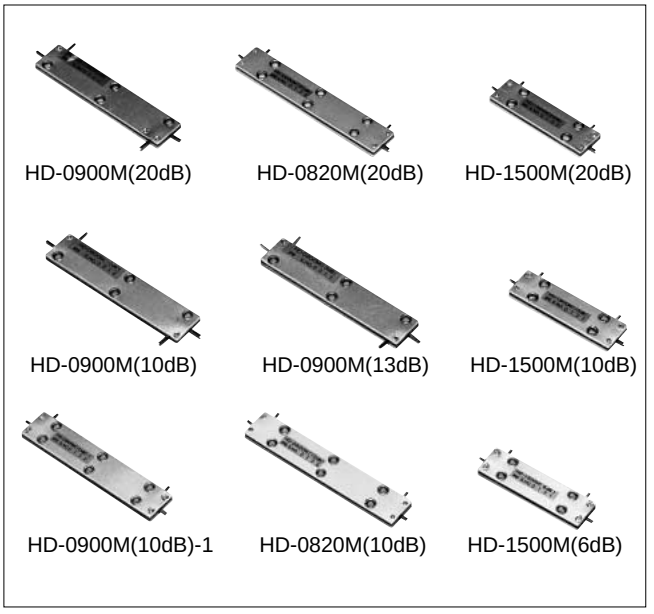
Card Couplers

HD-M Series



■Features

1.High Performance

The high frequency characteristics feature. Extremely high degree of matching, and high isolation.

2.Miniature and Lightweight

Corrosion-resistant aluminum is used for the cover and the Hirose Electric original pattern design, which uses a stripline triplate method, enables the couplers to be miniature and lightweight.

3.Equipped with Tabs

Tabs permit direct mounting to surface circuits.

4.Full Coupling Variations

Full variations of degrees of coupling over 6 dB are available.

5.Full Frequency Variations

Full complement of mobile radio frequencies.

■Product Specifications

Rating	Frequency range (NOTE)	720 to 1600 MHz	Operating temperature range	-10℃ to +65℃
	Characteristic impedance	50Ω		
	Maximum usable power (NOTE)	25 to 100 W	Operating relative humidity	95% or less

NOTE: The frequency range and the maximum usable power will differ depending on the model.

Item	Standard	Conditions
1.Insulation resistance	500 MΩ max.	Measured at 100 V DC
2.Vibration resistance	No electrical disconnections of 1μs or greater No damage, cracks, or parts looseness	Frequency of 10 to 2000 Hz, overall amplitude of 1.52 mm, 98 m/s² acceleration, in 3 axial directions, 2 hours each
3.Shock resistance	No electrical disconnections of 1μs or greater No damage, cracks, or parts looseness	490 m/s² acceleration, half sine wave, in 3 axial directions, 3 times each
4.Temperature cycle	No damage, cracks, or parts looseness	(-55℃: 30 min. → 5 to 35℃: Within 15 min.→ 80℃: 30 min. → 5 to 35℃: Within 15 min.) for 200 cycles
5.Corrosion resistance	No serious corrosion	Continuous immersion in 20% salt water for 48 hours

●The test method conforms to MIL-STD-202.
●Please see the specification items for details concerning VSWR, coupling,frequency sensitivity,and directivity.

■Materials

Part	Material	Processing
Cover	Aluminum	Conductive white Alumite
Board	Dielectric	Gold plating
Rivets	Aluminum	——
Eyelet	Brass	Nickel plating
Tabs	Phosphor bronze	Gold plating

■Product Number Breakdown

HHD - 00900M (10dB) - 1
❶ ❷ ❸ ❹

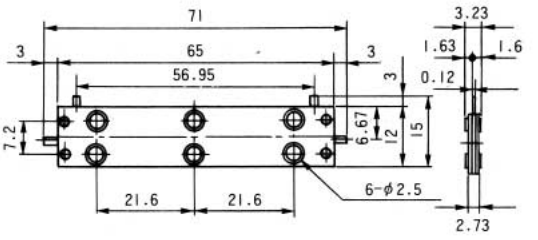
❶ Series Name: HD (Directional Couplers)	❸ Degree of Coupling (Example) (10dB) : 10dB
❷ Center Frequency 0820M : 820MHz 0900M : 900MHz 1500M : 1500MHz	❹ Suffix

■Specifications

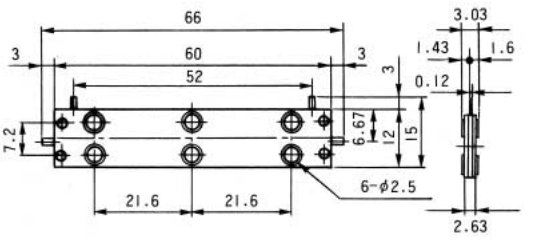
Model No.	(GHz) Frequency Range	(dB) Coupling	(dB) Frequency Sensitivity	(dB MAX) Insertion Loss	(dB Min) Directivity	(Max) Primary Line V.S.W.R.	(Max) Secondary Line V.S.W.R.	(g) Weight	(W) Power	
HD-0820M (10dB)	0.72～0.92	10±1.0	±0.25	0.35	20	1.2	1.2	4.7	25	
HD-0820M (20dB)	0.72～0.92	20±1.0	±0.25	0.5	15	1.2	1.2	4.7	25	
HD-0900M (10dB)	0.8～1.0	$10^{+1.5}_{-0.5}$	±0.5	0.8	17	1.2	1.2	5	50	※
HD-0900M (10dB)-1	0.8～1.0	10±1.0	±0.25	0.5	18	1.2	1.2	5	25	
HD-0900M (13dB)	0.8～1.0	13±1.0	±0.5	0.7	16	1.2	1.2	5	50	※
HD-0900M (20dB)	0.8～1.0	20±1.0	±0.5	0.5	15	1.2	1.2	5	50	※
HD-1500M (6dB)	1.4～1.6	6±1.0	±0.25	0.5	18	1.2	1.2	3.2	50	
HD-1500M (10dB)	1.4～1.6	10±1.0	±0.25	0.5	18	1.2	1.2	3	25	
HD-1500M (20dB)	1.4～1.6	20±1.0	±0.25	0.5	18	1.2	1.2	3	25	

●The coupling loss component is not included in the insertion loss (unless the item is marked with an ※ symbol).

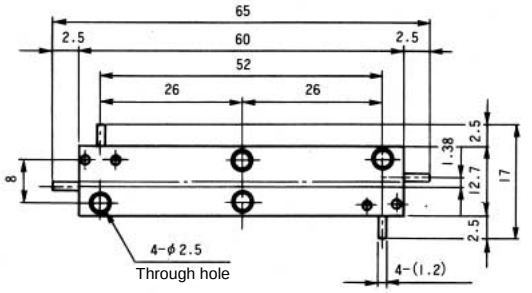
■External Dimensions



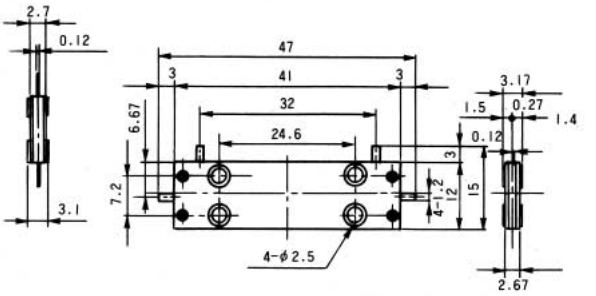
HD-0820M(10dB・20dB)



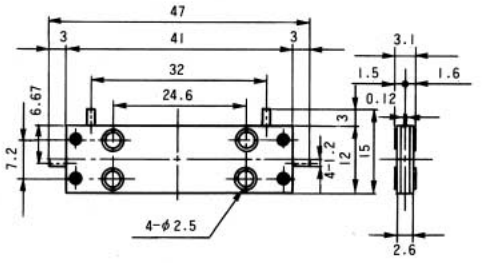
HD-0900M(10dB)-1



HD-0900M (10・13・20dB)

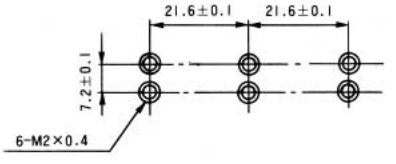


HD-1500M (6dB)

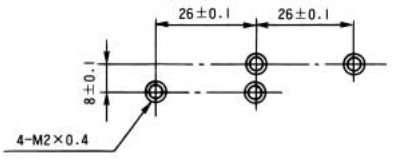


HD-1500M (10・20dB)

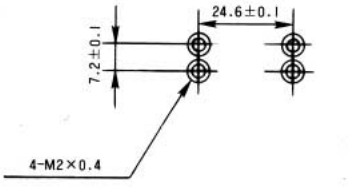
■Mounting Hole Dimensions



HD-0820M (10・20dB)
HD-0900M (10dB)-1

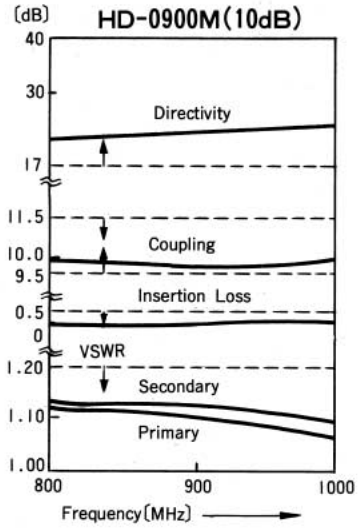


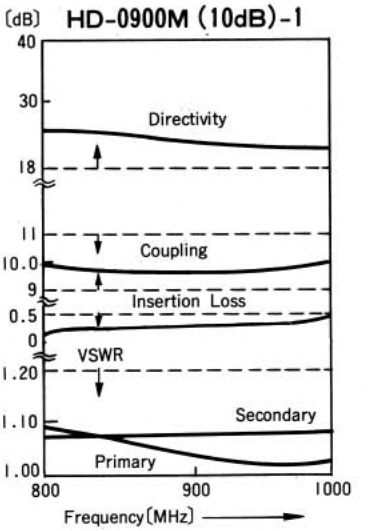
HD-0900M (10・13・20dB)

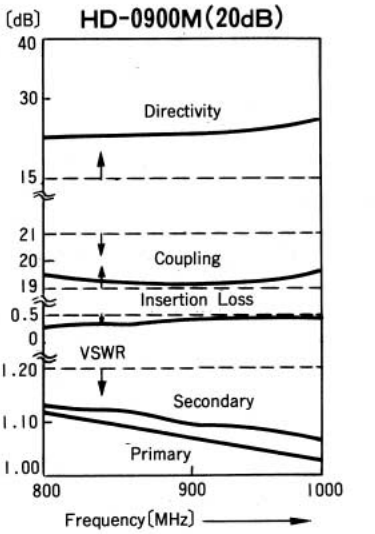


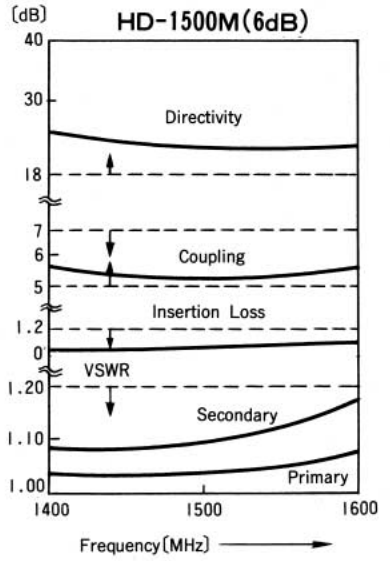
HD-1500M (6・10・20dB)

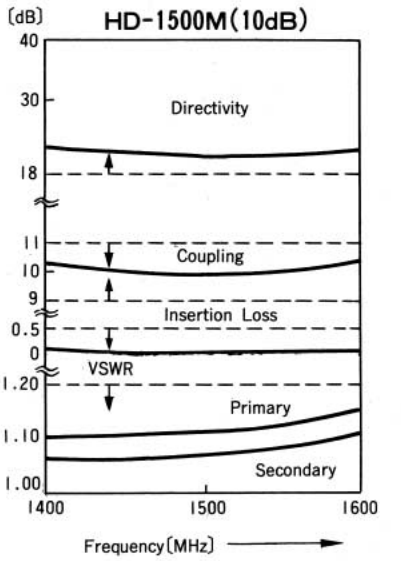
■Typical Data

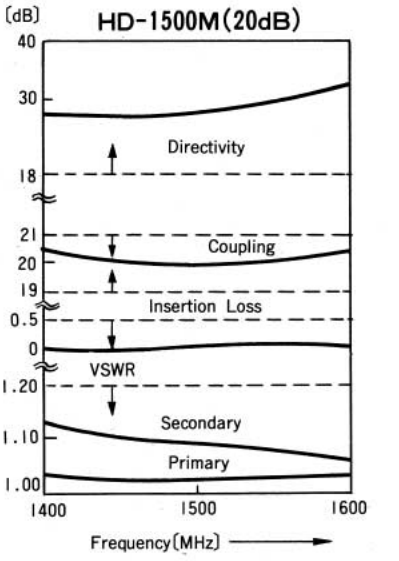












■Mounting Method

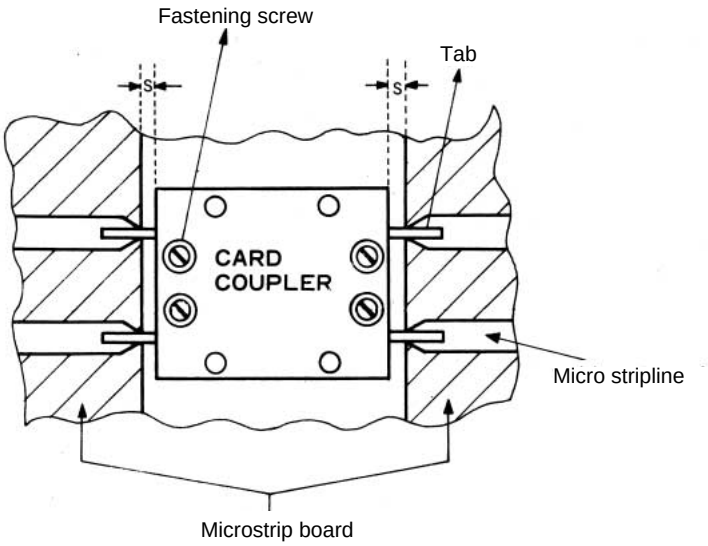


Figure 1.

The three types of mounting methods illustrated in the diagrams below will mount the card coupler for use under optimum conditions.
The fastening screws in the diagrams are M2 screws tightened to 1.5 kg · cm.
When the tip of the micro stripline is of Teflon type material (εr = 2.6), C chamfering of C1 is performed at t1.6, and of C0.5 at t1.2.
The side view diagrams of Figure 1 are illustrated in Figures 2, 3, and 4 below.
Gap S between the card coupler and the microstrip board surface should be used to agree with the following conditions.

Below 500 MHz ·····S≦0.5 mm
500 to 2300 MHz·····S≦0.25 mm
Above 2300 MHz·····S≦0.15 mm

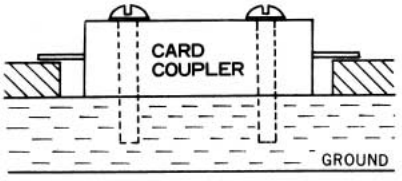


Figure 2.

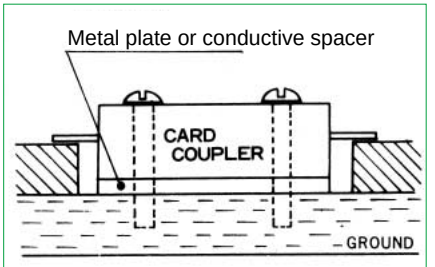


Figure 3.

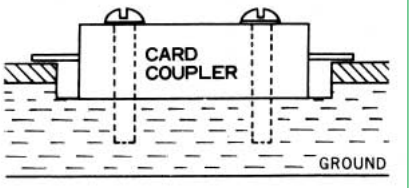


Figure 4.

●When the Ground Board is Constructed of 0.4 mm Stainless and 0.8 mm Aluminum

(When the Thickness of the Microstrip Board is 1.6 or 1.2 mm)

For t1.6 boards, use with the stainless case of the card coupler facing upward. For t1.2 boards, use with the aluminum case of the card coupler facing upward. Mount and fix the card coupler with fastening screws as illustrated in Figure 2. Next, solder the tabs and micro stripline, then use.

(When the Thickness of the Microstrip Board is Greater than 1.6 mm)

Insert a metal plate or a conductive spacer between the coupler and ground, then mount as illustrated in Figure 3 so that the surface of the tabs and the position of the microstrip board are equal. Fix the card coupler with fastening screws as illustrated in Figure 3. Next, solder the tabs and micro stripline, then use.

(When the Thickness of the Microstrip Board is Less than 1.2 mm)

Cut the ground at the position of the coupler and attach so that the surface of the tabs is in contact with the micro stripline. Fix the card coupler with fastening screws as illustrated in Figure 4. Next, solder the tabs and micro stripline, then use.

For VE Items (in which Aluminum Is Used Above and Below the Ground Board and the Eyelets Protrude Beyond the Cover)

The height of the cover will be a value 0.1 mm less than one half of the overall thickness.

For Directional Card Couplers (HD-0900M (10 dB) and HD-0900M (20 dB),etc.)

The height of the cover will be a value 0.35 mm less than one half of the overall thickness.

(When Spacing H of the Micro Stripline Board and the Tabs is 0 ≦ H ≦ 0.3 mm)

Fix the card coupler with fastening screws as illustrated in Figure 2.
Next, solder the tabs and micro stripline, then use.

(When Spacing H of the Micro Stripline Board and the Tabs is H < 0)

Insert a metal plate or a conductive spacer between the coupler and ground, then mount as illustrated in Figure 3 so that the surface of the tabs and the position of the microstrip board are equal. Fix the card coupler with fastening screws as illustrated in Figure 3. Next, solder the tabs and micro stripline, then use.

(When Spacing H of the Micro Stripline Board and the Tabs is H > 0.3 mm)

Cut the ground at the position of the coupler and attach so that the surface of the tabs is in contact with the micro stripline. Fix the card coupler with fastening screws as illustrated in Figure 4. Next, solder the tabs and micro stripline, then use.

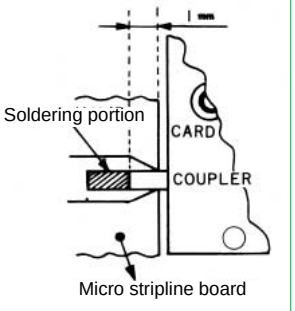


Figure 5.

At the time of soldering, solder with a space of 1 mm from the edge of the micro stripline as illustrated in Figure 5.