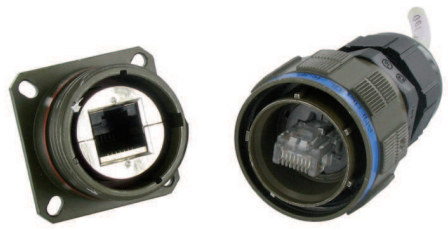
RJF TV

Ethernet connection system for harsh environment



RJFTV allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT, 100 BaseTx or 1000 BaseT networks in harsh environments.
With the patented RJStop system you can use a standard RJ45 cordset in a **metallic** plug which will protect it from shocks, dust and fluids.
No hazardous on-field cabling and grounding!

Applications

- Data acquisition and transmission in harsh environment
- Railways
- Radars
- Shelters
- Battlefield communication
- Systems
- Navy

Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

Main characteristics

- Sealed against fluids and dusts (IP68)
- Shock, vibration and traction resistant
- No cabling operation in field and no tools required
- Mechanical coding / Polarization (4 positions)
- Improved EMI protection
- **Tri Start Thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device - Shell size 19**
- **Robust metallic shells**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min
- Compatible with cable diameter from 6 mm [0.236 in] to 13 mm [0.512 in], for smaller diameters please consult us

Environmental protection

- Sealing: IP68
- Salt spray: 48h with aluminium shell - Nickel, & black zinc cobalt plating
  > 500h with aluminium shell - Olive drab cadmium plating
  500 h with marine bronze shell
- Fire retardant/Low smoke : UL94 V0 and NF F 16 101 & 16 102
- Vibrations : 10 - 500 Hz, 10 g, 3 axes: no discontinuity > 10 nano s.
- Compounded versions tested per NAS 1599 (5-3000 Hz, 20g, 12h)
- Shocks: IK06 ▸weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair)
- Humidity: 21 days, 43°C, 98% humidity
- Thermal shock: 5 cycles at -40°C / +100°C
- Temperature range: -40°C / +85°C

Part number code

RJF TV	2	2	G	03 100 BTX

Shell type
6: plug with plastic gland
6M: plug with metal gland
2: square flange receptacle
2PE: square flange receptacle, IP68 backshell, plastic gland
2PEM: square flange receptacle, IP68 backshell, metal gland
7: jam nut receptacle
7PE: jam nut receptacle, IP68 backshell, plastic gland
7PEM: jam nut receptacle, IP68 backshell, metal gland
Nota: *also available a transversally sealed receptacle (unmated)* ▶ *See page 36*

Back terminations *(receptacles only)*
1: female RJ45
1RA: right angle female RJ45
2: RJ45 Cordset

Shells material & Finish
N: aluminium shell - nickel plating *(receptacle inserts are metallized) - ROHS compliant*
G: aluminium shell - olive drab cadmium plating *(receptacle inserts are metallized)*
BZ: marine bronze shell *(receptacle inserts are metallized) - ROHS compliant*
BZC: aluminium shell - black zinc cobalt plating
ZC: aluminium shell - green zinc cobalt plating - *ROHS compliant*
ZN: aluminium shell - black zinc nickel plating - *ROHS compliant*

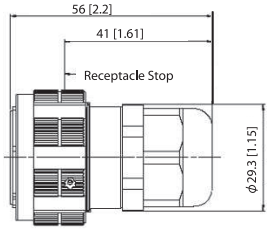
Cordset length *(type 2 back termination only) - Other lengths are available on demand*
03 100 BTX: 0.3m *[11.81 inches]*
05 100 BTX: 0.5m *[19.68 inches]*
10 100 BTX: 1m *[39.37 inches]*
00: 8 tinned holes at the rear of the PCB to solder the cable
OPEN: open cable - with no plug at the end

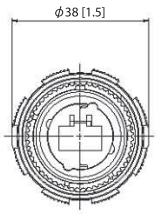
Remark: cabling configuration → 100 BTX = 568B (Ethernet specification)

Examples:
- Olive crab cadmium plug with plastic gland: RJF TV 6G
- Olive drab cadmium jam nut receptacle, female RJ45 back termination: RJF TV 71G
- Nickel jam nut receptacle, 1,5 m 100 BTX cordset back termination: RJF TV 72N 15 100BTX
- Olive drab cadmium in line square flange recept., 0,3 m 100 BTX cordset back termination: RJF TV 2PE 2 G 03 100BTX
- Nickel jam nut receptacle solder termination 8 tinned holes: RJF TV 22 N 00

Plug

■ Shell type 6 with plastic or metal gland

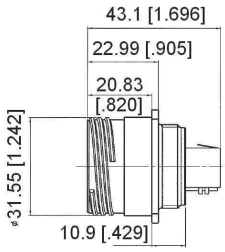




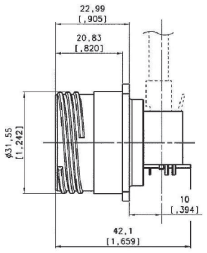
RJF TV 6 X

Receptacles

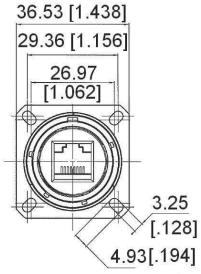
■ Square flange receptacle - 4 mounting holes: shell type 2



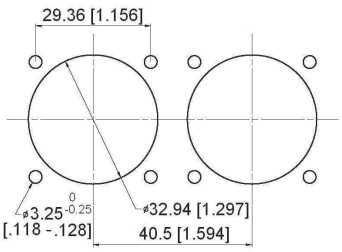
RJFTV 21 X (straight female RJ45)



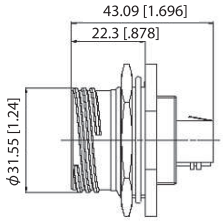
RJFTV 21 RA X (right angle female RJ45)



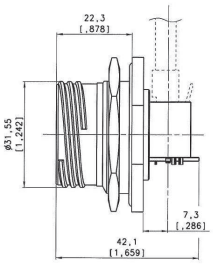
Panel Drilling



■ Jam nut receptacle - Hexagonal nut mounting: shell type 7

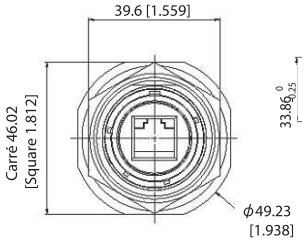


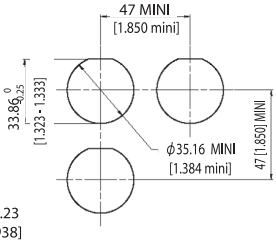
RJFTV 71 X (straight female RJ45)



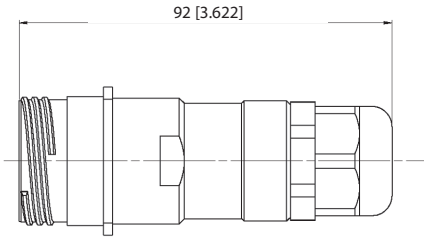
RJFTV 71 RA X (right angle female RJ45)

Panel drilling



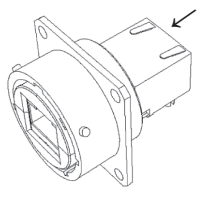


■ Receptacles with IP68 backshell: Shell type 2PE and 7PE with plastic or metal gland

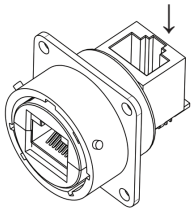


RJF TV 2PE/2PEM/7PE/7PEM

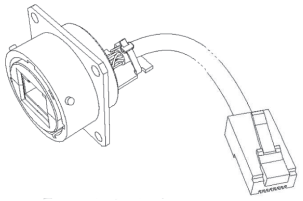
Back terminations



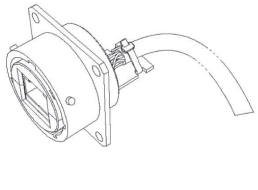
Type **1**
Female RJ45



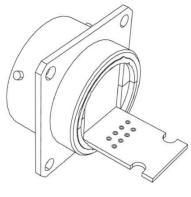
Type **1RA**
Right angle female RJ45



Type **2**
RJ45 cordset



Type **OPEN**
No plug at the end



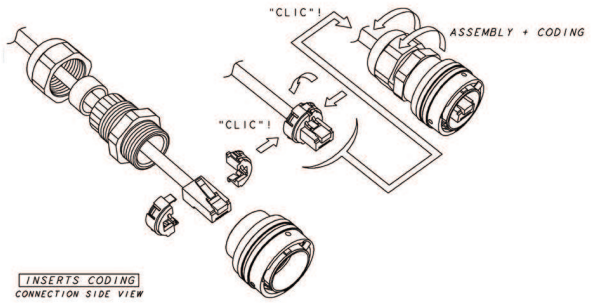
Type **2 - 00**
Solder - 8 tinned holes

Amphenol

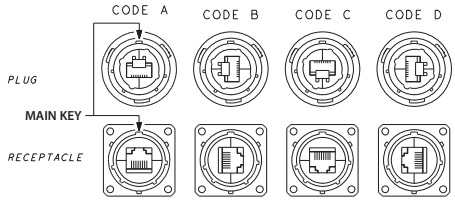
Assembly instructions

Insert codings

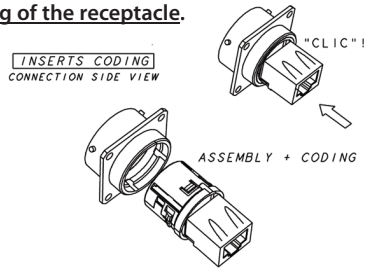
Assembling of the plug.



4 codings possibilities
(defined by the customer during the assembling).



Assembling of the receptacle.



IMPORTANT NOTE: to remove the insert, use the

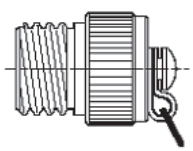
- **Insert removal tool for receptacle and plug**

P/N: **RJF ODE**

Accessories

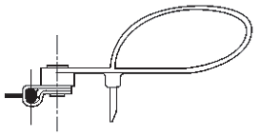
- **Metallic Caps**

RJFTVC	2	G
Connector type **6**: plug **2**: square flange receptacle **7**: jam nut receptacle		
Shell material & finish **N**: aluminium shell - nickel plating - *ROHS compliant* **G**: aluminium shell - olive drab cadmium plating **BZ**: marine bronze shell - *ROHS compliant* **ZC**: aluminium shell - green zinc cobalt plating - *ROHS compliant* **ZN**: aluminium shell - black zinc nickel plating - *ROHS compliant*		

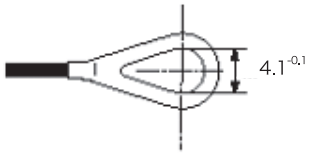


Plug Cap

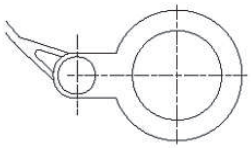
Receptacle Cap



Plug Cap end

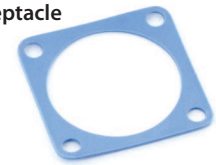


Square flange receptacle cap end



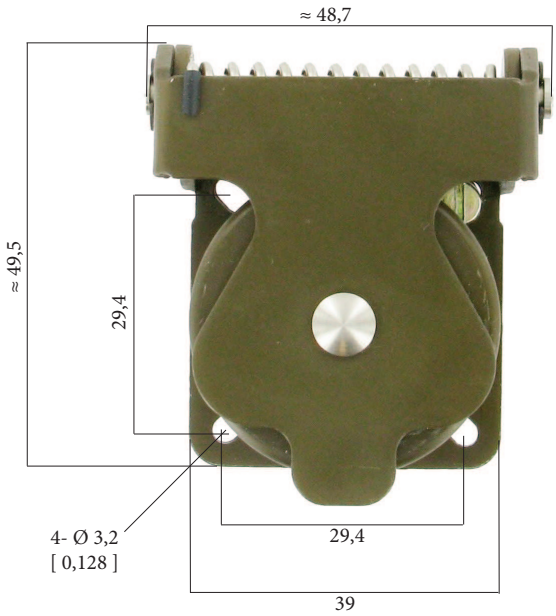
Jam Nut receptacle cap end

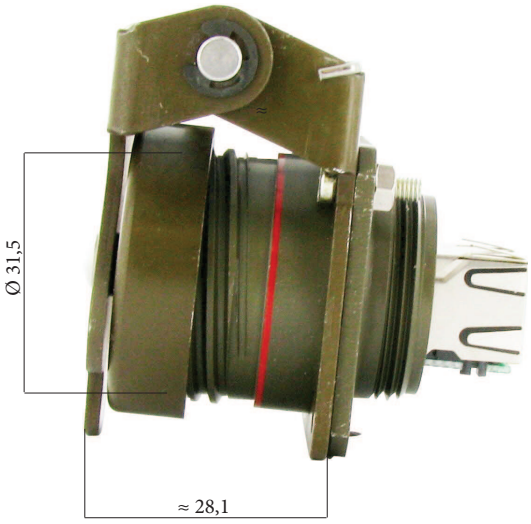
- **Panel gasket for square flange receptacle**
  Thickness: 0,8 mm [.031]):
  P/n: JE19



RJFTV
Self Closing Cap (SCC series)

This Self Closing cap automatically protects the RJF TV square flange receptacle (MIL-DTL-38999 type), protecting your system from dust and water projection. A spring automatically closes the upper part of the cap when the RJF TV plug is removed from the receptacle.





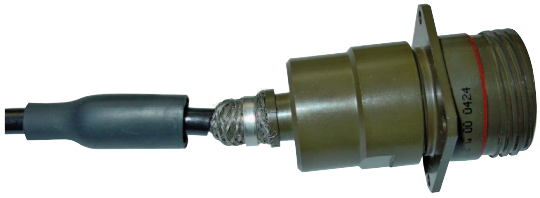
IMPORTANT NOTE
Metal Self Closing cap are sold separately (without receptacle).

	Plating	Part number
Part number	Black coating - *ROHS compliant*	**RJF TV SCC B**
	Nickel - *ROHS compliant*	**RJF TV SCC N**
	Olive drab cadmium	**RJFTV SCC G**

Remark: compatible with RJFTV square flange receptacle type RJFTV**2**xxx only *(see page 26)*.

RJF TV

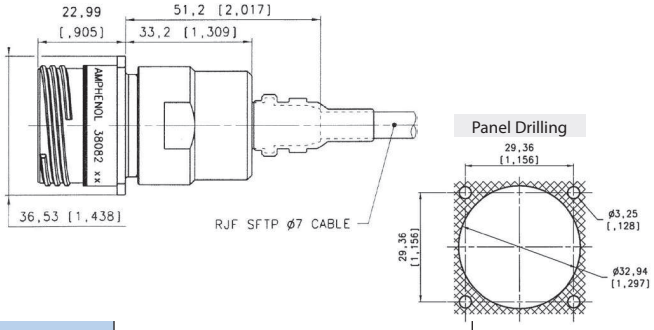
Receptacles & plugs with 360° EMI backshells



RJFTV series receptacles and plugs with EMI backshells provide a solution with 360° shielding: same protection than the one proposed by standard MIL-DTL-38999 series III connectors. With those solutions we recommend using our reinforced and double shielded Cat5E, Cat6, or Ca6A cable.

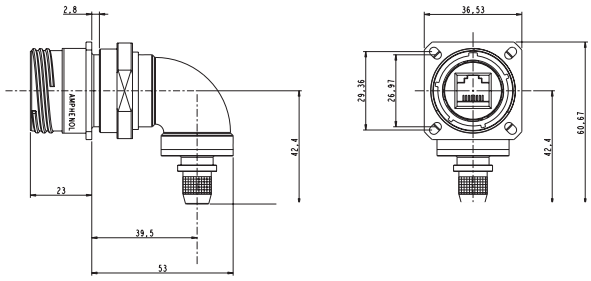
►*see pages 41-42-43*

Square flange receptacle - *Straight backshell*



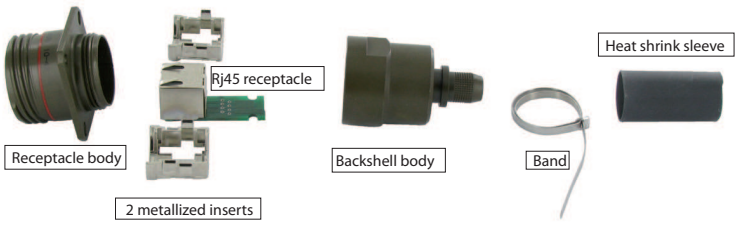
Part number	Plating	P/N
	Nickel - *ROHS compliant*	**Kit38082NI**
	Olive drab cadmium	**Kit38082**
	Green zinc cobalt - *ROHS compliant*	**Kit38082ZC**
	Black zinc cobalt - *ROHS compliant*	**Kit38082ZN**

Square flange receptacle - *Right angle backshell*



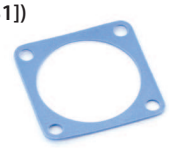
Part number	Plating	P/N
	Nickel - *ROHS compliant*	**Kit40791NI**
	Olive drab cadmium	**Kit40791**
	Green zinc cobalt - *ROHS compliant*	**Kit40791ZC**
	Black zinc cobalt - *ROHS compliant*	**Kit40791ZN**

Kit38082 and Kit40791 include:

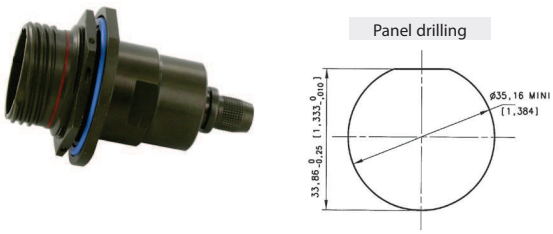


■ **Panel gasket for square flange receptacle (thickness: 0,8 mm [.031])**

P/n: JE19

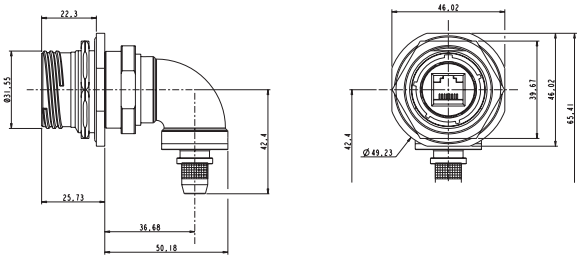


Jam nut receptacle - *Straight backshell*



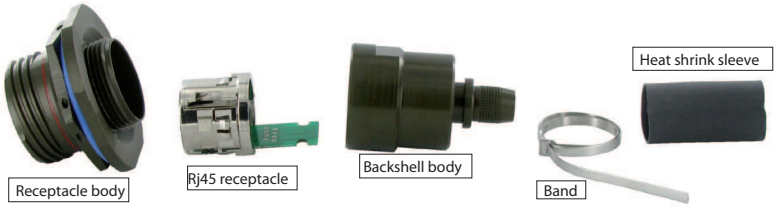
Part number	Plating	P/N
	Nickel - *ROHS compliant*	**Kit38204NI**
	Olive drab cadmium	**Kit38204**
	Green zinc cobalt - *ROHS compliant*	**Kit38204ZC**
	Black zinc cobalt - *ROHS compliant*	**Kit38204ZN**

Jam nut receptacle - *Right angle backshell*



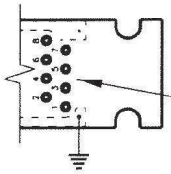
Part number	Plating	P/N
	Nickel - *ROHS compliant*	**Kit40771NI**
	Olive drab cadmium	**Kit40771**
	Green zinc cobalt - *ROHS compliant*	**Kit40771ZC**
	Black zinc cobalt - *ROHS compliant*	**Kit40771ZN**

Kit38204 and Kit40771 include:



IMPORTANT NOTE

With these receptacles, you will have to solder your own cable on the PCB.
So the wire positions have to be defined according to your network.

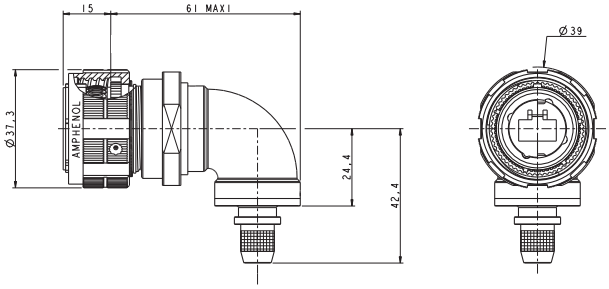


WIRE POSITION
TO BE DEFINED
BY CUSTOMER
ACCORDING TO NETWORK

Plug - *Straight backshell*

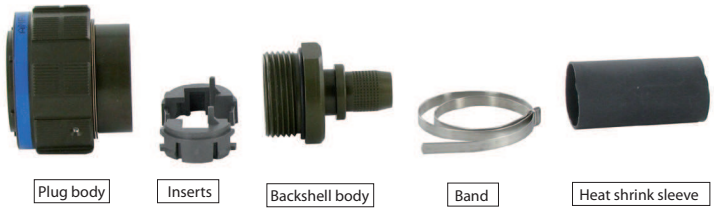
Part number	Plating	P/N
	Nickel - *ROHS compliant*	**Kit38081NI**
	Olive drab cadmium	**Kit38081**
	Green zinc cobalt - *ROHS compliant*	**Kit38081ZC**
	Black zinc cobalt - *ROHS compliant*	**Kit38081ZN**

Plug - *Right angle backshell*



Part number	Plating	P/N
	Nickel - *ROHS compliant*	**Kit40792NI**
	Olive drab cadmium	**Kit40792**
	Green zinc cobalt - *ROHS compliant*	**Kit40792ZC**
	Black zinc cobalt - *ROHS compliant*	**Kit40792ZN**

Kit38081 and Kit40792 include:

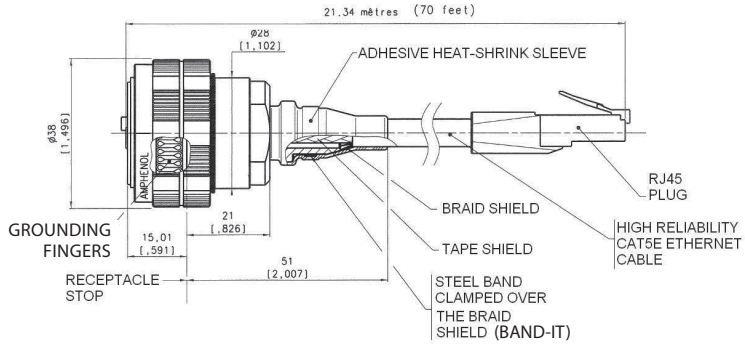


IMPORTANT NOTE

With these plugs, the standard RJ45 plug is not provided.
Customer will have to crimp a standard RJ45 on the cable by himself.

Remark: we advise using our double shielded, reinforced Cat5E, Cat6, or Cat6A cables (see pages 41-42-43) with these RJFTV series EMI connectors.
If customer wants to use his own cable, please check with us regarding compatibility with our backshells: **contact@rjfield.com**.
We also provide assembled cordsets ***(see examples below)***.
For this type of solution please provide the configuration needed: length, description of second end…

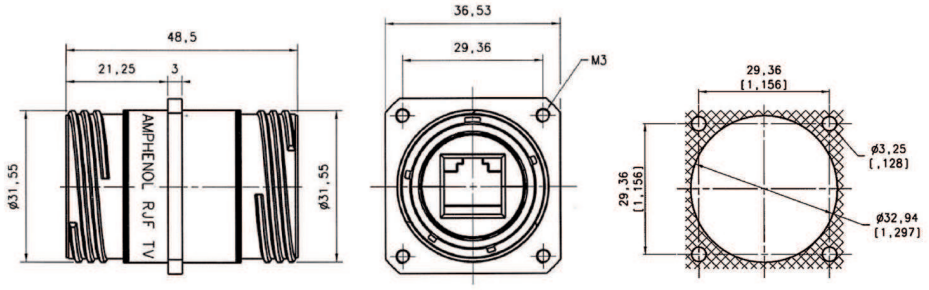
Example of assembled cordset:



RJF TV
Through bulkhead receptacles

Our RJFTV through bulkhead receptacles can be connected on each side with rugged RJFTV plugs.
This system allows mechanical protection and a sealing (IP68 when mated) inside and outside the equipement, and keeps the flexibility offered by panel mount and plug connectors.
They can be connected with RJFTV series plugs.

Square flange receptacle

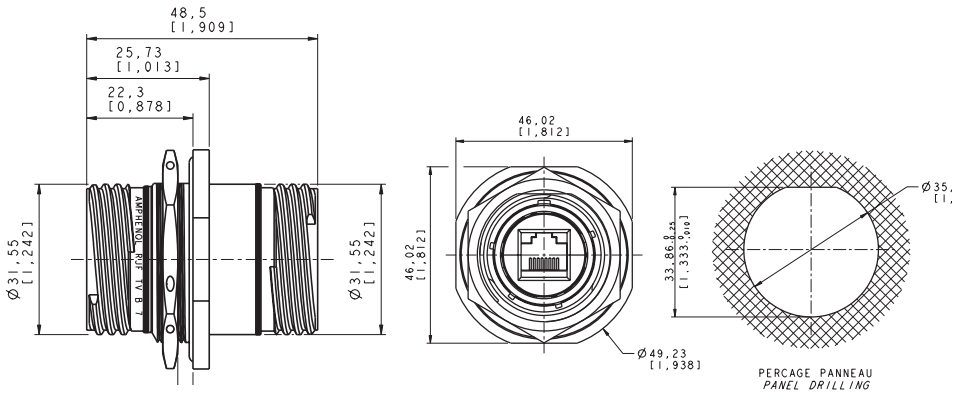


	Plating	Metallized insert	For coding A
Part number	Nickel - *ROHS compliant*	No	**RJF TV B 2 N ISO BRUT ***
	Nickel - *ROHS compliant*	Yes	**RJF TV B 2 N ISO NI ***
	Olive drab cadmium	No	**RJF TV B 2 G ISO BRUT ***
	Olive drab cadmium	Yes	**RJF TV B 2 G ISO NI ***

*** ISO BRUT = non conductive insert**
ISO NI = conductive insert

IMPORTANT NOTE
Possibility of other codings - Please consult us

Jam nut receptacle



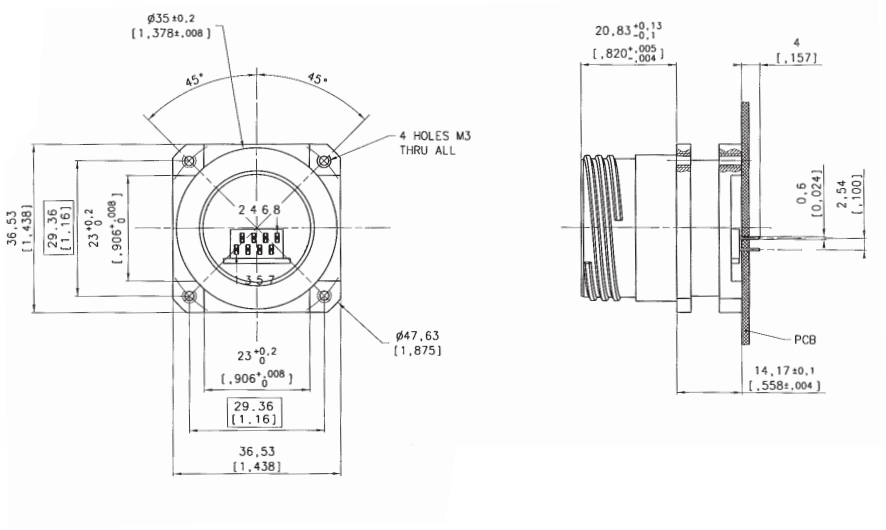
	Plating	Metallized insert	Part number
Part number	Nickel - *ROHS compliant*	No	**RJF TV B 7 N ISO BRUT ***
	Nickel - *ROHS compliant*	Yes	**RJF TV B 7 N ISO NI ***
	Olive drab cadmium	No	**RJF TV B 7 G ISO BRUT ***
	Olive drab cadmium	Yes	**RJF TV B 7 G ISO NI ***

*** ISO BRUT = non conductive insert**
ISO NI = conductive insert

RJF TV
Stand off receptacles

These receptacles can be sold directly to your PCB.
A compound insures a transversal sealing and good performance in high-vibration environments.
The shell of those receptacles are in the "Stand Off" style.
They can be connected with RJFTV series plugs.

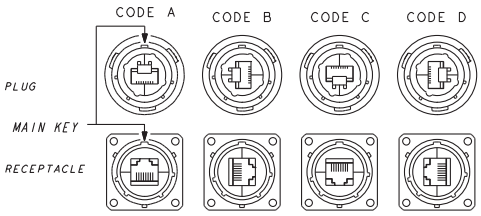
Square flange receptacle



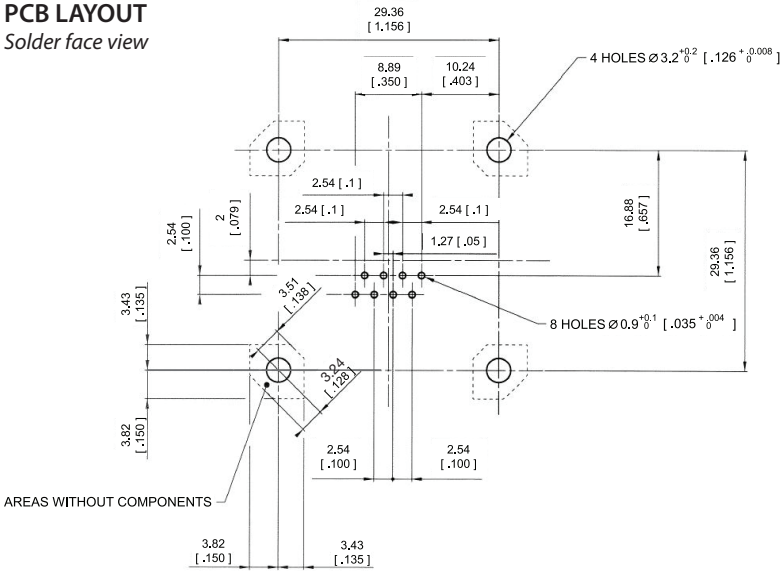
Part number *	Plating available	Part number
	Nickel - *ROHS compliant*	RJF TV 2S X 5N F459
	Olive drab cadmium	RJF TV 2S X 5G F459

* *new p/n - before it was RJFTV25GF459 or RJFTV25NF459*

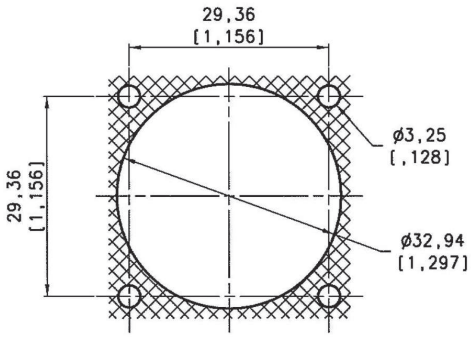
X to be replaced by the letter of the coding position you need (A, B, C, or D)



PCB LAYOUT
Solder face view

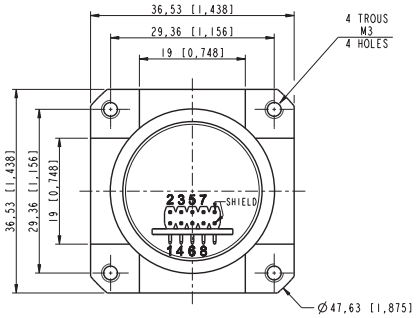


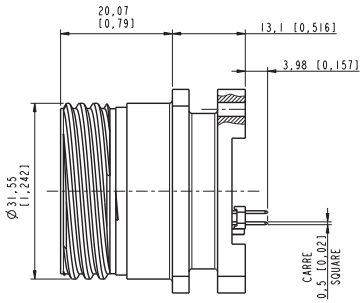
Panel drilling



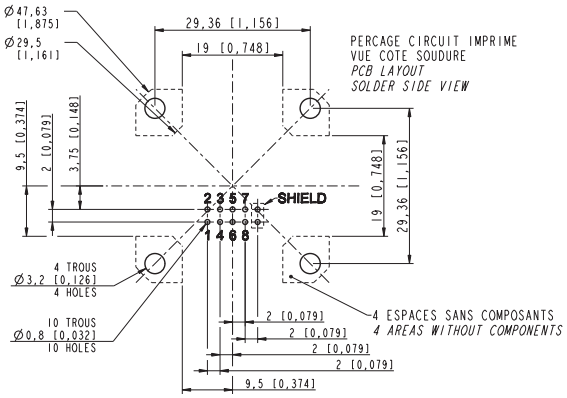
Amphenol

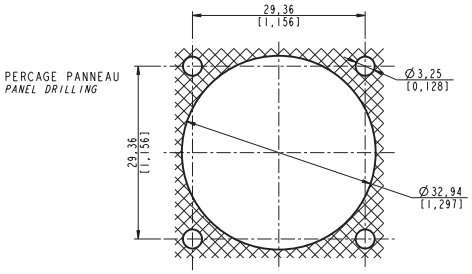
Now available with same distance between flange and PCB than the 38999 stand off one.
So you can use a 38999 stand off and a RJ45 stand off in the same implementation.



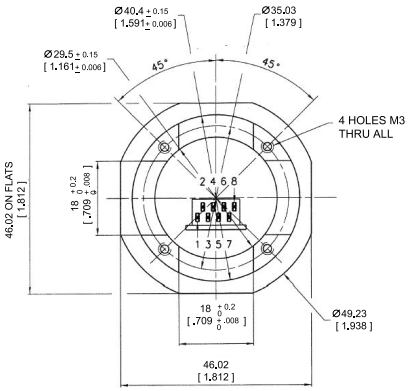


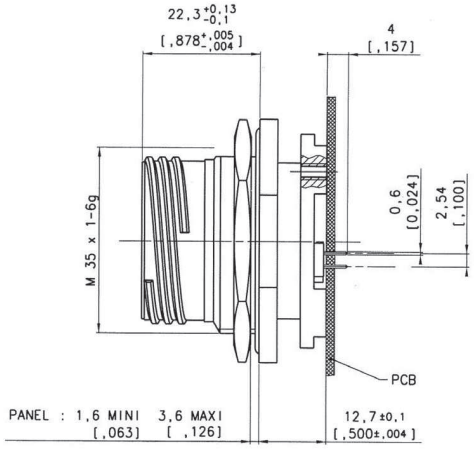
Part number: 36542
Plating: olive drab cadmium





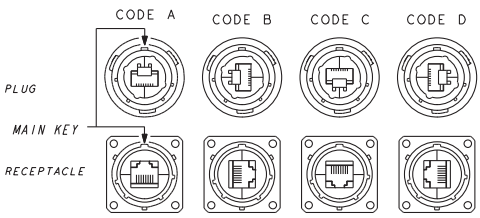
Jam nut receptacle





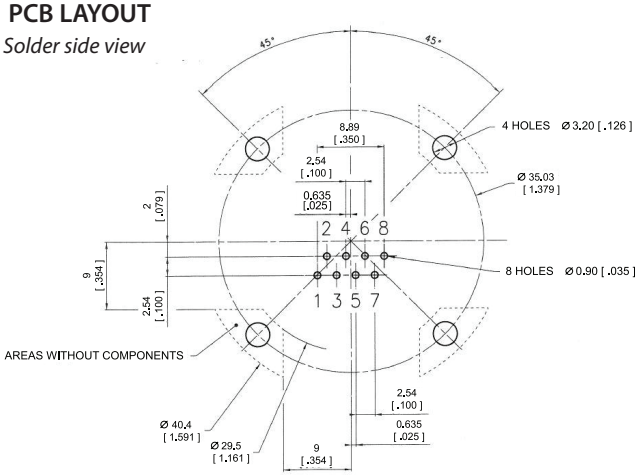
Part number	Plating	Part number
	Nickel - *ROHS compliant*	RJF TV 7S X 5N F459
	Olive drab cadmium	RJF TV 7S X 5G F459

X to be replaced by the letter of the coding position you need (A, B, C, or D)

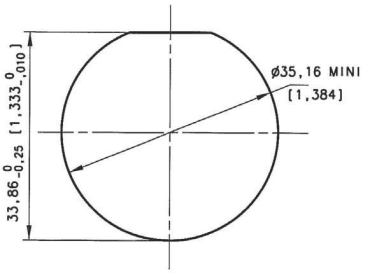


PCB LAYOUT

Solder side view

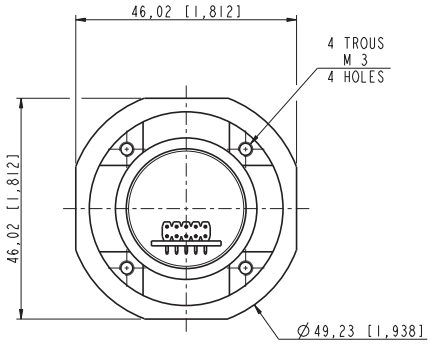


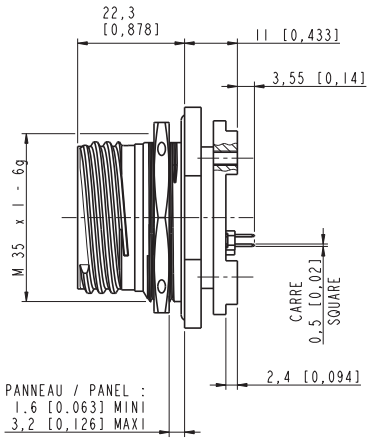
Panel Drilling



NEW

Now available with same distance between flange and PCB than the 38999 stand off one.
So you can use a 38999 stand off and a RJ45 stand off in the same implementation.

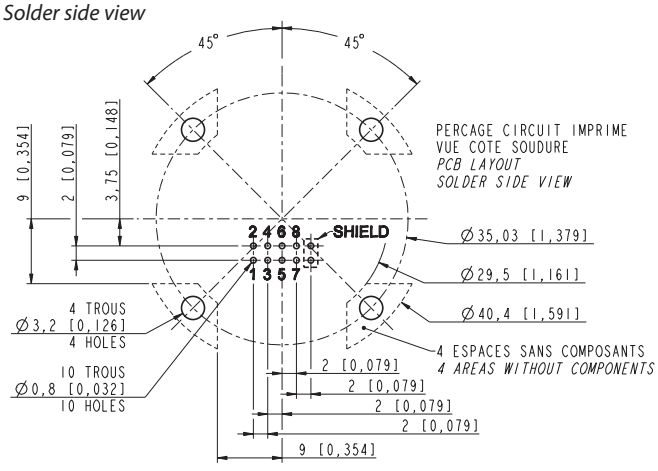


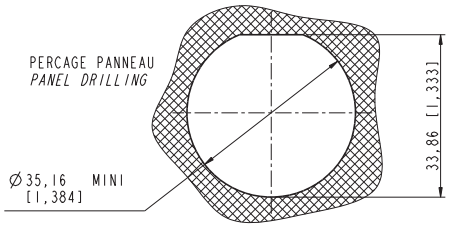


Part number: 36540
Jam nut receptacle, olive drab cadmium plating.

PCB LAYOUT

Solder side view





Amphenol

RJF TV

Environmentaly sealed receptacles, transversally sealed receptacles

In some applications, a transversal sealing for the receptacle is a « must ». This will prevent fluids and dust from going through the receptacle when plug or cap are not mated to the receptacle.
The sealed solution (version "S") has a compound at the rear of the receptacle as shown on the examples below. This feature is available both in RJF and RJF TV shells (please consult the relevant data sheet for product details and accessories).
In addition, the Sealed RJF TV has been successfully tested in very high vibration corresponding to airplane applications.

Applications

- Outdoor equipment
- Airplanes equipment
- Tactical radios
- Shelters
- Rugged computers
- Data acquisition and transmission in harsh environments

Data transmission

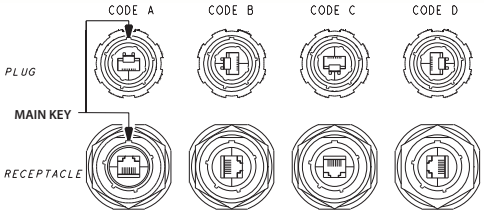
10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

Main characteristics

- Same as the RJF and RJF TV series.
- A complete IP68 sealing of the receptacle (even with no plug or no protective cap mated) is added.
- Outside dimensions are the same as the standard RJF and RJF TV series.
- Vibrations: the compounded versions of the RJF TV have been tested in vibration following the NAS 1599 Aeronautic specification (Ambient temperature):
  5 - 3000 Hz, 20g, 2,5 mm [.1 inch] double amplitude, 3 axes, 12 hours
  Note: this specification exceeds MIL-C-26500 requirements.

IMPORTANT NOTE

Due to the compound, the coding of the connector must be done in the factory : use the codes A, B, C or D in the part number: **see below**.



Example :
RJFTV 2S **A**2 G 15 100BTX

Part number code

Series **RJFTV:** MIL-DTL-38999 Series III	**RJF TV**	**7S**	**A**	**2**	**G**	**03 100BTX**
Shell type **2S:** sealed square flange receptacle **7S:** sealed jam nut receptacle						
Coding **A,B,C,D**						
Back terminations *(for receptacles only)* **1:** female RJ45 **1RA:** right angle female RJ45 **2:** RJ45 Cordset						
Shell material & finish **N:** aluminium shell - nickel plating - *ROHS compliant* **G:** aluminium shell - olive drab cadmium plating **BZ:** marine bronze shell - *ROHS compliant* ***Nota**: receptacle inserts are metallized*						
Cordset length *(For Receptacles with "2" Back Termination only) - Other lengths are available on demand* **03 100 BTX:** 0.3m [11.81 inches] **05 100 BTX:** 0.5m [19.68 inches] **10 100 BTX:** 1m [39.37 inches] **15 100 BTX:** 1.5m [59.05 inches] **OPEN**: open cable - with no plug at the end						

Remark: cabling configuration: 100 BTX = 568B (Ethernet specification)

Examples:
- *series III, sealed jam nut receptacle, A coding, with female RJ45 back termination, olive drab cadmium plating:* ***RJF TV 7SA 1 G***
- *series III, sealed square flange receptacle, A coding, with female RJ45 back termination, nickel plating:* ***RJF TV 2SA 1 N***
- *series III, sealed jam nut receptacle, A coding, 1.5m [59.05"] 100 BTX cordset, olive drab cadmium plating:* ***RJF TV 7SA 2 G15 100BTX***

RJF TV
Hermetic receptacles

ROHS COMPLIANT N, B & BZ

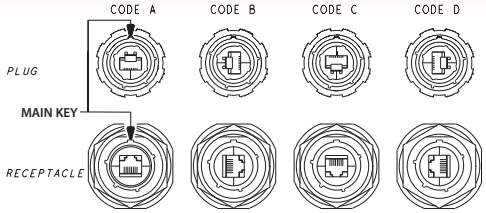
In some applications, a transversal hermiticity for the receptacle is a « must ».
This will prevent gas from going through the receptacle when plug or cap are not mated to the receptacle.
The hermetic solution (version "H") has a compound at the rear of the receptacle as shown on the examples below.
This feature is available both in RJF and RJF TV shells (please consult the relevant data sheet for product details and accessories).
Helium leakage is less than 1.10^{-6} cm^3 per second [0.1 micron cubic ft per hour] at one bar [15 psi] pressure differential.

Applications
- Outdoor equipment
- Airplanes equipment
- Tactical radios
- Shelters
- Rugged computers
- Data acquisition and transmission in harsh environments

Data Transmission
10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

Main characteristics
- Same as the RJF and RJF TV series.
- A complete IP68 sealing of the receptacle (even with no plug or no protective cap mated) is added.
- Outside dimensions are the same as the standard RJF and RJF TV series.
- Vibrations: the compounded versions of the RJF TV have been tested in vibration following the NAS 1599 Aeronautic specification (Ambient temperature):
  5 - 3000 Hz, 20g, 2,5 mm [.1 inch] double amplitude, 3 axes, 12 hours
  Note: this specification exceeds MIL-C-26500 requirements.

IMPORTANT NOTE
Due to the compound, the coding of the connector must be done in the factory: use the codes A, B, C or D in the part number: **see below**.



Example :
RJFTV 2H **A**2 N 15 100BTX

Part number code

	RJF TV	7H	A	2	G	03 100BTX
Series **RJFTV:** MIL-DTL-38999 series III						
Shell type **2H:** transversally sealed and hermetic square flange receptacle **7H:** transversally sealed and hermetic jam nut receptacle						
Coding **A,B,C,D**						
Back terminations *(for receptacles only)* **1:** female RJ45 **1RA:** right angle female RJ45 **2:** RJ45 Cordset						
Shell material & finish **N:** aluminium shell - nickel plating - *ROHS compliant* **G:** aluminium shell - olive drab cadmium plating **BZ:** marine bronze shell - *ROHS compliant* ***Nota**: receptacle inserts are metallized*						
Cordset length *(for receptacles with "2" back termination only) - Other lengths are available on demand* **03 100 BTX:** 0.3m [11.81 inches] **05 100 BTX:** 0.5m [19.68 inches] **10 100 BTX:** 1m [39.37 inches] **15 100 BTX:** 1.5m [59.05 inches] **OPEN**: open cable - with no plug at the end						

Remark: cabling configuration: 100 BTX = 568B (Ethernet specification)

Examples:
- *Series III, sealed jam nut receptacle, A coding, with female RJ45 Back termination, olive drab cadmium plating:* ***RJF TV 7HA 1 G***
- *Series III, sealed square flange receptacle, A coding, with female RJ45 back termination, nickel plating:* ***RJF TV 2HA 1 N***
- *Series III, sealed jam nut receptacle, A coding, 1.5m [59.05"] 100 BTX cordset, olive drab cadmium plating :* ***RJF TV 7HA 2 G15 100BTX***

Amphenol

RJF TV

For big insulation wire up to 1.6 mm

Special RJF TV plug dedicated to Ethernet cable with insulation wire from 1,1 to 1,6 mm.

Remark:
- compatible with any RJF TV receptacle
- for cables which are not compatible with standard RJ45 plug

Applications

- Robotics
- Industrial process control
- CNC machines
- Special machines
- Oil & Gas
- Motion control
- Data acquisition and transmission in harsh environment
- Tele-maintenance

Data transmission

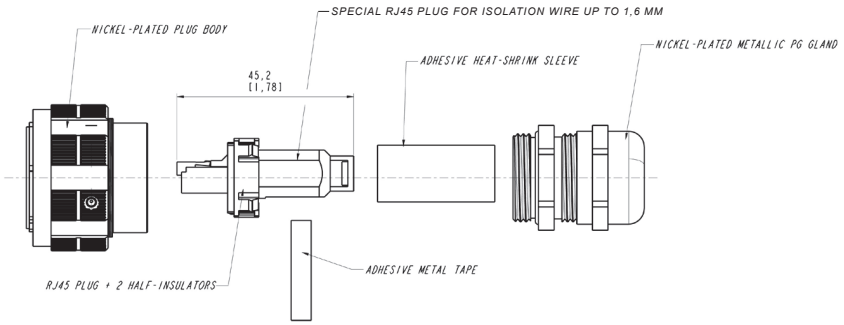
10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

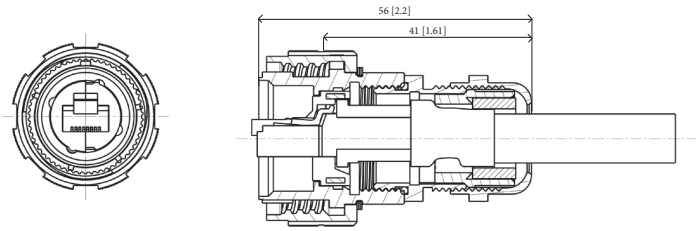
Main characteristics

- Sealed against fluids and dusts (IP68)
- Shock, vibration and traction resistant
- No cabling operation in field and no tools required
- Mechanical coding / Polarization (4 positions)
- Improved EMI protection
- **Tri Start Thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device - Shell size 19**
- **Robust metallic shells**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min
- Compatible with cable diameter from 6 mm [0.236 in] to 13 mm [0.512 in], for smaller diameters please consult us

Environmental protection

- Sealing: IP68
- Salt spray: 48 h with nickel plating
  > 96 h with black coating
  > 500 h with olive drab cadmium
- Fire retardant/Low smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 10 nano s.
- Shocks: IK06 ▸weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair)
- Humidity: 21 days, 43°C, 98% humidity
- Thermal shock: 5 cycles at - 40°C / +100°C
- Temperature range: - 40°C / +85°C





Part number	Plating	P/N
	Nickel - *ROHS compliant*	**35660**
	Olive drab cadmium	**35660G**