

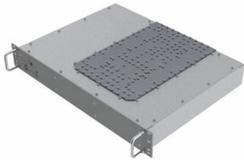


Filters & Combiners

DATA SHEET

Low Loss Combiner

LLC-1900-IN-10



- Low Loss Combining
- Narrow Guard Band
- High Reliability Design
- High Power Handling
- Cascadable for higher levels of combining
- Excellent Filter Response
- Occupies only 1.5U of Rack Space
- Built-In Software
- Control via Ethernet TCP/IP
- Duplex (Tx/Rx) Bandstop Port with AISG 2.0 compliant DC pass-through
- Tx Only Bandpass Port (10 MHz) with DC Block

Overview

CCI's PCS "0 MHz" Guard Band Low Loss Combiner (LLC) combines a 10 MHz band pass port with a synchronously tuned 10 MHz band stop port onto a single feeder without the insertion loss normally associated with passive combiners. The band pass port accommodates two (2) contiguous UMTS Carriers, one (1) 10 MHz LTE Carrier or up to six (6) contiguous NB-CDMA Carriers to be combined with either GSM, NB-CDMA, UMTS or LTE Carrier(s) on the band stop port. Utilizing precisely matched filters allows the placement of the Carrier(s) of the Bandpass (TX Only) to be positioned anywhere in the band while providing high rejection of unwanted spurious emissions and noise. The combining of LTE/LTE, UMTS/LTE & NB-CDMA/LTE, in most cases (LTE Carrier must be 10 MHz or wider), can be accomplished with zero (0) effective guard band, by leveraging the inherent guard bands of each technology (see Application Examples on Pages 3 thru 5). Additionally, the transmit paths are fully isolated to prevent intermodulation products.

Once the combiner is tuned, no power is required, effectively becoming a pure passive low-loss filter combiner. Control (when powered) is via TCP/IP (Ethernet), requiring only a web browser to tune the Bandpass to the desired Center Frequency. All software is resident internally, no extra software or controller is required.

The unit is housed in a single rack-mounted 19" by 1.5U assembly and can be used with additional CCI components, including Diplexers, Triplexers, Quadplexers, Pentaplexers, Duplexers, Dual Duplexers, DTMA's & Receive Multicouplers for further feeder line reduction.



Filters & Combiners

SPECIFICATIONS

Low Loss Combiner

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Electrical

RF Parameters	Ports	Frequency(MHz)	Specification
Return Loss	Bandstop	1850 - 1990	18 dB min.
	Bandpass	1930 - 1990	18 dB min.
	ANT	1850 - 1990	18 dB min.
Insertion Loss	Bandstop to ANT	1850 to ($f_c - 5$)	0.15 dB typ.
		($f_c + 5$) to 1990	0.15 dB typ.
	Bandpass to ANT	($f_c - 5$) to ($f_c + 5$)	0.6 dB typ.
Isolation	Bandstop to Bandpass	1930 to ($f_c - 5$)	30 dB min., 35 dB typ.
		($f_c - 5$) to ($f_c + 5$)	25 dB min., 28 dB typ.
		($f_c + 5$) to 1990	30 dB min., 35 dB typ.
Tuning Range (Bandpass)	Any center frequency (f_c) between 1935 - 1985 MHz, in 100 kHz steps		
Filter Range (Bandpass)	Any 10 MHz block starting at 1930 MHz up to and including any 10 MHz block ending at 1990 MHz		

General Characteristics	
Impedance	50 ohms
Guard Band:	
GSM/UMTS Combining	700 kHz each side of Bandpass required
UMTS/UMTS Combining	"0" Guard Band required
UMTS/LTE Combining	"0" Guard Band required for 10 MHz or greater LTE carrier
LTE/LTE Combining	"0" Guard Band required for 10 MHz or greater LTE carrier
CDMA/LTE Combining	"0" Guard Band required for 10 MHz or greater LTE carrier (assumes six (6) contiguous, standard NB-CDMA Channels)
Group Delay variation	50 nS typ.
Continuous Average Power	500 W max. (all ports)
Peak Envelope Power	2 kW max. (all ports)
IMD	<-110 dBm (-153 dBc) typical (2 x +43 dBm tones) all bands
DC Pass Current/AISG Pass (Bandstop port to ANT port)	3A/AISG signal (2.176 Mhz) per AISG 2.0

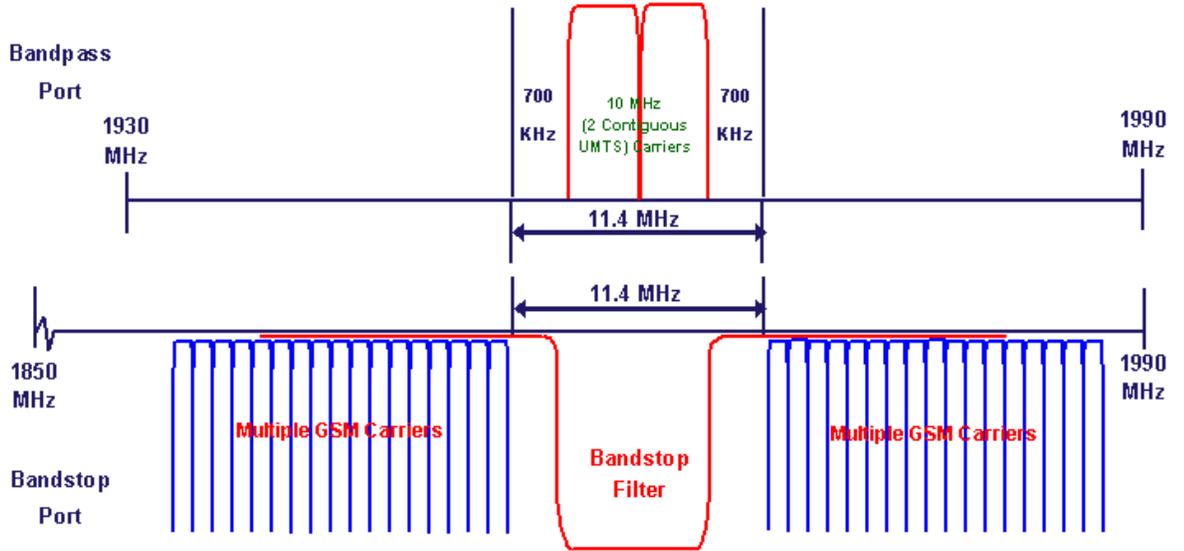


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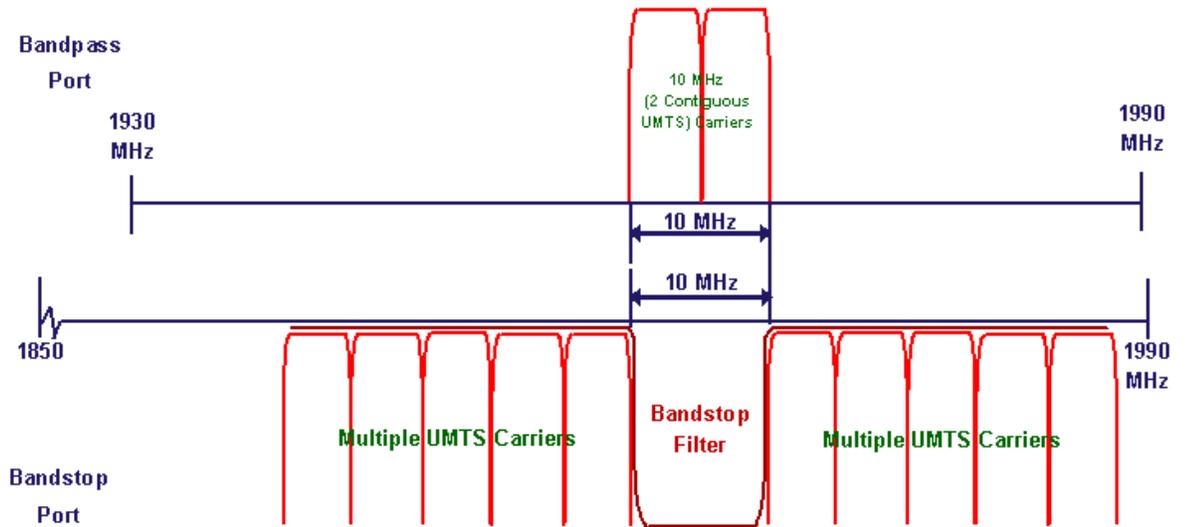
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GSM/UMTS Combining: 700 kHz guard band required



UMTS/UMTS Combining: "0" guard band required

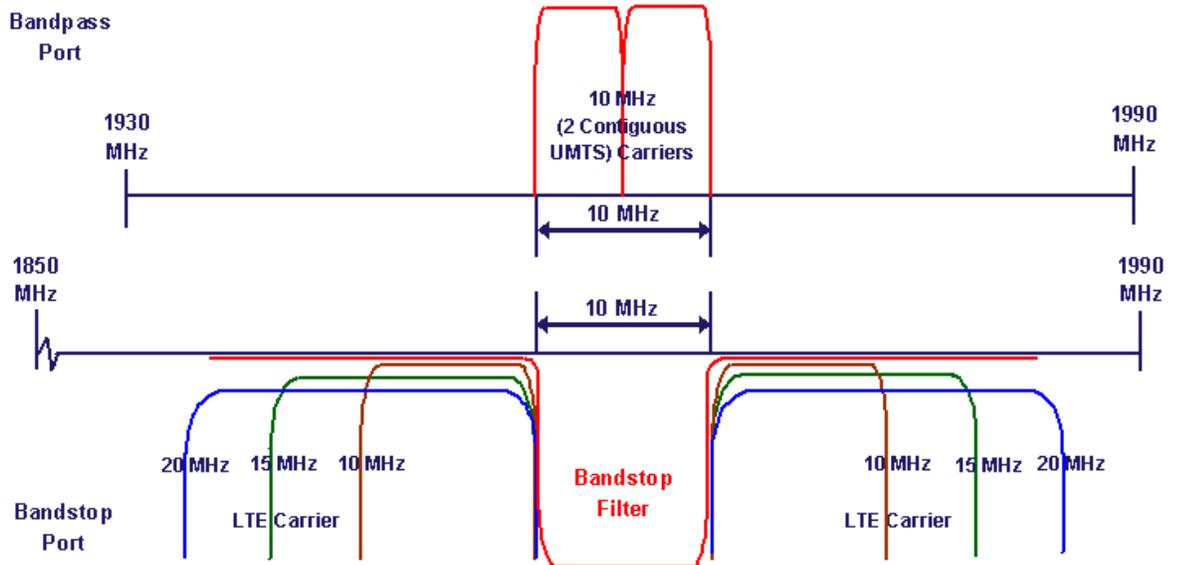


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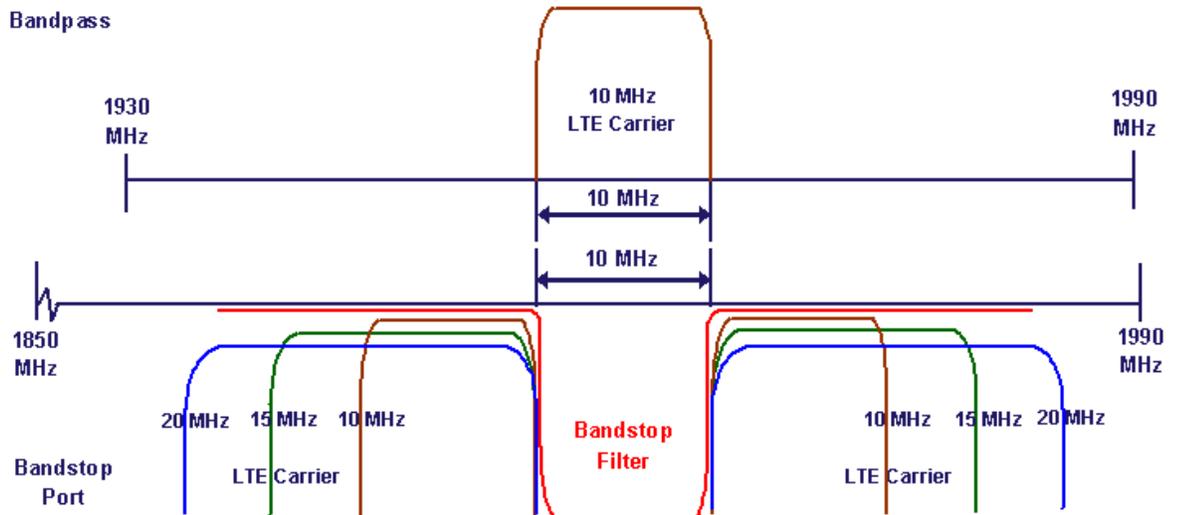
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UMTS/LTE Combining: "0" guard band required for 10 MHz or greater LTE carrier



LTE/LTE Combining: "0" guard band required for 10 MHz or greater LTE carrier

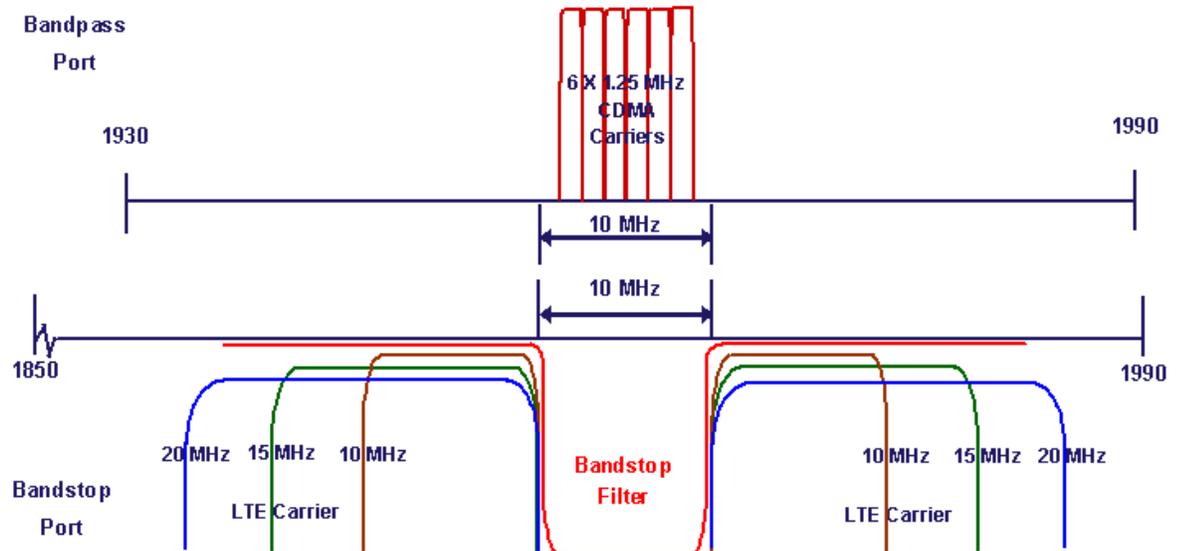


Filters & Combiners

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CDMA/LTE Combining: "0" guard band required for 10 MHz or greater LTE carrier

Environmental

Operating Temperature	0° C to +55° C
Enclosure	Indoor
Lightning Protection	Surge > 30 KA, 20 KA Mult, Res. Pulse < 250 uJ

Mechanical

Connectors	3 x 7-16 DIN female
Data Connection	RJ45 Ethernet
Alarm Connection	6 pin Molex connector (4.2 mm)
Power Connection	2 pin Molex connector (4.2 mm)
DC Power Requirement	2A @ +24VDC (only required when tuning)
DC Voltage	±18 to ±76 VDC
Dimensions (body only)(HxWxD)	2.59 x 17.5 x 13.41 in. (65.79 x 444.5 x 340.61 mm)
Dimensions (incl. connectors and handles)(HxWxD)	2.59 x 19 x 15.3 in. (65.79 x 482.6 x 388.62 mm)
Weight	25.0 lbs (11.34 kg)

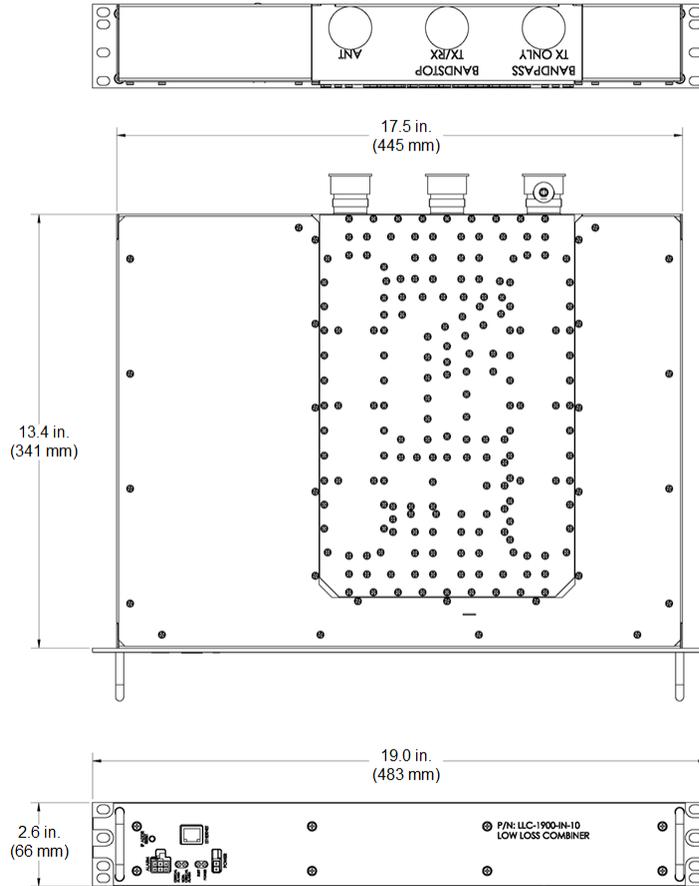


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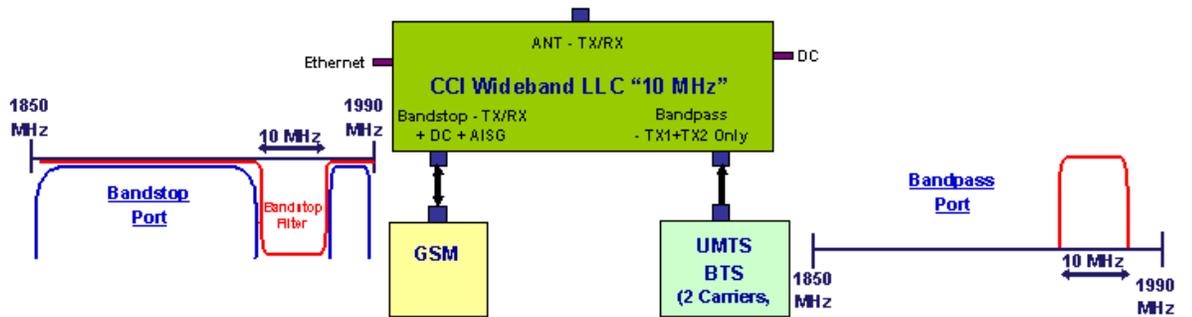
Low Loss Combiner

LLC-1900-IN-10



Low Loss Combiner Outline Drawing

Block Diagram



Low Loss Combiner Block Diagram



Filters & Combiners

STANDARDS & CERTIFICATIONS

Low Loss Combiner

LLC-1900-IN-10

Parts & Accessories

LLC-1900-IN-10 1900 Band Narrow Guard Band Tunable LLC

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

Antenna Interface Standards Group (AISG), Federal Communication Commission (FCC) Part 15 Class B, CE, CSA US, ISO 9001

