

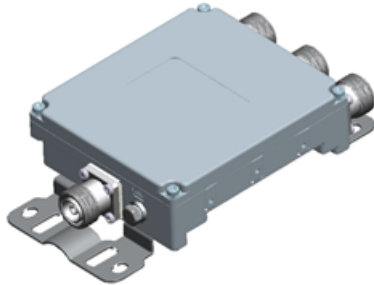


Filters & Combiners

DATA SHEET

Outdoor Broadband Triplexer

TPO-397236-E-T2



- The Outdoor triplexer combines the frequency ranges 390-960 MHz, 1695-2200 MHz, and 2300-2700 MHz onto a common port.
- Supports the 390-960 band on port 1, 1695-2200 band on port 2, and the 2300-2700 band on port 3
- High power 200 W per port with low insertion loss in a small, lightweight enclosure
- AISG 2.0 pass-through on either input port with Smart DC with Autosense
- Low intermodulation with isolation of >50 dB port to port
- High reliability of >500K Hours MTBF and multi-strike lightning protection
- Twin or Single outdoor (IP67) Triplexer with flexible pole or wall mounting options

Overview

The CCI Outdoor Broadband Triplexer combines the frequency ranges 390-960 MHz, 1710-2180 MHz, and 2300-2700 MHz onto a common port. Specifically intended for use in multi-band systems with limited feeder lines, this CCI Triplexer facilitates the addition of new technologies including LTE and new spectrum onto existing sites, while providing a high degree of isolation between systems. Decreasing the number of feeder lines lowers tower loading, leasing and installation expenditures and the total cost to upgrade a site is significantly reduced. An optional twin unit with two Triplexers mounted on a single bracket is also available.

The CCI Outdoor Triplexer provides full band performance for each band with low insertion loss, low Intermodulation, and high power handling. Excellent return loss delivers the best match to the antennas and base station, saving precious transmit power. The Triplexer enables full Remote Electrical Tilt (RET) and Tower Mount Amplifiers (TMA) control capability by providing DC and AISG 2.0 compliant pass-through on either input port using Smart DC with autosense.

Technical Description:

The Outdoor Broadband Triplexer consists of multiple filters and can be used as either a splitter or combiner to aggregate the 390-960 band on port 1, the 1695-2200 band on port 2, and the 2300-2700 band on port 3 onto a common feeder line. The fully weatherproof tower mount outdoor Triplexer provides DC and AISG signal pass-through, enabling power and control for TMA's & RET antennas. The Triplexer is available with DC/AISG pass options including a Smart DC with autosense. The Smart Bias-Tee architecture passes the DC and AISG carrier frequency from any one of the input ports to the common port while blocking the DC and AISG signals from being re-injected into the other input ports. The Triplexer has internal multi-strike lightning protection using a multi-stage surge protection circuit.

The unit has been designed to minimize insertion loss while maximizing isolation. Particular attention has been given to the intermodulation performance of the Triplexer to minimize any passive intermodulation products from occurring. The Triplexer housing is constructed from die cast aluminum and consists of an IP67 immersion proof enclosure, with IP67 immersion proof connectors suited to long-life masthead mounting. The Triplexer can be pole or wall mounted with the included bracket. The RF ports are configured with 4.3-10 connectors.

CCI filter and combiner products are designed and produced to ISO 9001 certification standards for reliability and quality at our state-of-the-art engineering and manufacturing facilities.



Filters & Combiners

SPECIFICATIONS

Outdoor Broadband Triplexer

TPO-397236-E-T2

Electrical Specification

RF Parameters	Ports	Frequency(MHz)	Specification
Return Loss	4 (Common)	390 - 960	18 dB minimum, 20 dB typical
		2300 - 2700	18 dB minimum, 20 dB typical
		1695 - 2200	18 dB minimum, 20 dB typical
Insertion Loss	1 (390-600 /700/800/900)	390 - 960	18 dB minimum, 20 dB typical
	2 (DCS/IMT2100)	1695 - 2200	18 dB minimum, 20 dB typical
	3 (2300-2700)	2300 - 2700	18 dB minimum, 20 dB typical
	4 to 1 (COMMON to 390-600 /700/800/900)	390 - 960	0.3 dB maximum
Isolation	4 to 2 (COMMON to 1695-2200)	2300 - 2700	0.3 dB maximum
	4 to 3 (COMMON to 2300-2700)	1695 - 2200	0.3 dB maximum
	4 to 1 (COMMON to 390-600 /700/800/900)	1695 - 2200	50 dB minimum
Group Delay	4 to 2 (COMMON to 1695-2200)	2300 - 2700	50 dB minimum
	4 to 3 (COMMON to 2300-2700)	390 - 960	50 dB minimum
	4 to 1 (COMMON to 390-600 /700/800/900)	1695 - 2200	50 dB minimum
Group Delay Variation	COMMON to 390-600 /700/800/900	390 - 960	7 ns maximum
	COMMON to 1695-2200	1695 - 2200	15 ns maximum
	COMMON to 2300-2700	2300 - 2700	17 ns maximum
Group Delay Variation	COMMON to 390-600 /700/800/900	390 - 960	4 ns maximum
	COMMON to 1695-2200	1695 - 2200	5 ns maximum
	COMMON to 2300-2700	2300 - 2700	7 ns maximum

DC/AISG	
DC Autosense	DC path is automatically determined, when the unit is used as a combiner or splitter
Combine Mode Priority	1. 1710 - 1880 MHz 2. 2300 - 2700 MHz 3. 1920 - 2170 MHz 4. 690 - 960 MHz
DC Autosense Combine Mode (Operation)	The port with dC voltage (7 to 30 V) is automatically passed to the COMMON Port. If more than one port has DC voltage present, the port with the highest priority is passed. If a short circuit is detected on the COMMON Port DC/AISG is disabled for the entire unit.
DC Autosense Splitter Mode (Operation)	DC/AISG pass through will be disabled for ports where a short circuit is detected and DC/AISG will be passed to all other ports.
DC Bypass Power-Up to Operating Time	<100 ms
Current Consumption @ TBD voltage	35 mA typical, 50 mA maximum (7.0 to 30 VDC)
Current (Single Path)	2.5 A maximum
Current Common	2.5 A maximum
AISG signal	2.176 MHz, per AISG 2.0



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General Characteristics	
Impedance	50 ohms
Continuous Average Power	200 W (+53 dBm) maximum per port
Peak Envelope Power	2 kW (+63 dBm) maximum per port
IM Performance(all ports)	<-117 dBm (-160 dBc) typical (2x +43 dBm tones) all bands

Environmental Specification

Operating Temperature	-40 °C to +65 °C
Ingress Protection	IP67
Relative Humidity	5 - 95%
MTBF	>500,000 hours
Lightning Protection	8/20us, ±10KA max, 10 strikes each, IEC61000-4-5

Mechanical Specification

Model	TPO-392226-S-Sx (3 In, 1 Out)	TPO-392226-S-Tx (6 In, 2 Out)
Modularity	Single	Twin
Ports, In-Line	3 x BTS, 1 x ANT	6 x BTS, 2 x ANT
Connectors	4 x 4.3-10 female	8 x 4.3-10 female
Dimensions w/Bracket	10.08 x 5.79 x 2.60 in. (256.0 x 147.0 x 66 mm)	10.08 x 5.79 x 4.65 in. (256.0 x 147.0 x 118 mm)
Housing Dimensions	6.61 x 5.79 x 2.01 in. (168.0 x 147.1 x 51.0 mm) - per Triplexer	
Weight	4.85 lbs (2.2 kg)	9.7 lbs (4.4 kg)
Housing Ground Lug	1 x M8	1 x M8
Finish	Housing - Powder Coat Gray; Bracket(s) - 304 Stainless Steel (Passivated per ASTM A-967)	
Packaging Size	TBD	17.91 x 12.4 x 13.78 in. (455 x 315 x 350 mm) for 4 pcs.
Packaging Weight	TBD	50.6 Lbs. (23 kg) for 4 pcs.
Available Mast Diameter	3 to 6 inches (76.2 to 152.4 mm)	
Pole Mounting	Use integral mouting bracket and the 2 band clamps provided (Orientation, the connectors will be in-line with mast)	
Wall Mounting	Use integral mouting bracket and appropriate fasteners (Orientation, no restrictions)	

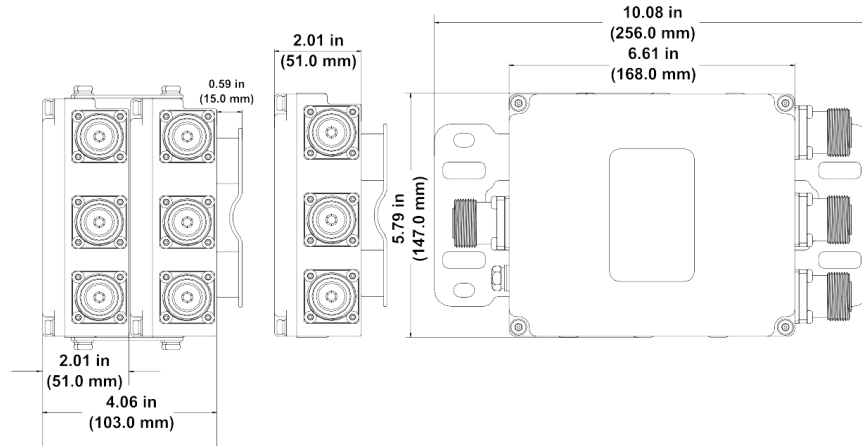


Filters & Combiners

SPECIFICATIONS

Outdoor Broadband Triplexer

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Outdoor Broadband Triplexer Outline Drawing



Filters & Combiners

STANDARDS & CERTIFICATIONS

Outdoor Broadband Triplexer

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Parts & Accessories

- TPO-397236-E-S2** Single Broadband Triplexer with 4.3-10 connectors and Smart DC for DC/AISG pass through in either direction on any port
- TPO-397236-E-T2** Twin Broadband Triplexer with 4.3-10 connectors and Smart DC for DC/AISG pass through in either direction on any port

Standards & Compliance

- Safety** EN 60950-1, UL 60950-1
- Emission** EN 55022
- Immunity** EN 55024
- Environmental** IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-5, IEC 60068-2-6, IEC-60068-2-11, IEC 60068-2-14, IEC 60068-2-18, IEC 60068-2-27, IEC 60068-2-29, IEC 60068-02-30, IEC 60068-2-52, IEC 60068-2-64, IEC61000-4-5, GR-63-CORE 4.3.1, EN 60529 IP67, IP68

Certifications

Federal Communication Commission (FCC) Part 15 Class B, CE, CSA US, ISO 9001

