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2-Way, 0.7-2.7 GHz, 40 Watts

N and SMA-Jack Connectors

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T-STYLE POWER DIVIDER/COMBINER

0.7-2.7 GHz, 40 Watts, 2-Way & 3-Way, N & SMA-Jack Connectors

2-Way, N-Jack Connectors

2-Way, SMA-Jack Connectors

3-Way, N-Jack Connectors

3-Way, SMA-Jack Connectors

Application Note

STOCK T-Style Power Divider, Power Combiners are available in two configurations, 2-Way and 3-Way, each offered with N-Jack and SMA-Jack connectors. All four models are optimized for broadband operation covering the frequency range from 0.7– 2.7 GHz with outstanding electrical performance. These Wilkinson-type, T-Style, power divider, power combiners are reciprocal units that can be used to divide or combine signals with equal facility.

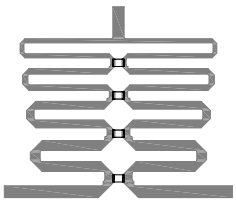
In 2-way power divider applications, the input signal is equally split into two output signals, each down 3 dB from the incident due to the 2 x 1/2 power division. No power is actually lost from this power split; it is just allocated into two amplitude and phase matched signals, thus a so-called 3 dB insertion loss. True insertion loss of less than 0.4 dB max @ 2.7 GHz will be found at the output ports resulting from dissipation of small amounts of RF & microwave energy within the connectors and microstrip circuit.

Model Number	Configuration	Connectors
PD3020	2-Way	N-Jack
PD3120	2-Way	SMA-Jack
PD3030	3-Way	N-Jack
PD3130	3-Way	SMA-Jack

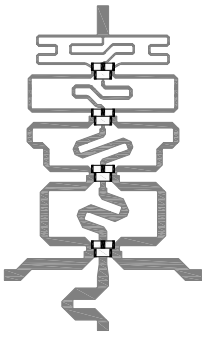
In 3-way power divider applications, the input signal is equally split into three output signals, each down 4.77 dB from the incident due to the 3 x 1/3rd power division. No power is actually lost from this power split; it is just allocated into three amplitude and phase matched signals, thus a so-called 4.77 dB insertion loss. True insertion loss of less than 0.7 dB max @ 2.7 GHz will be found at the output ports resulting from dissipation of small amounts of RF & microwave energy within the connectors and microstrip circuit.

In both configurations, all output signals are isolated from one another by 22 dB minimum through the use of resistors that dissipate any power reflected back to the circuit caused by unequal or unbalanced output loads. The 40 watt maximum power rating of these power dividers is applicable when connected to matched output load VSWR's of 1.2:1 or better. This maximum power rating must be reduced when load VSWR's increase or are unbalanced or out-of-phase with respect to one another. See **Power Divider Input Rating Tables** for additional guidelines.

The situation with power combining is a bit more complex. While it is possible to sum two or three input signals, respectively, with no loss, this can only be accomplished if the input signals are coherent and identical in phase and amplitude. Such a case would be the 2 or 3-way splitting of a signal which is then recombined after amplification, provided the amplified signals are phase-locked together. But outside this case, or cases of pure sine signals, or CW signals without any transmitted info, the combining of two non-coherent signals will result in a minimum 3 dB loss (1/2 power ratio) plus the true insertion loss of the power combiner (0.4 dB max @ 2.7 GHz). The combining of three non-coherent signals will result in a minimum 4.77 dB loss (1/3rd power ratio) plus the true insertion loss of the power combiner (0.7 dB max @ 2.7 GHz). Worst-case combining loss occurs with coherent signals 180° out-of-phase, where all input power is dissipated. Because the combining loss is dissipated through the isolation resistors, it is the power handling capability of these resistors that ultimately determines the combiner power rating. See **Power Combiner Input Rating Tables** for more information.



2-Way, T-Style, Power Divider Circuit



3-Way, T-Style, Power Divider Circuit

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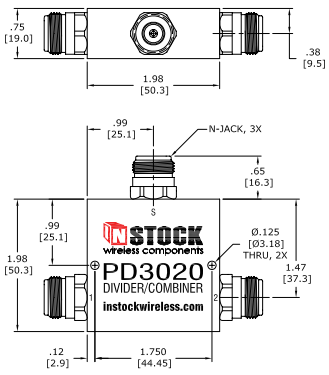
T-STYLE POWER DIVIDER/COMBINER

0.7-2.7 GHz, 40 Watts, 2-Way & 3-Way, N & SMA-Jack Connectors

2-Way/N-Jack

broadband T-Style housing

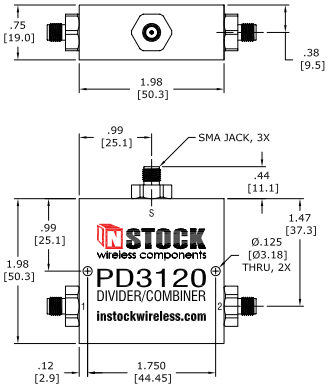
PD**3020** is a broadband 2-way power divider, power combiner furnished with N-Jack connectors in a T-Style housing. All wireless-band frequencies from 0.7-2.7 GHz are covered with optimum performance. Input power levels up to 40 watts can be handled in both power divider and power combiner applications. See power divider input rating tables for specific details …



2-Way/SMA-Jack

T-Style convenient cable access

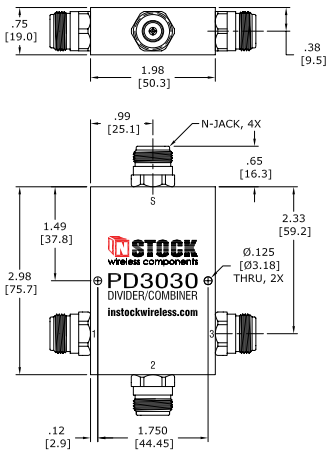
PD**3120**'s T-Style housing allows convenient cable access to all connector ports. Mechanical features include precision CNC-machined, brass, SMA-Jack connectors with tri-alloy plating to insure tarnish resistance. Connector pins are gold-plated beryllium copper for reliability and low contact resistance. Virgin electrical grade PTFE support insulators captivate the contact pins …



3-Way/N-Jack

true 3-way power split & balance

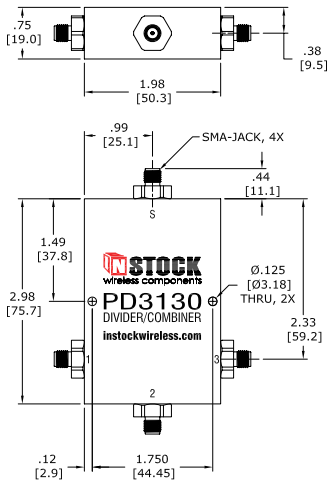
PD**3030** is a true 3-way power divider, power combiner furnished with N-Jack connectors in a T-Style housing. Elecrical performance is highlighted by 0.7 dB max insertion loss, 22 dB min isolation, 1.35:1 max input VSWR and 1.15:1 max output VSWR. Equal power split and balance is displayed by 0.3 dB amplitude balance and 4° phase balance. Narrow band performance is even better …



3-Way/SMA-Jack

precision microstrip circuit

PD**3130** is a true 3-way power divider, power combiner with equal power split and balance. Furnished with SMA-Jack connectors in a T-Style housing, PD3130 covers all wireless band frequencies from 0.7-2.7 GHz with optimum performance. The heart of the unit is a precision designed and etched microstrip circuit on a low-loss, high-frequency, dielectric substrate …



Model No.	Connectors	Frequency Range	Insertion Loss (above power split)	Amplitude Balance	Phase Balance	Isolation	Input VSWR	Output VSWR
PD3020	2-Way/N-Jack	0.7-2.7 GHz	0.4 dB max	0.2 dB max	2° max	22 dB min	1.25:1 max	1.15:1 max
PD3120	2-Way/SMA-Jack	0.7-2.7 GHz	0.4 dB max	0.2 dB max	2° max	22 dB min	1.20:1 max	1.15:1 max
PD3030	3-Way/N-Jack	0.7-2.7 GHz	0.7 dB max	0.3 dB max	4° max	22 dB min	1.35:1 max	1.15:1 max
PD3130	3-Way/SMA-Jack	0.7-2.7 GHz	0.7 dB max	0.3 dB max	4° max	22 dB min	1.30:1 max	1.15:1 max

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PD3020 - Power Divider/Combiner

T-Style, 2-Way, N-Jack, 0.7-2.7 GHz, 40 Watts

Features & Benefits

T-housing allows convenient cable access

Overview

PD3020 is a broadband, 2-way, power divider, power combiner furnished with N-Jack connectors in a T-Style housing. All wireless-band frequencies from 0.7 - 2.7 GHz are covered with optimal performance. Input power levels up to 40 watts can be handled in both power divider and power combiner applications. See **input power rating tables** for specific details.

Electrical

The heart of the unit is a precision designed and etched microstrip circuit on a low-loss, high frequency, dielectric substrate. Electrical performance is highlighted by 0.4 dB max insertion loss (above the 3.01 dB power split), 22 dB min isolation, 1.25:1 max input VSWR and 1.15:1 max output VSWR. Equal power split and balance is displayed by 0.2 dB max amplitude balance and 2 degrees max phase balance. Narrow band performance over your frequency range may be even better. See **power divider test sweeps** for specific details.

Mechanical

The PD3020's T-Style housing allows convenient cable access to all connector ports. Mechanical features include precision CNC machined, brass, N-Jack connectors with tri-alloy plating to insure tarnish resistance and low-PIM operation. Connector pins are gold plated phosphor bronze for reliability and low contact resistance. Virgin electrical grade PTFE insulators support the contact pins enabling high withstand voltage. Long-term operation and superior shielding is maintained by the rugged CNC-machined aluminum housing with yellow iridite finish. Secure mounting is provided by two 0.125 in. diameter (3.18 mm) through holes.

Physical

Housing dimensions are 1.98 in. wide by 1.98 in. deep by 0.75 in. high (50.3 x 50.3 x 19.1 mm). The N-Jack connectors extend 0.65 in. (16.5 mm) from the housing. Weight is 151 grams. Operating temperature range is from -65°C to +85°C. See **power divider outline drawing** for more information.

Warranty

Each unit is 100% electrically tested to insure complete compliance with all specifications. The PD3020 power divider, power combiner is covered by a **two-year warranty**.

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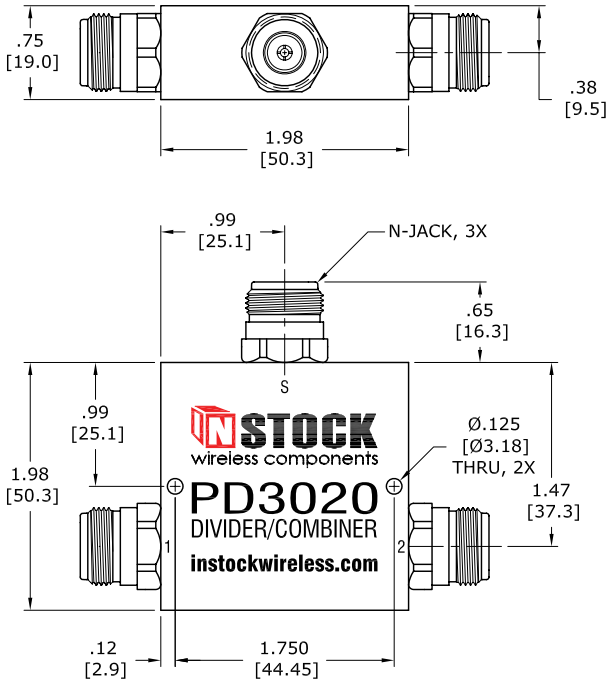
PD3020 - Power Divider/Combiner

2-Way, N-Jack, T-Style, 0.7-2.7 GHz, 40 Watts

T-housing allows convenient cable access

- Broadband Frequency (0.7 - 2.7 GHz)
- Low Insertion Loss (0.2 dB avg)
- High Isolation (30 dB avg)
- Excellent VSWR (1.10 : 1 avg)
- Tri-Alloy Plated Connectors for Low PIM

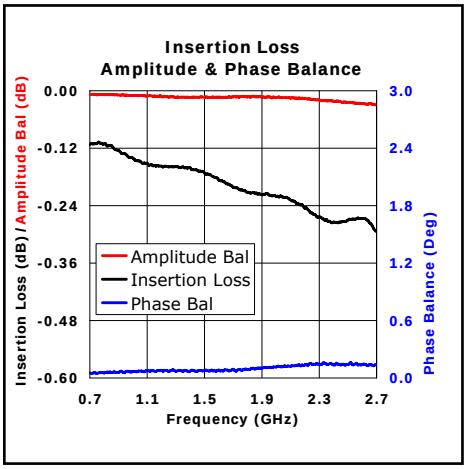


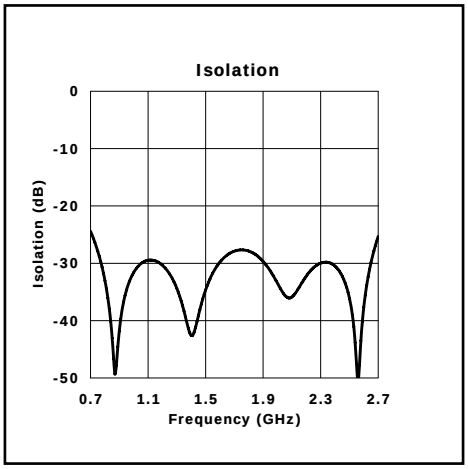
Power Divider Input Ratings		
Into Matched Load VSWR's	**In-Phase**	**180° Out-of-Phase**
1.2 : 1	40 Watts	40 Watts
2.0 : 1	40 Watts	10 Watts
∞	20 Watts	1 Watt
Power Combiner Input Ratings		
Input Signals	**In-Phase**	**180° Out-of-Phase**
Coherent	2 X 20 Watts	2 X 0.5 Watts
Non-Coherent	2 X 1 Watt	

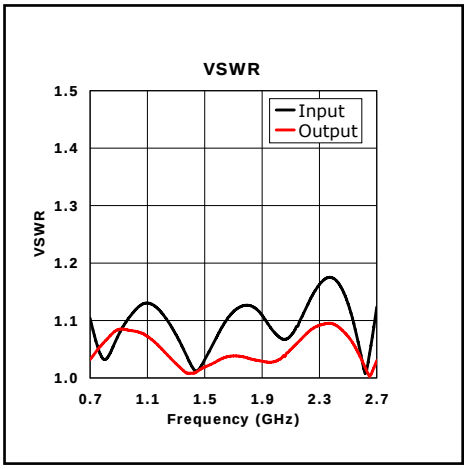
Mechanical Specifications

Connectors ..... N-Jack, 3X
Body ..... Brass, Tri-Alloy Plate
Connector Pin ..... Phosphor Bronze, Gold Plate
Insulator ..... PTFE, Virgin Electrical Grade
Housing ..... Aluminum, Yellow Iridite
Operating Temp ..... -65°C to +85°C
Weight ..... 151 Grams

Frequency Range	Insertion Loss (above 3.01 dB)	Amplitude Balance	Phase Balance	Isolation	Input VSWR	Output VSWR
0.7 - 2.7 GHz	0.4 dB max	0.2 dB max	2° max	22 dB min	1.25 : 1 max	1.15 : 1 max







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PD3120 - Power Divider/Combiner

T-Style, 2-Way, SMA-Jack, 0.7-2.7 GHz, 40 Watts

Features & Benefits

T-housing allows convenient cable access

Overview

PD3120 is a broadband, 2-way, power divider, power combiner furnished with SMA-Jack connectors in a T-Style housing. All wireless-band frequencies from 0.7 - 2.7 GHz are covered with optimal performance. Input power levels up to 40 watts can be handled in both power divider and power combiner applications. See **input power rating tables** for specific details.

Electrical

The heart of the unit is a precision designed and etched microstrip circuit on a low-loss, high frequency, dielectric substrate. Electrical performance is highlighted by 0.4 dB max insertion loss (above the 3.01 dB power split), 22 dB min isolation, 1.20:1 max input VSWR and 1.15:1 max output VSWR. Equal power split and balance is displayed by 0.2 dB max amplitude balance and 2 degrees max phase balance. Narrow band performance over your frequency range may be even better. See **power divider test sweeps** for specific details.

Mechanical

The PD3120's T-Style housing allows convenient cable access to all connector ports. Mechanical features include precision CNC machined, brass, SMA-Jack connectors with tri-alloy plating to insure tarnish resistance and low-PIM operation. Connector pins are gold plated beryllium copper for reliability and low contact resistance. Virgin electrical grade PTFE insulators support the contact pins enabling high withstand voltage. Long-term operation and superior shielding is maintained by the rugged CNC-machined aluminum housing with yellow iridite finish. Secure mounting is provided by two 0.125 in. diameter (3.18 mm) through holes.

Physical

Housing dimensions are 1.98 in. wide by 1.98 in. deep by 0.75 in. high (50.3 x 50.3 x 19.1 mm). The SMA-Jack connectors extend 0.65 in. (16.5 mm) from the housing. Weight is 111 grams. Operating temperature range is from -65°C to +85°C. See **power divider outline drawing** for more information.

Warranty

Each unit is 100% electrically tested to insure complete compliance with all specifications. The PD3120 power divider, power combiner is covered by a **two-year warranty**.

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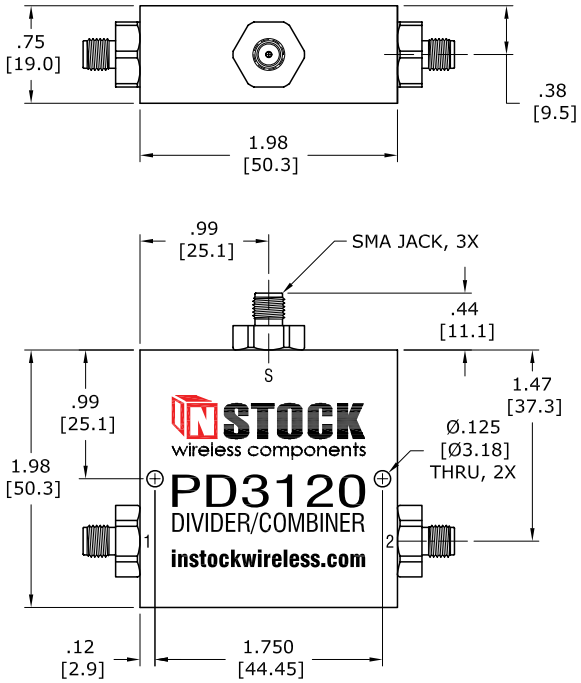
PD3120 - Power Divider/Combiner

2-Way, SMA-Jack, T-Style, 0.7-2.7 GHz, 40 Watts

T-housing allows convenient cable access

- Broadband Frequency (0.7 - 2.7 GHz)
- Low Insertion Loss (0.2 dB avg)
- High Isolation (30 dB avg)
- Excellent VSWR (1.10 : 1 avg)
- Tri-Alloy Plated Connectors for Low PIM

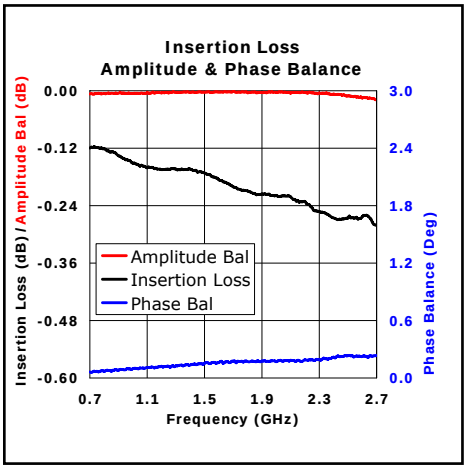


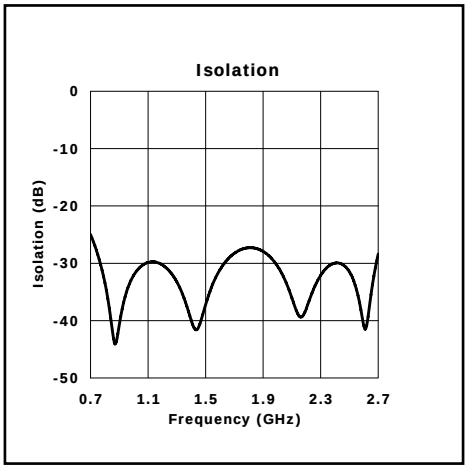
Power Divider Input Ratings		
Into Matched Load VSWR's	**In-Phase**	**180° Out-of-Phase**
1.2 : 1	40 Watts	40 Watts
2.0 : 1	40 Watts	10 Watts
∞	20 Watts	1 Watt
Power Combiner Input Ratings		
Input Signals	**In-Phase**	**180° Out-of-Phase**
Coherent	2 X 20 Watts	2 X 0.5 Watts
Non-Coherent	2 X 1 Watt	

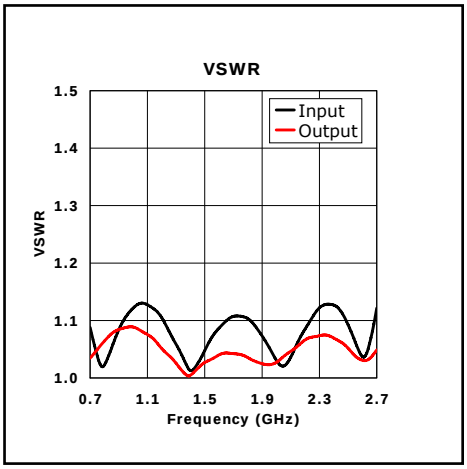
Mechanical Specifications

Connectors ..... SMA-Jack, 3X
Body ..... Brass, Tri-Alloy Plate
Connector Pin ..... Berylllium Copper, Gold Plate
Insulator ..... PTFE, Virgin Electrical Grade
Housing ..... Aluminum, Yellow Iridite
Operating Temp ..... -65°C to +85°C
Weight ..... 111 Grams

Frequency Range	Insertion Loss (above 3.01 dB)	Amplitude Balance	Phase Balance	Isolation	Input VSWR	Output VSWR
0.7 - 2.7 GHz	0.4 dB max	0.2 dB max	2° max	22 dB min	1.20 : 1 max	1.15 : 1 max







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PD3030 - Power Divider/Combiner

T-Style, 3-Way, N-Jack, 0.7-2.7 GHz, 40 Watts

Features & Benefits

T-housing allows convenient cable access

Overview

PD3030 is a broadband, 3-way, power divider, power combiner furnished with N-Jack connectors in a T-Style housing. All wireless-band frequencies from 0.7 - 2.7 GHz are covered with optimal performance. Input power levels up to 40 watts can be handled in both power divider and power combiner applications. See **input power rating tables** for specific details.

Electrical

The heart of the unit is a precision designed and etched microstrip circuit on a low-loss, high frequency, dielectric substrate. A true 3-way power divider, power combiner with equal power split and balance, the PD3030's electrical performance is highlighted by 0.7 dB max insertion loss (above the 4.77 dB power split), 22 dB min isolation, 1.35:1 max input VSWR and 1.15:1 max output VSWR. Equal power split and balance is displayed by 0.3 dB max amplitude balance and 4 degrees max phase balance. Narrow band performance over your frequency range may be even better. See **power divider test sweeps** for specific details.

Mechanical

The PD3030's T-Style housing allows convenient cable access to all connector ports. Mechanical features include precision CNC machined, brass, N-Jack connectors with tri-alloy plating to insure tarnish resistance and low-PIM operation. Connector pins are gold plated phosphor bronze for reliability and low contact resistance. Virgin electrical grade PTFE insulators support the contact pins enabling high withstand voltage. Long-term operation and superior shielding is maintained by the rugged CNC-machined aluminum housing with yellow iridite finish. Secure mounting is provided by two 0.125 in. diameter (3.18 mm) through holes.

Physical

Housing dimensions are 1.98 in. wide by 2.98 in. deep by 0.75 in. high (50.3 x 75.7 x 19.1 mm). The N-Jack connectors extend 0.65 in. (16.5 mm) from the housing. Weight is 217 grams. Operating temperature range is from -65°C to +85°C. See **power divider outline drawing** for more information.

Warranty

Each unit is 100% electrically tested to insure complete compliance with all specifications. The PD3030 power divider, power combiner is covered by a **two-year warranty**.

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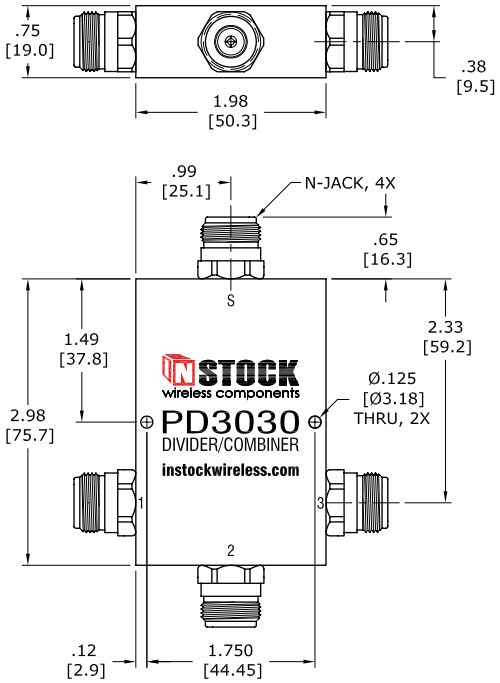
PD3030 - Power Divider/Combiner

3-Way, N-Jack, T-Style, 0.7-2.7 GHz, 40 Watts

T-Housing allows convenient cable access

- True 3-Way Equal Power Split and Balance
- Broadband Frequency (0.7 - 2.7 GHz)
- High Isolation (30 dB avg)
- Excellent VSWR (1.10 : 1 avg)
- Tri-Alloy Plated Connectors for Low PIM

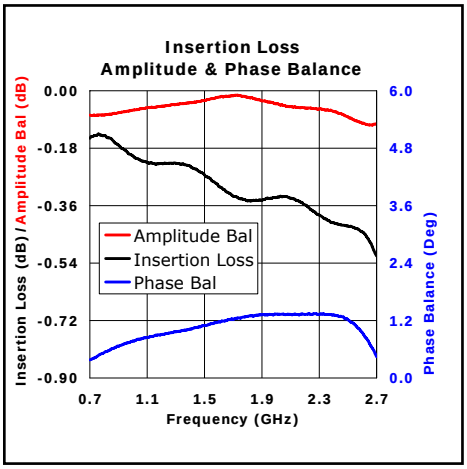


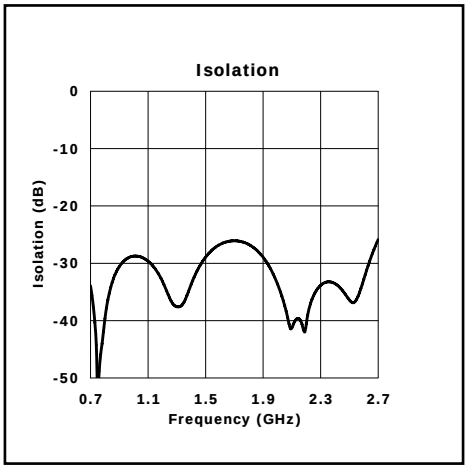
Power Divider Input Ratings		
Into Matched Load VSWR's	**In-Phase**	**180° Out-of-Phase**
1.2 : 1	40 Watts	40 Watts
2.0 : 1	40 Watts	10 Watts
∞	20 Watts	1 Watt
Power Combiner Input Ratings		
Input Signals	**In-Phase**	**180° Out-of-Phase**
Coherent	3 X 13.3 Watts	3 X 0.33 Watts
Non-Coherent	3 X 0.66 Watts	

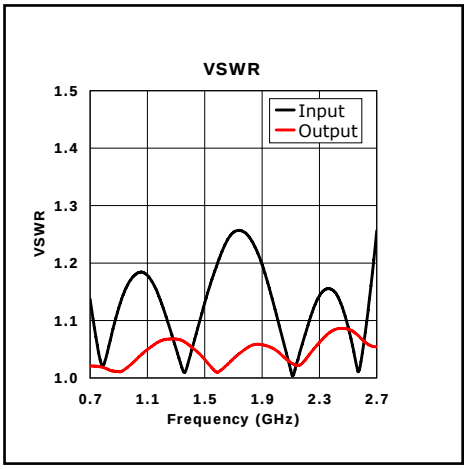
Mechanical Specifications

Connectors ..... N-Jack, 4X
Body ..... Brass, Tri-Alloy Plate
Connector Pin ..... Phosphor Bronze, Gold Plate
Insulator ..... PTFE, Virgin Electrical Grade
Housing ..... Aluminum, Yellow Iridite
Operating Temp ..... -65°C to +85°C
Weight ..... 217 Grams

Frequency Range	Insertion Loss (above 4.77 dB)	Amplitude Balance	Phase Balance	Isolation	Input VSWR	Output VSWR
0.7 - 2.7 GHz	0.7 dB max	0.3 dB max	4° max	22 dB min	1.35 : 1 max	1.15 : 1 max







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PD3130 - Power Divider/Combiner

T-Style, 3-Way, SMA-Jack, 0.7-2.7 GHz, 40 Watts

Features & Benefits

T-housing allows convenient cable access

Overview

PD3130 is a broadband, 3-way, power divider, power combiner furnished with SMA-Jack connectors in a T-Style housing. All wireless-band frequencies from 0.7 - 2.7 GHz are covered with optimal performance. Input power levels up to 40 watts can be handled in both power divider and power combiner applications. See **input power rating tables** for specific details.

Electrical

The heart of the unit is a precision designed and etched microstrip circuit on a low-loss, high frequency, dielectric substrate. A true 3-way power divider, power combiner with equal power split and balance, the PD3130's electrical performance is highlighted by 0.7 dB max insertion loss (above the 4.77 dB power split), 22 dB min isolation, 1.30:1 max input VSWR and 1.15:1 max output VSWR. Equal power split and balance is displayed by 0.3 dB max amplitude balance and 4 degrees max phase balance. Narrow band performance over your frequency range may be even better. See **power divider test sweeps** for specific details.

Mechanical

The PD3130's T-Style housing allows convenient cable access to all connector ports. Mechanical features include precision CNC machined, brass, SMA-Jack connectors with tri-alloy plating to insure tarnish resistance and low-PIM operation. Connector pins are gold plated beryllium copper for reliability and low contact resistance. Virgin electrical grade PTFE insulators support the contact pins enabling high withstand voltage. Long-term operation and superior shielding is maintained by the rugged CNC-machined aluminum housing with yellow iridite finish. Secure mounting is provided by two 0.125 in. diameter (3.18 mm) through holes.

Physical

Housing dimensions are 1.98 in. wide by 2.98 in. deep by 0.75 in. high (50.3 x 75.7 x 19.1 mm). The SMA-Jack connectors extend 0.44 in. (11.1 mm) from the housing. Weight is 163 grams. Operating temperature range is from -65°C to +85°C. See **power divider outline drawing** for more information.

Warranty

Each unit is 100% electrically tested to insure complete compliance with all specifications. The PD3130 power divider, power combiner is covered by a **two-year warranty**.

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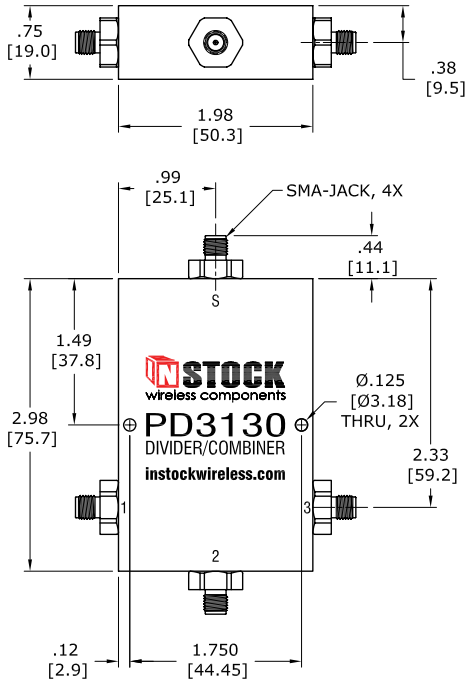
PD3130 - Power Divider/Combiner

3-Way, SMA-Jack, T-Style, 0.7-2.7 GHz, 40 Watts

designed for optimum broadband performance

- True 3-Way Equal Power Split and Balance
- Broadband Frequency (0.7 - 2.7 GHz)
- High Isolation (30 dB avg)
- Excellent VSWR (1.10 : 1 avg)
- Tri-Alloy Plated Connectors for Low PIM

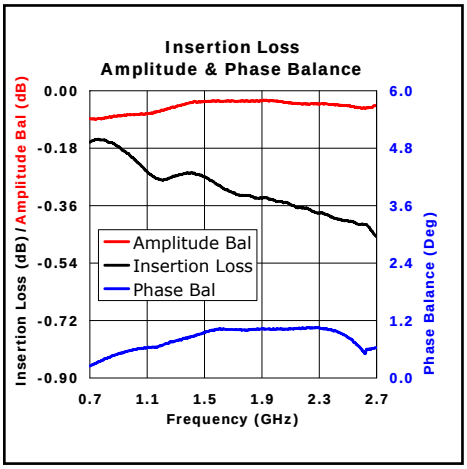


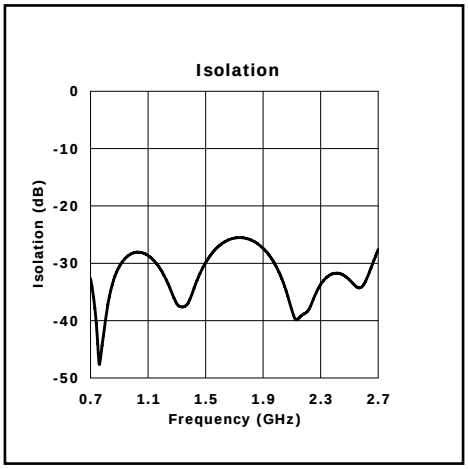
Power Divider Input Ratings		
Into Matched Load VSWR's	**In-Phase**	**180° Out-of-Phase**
1.2 : 1	40 Watts	40 Watts
2.0 : 1	40 Watts	10 Watts
∞	20 Watts	1 Watt
Power Combiner Input Ratings		
Input Signals	**In-Phase**	**180° Out-of-Phase**
Coherent	3 X 13.3 Watts	3 X 0.33 Watts
Non-Coherent	3 X 0.66 Watts	

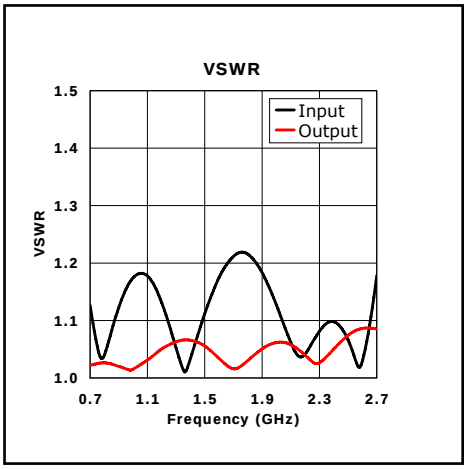
Mechanical Specifications

Connectors ..... SMA-Jack, 4X
Body ..... Brass, Tri-Alloy Plate
Connector Pin ..... Berylllium Copper, Gold Plate
Insulator ..... PTFE, Virgin Electrical Grade
Housing ..... Aluminum, Yellow Iridite
Operating Temp ..... -65°C to +85°C
Weight ..... 163 Grams

Frequency Range	Insertion Loss (above 4.77 dB)	Amplitude Balance	Phase Balance	Isolation	Input VSWR	Output VSWR
0.7 - 2.7 GHz	0.7 dB max	0.3 dB max	4° max	22 dB min	1.30 : 1 max	1.15 : 1 max







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