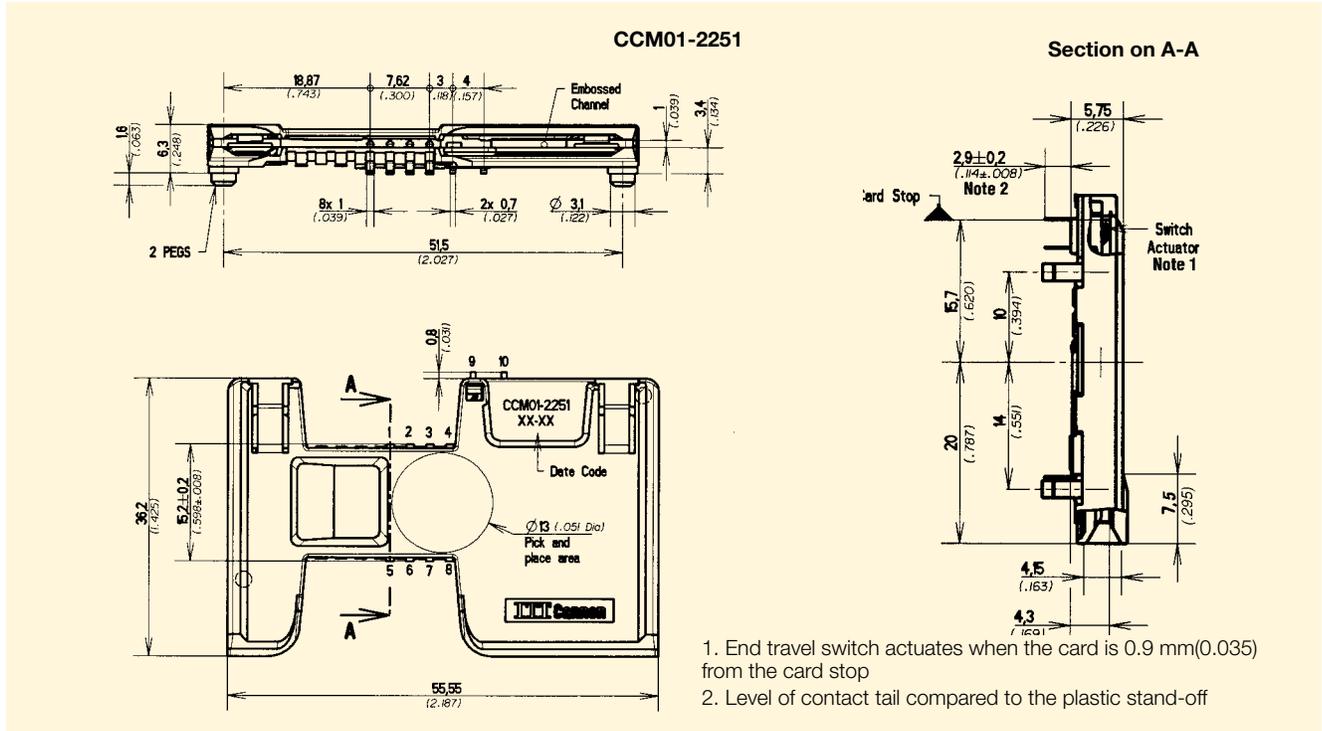
Part Number	N° of Contacts	Packaging Multiple
CCM01-2251	8	300
CCM01-2252	16	300

Packaging

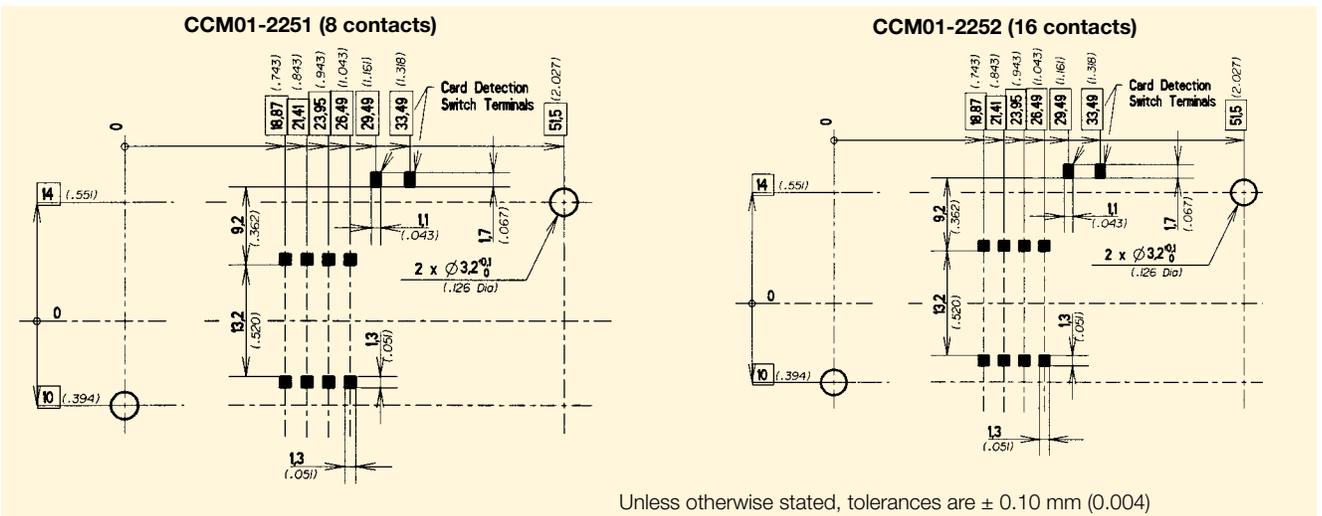
30 per tray, 10 trays per box.
Order multiple 300

Note 1: Inlay (precious metal) rating is based on a very abrasive card being used and is intended to represent worst case.

Dimensional Drawings



PCB Layout



CCM02 MK I



CCM02 MK I is a connector with landing contacts.

Though most applications only require a connector with 8 contacts, there are still limited requirements for a connector with 16 contacts to read AFNOR cards, as well as ISO cards.

Features

- Available with 8 & 16 through hole contacts.
- 100,000 card insertion cycles.
- The contacts don't touch the card until it is almost fully inserted - a minimal wiping action removes any non-conductive material.
- The connector has been designed to give a positive feel as the card is fully inserted.
- For added reliability, the integrated card end-travel switch (which is normally open) is sealed against dust and grit.

Construction

Contacts	Copper alloy
Plating	Contact area : Gold over Nickel Terminals : Tin lead (2µ min)
Moldings	Thermoplastic UL 94V-0 rated

Mechanical data

Number of Contacts	8 or 16
Mechanical life	100,000 cycles min
Card insertion force	10 N max
Card extraction force	1 N min / 10 N max
Contact force	0.15 N min / 0.35 N max
Vibration	Frequency 10 to 500 Hz. Acceleration 50m/s ² Duration 6 hours - amplitude 0.35 mm (0.014) Max electrical discontinuity 1µs
Shock	Peak value 500 m/s ² - Duration 11 ms 3 shocks in each direction of each axis Max electrical discontinuity 1 µs

Electrical data

Insulation resistance	1,000 MΩ min
Contact resistance max	100 mΩ max
Switching current	10 µA min / 1 A max
Dielectric strength	750 Vrms min
Card detection switch	Normally open
Rc card detection switch	100 mΩ max
Dielectric strength card detection switch	250 Vrms min
Switch current rating	1 mA min / 10 mA max
Maximum switch power	0.2 VA

Environmental data

Operating temperature	-40°C to +85°C
Soldering temperature	Wave: 260°C / 5 sec
Damp heat	IEC 512 test number 11c (10 days)
Salt mist	IEC 512 test number 11f (96 hours)
Card detection switch	Sealed IP 54

Ordering code

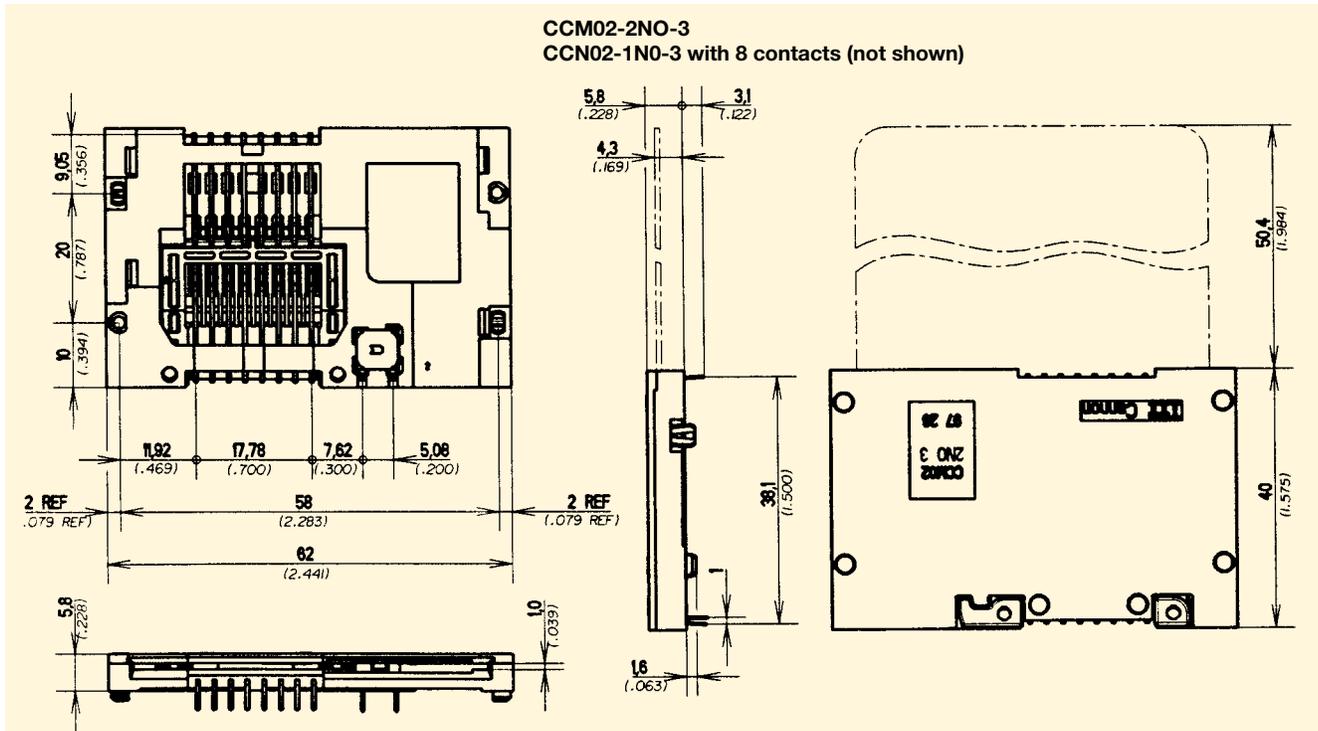
Part Number	N° of Contacts	Packaging Multiple
CCM02-1N0-3	8	300
CCM02-2N0-3	16	300
CCM02-1N0-32	8	300
CCM02-2N0-32	16	300
CCM02-2N0-43*	16	300
CCM02-1N0-35	8 with extended cover	200
CCM02-2N0-35	16 with extended cover	200

* Suitable for hand soldering, but not for infrared or convection processes.

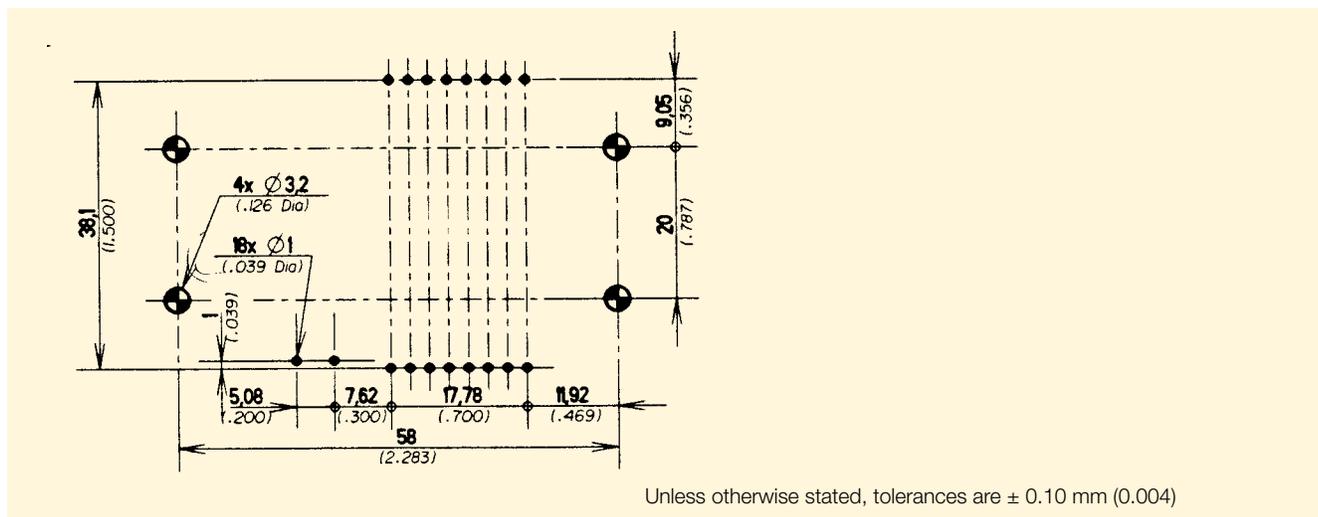
Packaging

30 per tray, 10 trays per box. Order multiple 300

Dimensional Drawings

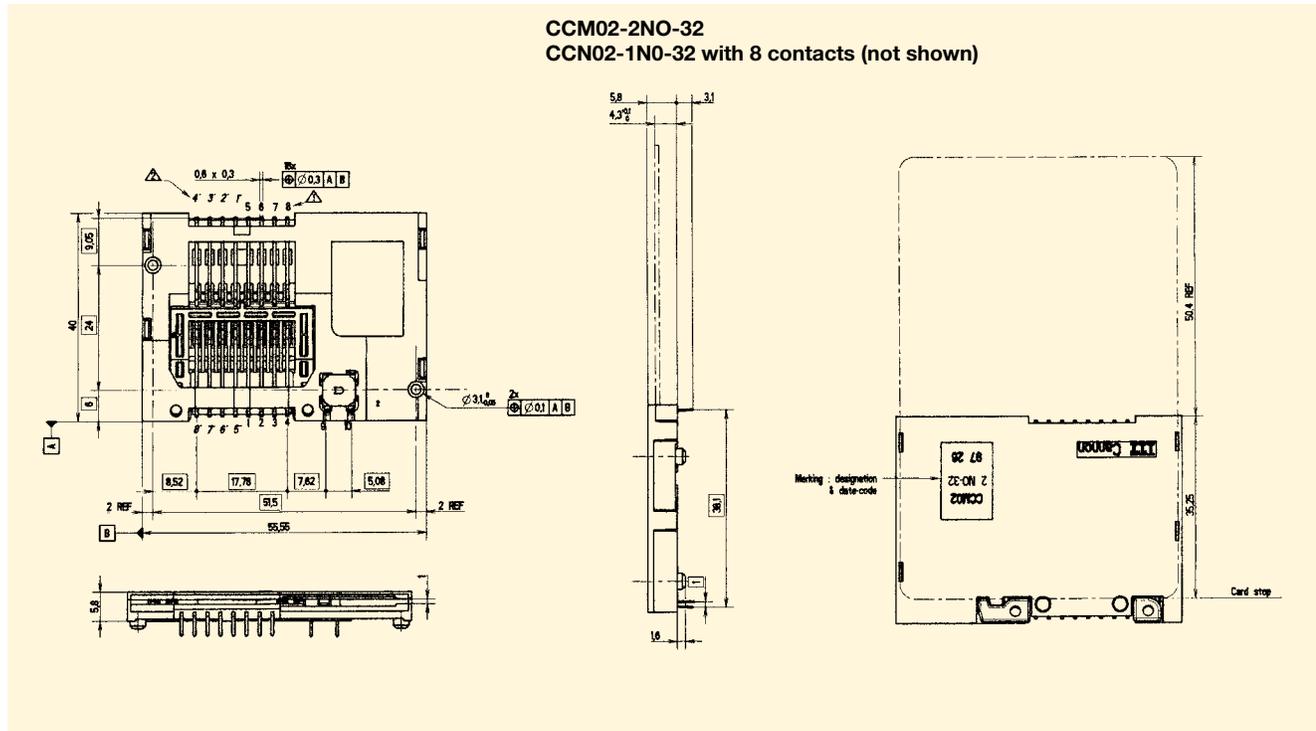


PCB Layout

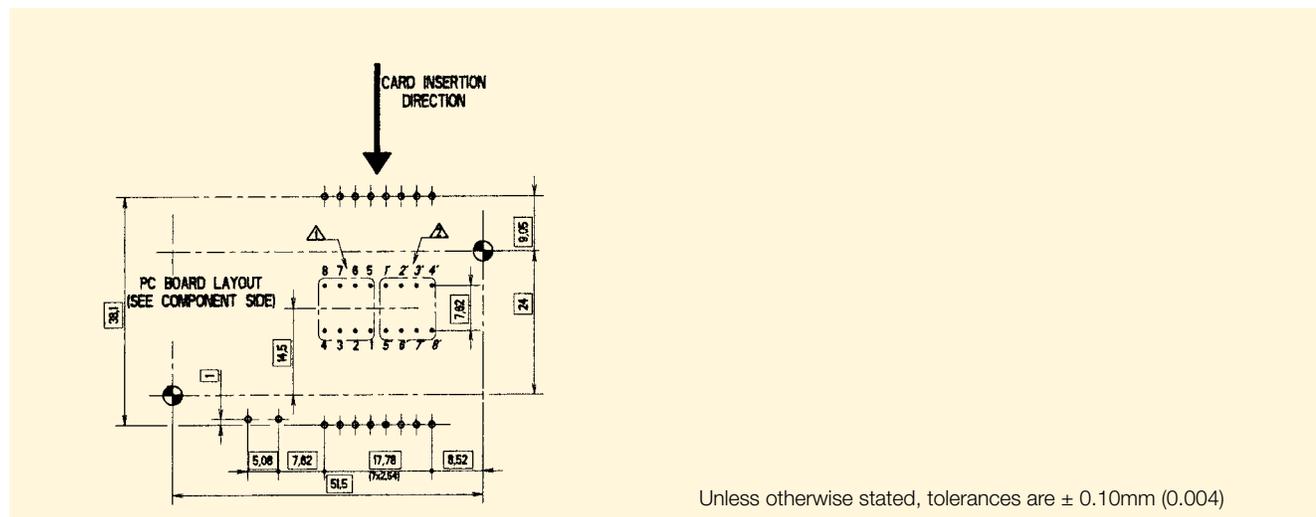


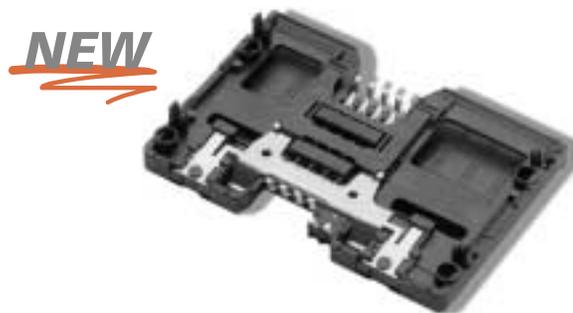
CCM02 MK I

Dimensional Drawings



PCB Layout





The CCM02 MK II connectors with landing contacts are dedicated for applications where the reader usage is high and the life span of the card is a key consideration, a connector with contacts which land on the card, rather than slide over it, should be specified so as to minimize card wear. The CCM02 has been redesigned to give an even higher performance in a compact, affordable package.

Features

- 500,000 card insertion cycles.
- The contacts don't touch the card until it is almost fully inserted – a minimal wiping action removes any non-conductive material.
- The connector has been designed to give a positive indication once the card has been fully inserted.
- The reduced size of the contact base saves PCB space, makes the connector more stable during surface mounting, and creates an air gap between the contacts and card entry slot, so reducing the risk of an electrostatic transfer to the PCB.
- For added reliability, the integrated card end-travel switch (which is normally open) is sealed against dust and grit.
- By using an inlay finish in the contact area, the life of the precious metal is extended by more than 10 times that of standard gold plating.
- The contact area is spooned to reduce the risk of accidental (or deliberate) damage and to optimize the electrical connection with the card.
- Snap-locks underneath the molding, position and hold the connector on the PCB and give additional support to the contact terminals.
- The plastic moldings are made from a high temperature thermoplastic suited for infrared and convection soldering processes.
- Available with through hole or surface mount terminals, this connector can be pick & placed automatically.

Construction

Contacts	Copper alloy
Plating	Contact area : Gold alloy inlay Terminals : Tin lead (2μ min)
Moldings	High temp. thermoplastic UL 94V-0 rated
Spring	Stainless steel
Card detection switch actuator	Stainless steel

Mechanical data

Number of Contacts	8
Mechanical life	500,000 cycles min
Card insertion force	10 N max
Card extraction force	1 N min / 10 N max
Contact force	0.25 N min / 0.5 N max
Card detection switch actuation force	0.8 N max for actuation (end travel switch actuates when card is 1.0 mm (0.039) from card stop) 1.8 N max for complete depression
Vibration	Frequency 10 to 500 Hz. Acceleration 50m/s ² Duration 6 hours - amplitude 0.35 mm (0.014) Max electrical discontinuity 1μs
Shock	Peak value 500 m/s ² – Duration 11 ms 3 shocks in each direction of each axis Max electrical discontinuity 1 μs

Electrical data

Insulation resistance	1,000 MΩ min
Contact resistance max	100 mΩ max
Switching current	10 μA min / 1 A max
Dielectric strength	750 Vrms min
Card detection switch	Normally open
Rc card detection switch	100 mΩ max
Dielectric strength card detection switch	250 Vrms min
Switch current rating	1 mA min / 10 mA max
Maximum switch power	0.2 VA

Environmental data

Operating temperature	-40°C to +85°C
Soldering temperature	Temperature/time profile acc. to CECC00802 para. 6.1, Fig. 3 with peak temperature 250°C
Damp heat	IEC 512 test number 11c (10 days)
Salt mist	IEC 512 test number 11f (96 hours)
Card detection switch	Sealed IP 54

Ordering code

Part Number	N° of Contacts	Packaging Multiple
CCM02-2503	8 Through Hole	300
CCM02-2504	8 SMT	300

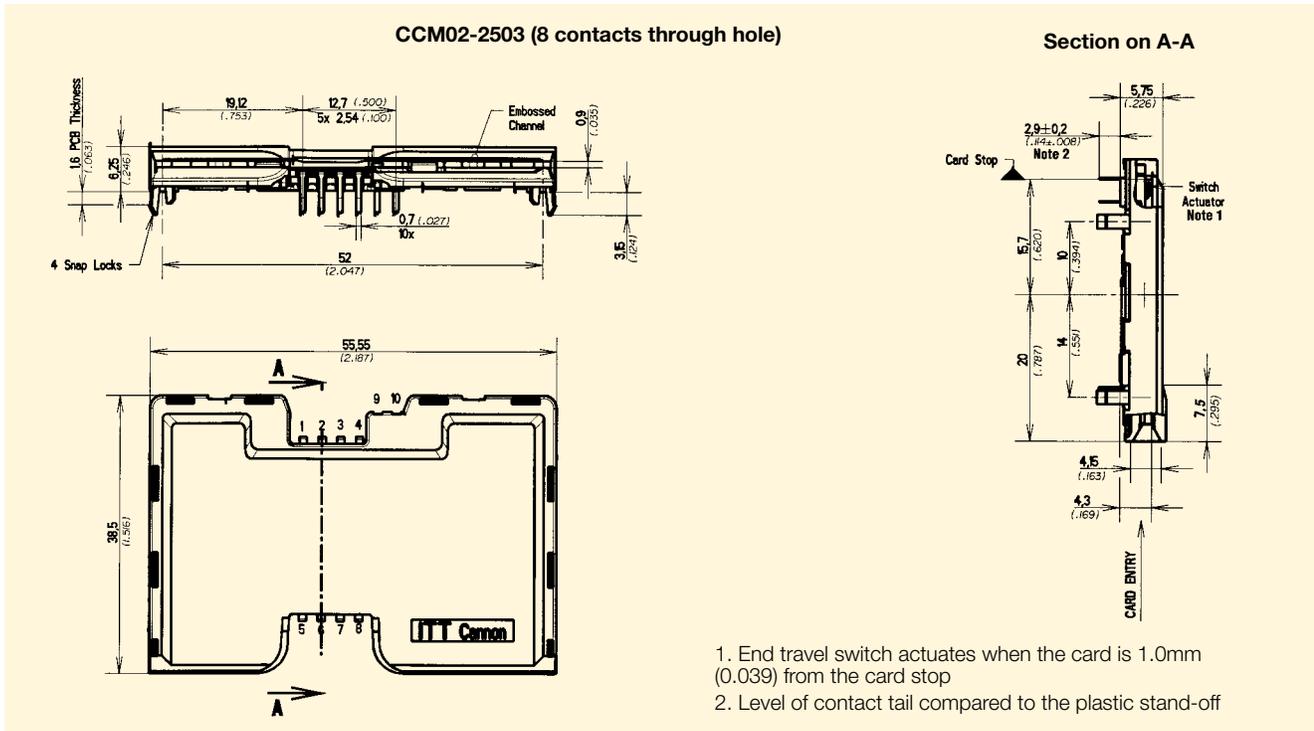
Packaging

30 per tray, 10 trays per box.

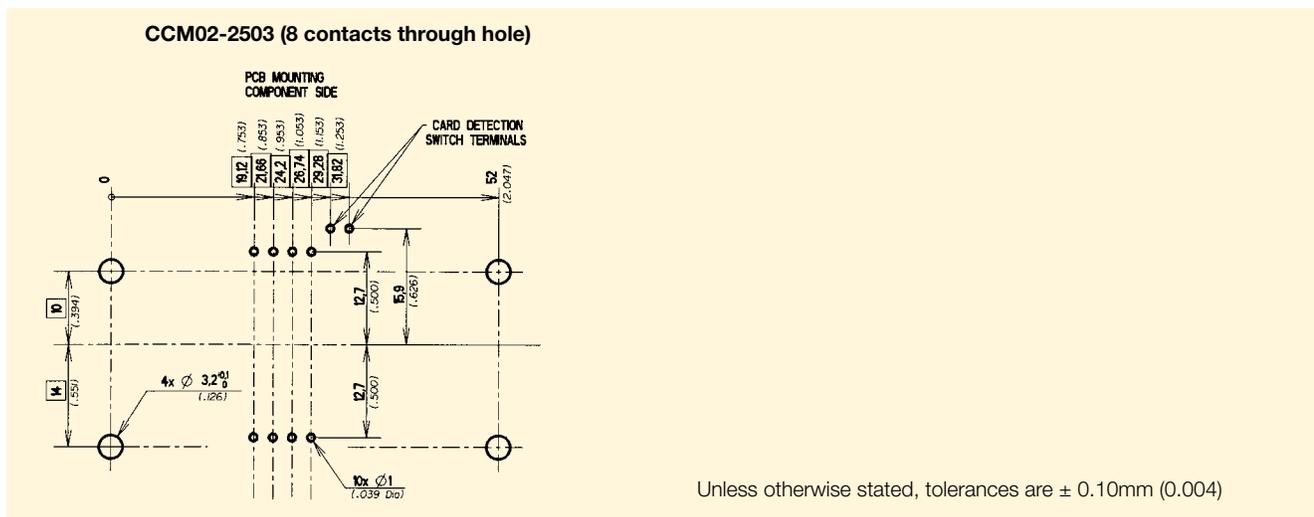
Order multiple 300

Note 1: Inlay (precious metal) rating is based on a very abrasive card being used and is intended to represent worst case.

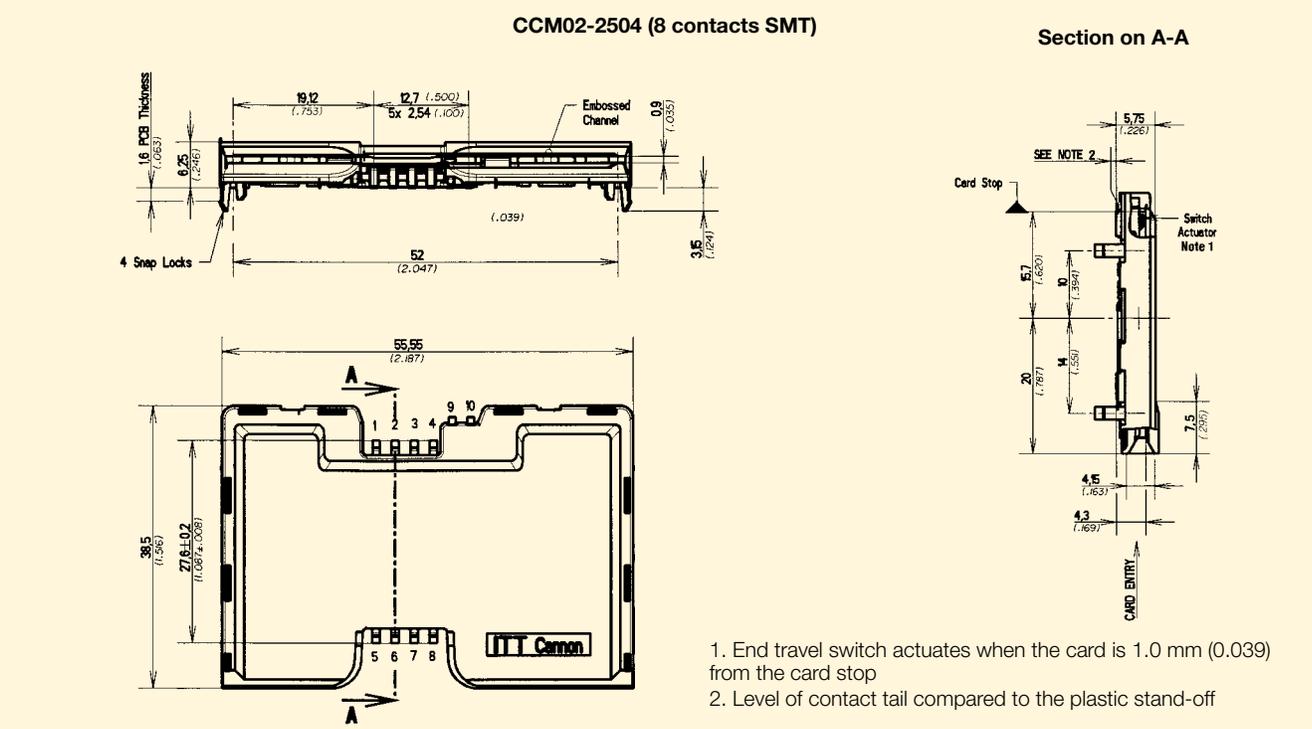
Dimensional Drawings



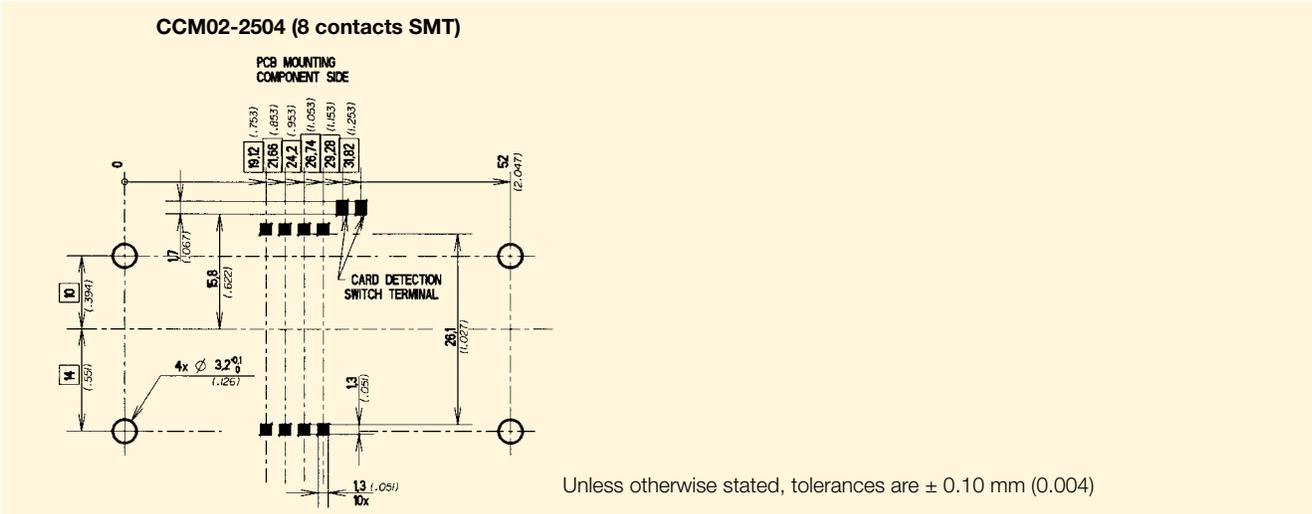
PCB Layout



Dimensional Drawings



PCB Layout



CCM03 MK I



The CCM03 MK I connectors are dedicated for Micro SIM/SAM Cards and offer two features which are not yet available in the CCM03 MK II:

- a card detection switch
- stand-offs which allow components to be mounted underneath the connector.

Features

- Available with 6 surface mount contacts, plus an optional blade switch to detect when the card is inserted and the cover closed.
- The 1.9 mm (0.007) stand-off option offers significant PCB space savings by allowing other components to be mounted underneath the connector.
- The molding is polarized so that the cover can only be closed if the card is correctly inserted.

Construction

Contacts	Copper alloy
Plating	Contact area : Gold over Nickel Terminals : Tin lead (2μ min)
Moldings	Thermoplastic UL 94V-0 rated
Slide lock/Metal cover	Stainless steel

Mechanical data

Number of Contacts	6
Mechanical life	5,000 cycles min
Card insertion force	1 N max
Card extraction force	1 N max
Contact force	0.25 N min / 0.5 N max
Slide locking force	3.5 N max
Vibration	Frequency 10 to 500 Hz. Acceleration 50m/s ² Duration 6 hours - amplitude 0.35 mm (0.014) Max electrical discontinuity 1μs
Shock	Peak value 500 m/s ² – Duration 11 ms 3 shocks in each direction of each axis Max electrical discontinuity 1 μs

Electrical data

Insulation resistance	1,000 MΩ min
Contact resistance max	100 mΩ max
Switching current	10 μA min / 1 A max
Dielectric strength	750 Vrms min
Card detection switch	Normally open (closes when card inserted and cover is shut)
Rc card detection switch	100 mΩ max
Dielectric strength card detection switch	250 Vrms min
Switch current rating	1 mA min / 10 mA max
Maximum switch power	0.2 VA

Environmental data

Operating temperature	-40°C to +85°C
Soldering temperature	Temperature/time profile acc. to CECC00802 para. 6.1, Fig. 3 with peak temperature 250°C
Damp heat	IEC 512 test number 11c (10 days)
Salt mist	IEC 512 test number 11f (96 hours)

Ordering code

Part Number	Switch	PCB Stand-offs	PCB Holes Diameters	Qty per reel	On Tray
CCM03-0	No	No	2.0 mm (0.008) ^{+0.1} / ₀		300
CCM03-0-1	No	No	2.0 mm (0.008) ^{+0.1} / ₀	750	
CCM03-0NO	Yes	No	2.0 mm (0.008) ^{+0.1} / ₀		300
CCM03-0NO-1	Yes	No	2.0 mm (0.008) ^{+0.1} / ₀	750	
CCM03-312	No	Yes	1.6 mm (0.006) ^{+0.1} / ₀	550	
CCM03-313	Yes	Yes	1.6 mm (0.006) ^{+0.1} / ₀	550	

Packaging

300 per tray. 550 or 750 pieces per reel, 5 reels per box.

CCM03 MK II



A new range of CCM03 connectors have been developed to interface with SIM/SAM cards as defined by GSM11-11 and ENV1375-1. The connectors are available with either hinged covers or fixed covers and have been designed to minimize the amount of space needed for PCB mounting.

Features

Hinged Cover

- Available with 6 or 8 contacts, with or without PCB locating pegs.
- The cover springs open when unlocked while the card is in place.
- The molding is polarized so that the cover can only be closed if the card is correctly inserted.
- The cover can be replaced without removing the connector from the PCB
- Inspection slots allow an electrical test to be made without opening the cover.
- The overall height of the connector is only 2.5 mm (0.098). The amount of space needed to mount the connector is just 29.65 mm (1.167) x 17.2 mm (0.677)

Fixed Cover

- Available with 6 or 8 contacts.
- The overall height of the connector is 2.85 mm max (0.014). Only 25.5 mm (1.003) x 17.2 mm (0.677) of board space is required to mount the connector.

General

- With tape and reel packaging as standard, the connectors are designed to be automatically pick-and-placed.
- The high temperature thermoplastic moldings are suited for infrared and convection soldering processes.
- By using an inlay finish in the contact area the life of the precious metal is extended by over 10 times that of standard gold plating.
- Robustly formed printed circuit tails allow a co-planarity of ± 0.05 mm (0.002) to be maintained.

Construction

Contacts	Copper alloy
Plating	Contact area : Gold alloy inlay Terminals : Tin lead (2 μ min)
Moldings	High temp. thermoplastic UL 94V-0 rated
Spring	Stainless steel

Mechanical data

Number of Contacts	6 or 8
Mechanical life, hinged cover	10,000 cycles min
Mechanical life, fixed cover	50,000 cycles
Durability of inlay, hinged cover	10,000 cycles min (see note 1)
Durability of inlay, fixed cover	5,000 cycles
Card insertion force	Hinged cover: 1 N max Fixed cover: 3 N max
Card extraction force	Hinged cover: 1 N max Fixed cover: 0.80 N min / 3 N max
Contact force	0.25 N min / 0.50 N max
Slide locking force	2 N min / 6 N max
Vibration	Frequency 10 to 500 Hz. Acceleration 50m/s ² Duration 6 hours - amplitude 0.35 mm (0.014) Max electrical discontinuity 1 μ s
Shock	Peak value 500 m/s ² – Duration 11 ms 3 shocks in each direction of each axis Max electrical discontinuity 1 μ s

Electrical data

Insulation resistance	1,000 M Ω min
Contact resistance max	100 m Ω max
Switching current	10 μ A min / 1 A max
Dielectric strength	750 Vrms min

Environmental data

Operating temperature	-40°C to +85°C
Soldering temperature	Temperature/time profile acc. to CECC00802 para. 6.1, Fig. 3 with peak temperature 250°C
Damp heat	IEC 512 test number 11c (10 days)
Salt mist	IEC 512 test number 11f (96 hours)

Note 1: Inlay (precious metal) rating is based on a very abrasive card being used and is intended to represent worst case.

Ordering code

Part Number	N° of Contacts	Cover	PCB Locating Pegs	Quantity per reel
CCM03-3001	6	Hinged	No	1000
CCM03-3002	6	Hinged	Yes	1000
CCM03-3003	8	Hinged	No	1000
CCM03-3004	8	Hinged	Yes	1000
CCM03-3504	8	Fixed	No	1200
CCM03-3505	6	Fixed	No	1200

Packaging

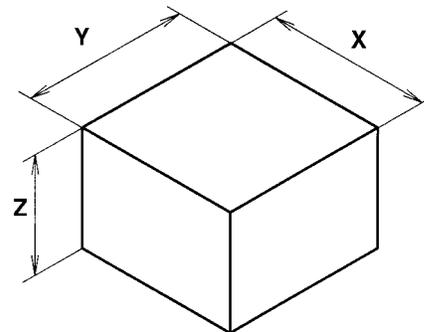
CCM03 connectors are packaged in accordance with EIA 481-3.

Standard packaging is in tape and reel.

A modification code is added to the part number that indicates reel packaging and the number of components per reel.

Ordering code

Part Number	Modification Code	Quantity per reel	N° reels per box
CCM03-3001	R 102	1000	5
CCM03-3002	R 102	1000	5
CCM03-3003	R 102	1000	5
CCM03-3004	R 102	1000	5
CCM03-3504	R 122	1200	5
CCM03-3505	R 122	1200	5

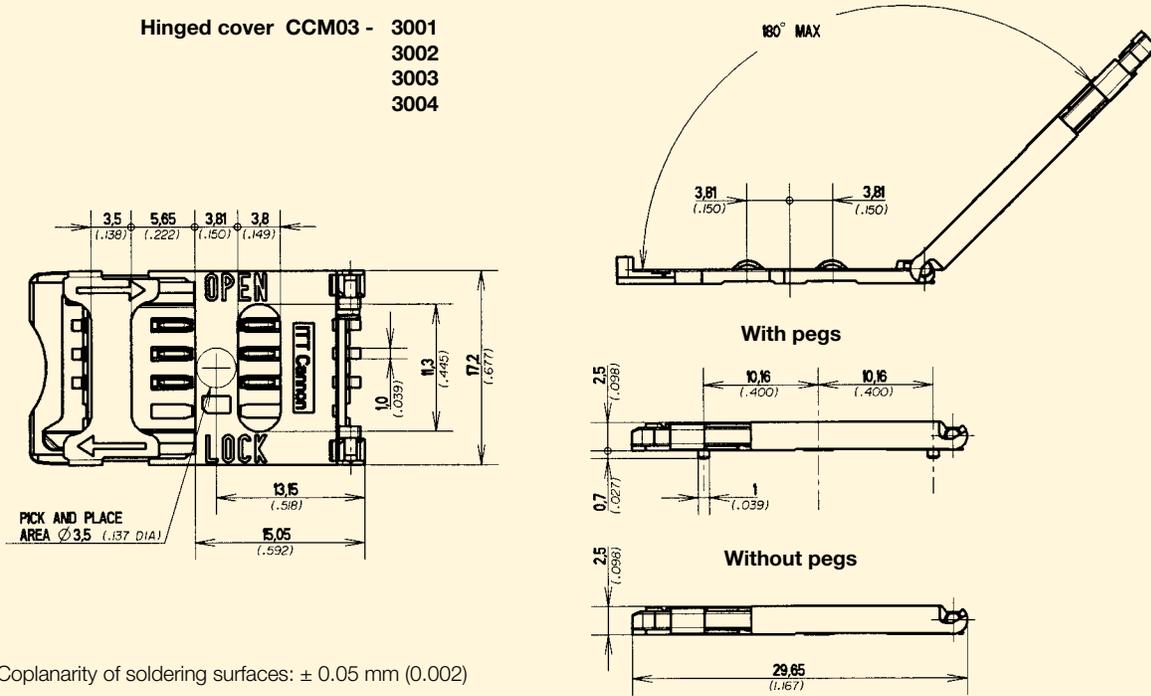


Reel Diameter	Reel Width	X	Y	Z
360 mm (14.173)	24.4 mm (0.961)	344 mm (13.543)	350 mm (13.779)	152 mm (5.984)

CCM03 MK II Hinged Cover

Dimensional Drawings

Hinged cover CCM03 - 3001
3002
3003
3004

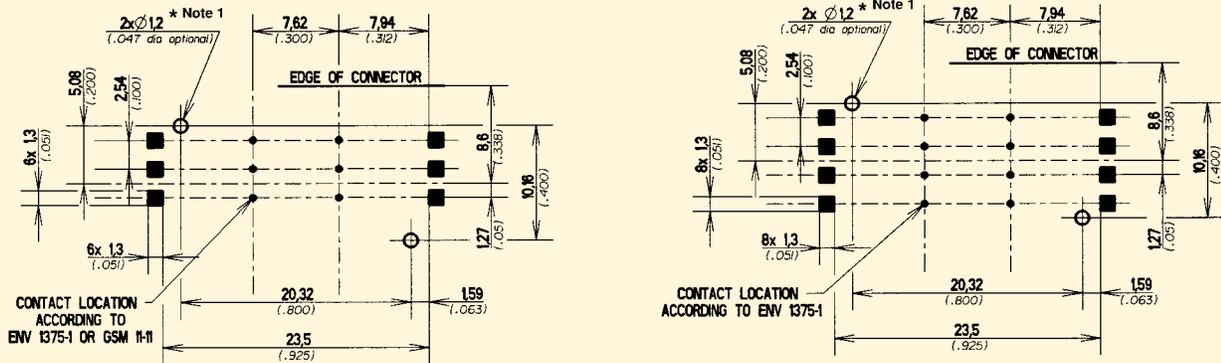


Note: Coplanarity of soldering surfaces: ± 0.05 mm (0.002)

PCB Layout

CCM03-3001 / 3002

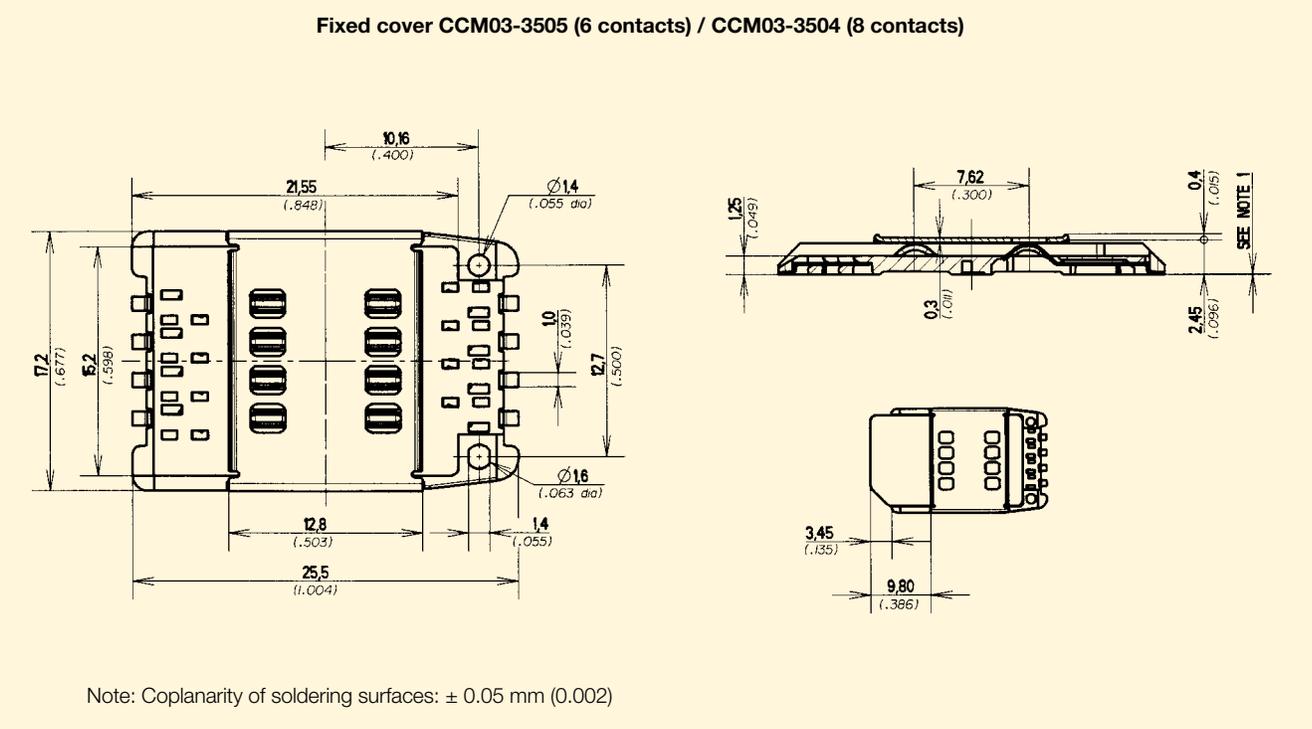
CCM03-3003 / 3004



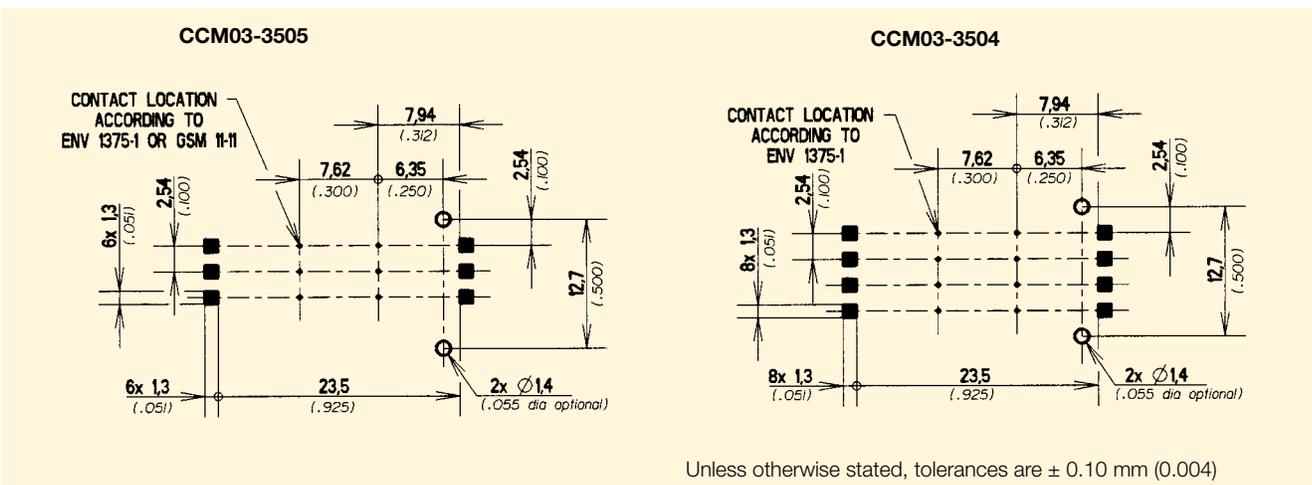
1. Mounting pegs only available with CCM03-3002 / 3004
Unless otherwise stated, tolerances are ± 0.10 mm (0.004)

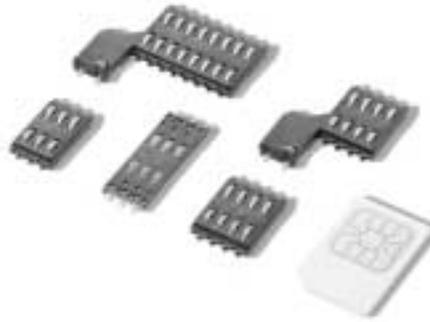
CCM03 MK II Fixed Cover

Dimensional Drawings



PCB Layout





The CCM04 without card guidance is used where space is at a premium and the card guidance can be built around the connector (rather than provided by the connector itself).

The CCM04 low profile without card guidance is dedicated to applications where the overall height of the connector is paramount. A range of low profile CCM04 connectors are available with 1.25 mm (0.005) thick moldings.

The wide choice of contact configurations and molding heights suit a broad range of applications.

Features

- Available in a variety of molding heights from 1.25 mm (0.049) to 5 mm (0.197).
- The integrated card detection switch (optional) is sealed against dust and grit.
- By using an inlay finish in the contact area, the life of the precious metal is extended by more than 10 times that of standard gold plating.
- The height of the contact above the insulator is 0.75 mm (0.03), so allowing a wider tolerance for the card entry slot.
- The contact area is spooned to reduce the risk of accidental (or deliberate) damage and to optimize the electrical connection with the card.
- The tip of the contact is protected by the molding so that it cannot catch on the card as the card is being inserted.
- The contact design ensures a consistent and reliable contact force over the life of the connector.
- Robustly formed printed circuit tails are well protected by the insulator body: a coplanarity of ± 0.05 mm (0.002) is guaranteed.
- The moldings are made from high temperature thermoplastic suited for infrared and convection soldering processes.
- With tape and reel packaging as standard, the connectors are designed to be automatically picked & placed.

Construction

Contacts	Copper alloy
Plating	Contact area : Gold alloy inlay Terminals : Tin lead (2 μ min)
Moldings	High temp. thermoplastic UL 94V-0 rated

Mechanical data

Number of Contacts	6, 8 or 16
Mechanical life	50,000 cycles min
Durability of inlay	5,000 cycles min (see note 1)
Contact force	0.25 N min / 0.5 N max
Card detection switch actuation force	0.8 N max for actuation (end travel switch actuates when card is 0.9 mm (0.35) from card stop) 1.8 N max for complete depression
Vibration 50m/s ²	Frequency 10 to 500 Hz. Acceleration Duration 6 hours - amplitude 0.35 mm (0.014) Max electrical discontinuity 1 μ s
Shock	Peak value 500 m/s ² – Duration 11 ms 3 shocks in each direction of each axis Max electrical discontinuity 1 μ s

Electrical data

Insulation resistance	1,000 M Ω min
Contact resistance max	100 m Ω min
Switching current	10 μ A min / 1 A max
Dielectric strength	750 Vrms min
Card detection switch	Normally open (closes on card insertion)
Switch contact resistance	100m Ω max
Dielectric switch contacts	250 Vrms min
Maximum switch power	0.2 VA

Environmental data

Operating temperature	-40°C to +85°C
Soldering temperature	Temperature/time profile acc. to CECC00802 para. 6.1, Fig. 3 with peak temperature 250°C
Damp heat	IEC 512 test number 11c (10 days)
Salt mist	IEC 512 test number 11f (96 hours)
Card detection switch	Sealed IP 54

Note 1: Inlay (precious metal) rating is based on a very abrasive card being used and is intended to represent worst case.

Ordering code

Molding Height	SMT Tails	Without Switch		With Switch	
		2 x 3 contacts	2 x 4 contacts	2 x 4 contacts	2 x 8 contacts
1.25 mm (0.049)	Standard	CCM04-1801	CCM04-1814	CCM04-1889	
1.25 mm (0.049)	Straight	CCM04-1800	CCM04-1813	CCM04-1888	
2.00 mm (0.079)	Standard	CCM04-1402	CCM04-1415		
2.75 mm (0.108)	Straight	CCM04-1200	CCM04-1217	CCM04-1316	CCM04-1333
2.75 mm (0.108)	Standard	CCM04-1201	CCM04-1218	CCM04-1317	CCM04-1334
3.50 mm (0.138)	Standard	CCM04-1202	CCM04-1219	CCM04-1318	
4.25 mm (0.167)	Standard	CCM04-1203	CCM04-1220	CCM04-1319	
5.00 mm (0.197)	Standard	CCM04-1204	CCM04-1221	CCM04-1320	

Packaging

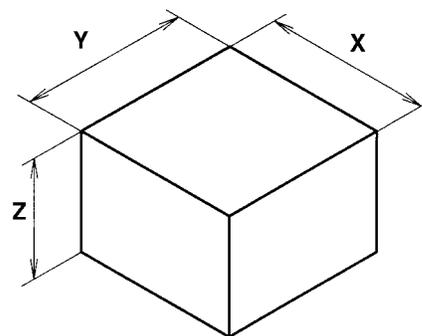
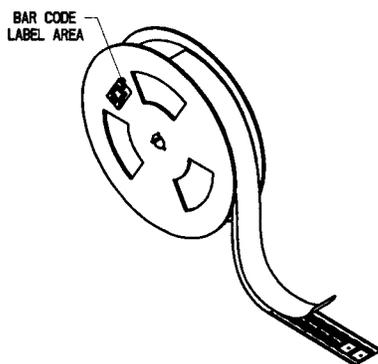
Connectors without a switch are packaged in accordance with EIA 481-2 or IEC 286-3.
Connectors with a switch are packaged in accordance with EIA 481-3 or IEC 286-3

Standard packaging is in tape and reel. A modification code is added to the part number that indicates reel packaging and the number of components per reel (which varies according to the molding height).

Example: A CCM04 with 8 contacts plus switch and a molding height of 3.50 mm (0.138) has a part number CCM04-1318-R751.

Molding Height	SMT Tails	Without Switch		With Switch		N° reels per box
		2 x 3 contacts	2 x 4 contacts	2 x 4 contacts	2 x 8 contacts	
1.25 mm (0.049)	Standard	R182 (1800pcs)	R132 (1300pcs)	R102 (1000pcs)		5
1.25 mm (0.049)	Straight	R182 (1800pcs)	R132 (1300pcs)	R102 (1000pcs)		5
2.00 mm (0.079)	Standard	R122 (1200pcs)	R901 (900pcs)			5
2.75 mm (0.108)	Straight	R122 (1200pcs)	R901 (900pcs)	R801 (800pcs)	R451 (450pcs)	5
2.75 mm (0.108)	Standard	R122 (1200pcs)	R901 (900pcs)	R801 (800pcs)	R451 (450pcs)	5
3.50 mm (0.138)	Standard	R112 (1100pcs)	R801 (800pcs)	R751 (750pcs)		5
4.25 mm (0.167)	Standard	R951 (950pcs)	R701 (700pcs)	R651 (650pcs)		5
5.00 mm (0.197)	Standard		R651 (650pcs)	R601 (600pcs)		5

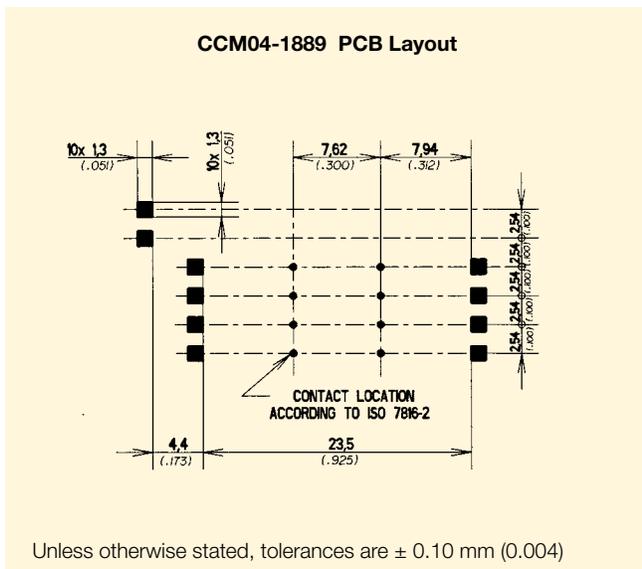
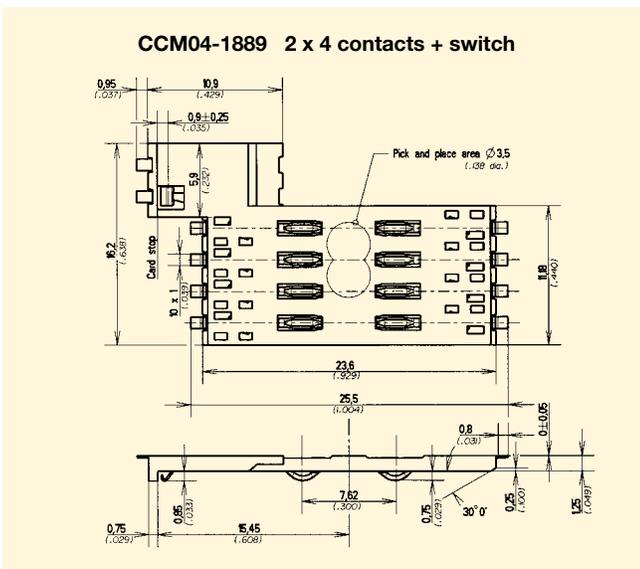
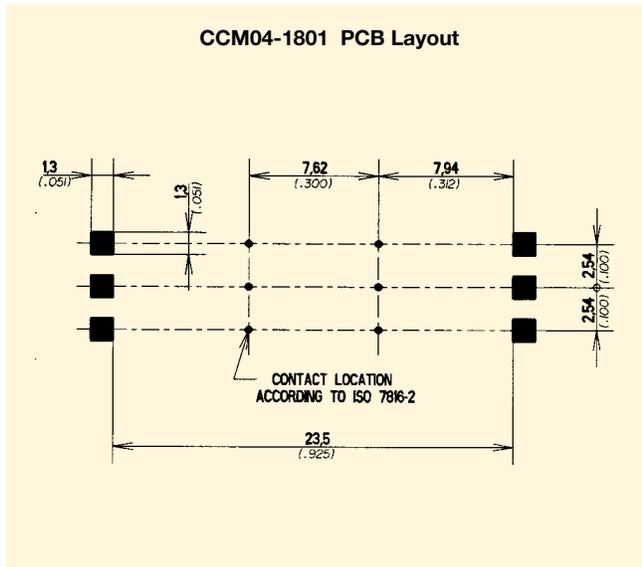
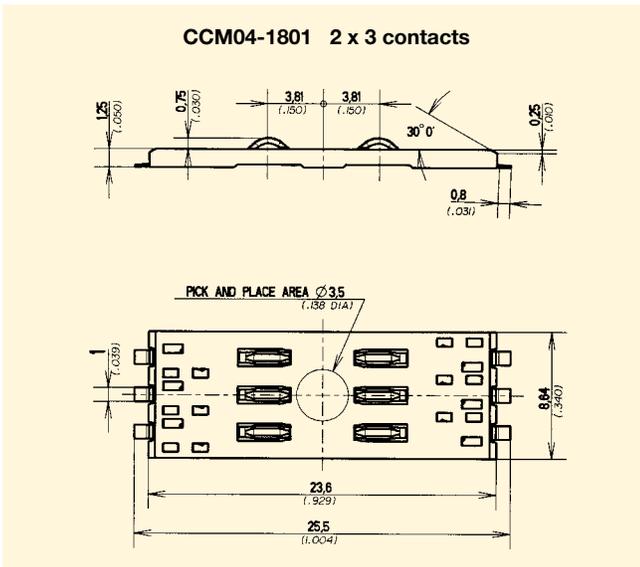
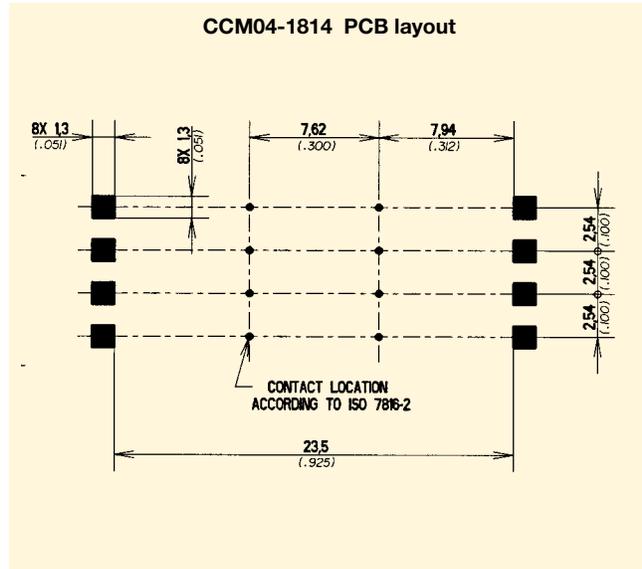
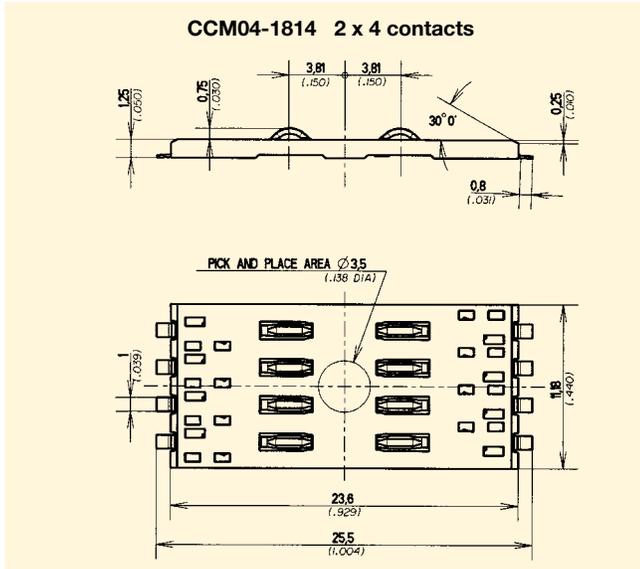
R = Reel



Reel Diameter	Reel Width	X	Y	Z
360 mm (14.173)	24.4 mm (0.961)	344 mm (13.543)	350 mm (13.779)	152 (5.984)

CCM04 MK II Low Profile

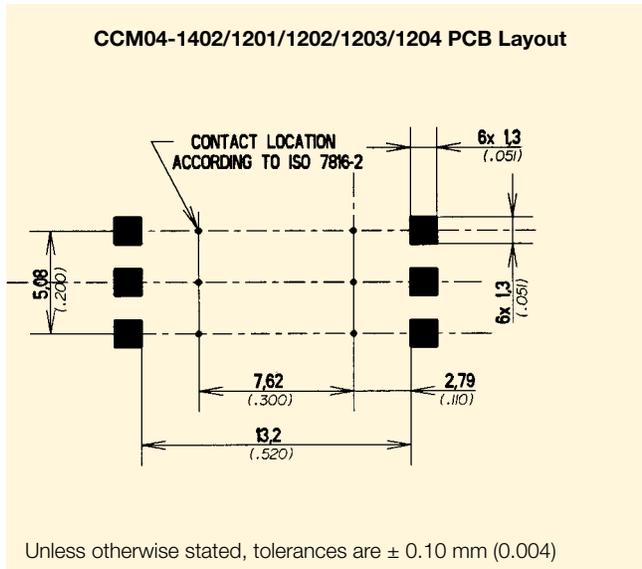
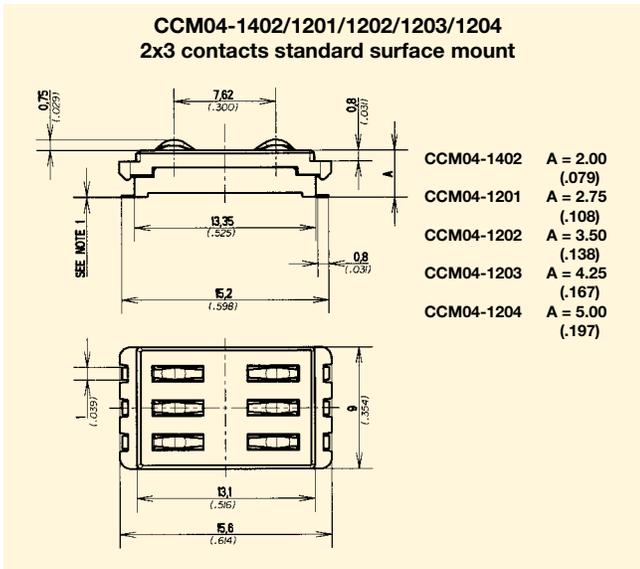
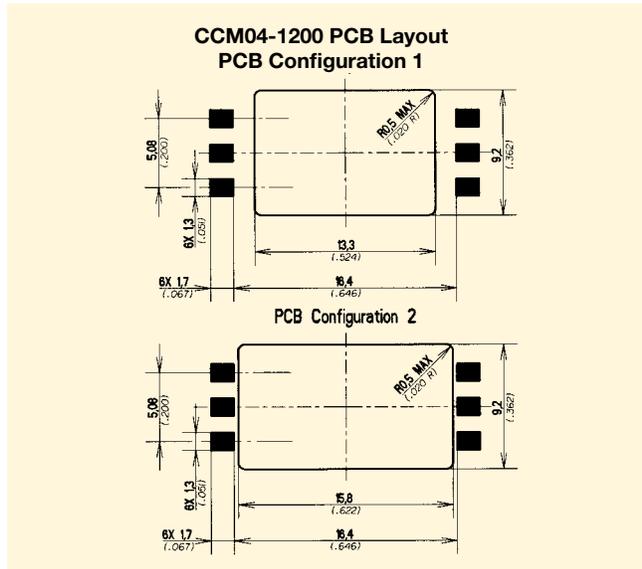
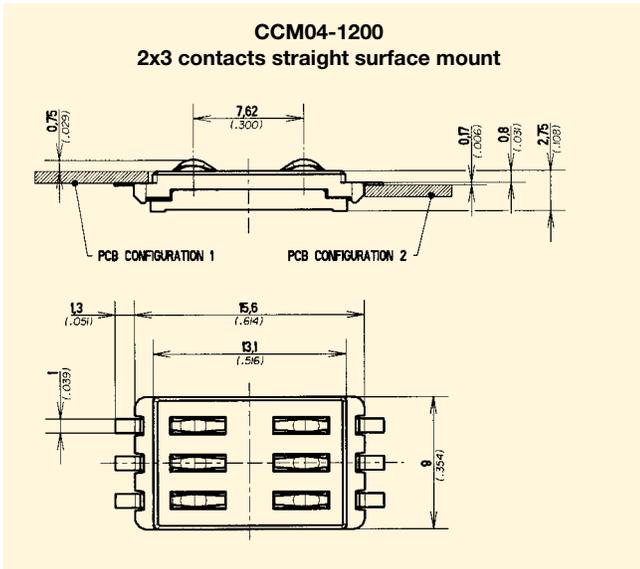
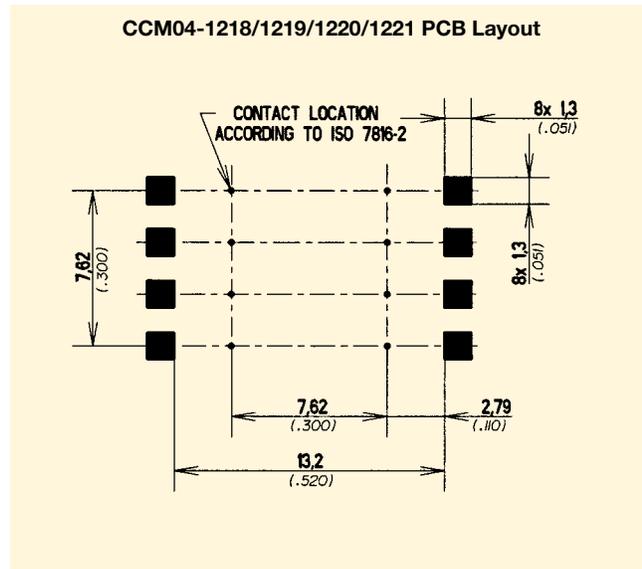
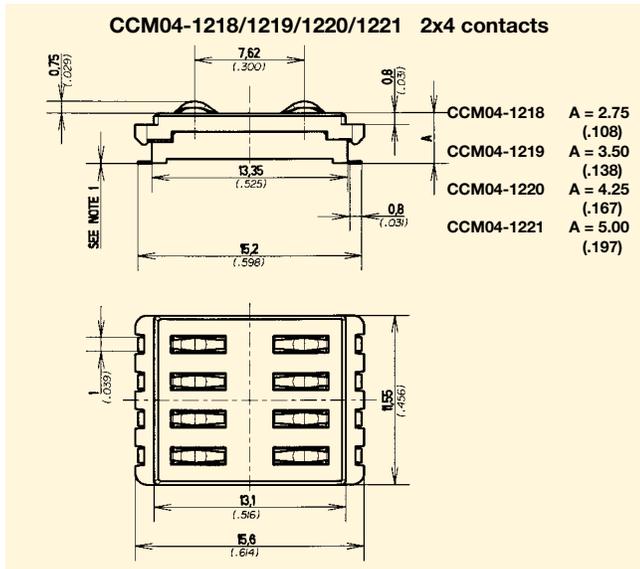
Dimensional Drawings



Unless otherwise stated, tolerances are ± 0.10 mm (0.004)

CCM04 MK II

Dimensional Drawings



Unless otherwise stated, tolerances are ± 0.10 mm (0.004)

CCM04 MK III Miniature Connectors

NEW



Introducing a new range of CCM04 connectors designed to interface with either full or SIM/SAM smart cards and designed to minimize space usage on the PCB while maximizing price economy.

Features

- Available with 6 contacts.
- By using an inlay finish in the contact area, the life of the precious metal is extended by up to 10 times that of a standard gold plating.
- The contact area is spooned to reduce the risk of accidental (or deliberate) damage and to optimize the electrical connection with the card.
- The insulators, molded from high temperature thermoplastic, are suited for infrared and convection soldering processes.
- With tape and reel packaging as standard, the connectors are designed to be automatically pick and placed.

Construction

Insulator	High temperature thermoplastic UL 94V.0
Contacts	Copper Alloy
Contact finish	Gold Alloy Inlay (Au / Ag / Pd)
PC Tail plating	Tin lead (2 µm min) Sn / Pb

Mechanical data

Mechanical life	50,000 cycles minimum
Precious metal	5000 cycles minimum (see note 1)
Contact force	0.25N min / 0.5N max

Electrical data

Insulation resistance	1000 MΩ min
Contact resistance max	100 mΩ max
Switching current	10 µA min / 1 A max
Dielectric strength	500 Vrms min

Environmental data

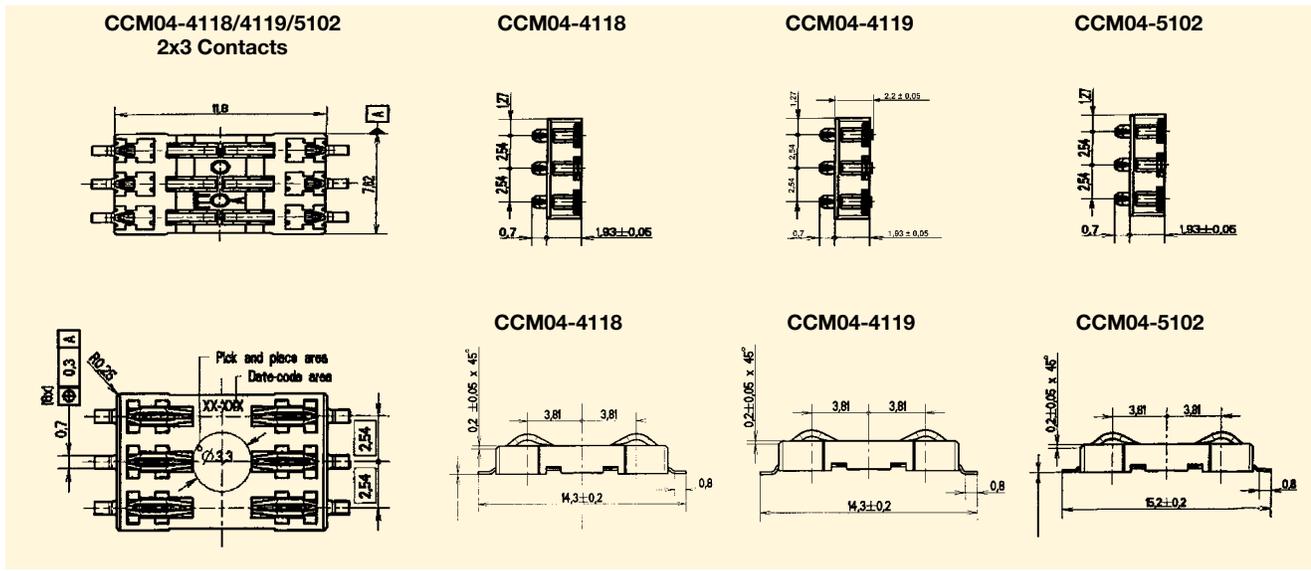
Operating temperature	-40°C to +85°C
Soldering temperature	Temperature/time profile acc. to CECC00802 para. 6.1, Fig. 3 with peak temperature
Salt mist	IEC 512 test number 11f (96 hours)
Damp heat	IEC 512 test number 11c (10 days)

Ordering Code

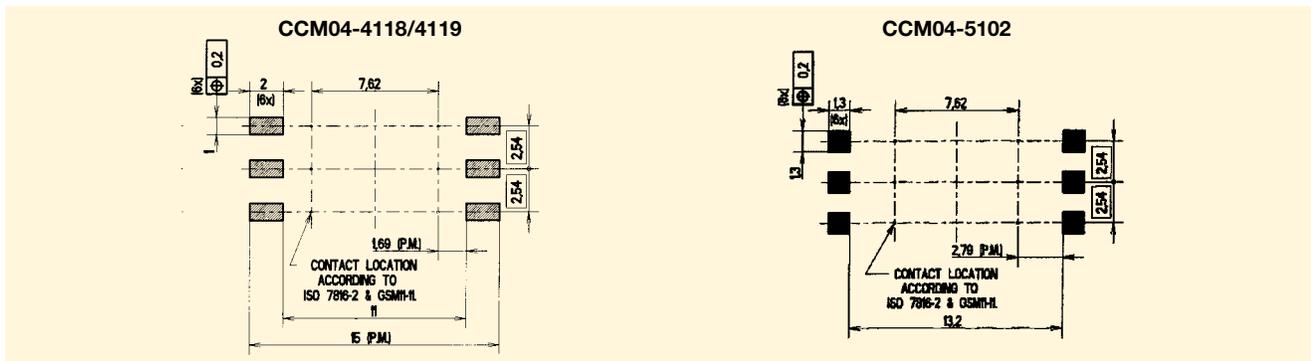
Part Number	N° of Contacts	Total Thickness	Insulator Thickness	Total Length	Insulator Length	Contact Level	Insulator Width
CCM04-4118	6	1.93 ± 0.05	1.93 ± 0.05	14.3 ± 0.2	11.8	0.7	7.62
CCM04-4119	6	2.20 ± 0.05	1.93 ± 0.05	14.3 ± 0.2	11.8	0.7	7.62
CCM04-5102	6	1.93 ± 0.05	1.93 ± 0.05	15.2 ± 0.2	11.8	0.7	7.62

CCM04 MK III

Dimensional Drawings



PCB Layout



Connectors range

CCM04-XXXX 2 x 3 contacts

Thickness

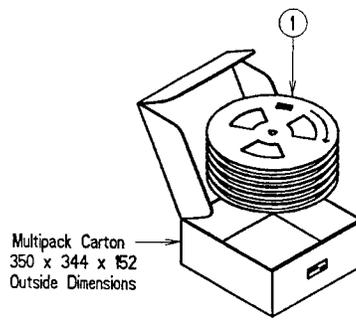
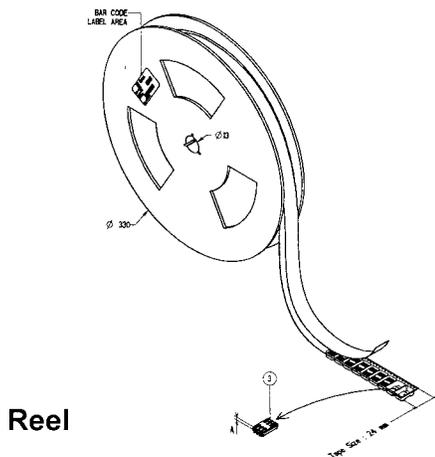
1.93 CCM04-4118 / 5102
2.20 CCM04-4119

Number of pieces per reel 2000 pcs
MOQ 10000 pcs

Minimum Order Quantity (MOQ)

Above versions are standard.
For other, please consult your sales representative.

Connectors are packed on tape on reel. There are 5 reels per box (MOQ)



NEW



The CCM05 is a connector for MultiMediaCards.

These cards have been developed as small form factor memory cards with ROM and RAM capabilities.

The CCM05 connector provides the physical interface between the card and the printed circuit board.

Features

- Two of the seven contacts are set forward to allow hot insertion (ground and supply voltage contacts)
- The fixed metal cover holds the card in place and includes two solder tabs to help fix the connector to the PCB.
- Every effort has been made to minimize the outer dimensions of the connector to save PCB space, including the terminals location on the inside of the connector.
- By using an inlay finish in the contact area, the life of the precious metal is extended by more than 10 times that of standard gold plating.
- The spooned contact is shaped so as to optimize the electrical connection with the card and prevent the contact from catching on sharp edges.
- The insulator, which is molded from a high temperature thermoplastic, is suited to infrared and convection soldering processes.
- With tape and reel packaging as standard, the connectors are designed to be automatically picked & placed.

**Coming
Soon**

- CCM05 connector with integrated card eject mechanism

Construction

Contacts	Copper alloy
Plating	Contact area : Gold alloy inlay Terminals : Tin lead (2μ min)
Moldings	High temp. thermoplastic UL 94V-0 rated

Mechanical data

Number of Contacts	7
Mechanical life	50,000 cycles min
Durability of inlay	5,000 cycles min (see note 1)
Card insertion force	3 N max
Card extraction force	0.8 N min / 3 N max
Contact force	0.25 N min / 0.50 N max

Vibration	Frequency 10 to 500 Hz. Acceleration 50m/s ² Duration 6 hours - amplitude 0.35 mm (0.014) Max electrical discontinuity 1μs
Shock	Peak value 500 m/s ² – Duration 11 ms 3 shocks in each direction of each axis Max electrical discontinuity 1 μs

Electrical data

Insulation resistance	1,000 MΩ min
Contact resistance max.	100 mΩ min
Switching current	10 μA min / 1 A max
Dielectric strength	750 Vrms min

Environmental data

Operating temperature	-40°C to +85°C
Soldering temperature	Temperature/time profile acc. to CECC00802 para. 6.1, Fig. 3 with peak temperature 250°C
Damp heat	IEC 512 test number 11c (10 days)
Salt mist	IEC 512 test number 11f (96 hours)

Ordering code

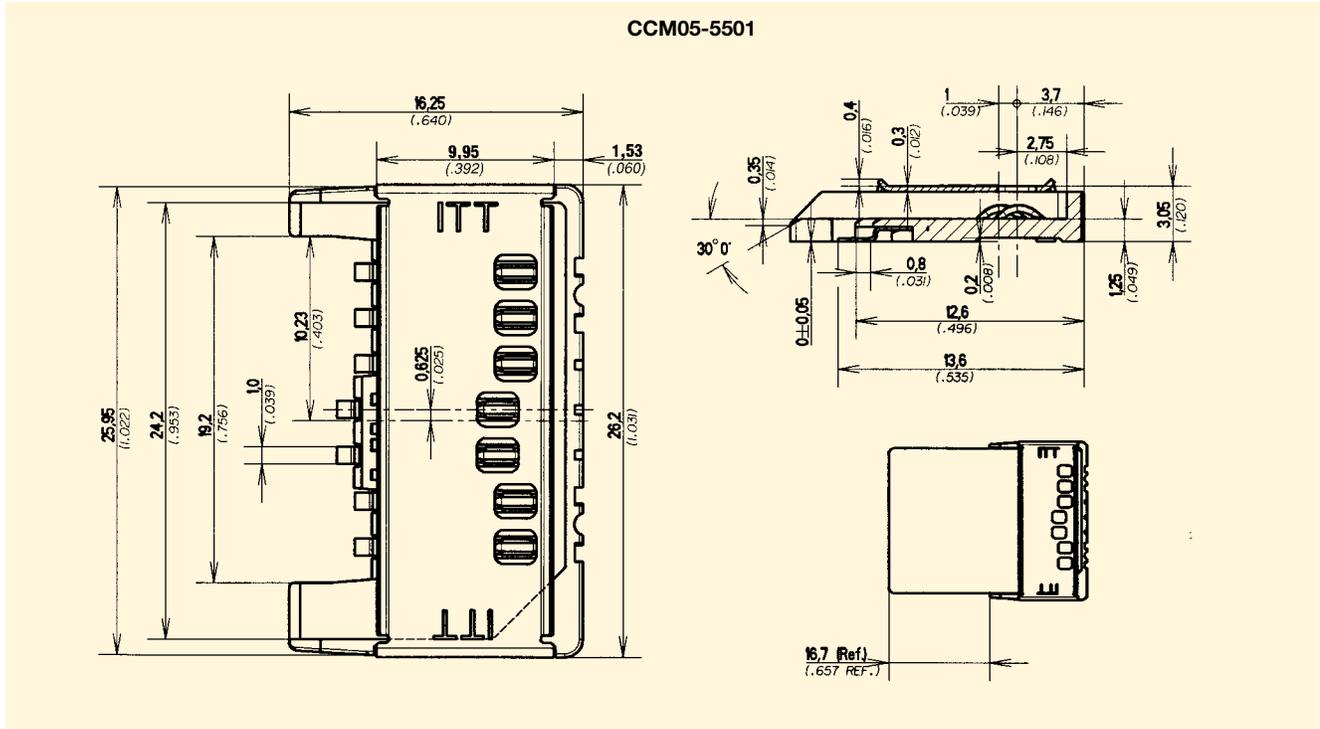
Part Number	N° of Contacts	Packaging Multiple
CCM05-5501	7	900

Packaging

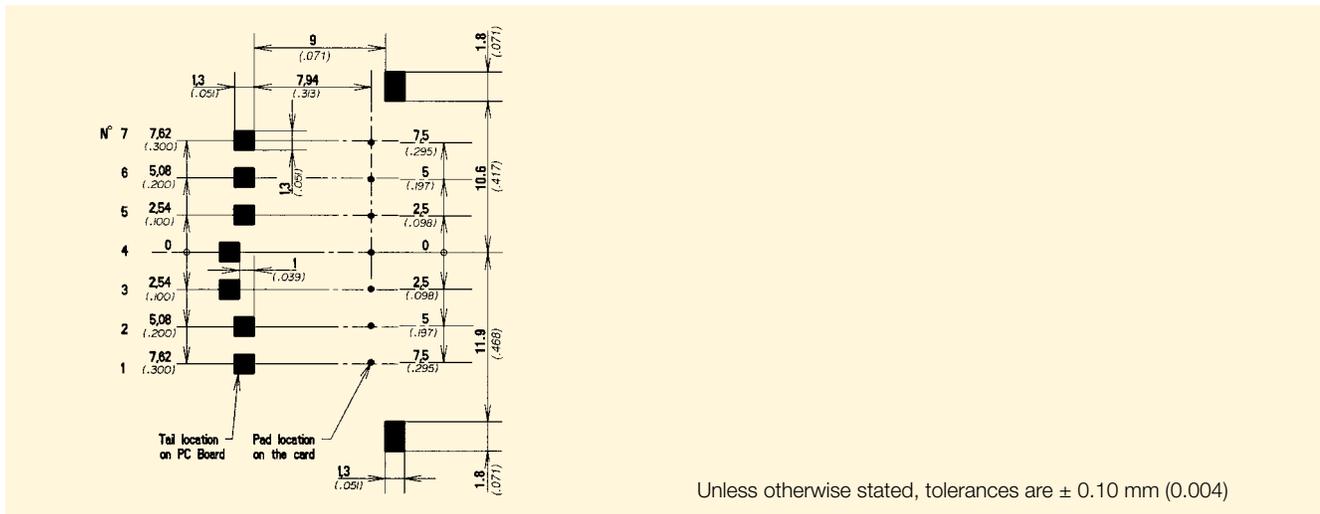
900 pieces per reel, 5 reels per box.

Note 1: Inlay (precious metal) rating is based on a very abrasive card being used and is intended to represent worst case.

Dimensional Drawings



PCB Layout



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For a complete listing of our worldwide sales and distribution partners please visit the "support" area of our website at www.ittcannon.com.

Product Safety Information

THIS NOTE MUST BE READ IN CONJUNCTION WITH THE PRODUCT DATA SHEET/CATALOG. FAILURE TO OBSERVE THE ADVICE IN THIS INFORMATION SHEET AND THE OPERATING CONDITIONS SPECIFIED IN THE PRODUCT DATA SHEET/CATALOG COULD RESULT IN HAZARDOUS SITUATIONS.

1. MATERIAL CONTENT AND PHYSICAL FORM

Electrical connectors do not usually contain hazardous materials. They contain conducting and non-conducting materials and can be divided into two groups.

a) Printed circuit types and low cost audio types which employ all plastic insulators and casings.

b) Rugged, Fire Barrier and High Reliability types with metal casings and either natural rubber, synthetic rubber, plastic or glass insulating materials. Contact materials vary with type of connector and also application and are usually manufactured from either: Copper, copper alloys, nickel, alumel, chromel or steel. In special applications, other alloys may be specified.

2. FIRE CHARACTERISTICS AND ELECTRIC SHOCK HAZARD

There is no fire hazard when the connector is correctly wired and used within the specified parameters. Incorrect wiring or assembly of the connector or careless use of metal tools or conductive fluids, or transit damage to any of the component parts may cause electric shock or burns. Live circuits must not be broken by separating mated connectors as this may cause arcing, ionization and burning. Heat dissipation is greater at maximum resistance in a circuit. Hot spots may occur when resistance is raised locally by damage, e.g. cracked or deformed contacts, broken strands of wire. Local overheating may also result from the use of the incorrect application tools or from poor quality soldering or slack screw terminals. Overheating may occur if the ratings in the product Data Sheet/Catalog are exceeded and can cause breakdown of insulation and hence electric shock. If heating is allowed to continue it intensifies by further increasing the local resistance through loss of temper of spring contacts, formation of oxide film on contacts and wires and leakage currents through carbonization of insulation and tracking paths. Fire can then result in the presence of combustible materials and this may release noxious fumes. Overheating may not be visually apparent. Burns may result from touching overheated components.

3. HANDLING

Care must be taken to avoid damage to any component parts of electrical connectors during installation and use. Although there are normally no sharp edges, care must be taken when handling certain components to avoid injury to fingers. Electrical connectors may be damaged in transit to the customers, and damage may result in creation of hazards. Products should therefore be examined prior to installation/use and rejected if found to be damaged.

4. DISPOSAL

Incineration of certain materials may release noxious or even toxic fumes.

5. APPLICATION

Connectors with exposed contacts should not be selected for use on the current supply side of an electrical circuit, because an electric shock could result from touching exposed contacts on an unmated connector. Voltages in excess of 30 V ac or 42.5 V dc are potentially hazardous and care should be taken to ensure that such voltages cannot be transmitted in any way to exposed metal parts of the connector body. The connector and wiring should be checked, before making live, to have no damage to metal parts or insulators, no solder blobs, loose strands, conducting lubricants, swarf, or any other undesired conducting particles. Circuit resistance and continuity check should be made to make certain that there are no high resistance joints or spurious conducting paths. Always use the correct application tools as specified in the Data Sheet/Catalog. Do not permit untrained personnel to wire, assemble or tamper with connectors. For operation voltage please see appropriate national regulations.

IMPORTANT GENERAL INFORMATION

(i) Air and creepage paths/Operating voltage. The admissible operating voltages depend on the individual applications and the valid national and other applicable safety regulations. For this reason the air and creepage path data are only reference values. Observe reduction of air and creepage paths due to PC board and/or harnessing.

(ii) Temperature

All information given are temperature limits. The operation temperature depends on the individual application.

(iii) Other important information

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