

NEW

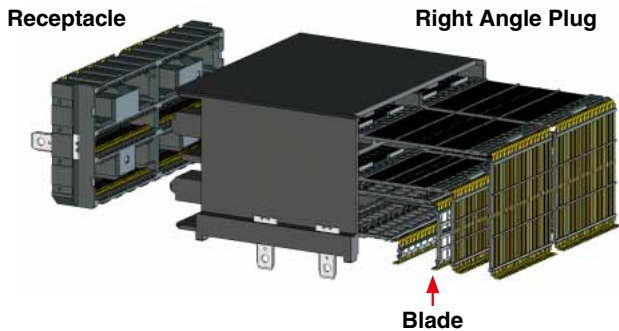
# 28+Gbps 0.5mm pitch Board to Board Connector

## IT9 Series



### Mechanical features

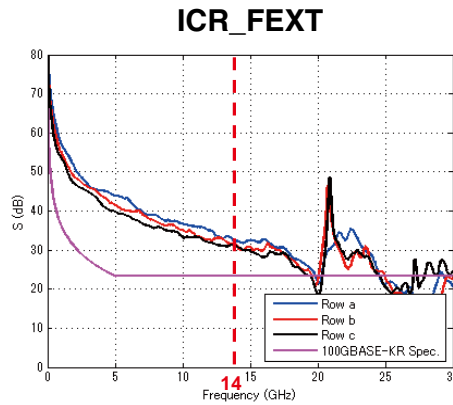
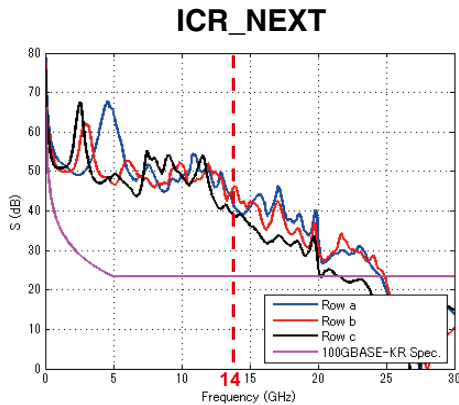
- 3row or 4row 0.5mm pitch SMT array
- Number of contacts : 84pos, 224pos.
- Mating length : 2.0mm
- High density
  - 50 Differential pairs / linear inch (224pos.)
- Blade variation
  - Differential signal blade (GSSGSSG...)
  - Power & low signal blade (SSSS...)
- Large mating guide  $\pm 1.6\text{mm}$
- Multiple connectors are allowed on the same PCB
- Robustness (Large retention pegs)



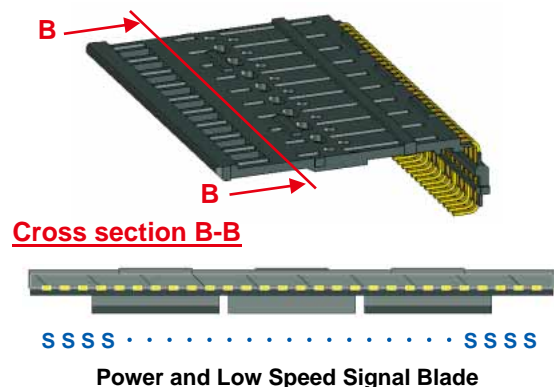
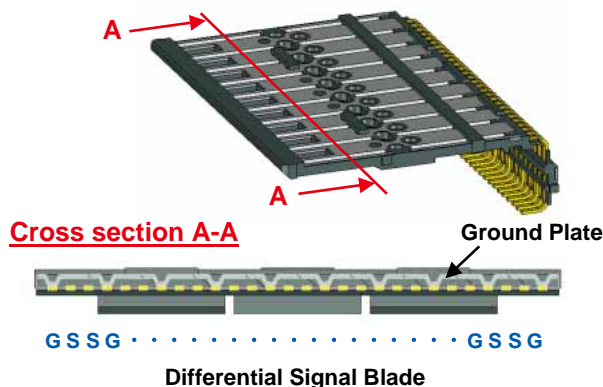
### Signal integrity features

#### ● Insertion Loss-to-Crosstalk-Ratio (ICR)

The insertion loss-to-crosstalk ratio (ICR) with 5-aggressor differential FEXT meets the IEEE802.3ap specification for 28Gbps with plenty of margins.



### Transmission blade variation



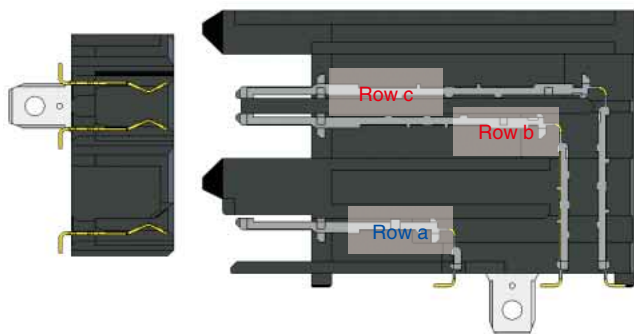
In cases where the application will demand a high level of reliability, such as automotive, please contact a company representative for further information.

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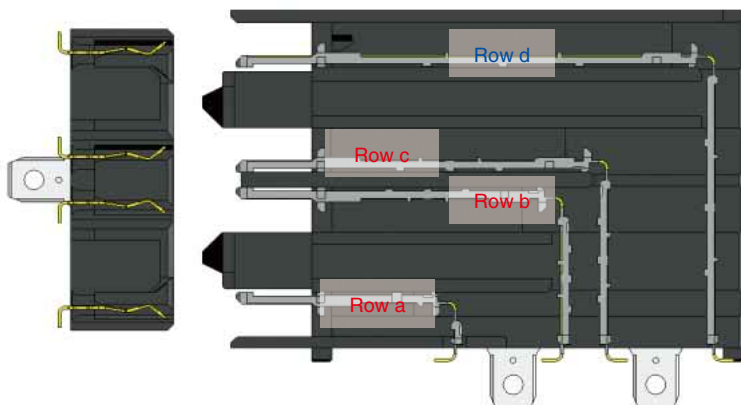
## Pin Assignment

84pos. : IT9M2-84P-0.5SH3 – IT9M2-84S-0.5SV3



Number of Contacts	Column	Pin Number																											
		28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
84	Row c	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G
	Row b	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G
	Row a	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Row c : For High Speed Signal Row b : For High Speed Signal Row a : For Power and Low Speed Signal														S : Differential Signal Pin (36 Pins / 18 Pairs) G : Dedicated Ground Pin (20 Pins) U : Universal Pin (28 Pins)															

224pos. : IT9M2-224P-0.5SH4 – IT9M2-224S-0.5SV4

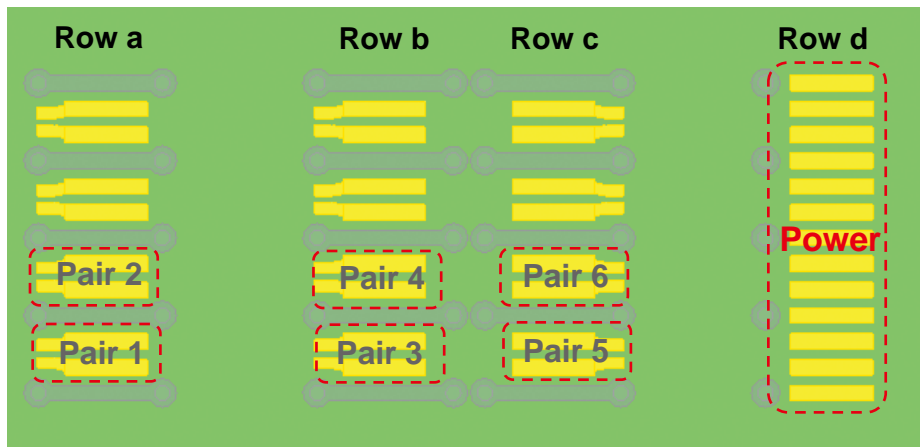


Number of Contacts	Column	Pin Number																											
		28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
224	Row d	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	Row c	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G
	Row b	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G
	Row a	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G
	Column	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29
	Row d	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	Row c	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G
	Row b	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G
	Row a	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G	S	S	G
	Row d : For Power and Low Speed Signal Row c : For High Speed Signal Row b : For High Speed Signal Row a : For High Speed Signal														S : Differential Signal Pin (108 Pins / 54 Pairs) G : Dedicated Ground Pin (60 Pins) U : Universal Pin (56 Pins)														

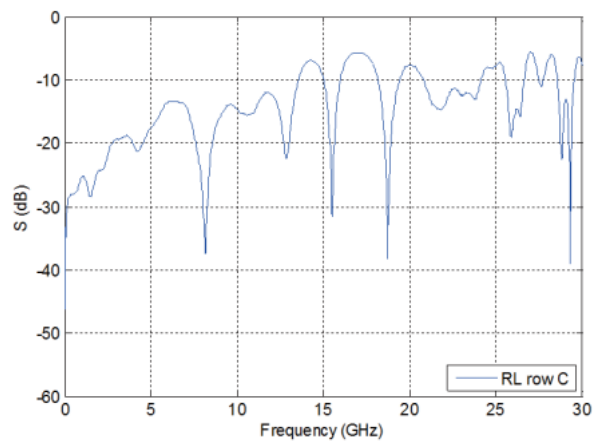
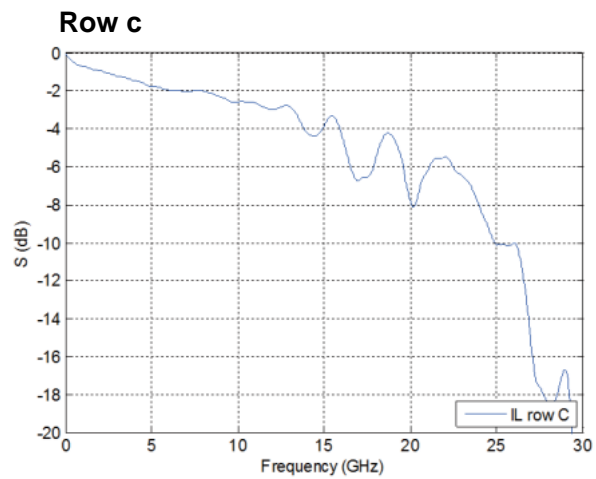
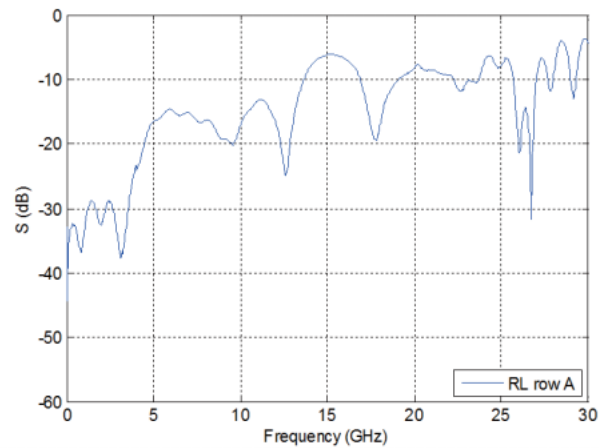
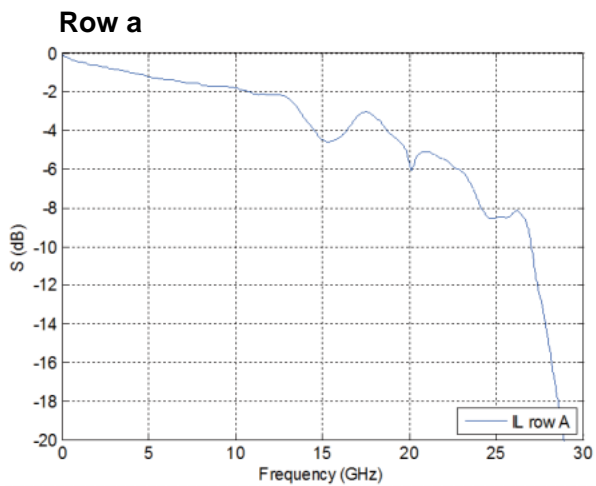
## Signal Integrity

### Pin assignment

#### Via-Connector-via

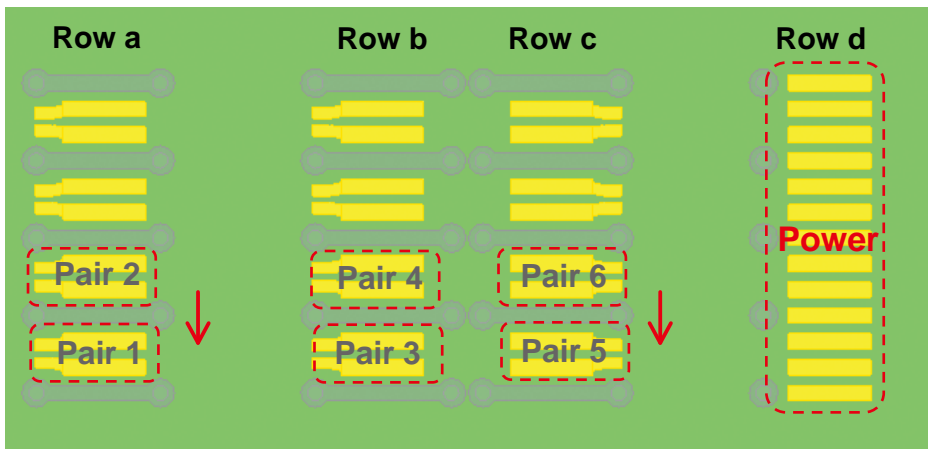


### Insertion Loss and Return Loss

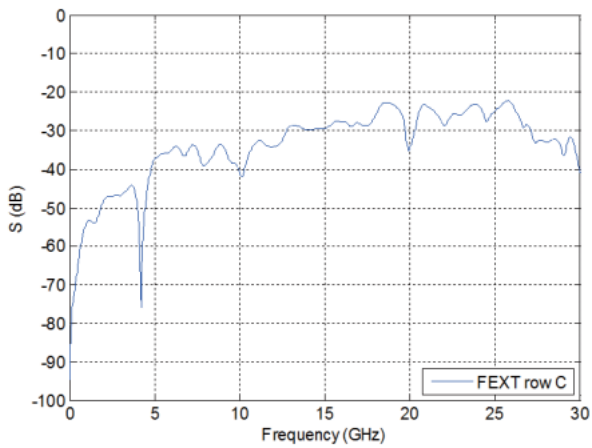
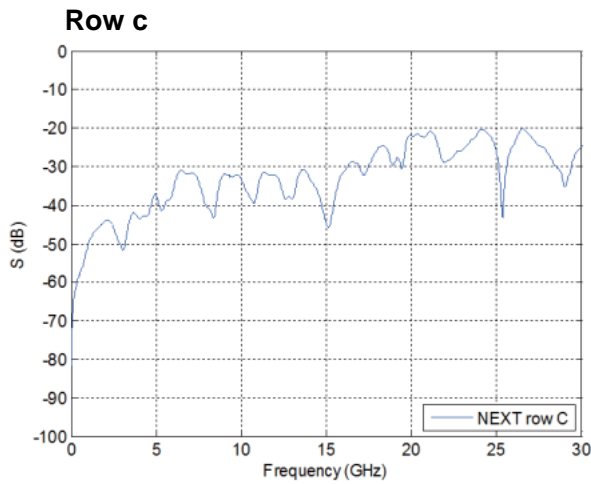
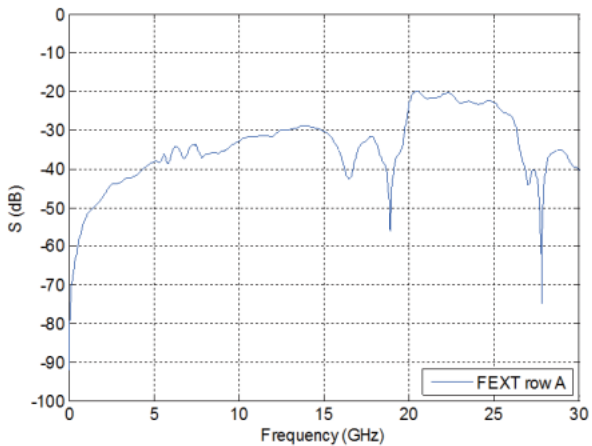
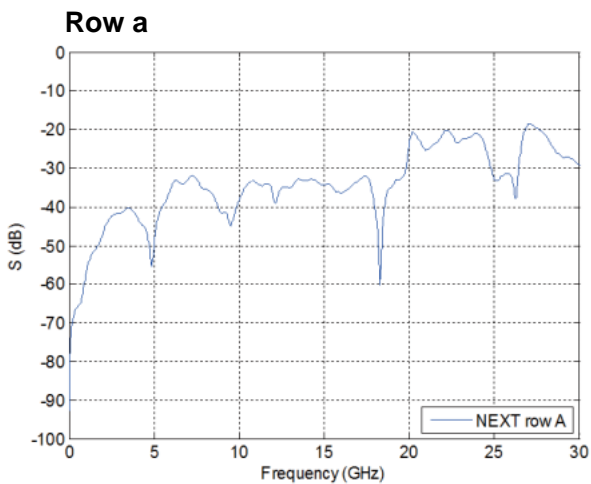


● Pin assignment

Via-Connector-via



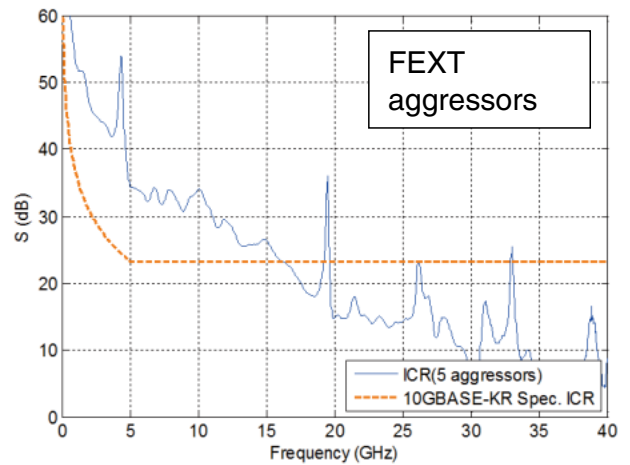
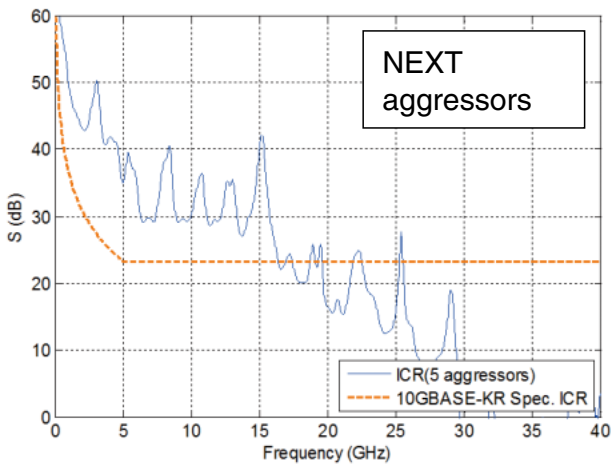
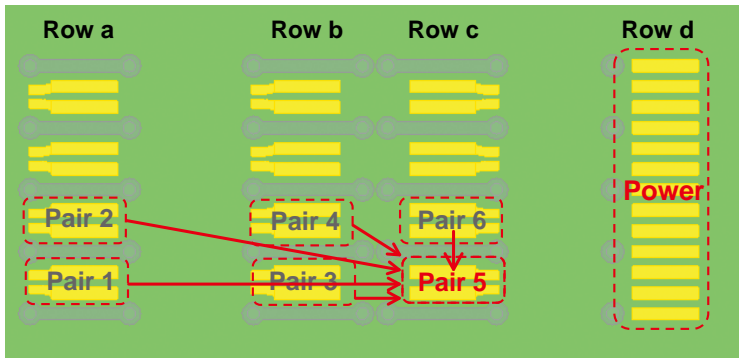
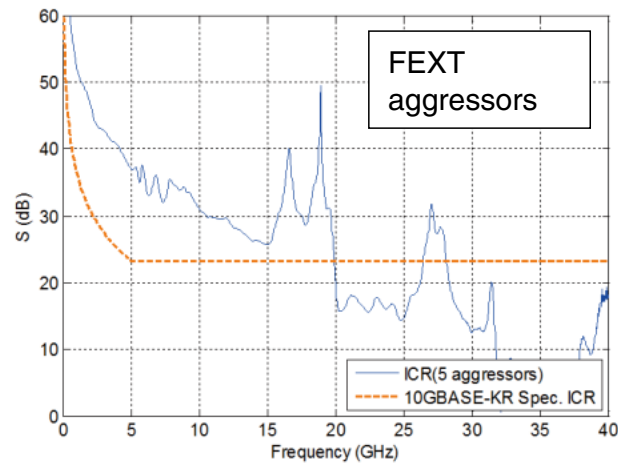
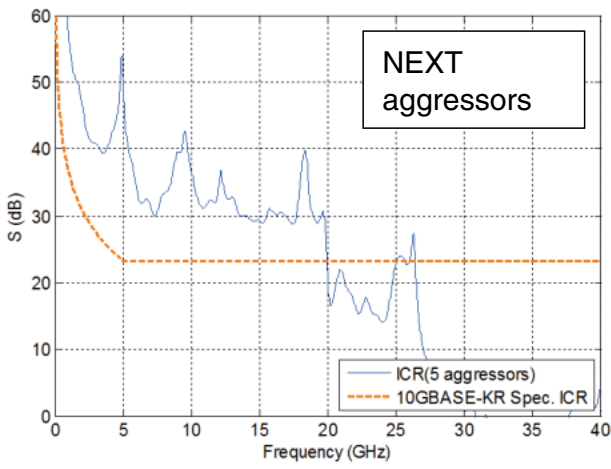
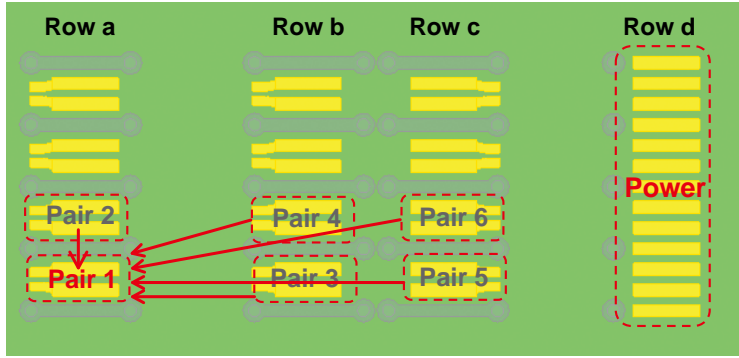
● Crosstalk



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### ● Insertion-loss-to-crosstalk ratio (ICR)

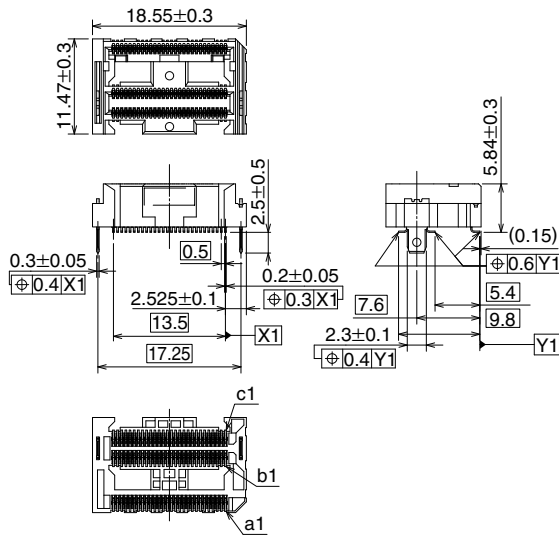
The insertion-loss-to-crosstalk ratio (ICR) with 5-aggressor meets the extrapolated IEEE 802.3ap specification to 14GHz with plenty of margins.



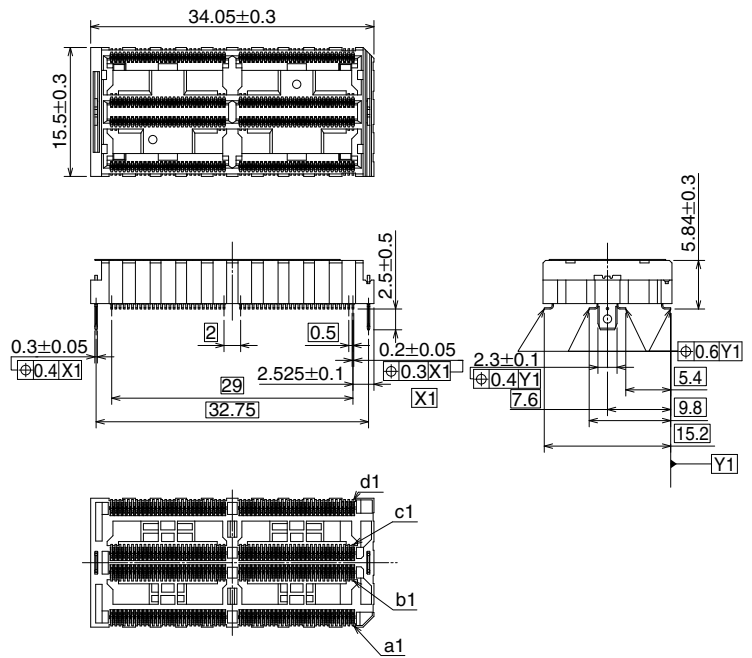
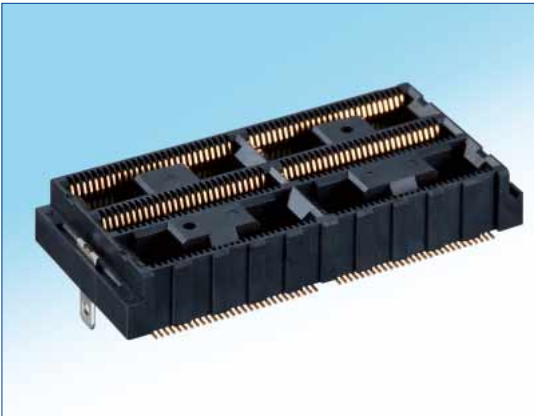
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## ■ Receptacle

### ● 3row type : IT9M2-84S-0.5SV3



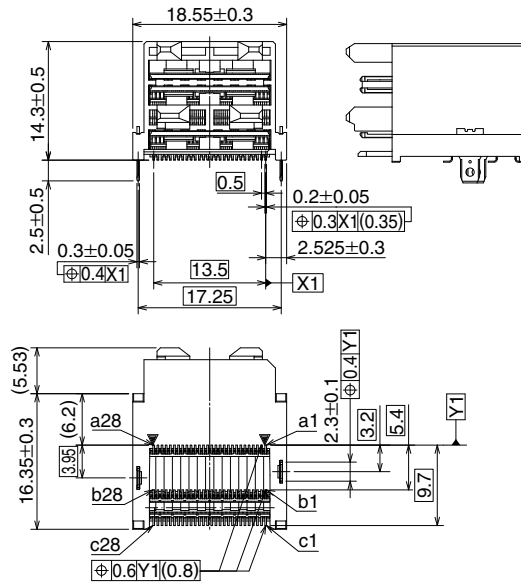
### ● 4row type : IT9M2-224S-0.5SV4



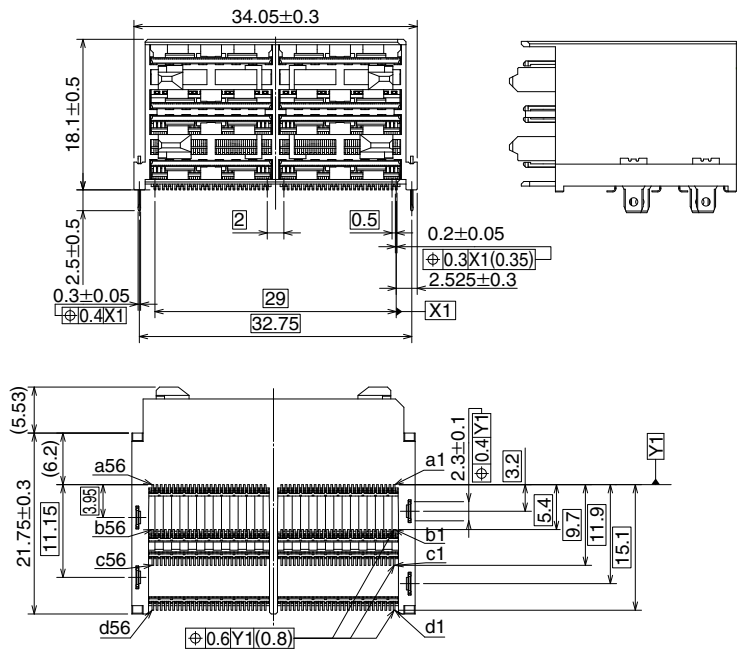
Part No.	HRS No.	No. of Contacts
IT9M2-84S-0.5SV3	636-1610-0	84
IT9M2-224S-0.5SV4	636-1611-0	224

## ■ Right angle plug

### ● 3row type : IT9M2-84P-0.5SH3



### ● 4row type : IT9M2-224P-0.5SH4



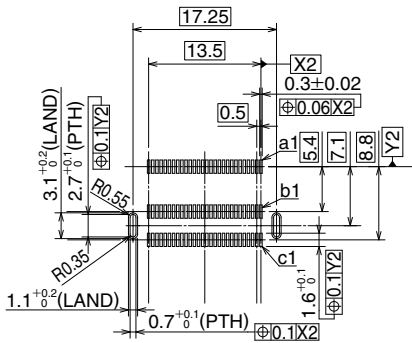
Part No.	HRS No.	No. of Contacts
IT9M2-84P-0.5SH3	636-1606-0	84
IT9M2-224P-0.5SH4	636-1607-0	224

## Recommended PCB Mouting Pattern

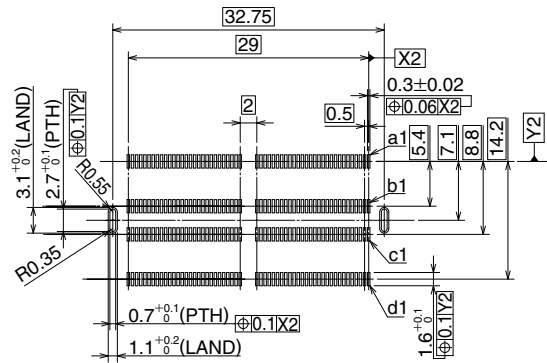
(Stencil thickness : t=0.13mm)

### ● Receptacle

IT9M2-84S-0.5SV3

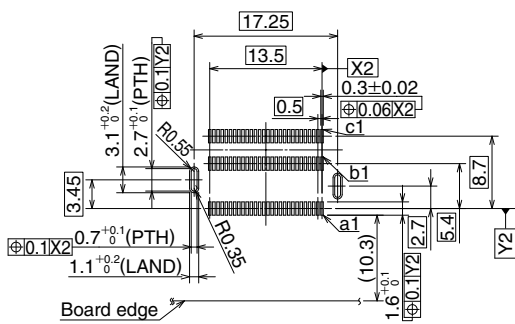


IT9M2-224S-0.5SV4

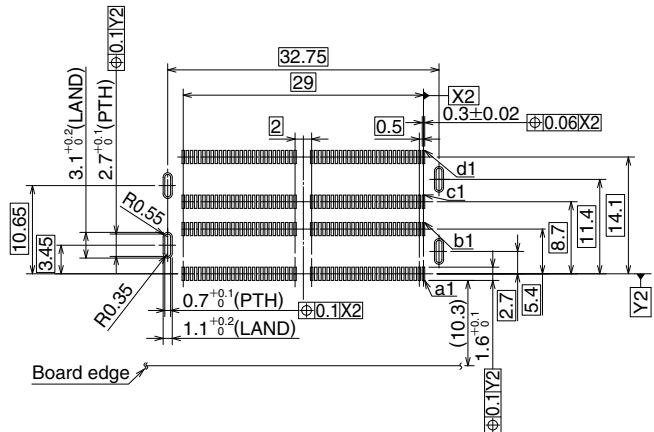


### ● Right angle plug

IT9M2-84P-0.5SH3



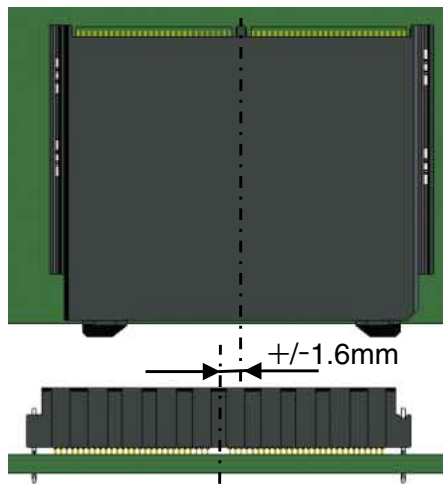
IT9M2-224P-0.5SH4



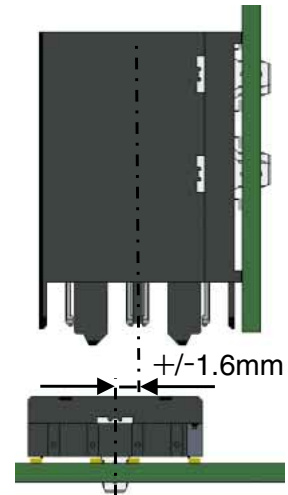
## ■ Processing recommendations

### ● Mating Alignment Requirements

Maximum mating guidance is up to  $\pm 1.6\text{mm}$  in both longitudinal and lateral directions.



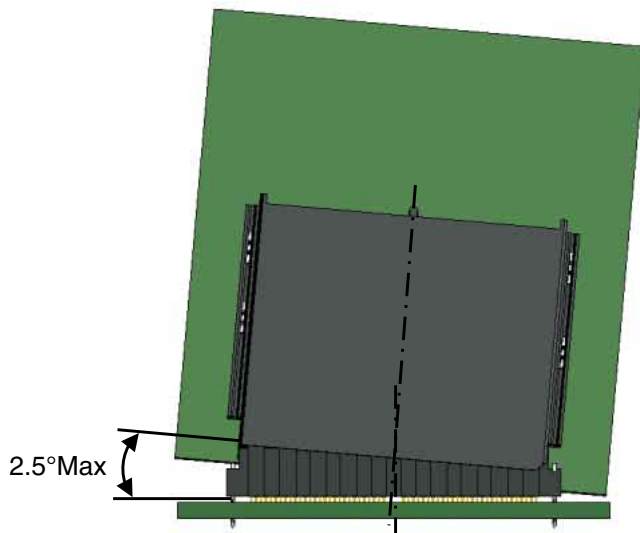
Longitudinal



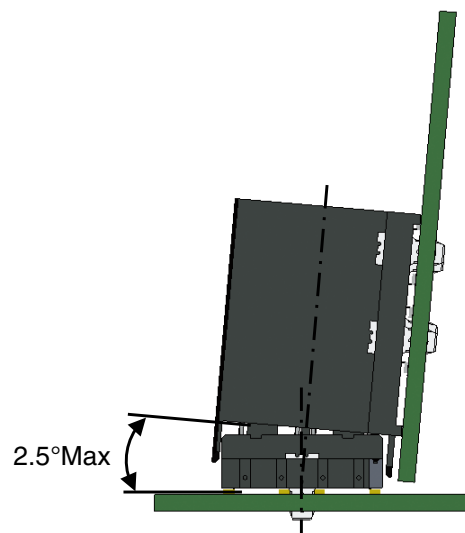
Lateral

These values do not include the influence of misalignment in other axis nor rotation / inclination in the same time, except for the misalignment in the single axis shown in each figure.

### ● Mating Angle Requirements



Longitudinal

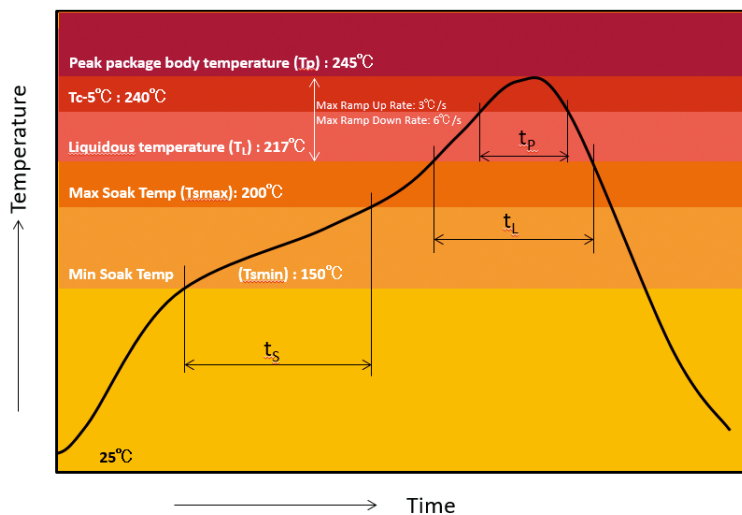


Lateral

## Mounting Temperature Profile (Reference)

Profile Feature	Condition	Note
Preheat/Soak Temperature Min (T <sub>smin</sub> ) Temperature Max (T <sub>smax</sub> ) Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> )	150°C 200°C 60-120 seconds	Soak requirements should be determined by board design, oven capability, and paste activation requirements. Caution- "oversoaking" may exhaust flux and affect soldering.
Ramp-up rate (TL to T <sub>p</sub> )	3°C/second max.	Other components may limit ramp rate to 2°C/sec.
Liquidous temperature (T <sub>L</sub> ) Time (t <sub>L</sub> ) maintained above T <sub>L</sub>	217°C 60-150 seconds	Shorter t <sub>L</sub> may require higher peak temperature.
Peak package body temperature (T <sub>p</sub> )	245°C max.	Cooler peak temperatures may require longer t <sub>L</sub> . For users T <sub>p</sub> must not exceed the classification temp (T <sub>C</sub> ) of 250°C.
Time (t <sub>p</sub> )* within 5°C of the specified classification temperature (T <sub>c</sub> )	30 seconds max.	
Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )	6°C/second max.	
Package Body Exposure Limit at Maximum Temperature	5 seconds	Adjust profile if maximum exposure limits approached or exceeded.

All temperatures refer to the center of the connector body, measured on the connector body surface that is facing up during assembly reflow. Reflow profiles in this document are based according to IPC/JEDEC J-STD-020D.1 and are for preconditioning. Actual board assembly profiles should be developed based on specific process needs and board designs and should not exceed the parameters in the table above.



Different solder pastes have different thermal performance characteristics. Consult with paste manufacturer for optimum profile setting.

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<http://www.hirose-connectors.com>