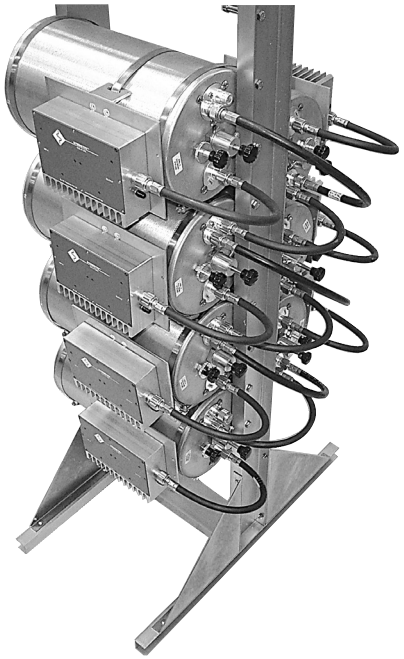
Expandable Series Combiner Multicouplers
400-550 MHz

These expandable series combiner transmitter multicouplers are ideally suited to UHF PMR and trunking applications on congested communications sites. These channels utilise a single cavity and dual isolator and are for use on sites configured with separate transmit and receive antennas.



Mechanical - TP4055 Series Combiner

Features:

- Ideal for Trunking and PMR systems
- Ideal for high-density sites
- Suited for use with broadband antennas
- Predictable Performance
- Long-Term Dependability
- RFI Systems Records support
- Rugged, high quality design
- Pegged Rack and other mounting styles available

¼ Wave or ¾ Wave, 168mm (6”) or 254mm (10”)

Series combiner multicouplers for this po pular UHF band are available using either ¼ or ¾ wavelength cavities in the choice of 168mm (6.625”) or 254mm (10”) diameters. The selectivity of cavity filters is tightly linked to the volume of the filter itself. With such a broad diversity of applications in this UHF band, all of these variants are offered to ensure every system requirement is catered to.

Most series combiner multicoupling designs can be satisfactorily implemented using ¼ wave, 168mm (6.625”) cavities, but close channel spacings or a requirement to keep per-channel insertion losses to a minimum may determine that the ¾ wave or 254mm (10’) models are more suited in a particular application. For assistance in choosing the correct cavity for your requirements please contact your nearest RFI Sales office.

Series Combiner Channel Insertion Loss

The typical channel losses specified in the tables shown are for equally-spaced channels only. Channel loss may be higher or lower in multicouplers where Tx-Tx separation varies from one channel to another. Contact RFI for series combiner channel loss specifications based on your actual frequency plan.

Series Combiner Tx Noise Suppression vs. Cavity Loss

The curves shown below for Tx noise suppression represent the selectivity of typical quarterwave, 168mm (6.625”) and 254mm (10 inch) series combiner cavity filters. Because series combiner cavities exhibit high loaded Q factors, excellent noise suppression and channel-to-channel isolation are achieved with 168mm (6.625”) cavities at a minimum separation of 50KHz. Closer separations are achievable using 254mm (10 inch) cavities. Additional cavities can be cascaded onto any channels in a series combiner system to customise an individual channel’s response if required.

Expandable Series Combiner Multicouplers
400-550 MHz

RFI WIRELESS

Technical Specifications

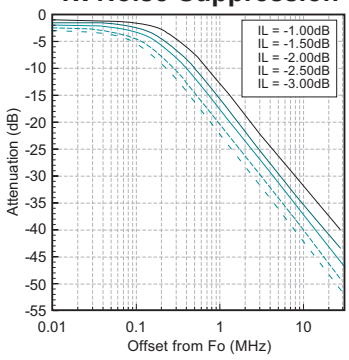
Model No.	Transmit	
	TP4055-1612-11	TP4055-1112-11
Frequency Range	400-550 MHz	
Cavity Type and Diameter	¼ wave, 6.625" (168mm)	¼ wave, 10" (254mm)
Maximum Continuous Transmit Power	150W (higher powers available)	
Dual Isolator Load Power (Continuous)	150 W	
Minimum Tx-Tx Separation @ Cavity Loss	250KHz @ 1.5dB 175KHz @ 2.5dB	200KHz @ 1.5dB 100KHz @ 2.5dB
Typical Tx-Tx Separtation @ Minimum Separation	80 dB	
Typical Antenna-Tx Isolation	70 dB	
Typical Tx Noise suppression	Depends on Cavity Loss setting - see curves	
Nominal Input Impedance	50 ohms	
Maximum Input return loss (VSWR)	-20 dB (1.22:1)	
Temperature Range	-30° to +60° C (-22° to + 140° F)	
Connectors, Input and Antenna	N(Female)	
Mechanical Mounting	Refer Mounting Hardware section	
Dimensions (Typical per-channel)	Refer Cavity Mechanics section	
Weight (Typical per-channel)	4.1Kg (9lbs)	4.7Kg (10.3lbs)
Shipping	Standard packaging - One channel per carton May be shipped pre-assembled in Pegged Rack or 483mm (19") rack kit (ordered separately)	

Typical Series Combiner Channel Performance - 168mm (6.625 inch) 400-550 MHz

Channel Insertion Loss

Tx-to-Tx Separation	Cavity Loss (dB)	Max Power	Loss (dB) vs. No. of channels			
			2	4	8	12
1 MHz	-1.5	150W	-2.2	-2.5	-2.8	-3.2
250 KHz			-2.9	-4.1	-5.1	-5.7
150 KHz	-2.0	130W	-3.7	-5.3	-6.5	-7.2
125 KHz	-2.5	110W	-4.2	-5.8	-7.0	-7.7

Tx Noise Suppression

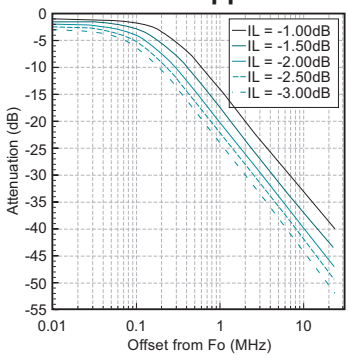


Typical Series Combiner Channel Performance - 254mm (10 inch) 400-550 MHz

Channel Insertion Loss

Tx-to-Tx Separation	Cavity Loss (dB)	Max Power	Loss (dB) vs. No. of channels			
			2	4	8	12
1 MHz	-1.5	150W	-2.4	-2.6	-2.9	-3.1
250 KHz			-2.9	-3.8	-4.4	-4.7
150 KHz	-2.0	130W	-3.6	-4.8	-5.6	-6.0
125 KHz	-2.5	110W	-4.1	-5.2	-6.0	-6.4

Tx Noise Suppression



Note: The use of cavity multicouplers for combining multiple channels with minimum frequency spacings may result in undesirable levels of isolator load heat dissipation due to interchannel coupling. Applications involving such requirements should be discussed with RFI prior to ordering to ensure the optimum solution is provided.

Expandable Series Combiner Multicouplers
400-550 MHz

Technical Specifications

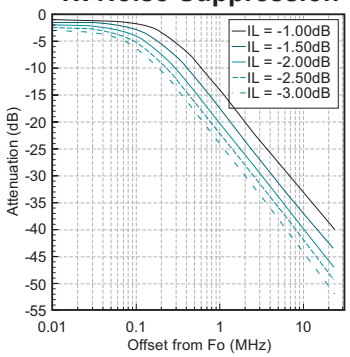
Model No.	Transmit only	
	TP4053-1632-11	TP4053-1132-11
Frequency Range	400-530 MHz	
Cavity Type and Diameter	¾ wave, 6.625" (168mm)	¾ wave, 10" (254mm)
Maximum Continuous Transmit Power	150W (higher powers available)	
Dual Isolator Load Power (Continuous)	150 W	
Minimum Tx-Tx Separation @ Cavity Loss	215 KHz @ -1.5 dB 115 KHz @ -2.5 dB	150 KHz @ -1.5 dB 75 KHz @ -2.5 dB
Typical Tx-Tx Separtation @ Minimum Separation	80 dB	
Typical Antenna-Tx Isolation	70 dB	
Typical Tx Noise suppression	Depends on Cavity Loss setting - see curves	
Nominal Input Impedance	50 ohms	
Maximum Input return loss (VSWR)	-20 dB (1.22:1)	
Temperature Range	-30° to +60° C (-22° to + 140° F)	
Connectors, Input and Antenna	N(Female)	
Mechanical Mounting	Refer Mounting Hardware section	
Dimensions (Typical per-channel)	Refer Cavity Mechanics section	
Weight (Typical per-channel)	6.3Kg (14lbs)	8.6Kg (19lbs)
Shipping	Standard packaging - One channel per carton May be shipped pre-assembled in Pegged Rack or 483mm (19") rack kit (ordered separately)	

Typical Series Combiner Channel Performance - 168mm (6.625 inch) 400-530 MHz

Channel Insertion Loss

Tx-to-Tx Separation	Cavity Loss (dB)	Max Power	Loss (dB) vs. No. of channels			
			2	4	8	12
1 MHz	-1.5	150W	-2.4	-2.6	-2.9	-3.1
250 KHz			-2.9	-3.8	-4.4	-4.7
150 KHz	-2.0	130W	-3.6	-4.8	-5.6	-6.0
125 KHz	-2.5	110W	-4.1	-5.2	-6.0	-6.4

Tx Noise Suppression

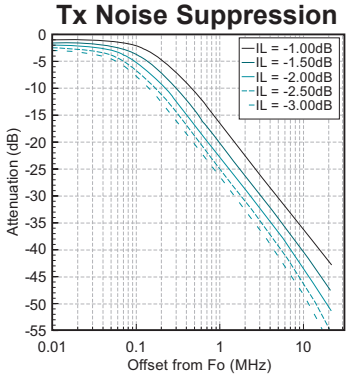


Typical Series Combiner Channel Performance - 254mm (10 inch) 400-530 MHz

Channel Insertion Loss

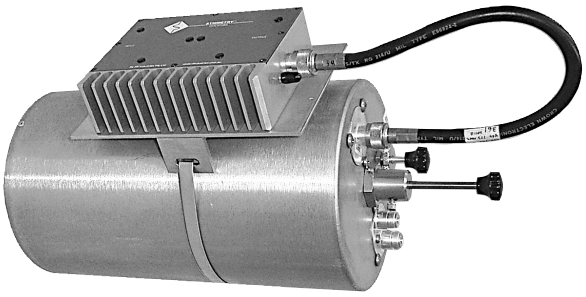
Tx-to-Tx Separation	Cavity Loss (dB)	Max Power	Loss (dB) vs. No. of channels			
			2	4	8	12
1 MHz	-1.5	150W	-2.4	-2.5	-2.8	-3.1
250 KHz			-2.7	-3.2	-3.7	-4.0
125 KHz	-2.0	150W	-3.4	-4.4	-5.0	-5.5
75 KHz	-2.5	125W	-4.3	-5.6	-6.6	-7.1

Tx Noise Suppression

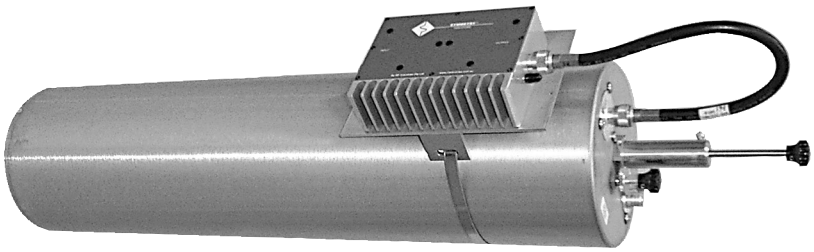


Note: The use of cavity multicouplers for combining multiple channels with minimum frequency spacings may result in undesirable levels of isolator load heat dissipation due to interchannel coupling. Applications involving such requirements should be discussed with RFI prior to ordering to ensure the optimum solution is provided.

Note: 254mm (10") versions of the above models available for higher selectivity and lower loss applications.



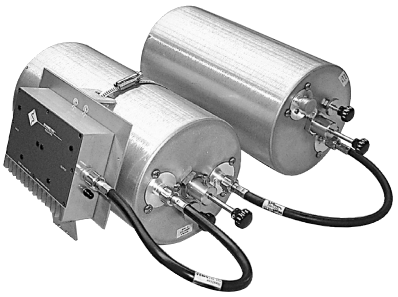
Typical - TP4055 ¼ Wave Series Models



Typical - TP4053 ¾ Wave Series Models

Expandable Series Combiner Multicouplers
400-550 MHz

These expandable transmit/receive multicouplers are ideally suited to both analogue and digital UHF voice and data applications on congested communications sites. These channels utilise dual cavities to provide the transmitter carrier noise suppression and transmit-receive isolation required for use on single (shared) transmit and receive antennas. Transmit channels may be ordered complete with dual isolators.



Typical - TP4055 Series Combiner
Transmit only channel

Typical - TP4055 Series Combiner
Receive/Transmit/Simplex channel

Features:

- Ideal for Trunking and PMR systems
- Broad Bandwidth
- Ideal for both analogue and digital technologies
- Excellent Performance
- Long-Term Dependability
- RFI Systems Records support
- Rugged, high quality design
- Pegged Rack and other mounting styles available

Technical Specifications

Model No.	Transmit only	Receive/Transmit/Simplex
	TP4055-2612-11	TP4055-2610-11
Frequency Range	400-550 MHz	
Cavity Type and Diameter	Quarterwave, 6.625" (168mm)	
Maximum Continuous Transmit Power	150W (higher powers available)	
Dual Isolator Load Power (Continuous) (Single Isolator versions available)	150 W	N/A
Minimum Channel Separation @ Cavity Loss	250 KHz @ -1.5 dB 175 KHz @ -2.5 dB	5MHz
Typical Isolation @ Minimum Separation	80 dB @ 175KHz	Varies with minimum Tx-Rx spacing
Nominal Input Impedance	50 ohms	
Maximum Input return loss (VSWR)	-20 dB (1.22:1)	
Temperature Range	-30° to +60° C (-22° to + 140° F)	
Connectors, Input and Antenna	N(Female)	
Mechanical Mounting	Refer Mounting Hardware section	
Dimensions (Typical per-channel)	Refer Cavity Mechanics section	
Weight (Typical per-channel)	6.1Kg (13.5lbs)	4Kg (8.8lbs)
Shipping	Standard packaging - One channel per carton May be shipped pre-assembled in Pegged Rack or 483mm (19") rack kit (ordered separately)	

Note: 254mm (10") versions of the above models available for higher selectivity and lower loss applications.

¼ wave or ¾ wave

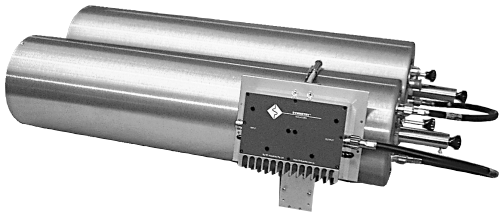
Series combiner multicouplers in the 400-550MHz UHF band are available using either ¼ or ¾ wavelength cavities. ¾ wave cavities have a higher Q (or selectivity), and as such they can accommodate closer channel spacings than the ¼ wave models for a comparable insertion loss.

Most series combiner multicoupling designs can be satisfactorily implemented using ¼ wave cavities, but close channel spacings, or a requirement to keep per-channel insertion losses to a minimum, may determine that the ¾ wave models are the most suitable in a particular application. For assistance in choosing the more suited wavelength for your requirements, please contact your nearest RFI Sales Office.

Technical Specifications

Model No.	Transmit only	Receive/Transmit/Simplex
	TP4053-2632-11	TP4053-2630-11
Frequency Range	400-530 MHz	
Cavity Type and Diameter	¾ wave, 6.625" (168mm)	
Maximum Continuous Transmit Power	150W (higher powers available)	
Dual Isolator Load Power (Continuous) (Single Isolator versions available)	150 W	N/A
Minimum Channel Separation @ Cavity Loss	215 KHz @ 1.5 dB 115 KHz @ 2.5 dB	5MHz
Typical Isolation @ Minimum Separation	80 dB @ 115KHz	Varies with minimum Tx-Rx spacing
Nominal Input Impedance	50 ohms	
Maximum Input return loss (VSWR)	-20 dB (1.22:1)	
Temperature Range	-30° to +60° C (-22° to + 140° F)	
Connectors, Input and Antenna	N(Female)	
Mechanical Mounting	Refer Mounting Hardware section	
Dimensions (Typical per-channel)	Refer Cavity Mechanics section	
Weight (Typical per-channel)	10.5Kg (23.1lbs)	8.4Kg (18.5lbs)
Shipping	Standard packaging - One channel per carton May be shipped pre-assembled in Pegged Rack or 483mm (19") rack kit (ordered separately)	

Note: 254mm (10") versions of the above models available for higher selectivity and lower loss applications.



Typical - TP4053 Transmit only Models

Typical - TP4053 Tx/Rx/Simplex Models