the source of passive components

CATALOG 2011

TAP MICROWAVE

Passive Components

En

Innovation shapes TAP Microwave's future .

Getting To Know

TAP Microwave is the professional global passive components supplier. We serve the world some of its reliable products - Microwave ultra-broadband power divider, directional coupler,hybrid coupler, filter , diplexer, Multiplexer,combiner, etc. Our products typical applications include: satellite communication base station network and relay ,military and defense equipment, measuring and testing systems.

" response within 8 hours "is our logos of service,and is the key to our quality and success. Our focus is to provide our customers with the highest level of product quality .

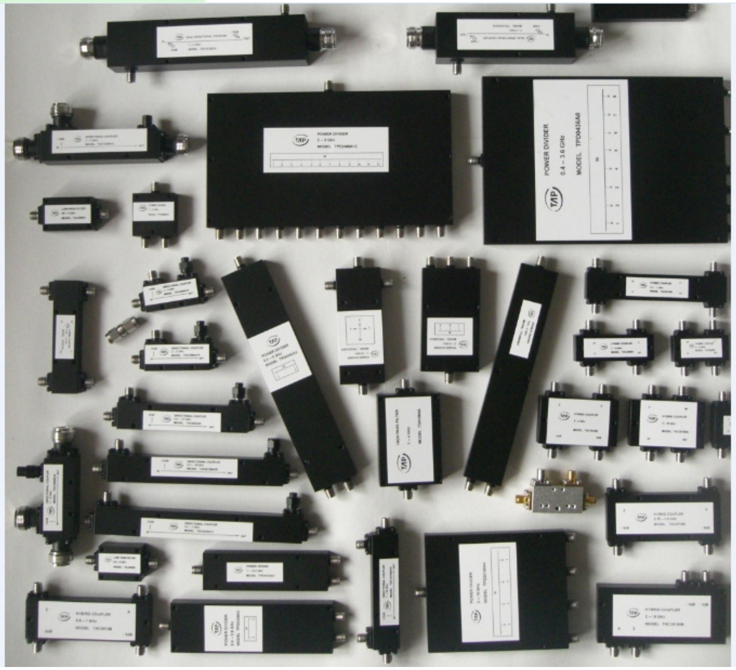
In-house control of all manufacturing processes insures that we according with ISO 9001:2000 quality management system standard from the time your order is placed to the time it is shipped, production delays will be minimized.

TAP is capable of Research & Develop independently, and is improving as well as perfecting itself with the powerful ability and its own advantage. Also we research and development division is constantly evaluating new materials ,plating techniques ,and manufacturing processes in order to provide the highest performing components available.

3 years free Warranty! We proudly offer a 3 years free warranty on all of our reliable, China made passive components. The quality and consistency of our products is why TAP is recognized by ODM’s and Carriers as a primary source of supply for passive components.

We believe that the base of business can and must be a ‘Honesty’. So that we always offer high quality products on time and support you to achieve enduring business success.

Characteristic Of The Products



Models covering DC~20GHz

High power Levels up to 500 Watt

Multi-octave 90 and 180 degree hybrids

Ultra-broadband coupler in 0.5~20GHz bandwidths

Standard product 2 way to 32 way power divider for choice

Miniature SMA and high power handling N connector available

Markets served include

Military Electronics, Avionics, Aerospace and Commercial





Engineering & Production Facilities

Mechanical Production

-Precision machined parts

Integration & Testing

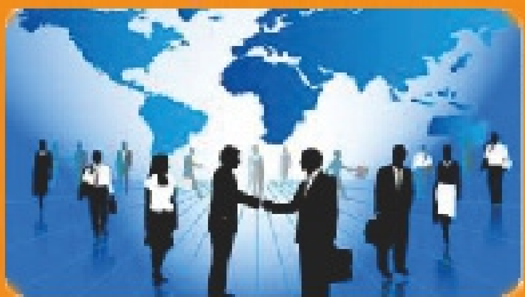
-Full RF/Microwave and environmental testing

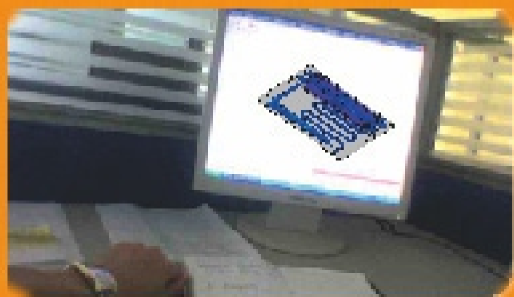
Customization

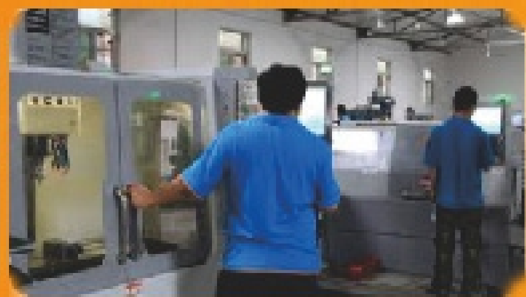
-4 engineers Over 7 years experience designing passive components

Documented Procedures

According with ISO 9001:2000 quality management system standard







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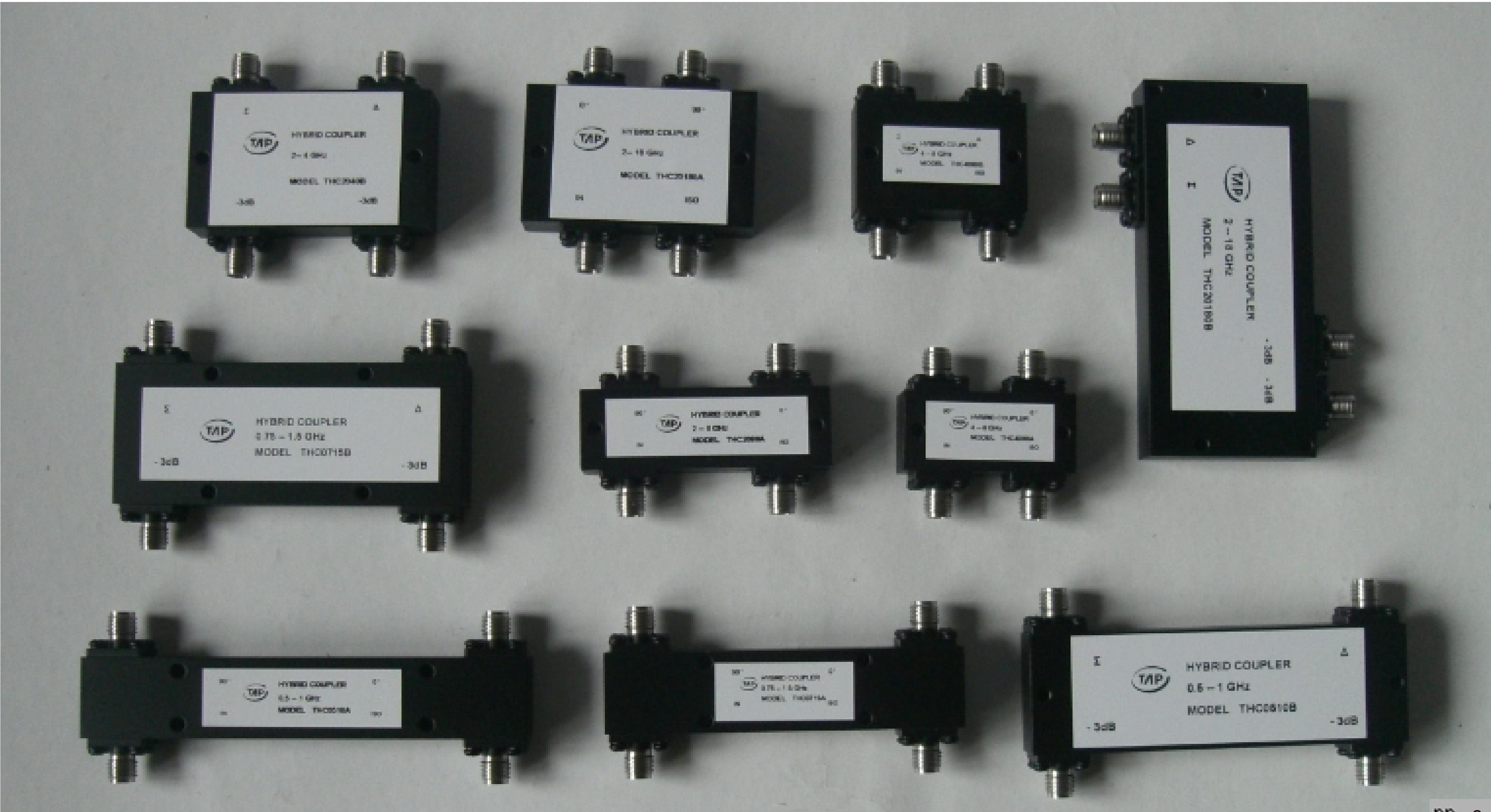
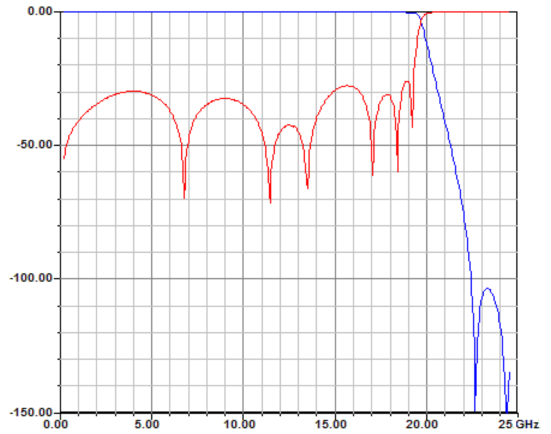
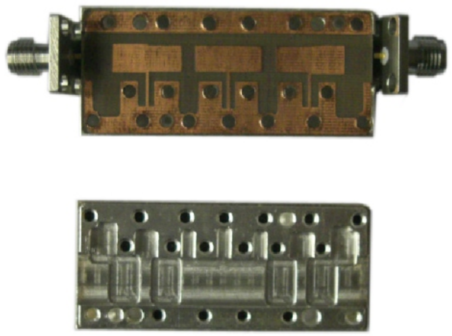
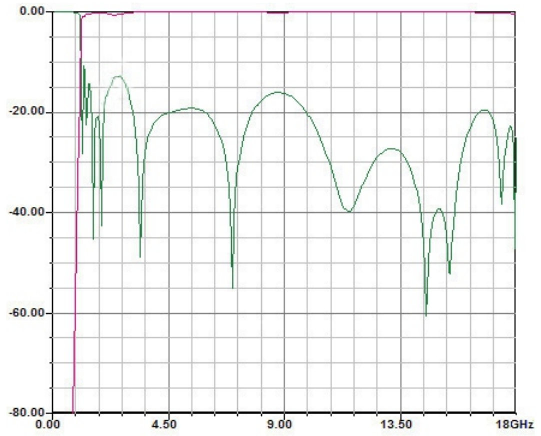


Military Filter







Ultra-broadband power divider

Model	Divider ways	Freq. Range	Insertion Loss	Amplitude Balance	Phase Balance	Isolation	VSWR	Forward Power	Reversed Power
TPD20180A2	2-way	2-18GHz	1.20dB	±0.30dB	±5°	18dB	1.50:1	10W	0.5W
TPD20180A3	3-way	2-18GHz	1.80dB	±0.70dB	±8°	16dB	1.65:1	10W	0.5W
TPD20180A4	4-way	2-18GHz	2.20dB	±0.60dB	±10°	16dB	1.65:1	10W	0.5W
TPD20180A8	8-way	2-18GHz	3.50dB	±0.80dB	±10°	15dB	1.85:1	10W	0.5W
TPD0436A2	2-way	0.4-3.6GHz	0.80dB	±0.20dB	±2°	18dB	1.40:1	30W	1W
TPD0436A4	4-way	0.4-3.6GHz	1.60dB	±0.30dB	±3°	16dB	1.50:1	30W	1W
TPD0436A8	8-way	0.4-3.6GHz	2.40dB	±0.50dB	±5°	16dB	1.60:1	30W	1W
TPD0560A2	2-way	0.5-6GHz	1.00dB	±0.20dB	±3°	18dB	1.40:1	30W	1W
TPD0560A4	4-way	0.5-6GHz	1.60dB	±0.30dB	±4°	16dB	1.50:1	30W	1W
TPD0560A8	8-way	0.5-6GHz	2.80dB	±0.50dB	±7°	16dB	1.60:1	30W	1W
TPD1080A2	2-way	1-8GHz	0.90dB	±0.30dB	±3°	16dB	1.40:1	20W	1W
TPD1080A4	4-way	1-8GHz	1.80dB	±0.40dB	±5°	15dB	1.50:1	20W	1W
TPD10124A2	2-way	1-12.4GHz	1.20dB	±0.30dB	±5°	16dB	1.45:1	20W	1W
TPD10124A4	4-way	1-12.4GHz	2.20dB	±0.50dB	±7°	16dB	1.60:1	20W	1W

Remark:

1.All connectors are SMA Female. Please contact us if you have other requirements.

2.Ask TAP Microwave technical support to get more detail information.

3.Insertion loss does excluding Distribution power.

4.Forward and reversed power is tested with the output VSWR 1.20:1 Of the loads.

Octave band power divider

Model	Divider ways	Freq. Range	Insertion Loss	Amplitude Balance	Phase Balance	Isolation	VSWR	Forward Power	Reversed Power
TPD0520A2	2-way	0.5-2.0GHz	0.50dB	±0.20dB	±2°	22dB	1.25:1	30W	1W
TPD0520A4	4-way	0.5-2.0GHz	0.80dB	±0.30dB	±3°	22dB	1.30:1	30W	1W
TPD0520A8	8-way	0.5-2.0GHz	1.20dB	±0.40dB	±4°	22dB	1.40:1	30W	1W
TPD0825A2	2-way	0.8-2.5GHz	0.40dB	±0.20dB	±2°	20dB	1.25:1	30W	1W
TPD0825A3	3-way	0.8-2.5GHz	0.60dB	±0.50dB	±5°	20dB	1.30:1	30W	1W
TPD0825A4	4-way	0.8-2.5GHz	0.70dB	±0.30dB	±3°	20dB	1.30:1	30W	1W
TPD0825A6	6-way	0.8-2.5GHz	1.20dB	±0.70dB	±7°	20dB	1.40:1	30W	1W
TPD0825A8	8-way	0.8-2.5GHz	1.20dB	±0.40dB	±5°	20dB	1.40:1	30W	1W
TPD0727A2	2-way	0.7-2.7GHz	0.50dB	±0.20dB	±2°	20dB	1.25:1	30W	2W
TPD0727A3	3-way	0.7-2.7GHz	0.80dB	±0.50dB	±5°	20dB	1.30:1	30W	2W
TPD0727A4	4-way	0.7-2.7GHz	0.90dB	±0.30dB	±3°	20dB	1.30:1	30W	2W
TPD0727A6	6-way	0.7-2.7GHz	1.30dB	±0.70dB	±7°	20dB	1.40:1	30W	2W
TPD0727A8	8-way	0.7-2.7GHz	1.50dB	±0.20dB	±2°	20dB	1.40:1	30W	2W
TPD1040A2	2-way	1.0-4.0GHz	0.50dB	±0.20dB	±2°	20dB	1.30:1	30W	1W
TPD1040A3	3-way	1.0-4.0GHz	0.80dB	±0.50dB	±5°	18dB	1.30:1	30W	1W
TPD1040A4	4-way	1.0-4.0GHz	0.80dB	±0.30dB	±3°	20dB	1.30:1	30W	1W
TPD1040A8	8-way	1.0-4.0GHz	1.30dB	±0.50dB	±5°	20dB	1.40:1	30W	1W
TPD2080A2	2-way	2.0-8.0GHz	0.60dB	±0.30dB	±3°	20dB	1.30:1	20W	1W
TPD2080A3	3-way	2.0-8.0GHz	1.10dB	±0.70dB	±7°	18dB	1.40:1	20W	1W
TPD2080A4	4-way	2.0-8.0GHz	1.20dB	±0.40dB	±5°	18dB	1.40:1	20W	1W
TPD2080A6	6-way	2.0-8.0GHz	1.80dB	±0.80dB	±7°	17dB	1.65:1	20W	1W
TPD2080A8	8-way	2.0-8.0GHz	1.80dB	±0.80dB	±7°	17dB	1.65:1	20W	1W
TPD2080A12	12-way	2.0-8.0GHz	2.20dB	±0.80dB	±8°	17dB	1.65:1	20W	1W
TPD2080A16	16-way	2.0-8.0GHz	2.90dB	±0.80dB	±8°	17dB	1.65:1	20W	1W

Ultra-broadband Directional Coupler

Model	Coupling	Freq. Range	Frequency Sensitivity	Insertion Loss	Directivity	VSWR	Power Handling
TDC05200A10	10±1dB	0.5-20GHz	±1.2dB	1.5dB	12dB	1.60:1	50W
TDC05200A20	20±1dB	0.5-20GHz	±1.3dB	1.5dB	10dB	1.60:1	50W
TDC05180A10	10±1dB	0.5-18GHz	±1.0dB	1.5dB	12dB	1.50:1	50W
TDC05180A20	20±1dB	0.5-18GHz	±1.0dB	1.3dB	10dB	1.50:1	50W
TDC10180A10	10±1dB	1-18GHz	±1.0dB	1.5dB	12dB	1.50:1	50W
TDC10180A20	20±1dB	1-18GHz	±1.0dB	1.3dB	10dB	1.50:1	50W
TDC20180A10	10±1dB	2-18GHz	±1.0dB	0.8dB	12dB	1.50:1	50W
TDC20180A20	20±1dB	2-18GHz	±1.0dB	0.7dB	12dB	1.50:1	50W
TDC20180A30	30±1dB	2-18GHz	±1.0dB	0.7dB	10dB	1.50:1	50W
TDC0520A6	6±0.7dB	0.5-2GHz	±0.7dB	0.5dB	20dB	1.20:1	50W
TDC0520A10	10±0.7dB	0.5-2GHz	±0.7dB	0.5dB	20dB	1.20:1	50W
TDC0520A20	20±1dB	0.5-2GHz	±1dB	0.35dB	20dB	1.20:1	50W
TDC0520A30	30±1dB	0.5-2GHz	±1dB	0.3dB	20dB	1.20:1	50W
TDC0825A6	6±0.7dB	0.8-2.5GHz	±0.7dB	0.5dB	20dB	1.20:1	50W
TDC0825A10	10±1dB	0.8-2.5GHz	±0.7dB	0.5dB	20dB	1.20:1	50W
TDC0825A20	20±1dB	0.8-2.5GHz	±1dB	0.3dB	20dB	1.20:1	50W
TDC0825A30	30±1dB	0.8-2.5GHz	±1dB	0.3dB	20dB	1.20:1	50W
TDC0727A10	10±1dB	0.7-2.7GHz	±1dB	0.5dB	20dB	1.20:1	50W
TDC0727A20	20±1dB	0.7-2.7GHz	±1dB	0.4dB	20dB	1.20:1	50W
TDC0727A30	30±1dB	0.7-2.7GHz	±1dB	0.3dB	20dB	1.20:1	50W
TDC40180A10	10±1dB	4-18GHz	±1.0dB	0.6dB	12dB	1.50:1	50W
TDC40180A20	20±1dB	4-18GHz	±1.0dB	0.6dB	12dB	1.50:1	50W
TDC1040A6	6±0.7dB	1-4GHz	±0.7dB	0.5dB	20dB	1.20:1	50W
TDC1040A10	10±1dB	1-4GHz	±0.7dB	0.5dB	20dB	1.20:1	50W

broadband Hybrid Coupler

	Model	Nominal Split	Freq.Range	Insertion Loss	Amplitude Balance	Phase Balance	Isolation	VSWR	Power Handling
90 DEGREE	THC20180A	3.1dB	2-18GHz	1.8dB	±0.7dB	±8°	15dB	1.50:1	50W
	THC10124A	3.1dB	1-12.4GHz	1.6dB	±0.7dB	±8°	16dB	1.40:1	50W
	THC0560A	3.1dB	0.5-6GHz	1.3dB	±0.7dB	±8°	16dB	1.40:1	50W
	THC1040A	3.1dB	1-4GHz	0.5dB	±0.50dB	±5°	20dB	1.25:1	50W
	THC2080A	3.1dB	2-8GHz	0.8dB	±0.60dB	±5°	18dB	1.30:1	50W
	THC0825A	3.1dB	0.8-2.5GHz	0.5dB	±0.30dB	±3°	22dB	1.20:1	50W
	THC0409A	3.1dB	0.45-0.9GHz	0.3dB	±0.50dB	±3°	22dB	1.20:1	50W
	THC0715A	3.1dB	0.75-1.5GHz	0.3dB	±0.50dB	±3°	22dB	1.20:1	50W
	THC0510A	3.1dB	0.5-1GHz	0.3dB	±0.50dB	±3°	22dB	1.20:1	50W
	THC0520A	3.1dB	0.5-2GHz	0.5dB	±0.30dB	±3°	12dB	1.20:1	50W
	THC1020A	3.1dB	1-2GHz	0.3dB	±0.50dB	±3°	22dB	1.20:1	50W
	THC2040A	3.1dB	2-4GHz	0.4dB	±0.50dB	±3°	20dB	1.25:1	50W
	THC4080A	3.1dB	4-8GHz	0.5dB	±0.50dB	±3°	18dB	1.30:1	50W
	THC1214A	3.1dB	1.2-1.4GHz	0.25dB	±0.30dB	±3°	24dB	1.20:1	50W
	THC2224A	3.1dB	2.2-2.4GHz	0.25dB	±0.30dB	±3°	24dB	1.20:1	50W

180 DEGREE	THC20180B	3.1dB	2-18GHz	2.7dB	±1.30dB	±14°	14dB	1.80:1	50W
	THC0409B	3.1dB	0.45-0.9GHz	0.3dB	±0.50dB	±3°	22dB	1.20:1	50W
	THC0715B	3.1dB	0.75-1.5GHz	0.3dB	±0.50dB	±3°	22dB	1.20:1	50W
	THC0510B	3.1dB	0.5-1GHz	0.3dB	±0.50dB	±3°	22dB	1.20:1	50W
	THC1020B	3.1dB	1-2GHz	0.3dB	±0.50dB	±3°	22dB	1.20:1	50W
	THC2040B	3.1dB	2-4GHz	0.4dB	±0.50dB	±3°	20dB	1.25:1	50W
	THC4080B	3.1dB	4-8GHz	0.5dB	±0.50dB	±3°	18dB	1.30:1	50W
	THC1214B	3.1dB	1.2-1.4GHz	0.30dB	±0.30dB	±3°	24dB	1.20:1	50W
	THC2224B	3.1dB	2.2-2.4GHz	0.30dB	±0.30dB	±3°	24dB	1.25:1	50W

Technical Note_ Power Divider

Power dividers and combiners are widely used to divide or combine signals in a variety of commercial and military systems. A splitter can be used as either a power combiner or a power divider, it is a reciprocal device. In the conventional circuit design, the circuits for an even number of two or more output signals have been proposed. In 1960, Ernest J. Wilkinson provided a topology of power dividers with the equivalent amplitude and in-phase outputs. The circuit has been widely used in microwave circuit designs. Wilkinson relied on quarter-wave transformers to match the split ports to the common port.

Targeting broadband electronic-warfare(EW) systems and complex switch-matrix applications, for example,TAP Microwave offers single package, two- and four-way broadband in-phase power dividers/combiners, designed to cover 100MHz - 20GHz, the TPD-A series of dividers/combiners boast average power-handling capability of 30 W.

An equal-amplitude, two-way split, single-stage Wilkinson is shown the figure below. The arms are quarter-wave transformers of impedance 1.414xZ_0 .Here we show a three-port circuit (the most common in practice by far, but Wilkinson described an N-way divider).

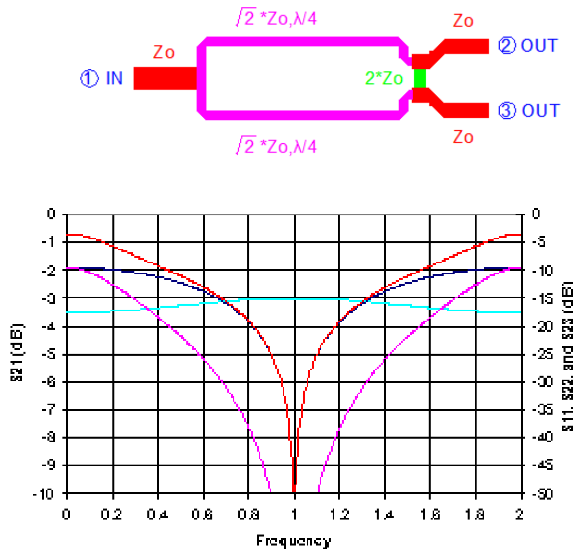


Fig. 1

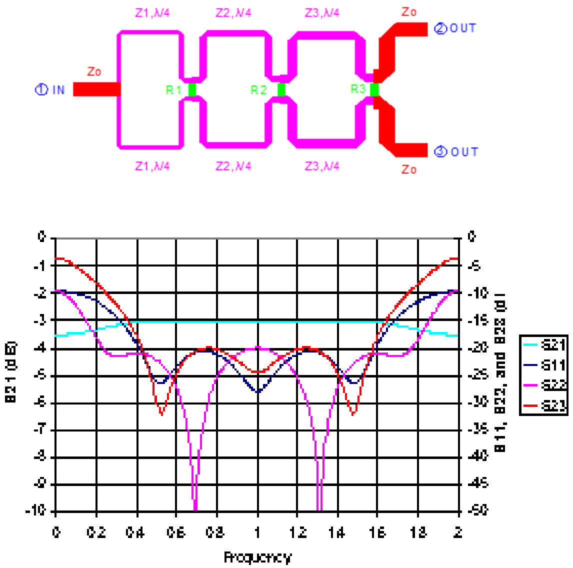


Fig. 2

Technical Note_ Power Divider

When choosing a power dividers, here are some key parameters you need to consider.

Frequency Range: The power divider must meet specifications listed..

Insertion Loss: Insertion loss refers to the additional loss above the nominal loss due to splitting. For example, in a 3 dB power divider the insertion loss might be specified as 0.5 dB. This implies that for a 0 dBm input signal, the two output signals will be approximately-3.5 dB each. The additional losses are caused primarily by reflections, dielectric absorption, radiation effects, and conductor losses. Broadband designs tend to have higher insertion losses because they are physically longer devices and in higher frequency.

Isolation: The difference in dB that the signal level measured at one output port is below the signal level into the adjacent output port, with the input port terminated in 50 ohms. Isolation is measured between adjacent ports since this is the most severe condition.

Amplitude Balance: Amplitude balance is a measure of how evenly the power is split between the two arms of the device,

Phase Balance: Is a measure of the differential phase shift between the two output arms. Like Amplitude Balance, Phase Balance primarily applies to equal output power components like Wilkinson power dividers. Most components provide a phase balance of a few degrees, and this balance tends to get worse at higher frequencies.

VSWR:Voltage Standing Wave Ratio(VSWR)is the ratio of maximum and minimum voltage at a given point along a transmission line.VSWR is a good measure of power transfer efficiency.A low VSWR(i.e.closer to unity with little or no reflections)means more power is delivered from the source to the load,while a high VSWR(i.e.much greater than 1 with lots of reflection within unit)has less power delivered to the load.

Power :Both average and peak power that may be applied to the common or input port with the output ports terminated in a load with the VSWR listed.

No.of output ports	2	3	4	5	6	8	10	12	16
Insertion Loss(dB)	3.01	4.77	6.02	7.00	7.78	9.03	10	10.8	12.04

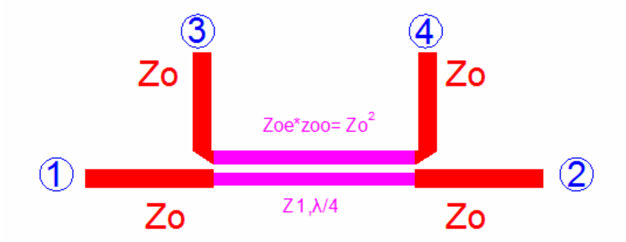
Table 1 Number of power divider outputs vs.corresponding insertion loss

Technical Note_ Directional Coupler

Directional coupler is a passive device which is extensively used in electronic warfare, electronic countermeasures, and instrumentation. In many applications, it is desired that this device is accomplished in planar technology and operates over a large frequency band.

Directional couplers are four-port circuits where one port is isolated from the input port and can be realized in microstrip, stripline, coax and waveguide. the coupling feature is generally a quarter (or multiple) quarter-wavelengths. The coupled port on a microstrip or stripline directional coupler is closest to the input port because it is a backward wave coupler.

Looking at the generic directional coupler schematic below, if port 1 is the input port, port 2 is the transmitted port (because it is connected with a straight line). port 3 is the coupled port, and the port 4 is the isolated port.



Item definition as applied to TAP Microwave directional coupler

Frequency Range: The frequency bandwidth in GHz over which a particular model will perform while meeting all its specification limits. Current standard frequency bandwidths are listed on TAP data sheets. Currently available TAP directional coupler designs operate over the frequency area beginning at 0.1GHz up to 20GHz.

Insertion Loss: TAP directional coupler Insertion loss includes coupled power. In a coupler with no dissipation, the thru or main line loss(port 1 to port2) caused by the power coupled to port3(coupled port) is :

$$\text{Insertion Loss (dB)}=10 \text{ Log } 1-\left(\frac{P3}{P1}\right)$$

Coupling: Denotes how much of the input power is sampled to the coupled port. For example, if the nominal coupling value on a specification model is 10dB and the tolerance is +/- 0.5dB,the absolute coupling value could vary from unit to unit from 9.5dB to 10.5dB. Coupling in TAP directional couplers is defined as:

$$\text{Coupling} = -10 \text{ Log Power at } \left(\frac{\text{Port 3}}{\text{Port 2}}\right)$$

Technical Note_ Directional Coupler

Frequency Sensitivity(or "flatness"): A coupler is a measure of how coupling varies over a given frequency range. the user should calculate absolute minimum and maximum coupling values to be expected using the following formula:

$$\text{Total coupling window} = \text{Frequency Sensitivity tolerance} + \text{Coupling Tolerance}$$

Directivity : There are no ideal terminations in TAP directional couplers so that a small amount of power will be present at the isolated port. It is defined as:

$$\text{Directivity (dB)} = -10\text{Log}\left(\frac{P4}{P3}\right)$$

Isolation: Also measures the small amount of power present at port 4(isolated port). a10dB directional coupler with 20db directivity would have an isolation of 30dB.

$$\text{Isolation (dB)} = -20\text{Log}\left(\frac{P4}{P2}\right)$$

$$\text{Isolation(dB)} = \text{coupling(dB)} + \text{directivity(dB)}$$

VSWR: (Voltage Standing Wave Ratio)or Return Loss: VSWR or Return Loss is caused by mismatches and discontinuities within the circuits of TAP directional couplers.A mismatch on either port 1 (Input port) or port 4 (Terminated port) will reduce directivity by an amount equal to return loss (in dB) of the mismatch.This permits measurement of Return Loss.

$$\text{Return Loss (dB)} = -10\text{Log}\left(\frac{\text{VSWR}-1}{\text{VSWR}+1}\right)$$

The TDC05180A20 0.5-18GHz 20dB directional coupler below is made in stripline, which means it is a backward wave coupler. The input port is on the left, and the port facing up is the coupled port, the opposite port is terminated with that cylinder -shaped .

Bi-directional coupler

A directional coupler where the isolated port is not internally terminated. You can use such a coupler to form a reflectometer, but it is not recommended.

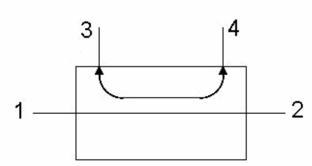


Fig. 1 Bi-directional coupler

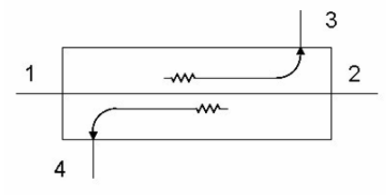


Fig. 2 Dual-directional coupler

Dual-directional coupler

Here we have two couplers in series, in opposing directions, with the isolated ports internally terminated. This component is the basis for the reflectometer.

Coupling Factor	3	5	6	7	10	15	20	30
Single Directional Coupler	3.01	1.65	1.26	0.97	0.46	0.14	0.04	0.004
Dual Directional Coupler	6.02	3.30	2.51	1.94	0.91	0.28	0.09	0.009

Table 1 Theoretical Mainline Insertion Loss Due to Coupling Factor (dB)

Technical Note_ Hybrid Coupler

A hybrid coupler is a special case, where a 3 dB split is desired between the through path and the coupled path. There are two types of hybrid couplers, the characterizing feature is the phase difference of the outputs. If 90 degrees, it is a 90 degree hybrid. If 180 degrees, it is a 180 degree hybrid.

A stripline offset coupled lines are used to design a 3dB hybrid coupler. Fig.1 shows the general structure of those kind of hybrid couplers. The dielectric constant is 2.2, dielectric name is Rogers RT5880. The mutual inductance coupling has a minus sign associated with it, the voltage coupling does not. The combined effect not only reverses the signal flow in the coupled line (backward coupling) but it puts the two signals 90 degrees out of phase.

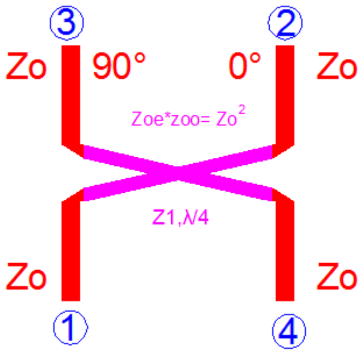


Fig. 1

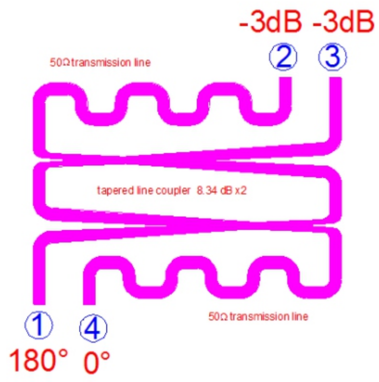


Fig. 2

90 degree hybrids are used in circuits requiring a balanced division of power into two transmission lines with 90 degree separation of phase. Applications include signal splitters, combiners, balanced mixers, image-rejection mixers, phase shifters, diplexers, switches and antenna feed networks.

The increasing use of broadband microwave systems has created a need for broadband 90 degree hybrids with tight output amplitude and phase tracking. All models use a three layer stripline construction. Coupled lines are etched on opposite sides of a thin coupler board sandwiched between two equal thickness dielectric boards. The tight 3 dB coupling is realized by using a non-uniform tapered line design synthesized with a CAD program developed at THC series. Typical structure is shown in fig.2 for model THC20180B which frequency range covers 2-18GHz. The identical 8.34 dB couplers are realized using a non-uniform tapered line design. These curves are of the 180 degree out port with respect to the zero degree out port.The data were taken with an automatic network analyzer.

Amplitude Balance

This terminology defines the power difference in dB between the two output ports of a 3 dB hybrids The amplitude balance is typically less than +/-0.5 dB for TAP hybrid coupler .

Phase Balance

The phase difference between the two output ports of a hybrid coupler should be 0, 90, or 180 degrees depending on the type used. However, like amplitude balance, the phase difference is sensitive to the input frequency and typically will vary a few degrees. The phase properties of a 90 degree hybrid coupler can be used to great advantage in microwave circuits. For example in a balanced microwave amplifier the two input stages are fed through a hybrid coupler. The FET device normally has a very poor match and reflects much of the incident energy. However, since the devices are essentially identical the reflection coefficients from each device are equal. The reflected voltage from the FETs are in phase at the isolated port and are 180 degree different at the input port. Therefore, all of the reflected power from the FETs goes to the load at the isolated port and no power goes to the input port. This results in a good input match (low VSWR). If phase matched lines are used for an antenna input to a 180 degree hybrid coupler as shown in Fig.3, a null will occur directly between the antennas. If you want to receive a signal in that position, you would have to either change the hybrid type or line length. If you want to reject a signal from a given direction, or create the difference pattern for a monopulse radar, this is a good approach.

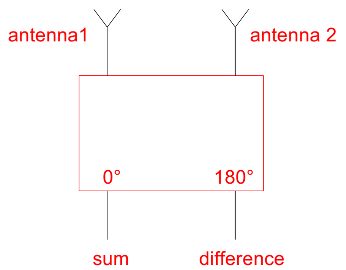


Fig. 3 Balanced Antenna Input

Technical Note_ Filter

In modern communication systems, filtering circuits mostly existing at the front end of a transceiver play import roles since they may significantly affect the system performance. In particular, in microwave and millimeter-wave system, front-end filters require characteristics of low insertion losses, high signal selectivity, steep band edge roll-off, high stopband rejection, and sometimes the size efficiency. Microstrips that have been widely used in building various kinds of filters exhibit insertion losses proportional to the operation frequency. The partial, yet strong, confinement electromagnetic fields in the dielectric also lead a microstrip to have high frequency dispersion and excessive losses.

Commonly used terminology for microwave filters

Filters are typically two port networks. They rely on impedance mismatching to reject RF energy. Where does all the energy go? That's up to you as a designer to figure out, and a big reason why filters are typically located between attenuators or isolators.

Lowpass filter (LPF)

This is a filter that passes lower frequencies down to DC, and rejects higher frequencies. A series inductor or shunt capacitor or combination of the two is a simple low-pass filter.

High-pass filter (HPF)

The opposite of a low pass filter, an HPF passes higher frequencies and rejects lower ones. A series capacitor or shunt inductor or combination of the two is a simple high-pass filter.

Band-pass filter (BPF)

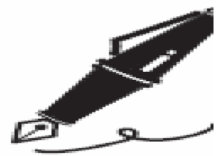
A band-pass filter has filter skirts both above and below the band. It can be formed by cascading a LPF and HPF, or using resonant structures such as a quarter-wave coupled lines.

multiplexer

A multiplexer is a network that separates signals from a common port to other ports, sorted according to their frequency.

A diplexer is a pair of filters arranged in a three port network, such that a signal at port one will be delivered to port 2 if it is a certain frequency band, and delivered to port 3 if it is in another frequency band. Not to be confused with a *"duplexer"*, which is another word for a circulator.

Triplexers are four port filters, where one input is split into three different frequency bands which each have a dedicated output port. Somewhere out there there are even higher orders of multiplexers, just like the TDU1003 quadraplexer.



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