

# RF Transformer For Wideband RF Applications

## RF SERIES



### FEATURES:

- RoHS peak reflow temperature rating: 245°C
- For single-ended to balanced applications
- Value-oriented construction
- Small surface mount package
- Excellent insertion loss
- Various impedance ratios available

### PACKAGING:

- Tape & Reel : 2200 /reel
- Tray: 100 /tray

### ELECTRICAL CHARACTERISTICS:

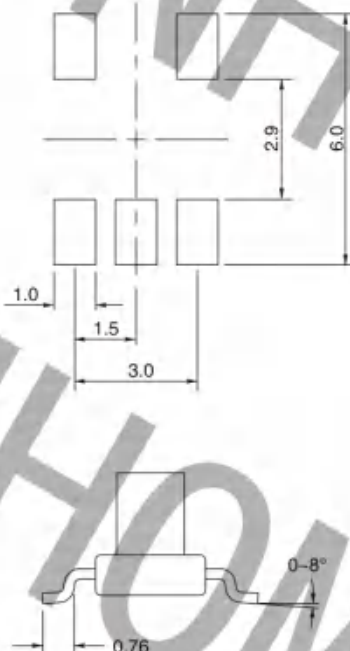
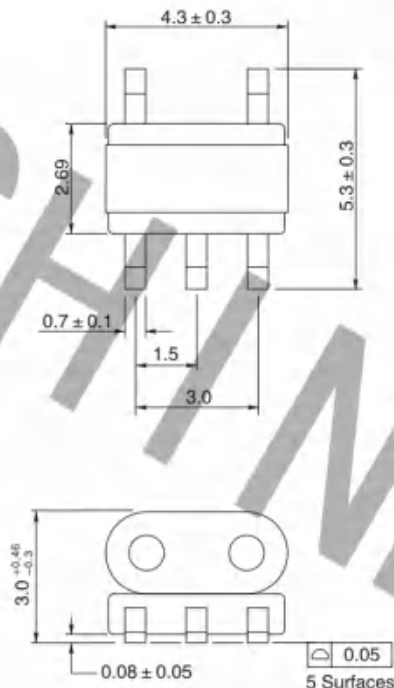
| Part No. | Impedance ratio<br>Pri : Sec<br>± 2% | Turns ratio<br>Pri : Sec<br>± 2% | Bandwidth<br>(MHz)Typ | Insertion loss<br>@ Midband<br>(dB) | Schematic |
|----------|--------------------------------------|----------------------------------|-----------------------|-------------------------------------|-----------|
| RF-2078  | 1:1                                  | 1:1                              | 5-500                 | 0.6                                 | A         |
| RF-2081  | 1:1.5CT                              | 1:1.2CT                          | 5-125                 | 0.9                                 | B         |
| RF-2156  | 1:1                                  | 1:1                              | 2.3-2700              | 0.2                                 | A         |

#### Notes:

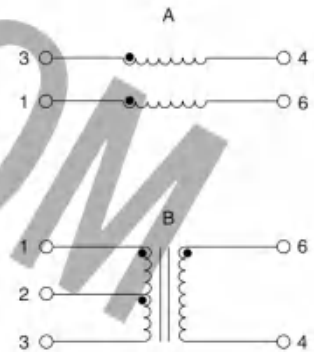
1. Impedance and turns ratios are specified primary:secondary. (CT=Center Tap).
2. Bandwidth is referenced to midband loss.
3. These transformers are verified to operate from -40°C to +85°C. Contact Applications Engineering for performance data.

### TECHNICAL INFORMATION & PHYSICAL CHARACTERISTICS:

#### Dimensions(mm)



#### Schematic



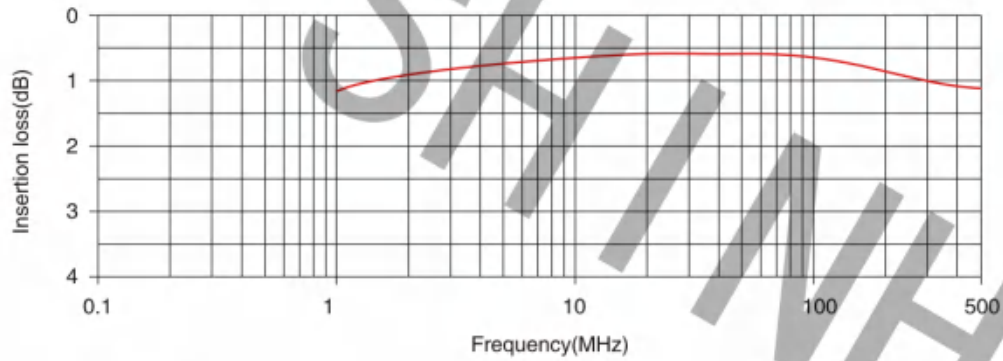
Weight ..... 0.43 grams  
Tape & Reel ..... 2200 /reel  
Tray ..... 100 /tray

#### Application Notes:

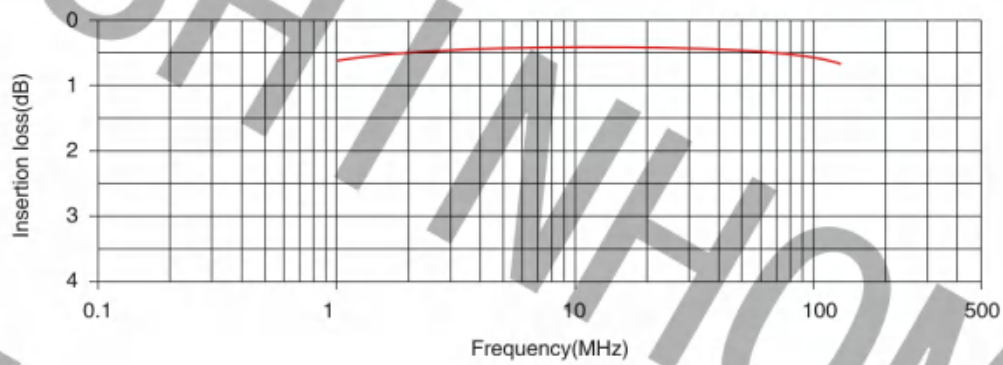
1. Bandwidth specifications are typical in a 75 Ω system.
2. Materials used in the products are UL94-V0 recognized. Products meet requirements of IEC 695-2-2 (Needle Flame Test).
3. For additional impedance ratios and frequency ranges, please contact Applications Engineering.

## Typical insertion loss:

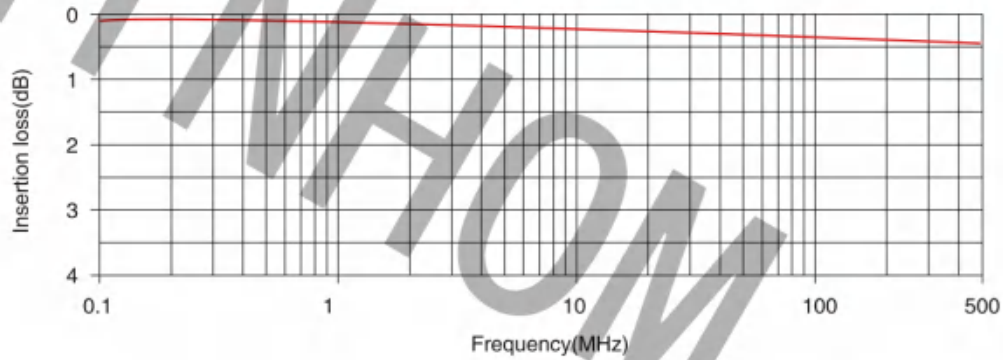
**RF-2078**



**RF-2081**

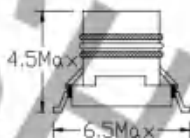
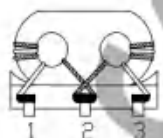
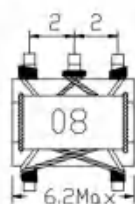


**RF-2156**



## EXTERNAL DIMENSIONS

(Unit: m/m)



| Part Number           | Winding Turns |            | Operating Frequency Range | Insertion Loss                                  | Pin Connection Fig. |
|-----------------------|---------------|------------|---------------------------|-------------------------------------------------|---------------------|
| Double Balanced Mixer |               |            |                           |                                                 |                     |
| RF-5-1003             | 3x4           |            | 8MHz~800MHz               | 3.5 dB Max.                                     | 1                   |
| RF-5-1005             | 2x4           |            | 400MHz~1.3GHz             | 4 dB Max.                                       | 1                   |
| RF-5-1008             | 4x4           |            | 6MHz~600MHz               | 2.5 dB Max.                                     | 1                   |
| RF-5-1011             | 5x4           |            | 5MHz~500MHz               | 2 dB Max.                                       | 1                   |
| RF-5-1012             | 1x4           |            | 50MHz~400MHz              | 10 dB Max.                                      | 1                   |
| RF-5-1013             | 2x4           |            | 10MHz~1.0GHz              | 6 dB Max.                                       | 1                   |
| Frequency Mixer       |               | Pri    Sec |                           |                                                 |                     |
| RF-5-1024             | 3 x 2         | 3          | 3.5MHz~470MHz             | 3 dB Max.                                       | 2                   |
| RF-5-1052             | 2 x 2         | 2          | 9MHz~350MHz               | 3 dB Max.                                       | 2                   |
| RF-5-1085             | 1 x 2         | 1          | —                         | 3 dB Max.                                       | 2                   |
| RF-5-1086             | 4 x 2         | 4          | 2.2MHz~400MHz             | 3 dB Max.                                       | 2                   |
| RF-5-1087             | 5 x 2         | 5          | 1.5MHz~300MHz             | 3 dB Max.                                       | 2                   |
| Distributor           |               |            |                           | IN to OUT-1,2<br>4.5 dB Max.                    |                     |
| RF-5-1014             | —             |            | 20MHz~600MHz              | OUT-1 to OUT-2<br>(ISOLATION)<br>10 dB Min.     | 3                   |
| Directional Coupler   |               |            |                           |                                                 |                     |
| RF-5-1006             | 5             |            | 6MHz~600MHz               | IN to OUT-1 0.9 dB Max.<br>IN to OUT-2 13~16 dB | 4                   |
| RF-5-1007             | 6             |            | 6MHz~600MHz               | IN to OUT-1 0.8 dB Max.<br>IN to OUT-2 15~17 dB | 4                   |
| RF-5-1015             | 4             |            | 6MHz~600MHz               | IN to OUT-1 1.3 dB Max.<br>IN to OUT-2 11~14 dB | 4                   |

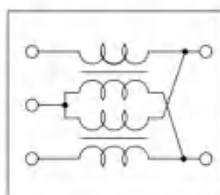
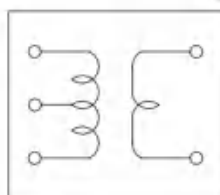
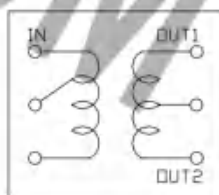
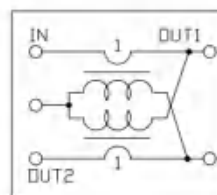
## Features

- Pair wire coil for high stability.
- Base pin terminal treated, allowing mounting "as is" on a PCB

## Applications

- Double balance mixers, broad-band transformers, impedance transformers, etc.

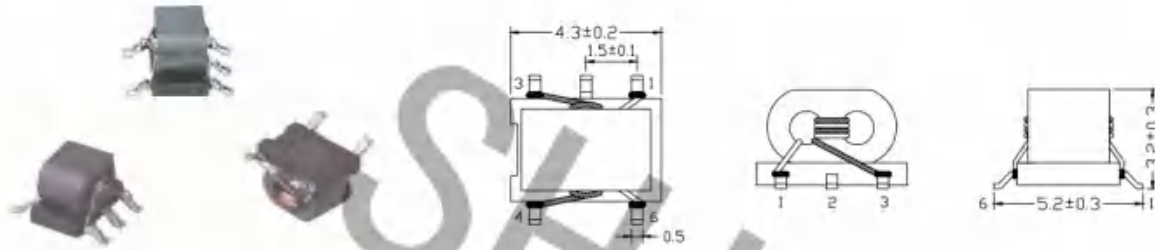
## Pin Connection


Double Balanced Mixer  
Fig.1

Transformer  
Fig.2

Distributor  
Fig.3

Directional Coupler  
Fig.4



## EXTERNAL DIMENSIONS

(Unit: m/m)



| Part Number                  | Winding Turns | Operating Frequency Range (MHz) | Insertion Loss (dB)                        | Pin Connection Fig. |
|------------------------------|---------------|---------------------------------|--------------------------------------------|---------------------|
| <b>Double Balanced Mixer</b> |               |                                 |                                            |                     |
| RF-3-1007A                   | 2             | 25MHz ~ 2000MHz                 | 3                                          | 1                   |
| RF-3-1009A                   | 3             | 6MHz ~ 2000MHz                  | 3                                          | 1                   |
| RF-3-1006A                   | 3             | 150MHz ~ 2300MHz                | 3                                          | 1                   |
| RF-3-1010A                   | 4             | 3.5MHz ~ 2000MHz                | 3                                          | 1                   |
| RF-3-1018A                   | 5             | 2MHz ~ 2000MHz                  | 3                                          | 1                   |
| <b>Frequency mixer</b>       |               |                                 |                                            |                     |
| RF-3-1025A                   | 1             | —                               | —                                          | 2                   |
| RF-3-1019A                   | 2             | 8MHz ~ 750MHz                   | 3                                          | 2                   |
| RF-3-1026A                   | 3             | 3.5MHz ~ 700MHz                 | 3                                          | 2                   |
| <b>Balun transformer</b>     |               |                                 |                                            |                     |
| RF-3-1021A                   | 1.5           | 20MHz ~ 750 MHz                 | 3                                          | 3                   |
| RF-3-1022A                   | 2.5           | 4.5MHz ~ 3300MHz                | 3                                          | 3                   |
| RF-3-1023A                   | 3.5           | 2.3MHz ~ 2700MHz                | 3                                          | 3                   |
| RF-3-1024A                   | 4.5           | 1.5MHz ~ 2400MHz                | 3                                          | 3                   |
| <b>DISTRIBUTOR</b>           |               |                                 |                                            |                     |
| RF-3-1079A                   | 2             | 1300MHz ~ 1700MHz               | IN to OUT-1,2<br>4.5dB Max.                | 4                   |
| RF-3-1076A                   | 3             | 800MHz ~ 1000MHz                | OUT-1 to OUT-2<br>(ISOLATION)<br>15dB Min. | 4                   |

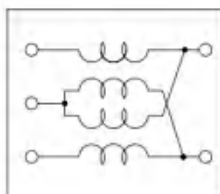
## Features

- Pair wire coil for high stability.
- Base pin terminal treated, allowing mounting "as is" on a PCB

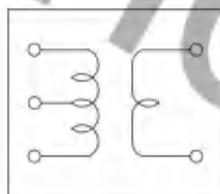
## Applications

- Double balance mixers, broad-band transformers, impedance transformers, etc.

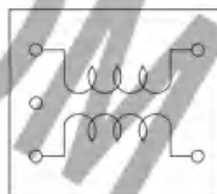
## Pin Connection



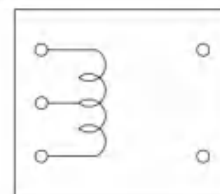
Double Balanced  
Fig.1



Mixer Transformer  
Fig.2



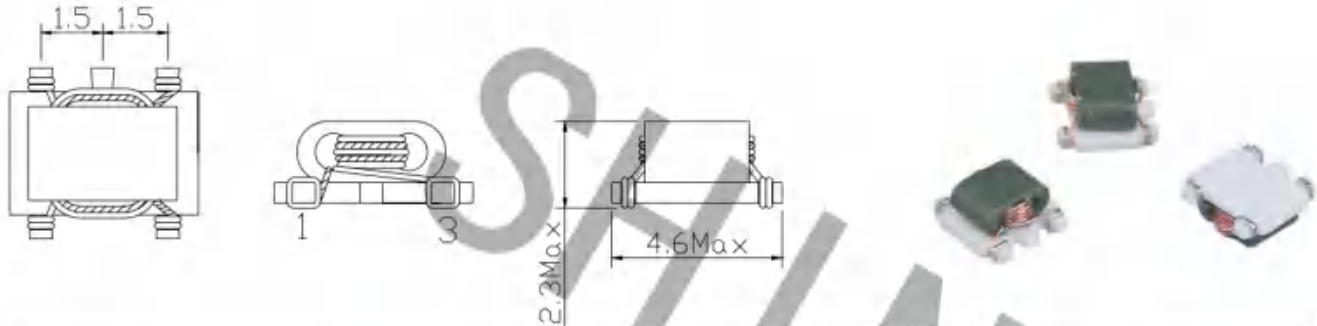
Balun Transformer  
Fig.3



Distributor  
Fig.4

## EXTERNAL DIMENSIONS

(Unit:m/m)

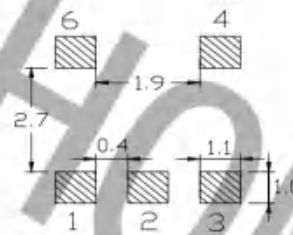
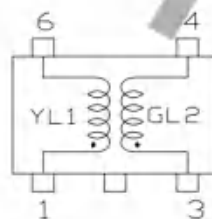


| Part Number | Insertion Loss | I <sub>DC</sub> (A) Max | R <sub>DC</sub> (Ω) Max | Impedance (Typical)              | Withstand Voltage |
|-------------|----------------|-------------------------|-------------------------|----------------------------------|-------------------|
| RF-3L-371   | 0.3 MHz 6±2 dB | 0.25                    | 0.35                    | 370 Ω @ 1 MHz<br>1100 Ω @ 10 MHz | 150VAC            |
|             | 1 MHz 7±2 dB   |                         |                         |                                  |                   |
|             | 10 MHz 18±3 dB |                         |                         |                                  |                   |
|             | 40 MHz 2±3 dB  |                         |                         |                                  |                   |

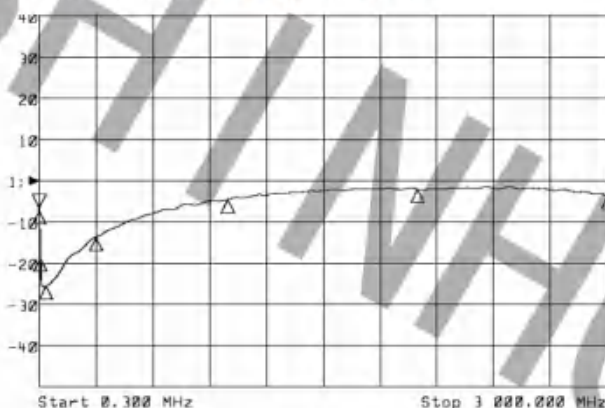
## Features:

- Low profile: 2.3mm(Max).
- Common mode impedance of 370 Ω at 1MHz , 1100 Ω at 10MHz.
- Operating temperature Range:-25℃~ +85℃.
- Suitable for reflow soldering.

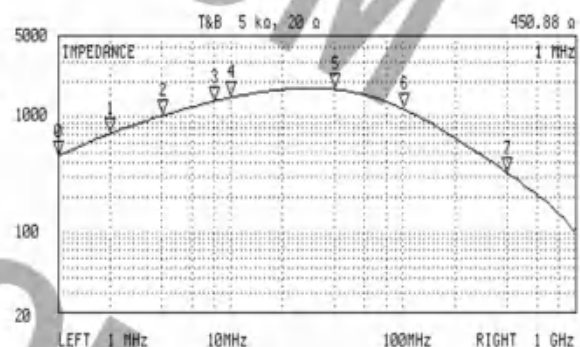
## Circuit & Pad: (Top View)



## Insertion Loss& Impedance



| 1: Mkr (MHz) | dB      | 2: Mkr (MHz) | dB |
|--------------|---------|--------------|----|
| 1: 0.3000    | -6.398  |              |    |
| 2: 1.0000    | -7.281  |              |    |
| 3: 10.0000   | -18.631 |              |    |
| 4: 40.0000   | -25.561 |              |    |
| 5: 300.0000  | -13.679 |              |    |
| 6: 1000.0000 | -4.441  |              |    |
| 7: 2000.0000 | -2.041  |              |    |
| 8: 3000.0000 | -3.518  |              |    |



| N | STINULUS | VAL       |
|---|----------|-----------|
| 0 | 1 MHz    | 450.88 Ω  |
| 1 | 2 MHz    | 712.06 Ω  |
| 2 | 4 MHz    | 1.0158 kΩ |
| 3 | 8 MHz    | 1.3516 kΩ |
| 4 | 10 MHz   | 1.4581 kΩ |
| 5 | 40 MHz   | 1.7185 kΩ |
| 6 | 100 MHz  | 1.1605 kΩ |
| 7 | 400 MHz  | 327.47 Ω  |



## RF Transformers for Surface Mounting

### RF 5S,5SL SERIES

#### FEATURES:

- Pair wire coil for high stability,
- Base pin terminal treated
- Excellent Frequency Response
- Low Profile Low Cost

#### OPTIONS:

- Bulk Packaging is Standard
- Custom design available
- dip Available

#### APPLICATIONS:

- Double balance mixers, broad-band impedance transformers
- Directional Couplers for Mixers
- Matching Power Combining and Splitting
- Step-Top box and cable modem

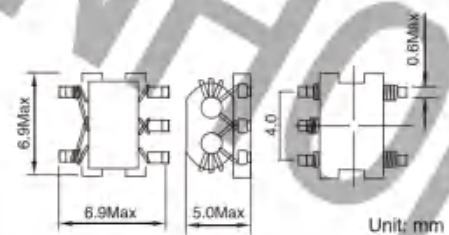


#### STANDARD SPECIFICATIONS

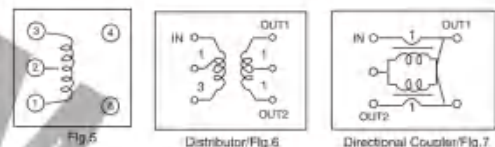
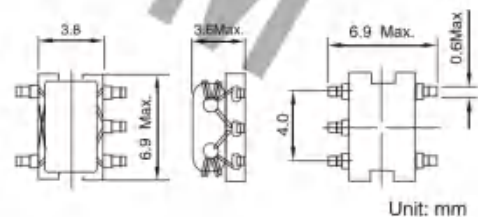
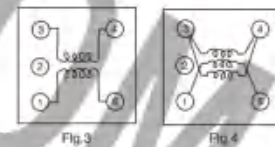
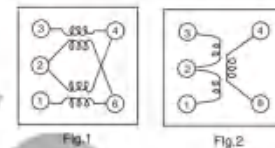
|                          | Part Number | Number of Turns per Winding | Operating Frequency Range | Insertion Loss                                                 | Fig |
|--------------------------|-------------|-----------------------------|---------------------------|----------------------------------------------------------------|-----|
| Double Balanced Mixer    | RF-5S-1012  | 1                           | 50MHz-400MHz              | 10dB max.                                                      | 1   |
|                          | RF-5S-1013  | 2                           | 100MHz-1.0GHz             | 6dB max.                                                       | 1   |
|                          | RF-5S-1003  | 3                           | 8MHz-800MHz               | 3.5dB max.                                                     | 1   |
|                          | RF-5S-1008  | 4                           | 6MHz-600MHz               | 2.5dB max.                                                     | 1   |
|                          | RF-5S-1011  | 5                           | 5MHz-500MHz               | 2dB max.                                                       | 1   |
|                          | RF-5S-1005  | 2                           | 400MHz-1.3MHz             | 4dB max.                                                       | 1   |
| Frequency Mixer          | RF-5S-1085  | 1                           | —                         | 3dB max.                                                       | 2   |
|                          | RF-5S-1052  | 2                           | 9MHz-350MHz               | 3dB max.                                                       | 2   |
|                          | RF-5S-1024  | 3                           | 3.5MHz-470GHz             | 3dB max.                                                       | 2   |
|                          | RF-5S-1086  | 4                           | 2.2MHz-400MHz             | 3dB max.                                                       | 2   |
|                          | RF-5S-1087  | 5                           | 1.5MHz-300MHz             | 3dB max.                                                       | 2   |
| Power Divider / Combiner | RF-5S-1014  |                             | 20MHz-600MHz              | IN to OUT-1,2 4.5dB max<br>OUT-1 to OUT-2 (ISOLATION) 10dB min | 6   |
| Directional Coupler      | RF-5S-1015  | 4                           | 6MHz-600MHz               | IN to OUT-11.9dB max<br>IN to OUT-2.11dB -14dB                 | 7   |
|                          | RF-5S-1006  | 5                           | 6MHz-600MHz               | IN to OUT-10.9dB max.<br>IN to OUT-2.13dB -16dB                | 7   |
|                          | RF-5S-1007  | 6                           | 6MHz-600MHz               | IN to OUT-10.8dB max.<br>IN to OUT-2.15dB -17dB                | 7   |
| Double Balanced Mixer    | RF-5SL-1001 | 2                           | 30MHz-850MHz              | 3dB                                                            | 1   |
|                          | RF-5SL-1002 | 3                           | 6.5MHz-1000MHz            | 3dB                                                            | 1   |
|                          | RF-5SL-1003 | 4                           | 3.5MHz-1600MHz            | 3dB                                                            | 1   |
|                          | RF-5SL-1004 | 5                           | 2.5MHz-1500MHz            | 3dB                                                            | 1   |
| Frequency Mixer          | RF-5SL-1027 | 1                           | —                         | 3dB                                                            | 2   |
|                          | RF-5SL-1028 | 2                           | 8MHz-550MHz               | 3dB                                                            | 2   |
|                          | RF-5SL-1029 | 3                           | 3.6MHz-500MHz             | 3dB                                                            | 2   |
|                          | RF-5SL-1030 | 4                           | 2MHz-370MHz               | 3dB                                                            | 2   |
|                          | RF-5SL-1037 | 1                           | —                         | 3dB                                                            | 2   |
|                          | RF-5SL-1038 | 2                           | 500MHz-850MHz             | 3dB                                                            | 2   |
|                          | RF-5SL-1039 | 3                           | 240MHz-500MHz             | 3dB                                                            | 2   |
|                          | RF-5SL-1040 | 4                           | 85MHz-380MHz              | 3dB                                                            | 2   |
| Balun Transformer        | RF-5SL-1048 | 1 <sub>10</sub>             | 5.5MHz-850MHz             | 3dB                                                            | 3   |
|                          | RF-5SL-1049 | 2 <sub>10</sub>             | 2.5MHz-2200MHz            | 3dB                                                            | 3   |
|                          | RF-5SL-1050 | 3 <sub>10</sub>             | 1.2MHz-1700MHz            | 3dB                                                            | 3   |
|                          | RF-5SL-1051 | 4 <sub>10</sub>             | 0.8MHz-1400MHz            | 3dB                                                            | 3   |
|                          | RF-5SL-1078 | 5 <sub>10</sub>             | 0.6MHz-1300MHz            | 3dB                                                            | 3   |
| Balun Transformer        | RF-5SL-1053 | 1 <sub>10</sub>             | 160MHz-2200MHz            | 3dB                                                            | 4   |
|                          | RF-5SL-1017 | 2 <sub>10</sub>             | 55MHz-1700MHz             | 3dB                                                            | 4   |
|                          | RF-5SL-1054 | 3 <sub>10</sub>             | 30MHz-1400MHz             | 3dB                                                            | 4   |

Note: 1, K= ± 10%, M= ± 20%

#### PHYSICAL CHARACTERISTICS



#### Pin Connections



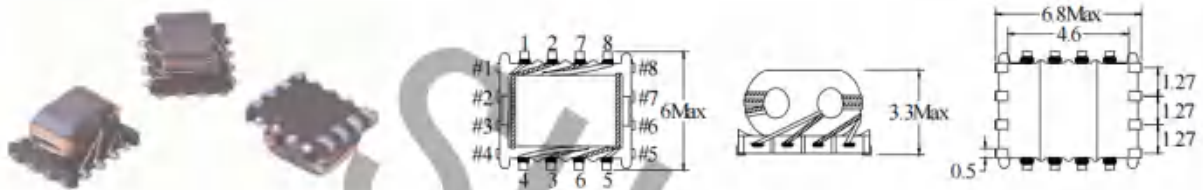
#### TECHNICAL INFORMATION:

- Soldering methods: Wave, Reflow
- Operating Temperature: 0°C to 70°C
- Storage Temperature: -55°C to 125°C

Note: All specifications subject to change without notice.

## EXTERNAL DIMENSIONS

(Unit:m/m)



| Part Number | Insertion Loss            | $I_{DC}$ (A)Max | $R_{DC}$ ( $\Omega$ )Max | Impedance (Typical)                            | Withstand Voltage |
|-------------|---------------------------|-----------------|--------------------------|------------------------------------------------|-------------------|
| LRF009-221  | 50MHz 2.8 dB $\pm$ 2.0dB  | 0.65            | 0.3                      | 220 $\Omega$ @ 100MHz<br>420 $\Omega$ @ 400MHz | 50V <sub>DC</sub> |
|             | 100MHz 7.3 dB $\pm$ 2.5dB |                 |                          |                                                |                   |
|             | 300MHz 12.0dB $\pm$ 3.0dB |                 |                          |                                                |                   |
|             | 500MHz 14.0dB $\pm$ 3.0dB |                 |                          |                                                |                   |

## Features:

- Low profile: 3.3mm(Max).
- Common mode impedance of 220  $\Omega$  at 100MHz, 420  $\Omega$  at 400MHz.
- Operating temperature Range: -25 $^{\circ}$ C $\sim$ +85 $^{\circ}$ C.
- Suitable for reflow soldering.

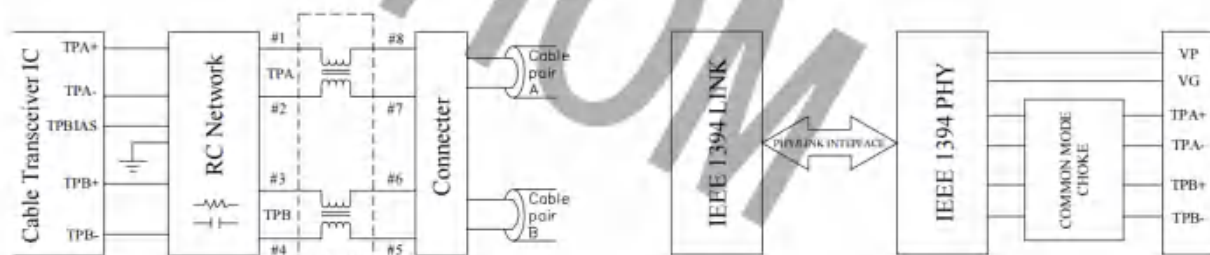
## Applications:

- LRF009-221 Series is a dual wound common mode choke w/c is ideal for NOISE ATTENUATION in a twisted pair cable interfaces as well as IEEE1394 & USB2.0 applications. An excellent impedance balance between two sets of twisted pairs is achieved by winding across a single core.
- One LRF009-221 common mode choke coil per interface port is possible with this dual winding configurations.

## Circuit(Top View) & Pad:



## Twisted Pair Cable Interface & IEEE 1394 Port:

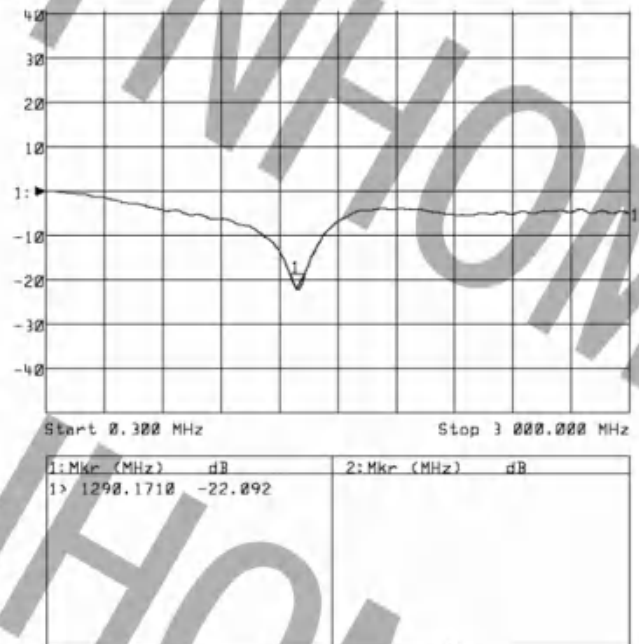




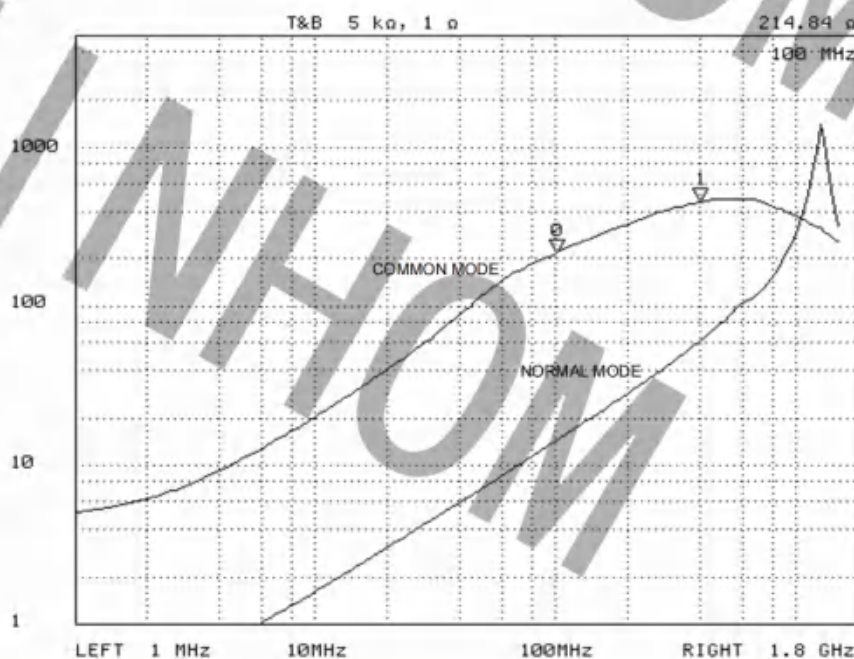
## Test Mode:



## Insertion Loss:



## |Z| - F:





## EXTERNAL DIMENSIONS

(Unit:m/m)



| Part Number | Insertion Loss | $R_{DC}$ ( $\Omega$ )Max | Impedance (Typical)                            | Withstand Voltage |
|-------------|----------------|--------------------------|------------------------------------------------|-------------------|
| LRF019T-221 | 50MHz          | 0.12                     | 220 $\Omega$ @ 100MHz<br>500 $\Omega$ @ 400MHz | 50V <sub>DC</sub> |
|             | 100MHz         |                          |                                                |                   |
|             | 300MHz         |                          |                                                |                   |
|             | 500MHz         |                          |                                                |                   |

## Features:

- Low profile: 2.3mm(Max).
- Common mode impedance of 220  $\Omega$  at 100MHz , 500  $\Omega$  at 400MHz .
- Operating temperature Range: -25℃~+85℃.
- Suitable for reflow soldering.

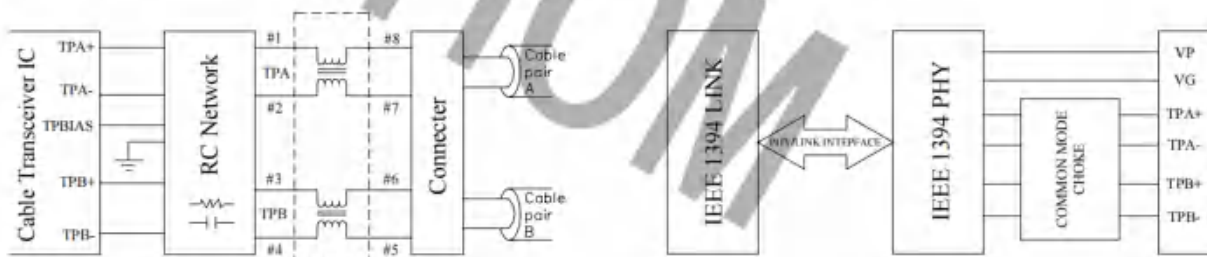
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- One LRF019T-221 common mode choke coil per interface port is possible with this dual winding configurations.

## Circuit(Top View) & Pad:



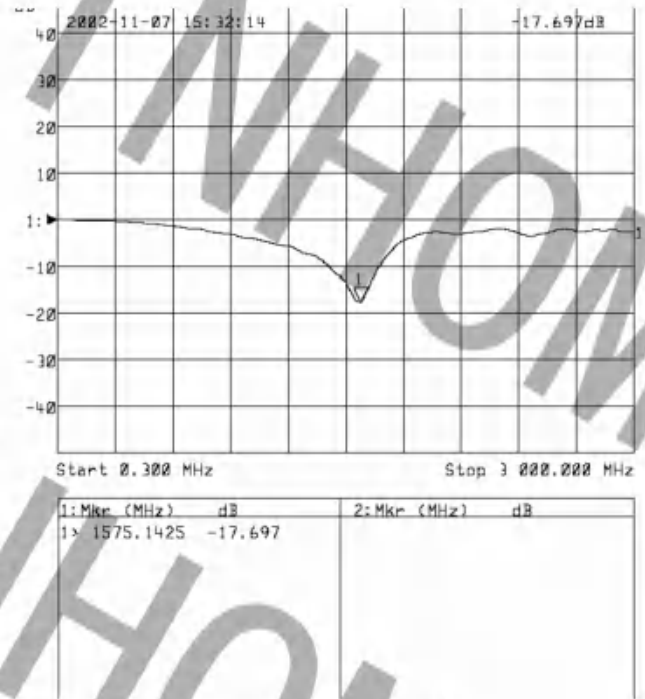
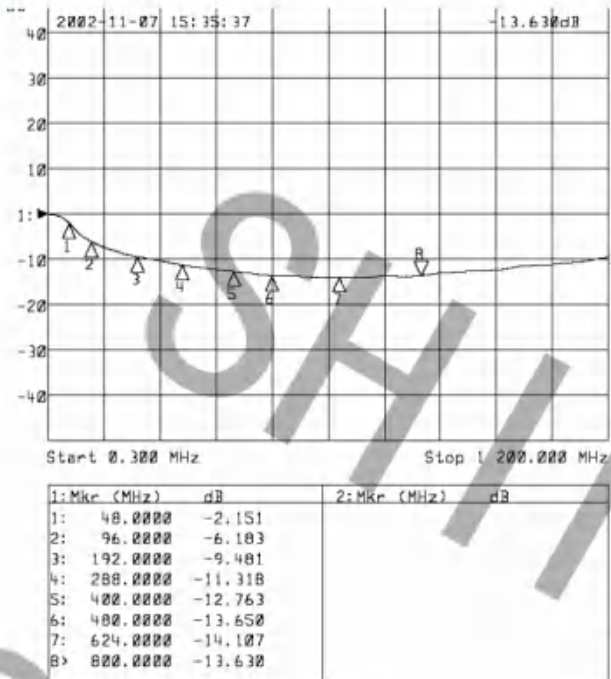
## Twisted Pair Cable Interface & IEEE 1394 Port:



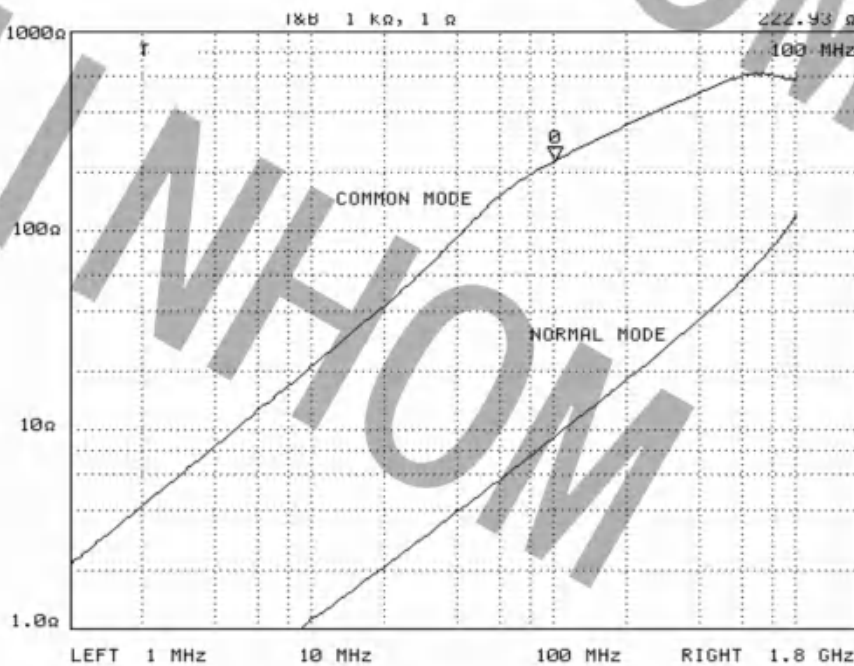
## Test Mode:



## Insertion Loss:



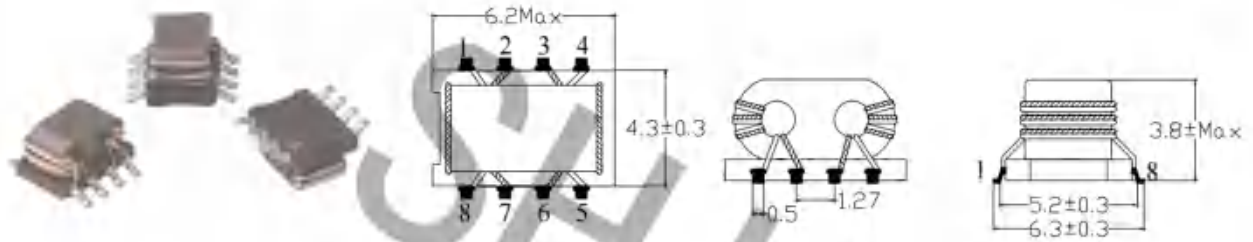
## |Z| - F:





## EXTERNAL DIMENSIONS

(Unit:m/m)



| Part Number | Insertion Loss<br>(HP-8711C) |             |              |              |
|-------------|------------------------------|-------------|--------------|--------------|
|             | 50MHz                        | 100MHz      | 300MHz       | 500MHz       |
| LRF018T-331 | 3.0dB±1.0dB                  | 9.0dB±2.0dB | 15.0dB±3.0dB | 17.0dB±3.0dB |
| LRF018T-181 | 1.3dB±1.0dB                  | 5.0dB±2.0dB | 10.0dB±3.0dB | 12.0dB±3.0dB |
| LRF018T-900 | 0.9dB±0.5dB                  | 2.6dB±1.0dB | 5.4dB±2.0dB  | 7.0dB±2.0dB  |
| LRF018T-560 | 6.5dB±2.5dB                  | 12dB±3.0dB  | 18dB±3.0dB   | 19dB±3.0dB   |

| Part Number | I <sub>DC</sub> | R <sub>DC</sub> | Impedance<br>Common Mode<br>(Typ.)(HP-4395A) | Rated<br>Voltage | Wisting<br>Voltage<br>(CH-901)                  | Insulation<br>Resistance<br>(CH-702A)            |
|-------------|-----------------|-----------------|----------------------------------------------|------------------|-------------------------------------------------|--------------------------------------------------|
| LRF018T-331 | 0.5A<br>(Max)   | 0.10 Ω<br>(Max) | 330 Ω @ 100MHz<br>740 Ω @ 400MHz             | DC 80V           | AC150V/<br>2mA/1min<br>AT WINDING<br>TO WINDING | DC100V/<br>10M Ω Min<br>AT WINDING<br>TO WINDING |
| LRF018T-181 | 0.5A<br>(Max)   | 0.09 Ω<br>(Max) | 180 Ω @ 100MHz<br>420 Ω @ 400MHz             |                  |                                                 |                                                  |
| LRF018T-900 | 0.5A<br>(Max)   | 0.08 Ω<br>(Max) | 90 Ω @ 100MHz<br>180 Ω @ 400MHz              |                  |                                                 |                                                  |
| LRF018T-560 | 0.5A<br>(Max)   | 0.12 Ω<br>(Max) | 560 Ω @ 100MHz<br>860 Ω @ 400MHz             |                  |                                                 |                                                  |

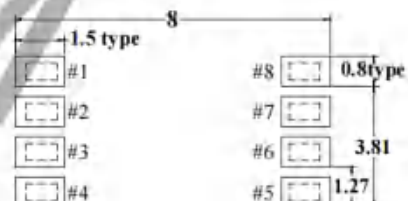
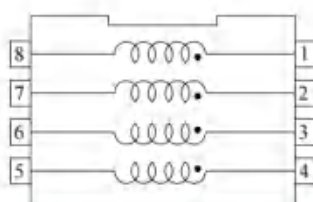
### Features:

- Low profile: 3.8mm(Max).
- Common mode impedance of 88~556 Ω at 100MHz ,176~860 Ω at 400MHz.
- Operating temperature Range: -25℃~+85℃.
- Suitable for reflow soldering.

### Applications:

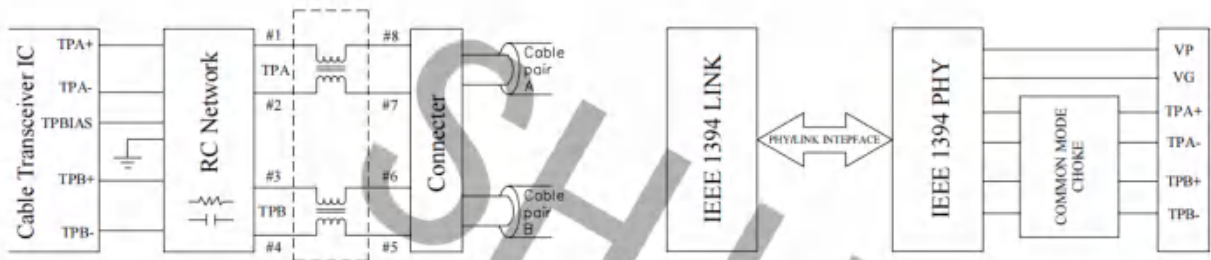
- LRF018T Series is a dual wound common mode choke w/c is ideal for NOISE ATTENUATION in a twisted pair cable interfaces as well as IEEE1394 & USB2.0 applications. An excellent impedance balance between two sets of twisted pairs is achieved by winding across a single core .
- One LRF018T common mode choke coil per interface port is possible with this dual winding configurations.

### Circuit(Top View) & Pad:

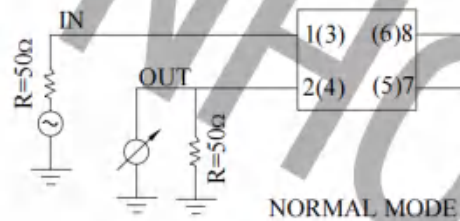
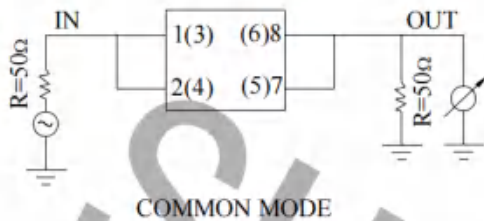




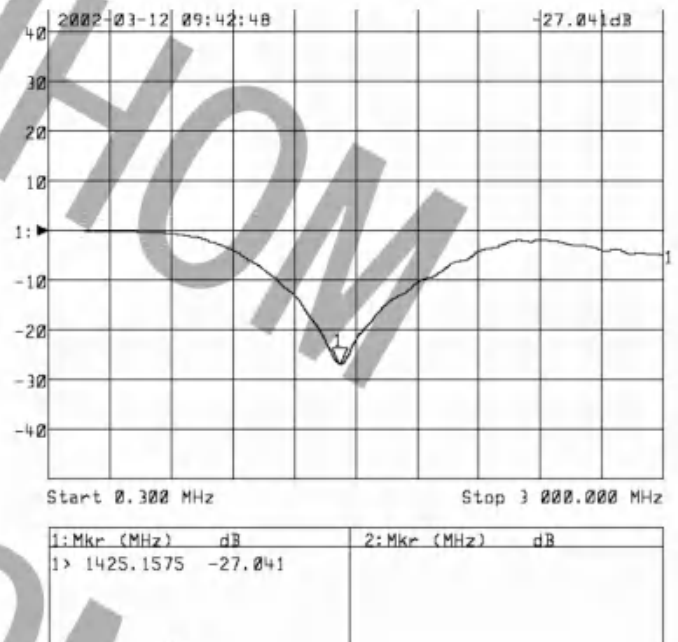
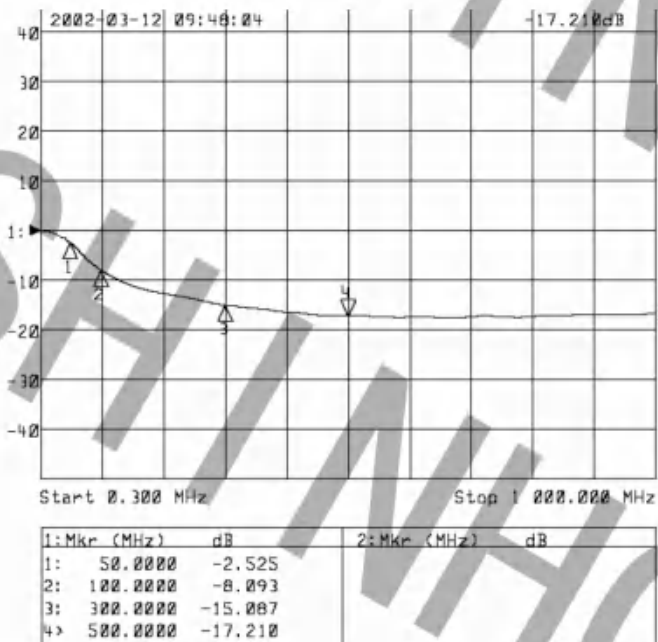
## Twisted Pair Cable Interface & IEEE 1394 Port:



## Test Mode:



## Insertion Loss:





RF-2C-ADCB-20-82



50Ω, 20dB Coupling, 1 to 800 MHz

## THE BIG DEAL

- Very Flat Coupling, 0.2 dB
- Very Low Loss, 0.3 dB
- Small Size
- Aqueous washable

## APPLICATIONS

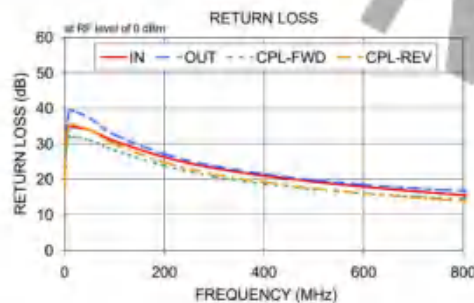
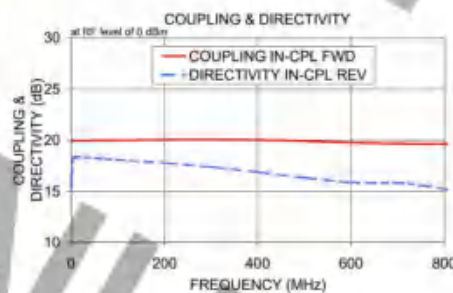
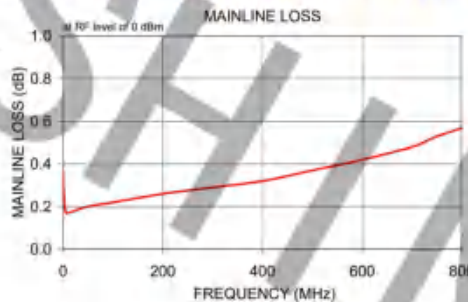
- Cable TV
- Communications

## ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter                                              | Condition(MHz)   | Min                  | Typ.                 | Max                  | Units |
|--------------------------------------------------------|------------------|----------------------|----------------------|----------------------|-------|
| Frequency Range                                        |                  | 1                    |                      | 800                  | MHz   |
| Mainline Loss <sup>1</sup> (above theoretical 0.05 dB) | 1<br>400<br>800  | -<br>-<br>-          | 0.2<br>0.3<br>0.6    | 0.4<br>0.6<br>0.9    | dB    |
| Coupling                                               | 1<br>400<br>800  | 19.5<br>19.5<br>18.5 | 20.2<br>20.4<br>20.2 | 20.9<br>21.6<br>21.8 | dB    |
| Coupling Flatness(±0.5dB)                              | 1-400<br>400-800 | -<br>-               | 0.2<br>0.2           | 0.6<br>0.7           | dB    |
| Directivity                                            | 1<br>400<br>800  | 15<br>14<br>10       | 20<br>24.4<br>15     | -<br>-<br>-          | dB    |
| Return Loss (Input)                                    | 1<br>400<br>800  | 21<br>15<br>11       | 28<br>21<br>16       | -<br>-<br>-          | dB    |
| Return Loss (Output)                                   | 1<br>400<br>800  | 21<br>15<br>11       | 27<br>22<br>17       | -<br>-<br>-          | dB    |
| Return Loss(Coupled)                                   | 1<br>400<br>800  | 18<br>14<br>11       | 24<br>19<br>15       | -<br>-<br>-          | dB    |
| Input Power <sup>2</sup>                               | 1-10<br>10-800   | -<br>-               | -<br>-               | 0.5<br>1.0           | W     |

1. Mainline loss includes theoretical power loss at coupled port.  
2. Over -40 to 85 deg C

## TYPICAL PERFORMANCE CURVES

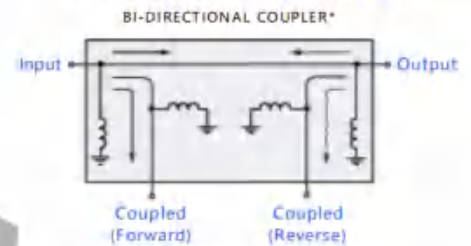


## MAXIMUM RATINGS

| Parameter             | Rating      |
|-----------------------|-------------|
| Operating temperature | -40°C-85°C  |
| Storage temperature   | -50°C-100°C |

Permanent damage may occur if any of these limits are exceeded.

## ELECTRICAL SCHEMATIC

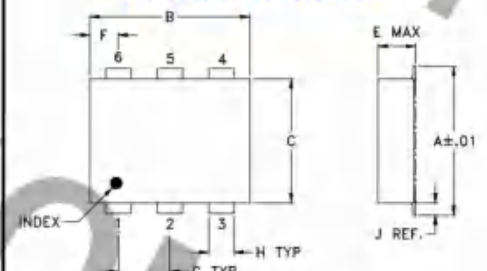


\*Electrical schematic is for Bi-Directional coupler with internal transformer(s) that routes DC from all ports to ground

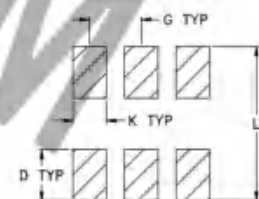
## PIN CONNECTIONS

|                      |      |
|----------------------|------|
| RF INPUT             | 1    |
| RF OUTPUT            | 6    |
| COUPLED (FORWARD) RF | 3    |
| COUPLED (REVERSE) RF | 4    |
| GROUND               | 2, 5 |

## OUTLINE DRAWING



## PBC Land Pattern



## Suggested Layout.

## OUTLINE DIMENSIONS, Unit(mm)

|    |       |   |      |
|----|-------|---|------|
| A  | 6.91  | G | 2.54 |
| B  | 7.87  | H | 0.76 |
| C  | 5.59  | L | 0.66 |
| D  | 2.54  | K | 1.65 |
| E  | 4.11  | L | 7.62 |
| F  | 1.4   |   |      |
| WT | 0.25G |   |      |



# Bi-Directional Coupler

Http://www.shinhom.com www.shinhomtech.com

RF-2C-SYDC-10-62HP

50Ω 10 dB Coupling 10 to 600 MHz



## The Big Deal

- High power handling, 20 W
- Multi-octave bandwidth
- Very low mainline loss, 0.5 dB
- Excellent VSWR, 1.10:1

## Applications

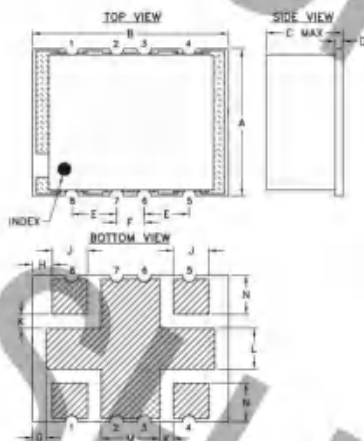
- VHF/UHF
- signal monitoring
- communications
- military mobile

## Electrical Specifications at 25°C

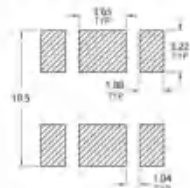
| Parameter                                | Condition (MHz) | Min. | Typ. | Max. | Unit |
|------------------------------------------|-----------------|------|------|------|------|
| Frequency Range                          |                 | 10   | —    | 600  | MHz  |
| Mainline Loss (above theoretical 0.5 dB) | 10              | —    | 0.2  | 0.8  | dB   |
|                                          | 50              | —    | 0.2  | 0.6  |      |
|                                          | 340             | —    | 0.3  | 0.7  |      |
|                                          | 600             | —    | 0.5  | 0.9  |      |
| Coupling                                 | 10 - 600        | —    | 9.6  | —    | dB   |
|                                          | 10              | 9.2  | 9.7  | 10.2 |      |
|                                          | 50              | 9.3  | 9.8  | 10.3 |      |
|                                          | 340             | 9.2  | 9.7  | 10.2 |      |
| Coupling Flatness(±)                     | 10 - 340        | —    | 0.2  | 0.4  | dB   |
|                                          | 340 - 600       | —    | 0.3  | 0.5  |      |
|                                          | 10              | 15   | 21   | —    |      |
|                                          | 50              | 18   | 22.8 | —    |      |
| Directivity                              | 340             | 18   | 24.5 | —    | dB   |
|                                          | 600             | 14   | 25.5 | —    |      |
|                                          | 10              | 12   | 15   | —    |      |
|                                          | 50              | 20   | 23   | —    |      |
| Return Loss (Input)                      | 340             | 19   | 25   | —    | dB   |
|                                          | 600             | 13   | 17   | —    |      |
|                                          | 10              | 12   | 15   | —    |      |
|                                          | 50              | 20   | 23   | —    |      |
| Return Loss (Output)                     | 340             | 19   | 26   | —    | dB   |
|                                          | 600             | 15   | 19   | —    |      |
|                                          | 10              | 12   | 15   | —    |      |
|                                          | 50              | 20   | 23   | —    |      |
| Return Loss (Coupling)                   | 340             | 19   | 27   | —    | dB   |
|                                          | 600             | 15   | 20   | —    |      |
|                                          | 10              | 12   | 15   | —    |      |
|                                          | 50              | 20   | 23   | —    |      |
| Input Power**                            | 10 - 600        | —    | —    | 20   | W    |

\*\*The user must provide adequate means of heat removal to limit the temperature of ground connections: 23.5 to 85°C, in order to ensure proper performance. At 25°C ambient temperature this requires thermal resistance of the user's PC board heat sink to be 20°C/W or less when the unit is driven at maximum specified RF input power, 20W. At higher ambient temperature, with the same heat sink, input power in watts must not exceed 20W x ((85°C - T\_ambient) / 60°C).

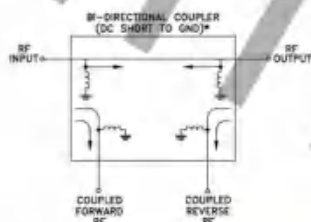
## Outline Drawing



## PCB Land Pattern



Suggested Layout, Tolerance to be within ±0.05 mm



| Pin     | Connections |
|---------|-------------|
| Input   | 8           |
| Output  | 1           |
| Forward | 5           |
| Reverse | 4           |
| Ground  | 2,3,6,7     |

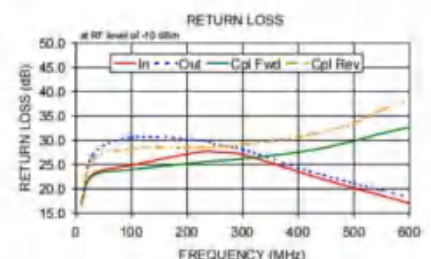
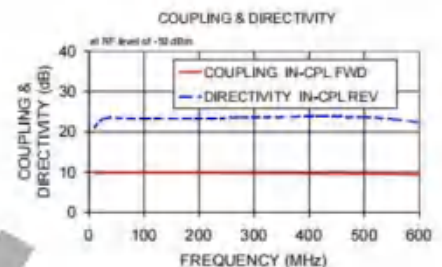
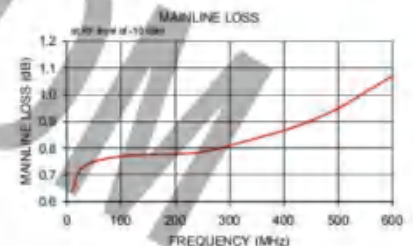
## Maximum Ratings

Operating Temperature -20°C to 85°C

Storage Temperature -55°C to 100°C

Power Input (as a splitter) 20 W max.

Case temperature is defined as temperature on ground leads.  
Permanent damage may occur if any of these limits are exceeded.



## RF-2C-SYDC-20-31HP

<http://www.shinhom.com>      [www.shinhomtech.com](http://www.shinhomtech.com)

- high power, 50W max. with output load VSWR 2.0 max.
- high power, 20W max. with output open or short
- low mainline loss, 0.1 dB typ.
- high directivity, 33 dB typ.
- excellent flatness, 0.1 dB typ.

- military mobile
- signal monitoring



**50Ω 20 dB Coupling 1.5 to 30 MHz 50 Watt**

| Parameter                                           | Condition (MHz) | Min. | Typ. | Max. | Unit |
|-----------------------------------------------------|-----------------|------|------|------|------|
| Frequency Range                                     |                 | 1.5  | -    | 30   | MHz  |
| Mainline Loss<br>(above theoretical loss, 0.044 dB) | 1.5-30          | -    | 0.06 | 0.25 | dB   |
| Coupling                                            | 1.5-30          | 19.5 | 20.5 | 21.5 | dB   |
| Coupling Flatness (±)                               | 1.5-30          | -    | 0.05 | 0.2  | dB   |
| Directivity                                         | 1.5-30          | 22   | 33   | -    | dB   |
| Return Loss (Input)                                 | 1.5-30          | 20   | 25   | -    | dB   |
| Return Loss (Output)                                | 1.5-30          | 20   | 25   | -    | dB   |
| Return Loss (Coupling)                              | 1.5-30          | 18   | 24   | -    | dB   |
| Input Power                                         | 1.5-30          | -    | -    | 50   | W    |

Suggested Layout. Tolerance to be within  $\pm 0.05\text{mm}$

| Outline Dimensions; Unit ( mm) |       |      |      |      |      |
|--------------------------------|-------|------|------|------|------|
| A                              | B     | C    | E    | F    | G    |
| 12.70                          | 15.75 | 9.14 | 2.92 | 1.78 | 1.85 |
| H                              | J     | K    | L    | M    | N    |
| -                              | 2.29  | 1.02 | 0.94 | 3.56 | 3.43 |
| P                              | Q     | R    | wt   |      |      |
| 0.25                           | -     | 3.43 | 3.0g |      |      |

|                   |         |
|-------------------|---------|
| Input             | 8       |
| Output            | 1       |
| Coupled(Forward)  | 5       |
| Coupled(Reverse ) | 4       |
| Ground            | 2,3,6,7 |

**FIGURE 6**

PIN B

.032, 4 PL

26X #.020 PTH FOR GROUND

.040 TYP

.145 TYP

.066 TRACE WIDTH, 4 PL  
(SEE NOTE BELOW)

PACKAGE OUTLINE

**NOTES:**

- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB CUPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

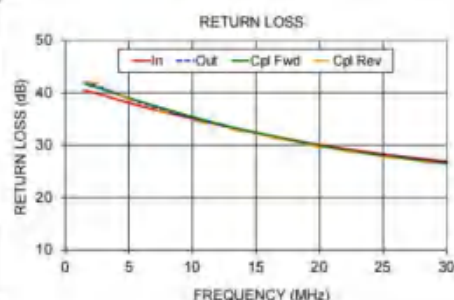
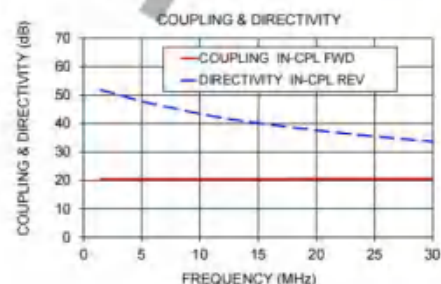
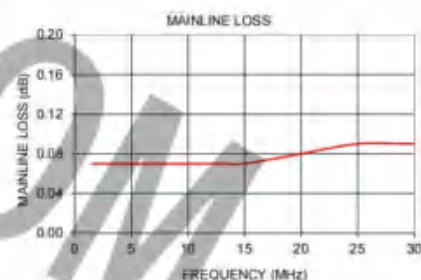
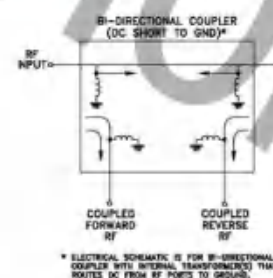
NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030"  $\pm$  .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

 DENOTES PCB COPPER LAYOUT WITH SMOBC  
 (SOLDER MASK OVER BARE COPPER)  
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

|                              |                |
|------------------------------|----------------|
| *Operating Temperature, Case | -40°C to 65°C  |
| Storage Temperature          | -55°C to 100°C |

\*Case temperature is defined as temperature on internal leads.  
 Permanent damage may occur if any of these limits are exceeded.





## Features

- high power handling
- low mainline loss
- good return loss

## Applications

- military mobile



**50Ω 20 dB Coupling 1.5 to 60 MHz 15 Watt**

### Electrical Specifications at 25°C

| Parameter             | Condition (MHz) | Min. | Typ.   | Max. | Unit |
|-----------------------|-----------------|------|--------|------|------|
| Frequency Range       |                 | 1.5  |        | 60   | MHz  |
| Mainline Loss         | 1.5-60          | -    | 0.1    | 0.4  | dB   |
| Nominal Coupling      | 1.5-60          | -    | 20±0.5 | -    | dB   |
| Coupling Flatness (±) | 1.5-60          | -    | ±0.3   | -    | dB   |
| Directivity           | 1.5-60          | 20   | 35     | -    | dB   |
| Return Loss           | 1.5-60          | -    | 32     | -    | dB   |
| Input Power           | 1.5-60          | -    | -      | 15   | W    |

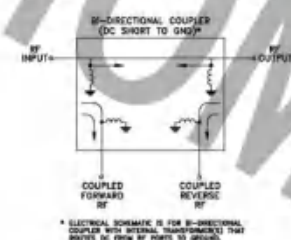
### Maximum Ratings

\*Operating Temperature, Case -40°C to 65°C

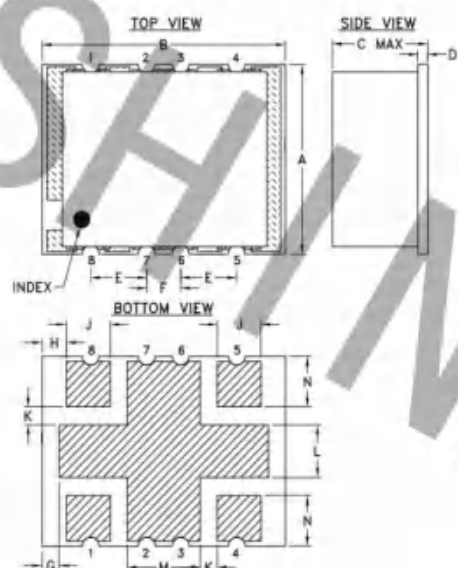
|                     |                |
|---------------------|----------------|
| Storage Temperature | -55°C to 100°C |
|---------------------|----------------|

\* Case temperature is defined as temperature on ground leads.  
Permanent damage may occur if any of these limits are exceeded.

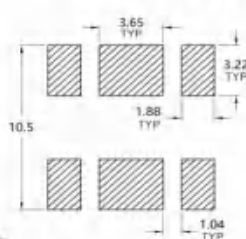
### Electrical Schematic



### Outline Drawing



## PCB Land Pattern

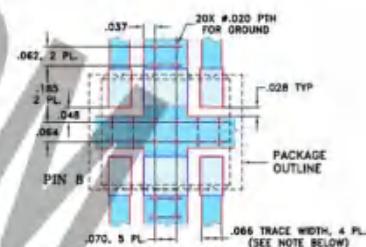


Suggested Layout, Tolerance to be within  $\pm 0.5\text{mm}$

Outline Dimensions: Unit ( mm)

|   |       |    |      |
|---|-------|----|------|
| A | 9.65  | H  | 1.27 |
| B | 12.70 | N  | 2.41 |
| C | 7.00  | M  | 3.56 |
| D | 1.00  | L  | 2.29 |
| E | 2.92  | K  | 1.02 |
| F | 1.78  | L  | 2.67 |
| G | 0.89  | WT | 0.8g |

### Suggested PCB Layout



## NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030"  $\pm$  .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
-  DENOTES PCB COPPER LAYOUT WITH SMDs (SOLDER MASK OVER BARE COPPER)
-  DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

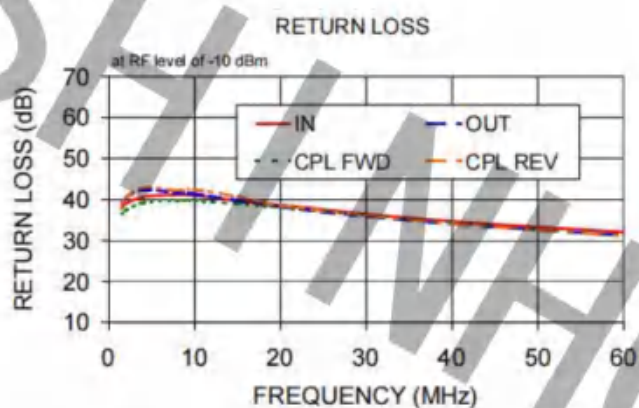
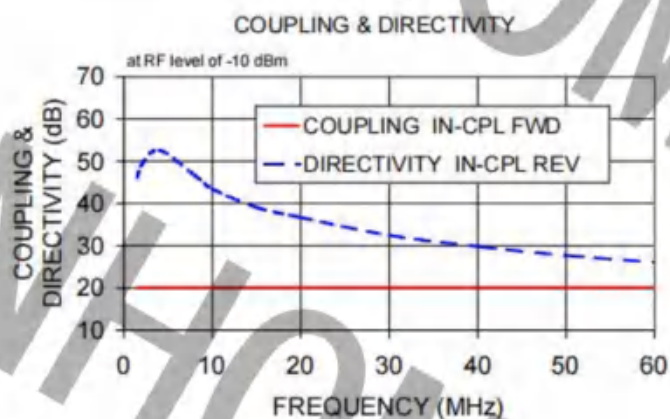
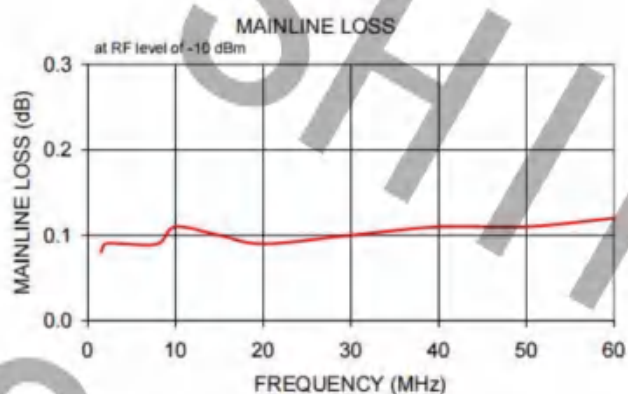
### Pan Connections

|         |         |
|---------|---------|
| Input   | 8       |
| Output  | 1       |
| Forward | 5       |
| Reverse | 4       |
| Ground  | 2,3,6,7 |



**Typical Performance Data****(TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = +25°C)**

| Freq.(MHz) | Mainline Loss (dB) | Coupling (dB) |             | Directivity (dB) |            | Return Loss (dB) |       |         |         |
|------------|--------------------|---------------|-------------|------------------|------------|------------------|-------|---------|---------|
|            | In-Out             | In-Cpl Fwd    | Out-Cpl Rev | Out-Cpl Fwd      | In-Cpl Rev | In               | Out   | Cpl Fwd | Cpl Rev |
| 1.5        | 0.08               | 20.06         | 19.94       | 43.29            | 46.09      | 37.74            | 38.71 | 36.46   | 38.64   |
| 2.0        | 0.09               | 20.07         | 19.94       | 45.39            | 49.18      | 39.02            | 40.51 | 37.41   | 40.45   |
| 4.0        | 0.09               | 20.10         | 19.96       | 47.26            | 52.62      | 40.63            | 42.30 | 39.20   | 42.92   |
| 8.0        | 0.09               | 20.10         | 19.98       | 43.88            | 46.67      | 41.17            | 41.69 | 39.76   | 42.18   |
| 10.0       | 0.11               | 20.12         | 20.02       | 41.51            | 43.47      | 40.96            | 41.34 | 39.70   | 42.36   |
| 15.0       | 0.10               | 20.11         | 20.04       | 38.56            | 39.06      | 39.69            | 39.72 | 38.91   | 40.69   |
| 20.0       | 0.09               | 20.10         | 20.05       | 36.40            | 36.70      | 38.63            | 38.17 | 38.03   | 38.54   |
| 30.0       | 0.10               | 20.10         | 20.11       | 32.62            | 32.46      | 36.47            | 35.84 | 36.17   | 36.17   |
| 40.0       | 0.11               | 20.10         | 20.13       | 29.91            | 29.79      | 34.69            | 34.03 | 34.31   | 34.17   |
| 50.0       | 0.11               | 20.09         | 20.10       | 27.59            | 27.69      | 33.23            | 32.55 | 32.59   | 32.55   |
| 60.0       | 0.12               | 20.07         | 20.03       | 25.78            | 26.07      | 32.03            | 31.24 | 31.36   | 31.12   |



## 2Way 0° Divide transformer Frequency: 30-2400MHZ.

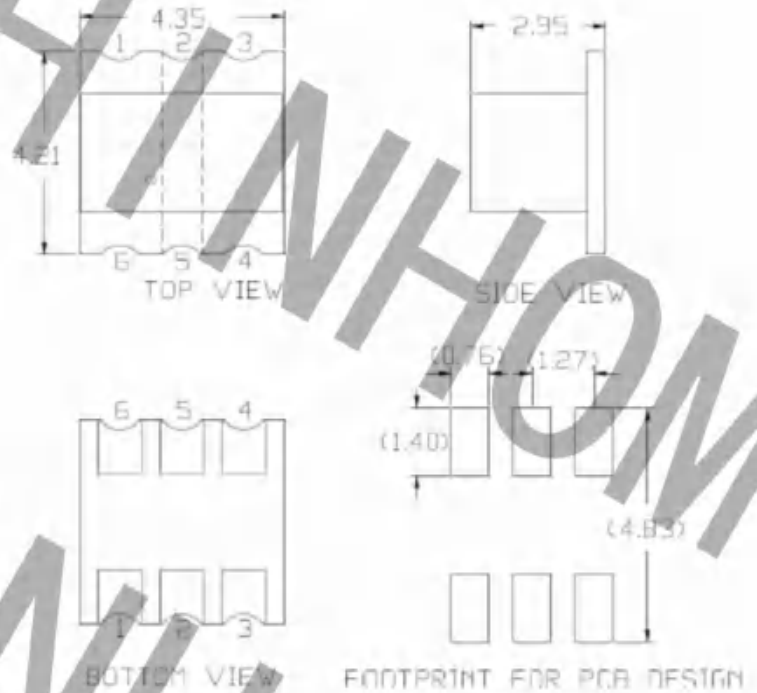
### Feature:

- .2way 0degree transformer.
- .SMT part.
- .Packaging 2000pcs per reel.
- .used in 75 ohm systems.
- .weld connect.
- .260 degree compatible.

**ROHS COMPLIANT**



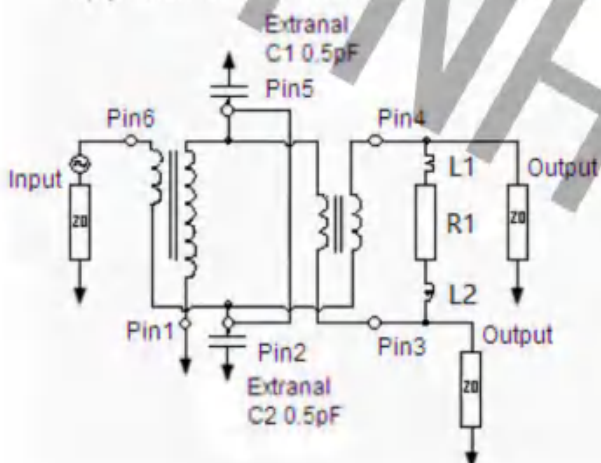
### Base dimension



### SUGGESTED PAD LAYOUT



### Application Circuit



| Reference | Manufacturer & p/n        | Value |
|-----------|---------------------------|-------|
| R1        | Yageo RC0402FR-07186RL    | 240Ω  |
| L1        | TOKO LL1005-FHL8N2J       | 8.2nH |
| L2        | TOKO LL1005-FHL8N2J       | 8.2nH |
| C1<br>C2  | Murata GRM1555C1HR50B401D | 0.5pF |



RFPS-018202-2W-1TL75 30-2400MHZ 2Way 0° Divider

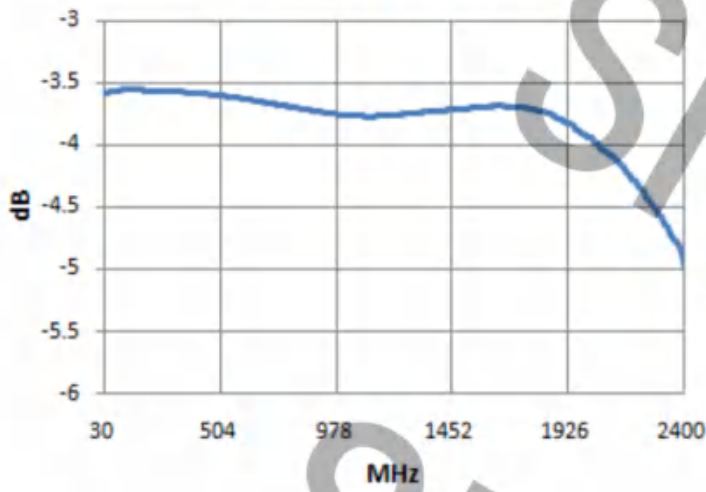
| PIN CONFIGURATION |                |
|-------------------|----------------|
| PIN               | FUNCTION       |
| 1                 | GND            |
| 2,5               | 0.5pF external |
| 3                 | Output1        |
| 4                 | Output2        |
| 6                 | Input          |

Electrical Specifications: TA=25°C, Zo=75Ω Pin=0dbm

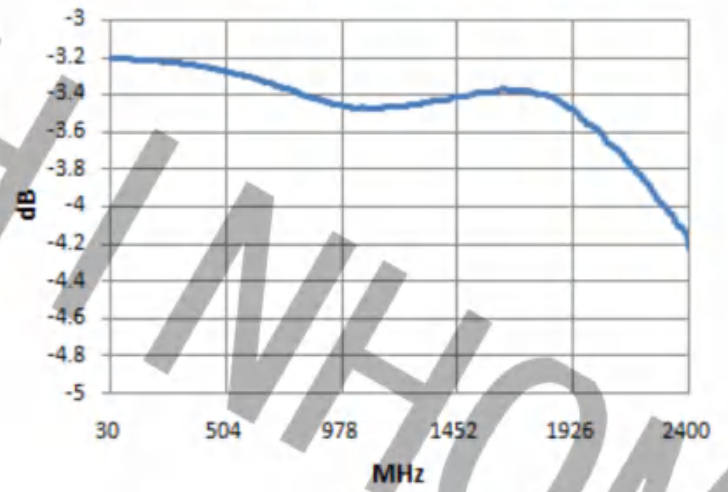
| Parameter                      | Test Conditions | Units           | Min. | Typ. | Max.    |
|--------------------------------|-----------------|-----------------|------|------|---------|
| Insertion loss1<br>Pin6-4      | 30-1002MHz      | dB              | ---  | 0.3  | 0.7     |
|                                | 1002-1600MHz    | dB              | ---  | 0.6  | 1.2     |
|                                | 1600-2150MHz    | dB              | ---  | 1.0  | 2.0     |
| Insertion loss1<br>Pin6-3      | 30-1002MHz      | dB              | ---  | 0.6  | 1.0     |
|                                | 1002-1600MHz    | dB              | ---  | 1.0  | 1.6     |
|                                | 1600-2400MHz    | dB              | ---  | 1.5  | 3.2     |
| Phase Unbalance                | 30-1002MHz      | degree          | ---- | 0.8  | +/-4.0° |
|                                | 1002-1600MHz    | degree          | ---- | 1.0  | +/-6.0° |
|                                | 1600-2400MHz    | degree          | ---- | 2.0  | +/-7.0° |
| Amplitude Unbalance            | 30-1002MHz      | dB              | ---  | 0.3  | +/-0.6  |
|                                | 1002-1600MHz    | dB              | ---  | 0.3  | +/-0.8  |
|                                | 1600-2400MHz    | dB              | ---  | 0.5  | +/-1.5  |
| Input return loss              | 30-1002MHz      | dB              | 20   | 39   | ---     |
|                                | 1002-1600MHz    | dB              | 14   | 22   | ---     |
|                                | 1600-2400MHz    | dB              | 11   | 18   | ---     |
| Output return loss1<br>Pin4    | 30-1002MHz      | dB              | 20   | 28   | ---     |
|                                | 1002-1600MHz    | dB              | 13   | 18   | ---     |
|                                | 1600-2400MHz    | dB              | 9    | 14   | ---     |
| Output return loss<br>Pin3     | 30-1002MHz      | dB              | 20   | 40   | ---     |
|                                | 1002-1600MHz    | dB              | 15   | 22   | ---     |
|                                | 1600-2400MHz    | dB              | 12   | 18   | ---     |
| Isolation                      | 30MHz           | dB              | 24   | 30   | ---     |
|                                | 65MHz           | dB              | 30   | 42   | ---     |
|                                | 65-870MHz       | dB              | 26   | 34   | ---     |
|                                | 870-1002MHz     | dB              | 24   | 31   | ---     |
|                                | 1002-1600MHz    | dB              | 22   | 31   | ---     |
|                                | 1600-1250MHz    | dB              | 15   | 24   | ---     |
| RF Power Rating (max)          |                 | 1W              |      |      |         |
| DC Current Rating (max)        |                 | 250mA           |      |      |         |
| Test Impedance (50Ω,75Ω, etc.) |                 | 75OHM           |      |      |         |
| Operating Temperature          |                 | -40°C to +85°C  |      |      |         |
| Storage Temperature            |                 | -40°C to +100°C |      |      |         |

RFPS-018202-2W-1TL75 30-2400MHZ 2Way 0° Divider

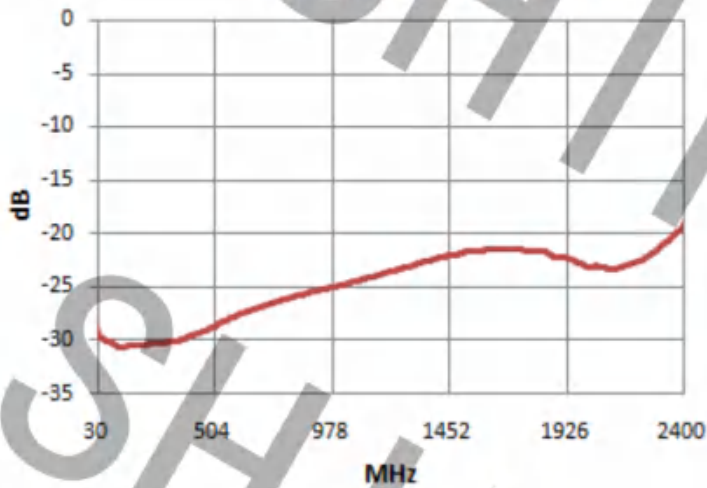
Insertion Loss 6-3



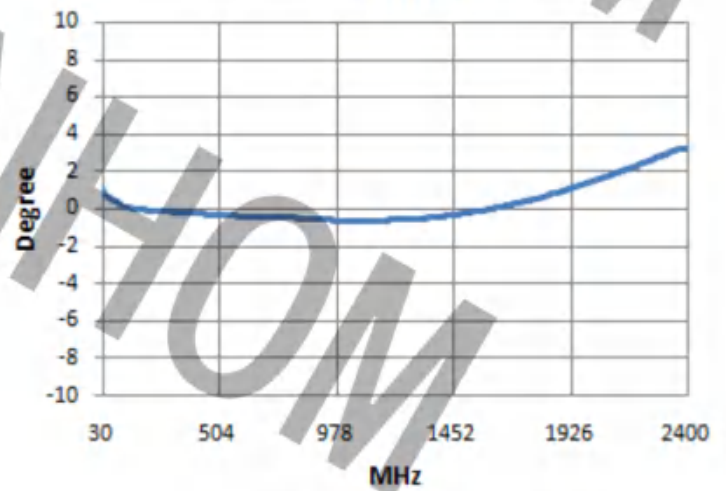
Insertion Loss 6-4



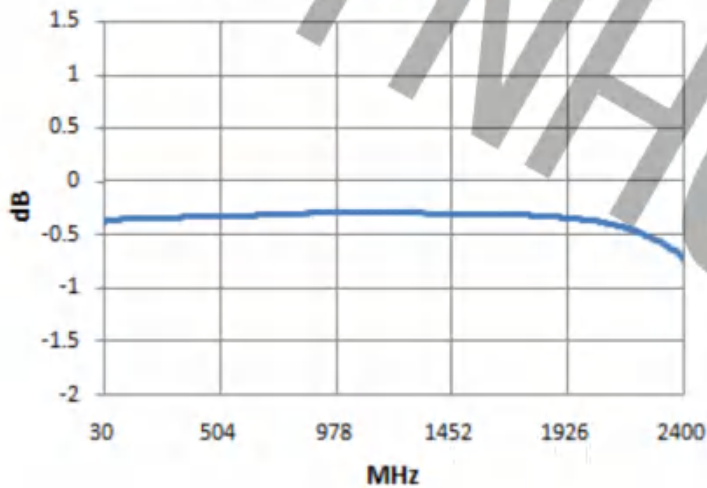
Input Return Loss



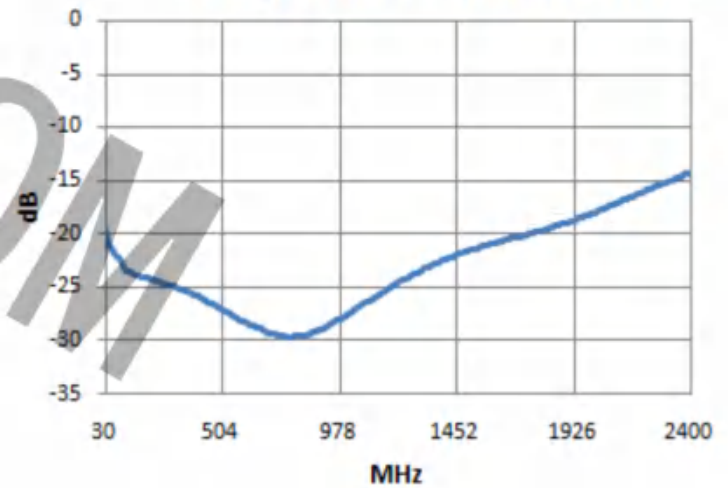
Phase



Amplitude



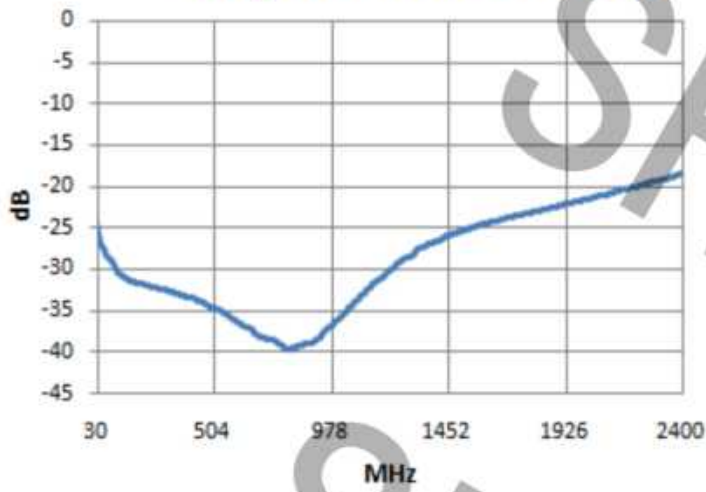
Output Return Loss Pin4



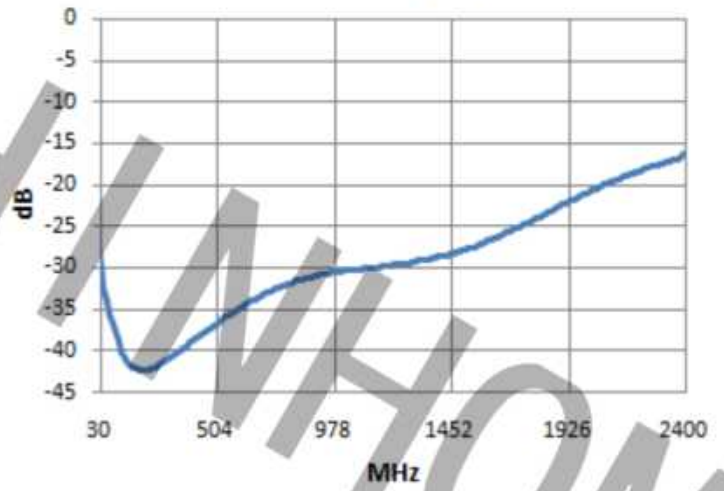


RFPS-018202-2W-1TL75 30-2400MHZ 2Way 0° Divider

**Output Return Loss Pin3**



**Isolation**



SH-SYD-20-33



50Ω, 30 to 3000 MHz

## FEATURES

- Wideband, 30-3000 MHz
- Low mainline loss, 1.6 dB typ.
- Excellent VSWR, 1.15:1 typ; all ports
- Good flatness,  $\pm 0.6$  dB typ.

## APPLICATIONS

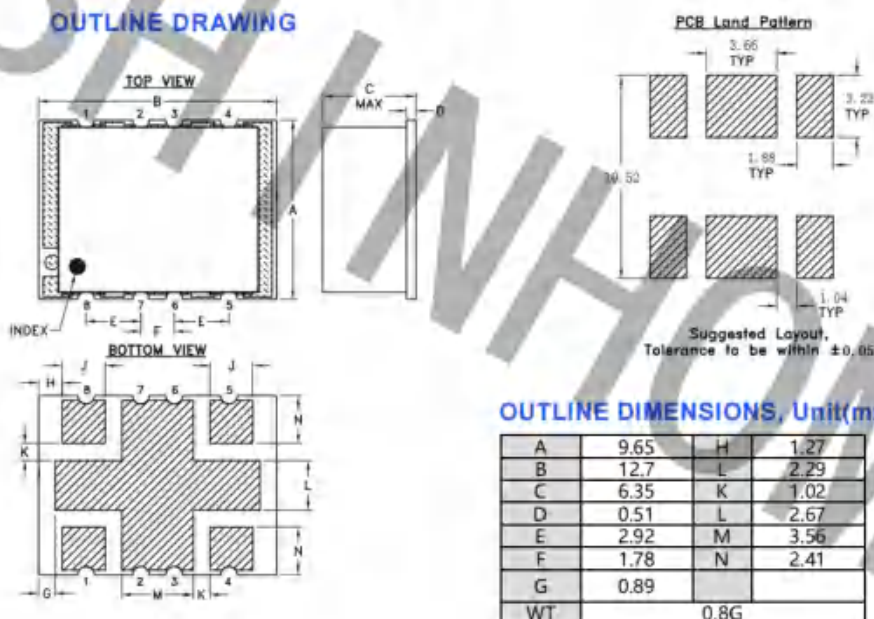
- VHF/UHF receivers/transmitters
- Cellular, PCS, PCN, UMTS

## ELECTRICAL SPECIFICATIONS AT 25°C

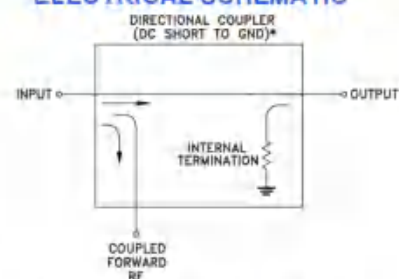
| Parameter                  | Condition (MHz) | Min. | Typ.           | Max. | Units |
|----------------------------|-----------------|------|----------------|------|-------|
| Frequency Range            |                 | 30   |                | 3000 | MHz   |
| Mainline Loss <sup>1</sup> | 30-3000         | -    | 1.6            | 2.5  | dB    |
|                            | 800-1000        | -    | 1.1            | 1.5  |       |
|                            | 1700-2000       | -    | 1.3            | 1.8  |       |
|                            | 2300-2700       | -    | 1.5            | 2.1  |       |
| Coupling Nominal           | 30-3000         | -    | 20.8 $\pm$ 0.8 | -    | dB    |
|                            | 800-1000        | -    | 21.5 $\pm$ 0.5 | -    |       |
|                            | 1700-2000       | -    | 21.1 $\pm$ 0.6 | -    |       |
|                            | 2300-2700       | -    | 20.8 $\pm$ 0.7 | -    |       |
| Coupling Flatness( $\pm$ ) | 30-3000         | -    | 1.4            | -    | dB    |
|                            | 800-1000        | -    | 0.3            | -    |       |
|                            | 1700-2000       | -    | 0.5            | -    |       |
|                            | 2300-2700       | -    | 0.5            | -    |       |
| Directivity                | 30-3000         | 9    | 15             | -    | dB    |
|                            | 800-1000        | 14   | 17             | -    |       |
|                            | 1700-2000       | 15   | 20             | -    |       |
|                            | 2300-2700       | 11   | 16             | -    |       |
| VSWR                       | 30-3000         | -    | 1.20           | -    | :1    |
|                            | 800-1000        | -    | 1.10           | -    |       |
|                            | 1700-2000       | -    | 1.15           | -    |       |
|                            | 2300-2700       | -    | 1.20           | -    |       |
| Input Power                | 30-3000         | -    | -              | 1    | W     |

1. Mainline loss includes theoretical power loss at coupled port.

## OUTLINE DRAWING



## ELECTRICAL SCHEMATIC



\* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.

## PAD CONNECTIONS

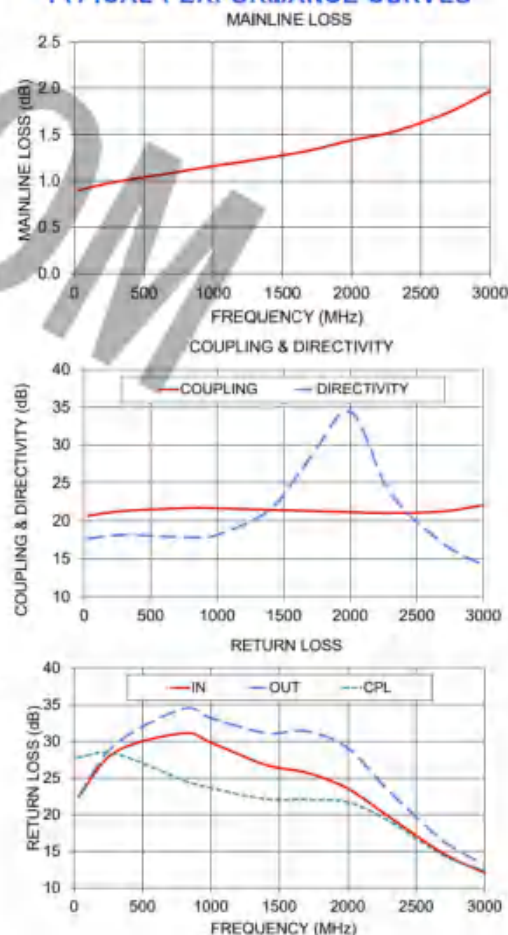
|         |               |
|---------|---------------|
| INPUT   | 8             |
| OUTPUT  | 1             |
| COUPLED | 5             |
| GROUND  | 2, 3, 4, 6, 7 |

## MAXIMUM RATINGS

| Parameter             | Rating      |
|-----------------------|-------------|
| Operating temperature | -40°C-85°C  |
| Storage temperature   | -50°C-100°C |

Permanent damage may occur if any of these limits are exceeded.

## TYPICAL PERFORMANCE CURVES



## RFPS-AD4PS-1

## Features

- wideband, 1-500 MHz
- high isolation, 30 dB typ.
- good input port matching VSWR, 1.12 typ.
- good output port matching VSWR, 1.10 typ.
- small surface mount package

## Applications

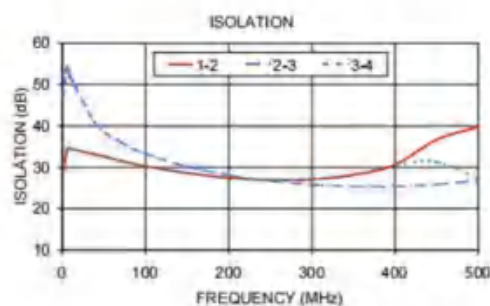
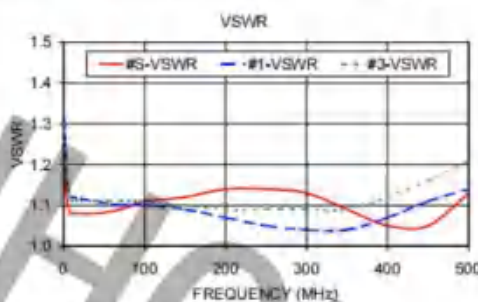
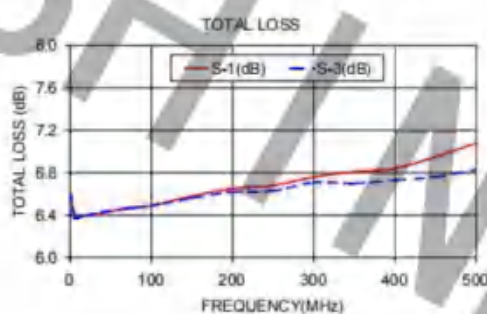
- VHF-TV
- aircraft communications

## Transformer Electrical Specifications

| Freq. Range<br>(MHz) | Isolation<br>(dB) |      | Insertion Loss(dB)<br>Above 6.0 dB |      | Phase Unbalance<br>(Degrees) |      | Amplitude Unbalance<br>(dB) |      |
|----------------------|-------------------|------|------------------------------------|------|------------------------------|------|-----------------------------|------|
|                      | min               | Max. | min                                | Max. | min                          | Max. | min                         | Max. |
| 1-500                | 18                | 32   | 0.4                                | 1.8  | 2                            | 7    | 0.4                         | 0.8  |

## Typical Performance Data (TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = +25°C)

| Freq.<br>(MHz) | Total Loss (dB) |      |      | Amp.<br>Unbal.<br>(dB) | Isolation(dB) |       |       | Phase<br>Unbal.(de<br>g.) | VSWRS |      |      |      |
|----------------|-----------------|------|------|------------------------|---------------|-------|-------|---------------------------|-------|------|------|------|
|                | S-1             | S-2  | S-3  |                        | 1-2           | 2-3   | 2-4   |                           | S     | 1    | 2    | 3    |
| 1              | 6.59            | 6.59 | 6.59 | 0.01                   | 28.61         | 46.82 | 30.70 | 0.02                      | 1.20  | 1.31 | 1.31 | 1.30 |
| 5              | 6.38            | 6.42 | 6.38 | 0.04                   | 33.63         | 54.15 | 34.52 | 0.05                      | 1.10  | 1.15 | 1.15 | 1.15 |
| 9              | 6.37            | 6.42 | 6.37 | 0.05                   | 34.35         | 52.09 | 34.63 | 0.08                      | 1.08  | 1.12 | 1.12 | 1.12 |
| 10             | 6.38            | 6.42 | 6.38 | 0.04                   | 34.41         | 51.62 | 34.60 | 0.09                      | 1.08  | 1.12 | 1.12 | 1.11 |
| 40             | 6.42            | 6.47 | 6.43 | 0.04                   | 33.14         | 40.57 | 32.89 | 0.28                      | 1.08  | 1.11 | 1.11 | 1.11 |
| 70             | 6.47            | 6.50 | 6.46 | 0.04                   | 31.60         | 36.15 | 31.47 | 0.52                      | 1.09  | 1.10 | 1.11 | 1.11 |
| 100            | 6.49            | 6.53 | 6.49 | 0.04                   | 30.28         | 33.28 | 30.23 | 0.71                      | 1.11  | 1.10 | 1.10 | 1.11 |
| 150            | 6.58            | 6.61 | 6.56 | 0.05                   | 28.63         | 30.21 | 28.64 | 1.04                      | 1.12  | 1.09 | 1.10 | 1.10 |
| 200            | 6.65            | 6.68 | 6.62 | 0.05                   | 27.48         | 28.12 | 27.52 | 1.47                      | 1.14  | 1.07 | 1.08 | 1.09 |
| 250            | 6.68            | 6.71 | 6.63 | 0.09                   | 26.98         | 26.73 | 27.02 | 1.66                      | 1.14  | 1.05 | 1.07 | 1.09 |
| 300            | 6.76            | 6.80 | 6.71 | 0.10                   | 27.10         | 25.83 | 27.23 | 1.99                      | 1.13  | 1.04 | 1.06 | 1.09 |
| 350            | 6.81            | 6.83 | 6.70 | 0.15                   | 28.13         | 25.41 | 28.36 | 2.08                      | 1.09  | 1.04 | 1.06 | 1.09 |
| 400            | 6.84            | 6.90 | 6.73 | 0.21                   | 30.62         | 25.41 | 30.49 | 2.21                      | 1.05  | 1.07 | 1.08 | 1.12 |
| 450            | 6.95            | 6.98 | 6.76 | 0.26                   | 36.71         | 25.89 | 31.30 | 2.54                      | 1.05  | 1.11 | 1.11 | 1.16 |
| 500            | 7.08            | 7.15 | 6.83 | 0.38                   | 39.78         | 26.85 | 27.20 | 3.34                      | 1.13  | 1.14 | 1.15 | 1.21 |



## Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| Power Input (as a splitter)                                     | 0.5W max.      |
| Internal Dissipation                                            | 0.25W max.     |
| Permanent damage may occur if any of these limits are exceeded. |                |



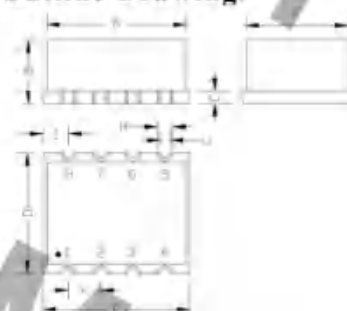
## Electrical Schematic



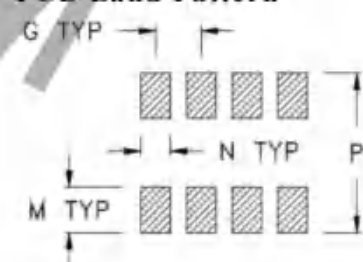
## Pin Connections

|          |            |
|----------|------------|
| SUM PORT | 2(input)   |
| PORT 1   | 8(output1) |
| PORT 2   | 7(output2) |
| PORT 3   | 6(output3) |
| PORT 4   | 5(output4) |
| GROUND   | 1,3,4      |

## Outline Drawing



## PCB Land Pattern



## Outline Dimensions: Unit (mm)

|   |       |   |       |
|---|-------|---|-------|
| A | 11.00 | G | 2.54  |
| B | 5.00  | H | 1.21  |
| C | 1.00  | I | 2.00  |
| D | 9.5   | J | 0.80  |
| E | 11.60 | K | 2.54  |
| F | 8.00  | M | 3.05  |
| N | 1.52  | P | 10.67 |



## Features

- low insertion loss, 0.25dB typ.
- excellent amplitude unbalance, 0.01dB typ.
- very good phase unbalance, 0.2deg. typ.
- aqueous washable

## Applications

- VHF/UHF receivers/transmitters



## Electrical Specifications

| Freq. Range<br>(MHz) | Isolation<br>(dB) |      | Insertion<br>Loss(dB)<br>Above 3.0 dB |      | Phase<br>Unbalance<br>(Degrees) |      | Amplitude<br>Unbalance<br>(dB) |      |
|----------------------|-------------------|------|---------------------------------------|------|---------------------------------|------|--------------------------------|------|
|                      | Typ.              | Max. | Typ.                                  | Max. | Min.                            | Max. | Min.                           | Max. |
| 1-650                | 30                | 20   | 0.2                                   | 1.0  | 2.0                             | 3.0  | 0.15                           | 0.3  |

## Typical Performance Data (TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = +25°C)

| Freq.<br>(MHz) | Total Loss (dB) |      | Amp.Unbal.<br>(dB) | Isolation<br>(dB) | Phase Unbal.<br>(deg.) | VSWRS |      |      |
|----------------|-----------------|------|--------------------|-------------------|------------------------|-------|------|------|
|                | S-1             | S-2  |                    |                   |                        | S     | 1    | 2    |
| 1.00           | 3.33            | 3.33 | 0.00               | 29.22             | 0.03                   | 1.08  | 1.26 | 1.26 |
| 30.00          | 3.18            | 3.17 | 0.01               | 44.81             | 0.03                   | 1.11  | 1.15 | 1.15 |
| 60.00          | 3.21            | 3.21 | 0.00               | 39.19             | 0.01                   | 1.13  | 1.15 | 1.15 |
| 90.00          | 3.22            | 3.22 | 0.00               | 36.18             | 0.00                   | 1.11  | 1.14 | 1.15 |
| 150.00         | 3.26            | 3.25 | 0.01               | 32.49             | 0.12                   | 1.14  | 1.14 | 1.15 |
| 200.00         | 3.31            | 3.28 | 0.03               | 29.34             | 0.09                   | 1.17  | 1.14 | 1.13 |
| 250.00         | 3.33            | 3.32 | 0.02               | 29.13             | 0.06                   | 1.18  | 1.14 | 1.13 |
| 300.00         | 3.37            | 3.35 | 0.02               | 27.54             | 0.17                   | 1.16  | 1.15 | 1.15 |
| 350.00         | 3.40            | 3.36 | 0.04               | 26.57             | 0.09                   | 1.18  | 1.14 | 1.14 |
| 425.00         | 3.47            | 3.42 | 0.05               | 25.55             | 0.28                   | 1.22  | 1.15 | 1.13 |
| 475.00         | 3.51            | 3.44 | 0.07               | 25.55             | 0.30                   | 1.23  | 1.17 | 1.16 |
| 525.00         | 3.56            | 3.49 | 0.07               | 25.05             | 0.30                   | 1.23  | 1.17 | 1.16 |
| 575.00         | 3.59            | 3.50 | 0.09               | 25.75             | 0.30                   | 1.25  | 1.18 | 1.15 |
| 625.00         | 3.68            | 3.54 | 0.14               | 25.60             | 0.47                   | 1.23  | 1.22 | 1.16 |
| 650.00         | 3.72            | 3.58 | 0.14               | 25.51             | 0.52                   | 1.26  | 1.23 | 1.18 |

## Electrical Schematic



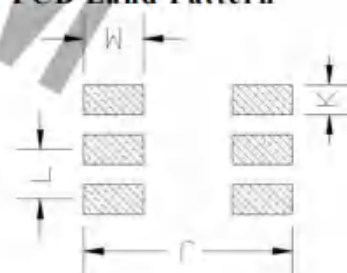
## Pin Connections

|          |     |
|----------|-----|
| SUM PORT | 1   |
| PORT 1   | 3   |
| PORT 2   | 4   |
| GROUND   | 6   |
| NOT USED | 2,5 |

## Outline Drawing

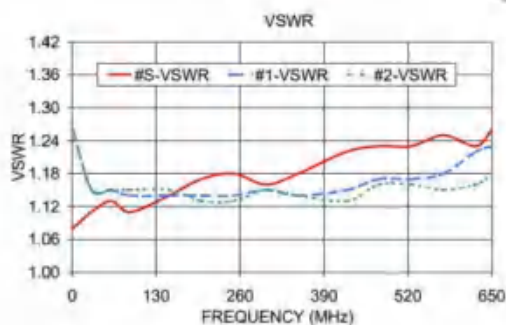
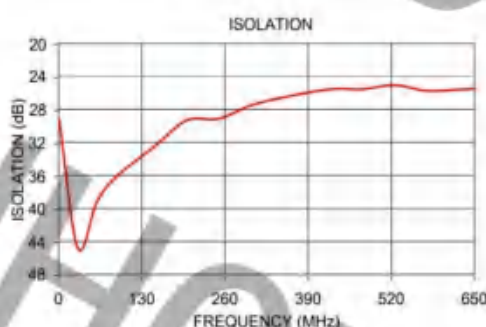
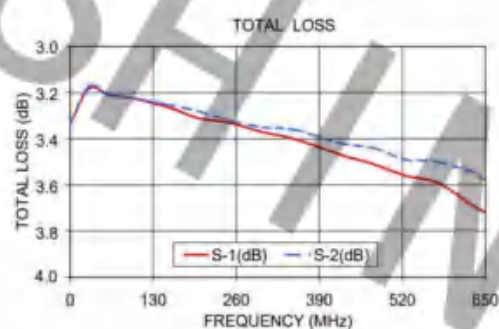


## PCB Land Pattern



## Outline Dimensions: Unit (mm)

|    |      |   |      |
|----|------|---|------|
| A  | 8.70 | J | 8.00 |
| B  | 6.50 | K | 1.50 |
| C  | 2.54 | G | 5.50 |
| D  | 1.30 | H | 4.30 |
| E  | 5.40 | L | 2.54 |
| F  | 6.50 | M | 2.00 |
| WT | 0.5g |   |      |



## Maximum Ratings

|                             |                |
|-----------------------------|----------------|
| Operating Temperature       | -40°C to 85°C  |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 0.5W max.      |
| Internal Dissipation        | 0.125W max.    |

Permanent damage may occur if any of these limits are exceeded.

## RFPS-JPS-2-1W

## Features

- low insertion loss, 0.4 dB typ.
- excellent insertion loss flatness, 0.2 dB peak to peak typ.
- excellent amplitude unbalance, 0.05 dB typ.
- very good phase unbalance, 0.1 deg. typ.
- excellent VSWR, 1.1:1 typ. all ports.
- J-leads for excellent solderability and strain relief

## Applications

- UHF/VHF
- instrumentation



2 Way-0° 50Ω 3 to 750 MHz

## Transformer Electrical Specifications

| Freq. range<br>(MHz) | Isolation(dB) |     | Insertion Loss (dB)<br>Above 3.0 dB. |     | Phase Unbalance<br>(Degrees)<br>Max. | Amplitude Unbalance<br>(dB)<br>Max. |
|----------------------|---------------|-----|--------------------------------------|-----|--------------------------------------|-------------------------------------|
|                      | min           | max | min                                  | max |                                      |                                     |
| 3-750                | 20            | 36  | 0.5                                  | 1.0 | 2.0                                  | 0.3                                 |

electrical schematic



## Typical Performance Data( TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = +25°C)

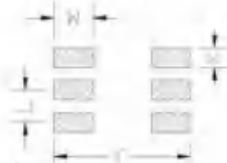
| Frequency.<br>(MHz) | Total Loss (dB) |      | Amp.<br>Unbal.<br>(dB) | Isolation<br>(dB) | PhaseUnbal.<br>(deg.) | VSWRS |      |      |
|---------------------|-----------------|------|------------------------|-------------------|-----------------------|-------|------|------|
|                     | S-1             | S-2  |                        |                   |                       | S     | 1    | 2    |
| 3                   | 3.57            | 3.57 | 0.00                   | 31.30             | 0.00                  | 1.13  | 1.35 | 1.35 |
| 5                   | 3.46            | 3.46 | 0.00                   | 35.31             | 0.01                  | 1.11  | 1.29 | 1.29 |
| 10                  | 3.38            | 3.38 | 0.00                   | 37.17             | 0.02                  | 1.11  | 1.24 | 1.24 |
| 22                  | 3.36            | 3.36 | 0.00                   | 36.06             | 0.06                  | 1.10  | 1.23 | 1.23 |
| 40                  | 3.38            | 3.39 | 0.01                   | 34.66             | 0.08                  | 1.11  | 1.22 | 1.22 |
| 100                 | 3.38            | 3.38 | 0.00                   | 30.08             | 0.27                  | 1.12  | 1.22 | 1.22 |
| 250                 | 3.53            | 3.52 | 0.01                   | 23.73             | 0.49                  | 1.17  | 1.22 | 1.22 |
| 375                 | 3.63            | 3.61 | 0.03                   | 21.42             | 0.73                  | 1.20  | 1.21 | 1.21 |
| 440                 | 3.66            | 3.63 | 0.03                   | 2.84              | 0.85                  | 1.21  | 1.21 | 1.21 |
| 500                 | 3.73            | 3.68 | 0.06                   | 50.52             | 0.84                  | 1.21  | 1.20 | 1.20 |
| 560                 | 3.77            | 3.70 | 0.07                   | 20.46             | 0.93                  | 1.21  | 1.18 | 1.18 |
| 620                 | 3.79            | 3.70 | 0.09                   | 20.69             | 0.88                  | 1.20  | 1.17 | 1.17 |
| 660                 | 3.86            | 3.73 | 0.13                   | 21.04             | 0.90                  | 1.18  | 1.16 | 1.16 |
| 700                 | 3.87            | 3.73 | 0.14                   | 21.60             | 0.89                  | 1.17  | 1.15 | 1.15 |
| 750                 | 3.98            | 3.77 | 0.16                   | 22.58             | 0.83                  | 1.14  | 1.13 | 1.13 |

## Outline Drawing



Suggested Layout,  
Tolerance to be within ±0.2

## PCB Land Pattern



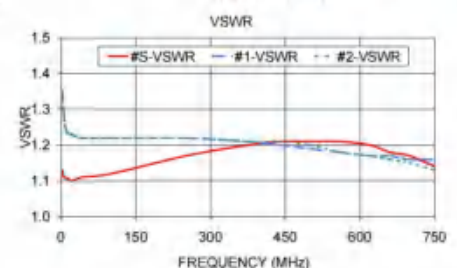
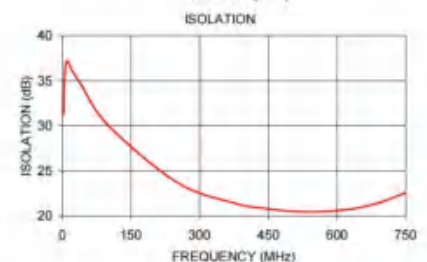
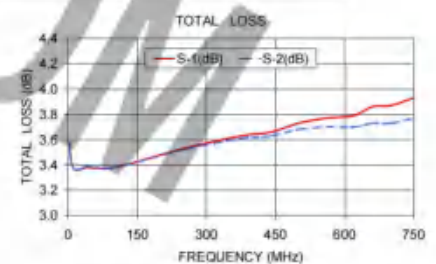
## Pin Connections

|          |             |
|----------|-------------|
| SUM PORT | 1 (input)   |
| PORT 1   | 3 (output1) |
| PORT 2   | 4 (output2) |
| PORT 3   | 6 (output3) |
| NOT USED | 2,5         |

## Maximum Ratings

|                             |                |
|-----------------------------|----------------|
| Operating Temperature       | -40°C to 85°C  |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 1 W max.       |
| Internal Dissipation        | 0.125W max.    |

Permanent damage may occur if any of these  
limits are exceeded.



## Outline Dimensions: Unit (mm)

|    |      |   |      |
|----|------|---|------|
| A  | 8.70 | G | 5.50 |
| B  | 6.50 | H | 4.30 |
| C  | 2.54 | I | 2.54 |
| D  | 1.30 | J | 8.00 |
| E  | 5.40 | K | 1.50 |
| F  | 6.54 | M | 2.00 |
| WT | 0.5g |   |      |



## RFPS-JPS-3-1

## Features

- wideband, 5 to 300 MHz
- high isolation, 28dB typ.
- good input port matching VSWR, 0.3 typ.
- small surface mount package

## Applications

- VHF
- defense & federal communications
- amateur & FM radio



## Electrical Schematic



## Pin Connections

|          |            |
|----------|------------|
| SUM PORT | 1(input)   |
| PORT 1   | 3(output1) |
| PORT 2   | 4(output2) |
| PORT 3   | 6(output3) |
| GROUND   | 2,5        |

## Transformer Electrical Specifications

| Freq. Range<br>(MHz) | Isolation<br>(dB) |      | Insertion<br>Loss(dB) |      | Phase<br>Unbalance<br>(Degrees) | Amplitude<br>Unbalance<br>(dB) |
|----------------------|-------------------|------|-----------------------|------|---------------------------------|--------------------------------|
|                      | Typ.              | Max. | Typ.                  | Max. |                                 |                                |
| 5-300                | 18                | 28   | 0.8                   | 1.5  | 6                               | 0.6                            |

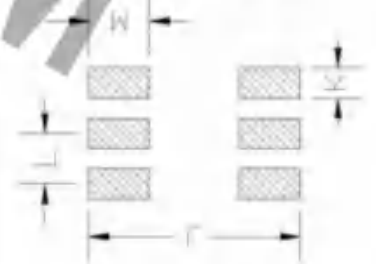
## Typical Performance Data (TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = +25°C)

| Freq.<br>(MHz) | Total Loss (dB) |       |       | Amp.<br>Unbal.<br>(dB) | Isolation(dB) |       |       | Phase<br>Unbal.<br>(deg.) | VSWRS |      |      |      |
|----------------|-----------------|-------|-------|------------------------|---------------|-------|-------|---------------------------|-------|------|------|------|
|                | S-1             | S-2   | S-3   |                        | 1-2           | 1-3   | 2-3   |                           | S     | 1    | 2    | 3    |
| 5.0            | -5.03           | -5.03 | -5.03 | 0.08                   | -28.7         | -27.6 | -27.6 | 0.02                      | 1.08  | 1.08 | 1.08 | 1.08 |
| 10.0           | -4.99           | -4.99 | -4.99 | 0.08                   | -28.8         | -27.8 | -27.7 | 0.05                      | 1.09  | 1.10 | 1.10 | 1.08 |
| 40.0           | -4.95           | -4.95 | -4.94 | 0.08                   | -28.3         | -27.3 | -27.2 | 0.01                      | 1.10  | 1.11 | 1.11 | 1.09 |
| 100.0          | -4.98           | -4.95 | -4.95 | 0.07                   | -26.3         | -25.8 | -25.2 | 0.01                      | 1.15  | 1.15 | 1.15 | 1.15 |
| 200.0          | -5.16           | -5.06 | -5.04 | 0.07                   | -22.9         | -22.8 | -21.7 | 0.05                      | 1.20  | 1.18 | 1.18 | 1.19 |
| 240.0          | -5.24           | -5.12 | -5.09 | 0.07                   | -21.9         | -21.9 | -20.7 | 0.09                      | 1.20  | 1.18 | 1.18 | 1.19 |
| 280.0          | -5.34           | -5.17 | -5.12 | 0.07                   | -21.0         | -21.0 | -19.7 | 0.13                      | 1.19  | 1.17 | 1.17 | 1.18 |
| 300.0          | -5.38           | -5.19 | -5.13 | 0.07                   | -20.6         | -20.6 | -19.3 | 0.15                      | 1.19  | 1.18 | 1.18 | 1.19 |
| 350.0          | -5.58           | -5.31 | -5.22 | 0.07                   | -19.6         | -19.6 | -18.3 | 0.15                      | 1.24  | 1.23 | 1.23 | 1.24 |

## Outline Drawing



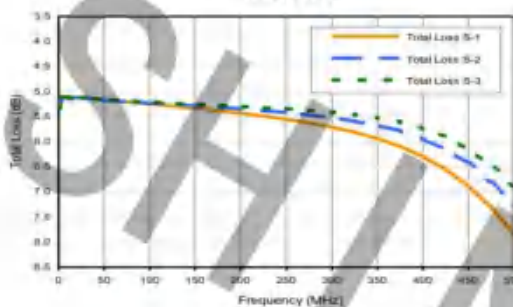
## PCB Land Pattern



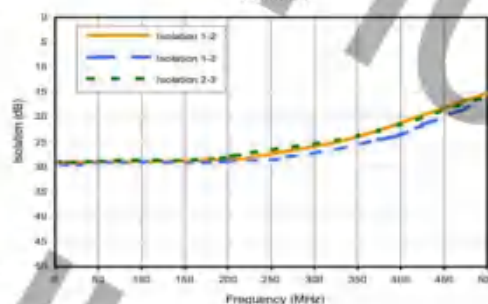
## Outline Dimensions: Unit (mm)

|    |      |   |      |
|----|------|---|------|
| A  | 8.70 | J | 7.60 |
| B  | 6.50 | K | 1.50 |
| C  | 2.54 | G | 5.50 |
| D  | 1.30 | H | 4.30 |
| E  | 5.40 | L | 2.54 |
| F  | 6.50 | M | 2.00 |
| WT | 0.5g |   |      |

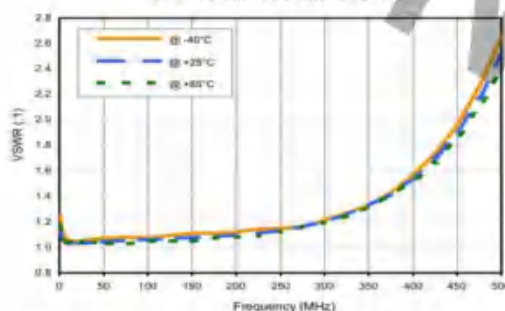
Total Loss



Isolation



VSWR SUM vs. TEMPERATURE



## Maximum Ratings

|                             |                |
|-----------------------------|----------------|
| Operating Temperature       | -40°C to 85°C  |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 1W max.        |
| Internal Dissipation        | 0.4W max.      |

Permanent damage may occur if any of these limits are exceeded.



RFPS-SC4PS-33

- Features**
  - wideband, 300 to 3000 MHz, useable from 100 to 3600 MHz
  - low insertion loss, 1.6 dB typ.
  - good isolation, 17 dB typ.
  - good amplitude unbalance, 0.4 dB typ.
- Applications**
  - communication systems
  - CATV
  - cellular, GPS, PCS
  - VHF/UHF/receivers/transmitters



electrical schematic



| Electrical Specifications at 25°C |                |      |      |      |        |
|-----------------------------------|----------------|------|------|------|--------|
| Parameter                         | Frequency(MHz) | Min. | Typ. | Max. | Unit   |
| Frequency Range                   |                | 300  | -    | 3000 | MHz    |
| Insertion Loss Above 6 dB         | 300-2700       | -    | 1.6  | 3.1  | dB     |
|                                   | 2700-3000      | -    | 2.6  | 3.8  |        |
| Isolation                         | 300-3000       | 12   | 17   | -    | dB     |
|                                   | 1000-2000      | 20   | -    | -    |        |
| Phase Unbalance                   | 300-2700       | -    | 7    | 15   | Degree |
|                                   | 2700-3000      | -    | 12   | 20   |        |
| Amplitude Unbalance               | 300-2700       | -    | 0.4  | 0.9  | dB     |
|                                   | 2700-3000      | -    | 0.7  | 1.2  |        |
| VSWR (Port 5)                     | 300-3000       | -    | 2.1  | -    | :1     |
| VSWR (Port 1-4)                   | 300-3000       | -    | 1.5  | -    | :1     |

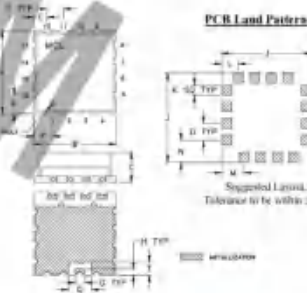
Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| Power Input (as a splitter)                                     | 1W max.        |
| Internal Dissipation                                            | 0.2W max.      |
| Permanent damage may occur if any of these limits are exceeded. |                |

Pin Connections

|         |           |
|---------|-----------|
| SUMPORT | 10        |
| PORT1   | 1         |
| PORT2   | 2         |
| PORT3   | 3         |
| PORT4   | 4         |
| GROUND  | ALL OTHER |

Outline Drawing

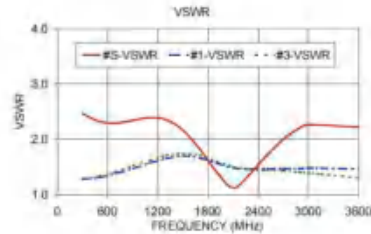
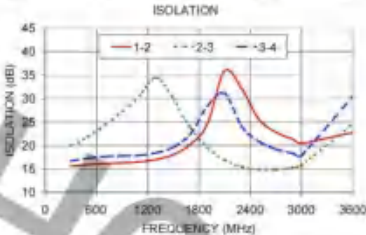
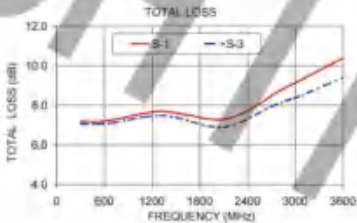


Outline Dimensions: Unit (mm)

|    |       |   |       |
|----|-------|---|-------|
| A  | 12.70 | B | 12.70 |
| C  | 4.57  | D | 2.54  |
| E  | 2.03  | F | 2.92  |
| G  | 1.52  | H | 1.02  |
| J  | 13.72 | K | 1.52  |
| L  | 2.54  | M | 3.43  |
| N  | 3.43  | P | 2.92  |
| Q  | 3.56  | T | 2.03  |
| W1 | L11   |   |       |

Typical Performance Data( TEST CONDITIONS: INPUT POWER = 0dBm a Temperature = +25°C)

| Fro. (MHz) | Total Loss (dB) |      |      | Amp. (dB) | Isolation (dB) |       |       | Phase Unbal. (deg.) | VSWRS |      |      |
|------------|-----------------|------|------|-----------|----------------|-------|-------|---------------------|-------|------|------|
|            | S-1             | S-2  | S-3  |           | I-2            | I-3   | I-4   |                     | S     | I    | 2    |
| 300        | 2.20            | 2.22 | 7.19 | 0.03      | 15.56          | 19.89 | 16.67 | 1.15                | 2.46  | 1.28 | 1.28 |
| 500        | 2.18            | 2.20 | 7.06 | 0.17      | 15.90          | 21.83 | 17.28 | 1.71                | 2.32  | 1.33 | 1.31 |
| 700        | 2.26            | 2.28 | 7.11 | 0.21      | 16.14          | 24.40 | 17.66 | 2.06                | 2.29  | 1.38 | 1.38 |
| 1000       | 2.41            | 2.44 | 7.27 | 0.23      | 20.50          | 27.19 | 21.06 | 2.29                | 2.34  | 1.47 | 1.47 |
| 1100       | 2.60            | 2.60 | 7.42 | 0.25      | 21.13          | 30.54 | 22.63 | 2.35                | 2.39  | 1.57 | 1.57 |
| 1300       | 2.71            | 2.67 | 7.49 | 0.28      | 21.95          | 34.52 | 23.14 | 2.95                | 2.35  | 1.65 | 1.65 |
| 1500       | 2.62            | 2.58 | 7.40 | 0.29      | 22.54          | 32.99 | 22.63 | 3.31                | 2.16  | 1.67 | 1.67 |
| 1700       | 2.48            | 2.33 | 7.18 | 0.35      | 20.26          | 29.26 | 22.45 | 3.84                | 1.82  | 1.62 | 1.62 |
| 2000       | 2.32            | 2.06 | 6.96 | 0.41      | 24.66          | 21.35 | 28.42 | 4.71                | 1.41  | 1.52 | 1.52 |
| 2400       | 2.29            | 1.94 | 6.90 | 0.45      | 35.91          | 16.89 | 31.12 | 5.70                | 1.12  | 1.41 | 1.41 |
| 2500       | 2.34            | 2.12 | 7.14 | 0.46      | 32.14          | 15.43 | 24.09 | 7.01                | 1.37  | 1.34 | 1.34 |
| 2600       | 2.66            | 2.52 | 7.52 | 0.51      | 25.62          | 14.83 | 20.89 | 8.66                | 1.71  | 1.33 | 1.33 |
| 2700       | 2.81            | 2.89 | 7.95 | 0.59      | 22.85          | 14.80 | 19.22 | 10.64               | 2.00  | 1.32 | 1.32 |
| 2900       | 8.95            | 8.25 | 8.26 | 0.77      | 21.31          | 15.32 | 18.31 | 12.58               | 2.21  | 1.29 | 1.29 |
| 3000       | 9.14            | 8.39 | 8.38 | 0.86      | 20.49          | 15.86 | 17.91 | 13.44               | 2.26  | 1.28 | 1.28 |



Demo Board MCL P/N: TB-652+ Suggested PCB Layout (PL-368)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROUTED RELEASED WITH SOLDERING THICKNESS 60μm x 100μm, COPPER 1/2 OZ. EACH SIDE. FOR OTHER RELEASED TRACES WIDTH MAY BE 10μm. 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE. 3. DENOTES PCB COPPER LAYOUT WITH IMAGE COUPLER MASK (SILVER MASK COUPLER) 4. DENOTES COPPER LAYER PATTERNING OF SILVER MASK

## RFPS-SCA-4-132

## Features

- wideband, 5-1300 MHz
- high isolation, 22dB typ.
- good matching VSWR, 1.20 typ.
- excellent amplitude unbalance, 0.3 dB typ.

## Applications

- cellular
- UHF/VHF receivers/transmitters



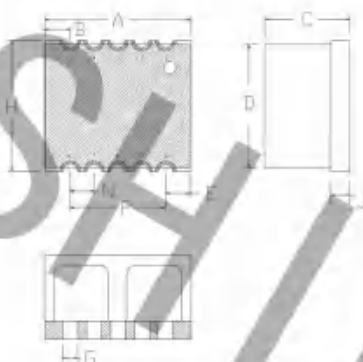
4 Way-0° 50Ω 5 to 1300 MHz

| Parameter                    | Frequency (MHz) | Min. | Typ. | Max. | Unit   |
|------------------------------|-----------------|------|------|------|--------|
| Frequency Range              |                 | 5    |      | 1300 | MHz    |
| Insertion Loss, above 6.0 dB | 5-500           |      | 0.8  | 1.5  | dB     |
|                              | 500-1000        |      | 1.2  | 2.4  |        |
|                              | 1000-1300       |      | 2.0  | 3.2  |        |
| Isolation                    | 5-1000          | 15   | 21   |      | dB     |
|                              | 1000-1300       | 13   | 18   |      |        |
| Phase Unbalance              | 5-500           |      | 2.0  | 5    | Degree |
|                              | 500-1000        |      | 4.0  | 11   |        |
|                              | 1000-1300       |      | 8.0  | 16   |        |
| Amplitude Unbalance          | 5-1000          |      | 0.5  | 0.9  | dB     |
|                              | 1000-1300       |      | 0.7  | 1.2  |        |
| VSWR (Port S)                | 5-500           |      | 1.22 | 1.32 | :1     |
|                              | 500-1300        |      | 1.28 | 1.8  |        |
| VSWR (Port 1-4)              | 5-500           |      | 1.57 | 1.8  | :1     |
|                              | 500-1300        |      | 1.40 | 1.8  |        |

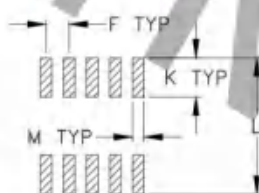
## electrical schematic



## Outline Drawing



## PCB Land Pattern

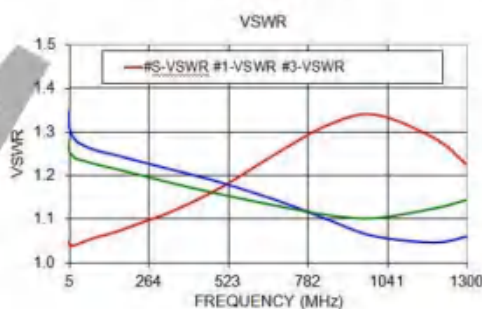
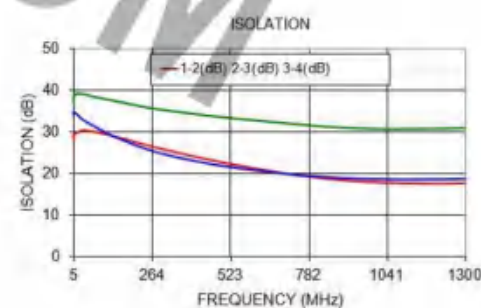
Suggested Layout, Tolerance to be within  $\pm 0.05$ 

| Pin Connections |               |            |
|-----------------|---------------|------------|
| SUM PORT        | 3             | (input)    |
| PORT 1          | 6             | (output 1) |
| PORT 2          | 7             | (output 2) |
| PORT 3          | 9             | (output 3) |
| PORT 4          | 10            | (output 4) |
| GND             | 1, 2, 4, 5, 8 |            |

## Maximum Ratings

|                             |                |
|-----------------------------|----------------|
| Operating Temperature       | -40°C to 85°C  |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 0.5 W max.     |
| Internal Dissipation        | 0.375 W max.   |

Permanent damage may occur if any of these limits are exceeded.



| Outline Dimensions: Unit (mm) |      |      |      |
|-------------------------------|------|------|------|
| A                             | 7.80 | G    | 0.80 |
| B                             | 1.35 | H    | 7.18 |
| C                             | 4.50 | N, F | 1.27 |
| D                             | 7.80 | J    | 1.00 |
| E                             | 1.35 | P    | 5.08 |



## RFPS-SCRP-2-682W

## Features

- very wideband, DC to 6800 MHz
- very good phase unbalance, 1 deg. typ.
- excellent amplitude unbalance, 0.1 dB typ.
- rugged shielded case

## Applications

- laboratory
- test set-ups
- PCS
- UNII
- WiMAX
- WiFi
- blue tooth



DC to 6800 MHz

Electrical Schematic



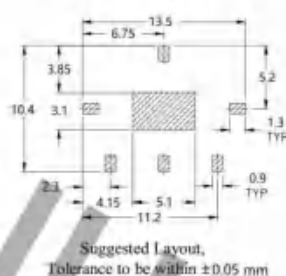
## Electrical Specifications

| Parameter                   | Frequency (MHz) | Min. | Typ. | Max. | Uni    |
|-----------------------------|-----------------|------|------|------|--------|
| Frequency Range             | DC-6800         | DC   | -    | 6800 | MHz    |
| Insertion Loss Above 9.5 dB | DC-6800         | -    | 0.8  | 1.6  | dB     |
| Isolation                   | DC-6800         | 17   | 19   | --   | dB     |
| Phase Unbalance             | DC-6800         | -    | 3    | 6    | Degree |
| Amplitude Unbalance         | DC-6800         | 0.1  | 0.4  | 0.7  | dB     |
| VSWR (Port S)               | DC-6800         | --   | 1.3  | 1.6  | :1     |
| VSWR (Port 1-2)             | DC-6800         | --   | 1.3  | 2.2  | :1     |

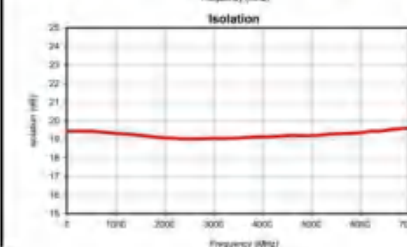
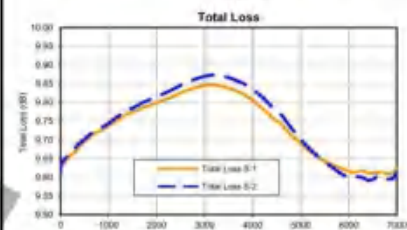
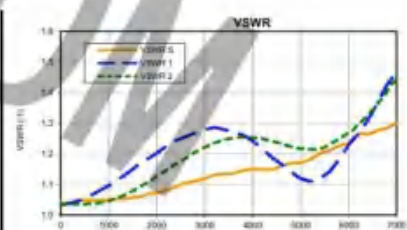
## Outline Drawing



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm 0.05$  mm



| Outline Dimensions (mm) |       |    |       |
|-------------------------|-------|----|-------|
| AB                      | 9.7   | GH | 10.80 |
| CD                      | 12.70 | J  | 4.75  |
| EF                      | 4.52  | KL | 0.89  |
| M                       | 0.51  | PN | 0.86  |
|                         | 1.91  |    | 3.81  |
|                         | 6.35  |    | 3.05  |
|                         | 5.08  |    | 3.05  |

## Maximum Ratings

Operating Temperature  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$

Storage Temperature  $-55^{\circ}\text{C}$  to  $100^{\circ}\text{C}$

Power Input (as a splitter) 0.5W max.

Internal Dissipation 0.5W max.

Permanent damage may occur if any of these limits are exceeded.

# 4 Way-0° Resistive 50Ω DC to 6000 MHz

Http://www.shinhom.com www.shinhomtech.com

RFPS-SRSC-4S-63

## Power Splitter/Combiner

### Features

- wideband, DC to 6000 MHz,
- good matching VSWR 1.3:1 typ.
- good amplitude unbalance, 0.4 dB typ

### Applications

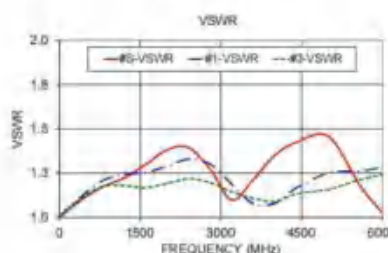
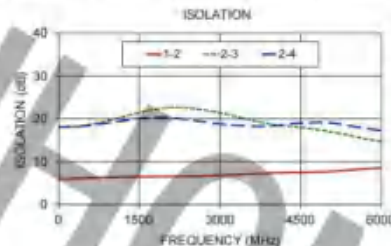
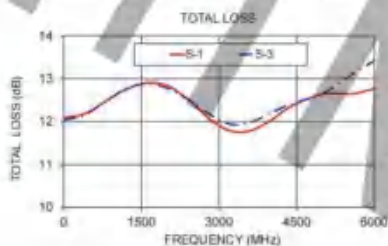
- communication systems
- CATV
- cellular, GPS, PCS
- VHF/UHF/receivers/transmitters

### Electrical Specifications at 25°C

| Parameter                       | Frequency(MHz)       | Min.         | Typ.         | Max.         | Unit   |
|---------------------------------|----------------------|--------------|--------------|--------------|--------|
| Frequency Range                 |                      |              |              | 6000         | MHz    |
| Insertion Loss, including 12 dB | DC-6000<br>3600-6000 | 11.5<br>11.5 | 12.0<br>12.5 | 13.2<br>14.0 | dB     |
| Isolation                       | DC-6000              | -            | 7            | -            | dB     |
| Phase Unbalance                 | DC-6000<br>3600-6000 | -<br>-       | 3<br>8       | 8<br>14      | Degree |
| Amplitude Unbalance             | DC-6000<br>3600-6000 | -<br>-       | 0.4<br>0.7   | 0.8<br>1.2   | dB     |
| VSWR (Port 5)                   | DC-6000              | -            | 1.35         | 1.65         | :1     |
| VSWR (Port 1-4)                 | DC-6000              | -            | 1.30         | 1.60         | :1     |

### Typical Performance Data (TEST CONDITIONS: INPUT POWER = 0dBm @ Temperature = +25°C)

| Freq.<br>(MHz) | Total Loss (dB) |       |       | Amp.<br>Unbal.<br>(dB) | Isolation(dB) |       |       | Phase<br>Unbal.(de<br>g.) | VSWRS |      |      |      |
|----------------|-----------------|-------|-------|------------------------|---------------|-------|-------|---------------------------|-------|------|------|------|
|                | S-1             | S-2   | S-3   |                        | 1-2           | 2-3   | 2-4   |                           | 5     | 1    | 2    | 3    |
| 1              | 12.09           | 12.08 | 12.04 | 0.05                   | 6.06          | 18.08 | 18.09 | 0.30                      | 1.00  | 1.00 | 1.00 | 1.01 |
| 400            | 12.18           | 12.18 | 12.15 | 0.03                   | 6.13          | 18.35 | 18.26 | 0.44                      | 1.10  | 1.11 | 1.11 | 1.11 |
| 800            | 12.47           | 12.50 | 12.47 | 0.04                   | 6.31          | 19.27 | 18.87 | 1.25                      | 1.17  | 1.21 | 1.19 | 1.17 |
| 1200           | 12.75           | 12.83 | 12.77 | 0.06                   | 6.46          | 20.50 | 19.60 | 2.18                      | 1.22  | 1.24 | 1.21 | 1.18 |
| 1600           | 12.90           | 13.00 | 12.88 | 0.15                   | 6.52          | 21.76 | 20.20 | 3.10                      | 1.30  | 1.25 | 1.19 | 1.17 |
| 2000           | 12.83           | 12.96 | 12.78 | 0.31                   | 6.53          | 22.58 | 20.34 | 3.41                      | 1.38  | 1.29 | 1.23 | 1.19 |
| 2400           | 12.52           | 12.72 | 12.51 | 0.43                   | 6.58          | 22.56 | 19.85 | 3.28                      | 1.39  | 1.33 | 1.28 | 1.22 |
| 2800           | 12.08           | 12.34 | 12.19 | 0.43                   | 6.71          | 21.90 | 19.13 | 2.97                      | 1.27  | 1.30 | 1.27 | 1.20 |
| 3200           | 11.79           | 12.03 | 11.94 | 0.34                   | 6.91          | 20.91 | 18.59 | 3.06                      | 1.10  | 1.19 | 1.23 | 1.14 |
| 3600           | 11.78           | 12.07 | 11.98 | 0.28                   | 7.15          | 19.66 | 18.30 | 3.81                      | 1.21  | 1.08 | 1.13 | 1.11 |
| 4000           | 12.03           | 12.39 | 12.20 | 0.36                   | 7.37          | 18.63 | 18.39 | 4.85                      | 1.35  | 1.08 | 1.12 | 1.09 |
| 4400           | 12.36           | 12.71 | 12.41 | 0.35                   | 7.48          | 18.16 | 18.97 | 5.91                      | 1.42  | 1.17 | 1.11 | 1.13 |
| 5000           | 12.64           | 12.95 | 12.65 | 0.39                   | 7.68          | 17.15 | 19.15 | 7.06                      | 1.46  | 1.25 | 1.12 | 1.16 |
| 5600           | 12.65           | 13.05 | 13.13 | 0.49                   | 8.26          | 15.62 | 18.00 | 8.66                      | 1.17  | 1.26 | 1.21 | 1.21 |
| 6000           | 12.77           | 13.11 | 13.42 | 0.68                   | 8.55          | 14.72 | 17.32 | 8.39                      | 1.02  | 1.28 | 1.29 | 1.24 |



### Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| Power Input (as a splitter)                                     | 0.2W max.      |
| Internal Dissipation                                            | 0.15W max.     |
| Permanent damage may occur if any of these limits are exceeded. |                |



### Electrical Schematic



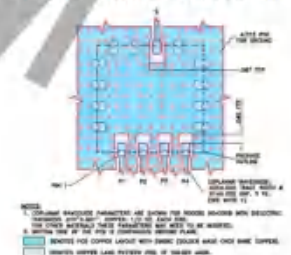
### Pin Connections

|          |           |
|----------|-----------|
| SUM PORT | 10        |
| PORT 1   | 1         |
| PORT 2   | 2         |
| PORT 3   | 3         |
| PORT 4   | 4         |
| GROUND   | ALL OTHER |

### Outline Drawing



### PCB Land Pattern



### Outline Dimensions: Unit (mm)

|   |       |    |       |
|---|-------|----|-------|
| A | 12.70 | B  | 12.70 |
| C | 4.70  | D  | 2.54  |
| E | 2.03  | F  | 2.92  |
| G | 0.76  | H  | 1.02  |
| J | 13.72 | K  | 0.76  |
| L | 2.54  | M  | 3.43  |
| N | 3.43  | P  | 2.92  |
| Q | 3.56  | R  | 1.52  |
| T | 2.03  | wt | 1.0g  |