NKA series module ruggedized mixed connector

Contents

NKA series module ruggedized mixed connector

Brief introduction

- Standard electric interface, VITA standard module
- Popular type, open type, customized
- Module combination structure, integrated transmission of various signals, including differential, RF, optical, electrical, low frequency, etc.
- Crimping structure
- Module interval: 21.59 & 25.4
- RF contacts and optical contacts can be replaced at site, and can be used in same cavity
- Enterprise standard: Q/21EJ1488-2011

Main technical characteristics

——Digital signal transmission rate: 6.25Gbps

——Differential impedance: 100Ω

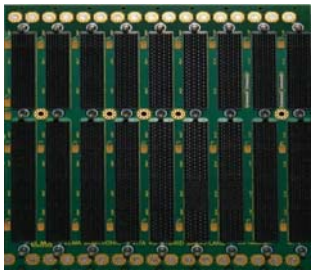
——Near end crosstalk: ＜5%

——Coaxial impedance: 50Ω

——RF frequency range: DC~40GHz

——VSWR ≤1.15+0.01F（F: GHz）

——Disconnect degree: better than -90dB（18GHz）



——On-line test: optical error rate: 1.25Gbps, non＞10^{-12} error

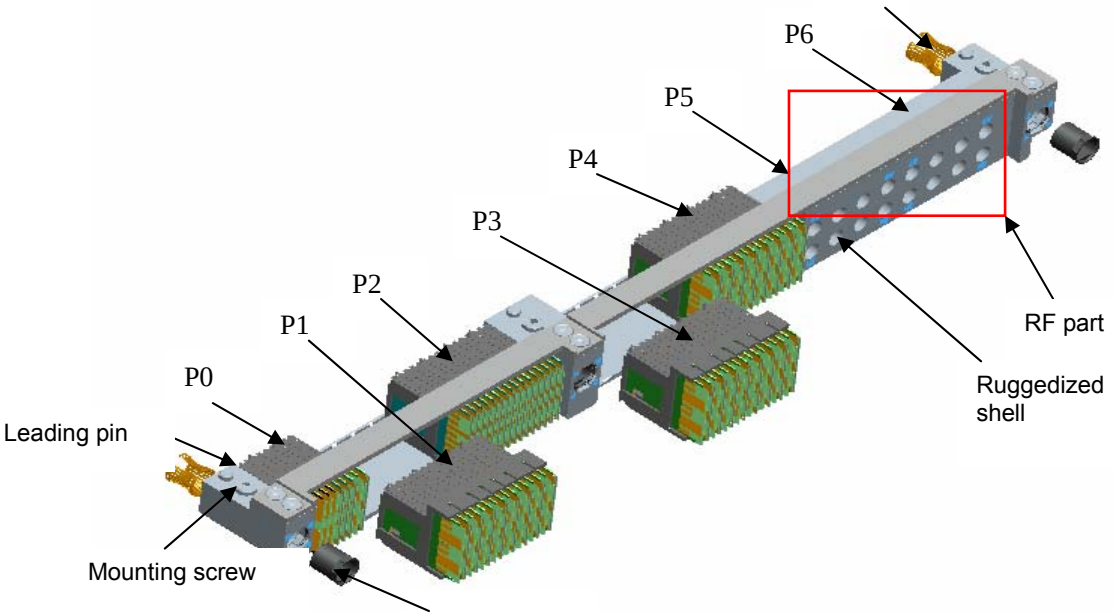
——Optical fiber insertion loss≤1.5dB

——Vibration: random vibration, power chart density: 0.2g^2/Hz

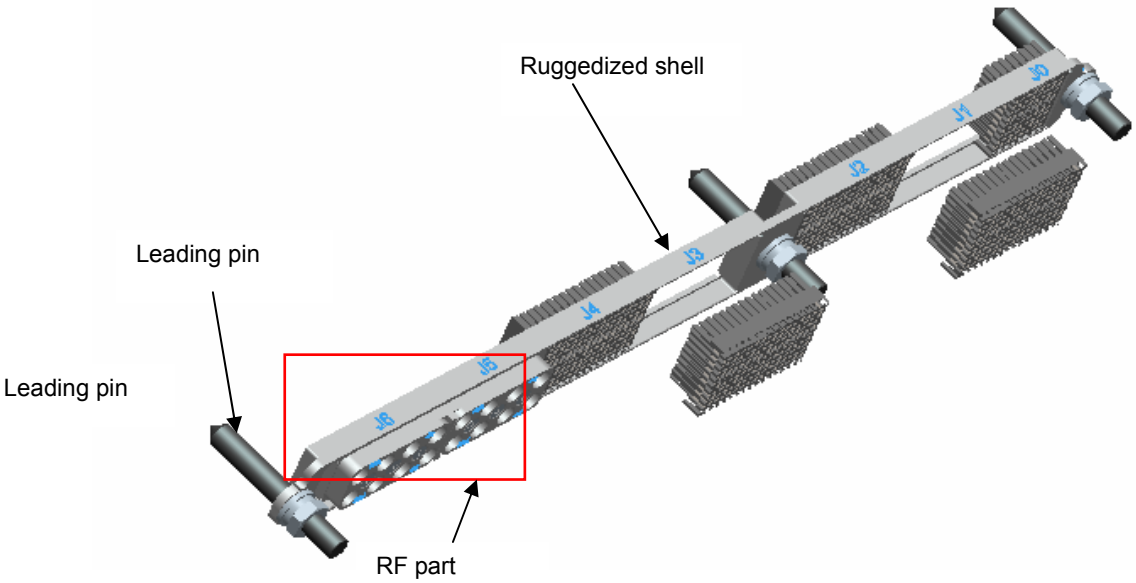
——Shock: half sinusoid, 80g, lasting 11ms

——Salt spray: 96h

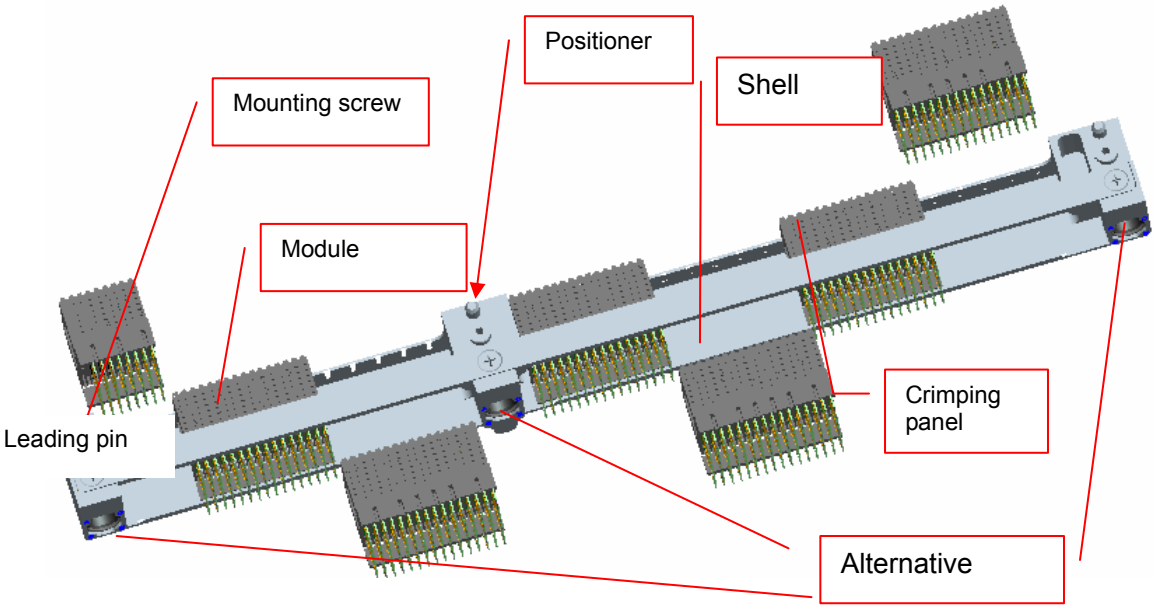
——Operating temperature: -55℃~+125℃（optical & electrical mixed type: -55℃~+80℃）



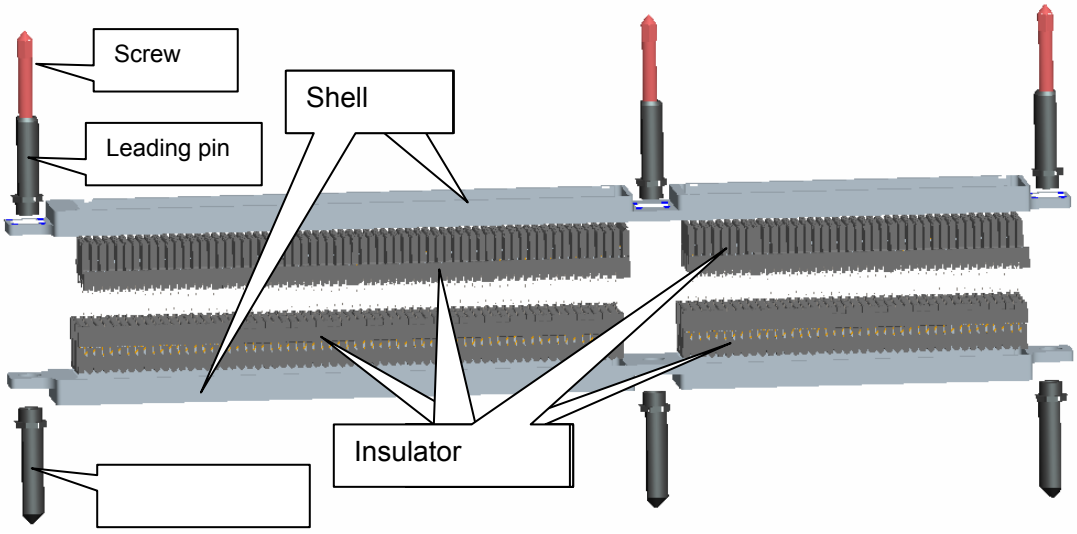
Picture 1: NKA series module mixed connector (6U plug)



Picture 2: NKA series module mixed connector (6U receptacle) structure



Picture 3: NKA series module electrical connector (6U plug) structure



Picture 4: NKA series module electrical connector (6U dual-side receptacle) structure

Technical characteristics index

	Electrical performance
Item	**RF contact**
Frequency range	DC~40 GHz
Characteristics impedance	50Ω
RF insertion loss	≤0.06$\sqrt{f}$ dB (*f*：GHz)
VSWR	≤1.15+0.01*f* (*f*：GHz)
Stability	DC~18GHz: ≤±3°；DC~40GHz: ≤±6°
Disconnect degree	-90dB (500MHz~18GHz), -70dB (1GH~40GHz)
RF leakage	Better than -80dB (2~3GHz)
Contact resistance	Central contact: 11mΩ Outer contact: 5 mΩ
Item	**Differential contact**
Transmission rate	6.25Gbps
Characteristics impedance	100Ω
Low level contact resistance	≤80 mΩ
Rating current	1A
Withstanding voltage	500V
Insulation resistance (normal)	≥1000 MΩ
Item	**Optical contact**
Insertion loss	≤1.5dB
Error rate	Non ＞10^{-12} error (1.25Gbps, code 2^{23}-1)
Item	**Power contact**
Rating voltage	48V
Contact resistance	10 mΩ
Rating current	16A
Withstanding voltage	500V
Insulation resistance (normal)	≥1000 MΩ
	Mechanical performance
Item	**Parameter**
Endurance	500 cycles
Vibration	Frequency: 50~2000Hz, power chart density 0.2g^2/Hz
Shock	80g, half sinusoid, 80g, lasting 11ms
Electrical continuity	Forbid 1μs electrical discontinuity
	Environmental performance
Item	**Parameter**
Operating temperature	-55℃~+125℃ (optical & electrical mixed type: -55℃~+80℃)
Salt spray	96h

Ordering information

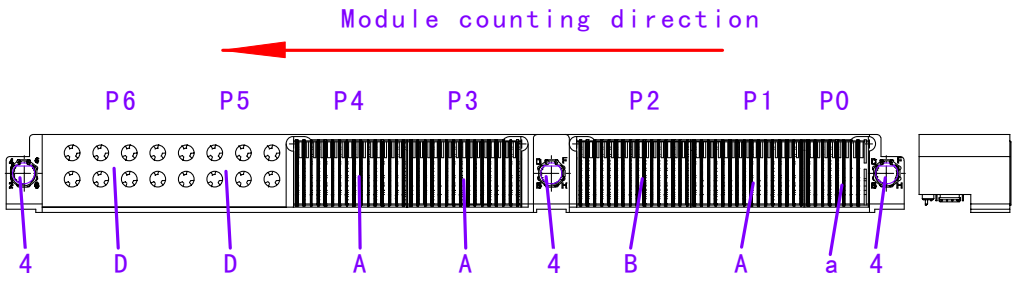
Basic series	NKA-	61	T	8	aAB	8	AADD	8	-	A	-S
Module number	First number means overall module, second number means half module, the example is 6 overall modules and 1 half module.										
Connector type	T：plug Z：receptacle RT: panel plug RZ: panel receptacle LT: fluid plug LZ: fluid receptacle										
Leading key	Leading key is marked with number 1~9, see page 38 for the details. Omit means non leading key.										
Type code②	It is defined by the combination type of unit modules, including overall module and half module. Overall module is marked by capitalized letter; half module is marked by lower case letter. See page 7 for details.										
Leading key	Leading key is marked with number 1~9, see page 38 for the details.										
Type code	It is defined by the combination type of unit modules, including overall module and half module. Overall module is marked by capitalized letter; half module is marked by lower case letter. See page 7 for details.										
Leading key	Leading key is marked with number 0~8, see page 38 for the details. Omit means non leading key.										
Separator	It is used to separate the type code and type distinguish code.										
Same type distinguish code	A, B, C, etc. If the module is mounted with same contacts, the distinguish code is A. If the contact type is changed, the distinguish code will be changed accordingly.										
Shell material	Omit: aluminum alloy -S: stainless steel										

Remarks:

① Module number: in front of the plug mating surface, put the right-angle leading pin down side, like picture 5. And then count the module number (including the overall module and half module) from right to left (standard VITA series 6U module, P0, P6 direction).

② Type code: in front of the plug mating surface, put the right-angle leading pin down side, like picture 5. And then compare the modules and key definition; record the module and leading key code from right to left (standard VITA series 6U module, P0, P6 direction). See picture 5: the example connector part number is NKA-61T4aAB4AADD4-A. ③ and ④ are only for standard 6U module. Standard 3U module doesn't have ③ or ④ item.

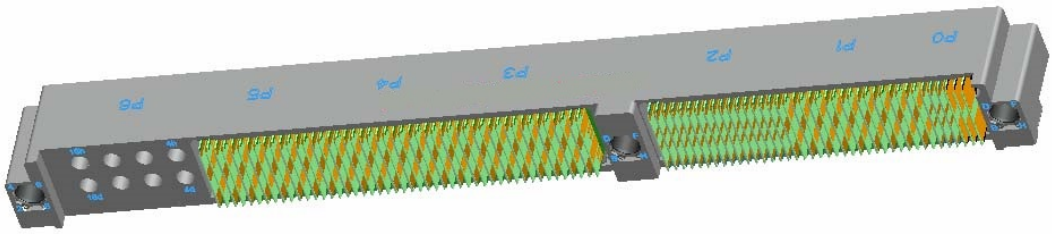
2、Dual side receptacle is special connector, and is consisted of front panel receptacle, back panel receptacle and dual side leading pins. The front panel receptacle and back panel receptacle can be selected according to need; dual side leading pin P/N is J1410956-2. The dual side receptacle ordering is separately; the front panel receptacle, back panel receptacle and dual side leading pins can be ordered separately.



Picture 1 Module quantity and code

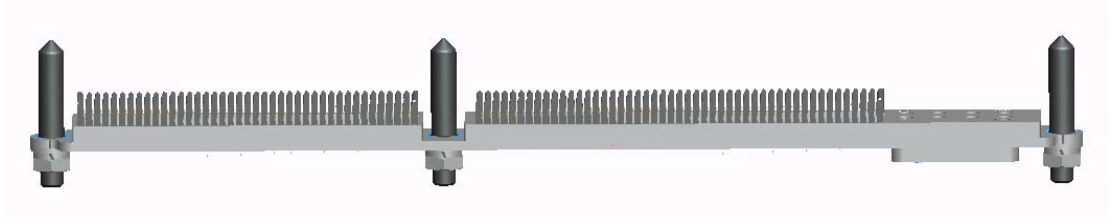
Part number example:

NKA-61T8aAB8AAAD8-A: 6U plug, including 6 overall modules and 1 half module; the overall module includes four A (differential), one B (single-ended) and one D (RF); half module is marked with a. “a” is also known as basic module. In this type, P0 is basic module a；P1, P3, P4, P5 are differential module A；P2 is single-ended module B；P6 is RF module D. Non RF part termination type is crimping; RF contacts are matched with coaxial wires. The transmission signal type is: 6 power signal, 128 single-ended, 132 differential pairs, 203 grounding signal, and 8 RF signal. See the picture below.



NKA-61T8aAB8AAAD8-A（plug）

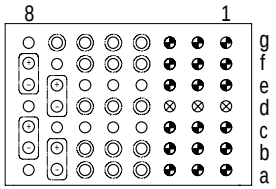
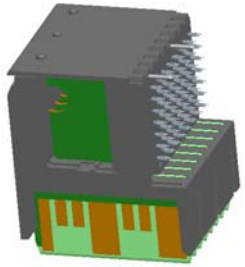
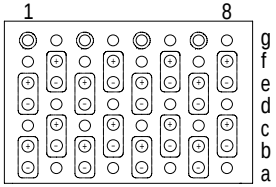
NKA-61Z8eIJ8IIJD8-A: 6U receptacle, including 6 overall modules and 1 half module; the overall module includes three I (overall module in the middle of receptacle), two J (overall module at the right side of receptacle), one D (RF module). Half module is marked with e. “e” is VITA standard receptacle half module. In this type, J0 is VITA standard receptacle half module; J1, J3, J4 are overall module in the middle of receptacle I； J2, J5 are overall modules at the right side of receptacle J；P6 is RF module D. Non RF part termination type is crimping; RF contacts are matched with coaxial wires. The transmission signal type is the same with WEB SITE: www.tech-arma.com . See the picture below.

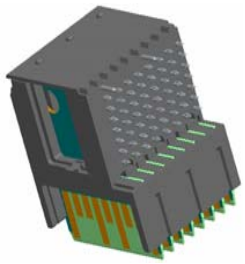
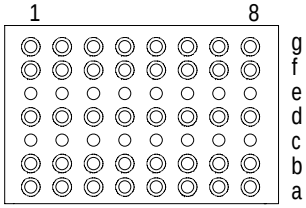
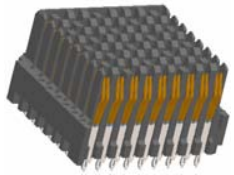
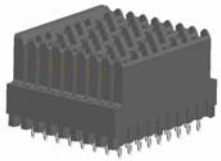


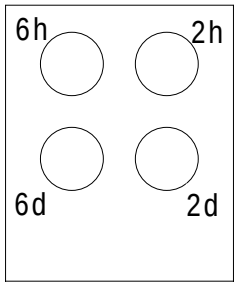
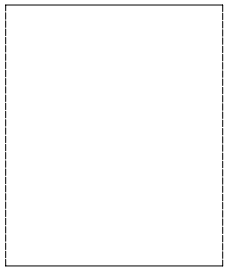
NKA61Z8eIJ8IIJD8-A（receptacle）

Unit module and type code

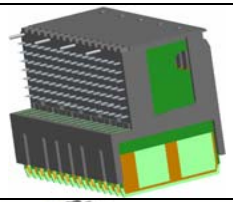
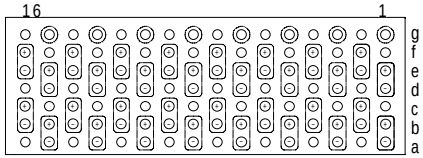
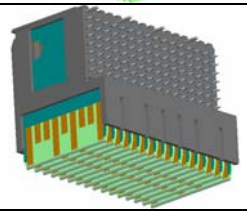
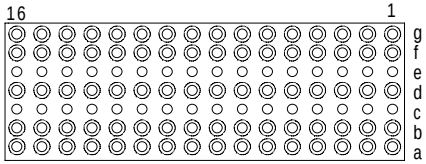
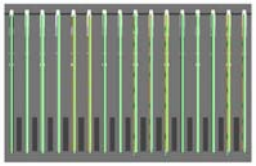
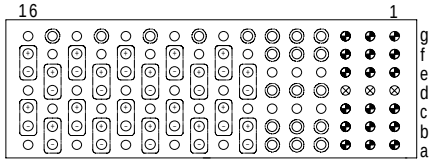
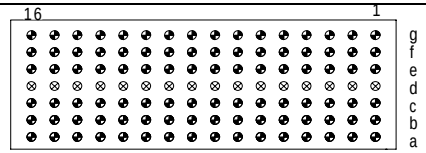
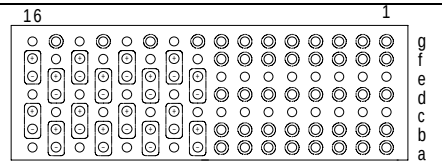
[Half module type]

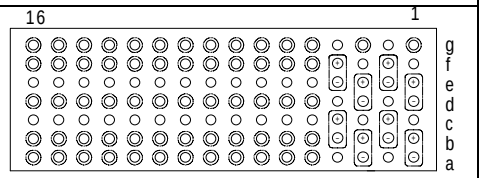
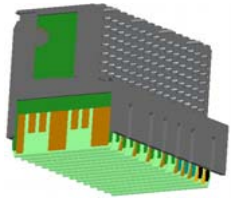
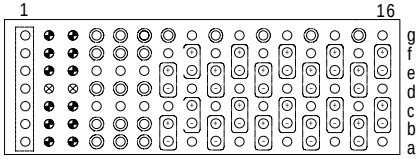
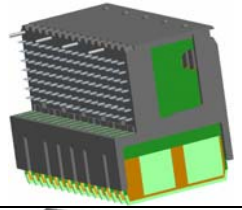
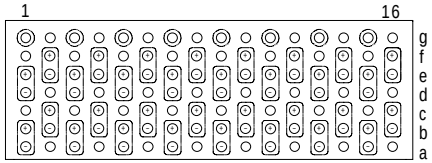
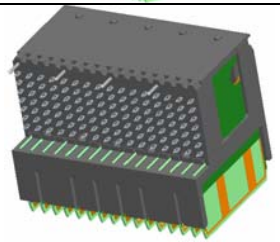
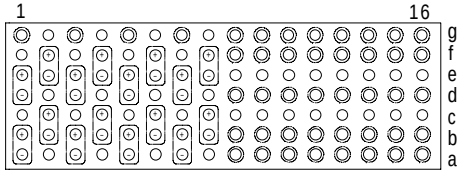
Applicable connector type	Type code	P/N	Picture	Signal layout	Illustration	Remarks
Plug	a	J1410189-3			VITA standard plug basic module, can be mounted with differential, single-ended, blade and power contact.	It is used at P0 position, the configuration is 7 rows 8 lists, 3 lists of power contacts, 3 lists of single-ended contacts and 2 lists of differential contacts. Altogether 6 power/16 single-ended/4 pairs differential/11 grounding.
	b	J1410971-3			VITA standard back panel plug differential half module, can be mounted with differential, single-ended contacts.	It is used at RP2 position, the configuration is 7 rows 8 lists, all of them are differential contacts. Signal type includes: 16 pair differential/4 single-ended/ 20 grounding.

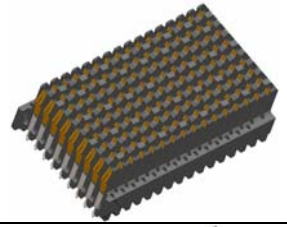
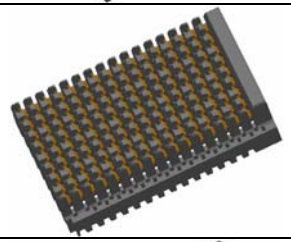
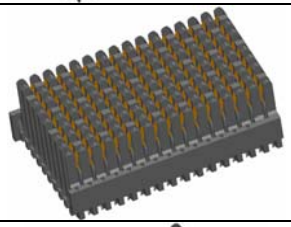
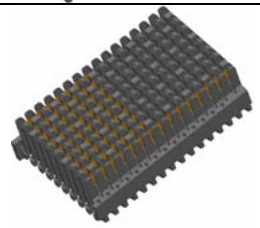
Applicable connector type	Type code	P/N	Picture	Signal layout	Illustration	Remarks
	c	J1410972-3			VITA standard back panel plug single-ended half module, can be mounted with single-ended contacts.	It is used at RP2 position, the configuration is 7 rows 8 lists, all of them are single-ended contacts. Signal type includes: 40 single-ended/16 grounding
Receptacle	e	J1410186-1		Mounted with same type contact, either differential or grounding. The signal type is according with the mated plug module.	VITA standard receptacle half module.	Used for J0 or RJ2 module, the configuration is 9 rows 8 lists. It is selected when J1 is non RF, optical or empty module.
	f	J1410186-2		Mounted with same type contact, either differential or grounding. The signal type is according with the mated plug module.	VITA standard receptacle separated half module.	Used for J0 position, the configuration is 9 rows 8 lists. It is selected when J1 is non RF, optical or empty module.

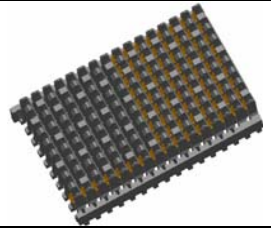
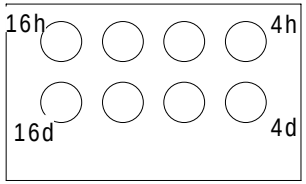
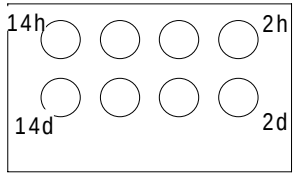
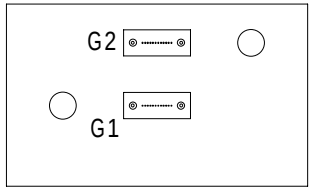
Applicable connector type	Type code	P/N	Picture	Signal layout	Illustration	Remarks
Plug /receptacle	d				Four 12# contacts	Mounted with four 12# RF or optical contacts. If customers want to change with other contact type (low frequency or high voltage), please write clear in order, including the contact type, quantity and position.
	n				8 lists of empty modules	Empty module, when the needed contacts less than standard module height (3U, 6U, etc), used for filling the space to reach module standard height.

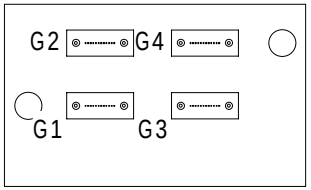
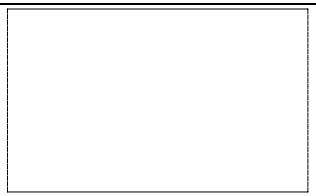
[Overall module type]

Applicable connector type	Type code	P/N	Picture	Signal layout	Illustration	Remarks
Plug	A	J1410187-3			VITA standard plug differential module (16 lists)	The configuration is 7 rows 16 lists, altogether 112 cores. 40 grounding/ 32 differential pair/ 8 single-ended, can be mounted at P1~P6 position.
	B	J1410190-3			VITA standard plug single-ended module (16 lists)	The configuration is 7 rows 16 lists, altogether 112 cores. 32 grounding/ 80 single-ended, can be mounted at P1~P6 position.
	C	J1410187-4			VITA standard plug mixed module (16 lists), can be mounted with differential, single-ended and blade type power contacts.	The configuration is 7 rows 16 lists, altogether 112 cores. The disigned configuration is J1410189-3+8 lists differential contacts, including 3 lists power, 3 lists single-ended, 10 lists differential contacts, altogether 6 power/ 20 single-ended /20 differential pair. If customers need to change with other contacts group, please write clear in the order, including the contact type, quantity and position. Can be mounted at P1~P6 position.
		J1410187-5			VITA standard plug power whole module, mounted with 16 lists power contacts.	
		J1410187-6			VITA standard plug mixed module, 8 lists single-ended contacts and 8 lists differential contacts.	

Applicable connector type	Type code	P/N	Picture	Signal layout	Illustration	Remarks
Plug		J1410187-8			VITA standard mixed plug module, 4 lists differential and 12 lists single-ended.	
	E	J1410968-3			VITA standard back panel plug basic module (15 lists), can be mounted with differential, single-ended and blade type power contacts.	Used for RP0 position, the configuration is 7 rows 15 lists. Signal type includes: 20 differential pair/ 20 single-ended/ 4 power/ 31 grounding.
	F	J1410975-3			VITA standard back panel plug differential module (16 lists)	Used for RP1, RP3, RP4, RP5, RP6 position, the configuration is 7 rows 16 lists. Signal type includes: 32 differential pair/ 8 single-ended / 40 grounding.
	H	J1410970-3			VITA standard back panel plug central overall module (16 lists)	Used for RP1 position, the configuration is 7 rows 16 lists. Signal type includes: 16 differential pair/ 44 single-ended/ 36 grounding

Applicable connector type	Type code	P/N	Picture	Signal layout	Illustration	Remarks
Receptacle	I	J1410140-1		Mounted with same type contact, either differential or grounding. The signal type is according with the mated plug module.	Overall module in the middle of receptacle	Used for J1, J3, J4, J5, RJ1, RJ4, RJ5, RJ6 position, the configuration is 9 rows 16 lists.
	J	J1410142-1		Mounted with same type contact, either differential or grounding. The signal type is according with the mated plug module.	Overall module at the right side of receptacle	Used for J2, J6, RJ3 position, the configuration is 9 rows 16 lists. If it is high & low frequency mixed, optical & electrical mixed or empty module products, can be mounted at any position from J1 to J6.
Receptacle	K	J1410964-1		Mounted with same type contact, either differential or grounding. The signal type is according with the mated plug module.	Overall module at the left side of back panel receptacle.	Used for RP0 position, the configuration is 9 rows 15 lists.
	L	J1410965-1		Mounted with same type contact, either differential or grounding. The signal type is according with the mated plug module.	Overall module at the left side of back panel receptacle (not full filled).	Used for RP0 position, the configuration is 9 rows 7 lists.

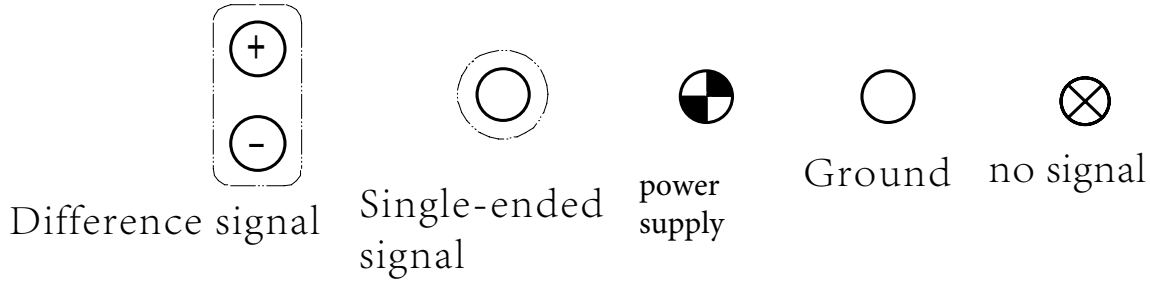
Applicable connector type	Type code	P/N	Picture	Signal layout	Illustration	Remarks
	M	J1410966-1		Mounted with same type contact, either differential or grounding. The signal type is according with the mated plug module.	Overall module at the left side of back panel receptacle (not full filled).	Used for RP1 position, the configuration is 9 rows 8 lists.
Plug/ receptacle	D				Eight 12# contacts	It is designed to be mounted with eight 12# RF or optical contacts. If customers want to change with power contacts, please write clear in the order, including the contact type, quantity and position. It can be mounted at P2~P6 position. We suggest that single RF module be mounted at P2 or P6 position.
						It is designed to be mounted with eight 12# RF or optical contacts. If customers want to change with low frequency or high voltage contacts, please write clear in the order, including the contact type, quantity and position. It can be mounted at P1 position (P0 is RF contacts).
Plug/ receptacle	G				Two MT optical contacts	Each MT contact can connect 12 loops (or 24 loops) optical signal, can be mounted at any position from P1 to P6. We suggest that single optical module be mounted at P2 or P6 position.

Applicable connector type	Type code	P/N	Picture	Signal layout	Illustration	Remarks
	G4				Four MT optical contacts	Each MT contact can connect 12 loops (or 24 loops) optical signal. The two modules are used together, usually mounted at P5 or P6 position.
	N				16 lists empty module	Empty module, when the needed contacts less than standard module height (3U, 6U, etc), used for filling the space to reach module standard height.

Remarks: 1.P means plug module, J means receptacle module.

2. RP* means back panel plug (receptacle) P* (J*) position,* range from 0 to 6.

3. Signal mark: please note that in differential signals, “+”“-”means differential pair, not the active or negative signal in actual solution.

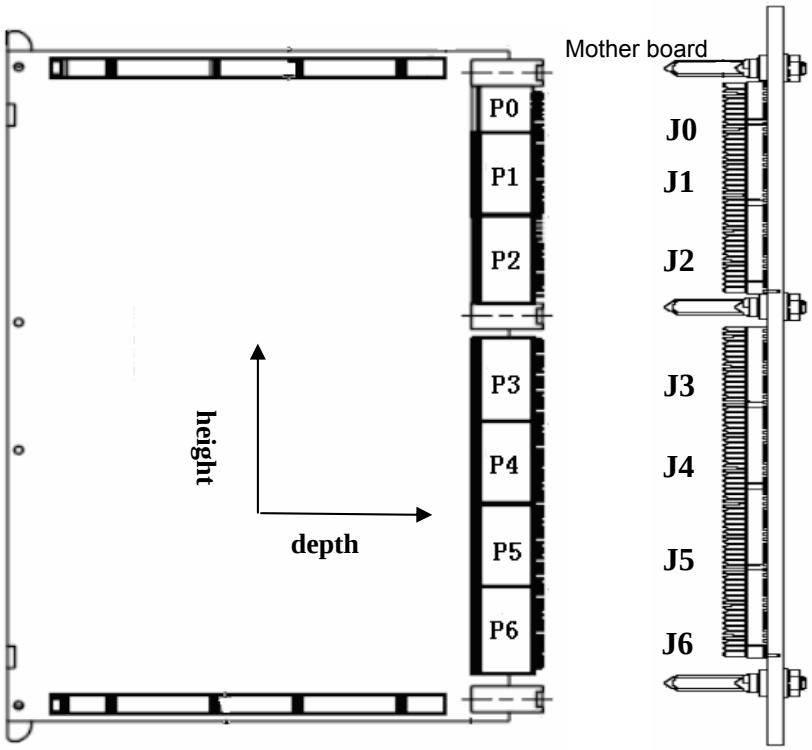


Type code illustration

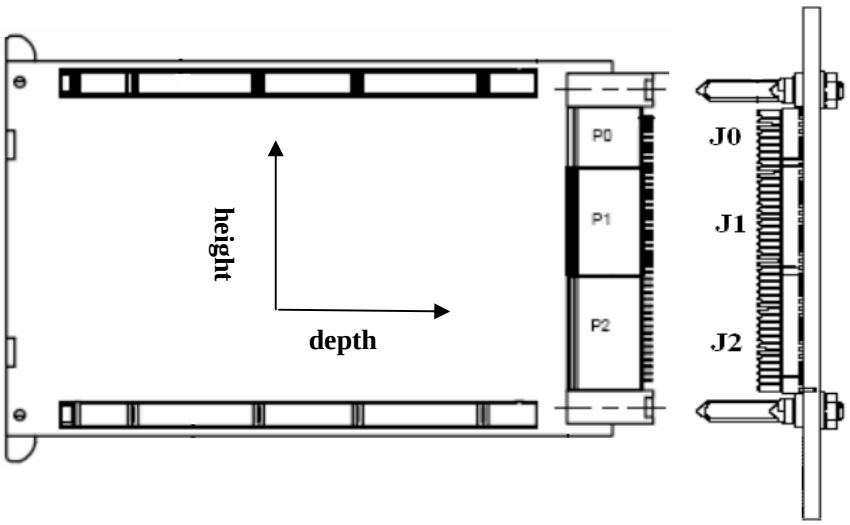
Type	Plug module position	Plug module	According receptacle module	Receptacle module position
Half module	P0	a	e	Used for J0 module, 9 rows 8 lists, can be selected when J1 is I or J.
			f	Used for J0 module, 9 rows 8 lists, can be selected when J1 is RF, optical or empty module.
		d	d	Same with plug
		n	n	Same with plug
	RP2	b	e	Used for RJ2 module, 9 rows 8 lists.
		c	e	Used for RJ2 module, 9 rows 8 lists.
Overall module	P1~P6	A	I	Used for J1, J3, J4, J5 position, when the neighbored module is I or J.
			J	Used for J2, J6, RJ3 position, 9 rows 16 lists. If it is high & low frequency mixed, optical & electrical mixed or empty module products, can be mounted at J1~J6.
		B	I	Used for J1, J3, J4, J5 position, when the neighbored module is I or J.
			J	Used for J2, J6, RJ3 position, 9 rows 16 lists. If it is high & low frequency mixed, optical & electrical mixed or empty module products, can be mounted at J1~J6.
		C	I	Used for J1, J3, J4, J5 position, when the neighbored module is I or J.
			J	Used for J2, J6 position, 9 rows 16 lists. If it is high & low frequency mixed, optical & electrical mixed or empty module products, can be mounted at J1~J6.
		D	D	Same with plug
		G	G	Same with plug
		N	N	Same with plug
	RP0	E	K	Back panel receptacle overall module, left side, RJ0 position, 9 rows 15 lists. Signal type is same with plug.

			L	Back panel receptacle overall module (not full filled), left side, RJ0 position.
	RP1, RP3, RP4, RP5, RP6	F	M	Back panel receptacle whole module (not full filled), left side, RJ1 position.
			I	Used for RJ1, RJ4, RJ5, RJ6 position.
			J	Used for RJ3 position, 9 rows 16 lists.
	RP1	H	M	Back panel receptacle whole module (not full filled), left side, RJ1 position.
			I	Use for RJ1 position.

VITA standard 6U and 3U module structure

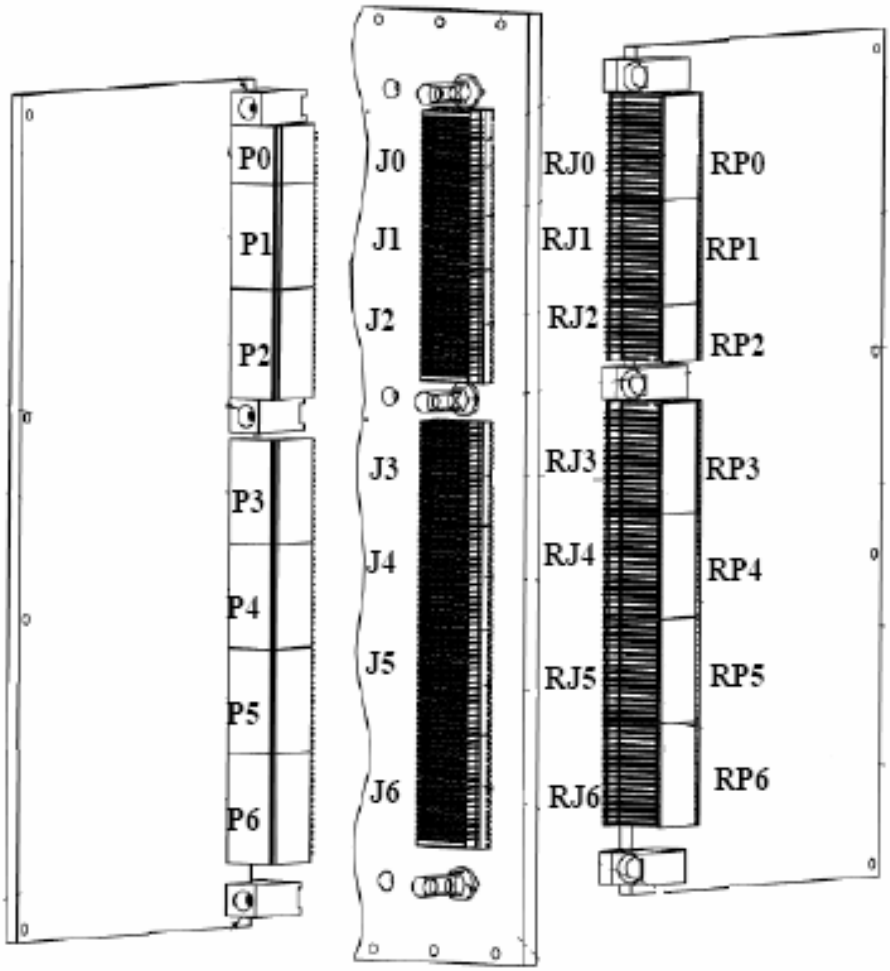


NKA standard 6U module structure



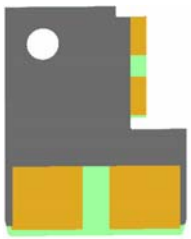
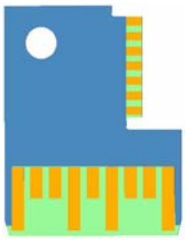
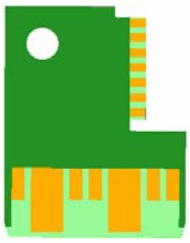
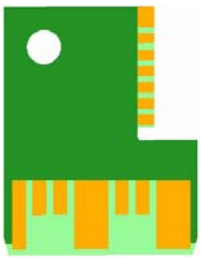
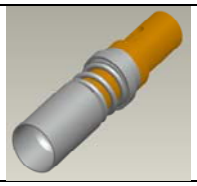
NKA standard 3U module structure

VITA standard 6U dual side module structure



VITA standard 6U dual side module structure

Contact introduction

No.	Mating surface	Type and parameter	Remarks
1		Power contact, rating current: 16A	
2		Single-ended signal contact, each blade provides 5 loops single-ended signals, others are grounding wires. Rating current: 1A.	
3		Single-ended & differential signal mixed contact, each blade provides 1 loop single-ended signal and 2 differential pairs, others are grounding wires. Rating current: 1A, differential transmission speed 6.25 Gbps.	The two types are used in pairs, listed in sequence.
		Differential signal contact, each blade provides 2 differential pairs, others are grounding wires. Differential transmission speed 6.25 Gbps.	
4		RF contact, operating frequency reaches 40GHz, rear mounting and remove, float mounting, reliable contact.	Termination connection: coaxial cables.
5			
6		MT type optical contact, receptacle is floating structure, reliable contact. Each MT core connects 12 loops (or 24 loops) optical signal.	

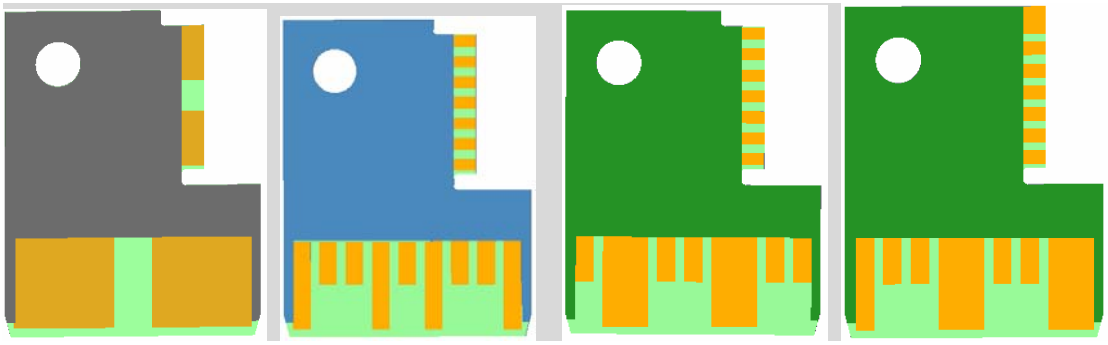
7		12# optical contact, rear mounting and remove, can be used in same cavity with 12# RF contact.	

Electrical module and high speed performance test

[Electrical module]

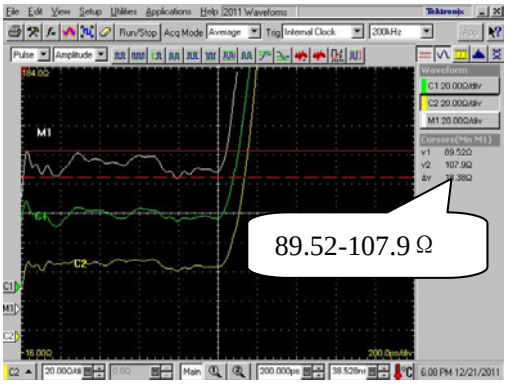
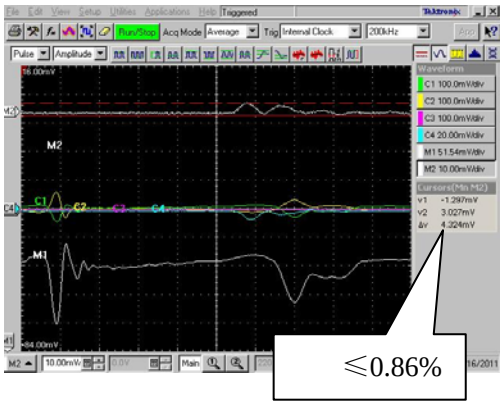
- NKA series connector is consisted of electrical module, RF module and optical module; it achieves integrated transmission of power signal, differential signal, single-ended signal, RF signal and optical signal. The electrical module transmits electric signals through different group and configuration of 4 different gold finger circuit board types.
- Pattern interval: plug: 1.35mm×1.8 mm, receptacle: 1.8 mm×1.8 mm.
- Differential impedance: 100Ω
- Near end crosstalk: in 100ps raising time, crosstalk ≤ 5%
- Data transmission rate: 6.25Gbps

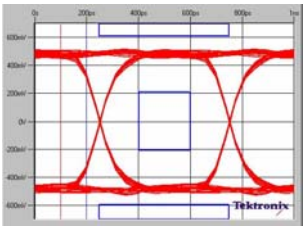
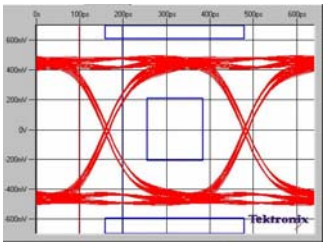
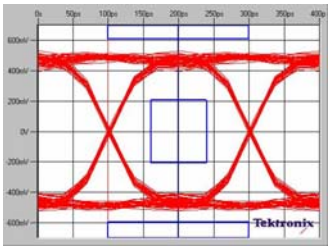
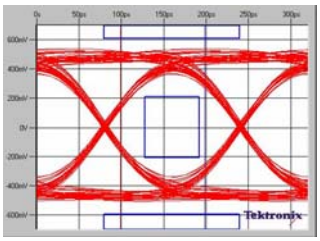
PCB silicon chip (gold finger) type



Power PCB single-ended signal single-ended & differential mixed Differential PCB

[High speed performance test]

[Characteristics impedance]	[Near end crosstalk]
	

Transmission eye diagram	
2Gbps	3.125Gbps
	
5Gbps	6.25Gbps
	

RF module and components

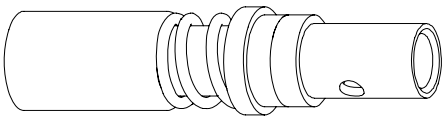
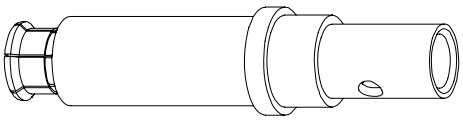
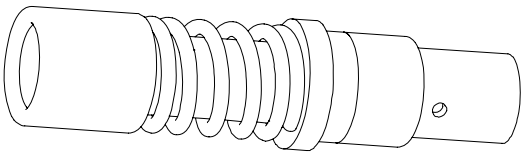
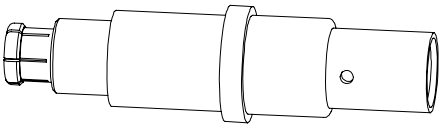
[RF contact]

1. Brief introduction

- Float structure, rear mounting and remove
- Steady pole and insertion loss

RF contact need to be ordered separately, not supplied with products.

2. Ordering information

<table>
<tr><td colspan="2">Float structure RF contact</td></tr>
<tr><td>12# RF socket: RF(F)-12JB2(V48)
RF(F)-12J2(V48)
（used for plug, DC~18GHz）
  </td><td>12# RF pin: RF(F)-12KB2(V48)
RF(F)-12K2(V48)
（used for receptacle: DC~18GHz）
  </td></tr>
<tr><td>12# RF socket: RF(F)-12JB2C(V48)
（used for plug, DC~40GHz）
  </td><td>12# RF pin: RF(F)-12KB2C(V48)
（used for receptacle: DC~40GHz）
  </td></tr>
<tr><td colspan="2">The sockets are floating in plug, pins are fixed in receptacle.</td></tr>
</table>

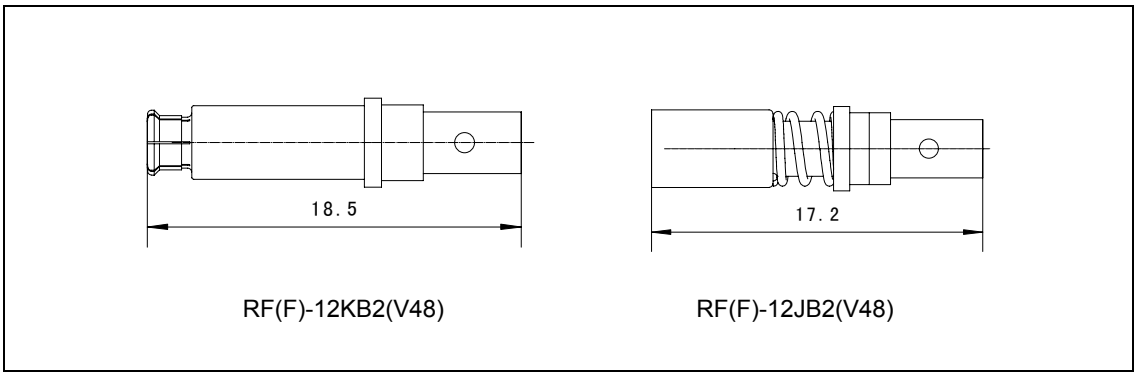
3. Applicable cable

No.	RF socket (for plug)	RF pin (for receptacle)	RF cable	Other applicable cable type
1.	RF(F)-12JB2(V48)	RF(F)-12KB2(V48)	Flexi form 405 NM FJ (semi-flexible)	Other ID 0.56mm, OD 2.2mm cable
2.	RF(F)-12J2(V48)	RF(F)-12K2(V48)	Gore CXN3506 (flexible)	Other ID 0.5mm, OD 2mm cable
3.	RF(F)-12JB2C(V48)	RF(F)-12KB2C(V48)	HFE100D (semi-flexible)	Other ID 0.5mm, shielding layer OD 2.2mm cable.

4. Parameter

Item	RF contact
Frequency range	DC~40 GHz
Characteristics impedance	50Ω
RF insertion loss	≤0.06$\sqrt{f}$ dB（*f*：GHz）
VSWR	≤1.15+0.01*f*（*f*：GHz）
Pole stability	DC~18GHz: ≤±3°；DC~40GHz: ≤±6°
Disconnect degree	-90dB（500MHz~18GHz），-70dB（1GH~40GHz）
RF leakage	Better than -80dB（2~3GHz）
Contact resistance	Central contact: 11mΩ Outer contact: 5mΩ
Insulation resistance	1000MΩ
Endurance	500 cycles

5. Outline dimension



RF(F)-12KB2(V48)　　RF(F)-12JB2(V48)

[RF components]

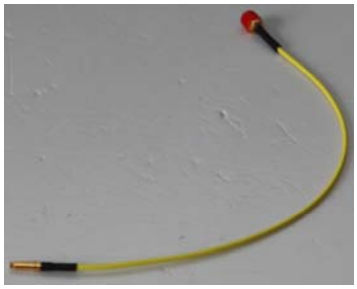
1. Ordering information

If the RF contacts need to be soldered with cables, please provide the below information in order:

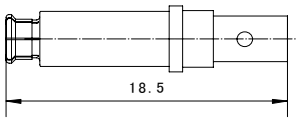
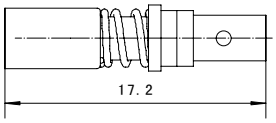
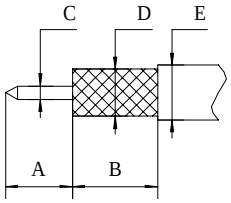
		RF(F)-12KB2(V48)	/SMA-JB2①	-200	A
RF contact P/N	RF(F)-12KB2(V48), RF(F)-12JB2(V48), etc.				
RF contact P/N	①RF(F)-12KB2(V48), SMA-JB2, etc.				
Cable length	200 mm, according to need				
Cable type	omit: RF cable A：according to need				

Remarks: ①If another end of the cable doesn't need adapter, omit this item.

Example:

RF(F)-12JB2(V48)-200	RF(F)-12KB2(V48)/SMA-JB2-200
	

2. RF contacts and cable soldering

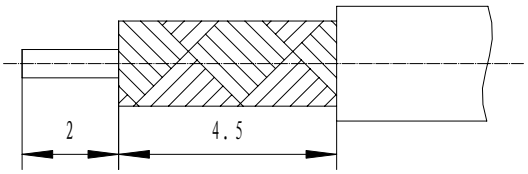
12# RF socket	12# RF pin	Strip length
		

Contact type	Contact P/N	Applicable cable	A	B	C	D	E
12# RF socket	RF(F)-12JB2(V48)	Flexiform 405 NM FJ (semi-flexible)	2	4.5	0.56	2.2	2.5
12# RF pin	RF(F)-12KB2(V48)		2	4.5	0.56	2.2	2.5
12# RF socket	RF(F)-12J2(V48)	Gore CXN3506 (flexible)	2	4.5	0.5	1.95	2.2
12# RF pin	RF(F)-12K2(V48)		2	4.5	0.5	1.95	2.2
12# RF socket	RF(F)-12JB2C(V48)	HFE100D(semi-flexible)	2	4.5	0.51	2.08	2.54
12# RF pin	RF(F)-12KB2C(V48)		2	4.5	0.51	2.08	2.54

Soldering illustration

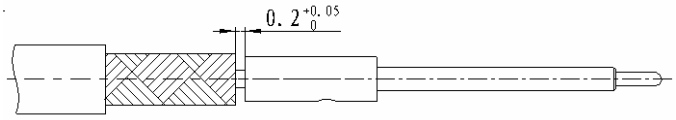
Take RF(F)-12J2(V48) for example, introduce the soldering steps and points.

1）Stripping and tin plating: strip the cable sleeve, and then give tin plating treatment of the cable shielding layer. Then strip the shielding layer. The strip length is listed in picture 6.



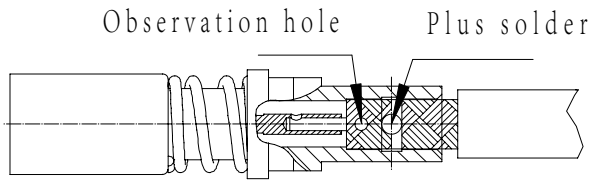
Picture 6: cable strip dimension

2）Solder the central conductor: we suggest use insulator soldering. Before soldering, fill some tin at the pin end, put a blade on the cable core, the blade thickness is $0.2^{+0.05}_{0}$. Then heat the pin, push the core into it after the tin is melt. See picture 7. Please note that keep about $0.2^{+0.05}_{0}$ distance between cable shielding layer and central conductor. After soldering, clean the rest tin and check the straightness of the central conductor and the cable core.



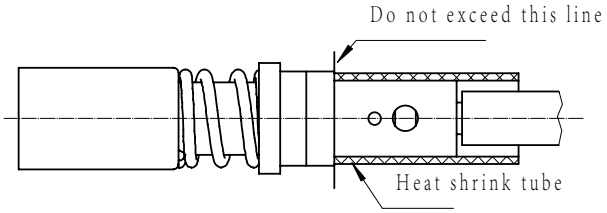
Picture 2: central conductor soldering

3）Solder the outer conductor: see picture 8. In soldering, put the contact even, insert the soldered central conductor into the contact shell, and push it to the end. Put some tin at the marked position in the picture. Clear the rest tin after soldering.



Picture 3 : outer conductor soldering picture

4）Mount the heat shrink sleeve: see picture 9. Mount the heat shrink sleeve. Please use the according type that is provided with the products. Other sleeve types may cause problem in remove of RF contacts.



Picture 4: heat shrink sleeve mounting

5）Contact endurance: 500 cycles. Please keep the mating surface clean in duration. Take care not to scratch the contacts in using.

3. Remove of RF contact

The remove tools of RF contacts need to be ordered separately. Different RF contacts need different remove tools, the steps are the same.

Remove steps: see picture 10.

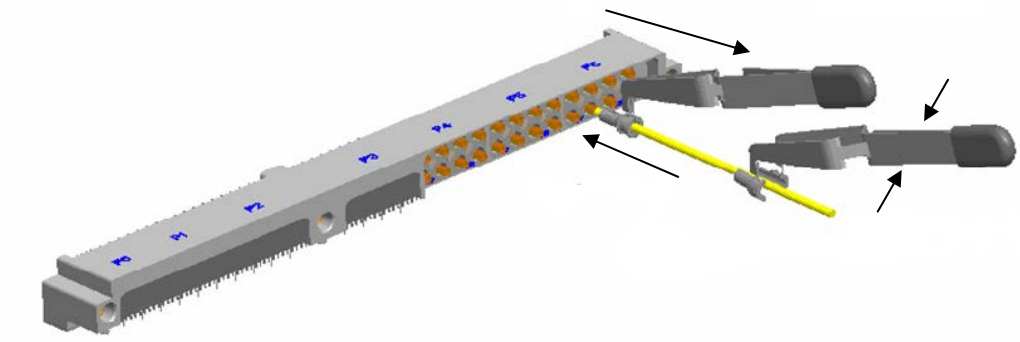
① Hold the handle rear end and let the front end open

② Cover the remove head on the RF cable from the connector rear direction

③ Release the handle rear end, let the remove head connects with the RF cable

④ Push the remove tool ahead vertically

⑤ After hear a tiny “clerk”, release the remove tool, pull the cable backward to get out the contact.



Picture 5: Remove steps illustration

4. RF contact P/N and the according remove tool

No.	RF contact P/N	Remove tool P/N
1	RF(F)-12JB2(V48)	QX-LRM-RF(R)
	RF(F)-12KB2(V48)	
2	RF(F)-12J2(V48)	
	RF(F)-12K2(V48)	
3	RF(F)-12JB2C(V48)	

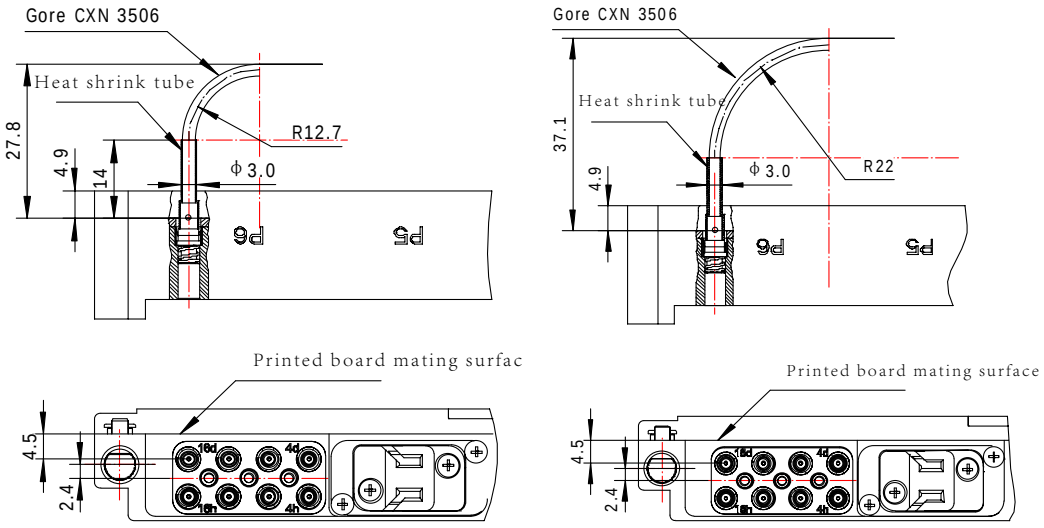
No.	RF contact P/N	Remove tool P/N
	RF(F)-12KB2C(V48)	

5. RF contact information

5.1 Cable bending radius

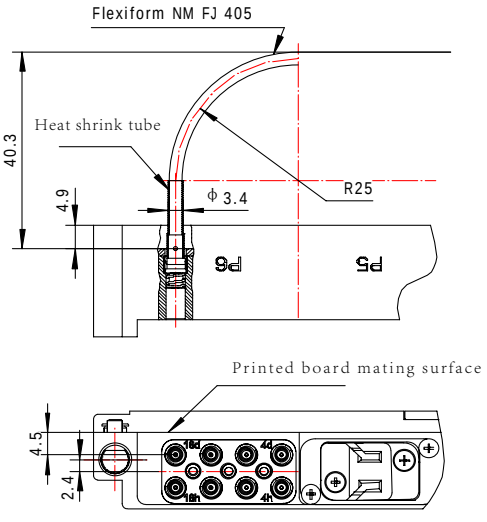
In the using process, please keep attention to the bending radius of the RF contacts. In bending process, the actual value should be larger than the minimum value. It is to protect the transmission characteristics of the RF cable. The bending radius is listed below, according to different cable types. Meanwhile, leave enough space when mounting with the module or the cabinet back cover.

1）Bending radius of some daughter board cable:



a）bend not frequently　　b）bend frequently

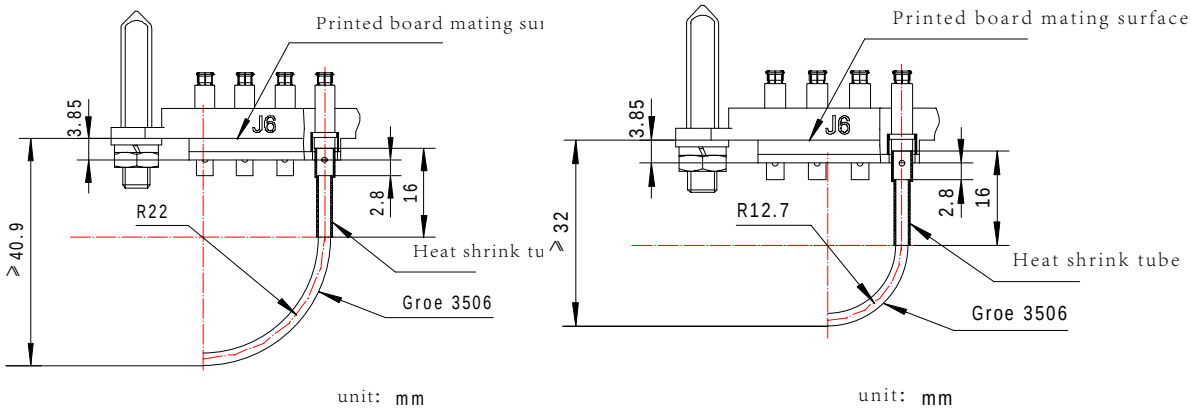
Picture 6: Gore CXN 3506 cable bend radius



Picture 7: Flexiform NM FJ 405 cable bending radius

2）Bending radius of mother board cable

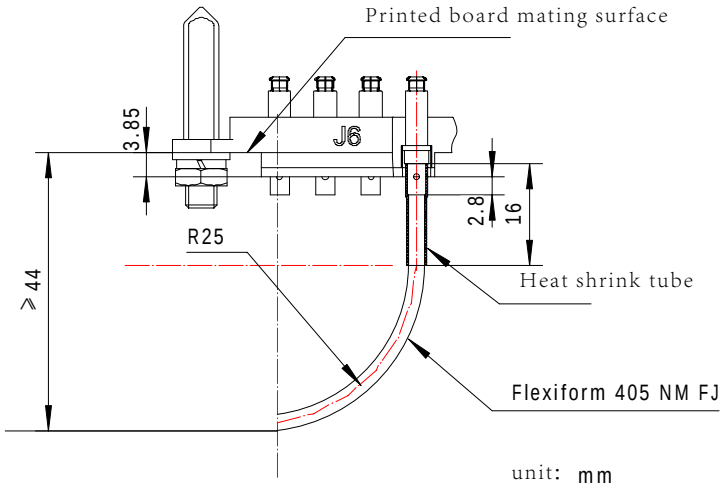
（1）Mother board RF contact, with GORE CXN3506 flexible cable



a）bend frequently　　b）bend not frequently

Pin contact, total length 18.5mm, applicable cable type: Gore CXN3506 flexible cable, cable OD 2.2mm, bending radius 22mm. The mounting position on the mother board is marked in the above drawing. This contact is matched with floating sockets.

(2）Mother board RF contact, with Flexiform 405 NM FJ semi-flexible cable

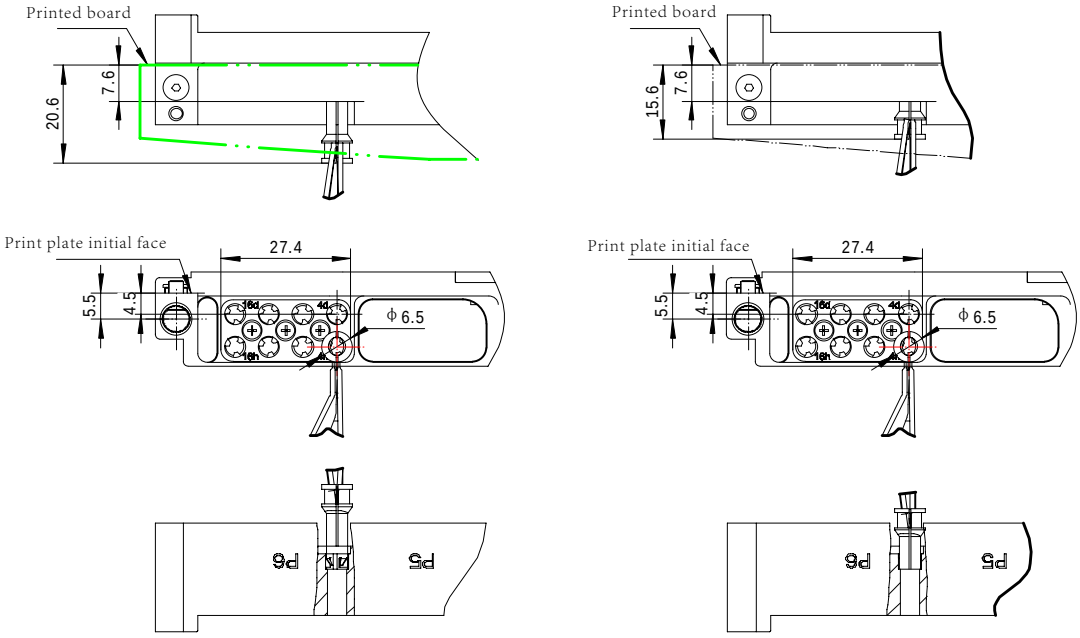


Pin contacts are used for mother board, applicable cable type: Flexiform 405 NM FJ (semi-flexible cable), cable OD 2.6mm, bending radius 25mm. The mounting position on the mother board is marked in the above picture. This contact is matched with floating sockets.

In the mounting process, please ensure that the distance between the mating surface and the cabinet cover ≥ the dimension in the above picture. The reason is that: 1. if the bending radius is too small, the cable characteristics will be affected. 2. If the space too small, the contacts can not be mounted or removed.

5.2 Cable remove space

For high & low frequency mixed plugs, as the RF contacts are removable, a certain space is needed for the remove. Restricted by the structure, the distance between the remove tool and the PCB is small, so we suggest that not to mount components on the PCB in the remove range. It is to protect the components in contact removing. The remove space of PCB is showed in the below picture:



The retractor is in contact with the housing

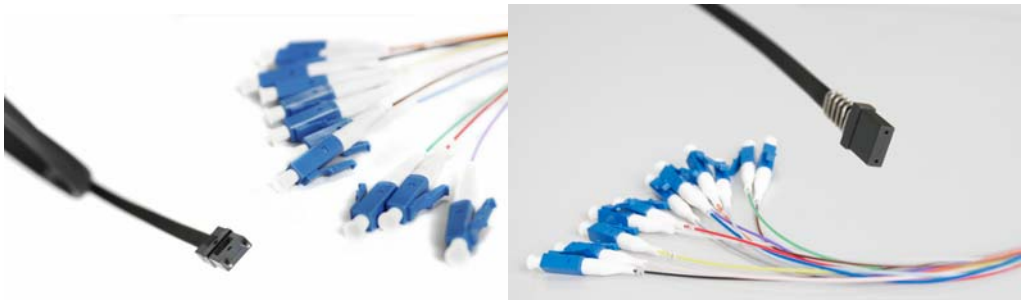
The stripper is inserted in place

Optical components

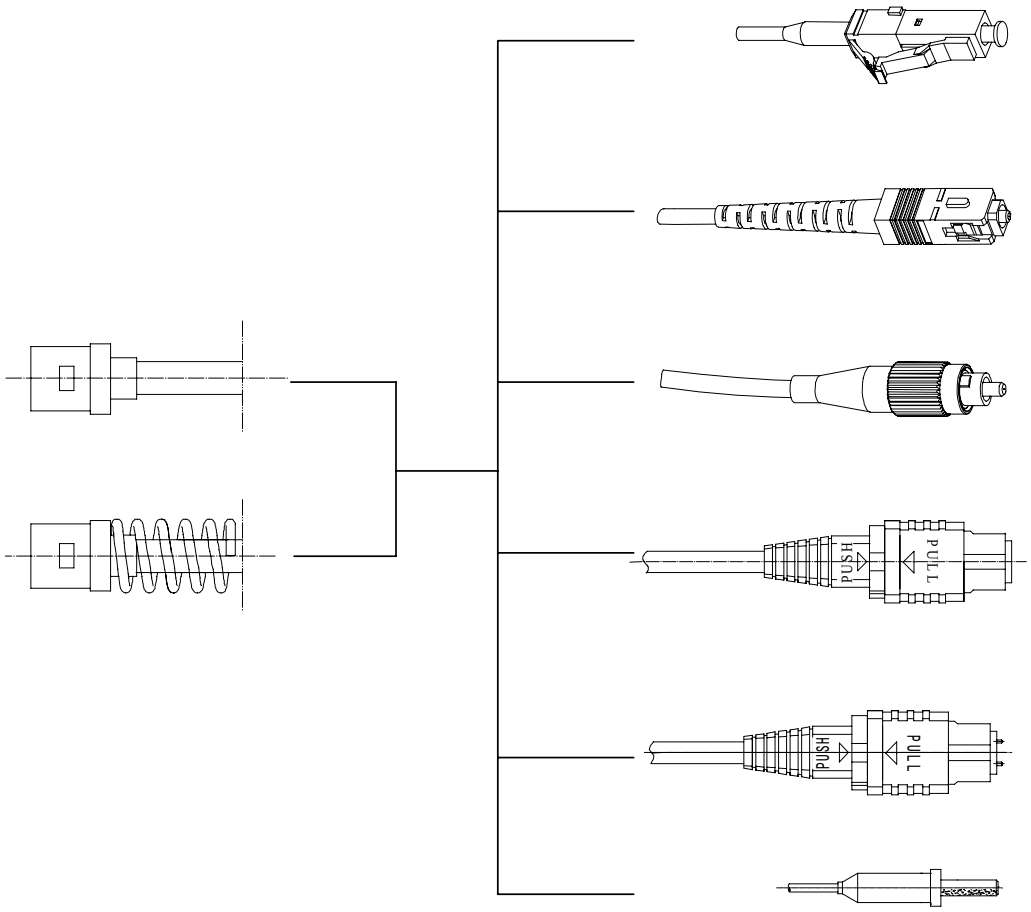
Optical patch cord

Brief introduction

NKA series module mixed connector, the optical contact is MT type. One MT optical contact can connect 12 loops (or 24 loops) optical signal, transmission mode includes 3 types: G652 standard SM, fiber core diameter 62.5/125 MM, and fiber core diameter 50/125 MM. MT type optical contacts can adapts various optical plug types, for example: FC, SC, LC, ST, MPO, MPO/D, LA711/16GP, LA711/12GP, also can be customized. It achieves the inter connection between equipment conveniently.



[Optical movable plug picture]



Ordering information

Optical patch cord (including MT type optical contact, optical fiber and optical movable plug) need to be ordered separately, please provide the below information in order.

Basic series	**RF-**	**MT-**	**12**	**LC-**	**0.9**	**M**	**0.4**	**/0.2**
Contact type	MT—for plug MT/S—for receptacle							
Movable plug number	12							
Movable plug type	LC, FC, SC, MPO, MPO/D, MT/S, JY599/16GP, JY599/12GP, etc.							
Branch fiber diameter②	0.9、2							
Transmission mode	M： S： MⅠ：	fiber core diameter 62.5/125 MM G652 standard SM fiber core diameter 50/125 MM						
Total length	Unit: m							
Strip length②	Unit: m							

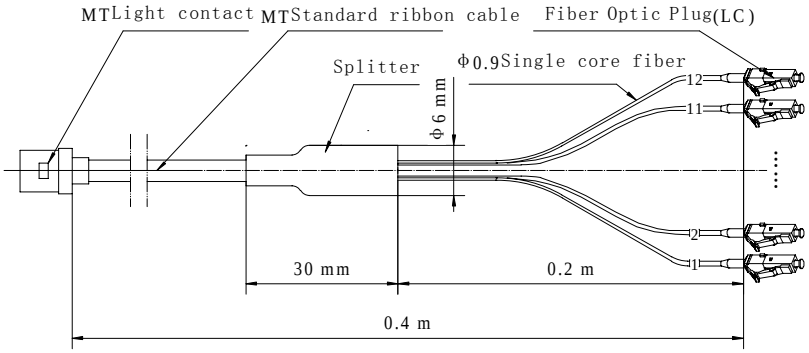
Remarks:

①If only one movable plug, do not need to write the quantity.

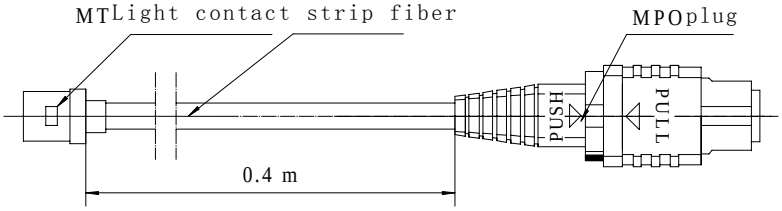
②If movable plug is MPO, MPO/D or MT/S, do not need branch fiber, this item can be omit.

[Optical patch cord ordering P/N example]

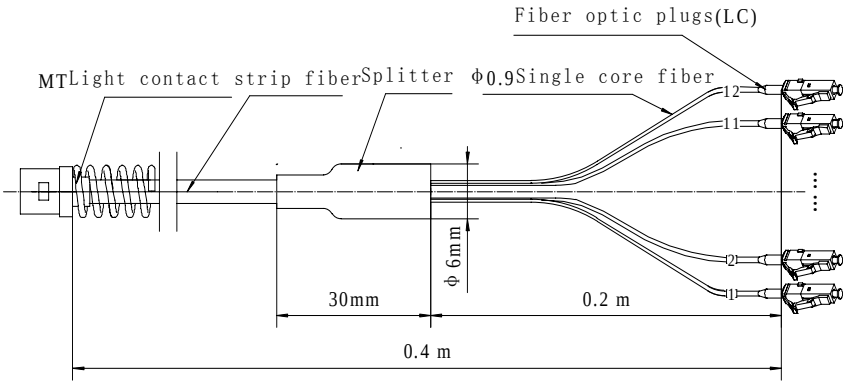
Example 1：RF-MT-12LC-0.9M0.4/0.2 (for plug)



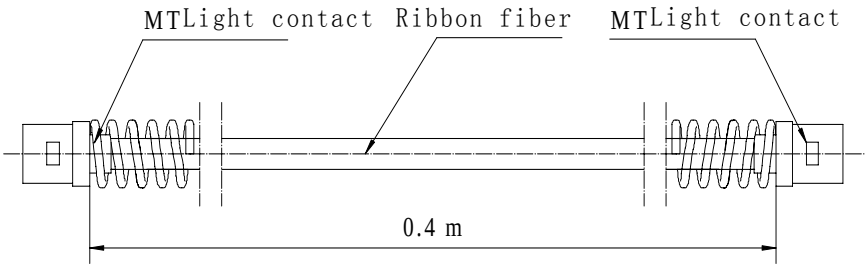
Example 2：RF-MT-MPO-M0.4 (for plug)



Example 3：RF-MT/S-12LC-0.9M0.4/0.2 (for receptacle)



Example 4：RF-MT/S-MT/S-M0.4 (for receptacle)



Feature and advantage

- Adapt MT type optical contact, high optical signal density
- Elastic contact, ensures reliable contact in vibration and shock environment, insertion loss ＜1.5dB
- MT type removable optical contact, supplied separately. It can be used with other optical components, very convenient.

Technical characteristics

Insertion loss：≤1.5dB

Operating temperature：-55℃~80℃

Error rate：$\leq 10^{-12}$

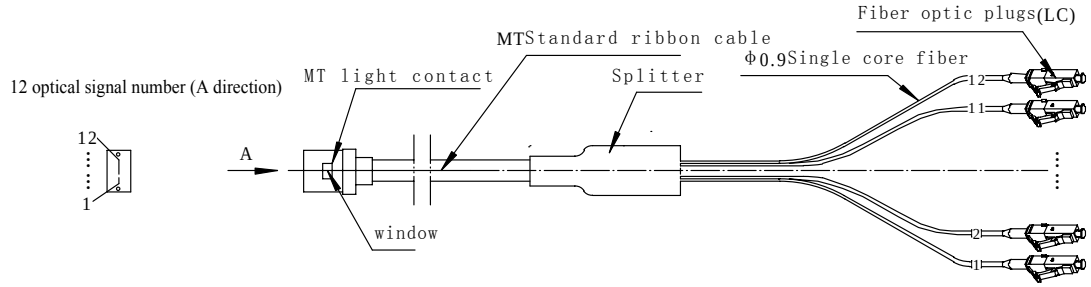
Random vibration: frequency: 10~2000Hz, power chart density $0.2g^2$/Hz

Shock: 80g

Optical patch cord code

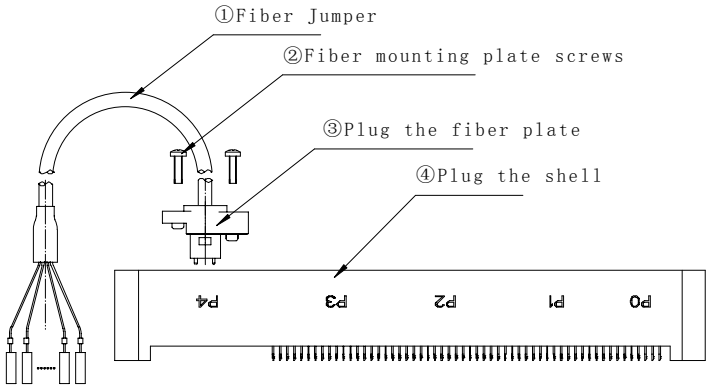
Take RF-MT-12LC-0.9M0.4/0.2 for example, see the below picture. In front of the MT optical contacts, the sequence of 12 loops optical signals is from the upside to the downside, 1~12. The color sequence is blue, orange, green, brown, gray, white, red, black, yellow, purple, pink, turquoise.

If only use 4 loops of the 12 loops fiber, then it is usually the loops at the two sides, that is: blue, orange, pink, turquoise. If only use 6 loops, the same reason.



Optical patch cord mounting illustration

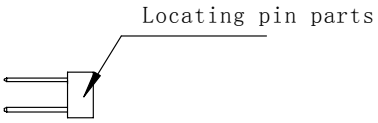
1） Mounting steps



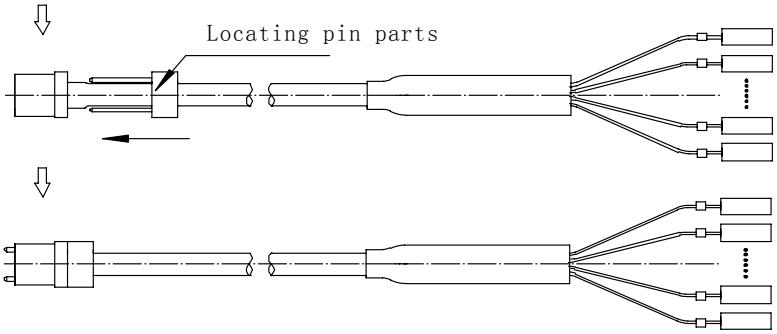
Steps: （1）release the screw ②, remove the board ③;

（2）Mount the optical patch cord ① with positioner; this component is matched part, the mounting method is listed below:

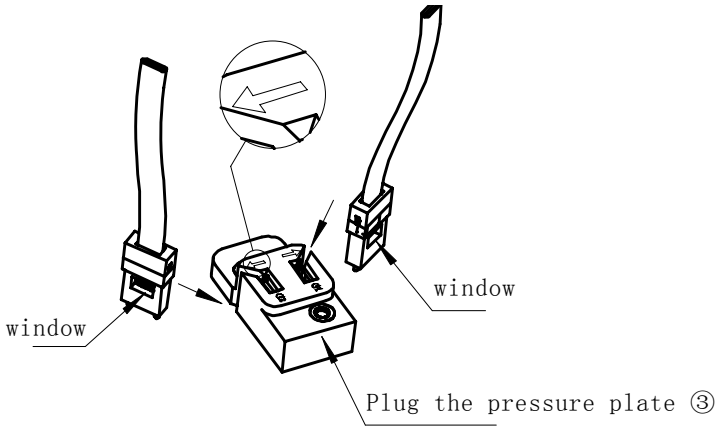
The locating pin part is a spare part, provided with the connector.



The positioning pin components installed on the fiber jumpers, according to the direction shown in the direction, there is no points before and after the points.

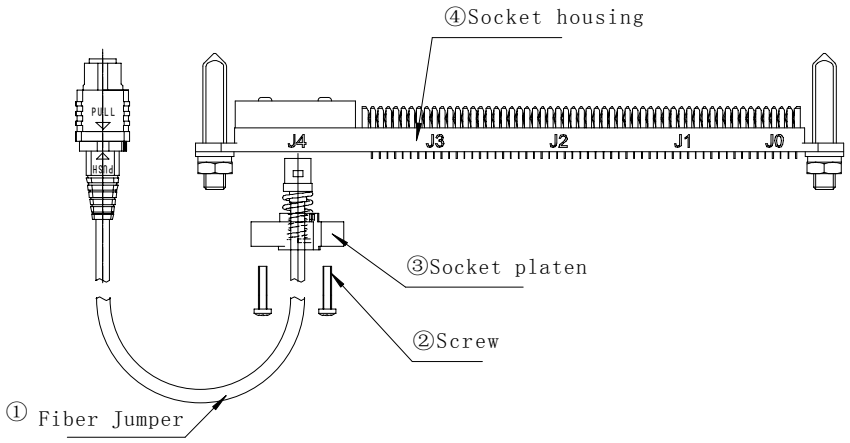


（3）Put the mounted optical patch cord into the plug board ③ from the 45°groove. In the mounting process, please note that the MT optical contact window direction should be same with the connector arrow direction. See the below picture:



（4）Coat the screw ② with some glue, and then tighten the screw.

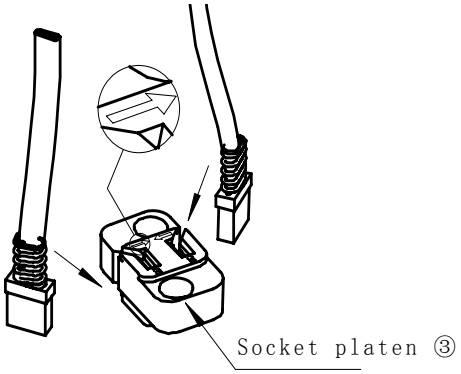
2） The sequence of the optical patch cord



Steps:（1）Remove the screw ②, and then remove the receptacle crimp board ③;

（2）Put the MT patch cord into the receptacle crimp board ③ from the 45°groove. In the mounting process, please note that the MT optical contact window direction should be same with the connector arrow direction. See the below picture:

（3）Put the receptacle crimp board ③ into the insulator, coat the screw ② with some glue, and then tighten the screw.

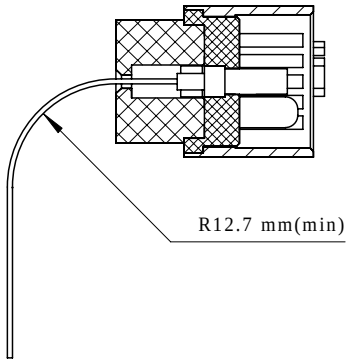


（The above steps is for the both sides mounting of PCB. If the modules are mounted at the same side of PCB, the optical patch cord mounting direction is decided according to the actual situation.

Optical patch cord note points in using:

（1）Please take care of the optical patch cord in using process, do not pull it by force. Meanwhile, ensure that the optical fiber bending radius ≥ the minimum value 12.7mm. See picture 13.

（2）When customers don’t use the connectors for some time, please take some protection. If the connectors are reused after long time storage, use Kim cloth to clean the surface of the MT optical contacts.



Picture 8: minimum bending radius

Optical components

Single core optical fiber

1. Ordering information

Basic series	NKA	/	12	G P	-	LC-	M	2	-	L	1
Separator	/										
Contact size	12#										
Optical contact	GP：pin GS：socket										
Punctuation	-										
Plug type	LC, FC, SC, MPO, MPO/D, LA711/16GP, LA711/12GP, etc										
Fiber type	M：fiber core diameter 62.5/125 MM MI：fiber core diameter 50/125 MM S：G652 standard SM										
Fiber OD	0.9：means the fiber OD is 0.9mm 2：means the fiber OD is 2mm										
Punctuation	-										
Fiber length code	L										
Fiber length	Unit: m										

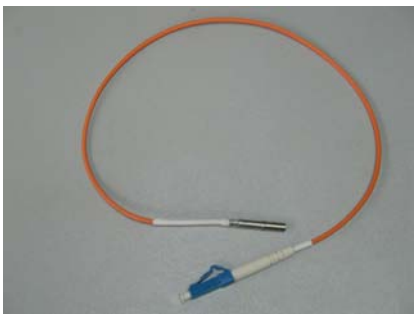
Part number example

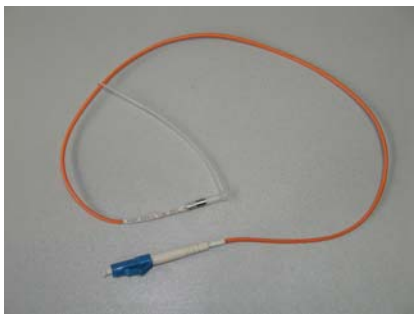
NKA/12GP-LC-M2-L0.2（for mother board）

Matched with 62.5/125 MM fiber, fiber OD is 2mm, one side is NKA/12GP, another side is LC optical connector, fiber total length 0.2m.

NKA/12GS-LC-M2-L0.2（for module）

Matched with 62.5/125 MM fiber, fiber OD is 2mm, one side is NKA/12GS, another side is optical connector, fiber total length 0.2m.





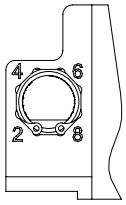
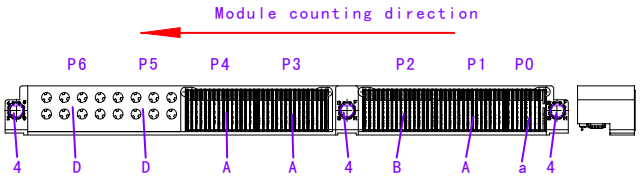
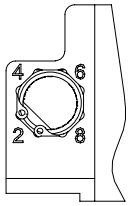
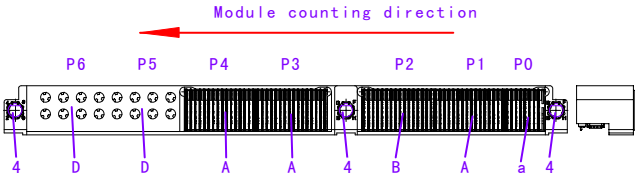
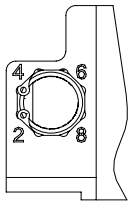
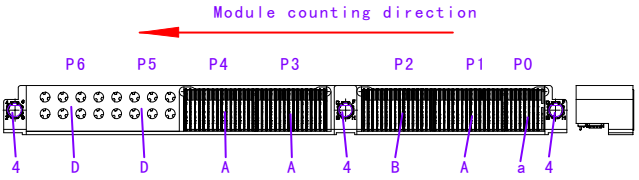
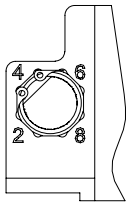
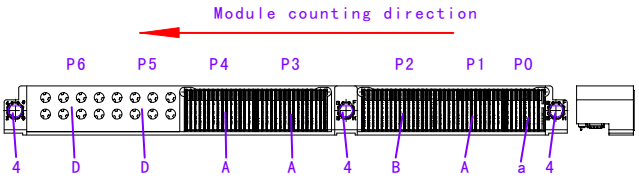
2. Feature

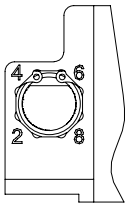
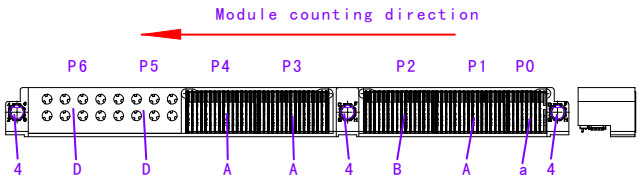
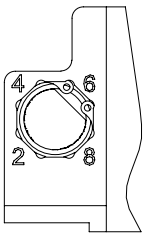
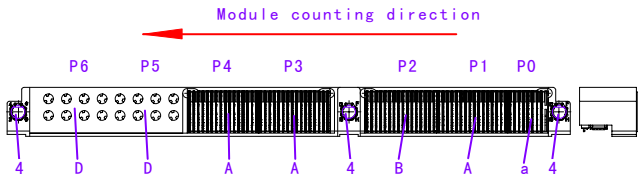
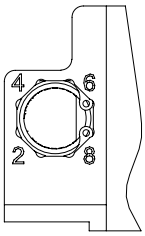
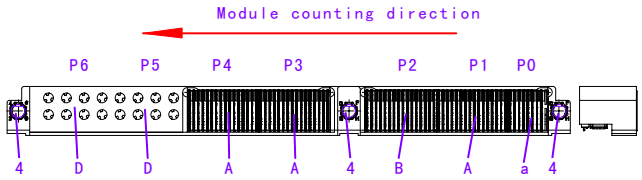
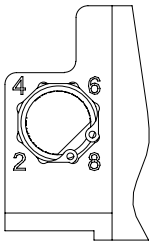
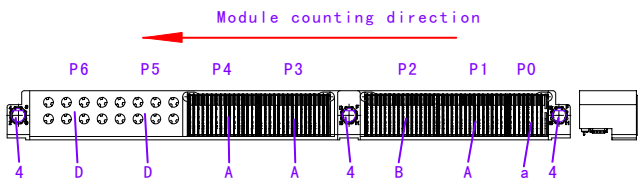
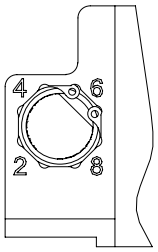
- Plug contacts are floating structure, ensures reliable connection.
- Rear mounting and remove, easy to be serviced.
- Can be used with same size RF contacts, can be mounted in same cavity.
- Insertion loss ≤1.0dB

3. Remove tool and method

The remove tool and method is the same with RF contacts. Please take care when pulling the optical fibers, do not pull it by force. This is to protect the optical fibers and the characteristics.

Leading key

Key code	Configuration	illustration	Remarks
0			Anti mis-mating key can be adjusted at site.
1			Anti mis-mating key can be adjusted at site.
2			Anti mis-mating key can be adjusted at site.
3			Anti mis-mating key can be adjusted at site.

4			Anti mis-mating key can be adjusted at site.
5			Anti mis-mating key can be adjusted at site.
6			Anti mis-mating key can be adjusted at site.
7			Anti mis-mating key can be adjusted at site.
8		In the order, don't need to write the anti mis-mating key position. The components are supplied separately. In using, customers can change the anti mis-mating key position according to need. Remarks: For those products that only the anti mis-mating keys are different, the type can be concluded in one part number, the key code use "8". This is to simplify the ordering process; the key can be adjusted in using.	

Leading components mounting

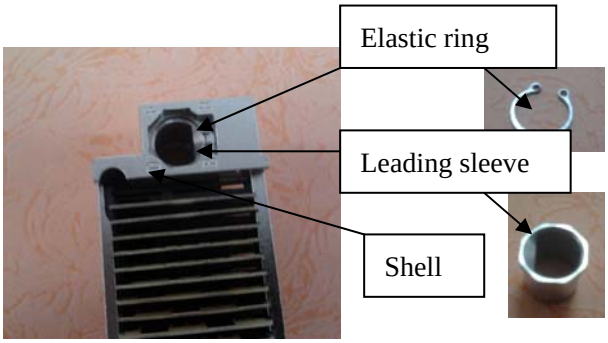
3U connector has 2 pairs of leading pins and sleeves; 6U connector has 3 pairs of leading pins and sleeves. Each pair has 8 keys to anti mis-mating. It means that each 3U connector type has 64 different configurations; each 6U connector type has 512 different configurations.

Each pair has 8 keys; the key should be same in using. It is to ensure that connectors can be mated correctly. As a result, the mounting of leading pins and sleeves is very important of connectors. Then we will introduce the mounting method of leading sleeves first, and leading pins mounting will be introduced in receptacle mounting illustration.

1. Plug leading sleeve mounting

1. Leading sleeve mounting

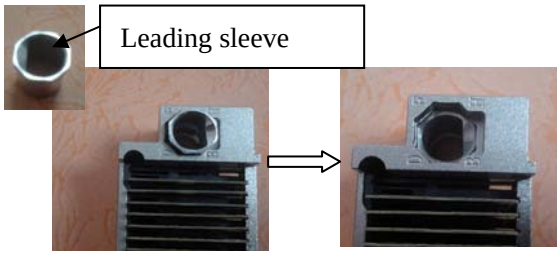
The leading sleeve is mounted on the plug, and be fixed by elastic ring. See the picture.



Mounting steps:

1）First confirm the connector key.

2）After the key is confirmed, put the leading sleeve into the plug hole, mount it to the correct place. Please note that the leading sleeve structure should be applicable with the shell structure. See the below picture.



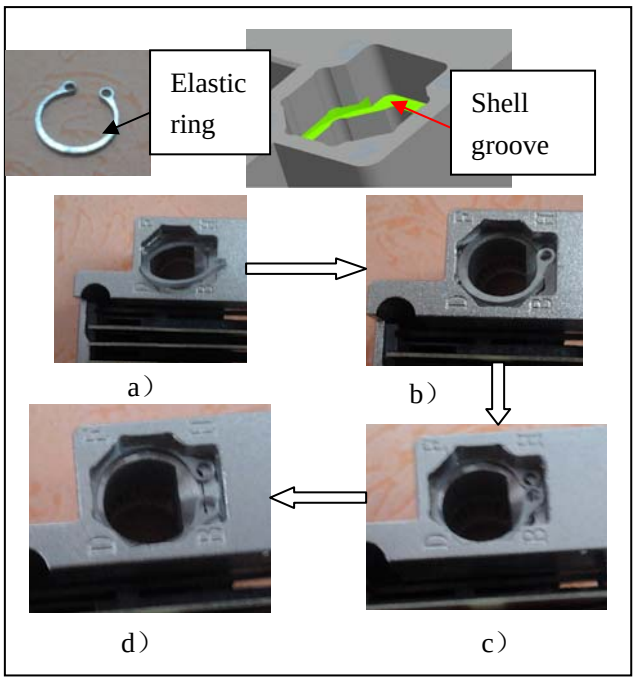
3）After the leading sleeve be mounted to the correct place, mount the elastic ring into the shell groove. In this process, please note that the elastic ring open direction should be according with the shell groove opening direction. The mounting steps are listed as below:

a）Put one end of the elastic ring into the shell, and keep the open direction the same with the shell groove open direction.

b）Add some force to mount most part of the ring into the shell.

c）Use the tool to crimp the elastic ring into the shell groove.

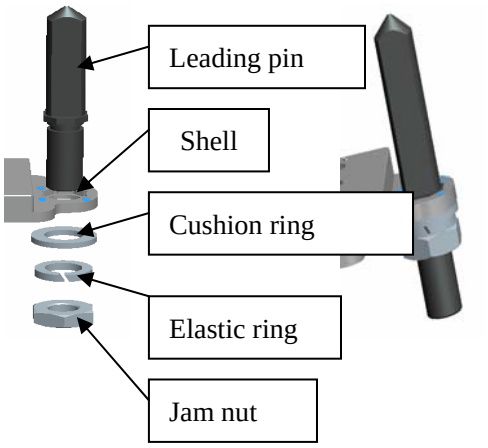
d）After the elastic ring be crimped into the shell, the two ends may be stagger because of the change of the shape. In this situation, adjust the position of the ring. (Use some tiny tools)



After this step, the leading sleeve mounting process finished. If customers need to change the leading sleeve key, use tools to get out the elastic ring. Change the key position and then repeat the above steps to mount the spare ring. The ring that removed from the shell will not be used again.

2. Leading pin mounting

In leading pin mounting, first customers need to confirm the leading pin key position (should be the same with the mated plug leading sleeve), and then mount the leading pin into the shell. Then put on the cushion ring and the elastic ring, tighten the jam nut. If customers need to adjust the key position, release the jam nut, and remove the leading pin from the shell, rotate the leading pin to the needed position and then mount it again. See the below picture.



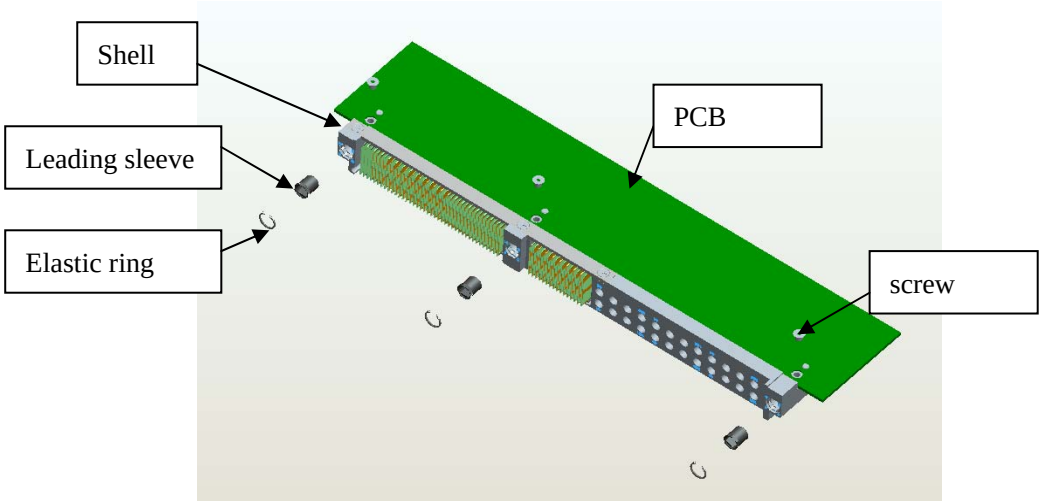
Connector mounting

Plug mounting

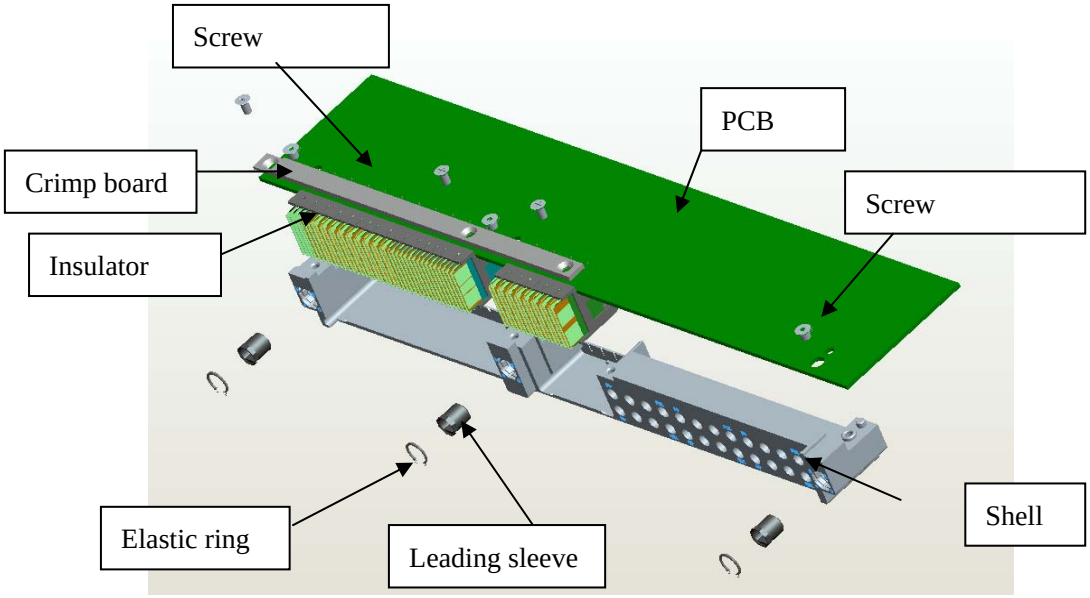
NKA series ruggedized connector plug mounting has two types:

The first one is to crimp the connector with the PCB, and then use screw (coat with clue), fix the PCB board with the shell, see picture 14. The details of mounting method and tools will be introduced later.

Another method is to crimp the connector insulator part with the PCB panel first, and then mount the crimped insulator as well as the PCB panel on the plug shell, use screw (coat with clue), fix the PCB panel with the shell, mount the crimp board at the end, use screw (coat with clue) to fix the crimp board with the shell. See picture 15.



Picture 9: plug mounting 1



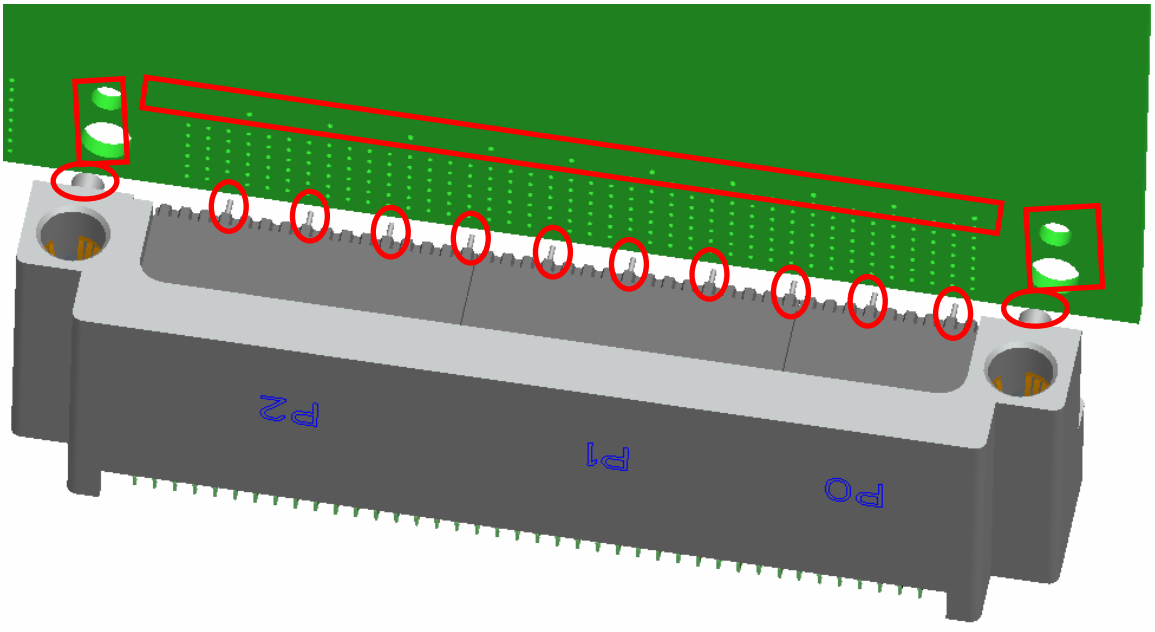
Picture 15: plug mounting 2

Connector mounting introduction

First: watch the structure

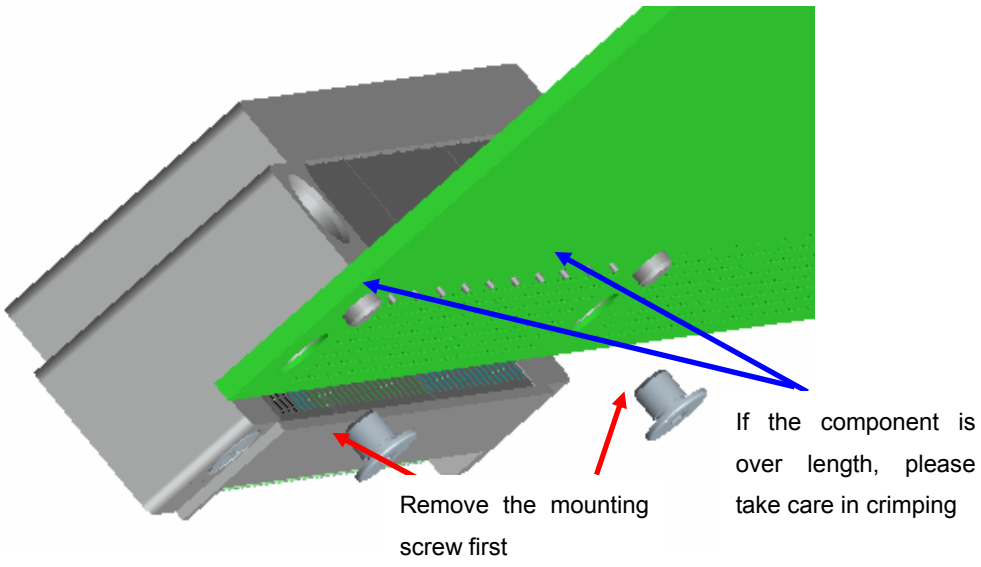
When get a NKA series plug, watch the structure, confirm the key point of mating between plug and PCB daughter board.

（1）The two side thread holes and leading studs on the plug shell（2）The locating pins on the plug module;（3）The contacts on the plug module. According to the key position requirement, mount the leading sleeves and washers on the connector first. See picture 16.

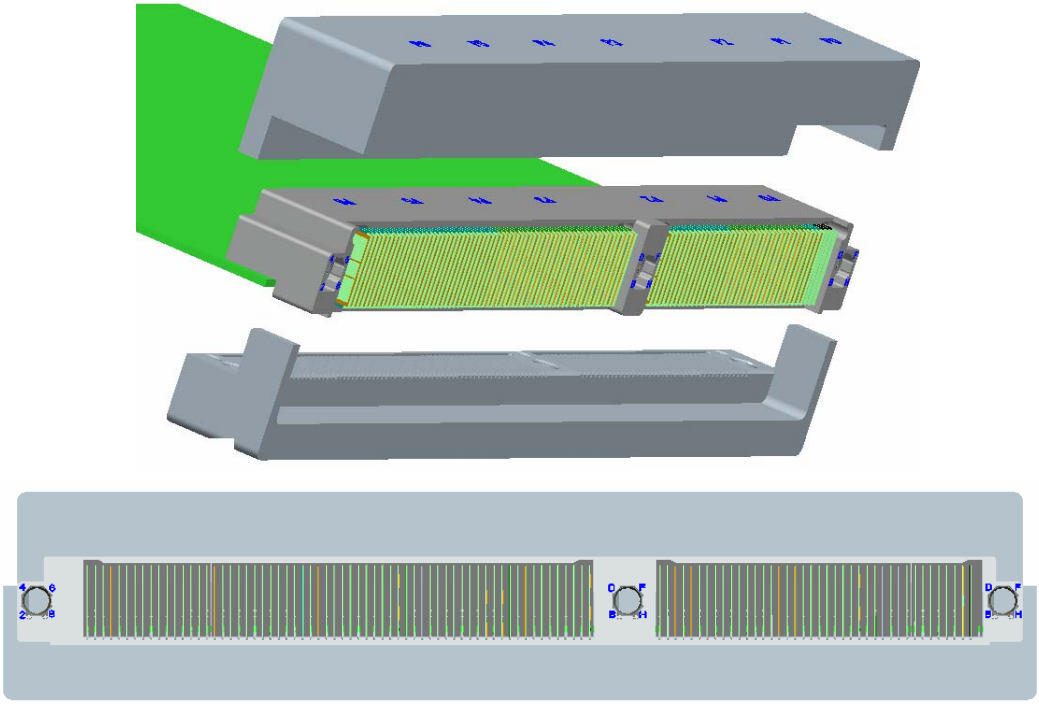


Picture 10: product structure

Second: first remove the mounting screw on the mating surface of the plug shell and the PCB board, and then test mounting of some important part of plug and PCB (forbid large force). After the parts are at the correct positions, add the force to mount the shell on the PCB panel. Then, check whether need a washer according to the daughter board thickness (inner leading pin extend the connector 2.5mm, plug shell leading stud extent the connect surface 2.7mm. If PCB daughter board thickness ＜2.5mm, the leading pin and stud will have some rest length behind the PCB board. If the PCB daughter board thickness is between 2.5mm and 2.7m, only leading stud has rest length behind the PCB panel. If this happens, please take care in crimping process, not to hurt the leading pin and stud). See picture 17. If there isn't any suitable tool, customers can choose our company tools, special for mounting (for 3U cushion board type: NKA-3UT-DianBan；for 3U crimp board type: NKA-3UT-YaBan；for 6U cushion board type: NKA-6UT-DianBan；for 6U crimp board type: NKA-6UT-YaBan). See picture 18 for mounting tool illustration.



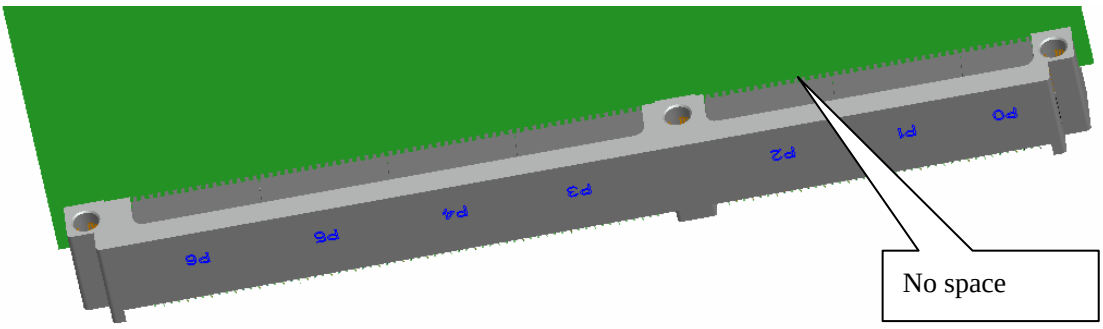
Picture 11: Product mounting

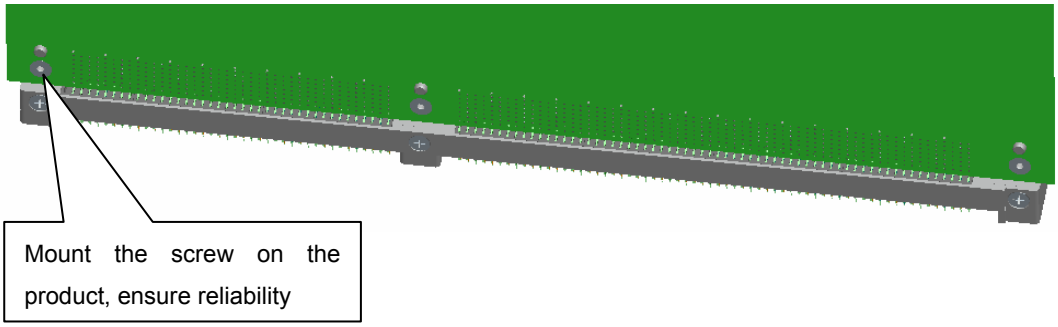


Picture 12 Mounting process

Third: Crimping

After the above steps (take care of the mechanism that is beyond the PCB board, usually add cushion board and crimp board), put it under the pressure machine to crimp it. First time crimping, set the pressure value at the minimum (≤0.2×n Mpa, “n” means the module number, single RT2 connector module applicable to 0.2Mpa, the total pressure can be worked out according to the module number), and then adjust the pressure gradually to the effective value, record the effective value; it can also provides reference for same series products other types. After crimping, check the quality; ensure that there isn’t any space between connector and PCB. Behind the PCB panel, coat the screw with some glue, and then mount it on the shell, then the crimping process finish. See picture 19.

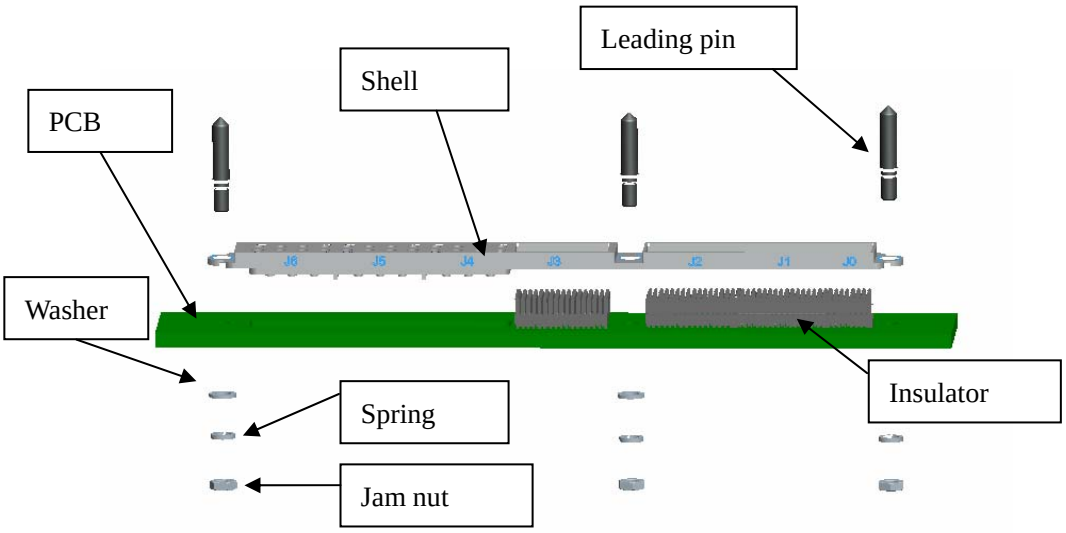




Picture 13: Mounted products

Receptacle mounting:

NKA series receptacle mounting steps is listed below: first crimp the insulator on the PCB panel, then mount the shell with the insulator, at last mount the leading pin, fix it with jam nuts. See picture 20.

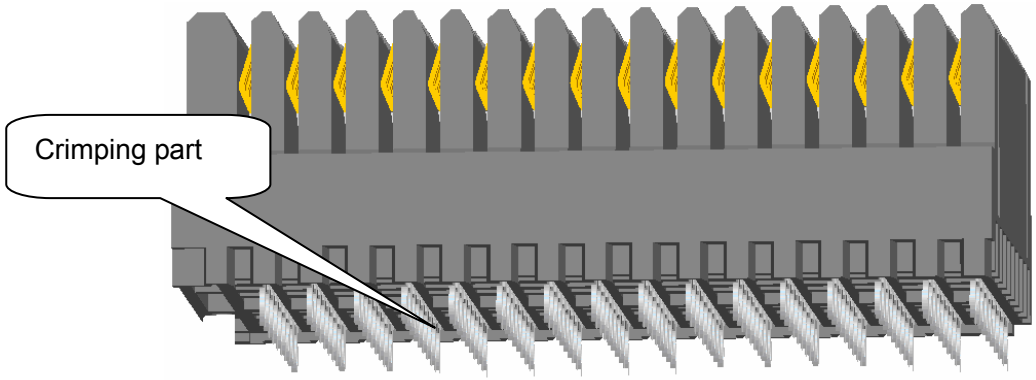


Picture 14: Receptacle mounting

Mounting steps:

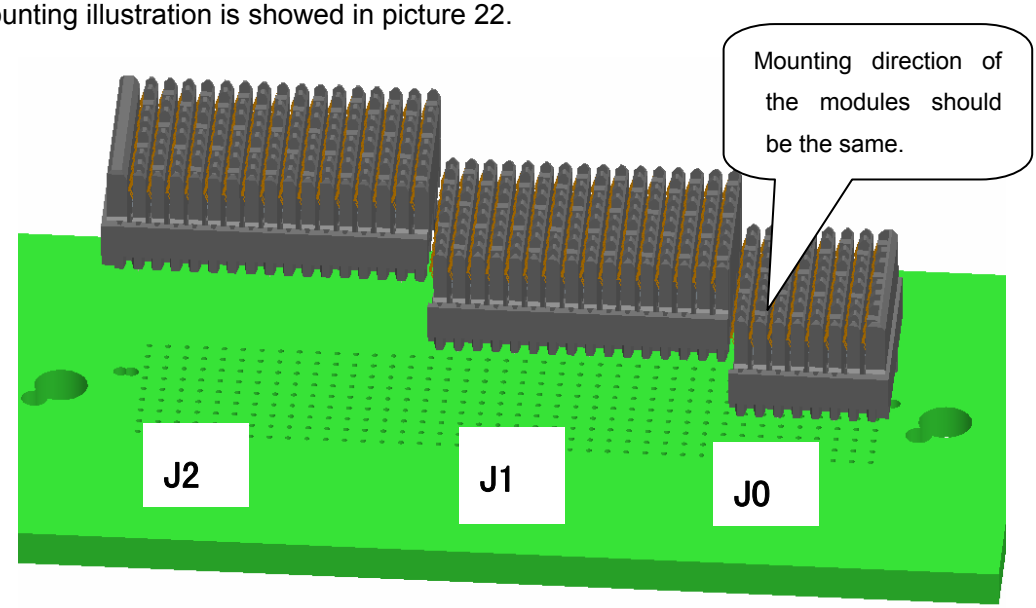
First: watch the structure, confirm the mounting type

When get a NKA series receptacle, watch the structure, the pin beyond insulator 1.62mm, if the PCB thickness ＜1.62mm, need to add a cushion board behind the PCB panel, or the product may be hurt in mounting. Picture 21 shows the connector inside module.



Picture 15: Module structure

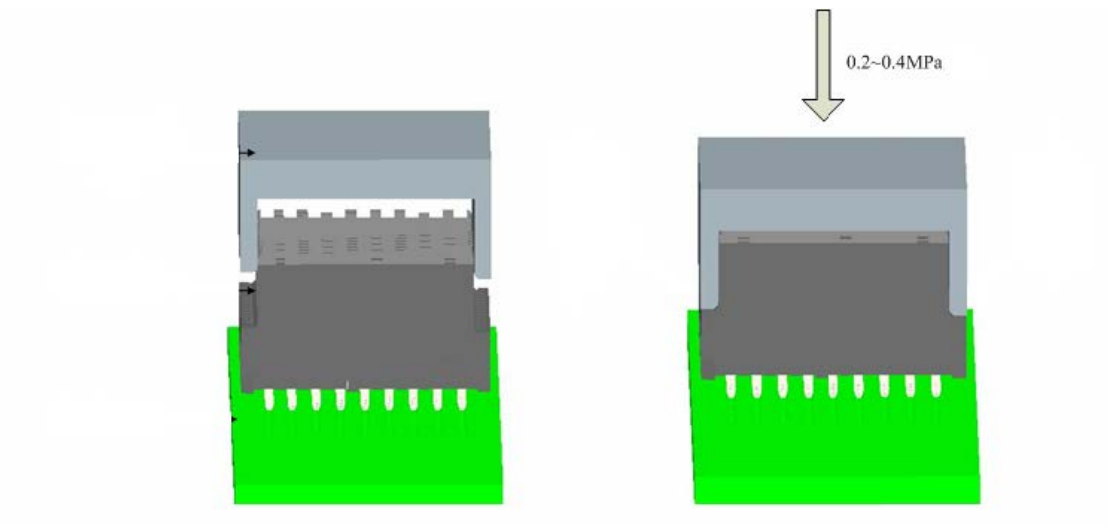
Restricted by the structure, the receptacle can't be designed into integrated structure, so it is packed separately, including the shell, leading components and modules. As a result, the receptacle mounting is a little different with plug mounting. Customers please don't change the module sequence after receiving it. Each module mounting accords the sequence from J0 to J6. The mounting illustration is showed in picture 22.



Picture 16: Product mounting illustration

Second: Test mounting

Put each module on the PCB panel at the correct position, and then use suitable tool to protect the connectors from being destroyed. If there isn't any suitable tool, customers can choose our company tools, special for mounting (single module mounting tool P/N: NKA-ZGJ; multiple modules mounting tool P/N: NKA-ZGJ-1). When using our special tools, please note that not to leave any space between the tool and the product, or the product may be damaged in crimping. The tool illustration is showed in picture 23.

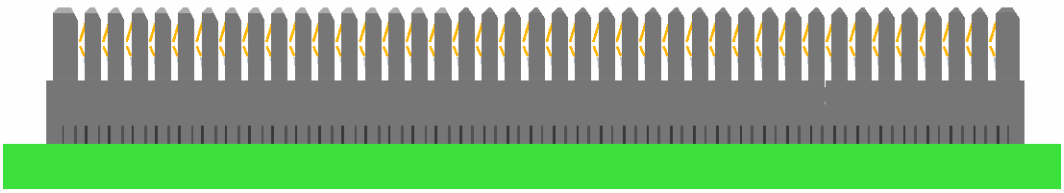


Picture 17: crimping tool illustration

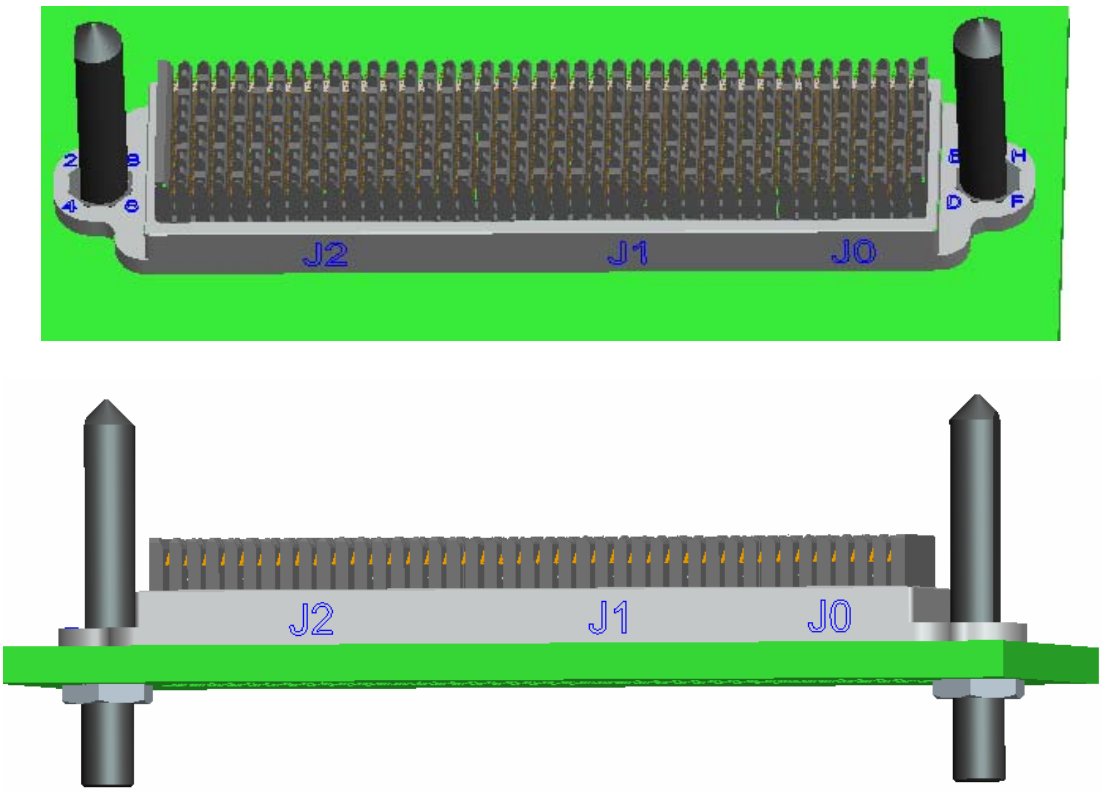
Third: test crimping

After the above steps (take care of the mechanism that is beyond the PCB panel, usually add cushion board and crimp board), put it under the pressure machine to crimp it. First time crimping, set the pressure value at the minimum (≤0.3×n Mpa, “n” means the overall module number, single connector module applicable to 0.3Mpa, the total pressure can be worked out according to the module number), and then adjust the pressure gradually to the effective value, record the effective value; it can also provides reference for same series products.

After crimping, check the quality; ensure that there isn’t any space between connector and PCB. The mounting illustration is showed in picture 24. At last, mount the receptacle shell and leading components on the PCB panel, keep the leading pin configuration same with the plug leading sleeve configuration, or the plug and the receptacle can’t be mated (If the configuration is different with plug, we suggest to change the receptacle configuration). The mounted product is showed in picture 25.



Picture 18: receptacle insulator mounting



Picture 19: Mounted receptacle

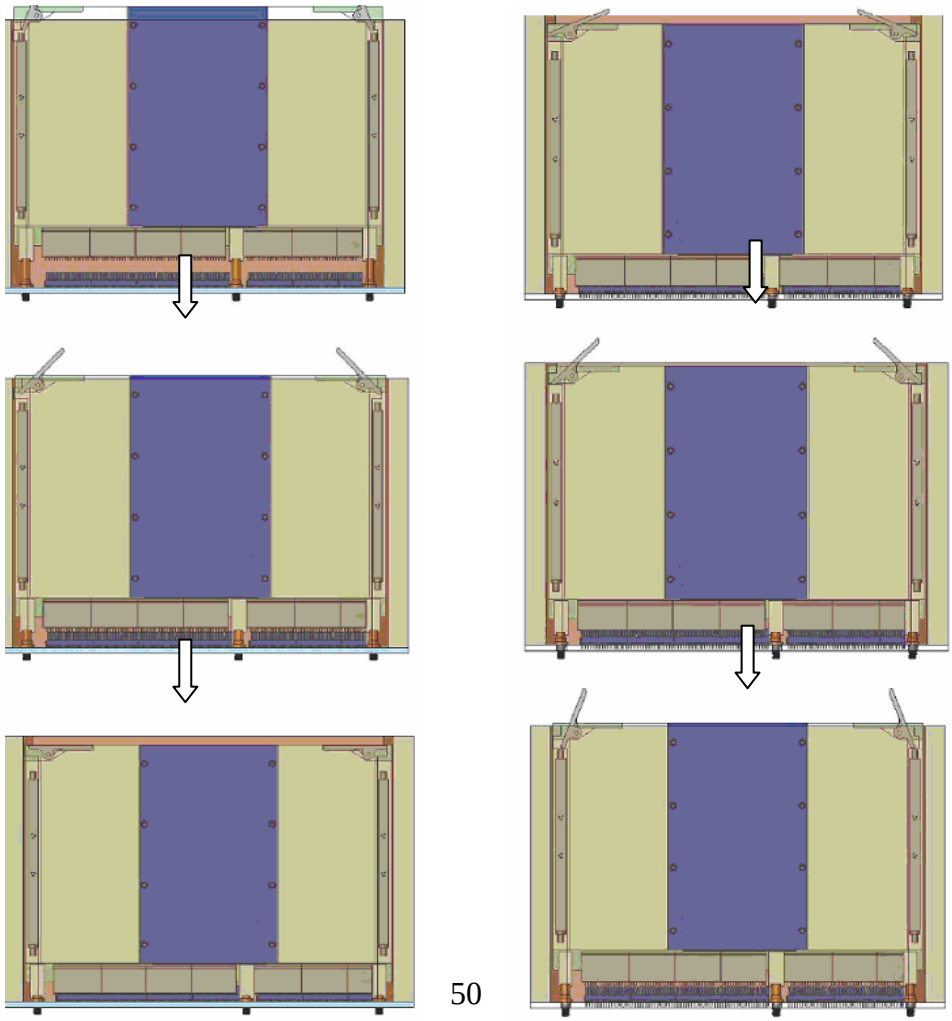
Points for plug and receptacle mating

After the high speed part be crimped into the PCB panel, optical and RF contacts be mounted, then it comes to the step to mate the plug and the receptacle, as well as the PCB and module match relation. Below are some points that need to be noticed:

1. Module insertion and remove sequence

To insert or remove the module, need an extraction tool. See the below picture. In inserting, plug module leading sleeve contact with the mother board receptacle leading pin, position the connector, and then the extraction tool worked with the extraction groove on the cabinet, crimp the module into the cabinet. Until the extraction tool reaches the restricted position, the module is mated to the correct position. In removing, the steps are contract to inserting.

In inserting process, please note that use the leading component to position the connector first, and then use the extraction tool and add force. It is to avoid wrong position of connectors that may hurt the contacts.

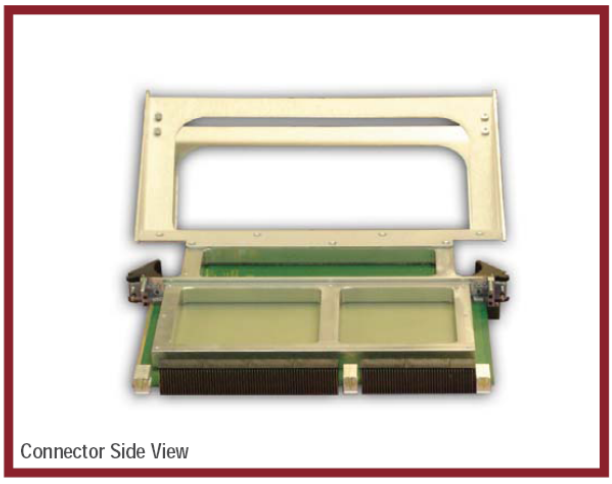


2. Interval problem of the plug and the receptacle after mating

Because of the tolerance between the modules and the cabinet, after the module and cabinet mated, the connector may not be at the correct position; there may be some interval between the plug and the receptacle. Apart from that, over mating should also be avoided and a matching interval is need in designing. According to VITA standard, the interval of plug and receptacle mating should ≤ 0.5mm; please note it in cabinet design.

3. Daughter mounting problem

Restricted by the contact type, this series connectors insert and remove force is larger than common wire spring socket connectors. Moreover, NKA series connectors have more cores. According to VITA standard, if there isn't any front cover or back cover, the extraction tool can be mounted directly on the PCB panel. In inserting and removing, the PCB panel bears a large force. The standard 6U board is 160mm×233.35mm, PCB panel thickness is only 1.6mm~3.05mm, as a result, the PCB panel may be out of shape in inserting and removing. And that may cause un smoothness in inserting and removing, or connectors not be mated to the correct position. So please ruggedize the PCB in structure design if there is no cooling board, it is meant to protect the PCB and ensure the mating.

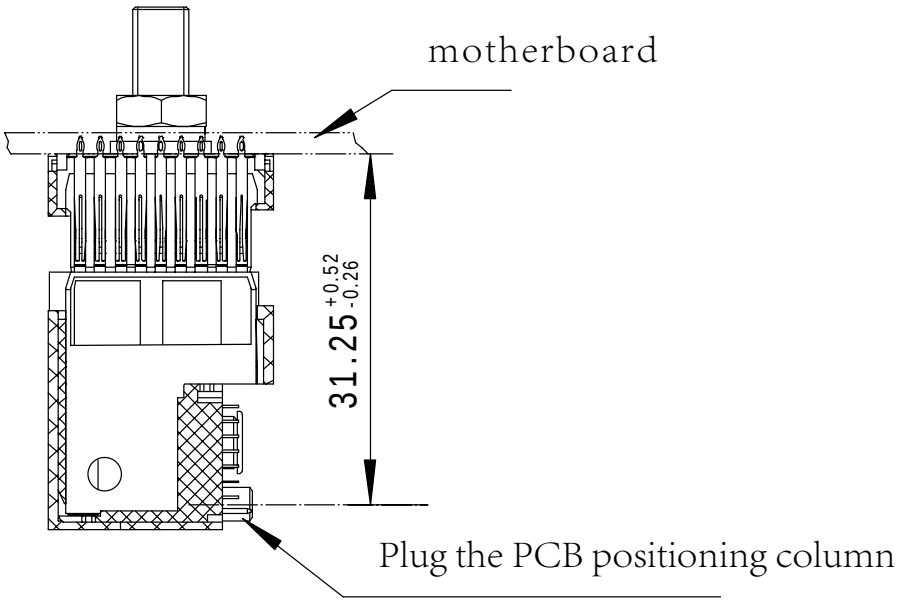


Connector Side View

Apart from that, there are many types of extraction tools that are according with VITA standard. We suggest choose overseas products and metal links.

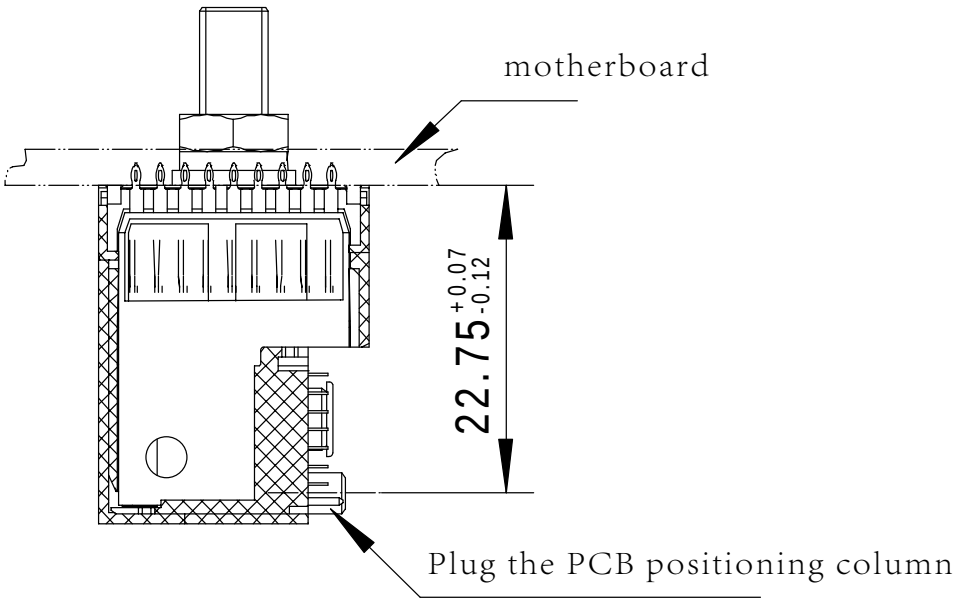
4. Connectors mated and unmated dimensions (only for contacts, not the leading components)

1）Connectors unmated



Picture 20: Connectors unmated

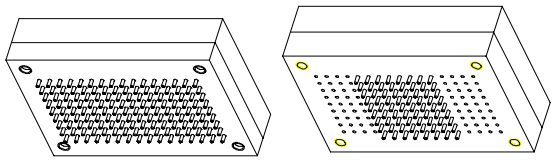
2）Connectors mated



Picture 21 Mated dimension

Remove of connector high speed part

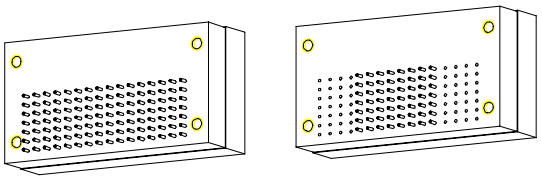
For NKA series module ruggedized mixed connectors, the high speed part is stitched with the PCB panel. It is achieved through the high strength elastic structure of the connector contacts. If any one of the modules has problem, customers can use a remove tool to remove it (Once the product is removed, it can't be used again. But the PCB can still be used). The remove tool is selected according to different panel thickness and module list number. Operation step: first adjust the pins with the tubes from the back side of PCB, and then put it under a pressure machine to stitch it. After stitching, get out the connector first and then the tool, this can protect the PCB tube from being hurt.



RT2-2.5ZGJ-16（2.5mmPlate thickness 16-pin socket connector removal tool)

RT2-2.5ZGJ-8（2.5mm8-pin socket connector removal tool)

Picture 22: Remove tool for 2.5mm thickness backplane receptacle



RT 2-2.5TG J-16（2.5mmPlate thickness 16-pin plug connector removal tool)

RT2-2.5TGJ-8（2.5mm 8-pin plug connector removal tool)

Picture 23: Remove tool for 2.5mm daughter board rear plug

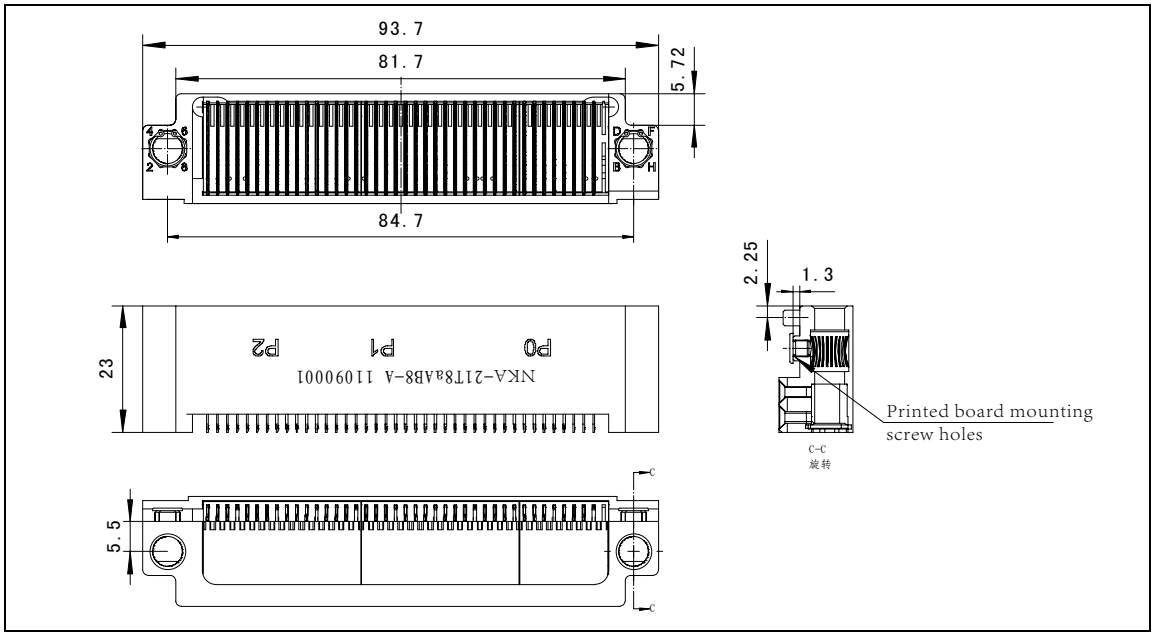
Applicable remove tool types:

P/N	Applicable PCB thickness and insulator type
RT2-2.5TGJ-8	1.5～2.5mm thickness daughter board, 8 lists plug insulators
RT2-2.5TGJ-16	1.5～2.5mm thickness daughter board, 16 lists plug insulators
RT2-2.5ZGJ-8	1.5～2.5mm thickness backplane, 8 lists receptacle insulators
RT2-2.5ZGJ-16	1.5～2.5mm thickness backplane, 16 lists receptacle insulators
RT2-3.5TGJ-8	2～3.5mm thickness daughter board, 8 lists plug insulators
RT2-3.5TGJ-16	2～3.5mm thickness daughter board, 16 lists plug insulators

RT2-4.5ZGJ-8	2.5～4.5mm thickness backplane, 8 lists receptacle insulators
RT2-4.5ZGJ-16	2.5～4.5mm thickness backplane, 16 lists receptacle insulators
RT2-4.5TGJ-16	3.5～4.5mm thickness daughter board, 16 lists plug insulators
RT2-4.5TGJ-8	3.5～4.5mm thickness daughter board, 8 lists plug insulators
RT2-5.5ZGJ-16	4～5.5mm thickness backplane, 16 lists receptacle insulators
RT2-5.5ZGJ-8	4～5.5mm thickness backplane, 8 lists receptacle insulators

Outline dimensions

[NKA-21T8aAB8-A]



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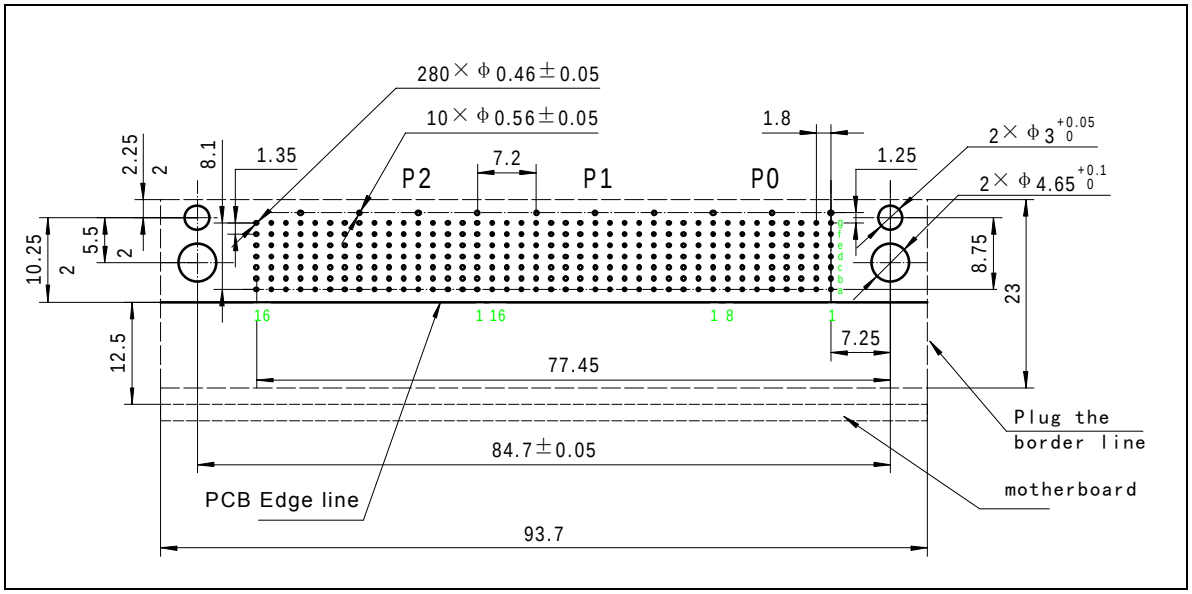

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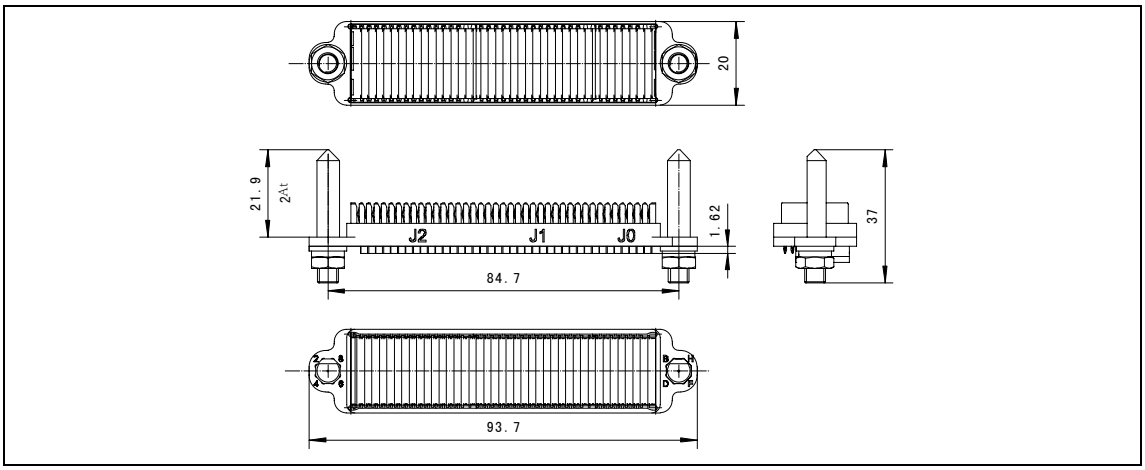

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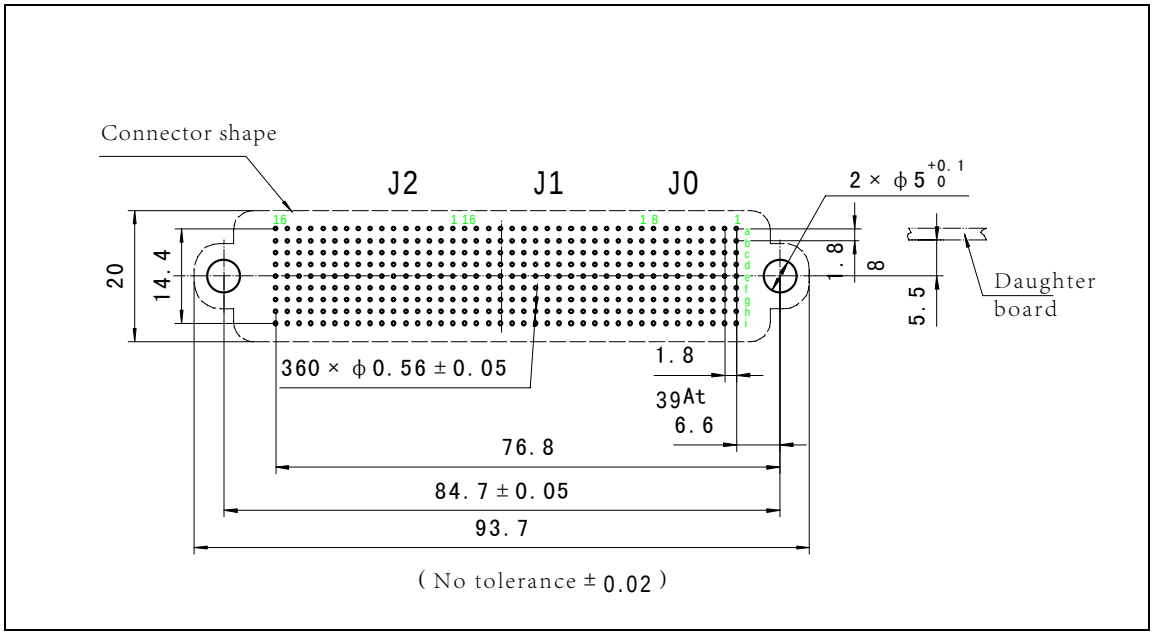

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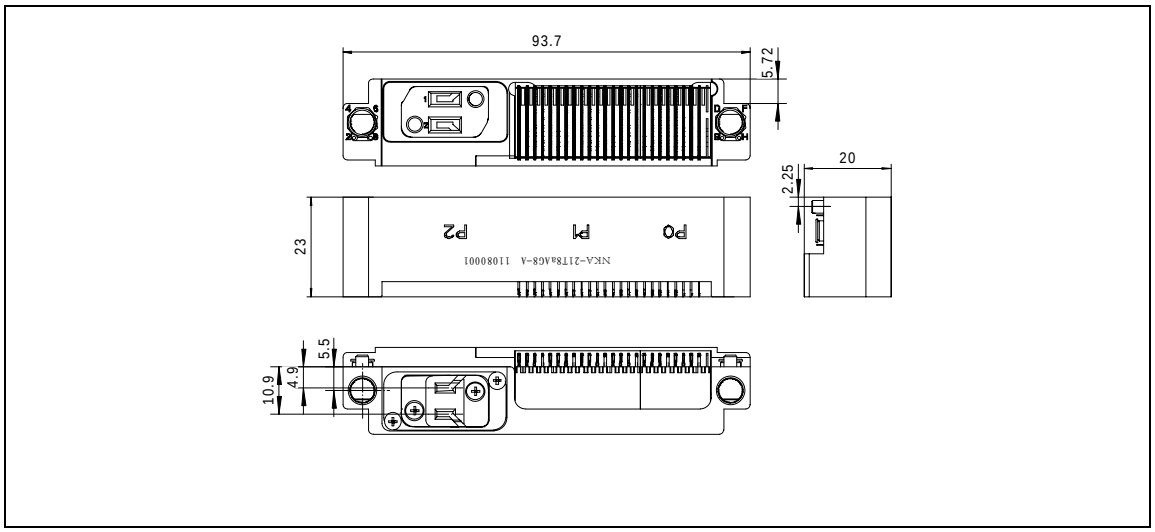

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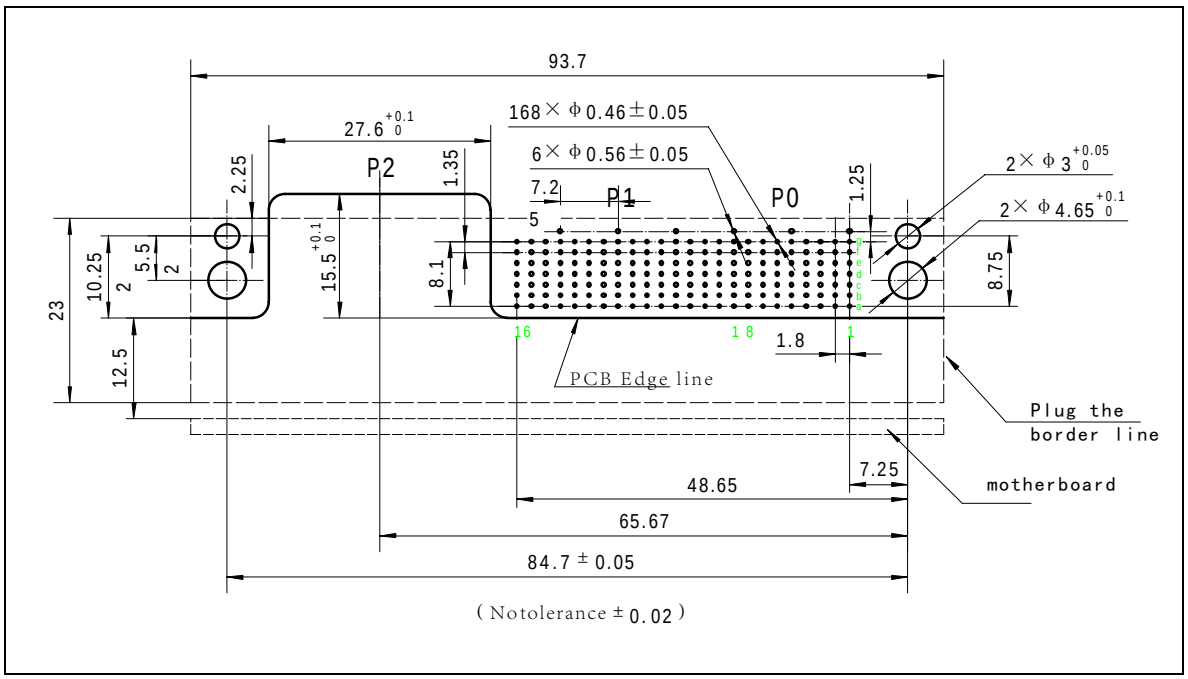

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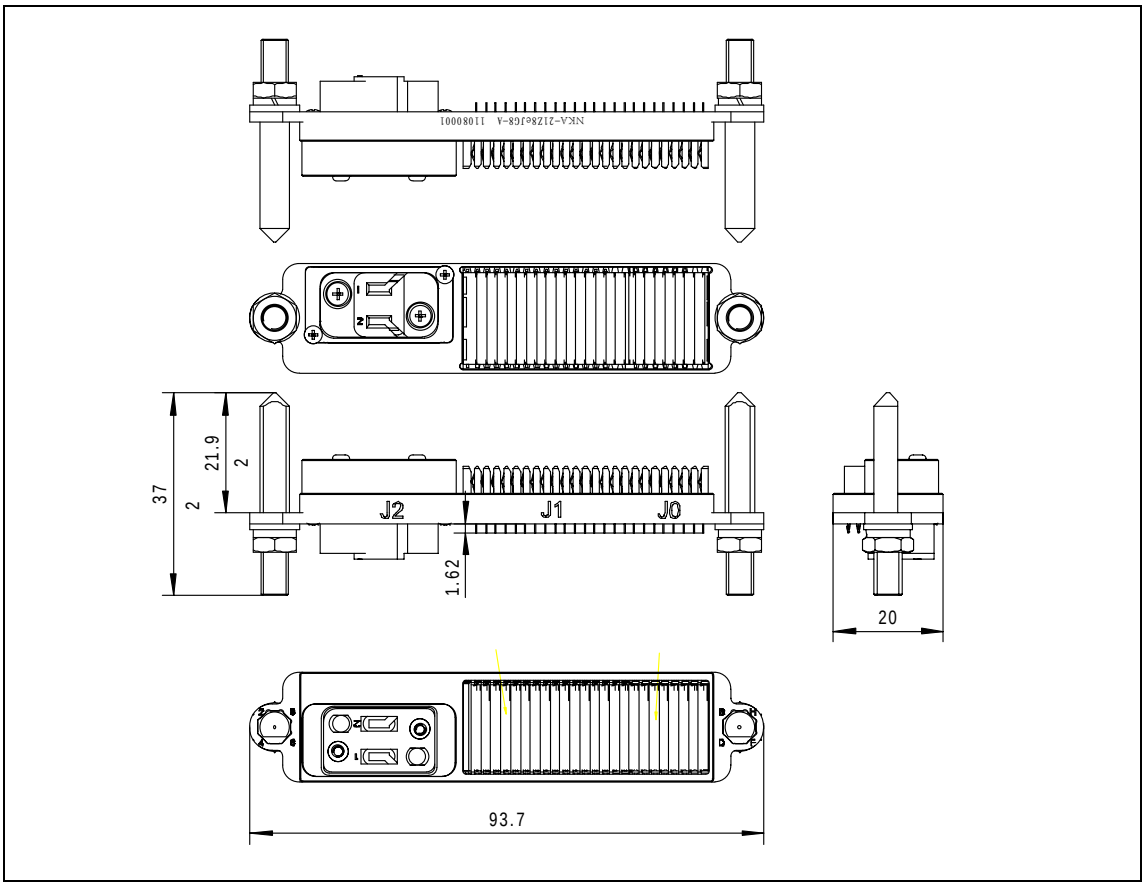

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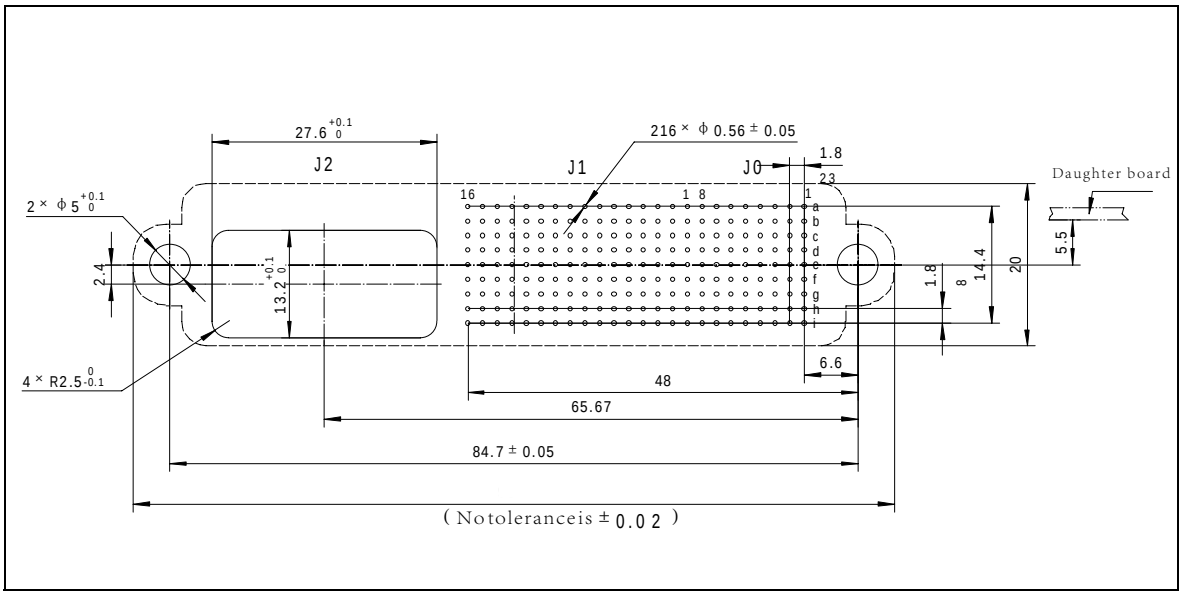

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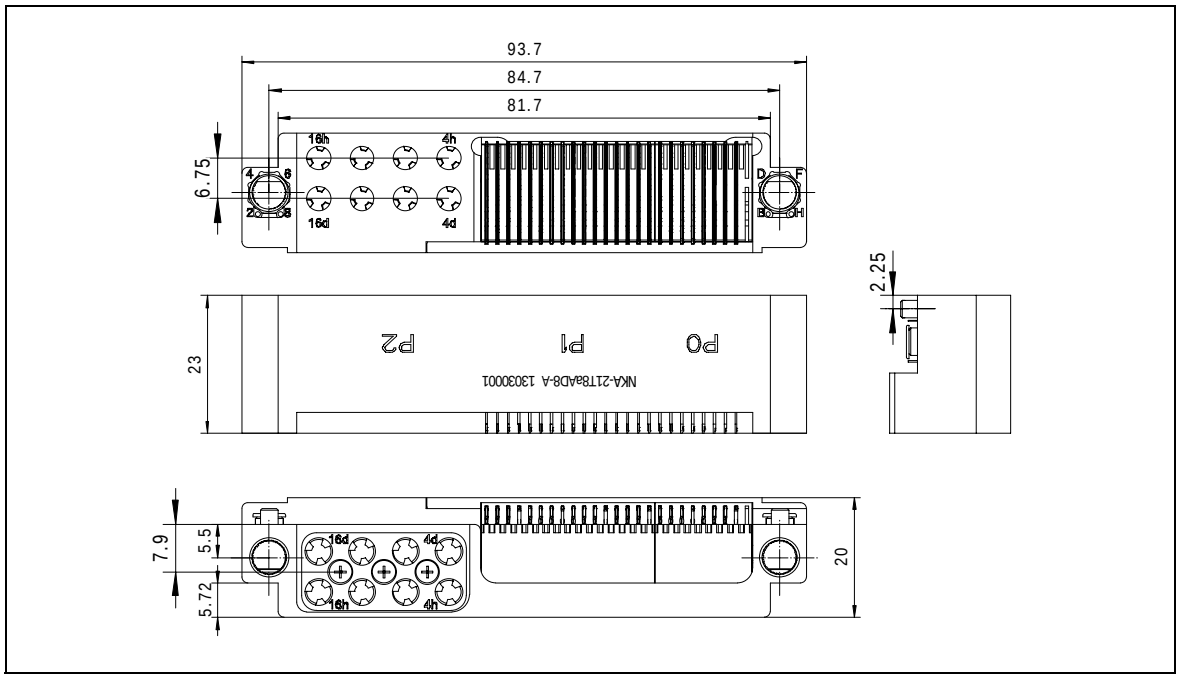

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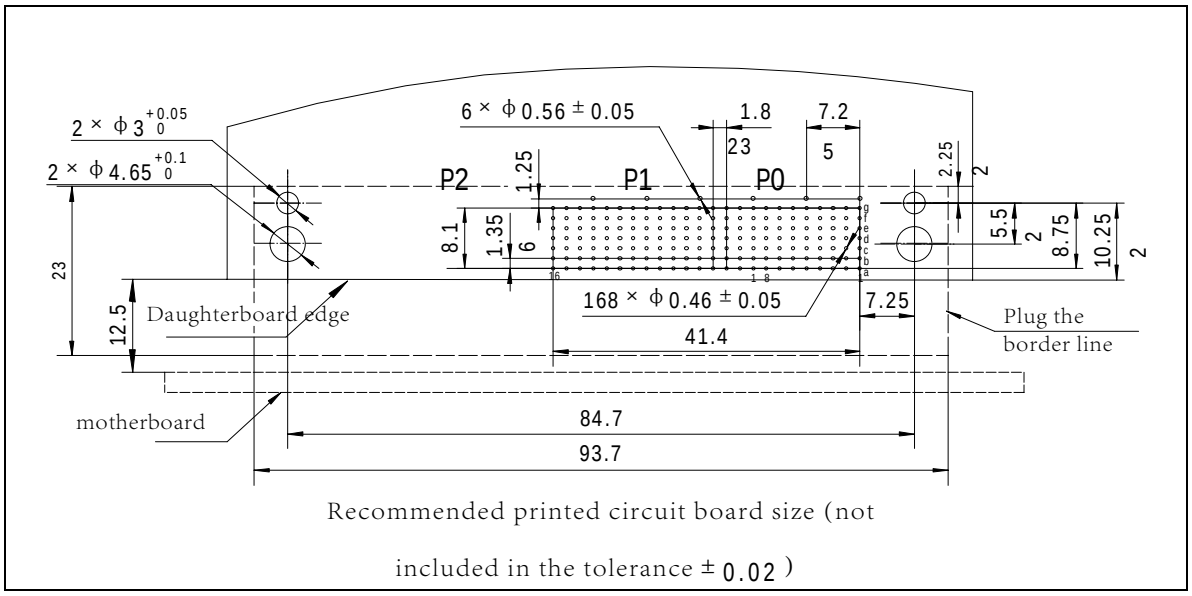

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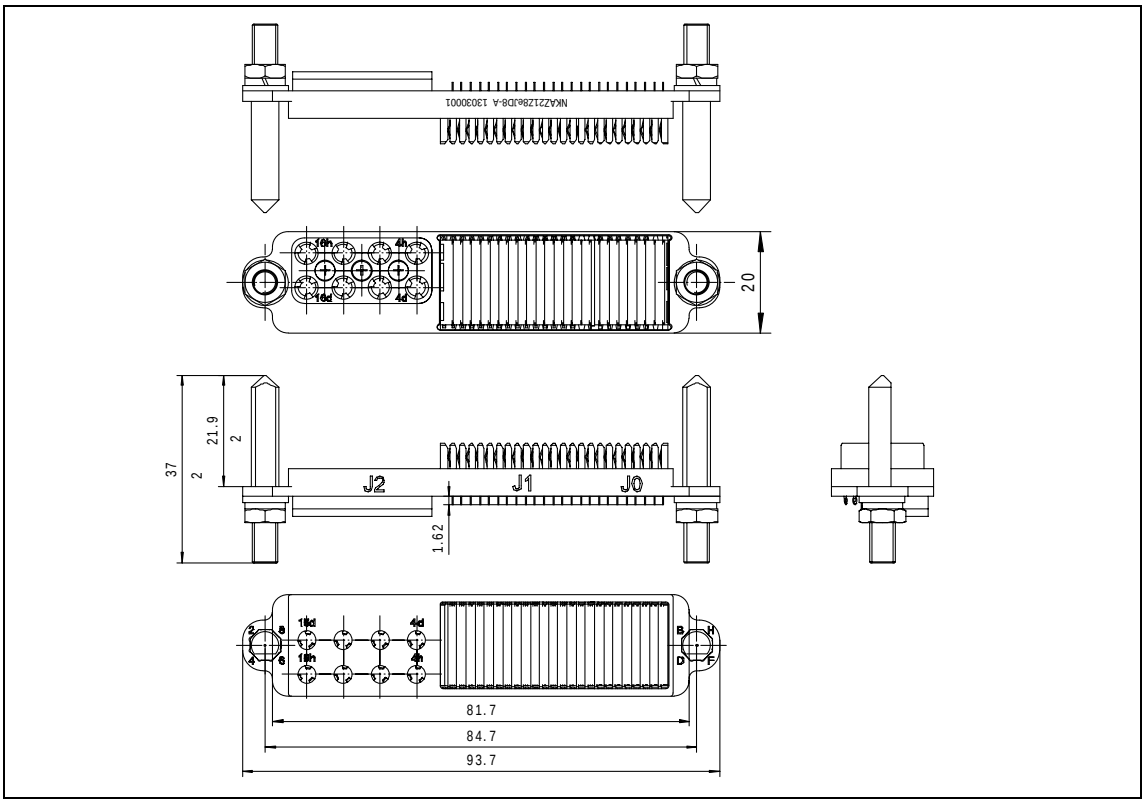

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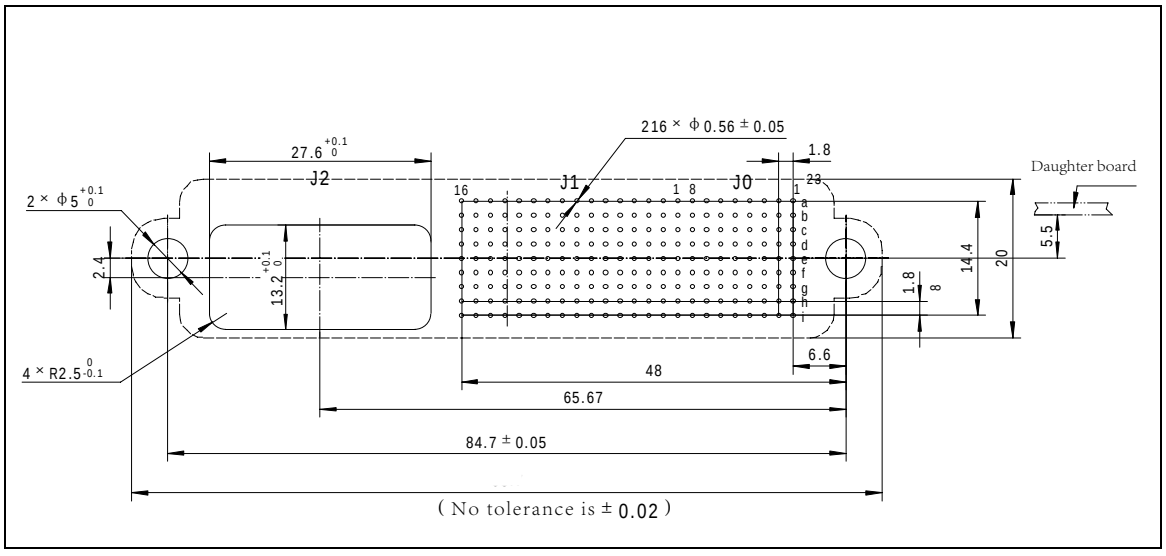

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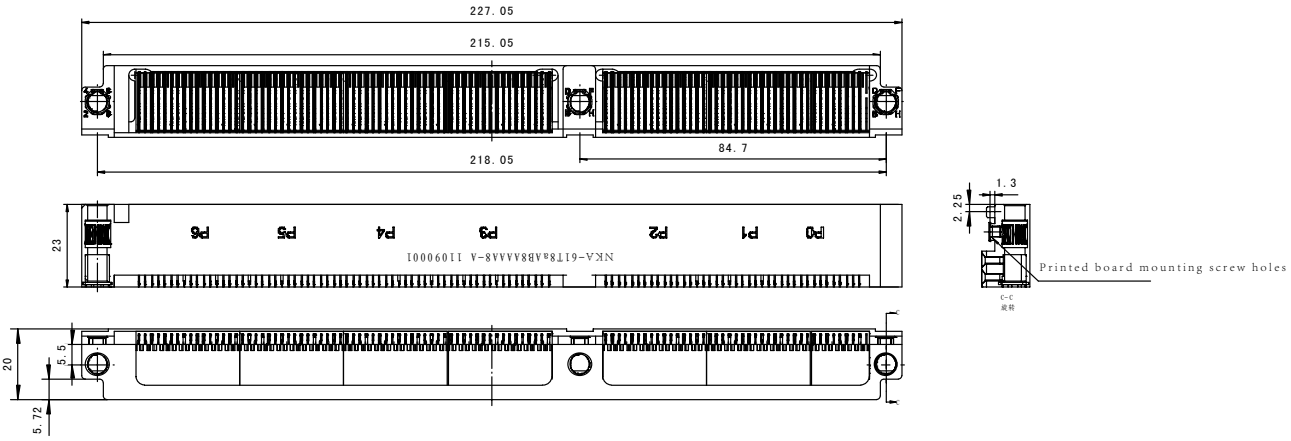

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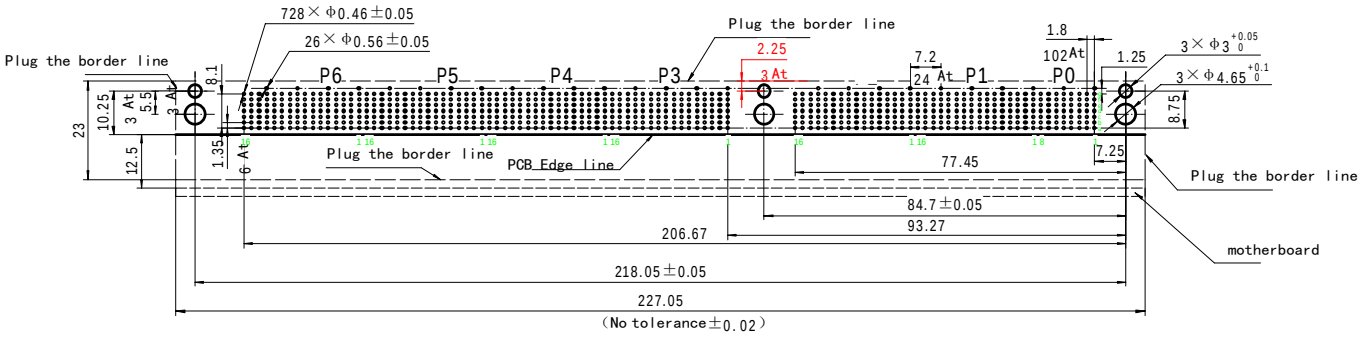

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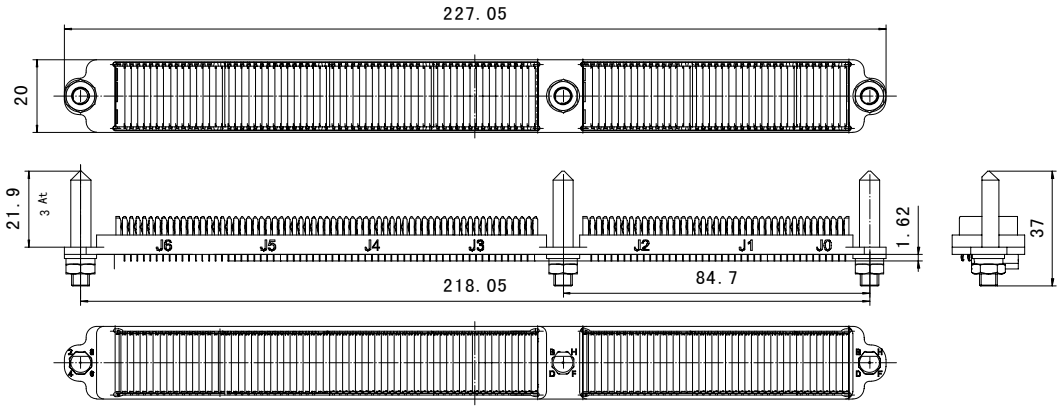

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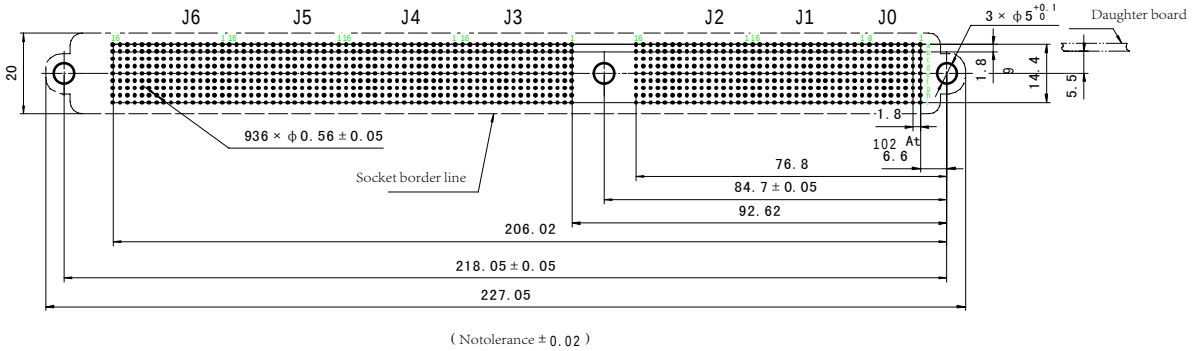

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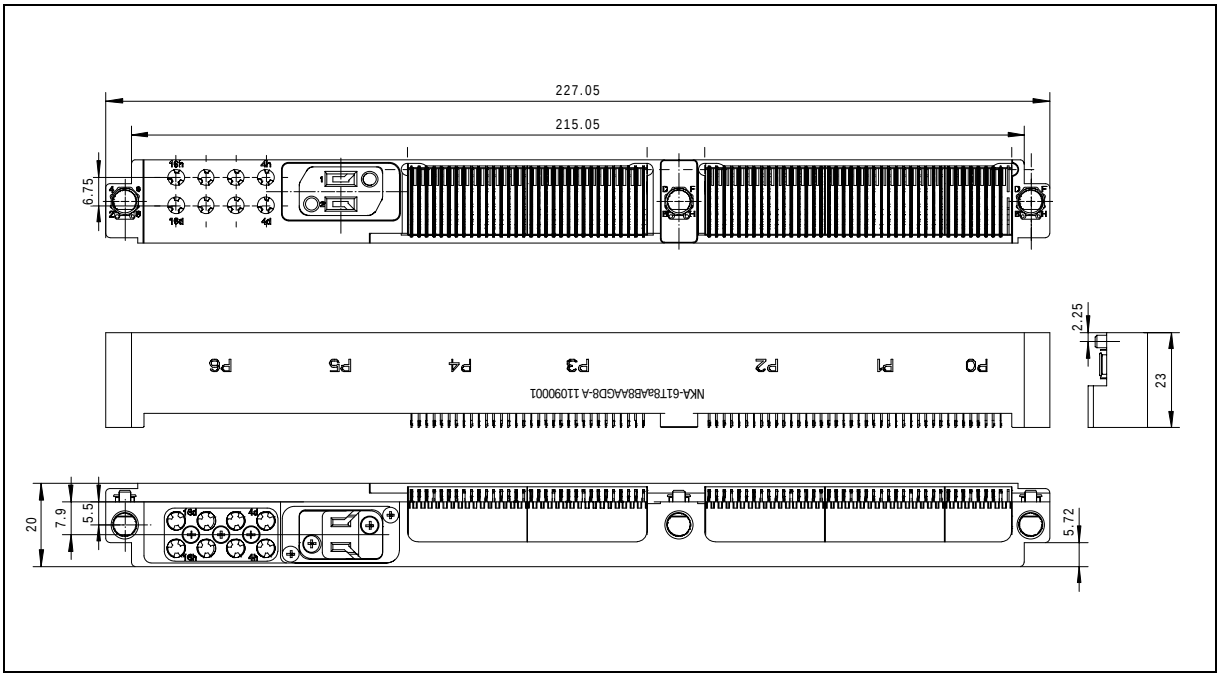

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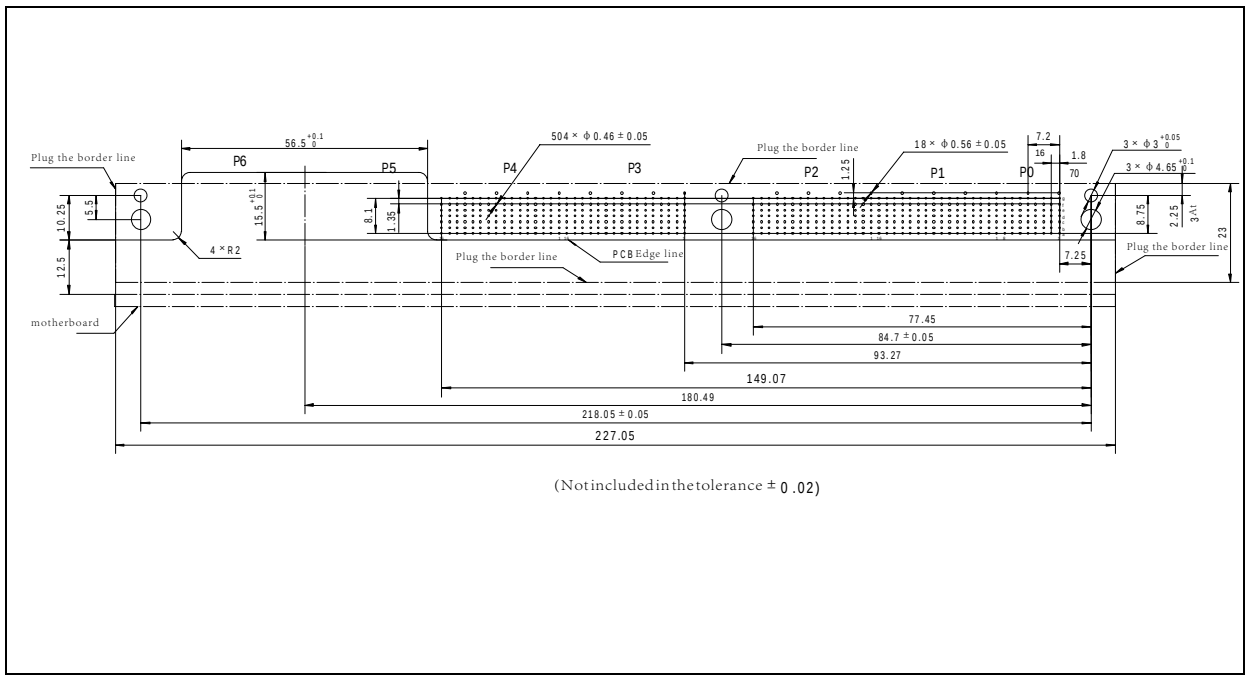
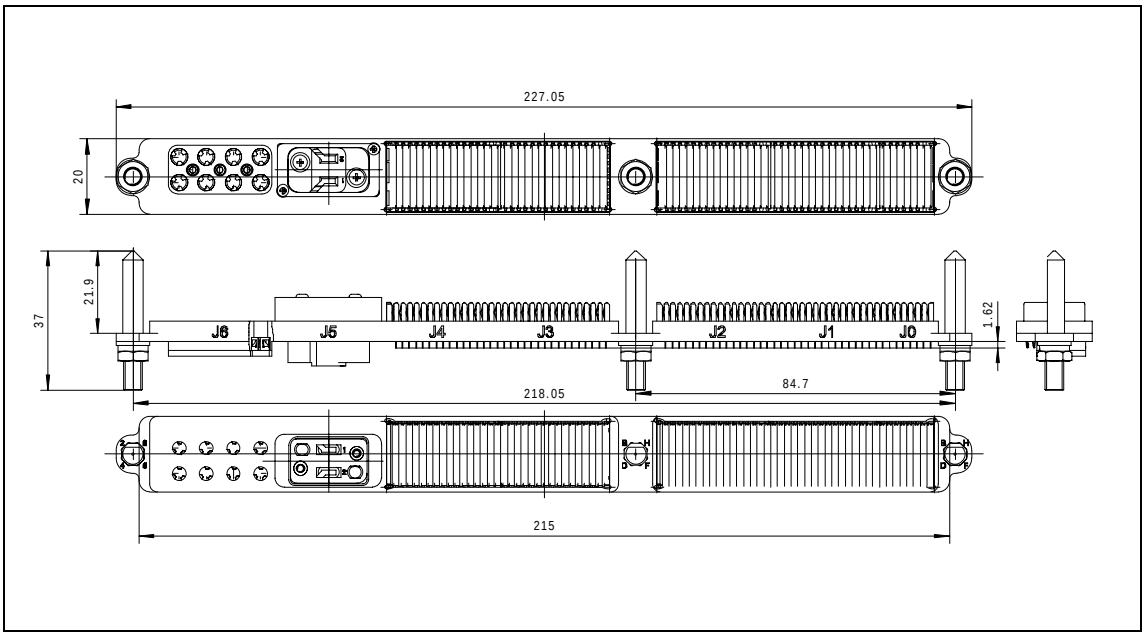
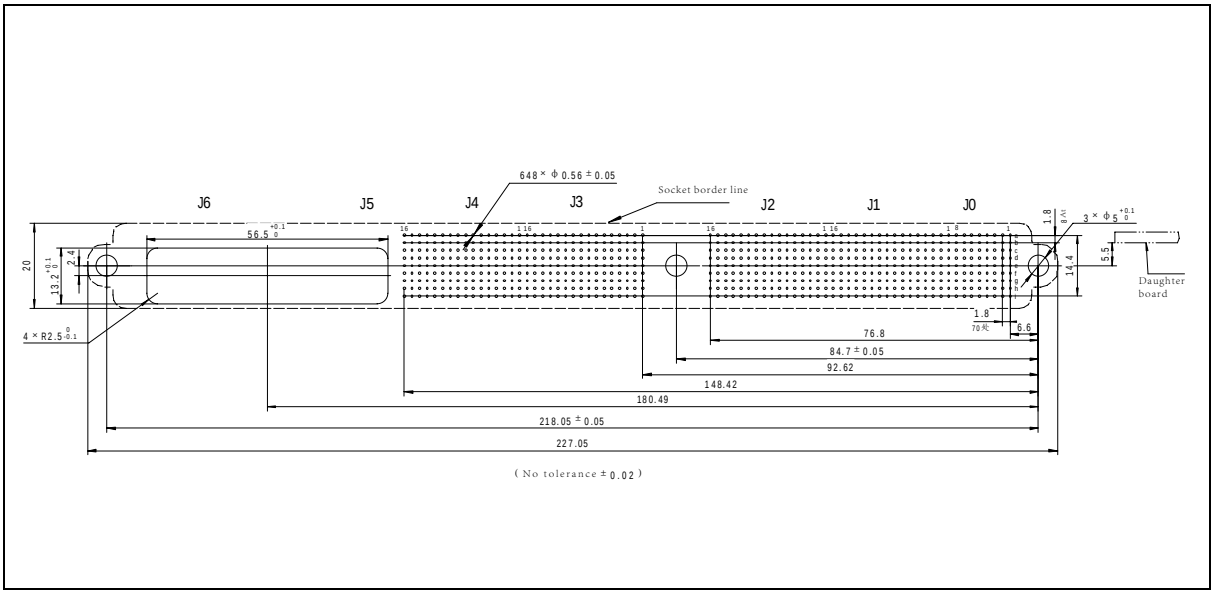


[NKA-61Z8eIJ8IJGD8-A]

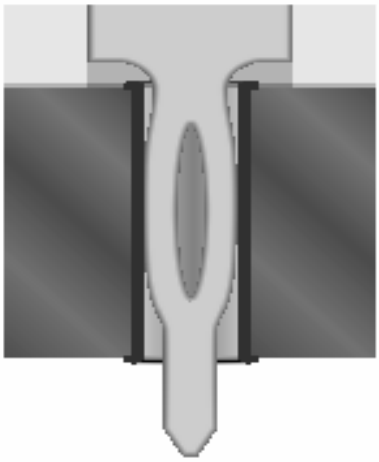


[NKA-61Z8eIJ8IJGD8-A]



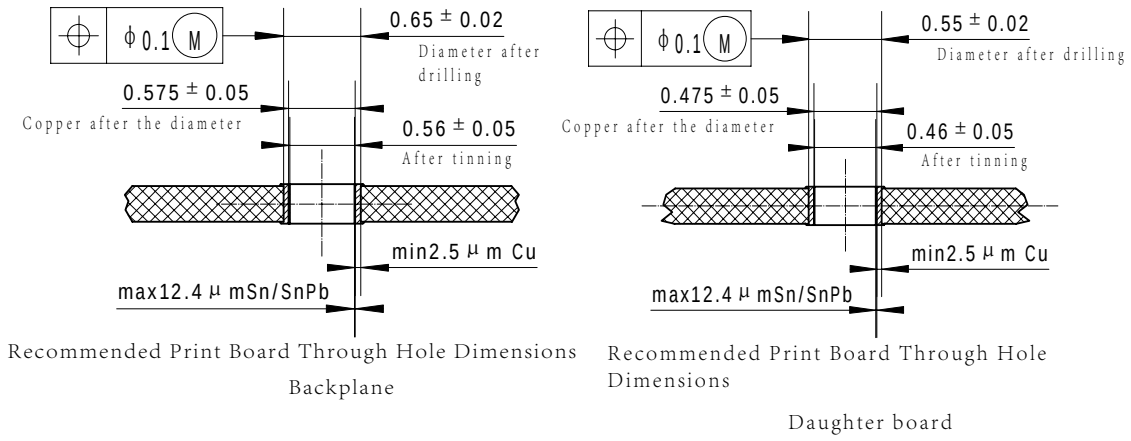
PCB panel cut-out plating structure

NKA series contacts are stitching structure, the feature is that the contact shape can be changed and recovered. As a result the contacts can be moved repeatly, and the performance will not be hurt.



Picture 24: PCB cut-out plating non-soldering area

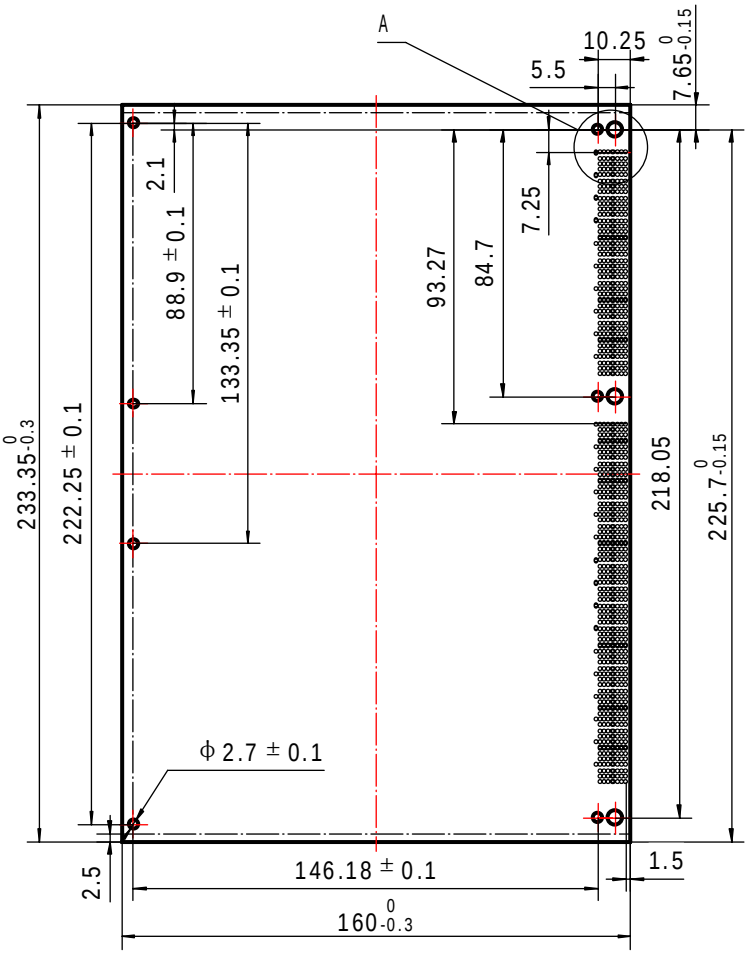
PCB cut-out plating structure, see the below picture:

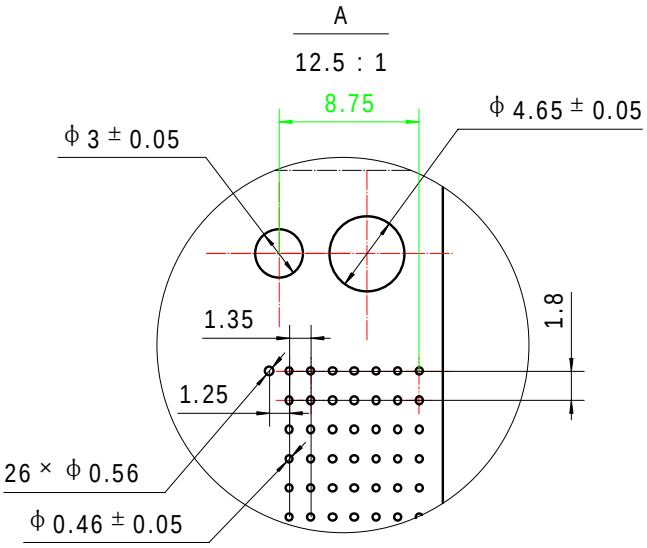


Picture 25: PCB cut-out plating structure

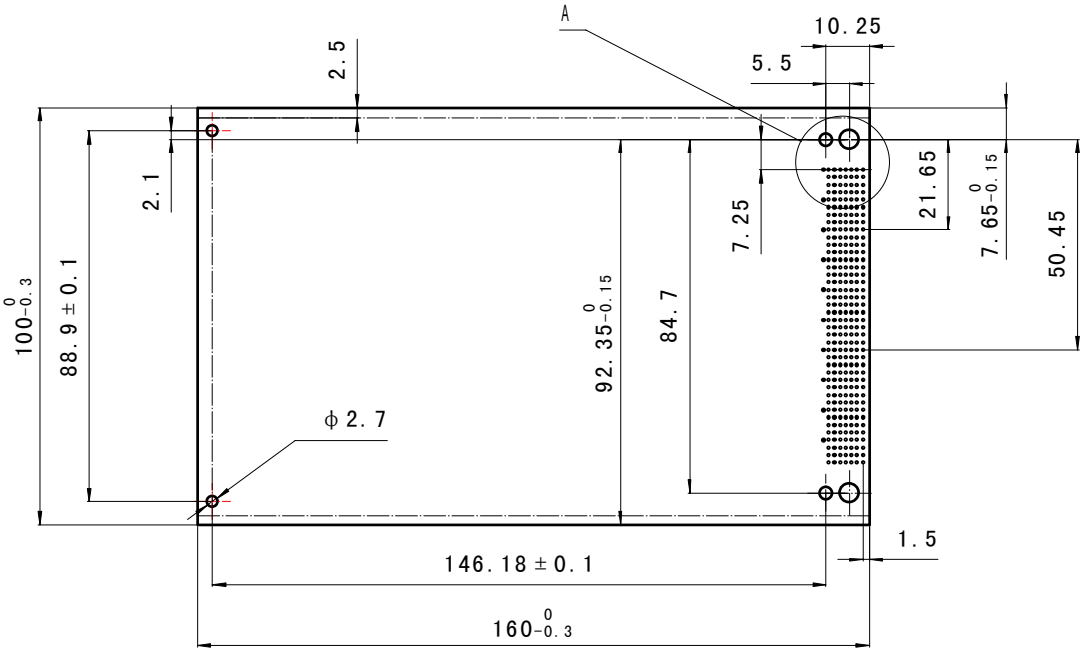
VITA standard PCB panel mounting dimension

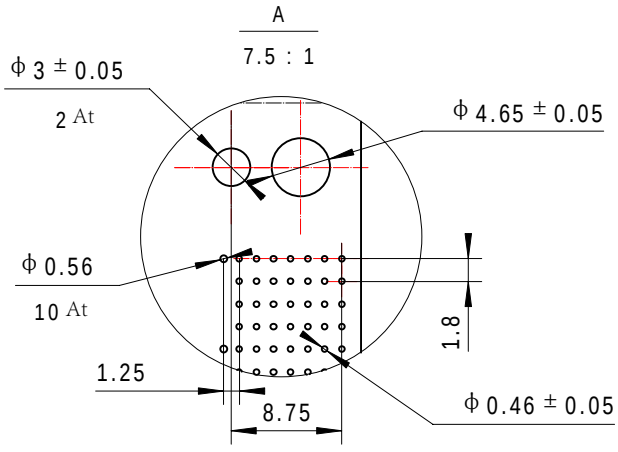
[VITA series 6U PCB mounting dimension]



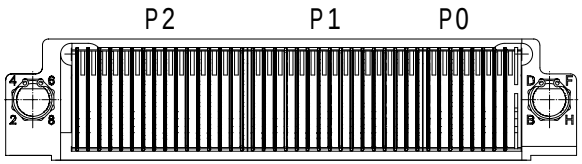
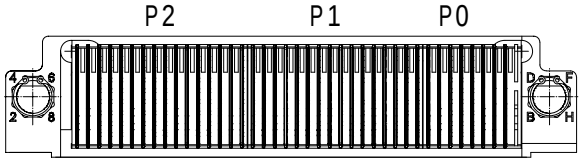
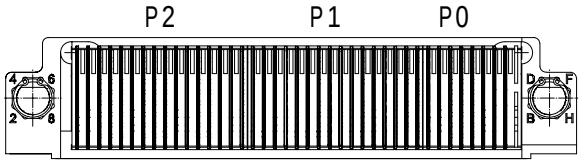
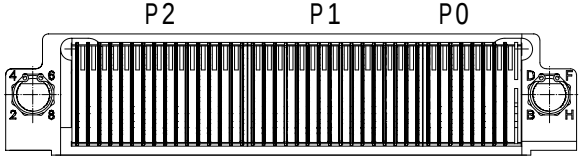

A
12.5 : 1
8.75
ϕ 3 ± 0.05
ϕ 4.65 ± 0.05
1.35
1.8
1.25
26 × ϕ 0.56
ϕ 0.46 ± 0.05

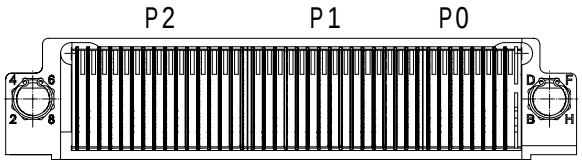
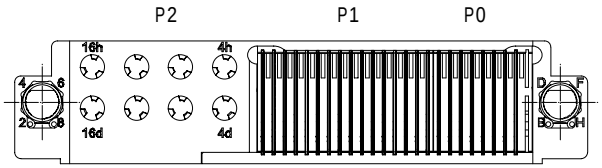
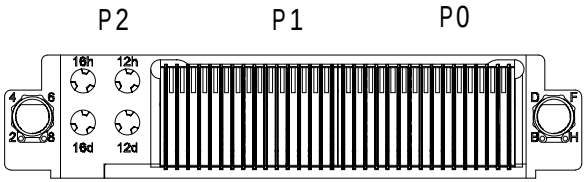
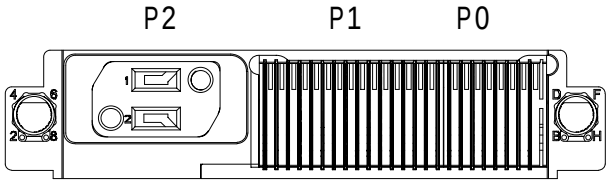
[VITA series 3U PCB mounting dimension]

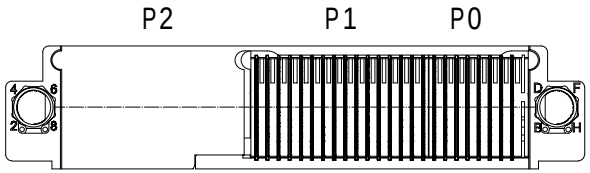
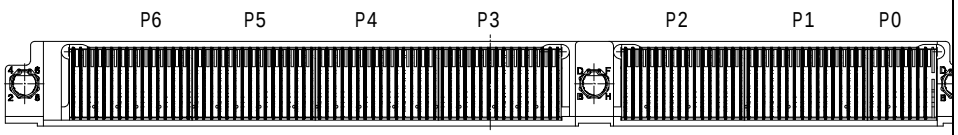
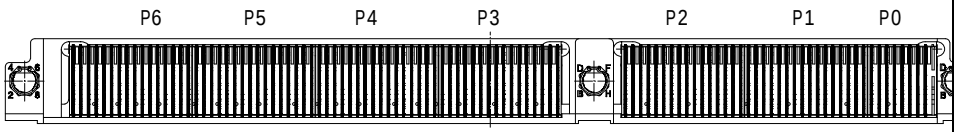
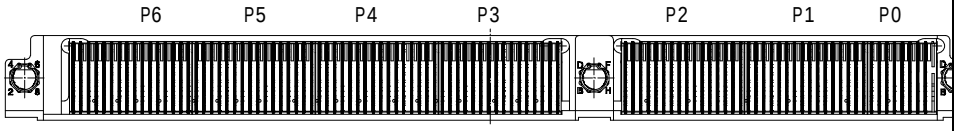


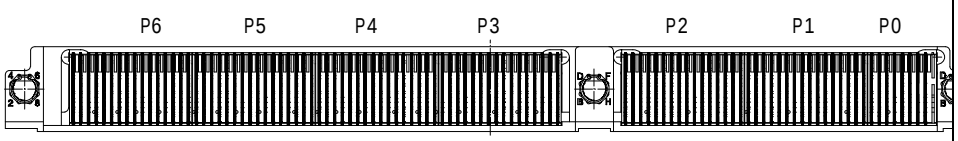
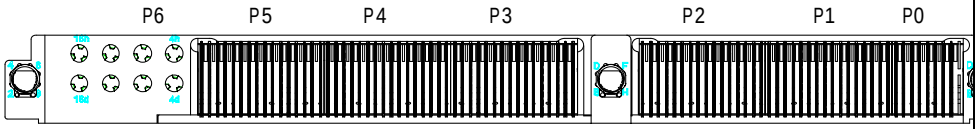


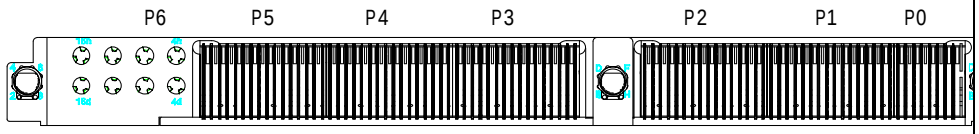
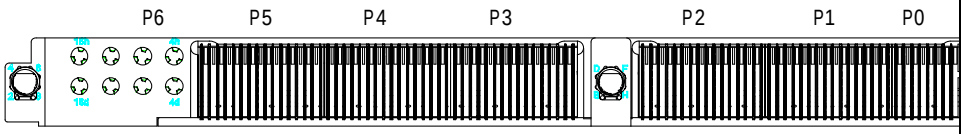
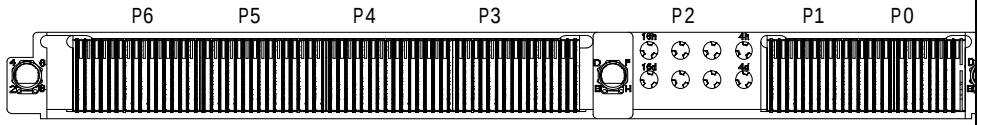
NKA series connector types and the signal type

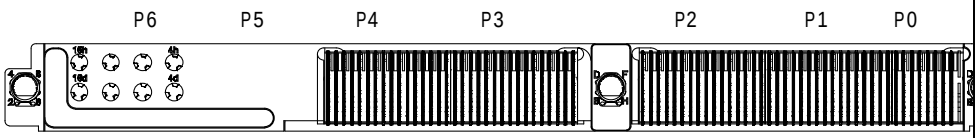
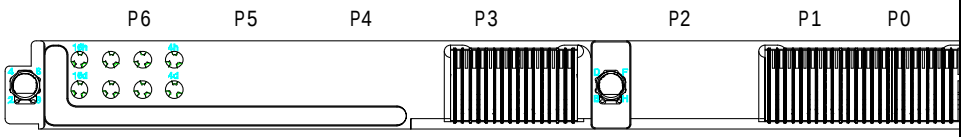
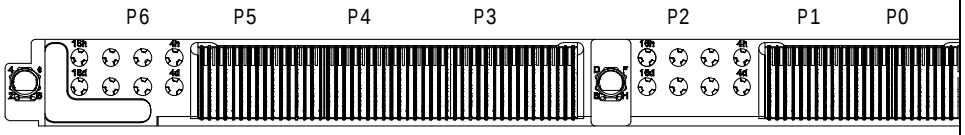
No.	P/N（plug/receptacle）	Plug mating surface	Signal type	Remarks
3U connector				
1	NKA-21T8aAB8-A/ NKA-21Z8eIJ8-A		P0 is basic module, P1 is differential module, P2 is single-ended module, altogether 6 groups power, 36 differential pairs, and 104 single-ended.	
2	NKA-21T8aAA8-A/ NKA-21Z8eIJ8-A		P0 is basic module, P1, P2 are differential modules, altogether 6 groups power, 68 differential pairs, and 32 single-ended	
3	NKA-21T8aBB8-A/ NKA-21Z8eIJ8-A		P0 is basic module, P1, P2 are differential modules, altogether 6 groups power, 4 differential pairs, and 176 single-ended	
4	NKA-21T8aCB8-A/ NKA-21Z8eIJ8-A		P0 is basic module, P1 is differential module, P2 is single-ended module, altogether 12 groups power, 24 differential pairs, and 116 single-ended	

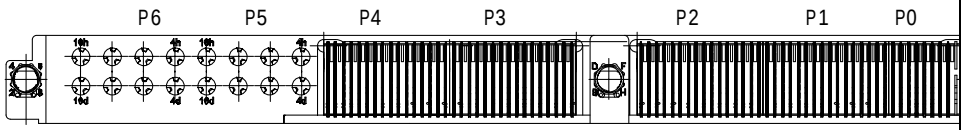
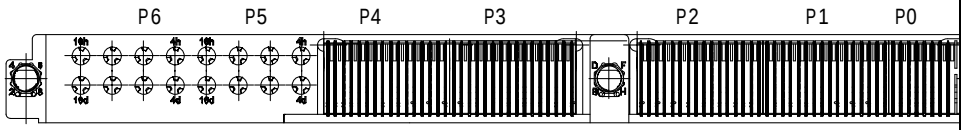
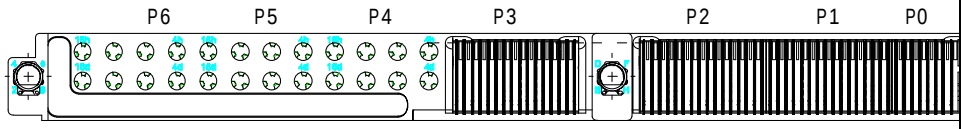
5	NKA-21T8aAC8-B/ NKA-21Z8eIJ8-A		P0 is basic module, P1 is differential module, P2 is differential & single-ended mixed module, altogether 6 groups power, 52 differential pairs, and 60 single-ended	
6	NKA-21T8aAD8-A/ NKA-21Z8eJD8-A		High & low frequency mixed, P0 is basic module, P1 is differential module, P2 is 8-core RF, altogether 6 groups power, 36 differential pairs, 24 single-ended, and 8 RF.	
7	NKA-21T8CAd8-A/ NKA-21Z8IJd8-A		High & low frequency mixed, altogether 6 groups power, 52 differential pairs, 28 single-ended, and 4 RF.	
8	NKA-21T8aAG8-A/ NKA-21Z8eJG8-A		Optical & electrical mixed, P0 is basic module, P1 is differential module, P2 is 2-core MT optical contacts, altogether 6 groups power, 36 differential pairs, 24 single-ended, and 2 RF.	

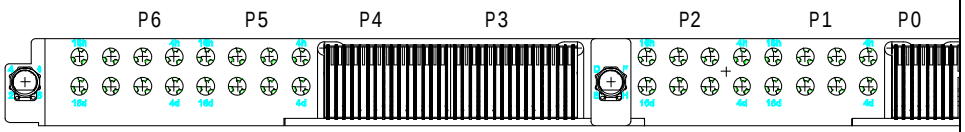
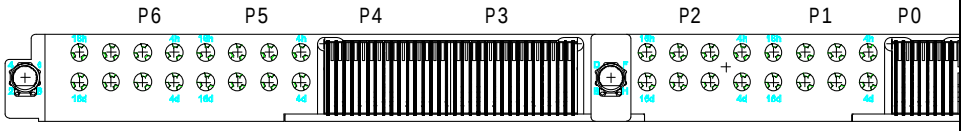
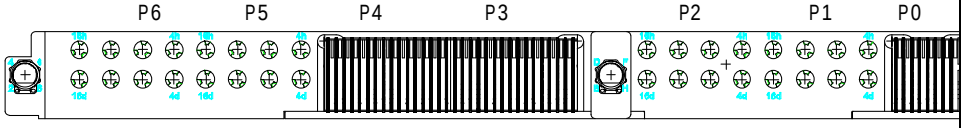
9	NKA-21T8aAN8-A/ NKA-21Z8eJN8-A		P0 is basic module, P1 is differential module, P2 is empty module, altogether 6 groups power, 36 differential pairs, 24 single-ended	
6U connector				
1	NKA-61T8aAB8AABB8-A/ NKA-61Z8eIJ8IIIJ8-A		P0 is basic module, P1, P3, P4 are differential modules, P2, P5, P6 are single-ended modules, altogether 6 groups power, 100 differential pairs, 280 single-ended	
2	NKA-61T8aAA8AAAA8-A/ NKA-61Z8eIJ8IIIJ8-A		P0 is basic module, P1~P6 are differential modules, altogether 6 groups power, 196 differential pairs, 64 single-ended	
3	NKA-61T8aAB8AAAA8-A/ NKA-61Z8eIJ8IIIJ8-A		P0 is basic module, P1, P3~P6 are differential modules, P2 is single-ended module, altogether 6 groups power, 164 differential pairs, 136 single-ended	

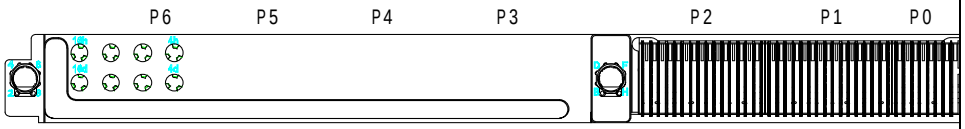
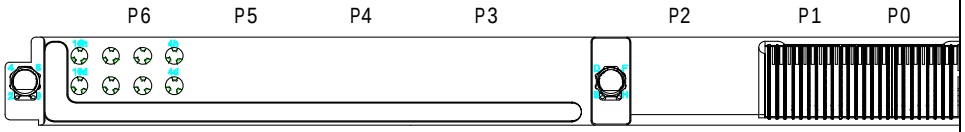
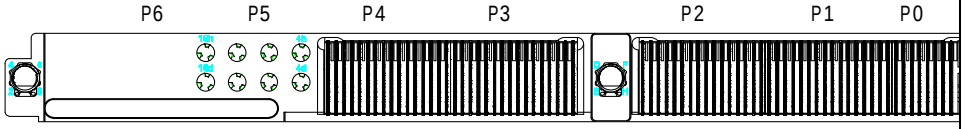
4	NKA-61T8aBB8BBBB8-B/ NKA-61Z8eIJ8IIIJ8-A		P0 is basic module (special), P1~P6 are differential modules, altogether 10 groups power, 495 single-ended	“-B” is alternative code, here means that basic module a is changed, now it is 5 lists power and 3 lists single-ende d
5	NKA-61T8aAA8AANN8-A/ NKA-61Z8eIJ8IJNN8-A		P0 is basic module, P1~P4 are differential modules, P5, P6 are empty modules, altogether 6 groups power, 132 differential pairs, 48 single-ended	
6	NKA-61T8aAB8AAAD8-A/ NKA-61Z8eIJ8IIJD8-A		High & low frequency mixed, P0 is basic module, P1, P3~P6 are differential modules, P2 is single-ended module, P6 is RF module, altogether 6 groups power, 132 differential pairs, 128 single-ended and 8 RF	

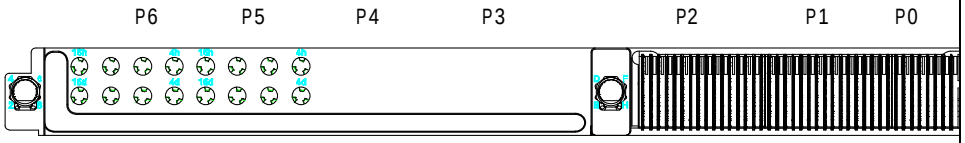
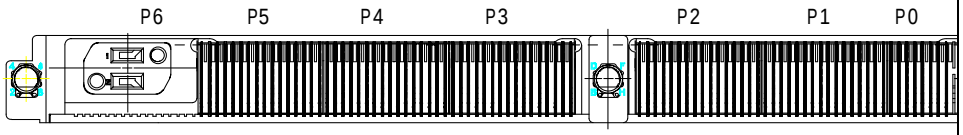
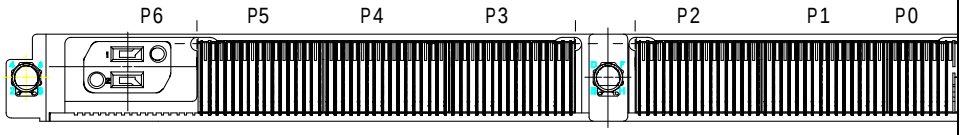
7	NKA-61T8aAA8BABD8-A/ NKA-61Z8eIJ8IIJD8-A		High & low frequency mixed, P0 is basic module, P1, P2, P4 are differential modules, P3, P5 are single-ended modules, P6 is RF module, altogether 6 groups power, 100 differential pairs, 200 single-ended and 8 RF	
8	NKA-61T8aBB8AAAD8-B/ NKA-61Z8eIJ8IIJD8-A		High & low frequency mixed, P0 is basic module (special), P1, P2 are single-ended modules, P3~P5 are differential modules, P6 is RF module, altogether 10 groups power, 96 differential pairs, 199 single-ended and 8 RF	“-B” is alternative code, here means that basic module a is changed, now it is 5 lists power and 3 lists single-ended
9	NKA-61T8aAD8AAAA8-A/ NKA-61Z8eJD8IIIJ8-A		High & low frequency mixed, P0 is basic module, P1, P3~P6 are differential modules, P2 is RF module, altogether 6 groups power, 164 differential pairs, 56 single-ended and 8 RF	

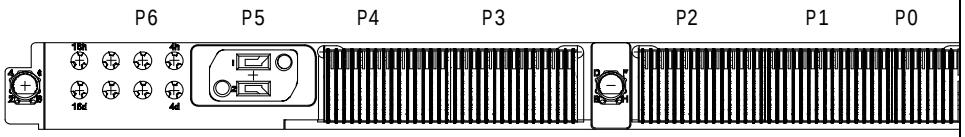
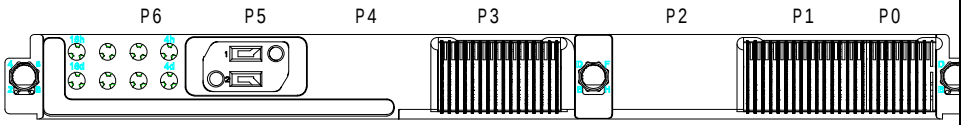
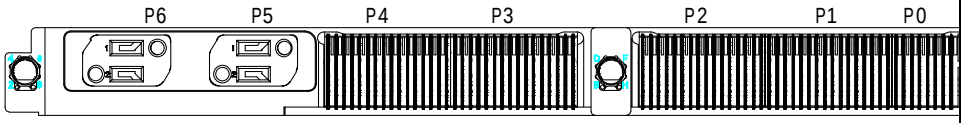
10	NKA-61T8aAA8AAND8-A/ NKA-61Z8eIJ8IJND8-A		High & low frequency mixed, P0 is basic module, P1~P4 are differential modules, P5 is empty module, P6 is RF module, altogether 6 group power, 132 differential pairs, 48 single-ended and 8 RF	
11	NKA-61T8aAN8ANND8-A/ NKA-61Z8eJN8JNND8-A		High & low frequency mixed, P0 is basic module, P1, P3 are differential modules, P2, P4, P5 are single-ended modules, P6 is RF module, altogether 6 group power, 68 differential pairs, 32 single-ended and 8 RF	
12	NKA-61T8aAD8AAAD8-A/ NKA-61Z8eJD8IIJD8-A		High & low frequency mixed, P0 is basic module, P1, P3~P5 are differential modules, P2, P6 are RF modules, altogether 6 group power, 132 differential pairs, 48 single-ended and 16 RF	

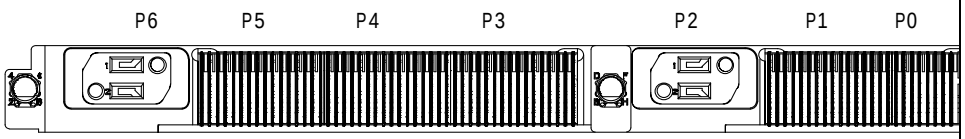
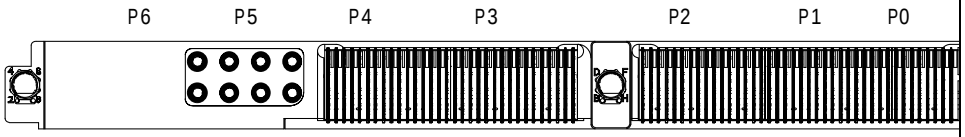
13	NKA-61T8aAB8AADD8-A/ NKA-61Z8eIJ8IJDD8-A		High & low frequency mixed, P0 is basic module, P1, P3, P4 are differential modules, P2 is single-ended modules, P5, P6 are RF modules, altogether 6 group power, 100 differential pairs, 120 single-ended and 16 RF	
14	NKA-61T8aAA8AADD8-A/ NKA-61Z8eIJ8IJDD8-A		High & low frequency mixed, P0 is basic module, P1~P4 are differential modules, P5, P6 are RF modules, altogether 6 group power, 132 differential pairs, 48 single-ended and 16 RF	
15	NKA-61T8aAB8ADDD8-A/ NKA-61Z8eIJ8JDDD8-A		High & low frequency mixed, P0 is basic module, P1, P4 are differential modules, P2 is single-ended module, P4~P6 are RF modules, altogether 6 group power, 68 differential pairs, 112 single-ended and 24 RF	

16	NKA-61T8aDD8AADD8-A/ NKA-61Z8fDD8IJDD8-A		High & low frequency mixed, P0 is basic module, P3, P4 are differential modules, P1, P2, P5, P6 are RF modules, altogether 6 group power, 68 differential pairs, 32 single-ended and 32 RF	
17	NKA-61T8aDD8BADD8-B/ NKA-61Z8fDD8IJDD8-A		High & low frequency mixed, P0 is basic module (special), P3 is single-ended module, P4 is differential module, P1, P2, P5, P6 are RF modules, altogether 10 group power, 32 differential pairs, 103 single-ended and 32 RF	“-B” is alternative code, here means that basic module a is changed, now it is 5 lists power and 3 lists single-ended
18	NKA-61T8aDD8AADD8-B/ NKA-61Z8fDD8IJDD8-A		High & low frequency mixed, P0 is basic module (special), P3, P4 are differential modules, P1, P2, P5, P6 are RF modules, altogether 10 group power, 64 differential pairs, 31 single-ended and	“-B” is alternative code, here means that basic module a is changed, now it is 5

			32 RF	lists power and 3 lists single-ended
19	NKA-61T8aAA8NNND8-A/ NKA-61Z8eIJ8NNND8-A		High & low frequency mixed, P0 is basic module, P1, P2 are differential modules, P2~P4 are empty modules, P6 is RF module, altogether 6 group power, 68 differential pairs, 32 single-ended and 8 RF	
20	NKA-61T8aAN8NNND8-A/ NKA-61Z8eJN8NNND8-A		High & low frequency mixed, P0 is basic module, P1, P2 are differential modules, P2~P4 are empty modules, P6 is RF module, altogether 6 group power, 36 differential pairs, 24 single-ended and 8 RF	
21	NKA-61T8aAA8AADN8-A/ NKA-61Z8eIJ8IJDN8-A		High & low frequency mixed, P0 is basic module, P1~P4 are differential modules, P6 is empty module, P5 is RF module, altogether 6 group power, 132 differential pairs, 48 single-ended and 8 RF	

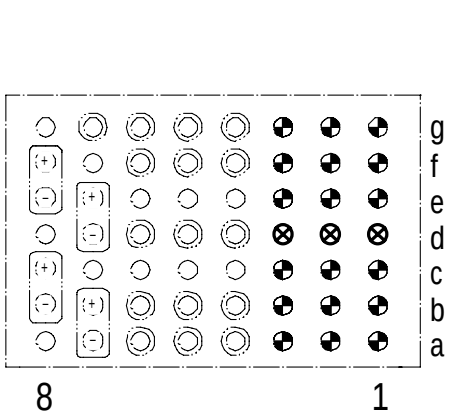
22	NKA-61T8aAA8NNDD8-A/ NKA-61Z8eIJ8NNDD8-A		High & low frequency mixed, P0 is basic module, P1, P2 are differential modules, P2, P3 are empty modules, P5, P6 are RF modules, altogether 6 group power, 68 differential pairs, 32 single-ended and 16 RF	
23	NKA-61T8aAA8AAAG8-A/ NKA-61Z8eIJ8IIJG8-A		Optical & electrical mixed, P0 is basic module, P1-P2, P3-P6 are differential modules, P6 is optical module, altogether 6 group power, 164 differential pairs, 56 single-ended and 2-core MT optical contacts	1-core MT can transmit 12 loops optical signals
24	NKA-61T8aAB8AAAG8-A/ NKA-61Z8eIJ8IIJG8-A		Optical & electrical mixed, P0 is basic module, P1, P3-P6 are differential modules, P2 is single-ended module, P6 is optical module, altogether 6 group power, 132 differential pairs, 128 single-ended and 2-core MT optical contact	1-core MT can transmit 12 loops optical signals

25	NKA-61T8aAB8AAGD8-A/ NKA-61Z8eIJ8IJGD8-A		Optical & electrical mixed, P0 is basic module, P1, P3, P4 are differential modules, P2 is single-ended module, P5 is optical module, altogether 6 group power, 100 differential pairs, 120 single-ended, 2-core MT optical contact, and 8 RF	1-core MT can transmit 12 loops optical signals
26	NKA-61T8aAN8ANGD8-A/ NKA-61Z8eJN8JNGD8-A		Optical & electrical, RF mixed, P0 is basic module, P1, P3 are differential modules, P2, P4 are empty modules, P5 is optical module, P6 is RF module, altogether 6 group power, 68 differential pairs, 32 single-ended, 2-core MT optical contact, and 8 RF	1-core MT can transmit 12 loops optical signals
27	NKA-61T8aAA8AAGG8-A/ NKA-61Z8eIJ8IJGG8-A		Optical & electrical mixed, P0 is basic module, P1-P4 are differential modules, P5, P6 are optical modules, altogether 6 group power, 132 differential pairs, 48 single-ended, 4-core MT optical contact	

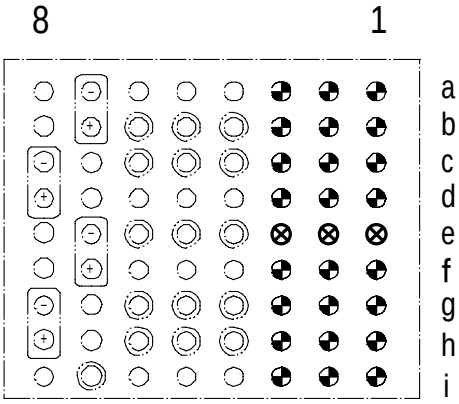
28	NKA-61T8aBG8AAAG8-B/ NKA-61Z8eJG8IIJG8-A		Optical & electrical mixed, P0 is basic module, P1 is single-ended module, P3-P5 are differential modules, P2, P6 are optical modules, altogether 6 group power, 100 differential pairs, 120 single-ended, 4-core MT optical contact	“-B” is alternative code, here means that basic module a is changed, now it is 5 lists power, 3 lists single-ended.
29	NKA-61T8aAA8AADN8-B/ NKA-61Z8eIJ8IJDN8-B		P0 is basic module, P1-P4 are differential modules, P5 is power module, P6 is empty module, altogether 6 group power, 132 differential pairs, 48 single-ended, 8 power contact	“-B” is alternative code, here means that P5 is mounted with 8 power contacts, wire soldering at the termination.

Plug and receptacle signal relationship

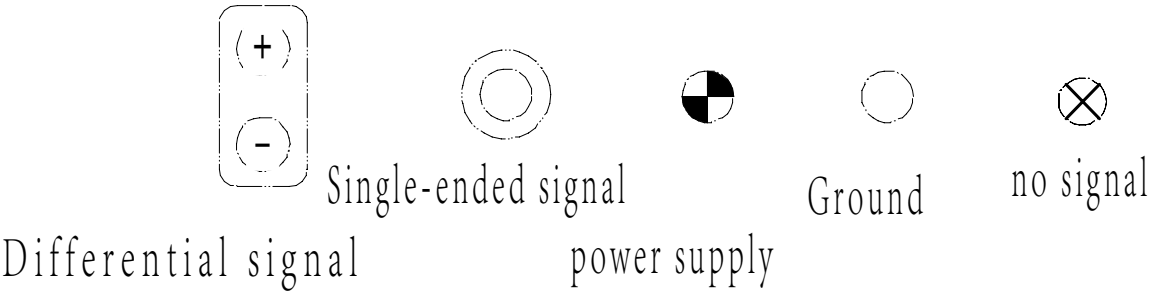
Take basic module for example



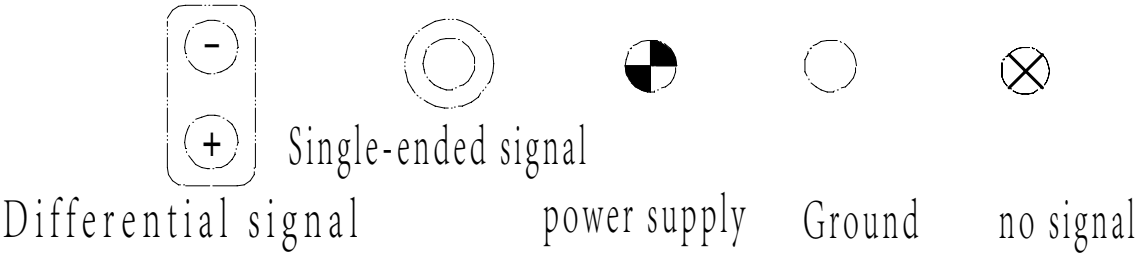
Plug half module



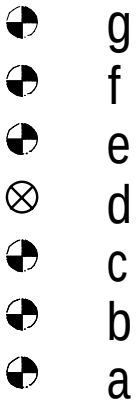
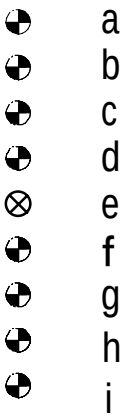
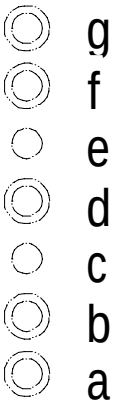
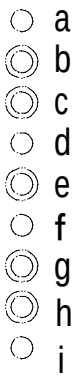
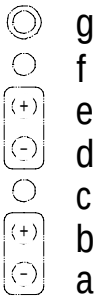
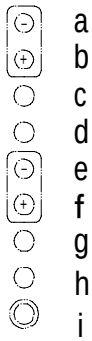
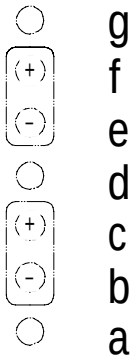
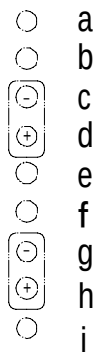
Socket half module



Plug signal type



Receptacle signal type

Signal type	Plug	Receptacle	Relation	
			Plug	Receptacle
Power			abc	abcd
			d	e
			efg	fghi
Single-ended			The receptacle add grounding points “a” and “i” at the two ends, signal relationship:	
			a	b
			b	c
			c	d
			d	e
			e	f
			f	g
			g	h
Differential 1(includes single-ended signal)			a	a
			b	b
			c	cd
			d	e
			e	f
			f	gh
			g	i
Differential 2 (non single-ended signal)			a	ab
			b	c
			c	d
			d	ef
			e	g
			f	h
			g	i

PCB wiring solutions

A suitable wiring can improve the product, high speed PCB panel wiring need to consider the interval between the trace and the solder pad, as well as the interval between traces. Or it may cause high manufacturing cost of PCB panel.

Because NKA series connectors have high transmission rate, we suggest to use RO4350B for board material or other material that the medium loss ＜ 0.0034.

1. Wiring instruction

1） Minimum interval

Consider the tolerance, the minimum interval of all the characteristics, actual solder pad/trace, trace/trace should be 0.005 inch (0.127 mm).

2）Impedance

In product design, ensure the wire dimension meets the requirement, consider the characteristics impedance.

3）Trace in middle

All the traces in holes need to be in the middle to optimize the interval.

4）un functional solder pad

For high speed application, the non wiring solder pad can be removed (except the top pad and the bottom pad)

5）Copper blade weight

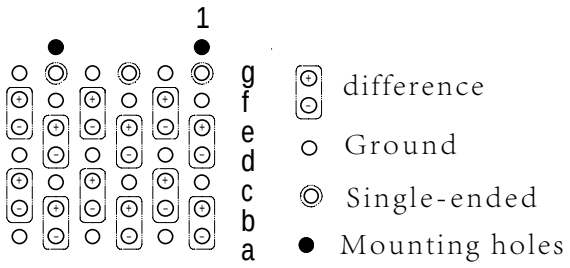
In wiring, consider the copper blade weight. Higher weight may affect the minimum trace width.

6）Fillet

When the electric design need impact structure from the hole to the solder pad, a fillet is needed from the trace to the solder pad interface (exit).

2. Technique engineering

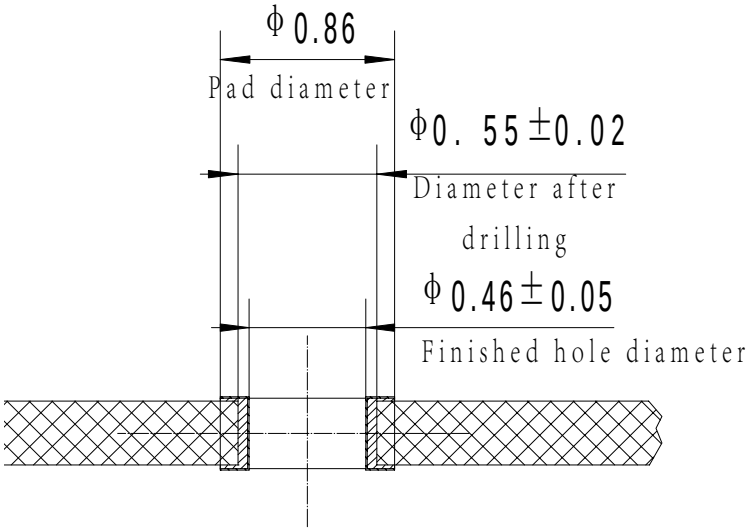
1）NKA series connector differential configuration:



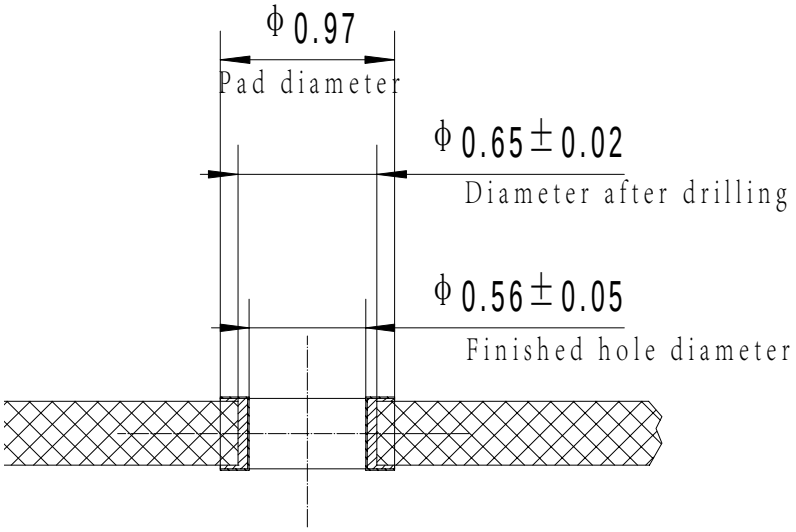
Picture 26 Connector differential configuration and signal type (daughter board)

2）Borehole, finished hole and solder pad hole

The dimension of borehole, finished hole and solder pad hole is showed in picture 33 and 34, the unit is mm.



Picture 27: daughter board borehole, finished hole, solder pad dimension

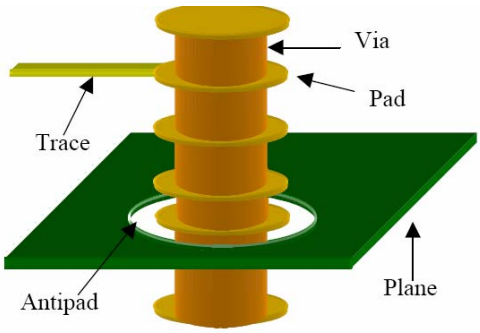


Picture 4: panel borehole, finished hole, solder pad dimension

Finished hole dimension is 0.56±0.05mm, can be either metal hole or non-metal hole.

3）Anti solder pad dimension

Anti solder pad structure is showed in picture 35.



Picture 28 Anti solder pad structure

Anti solder pad is designed into two types: one is minimum, another one is maximum. Choose suitable anti solder pad according to different system target.

（1）Minimum anti solder pad

If customers pay attention to the below characteristics, please choose minimum type in designing:

a. reduce the noise in neighbored pins

b. reduce EMI disturb

c. have strict requirement of single-ended signal and differential signal

In this situation, the recommended anti solder pad dimension is: **solder pad diameter +0.25mm**

Please note that, this type is not suitable for high speed transmission system.

（2） Maximum anti solder pad

If customers pay attention to the below characteristics, please choose maximum type in designing:

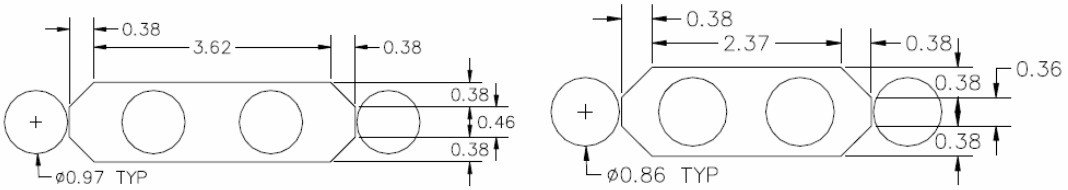
a. increase the electric interval of the pins

b. reduce the reflex in high speed transmission system

c. improve the processing of PCB panel

In this situation, the anti solder pad dimension is according to different signal types.

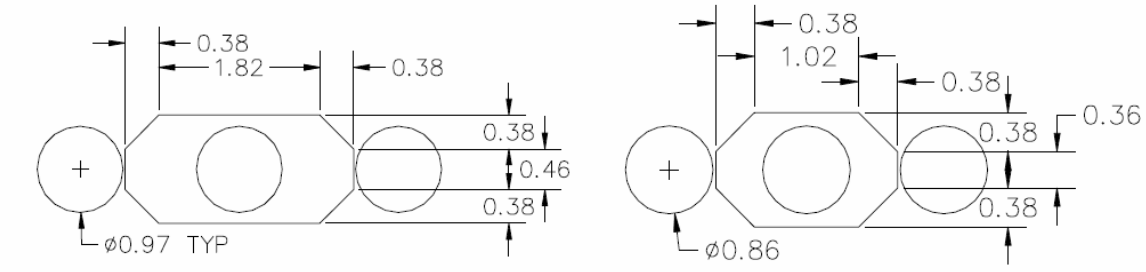
Differential signal



Mother board anti solder pad　　Daughter board anti solder pad

Picture 29: mother board and daughter board anti solder pad structure-differential

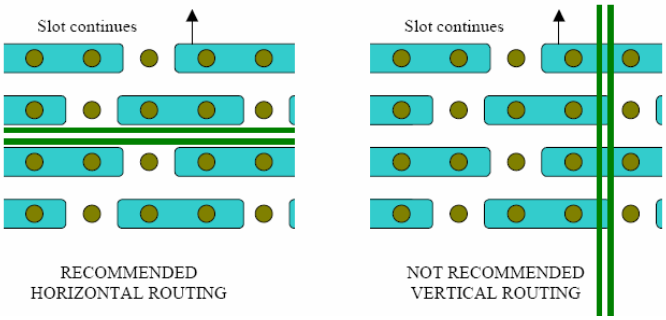
Single-ended signal



Mother board anti solder pad　　Daughter board anti solder pad

Picture 30: mother board and daughter board anti solder pad structure: single-ended

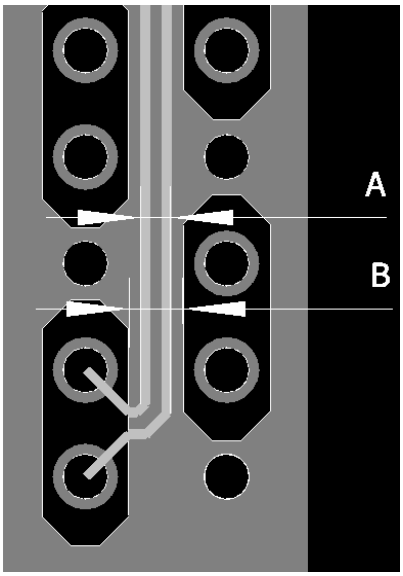
The above type is applicable to horizontal wiring, if the wiring is vertical type, the anti solder pad dimension need to be reduced appropriately. In actual use, it is recommended to use horizontal wiring type.



Picture 31: Differential wiring type

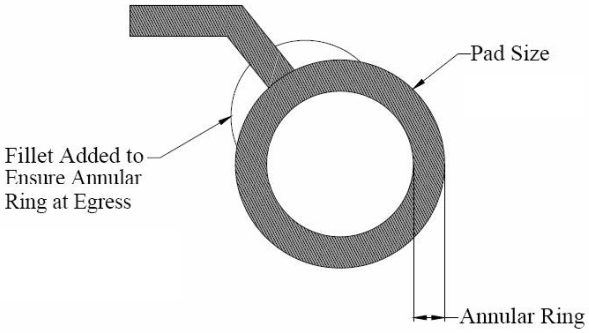
4）Differential wiring example

The total width of differential wiring should be less than the minimum interval of the anti solder pad. In another word, the dimension in picture 39 A＜B.



Picture 32: High differential wiring example

Suggest to use solder pad fillet; see the below picture:

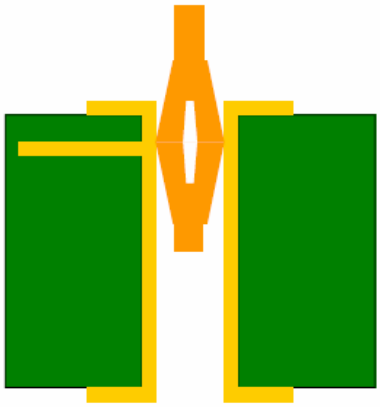


Picture 33: Best fillet

Fillet diameter is half of the solder pad diameter, concentric with the trace.

5）The technique design for high speed via stub

In high speed data transmission, via stub effect may cause the discontinuity in data transmission and reduce the data transmission quantity. Via stub effect means the discontinuity part in signal transmit way. See the below picture:



Picture 34: via stub

Because the via stub effect affects the high speed transmission characteristics a lot, so the PCB panel is usually designed with some actions to reduce the effect.

For NKA series connectors, the plug high speed part that matched with PCB panel is 1.45mm long, receptacle high speed part matched with PCB panel is 1.62mm. The rest part of the PCB stub can adapts back drill or blind hole treatment to reduce the via stub effect.

Back drill Blind hole

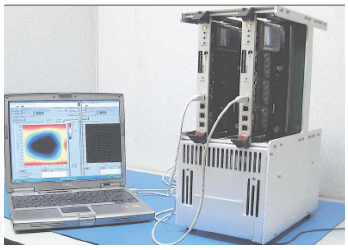
Picture 35: actions that can reduce via stub effect

NKA backplane, module debugging system

Brief introduction

NKA backplane, module debugging system is developed according to NKA series integrated connectors. As a connection solution, it is based on integrated connector interface and provides customers with a problem treatment platform. It can lead out various signals in customers' modules and backplanes, and achieves the debugging of modules and backplanes. It services customers with a lot of convenience, not only the test in the researching period, but also the after-sales service and test.

NKA backplane, module debugging system is divided into two kinds: NKA adapter panel and NKA debugging platform.



NKA adapter panel

NKA adapter panel can adapts the optical, electrical, RF signal in the backplane to the cabinet outside, convinient for the service and test of backplanes and modules.

[Brief introduction]

——Comply with VITA

——The panel is rigid & flexible mixed design, it is meant to control the characteristics impedance ——Support 3U, 6U standard NKA board card

——Achieve the integrated adapt of electrical, RF, optical signal

——Optical patch cord and RF cable assembly can be replaced at site

——Enterprise standard: Q/21EJ1733-2012；

[Main technical characteristics]

——Digital signal transmission rate: 6.25Gbps；

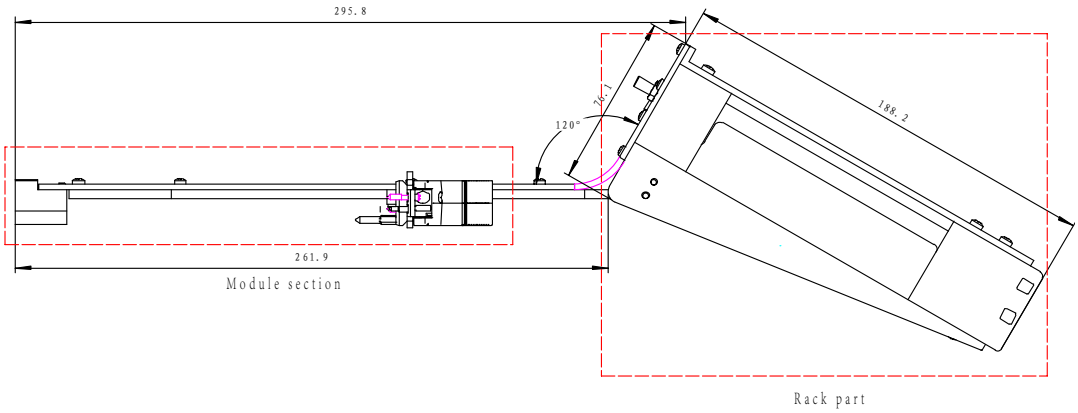
——Differential impedance: 100Ω

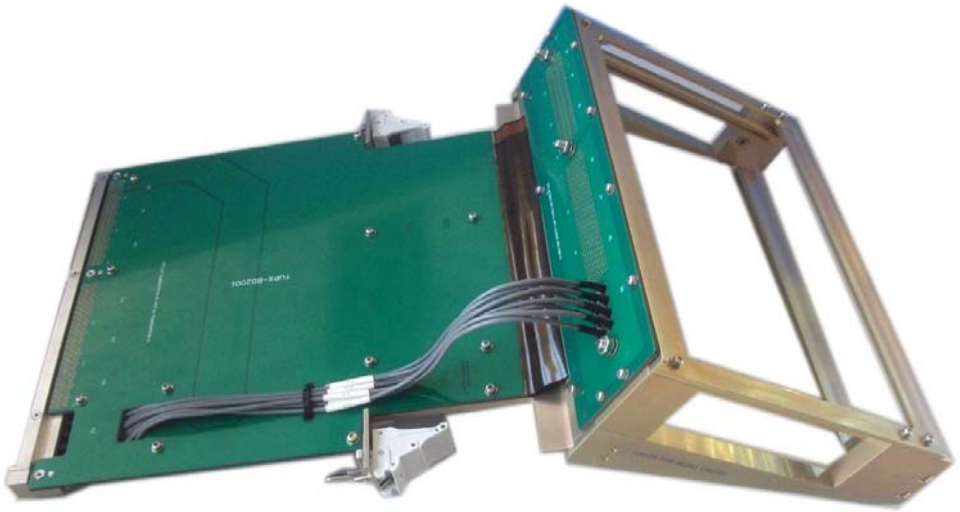
——Near end crosstalk: ≤5%

——RF frequency reaches 18GHz

——Optical fiber insertion loss ≤1.5dB(MT), single core optical signal insertion loss ≤1.0dB；

——Operating temperature: -20℃~80℃；





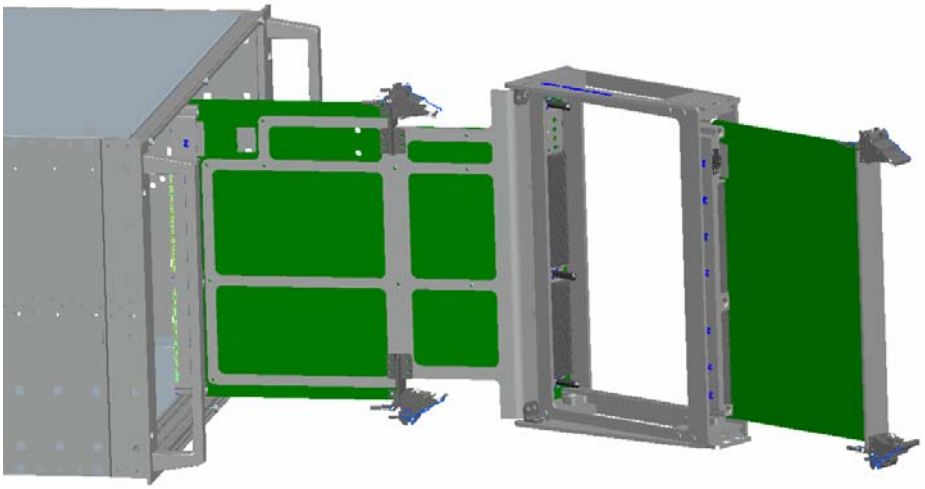
[Ordering information]

Basic series	NKAZ	B	02①	001
Operating object	Panel			
Connector type code	01，02…			
Serial number	001，002…			

Remarks: ① type configuration code 02：61T8aAB8ADDD8-A/61Z8aAB8ADDD8-A

[Using situation]

In the use of NKA adapter panel, insert the module into the cabinet and make it connect with the backplane, and then insert the module into the adapter panel rack part. Optical signal is lead out through optical patch cord, RF signal is lead out through RF cable assembly, low frequency signal (differential, single-ended, power signal) is lead out through PCB panel.



Debugging platform

Debugging platform is developed according to NKA standard, and it is a module open type test & research platform. It can imitate the module actual operating environment, achieves the adjustment of single module or the interconnection of multiple modules.

[Brief introduction]

——Module open type test & research platform

——Comply with VITA standard

——Support 0.85” and 1.0” interval 3U, 6U standard NKA board card

——Support back I/O；

——Changeable panel structure design

——Excellent performance of wind cooling, from the upside to the downside

——Supplied with RTM quick test board card and high speed panel adapter cable assembly

[Main technical characteristics]

——Outline dimension: 10U H×45HP×350mm；

——Dual side panel, each side has four 6U electric slot, board card interval 1.0”；

——Rating voltage: 220V AC；

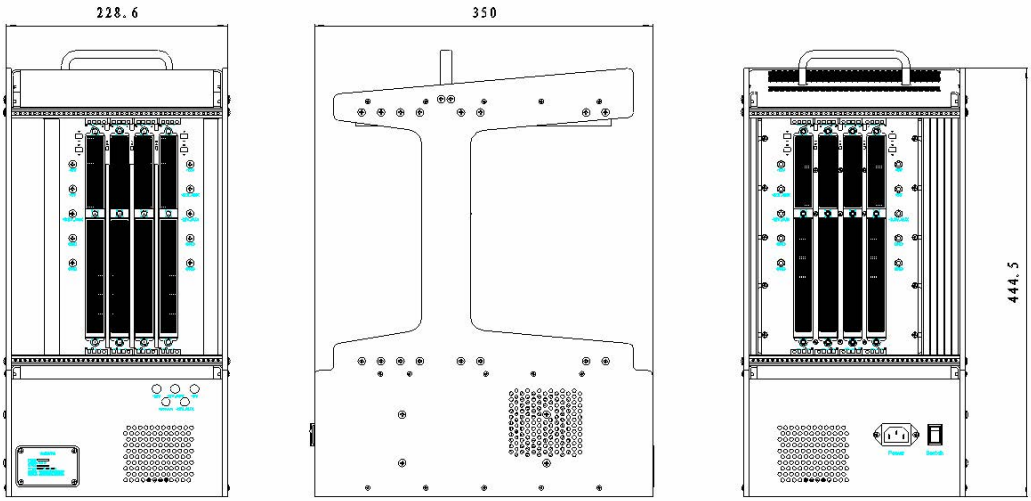
——Power output: +5V@20A、+3.3V@3.3A、+12V@9A and -12V@2A；

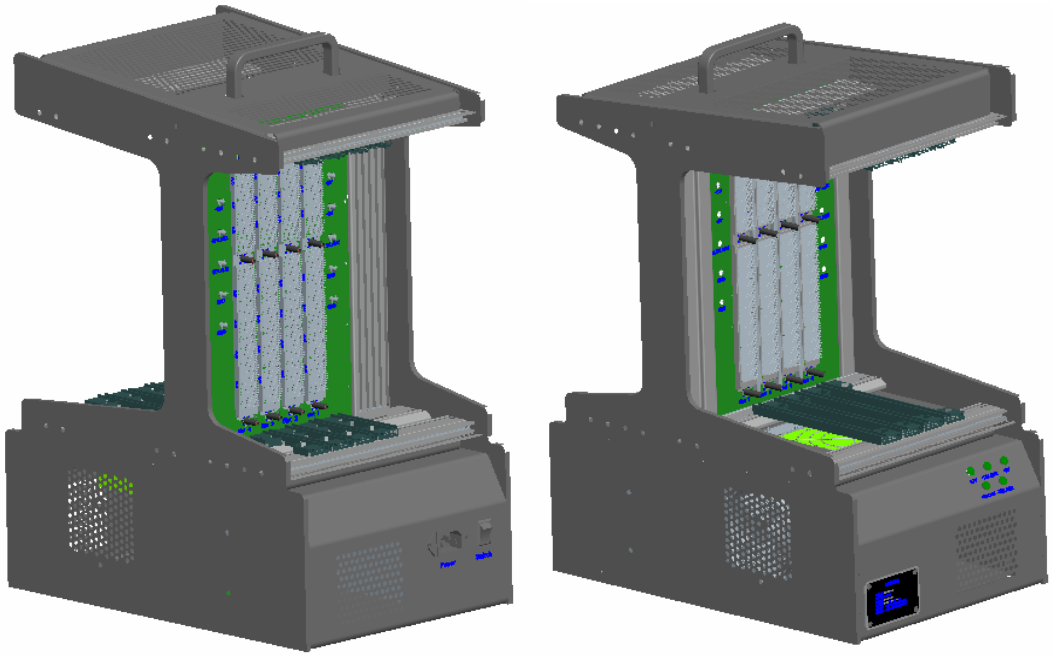
——Panel output voltage: +12V DC、+12V_AUX DC、+5V DC、+3.3_AUX DC 和-12V_AUX DC；

——Differential signal transmission rate: 6.25Gbps；

——Operating temperature: 0℃~50℃；

——Storage temperature: -20℃~80℃





[Ordering information]

Basic series		NKAZ	6U	4S	001
Module height	3U、6U				
Slot number	4S、8S				
Serial number	001，002…				

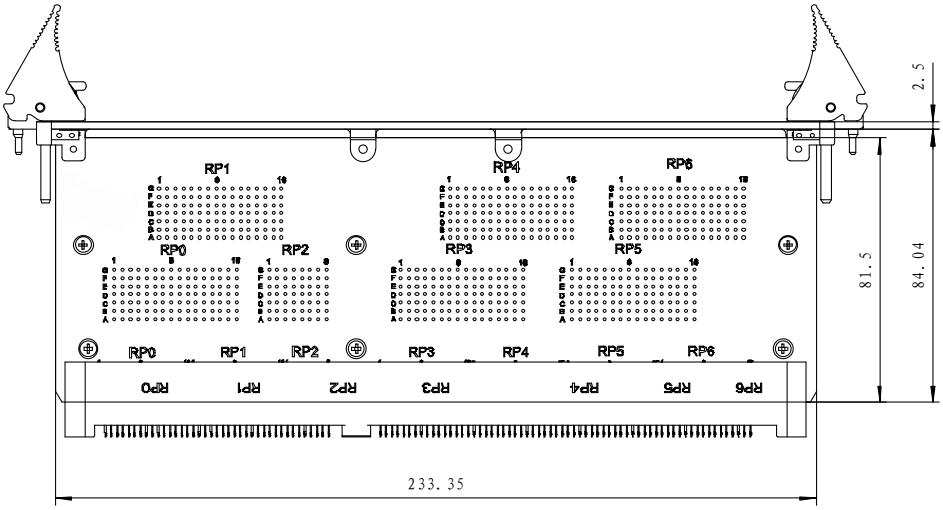
[Accessory]

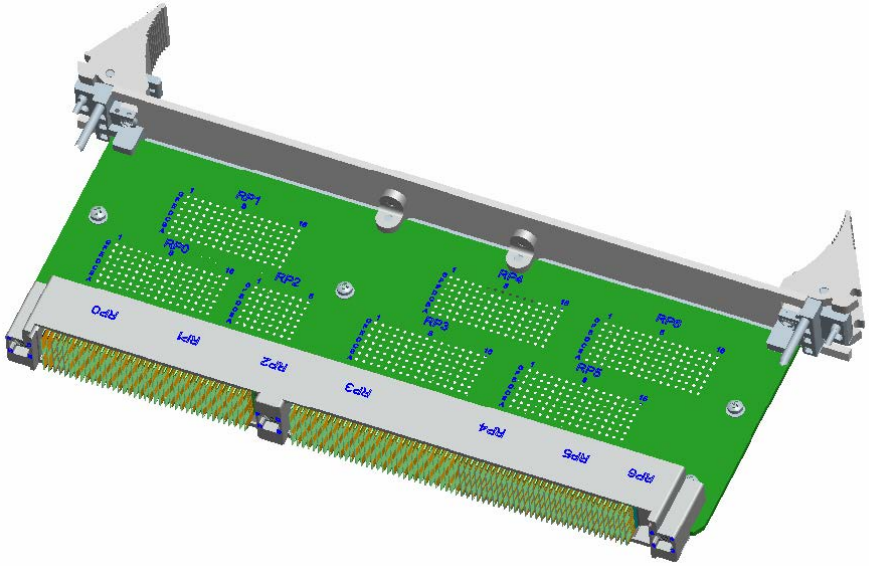
1、 RTM(Rear Transition Modular) board card

——Comply with VITA46.10 standard

——6U×80mm RTM structure

——Innovate the NKA connector structure, deliver the signals in the connector separately ——Achieves quick test of signals





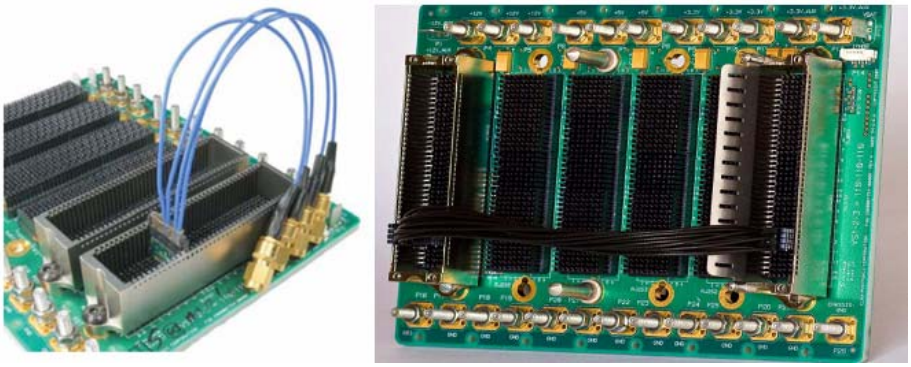
2、 Adapter cable assembly

——Comply with VITA standard

——Differential signal transmission rate 6.25Gbps

——Characteristics impedance 100Ω

——Achieves high speed interconnection between board cards, board card to outside equipment



[Using situation]

In the use of NKA debugging platform, the rear panel is 220V AC input, the cooling fan inside the cabinet blows and cools the board card，the indicator light on the front panel checks the operation situation of the panel. The signals between the panel slots can be inter connected through adapter cable assemblies.