RF Filter Products & Solutions

A Comprehensive Selection Guide from RFS

RFS | Edition 2

Table of Contents

Radio Frequency Systems

A leader in wireless and broadcast infrastructure

Radio Frequency Systems (RFS) is a global designer and manufacturer of cable, antenna and tower systems, plus active and passive RF conditioning modules, providing total-package solutions for wireless infrastructure. RFS serves OEMs, distributors, system integrators, operators and installers in the broadcast, wireless communications, land-mobile and microwave market sectors.

Helping operators get more from existing infrastructure

Today, mobile network operators are trying to evolve their operations to support new technologies while meeting surging demand for mobile data. It's not easy. They need to move quickly to keep pace with demand, work within tight budgets, and make the best possible use of finite physical infrastructure.

Radio frequency conditioning products from RFS help operators address each of these challenges. They give operators new ways to easily and efficiently adopt new technologies and add capacity without breaking their budget on new infrastructure.

- ShareLite™ multiplexers combine different frequency bands from different base stations into a single feeder cable or antenna so operators can support new frequency bands and provide more capacity without adding new feeder cables and antennas.
- UltraAmp™ Tower Mounted Amplifiers amplify signals from the antenna and reduce noise from the base transceiver station (BTS) so operators can improve coverage and capacity without deploying new cells in cases where remote radio heads (RRHs) cannot be mounted on the tower.
- Co-location filters reduce interference and improve system performance when frequency bands are located close together so operators can maximize capacity and use every kHz of frequency spectrum as efficiently as possible.
- In-band combiners combine the same frequency band from different base stations into a single feeder cable or antenna so operators can share equipment, support new technologies and increase capacity without installing new antennas or renegotiating lease agreements.

www.RFSworld.com

ShareLite™ **Multiplexers**

ShareLite™ Diplexers, Triplexers and Quadplexers

Maximize RF Spectrum Efficiency with RFS Combining Solutions

Sharelite™ multiplexers combine multiple frequency bands from several base stations into a single feeder cable or antenna. They give operators a fast, easy and efficient way to adapt existing physical infrastructure to support new frequency bands and deliver more capacity to end users. Without multiplexers, operators often augment or replace feeder cables and antennas to support new frequency bands, adding considerable costs, complications and time to roll outs, and extra weight to already loaded towers.

Available for every application

Sharelite™ multiplexers are available in a range of single, dual, and quad configurations to support the typical frequency combinations used in indoor and outdoor 3G, 4G, and 5G systems around the globe. With this wide range of options, operators can use RFS multiplexers to address almost any equipment- or technology-sharing requirement. Most RFS multiplexers are available with 4.3-10 connectors, however 7/16 and NEX10 connectors are also available.

All RFS multiplexers have optional automatic DC sensing capabilities to support every possible DC voltage and control signal scenario in a single multiplexer.

Built to perform

To ensure optimal performance across the combined frequency bands, all RFS multiplexers have extremely high rejection levels and very low insertion loss. The multiplexer housings are lightweight and compact. They withstand severe weather conditions including rapid temperature changes.

The RFS Advantage

With RFS multiplexers, operators can:

- **Reduce installation time** by sharing feeders and antennas across multiple frequency bands
- **Reduce interference** with extremely high rejection levels between bands
- **Keep performance high and link budgets down** with very low insertion loss
- **Prevent installation errors and reduce equipment stocking and logistics requirements** with Auto DC sense technologies
- **Simplify installations and reduce tower loading** with lightweight and compact designs

Portfolio Overview – Typical Frequency Combinations (North America)

Model Number	US 600 Band 71 617-652 663-698	US 700 Band 12 (Lower ABC) 698-716 728-746	US 700 Band 13 (Upper C) 746-756 777-787	800 SMR Band 27 807-824 852-869	CEL 850 Band 5 824-849 869-894	AWS-4 Lower 1695-1710	AWS-1, 3 Band 66 1710-1780 2110-2200	PCS Band 2 1850-1910 1930-1990	WCS Band 30 2305-2320 2345-2360	BRS Band 41 2490-2690
Diplexers										
FD9R Series		1	1	1	1		2	2		
FDBL Series	1	1	1	1	1	2	2	2	2	2
FDJ8 Series	1	1	1		2					
FDA4P Series						1	1	2		
FDPL Series						1	1	2	2	2
FDRL Series							1	1		2
FDRM Series						1	1	1	2	2
Triplexers										
FTL8Z Series		1	1		2		3	3		
FTJ8L Series	1	1	1		2	3	3	3	3	3
FTA3PB Series		1	1	1	1		2	3		
FTA4PK Series	1	1				2	2	3		
FTBRM Series	1	1	1	1	1	2	2	2	3	3
Quadplexers										
FQJ8A4P Series	1	1	1	2	2	3	3	4	3	

Portfolio Overview – Typical Frequency Combinations (APAC, EMEA, LATAM)

Model Number	Tetras 380-470	ME 700 Band 68 698-728 753-783	APT 700 Band 28 703-748 758-803	EDD 800 Band 20 832-862 791-821	CEL 850 Band 5 824-849 869-894	E-GSM 900 Band 8 880-915 925-960	L-Band Band 32 1452-1496	DCS 1800 Band 3 1710-1785 1805-1880	IMT 2100 Band 1 1920-1980 2110-2170	TDD 2300 Band 40 2300-2400	FDD 2600 Band 7 2500-2570 2620-2690	TDD 2600 Band 38 2570-2620
Diplexers												
FD9R Series		1	1	1	1	1		2	2			
FDBL Series	1	1	1	1	1	1		2	2	2	2	2
FDCM Series		1	1	1	1	1		1	2	2	2	2
FDEG Series		1	1	1	1	2						
FDDG Series		1	1	1		2						
FDJ8 Series		1	1		2	2						
FDDW Series								1	2			
FDDV Series							1	1	2	2	2	2
FDRM Series								1	1	2	2	2
FDRL Series								1	1		2	2
FDNT Series									1	1	2	2
FDB7B38 Series											1	2
Triplexers												
FT9DW Series	1	1	1	1	1	1		2	3			
FTBDV Series	1	1	1	1	1	1	2	2	3	3	3	3
FTEGL Series		1	1	1		2	3	3	3	3	3	3
FTJ8L Series		1	1		2	2	3	3	3	3	3	3
FTBRM Series	1	1	1	1	1			2	2	3	3	3
FTDWM Series							1	1	2	3	3	3
Quadplexers												
FQEGDV Series		1	1	1		2	3	3	4	4	4	4
FQBDWM Series	1	1	1	1	1	1	2	2	3	4	4	4

In the above tables, 1, 2, 3 and 4 refer to the the port number designation.

ShareLite™ Multiplexers

RFS Portfolio of Diplexers, Triplexers and Quadplexers

Diplexer Product Specifications

		MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS				
Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FD9R Series Path 1: 698-960 MHz / Path 2: 1710-2200 MHz									
Single Configuration									
FD9R6004/1C-3L	Full Pass	1.2 (2.6)	147 x 164 x 37 (5.8 x 6.5 x 1.5)	7/16 (F)	Path 1	0.07	58/64	3	-155
FD9R6004/2C-3L	DC Path 2 Only				Path 2	0.13	57/70		
FD9R6004/3C-3L	DC Path 1 Only								
Dual Configuration									
KIT-FD9R6004/1C-DL	Full Pass	2.9 (6.4)	147 x 164 x 118 (5.8 x 6.5 x 4.6)	7/16 (F)	Path 1	0.07	58/64	3	-155
KIT-FD9R6004/2C-DL	DC Path 2 Only				Path 2	0.13	57/70		
KIT-FD9R6004/3C-DL	DC Path 1 Only								
FDBL Series Path 1: 380-960 MHz / Path 2: 1695-2700 MHz									
Dual Configuration									
FDBL5003D4-1C	All DC Pass	3.5 (7.7)	185 x 219 x 51 (7.3 x 8.6 x 2.0)	4.3-10 (F)	Path 1	0.2	50	2.5	-155
FDBL5003D4-2C	DC Pass Path 1 Only								
FDBL5003D4-3C	DC Pass Path 2 Only								
FDBL5003D4-NC	No DC Pass								
FDBL5003D4-SA	Auto DC w/SBT*								
FDBL5003D4-S2	Auto DC (Logic 2)								
FDBL5003D4-S	Auto DC Sense				Path 2			3	
FDBL5003D7-1C	All DC Pass			7/16 (F)					
FDBL5003D7-2C	DC Pass Path 1 Only								
FDBL5003D7-3C	DC Pass Path 2 Only								
FDBL5003D7-NC	No Pass								
FDBL5003D-S	Auto DC Sense								
FDCM Series Path 1: 690-960 & 1710-2170 MHz / Path 2: 2300-2700 MHz									
Single Configuration									
FDCM6520SN-1C	All DC Pass	2.8 (6.1)	190 X 181 X 61 (7.5 X 7.1 X 2.4)	Type N (F)	Path 1	0.2	65	<8 & <15	-153
					Path 2			<15	
FDEG Series Path 1: 694-862 / Path 2: 880-960 MHz									
Single Configuration									
FDEG5020S4-1C	All DC Pass	3 (6.6)	191 X 172 X 81 (7.5 X 6.8 X 3.2)	4.3-10 (F)	Path 1	0.2	50	40	-161
FDEG5020S4-2C	DC Pass Path 1 Only								
FDEG5020S4-3C	DC Pass Path 2 Only								
FDEG5020S4-NC	No DC Pass								
FDEG5020S4-S1	Auto DC Sense								
FDEG5020S7-1C	All DC Pass			7/16 (F)	Path 2			35	
FDEG5020S7-2C	DC Pass Path 1 Only								
FDEG5020S7-3C	DC Pass Path 2 Only								
FDEG5020S7-NC	No DC Pass								
Dual Configuration									
FDEG5020D4-1C	All DC Pass	5.3 (11.7)	191 x 172 x 157 (7.5 x 6.8 x 6.2)	4.3-10 (F)	Path 1	0.2	50	40	-161
FDEG5020D4-2C	DC Pass Path 1 Only								
FDEG5020D4-3C	DC Pass Path 2 Only								
FDEG5020D4-NC	No DC Pass								
FDEG5020D4-S1	Auto DC Sense								
FDEG5020D4-S1A	Auto DC w/SBT*								
FDEG5020D7-1C	All DC Pass			7/16 (F)	Path 2			35	
FDEG5020D7-2C	DC Pass Path 1 Only								
FDEG5020D7-3C	DC Pass Path 2 Only								
FDEG5020D7-NC	No DC Pass								
FDEG5020D7-S1	Auto DC Sense								
FDEG5020D7-S1A	Auto DC w/SBT*								
FDDG Series Path 1: 694-862 / Path 2: 876-960 MHz									
Dual Configuration									
FDDG3015-1C	All DC Pass	3.9 (8.7)	162 x 184 x 142 (6.4 x 7.2 x 5.6)	7/16 (F)	Path 1	0.15	30	<35	-160
FDDG3015-2C	DC Pass Path 1 Only				Path 2			<30	
FDDG3015-3C	DC Pass Path 2 Only								

* SBT = Smart Bias-T

NOTE: For complete product specifications, please visit our eCatalog

ShareLite™ Multiplexers

RFS Portfolio of Diplexers, Triplexers and Quadplexers

Diplexer Product Specifications

		MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS				
Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FDJ8 Series Path 1: 555-806 MHz / Path 2: 824-960 MHz									
Single Configuration									
FDJ85020S4-1C	All DC Pass	3 (6.6)	172 x 191 x 86 (6.7 x 7.5 x 3.4)	4.3-10 (F)	Path 1	0.2	50	40	-161
FDJ85020S4-2C	DC Pass Path 1 Only								
FDJ85020S4-3C	DC Pass Path 2 Only								
FDJ85020S4-NC	No DC Pass								
FDJ85020S4-S1	Auto DC Sense								
FDJ85020S7-1C	All DC Pass			7/16 (F)	Path 2			35	
FDJ85020S7-2C	DC Pass Path 1 Only								
FDJ85020S7-3C	DC Pass Path 2 Only								
FDJ85020S7-NC	No DC Pass								
Dual Configuration									
FDJ85020D4-1C	All DC Pass	5.1 (11.2)	172 x 191 x 157 (6.7 x 7.5 x 6.2)	4.3-10 (F)	Path 1	0.2	50	40	-161
FDJ85020D4-2C	DC Pass Path 1 Only								
FDJ85020D4-3C	DC Pass Path 2 Only								
FDJ85020D4-NC	No DC Pass								
FDJ85020D4-S	Auto DC Sense								
FDJ85020D4-S1	Auto DC Sense								
FDJ85020D4-S1A	Auto DC w/SBT*								
FDJ85020D7-1C	All DC Pass			7/16 (F)	Path 2			35	
FDJ85020D7-2C	DC Pass Path 1 Only								
FDJ85020D7-3C	DC Pass Path 2 Only								
FDJ85020D7-NC	No DC Pass								
FDJ85020D7-S	Auto DC Sense								
FDJ85020D7-S1	Auto DC Sense								
FDJ85020D7-S1A	Auto DC w/SBT*								
Quad Configuration									
FDJ85020Q4-S1	Auto DC Sense	10.7 (23.5)	172 X 429 X 157 (6.7 X 16.9 X 6.2)	4.3-10 (F)	Path 1	0.2	50	40	-161
FDJ85020Q7-S1	Auto DC Sense			7/16 (F)	Path 2			35	
FDDW Series Path 1: 1710-1880 / Path 2: 1920-2170 MHz									
Single Configuration									
FDDW6015S4-1C	All DC Pass	2.7 (6.0)	191 x 206 x 66 (7.5 x 8.1 x 2.6)	4.3-10 (F)	Path 1 Path 2	0.15	55/60	20	-161
FDDW6015S4-2C	DC Pass Path 1 Only								
FDDW6015S4-3C	DC Pass Path 2 Only								
FDDW6015S4-NC	No DC Pass								
FDDW6015S7-1C	All DC Pass			7/16 (F)					
FDDW6015S7-2C	DC Pass Path 1 Only								
FDDW6015S7-3C	DC Pass Path 2 Only								
FDDW6015S7-NC	No DC Pass								
Dual Configuration									
FDDW6015D4-1C	All DC Pass	5 (11.1)	191 x 206 x 117 (7.5 x 8.1 x 4.6)	4.3-10 (F)	Path 1 Path 2	0.15	55/60	20	-161
FDDW6015D4-2C	DC Pass Path 1 Only								
FDDW6015D4-3C	DC Pass Path 2 Only								
FDDW6015D4-NC	No DC Pass								
FDDW6015D4-S1	Auto DC Sense								
FDDW6015D4-S1A	Auto DC w/SBT*								
FDDW6015D7-1C	All DC Pass			7/16 (F)					
FDDW6015D7-2C	DC Pass Path 1 Only								
FDDW6015D7-3C	DC Pass Path 2 Only								
FDDW6015D7-NC	No DC Pass								
FDDW6015D7-S1	Auto DC Sense								
FDDW6015D7-S1A	Auto DC w/SBT*								

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Diplexer Product Specifications

		MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS				
Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FDDV Series Path 1: 1427-1880 MHz / Path 2: 1920-2690 MHz									
Single Configuration									
FDDV5015S4-1C	All DC Pass	2.8 (6.1)	192 x 172 x 70 (7.5 x 6.8 x 2.7)	4.3-10 (F)	Path 1 Path 2	0.2	50	20	-161
FDDV5015S4-2C	DC Path 1 Only								
FDDV5015S4-3C	DC Path 2 Only								
FDDV5015S4-NC	No DC Pass								
FDDV5015S4-S1	Auto DC Sense								
FDDV5015S7-1C	All DC Pass			7/16 (F)					
FDDV5015S7-2C	DC Path 1 Only								
FDDV5015S7-3C	DC Path 2 Only								
FDDV5015S7-NC	No DC Pass								
Dual Configuration									
FDDV5015D4-1C	All DC Pass	4.2 (9.3)	220 X 172 X 103 (8.7 X 6.7 X 4.2)	4.3-10 (F)	Path 1 Path 2	0.2	50	20	-161
FDDV5015D4-2C	DC Path 1 Only								
FDDV5015D4-3C	DC Path 2 Only								
FDDV5015D4-NC	No DC Pass								
FDDV5015D4-S1	Auto DC Sense								
FDDV5015D4-S1A	Auto DC w/SBT*								
FDDV5015D7-1C	All DC Pass			7/16 (F)					
FDDV5015D7-2C	DC Path 1 Only								
FDDV5015D7-3C	DC Path 2 Only								
FDDV5015D7-NC	No DC Pass								
FDDV5015D7-S1	Auto DC Sense								
FDDV5015D7-S1A	Auto DC w/SBT*								
FDA4P Series Path 1: 1850-1910 & 1930-1990 MHz / Path 2: 1695-1780 & 2110-2200 MHz									
Single Configuration									
FDA4P5020S4-1C	All DC Pass	2.9 (6.4)	165 x 210 x 85 (6.5 x 8.3 x 3.3)	4.3-10 (F)	Path 1 Path 2	0.2	50	12	-155
FDA4P5020S4-2C	DC Pass Path 1 Only								
FDA4P5020S4-3C	DC Pass Path 2 Only								
FDA4P5020S4-S	Auto DC Sense								
FDA4P5020S7-1C	All DC Pass			7/16 (F)					
FDA4P5020S7-2C	DC Pass Path 1 Only								
FDA4P5020S7-3C	DC Pass Path 2 Only								
FDA4P5020S7-S	Auto DC								
Dual Configuration									
FDA4P5020T4-1C	All DC Pass	7.5 (16.5)	165 x 232 x 185 (6.5 x 9.1 x 7.2)	4.3-10 (F)	Path 1 Path 2	0.2	50	12	-155
FDA4P5020T4-2C	DC Pass Path 1 Only								
FDA4P5020T4-3C	DC Pass Path 2 Only								
FDA4P5020T4-S	Auto DC Sense								
FDA4P5020T7-S	Auto DC Sense			7/16 (F)					
FDA4P5020T7-1C	All DC Pass								
FDA4P5020T7-2C	DC Pass Path 1 Only								
FDA4P5020T7-3C	DC Pass Path 2 Only								
FDPL Series Path 1: 1850-1915 & 1930-1995 MHz / Path 2: 1695-1780 & 2110-2700 MHz									
Single Configuration									
FDPL4020S4-NC	No DC Pass	0.7 (1.6)	100 X 106 X 44 (3.9 X 4.1 X 1.7)	4.3-10 (F)	Path 1	0.25	40	<12	-161
FDPL4020S4-1C	All DC Pass								
FDPL4020S0-1C	All DC Pass			NEX10 (F)	Path 2	0.2		<6	
FDPL4020S0-NC	No DC Pass								
Dual Configuration									
FDPL4020AD4-NC	No DC Pass	1.4 (3.1)	181 X 106 X 44 (7.1 X 4.1 X 1.7)	4.3-10 (F)	Path 1	0.25	40	<12	-161
FDPL4020AD4-1C	All DC Pass								
FDPL4020AD0-1C	All DC Pass			NEX10 (F)					
FDPL4020AD0-NC	No DC Pass								
FDPL4020CD4-NC	No DC Pass		100 X 106 X 78 (3.9 X 4.1 X 3)	4.3-10 (F)	Path 2	0.2		<6	
FDPL4020CD4-1C	All DC Pass								
FDPL4020CD0-1C	All DC Pass			NEX10 (F)					
FDPL4020CD0-NC	No DC Pass								

* SBT = Smart Bias-T

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Diplexer Product Specifications

		MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS				
Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FDPL Series Path 1: 1850-1915 & 1930-1995 MHz / Path 2: 1695-1780 & 2110-2700 MHz									
Quad Configuration									
FDPL4020AQ4-NC	No DC Pass	2.7 (6.0)	181 X 106 X 78 (7.1 X 4.1 X 3)	4.3-10 (F)	Path 1	0.25	40	<12	-161
FDPL4020AQ4-1C	All DC Pass								
FDPL4020AQ0-1C	All DC Pass			NEX10 (F)					
FDPL4020AQ0-NC	No DC Pass								
FDPL4020CQ4-NC	No DC Pass		100 X 106 X 155 (3.9 X 4.1 X 6.1)	4.3-10 (F)	Path 2	0.2		<6	
FDPL4020CQ4-1C	All DC Pass								
FDPL4020CQ0-1C	All DC Pass			NEX10 (F)					
FDPL4020CQ0-NC	No DC Pass								
FDRM Series Path 1: 1695-2200 MHz / Path 2: 2300-2700 MHz									
Single Configuration									
FDRM5015S4-1C	All DC Pass	2.5 (5.2)	156 X 183 X 67 (6.1 X 7.2 X 2.6)	4.3-10 (F)	Path 1 Path 2	0.15	50	9	-161
FDRM5015S4-2C	DC Path 1 Only								
FDRM5015S4-3C	DC Path 2 Only								
FDRM5015S4-NC	No DC Pass								
FDRM5015S4-S1	Auto DC Sense								
FDRM5015S7-1C	All DC Pass			7/16 (F)					
FDRM5015S7-2C	DC Path 1 Only								
FDRM5015S7-3C	DC Path 2 Only								
FDRM5015S7-NC	No DC Pass								
FDRM5015S9-1C	All DC Pass			4.1-9.5 (F)					
Dual Configuration									
FDRM5015D4-1C	All DC Pass	4.9 (10.8)	156 x 183 x 132 (6.2 x 7.2 x 5.6)	4.3-10 (F)	Path 1 Path 2	0.15	50	9	-161
FDRM5015D4-2C	DC Path 1 Only								
FDRM5015D4-3C	DC Path 2 Only								
FDRM5015D4-NC	No DC Pass								
FDRM5015D4-S1	Auto DC Sense								
FDRM5015D4-S1A	Auto DC w/SBT*								
FDRM5015D7-1C	All DC Pass			7/16 (F)					
FDRM5015D7-2C	DC Path 1 Only								
FDRM5015D7-3C	DC Path 2 Only								
FDRM5015D7-NC	No DC Pass								
FDRM5015D7-S1	Auto DC Sense								
FDRM5015D7-S1A	Auto DC w/SBT*								
Quad Configuration									
FDRM5015Q4-1C	All DC Pass	7.8 (17.2)	156 x 420 x 103 (6.2 x 16.5 x 4)	4.3-10 (F)	Path 1 Path 2	0.15	50	9	-161
FDRM5015Q4-NC	No DC Pass								
FDRL Series Path 1: 1710-2180 MHz / Path 2: 2490-2690 MHz									
Single Configuration									
FDRL3502S4-1C	All DC Pass	1.9 (4.3)	215 x 163 x 33 (8.5 x 6.4 x 1.3)	4.3-10 (F)	Path 1 Path 2	0.2	55/60	5	-155
FDRL3502/1C-3L	All DC Pass			7/16 (F)					
FDRL3502/2C-3L	DC Path 1 Only								
FDRL3502/3C-3L	DC Path 2 Only								
Dual Configuration									
FDRL3502D4-1C	All DC Pass	4.2 (9.25)	215 x 163 x 124 (8.5 x 6.4 x 4.9)	4.3-10 (F)	Path 1 Path 2	0.2	55/60	5	-155
KIT-FDRL3502/1C-DL	All DC Pass			7/16 (F)					
KIT-FDRL3502/2C-DL	DC Pass Path 1 Only								
KIT-FDRL3502/3C-DL	DC Pass Path 2 Only								
Quad Configuration									
KIT-FDRL3502-1C-QL	All DC Pass	10 (22.5)	215 x 163 x 290 (8.5 x 6.4 x 11.4)	7/16 (F)	Path 1 Path 2	0.2	55/60	5	-155

* SBT = Smart Bias-T

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Diplexer Product Specifications

		MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS				
Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FDNT Series Path 1: 1850-2400 MHz / Path 2: 2490-2900 MHz									
Single Configuration									
FDNT5015S4-1C	All DC Pass	2.5 (5.2)	156 X 183 X 73 (6.2 X 7.2 X 3.1)	4.3-10 (F)	Path 1 Path 2	0.12	50	9	-161
FDNT5015S4-2C	DC Path 1 Only								
FDNT5015S4-3C	DC Path 2 Only								
FDNT5015S7-NC	No DC Pass								
FDNT5015S7-1C	All DC Pass			7/16 (F)					
FDNT5015S7-2C	DC Path 1 Only								
FDNT5015S7-3C	DC Path 2 Only								
FDNT5015S7-NC	No DC Pass								
Dual Configuration									
FDNT5015D4-1C	All DC Pass	3.6 (8)	156 x 183 x 132 (6.2 x 7.2 x 5.6)	4.3/10 (F)	Path 1 Path 2	0.12	50	9	-161
FDNT5015D4-2C	DC Path 1 Only								
FDNT5015D4-3C	DC Path 2 Only								
FDNT5015D4-NC	No DC Pass								
FDNT5015D4-S1	Auto DC Sense								
FDNT5015D4-S1A	Auto DC w/SBT*								
FDNT5015D7-1C	All DC Pass			7/16 (F)					
FDNT5015D7-2C	DC Path 1 Only								
FDNT5015D7-3C	DC Path 2 Only								
FDNT5015D7-NC	No DC Pass								
FDNT5015D7-S1	Auto DC Sense								
FDNT5015D7-S1A	Auto DC w/SBT*								
FDB7B Series Path 1: 2540-2560 &2660-2680 MHz / Path 2: 2600-2615									
Single Configuration									
FDB7B385025S7-1C	All DC Pass	3 (6.6)	228 X 188 X 60 (9 X 7.4 X 2.3)	7/16 (F)	Path 1	0.3	50	15	-161
					Path 2			23.5	

* SBT = Smart Bias-T

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ShareLite™ Multiplexers

RFS Portfolio of Diplexers, Triplexers and Quadplexers

Triplexer Product Specifications

		MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS				
Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FT9DW Series Path 1: 380-960 MHz / Path 2: 1710-1880 MHz / Path 3: 1920-2170 MHz									
Single Configuration									
FT9DW5020S4-1C	Full Pass	1.8 (4.1)	206 x 191 x 66 (8.1 x 7.5 x 2.6)	4.3-10 (F)	Path 1	0.1	50/55	3	-161
FT9DW5020S4-2C	DC Pass Path 1 Only								
FT9DW5020S4-3C	DC Pass Path 2 Only								
FT9DW5020S4-4C	DC Pass Path 3 Only				Path 2	0.2	55/60	22	
FT9DW5020S4-NC	No DC Pass								
FT9DW5020S7-1C	Full Pass			7/16 (F)					
FT9DW5020S7-2C	DC Pass Path 1 Only								
FT9DW5020S7-3C	DC Pass Path 2 Only				Path 3	0.2	55/60	18	
FT9DW5020S7-4C	DC Pass Path 3 Only								
FT9DW5020S7-NC	No DC Pass								
Dual Configuration									
FT9DW5020D4-1C	Full Pass	5.5 (12.1)	206 x 191 x 117 (8.1 x 7.5 x 4.6)	4.3-10 (F)	Path 1	0.1	50/55	3	-161
FT9DW5020D4-2C	DC Pass Path 1 Only								
FT9DW5020D4-3C	DC Pass Path 2 Only								
FT9DW5020D4-4C	DC Pass Path 3 Only								
FT9DW5020D4-NC	No DC Pass								
FT9DW5020D4-S	Auto DC Sense				Path 2	0.2	55/60	22	
FT9DW5020D4-SA	Auto DC w/SBT*								
FT9DW5020D7-1C	Full Pass			7/16 (F)					
FT9DW5020D7-2C	DC Pass Path 1 Only								
FT9DW5020D7-3C	DC Pass Path 2 Only								
FT9DW5020D7-4C	DC Pass Path 3 Only				Path 3	0.2	55/60	18	
FT9DW5020D7-NC	No DC Pass								
FT9DW5020D7-S	Auto DC Sense								
FT9DW5020D7-SA	Auto DC w/SBT*								
FTEGL Series Path 1: 698-862 MHz / Path 2: 880-960 MHz / Path 3: 1427-2690 MHz									
Single Configuration									
FTEGL5020S4-1C	Full Pass	3.3 (7.2)	322 x 228 x 101 (12.6 x 8.9 x 3.9)	4.3-10 (F)	Path 1	0.15	50	40	-161
FTEGL5020S4-2C	DC Pass Path 1 Only								
FTEGL5020S4-3C	DC Pass Path 2 Only								
FTEGL5020S4-4C	DC Pass Path 3 Only				Path 2	0.2		40	
FTEGL5020S4-NC	No DC Pass								
FTEGL5020S4-S1	Auto DC Sense			7/16 (F)					
FTEGL5020S7-1C	Full Pass								
FTEGL5020S7-2C	DC Pass Path 1 Only								
FTEGL5020S7-3C	DC Pass Path 2 Only				Path 3	0.15		6	
FTEGL5020S7-4C	DC Pass Path 3 Only								
FTEGL5020S7-NC	No DC Pass								
Dual Configuration									
FTEGL5020D4-1C	Full Pass	5.5 (12)	322 x 228 x 168 (12.6 x 8.9 x 6.6)	4.3-10 (F)	Path 1	0.15	50	40	-161
FTEGL5020D4-2C	DC Pass Path 1 Only								
FTEGL5020D4-3C	DC Pass Path 2 Only								
FTEGL5020D4-4C	DC Pass Path 3 Only								
FTEGL5020D4-NC	No DC Pass								
FTEGL5020D4-S	Auto DC Sense				Path 2	0.2		40	
FTEGL5020D4-SA	Auto DC w/SBT*								
FTEGL5020D4-S1	Auto DC Sense			7/16 (F)					
FTEGL5020D7-1C	Full Pass								
FTEGL5020D7-2C	DC Pass Path 1 Only								
FTEGL5020D7-3C	DC Pass Path 2 Only								
FTEGL5020D7-4C	DC Pass Path 3 Only				Path 3	0.15		6	
FTEGL5020D7-NC	No DC Pass								
FTEGL5020D7-S	Auto DC Sense								
FTEGL5020D7-SA	Auto DC w/SBT*								

* SBT = Smart Bias-T

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ShareLite™ Multiplexers

RFS Portfolio of Diplexers, Triplexers and Quadplexers

Triplexer Product Specifications

		MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS				
Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FTJ8L Series Path 1: 617-806 MHz / Path 2: 824-960 MHz / Path 3: 1427-2700 MHz									
Single Configuration									
FTJ8L5020S4-S1	Auto DC Sense	3.3 (7.2)	229x 228 x 101 (9.0 x 8.9 x 3.9)	4.3-10 (F)	Path 1	0.15	50	40	-161
					Path 2	0.2		40	
					Path 3	0.15		6	
Dual Configuration									
FTJ8L5020D4-S1	Auto DC Sense	5.5 (12)	229 x 228 x 168 (9.0 x 8.9 x 6.6)	4.3-10 (F)	Path 1	0.15	50	40	-161
					Path 2	0.2		40	
					Path 3	0.15		6	
FTL8Z Series Path 1: 698-787 MHz / Path 2: 824-894 MHz / Path 3: 1710-2180 MHz									
Single Configuration									
FTL8Z5002-1C	Full Pass	3.4 (7.5)	228 x 211 x 87 (8.9 x 8.3 x 3.4)	7/16 (F)	Path 1	0.2	50	25	-155
FTL8Z5002-2C	DC Pass Path 1 Only				Path 2	0.2		30	
FTL8Z5002-3C	DC Pass Path 2 Only								
FTL8Z5002-4C	DC Pass Path 3 Only				Path 3	0.15		6	
FTL8Z5002-NC	No DC Pass								
Dual Configuration									
FTL8Z5002T7-4C	DC Pass Path 3 Only	7.3 (16)	228 x 211 x 154 (8.9 x 8.3 x 6.1)	4.3-10 (F)	Path 1	0.2	50	25	-155
					Path 2	0.2		30	
					Path 3	0.15		6	
FTA3 Series Path 1: 698-894 MHz / Path 2: 1850-1990 MHz / Path 3: 1710-1780 & 2110-2180 MHz									
Dual Configuration									
FTA3PB5030-S	Auto DC Sense	6.3 (14)	238 x 190 x 125 (9.4 x 7.5 x 4.9)	7/16 (F)	Path 1	0.1	50	3	-155
					Path 2	0.15		18	
					Path 3	0.15		12	
FTA4 Series Path 1: 555-748 MHz / Path 2: 1850-1990 MHz / Path 3: 1695-1780 & 2110-2200 MHz									
Dual Configuration									
FTA4PK5030-S	Auto DC Sense	6.3 (14)	238 x 190 x 125 (9.4 x 7.5 x 4.9)	7/16 (F)	Path 1	0.1	50	3	-155
					Path 2	0.15		18	
FTA4PK5030D4-S				4.3-10 (F)	Path 3	0.15		12	
FTBRM Series Path 1: 380-960 MHz / Path 2: 1695-2200 MHz / Path 3: 2300-2700 MHz									
Single Configuration									
FTBRM5015S4-1C	Full Pass	2.4 (5.4)	156 X 183 X 54 (6.2 X 7.2 X 4)	4.3-10 (F)	Path 1	0.15	50	2	-161
FTBRM5015S4-2C	DC Pass Path 1 Only								
FTBRM5015S4-3C	DC Pass Path 2 Only								
FTBRM5015S4-4C	DC Pass Path 3 Only								
FTBRM5015S4-NC	No DC Pass				Path 2	0.1		10	
FTBRM5015S4-S1	Auto DC Sense								
FTBRM5015S9-1C	Full Pass			4.1-9.5 (F)					
FTBRM5015S7-1C	Full Pass			7/16 (F)					
FTBRM5015S7-2C	DC Pass Path 1 Only				Path 3	0.1		8	
FTBRM5015S7-3C	DC Pass Path 2 Only								
FTBRM5015S7-4C	DC Pass Path 3 Only								
FTBRM5015S7-NC	No DC Pass								
Dual Configuration									
FTBRM5015D4-1C	Full Pass	4.9 (10.8)	156 x 183 x 108 (6.2 x 7.2 x 4.0)	4.3-10 (F)	Path 1	0.15	50	2	-161
FTBRM5015D4-2C	DC Pass Path 1 Only								
FTBRM5015D4-3C	DC Pass Path 2 Only								
FTBRM5015D4-4C	DC Pass Path 3 Only								
FTBRM5015D4-NC	No DC Pass				Path 2	0.1		10	
FTBRM5015D4-S	Auto DC Sense								
FTBRM5015D4-S1	Auto DC Sense								
FTBRM5015D4-SA	Auto DC w/SBT*			4.1-9.5 (F)					
FTBRM5015D9-1C	Full Pass			7/16 (F)					
FTBRM5015D7-1C	Full Pass								
FTBRM5015D7-2C	DC Pass Path 1 Only				Path 3	0.1		8	
FTBRM5015D7-3C	DC Pass Path 2 Only								
FTBRM5015D7-4C	DC Pass Path 3 Only								
FTBRM5015D7-NC	No DC Pass								
FTBRM5015D7-S1	Auto DC Sense								
FTBRM5015D7-S1A	Auto DC w/SBT*								

* SBT = Smart Bias-T

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RFS Portfolio of Diplexers, Triplexers and Quadplexers

Triplexer Product Specifications

		MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS				
Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FTBRM Series Path 1: 380-960 MHz / Path 2: 1695-2200 MHz / Path 3: 2300-2700 MHz									
Quad Configuration									
FTBRM5015Q9-1C	Full Pass	7.8 (17.2)	156 x 420 x 103 (6.2 x 16.5 x 4)	4.1-9.5 (F)	Path 1	0.15	50	2	-161
					Path 2	0.1		10	
FTBRM5015Q7-1C				7/16 (F)	Path 3	0.1		8	
FTDWM Series Path 1: 1427-1880 MHz / Path 2: 1920-2170 MHz / Path 3: 2300-2700 MHz									
Single Configuration									
FTDWM5015S4-1C	Full Pass	2.4 (5.3)	172 X 191 X 80 (6.8 X 7.5 X 3.1)	4.3-10 (F)	Path 1	0.15	50	18	-161
FTDWM5015S4-2C	DC Pass Path 1 Only								
FTDWM5015S4-3C	DC Pass Path 2 Only								
FTDWM5015S4-4C	DC Pass Path 3 Only								
FTDWM5015S4-NC	No DC Pass				Path 2	0.2		18	
FTDWM5015S4-S1	Auto DC Sense								
FTDWM5015S7-1C	Full Pass			7/16 (F)					
FTDWM5015S7-2C	DC Pass Path 1 Only								
FTDWM5015S7-3C	DC Pass Path 2 Only								
FTDWM5015S7-4C	DC Pass Path 3 Only				Path 3	0.2		9	
FTDWM5015S7-NC	No DC Pass								
Dual Configuration									
FTDWM5015D4-1C	Full Pass	4.7 (10.3)	172 x 191 x 122 (6.8 x 7.5 x 4.8)	4.3-10 (F)	Path 1	0.15	50	18	-161
FTDWM5015D4-2C	DC Pass Path 1 Only								
FTDWM5015D4-3C	DC Pass Path 2 Only								
FTDWM5015D4-4C	DC Pass Path 3 Only								
FTDWM5015D4-NC	No DC Pass				Path 2	0.2		18	
FTDWM5015D4-S1	Auto DC Sense								
FTDWM5015D4-S1A	Auto DC w/SBT*			7/16 (F)					
FTDWM5015D7-1C	Full Pass								
FTDWM5015D7-2C	DC Pass Path 1 Only								
FTDWM5015D7-3C	DC Pass Path 2 Only								
FTDWM5015D7-4C	DC Pass Path 3 Only				Path 3	0.2		9	
FTDWM5015D7-NC	No DC Pass								
FTDWM5015D7-S1	Auto DC Sense								
FTDWM5015D7-S1A	Auto DC w/SBT*								
FTBDV Series Path 1: 380-960 MHz / Path 2: 1427-1880 MHz / Path 3: 1920-2600 MHz									
Single Configuration									
FTBDV5015S4-1C	Full Pass	3.4 (7.4)	200 x 200 x 70 (7.9 x 7.9 x 2.8)	4.3-10 (F)	Path 1	0.15	50	6	-161
FTBDV5015S4-2C	DC Pass Path 1 Only								
FTBDV5015S4-3C	DC Pass Path 2 Only								
FTBDV5015S4-4C	DC Pass Path 3 Only								
FTBDV5015S4-NC	No DC Pass				Path 2	0.2		25	
FTBDV5015S4-S1	Auto DC Sense								
FTBDV5015S7-1C	Full Pass			7/16 (F)					
FTBDV5015S7-2C	DC Pass Path 1 Only								
FTBDV5015S7-3C	DC Pass Path 2 Only								
FTBDV5015S7-4C	DC Pass Path 3 Only				Path 3	0.2		30	
FTBDV5015S7-NC	No DC Pass								
Dual Configuration									
FTBDV5015D4-1C	Full Pass	5.3 (11.7)	200 x 200 x 112 (7.9 x 7.9 x 4.4)	4.3-10 (F)	Path 1	0.15	50	6	-161
FTBDV5015D4-2C	DC Pass Path 1 Only								
FTBDV5015D4-3C	DC Pass Path 2 Only								
FTBDV5015D4-4C	DC Pass Path 3 Only								
FTBDV5015D4-NC	No DC Pass				Path 2	0.2		25	
FTBDV5015D4-S1	Auto DC Sense								
FTBDV5015D4-S1A	Auto DC w/SBT			7/16 (F)					
FTBDV5015D7-1C	Full Pass								
FTBDV5015D7-2C	DC Pass Path 1 Only								
FTBDV5015D7-3C	DC Pass Path 2 Only								
FTBDV5015D7-4C	DC Pass Path 3 Only				Path 3	0.2		30	
FTBDV5015D7-NC	No DC Pass								
FTBDV5015D7-S1	Auto DC Sense								
FTBDV5015D7-S1A	Auto DC w/SBT								

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ShareLite™ Multiplexers

RFS Portfolio of Diplexers, Triplexers and Quadplexers

Quadplexer Product Specifications

		MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS				
Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FQEGDV Series	**Path 1: 694-862 MHz / Path 2: 880-960 MHz / Path 3: 1427-1880 MHz / Path 4: 1920-2700 MHz**								
Single Configuration									
FQEGDV5020S4-1C	Full Pass	6 (13.2)	210 X 330 X 80 (8.3 X 13 X 3.2)	4.3-10 (F)	Path 1	0.35	50	40	-161
FQEGDV5020S4-2C	DC Pass Path 1 Only								
FQEGDV5020S4-3C	DC Pass Path 2 Only								
FQEGDV5020S4-4C	DC Pass Path 3 Only								
FQEGDV5020S4-5C	DC Pass Path 4 Only				Path 2	0.35		45	
FQEGDV5020S4-NC	No DC Pass								
FQEGDV5020S4-S1	Auto DC Sense								
FQEGDV5020S4-S1A	Auto DC w/SBT*								
FQEGDV5020S7-1C	Full Pass			7/16 (F)	Path 3	0.25		25	
FQEGDV5020S7-2C	DC Pass Path 1 Only								
FQEGDV5020S7-3C	DC Pass Path 2 Only								
FQEGDV5020S7-4C	DC Pass Path 3 Only								
FQEGDV5020S7-5C	DC Pass Path 4 Only				Path 4	0.25		25	
FQEGDV5020S7-NC	No DC Pass								
FQEGDV5020S7-S1	Auto DC Sense								
FQEGDV5020S7-S1A	Auto DC w/SBT*								
Dual Configuration									
FQEGDV5020D4-1C	Full Pass	9.8 (21.6)	215 x 330 x 130 (8.5 x 13 x 5.1)	4.3-10 (F)	Path 1	0.35	50	40	-161
FQEGDV5020D4-2C	DC Pass Path 1 Only								
FQEGDV5020D4-3C	DC Pass Path 2 Only								
FQEGDV5020D4-4C	DC Pass Path 3 Only								
FQEGDV5020D4-5C	DC Pass Path 4 Only				Path 2	0.35		45	
FQEGDV5020D4-NC	No DC Pass								
FQEGDV5020D4-S1	Auto DC Sense								
FQEGDV5020D4-S1A	Auto DC w/SBT*								
FQEGDV5020D7-1C	Full Pass			7/16 (F)	Path 3	0.25		25	
FQEGDV5020D7-2C	DC Pass Path 1 Only								
FQEGDV5020D7-3C	DC Pass Path 2 Only								
FQEGDV5020D7-4C	DC Pass Path 3 Only								
FQEGDV5020D7-5C	DC Pass Path 4 Only				Path 4	0.25		25	
FQEGDV5020D7-NC	No DC Pass								
FQEGDV5020D7-S1	Auto DC Sense								
FQEGDV5020D7-S1A	Auto DC w/SBT*								
FQJ8A4P Series	**Path 1: 555-798 MHz / Path 2: 824-960 MHz / Path 3: 1695-1780 & 2110-2360 MHz / Path 4: 1850-1990 MHz**								
Single Configuration									
FQJ8A4P6020S4-S1	Auto DC Sense	5.8 (12.9)	196 x 356 x 108 (7.7 x 14 x 4.3)	4.3-10 (F)	Path 1	0.4	60	38	-161
					Path 2	0.4		32	
					Path 3	0.35		15	
					Path 4	0.35		17	
Dual Configuration									
FQJ8A4P6020D4-S1	Auto DC Sense	9.8 (21.6)	196 x 356 x 163 (7.7 x 14.0 x 6.4)	4.3-10 (F)	Path 1	0.4	60	38	-161
					Path 2	0.4		32	
					Path 3	0.35		15	
					Path 4	0.35		17	

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RFS Portfolio of Diplexers, Triplexers and Quadplexers

Quadplexer Product Specifications

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Model Number	DC Pass	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Path	Insertion Loss, Typ., dB	Rejection, dB	Group Delay, Max., ns	PIM, dBm
FQBDWM Series	**Path 1: 380-960 MHz / Path 2: 1427-1880 MHz / Path 3: 1920-2200 MHz / Path 4: 2300-2690 MHz**								
Single Configuration									
FQBDWM5020S4-1C	Full Pass	4.6 (10.1)	200 x 235 x 71 (7.9 x 9.3 x 2.8)	4.3-10 (F)	Path 1	0.3	50	5	-161
FQBDWM5020S4-2C	DC Pass Path 1 Only								
FQBDWM5020S4-3C	DC Pass Path 2 Only								
FQBDWM5020S4-4C	DC Pass Path 3 Only								
FQBDWM5020S4-5C	DC Pass Path 4 Only				Path 2	0.4		25	
FQBDWM5020S4-NC	No DC Pass								
FQBDWM5020S4-S1	Auto DC Sense								
FQBDWM5020S4-S1A	Auto DC w/SBT*								
FQBDWM5020S7-1C	Full Pass			7/16 (F)	Path 3	0.4		25	
FQBDWM5020S7-2C	DC Pass Path 1 Only								
FQBDWM5020S7-3C	DC Pass Path 2 Only								
FQBDWM5020S7-4C	DC Pass Path 3 Only								
FQBDWM5020S7-5C	DC Pass Path 4 Only				Path 4	0.3		15	
FQBDWM5020S7-NC	No DC Pass								
FQBDWM5020S7-S1	Auto DC Sense								
FQBDWM5020S7-S1A	Auto DC w/SBT*								
Dual Configuration									
FQBDWM5020D4-1C	Full Pass	6.8 (15)	210 X 235 X 108 (8.3 X 9.3 X 4.2)	4.3-10 (F)	Path 1	0.3	50	5	-161
FQBDWM5020D4-2C	DC Pass Path 1 Only								
FQBDWM5020D4-3C	DC Pass Path 2 Only								
FQBDWM5020D4-4C	DC Pass Path 3 Only								
FQBDWM5020D4-5C	DC Pass Path 4 Only				Path 2	0.4		25	
FQBDWM5020D4-NC	No DC Pass								
FQBDWM5020D4-S1	Auto DC Sense								
FQBDWM5020D4-S1A	Auto DC w/SBT*								
FQBDWM5020D7-1C	Full Pass			7/16 (F)	Path 3	0.4		25	
FQBDWM5020D7-2C	DC Pass Path 1 Only								
FQBDWM5020D7-3C	DC Pass Path 2 Only								
FQBDWM5020D7-4C	DC Pass Path 3 Only								
FQBDWM5020D7-5C	DC Pass Path 4 Only				Path 4	0.3		15	
FQBDWM5020D7-NC	No DC Pass								
FQBDWM5020D7-S1	Auto DC Sense								
FQBDWM5020D7-S1A	Auto DC w/SBT*								

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Model Number Structure

FT	BRM	50	15	D	7	–1C
PRODUCT TYPE	FREQUENCY, MHZ	REJECTION TYP., DB	INSERTION LOSS, TYP., DB	CONFIGURATION	CONNECTOR TYPE	DC ROUTING (TYPICAL)
FD Filter Diplexer	6 600 MHz Spectrum	35	15 0.15	S Single	2 2.2-5 Female	1C All DC pass
FT Filter Triplexer	7 700 MHz Spectrum	40	20 0.2	D or T Dual (two paths in a single housing/ clamshell design OR two single units attached together by external bracket)	4 4.3-10 Female	2C DC pass path 1 only
FQ Filter Quadplexer	7L 698-746	50	25 0.25	AD Side-by-side Dual	7 7/16 Female	3C DC pass path 3 only (if applicable)
FP Filter Pentaplexer	70 694-803	60		CD Clamshell Dual	9 4.1/9.5 Female	4C DC pass path 4 only (if applicable)
	75 746-787, Upper C block	70		Q Quad (four filter paths; 4x single or 2x dual)	0 NEX10 Female	5C DC pass path 5 only (if applicable)
	8 800 MHz Spectrum					6C DC pass path 5 only (if applicable)
	9 900 MHz Spectrum					NC No DC Pass
	A 1710-1755/2110-2155					S Auto DC sensing (voltage sensing)
	A3 1710-1780/2110-2180					SA Auto DC sensing with AISG modem (voltage sensing)
	A4 1695-1780/2110-2200					S1 Auto DC sensing (current sensing logic 1)
	AW1695-1780/2110-2360					S1A Auto DC sensing with AISG modem (current sensing logic 1)
	B 380-960					S2 Auto DC sensing (logic 2, if applicable)
	C 698-960 / 1710-2180					S2A Auto DC sensing with AISG modem (logic 2, if applicable)
	D 1710-1880 or 1427-1880					
	E 694-862					
	E1 694-880					
	E2 694-894					
	F 380-2690		P 1850-1910/1930-1990			
	G 880-960		R 1710-2200			
	H 905-960		S 1350-1525			
	H1 898.4-960		T 2490-2690			
	J 555-806		V 1920-2690			
	K 1695-2200		W 1920-2170			
	L 1695-2700		X 3400-3520			
	M 2300-2690		X5 3400-6000			
	N 2300-2390		Z 3600-3800 / 4400-4900			

Examples

FTBRM5015D7-1C

FT	=	Triplexer
BRM	=	380-960/1695-2200/2300-2700
50	=	50 dB typical rejection
15	=	15 dB typical insertion loss
D	=	Dual (clamshell)
7	=	7/16 Female connectors
1C	=	All DC Pass

FDJ85020D4-S

FD	=	Diplexer
J8	=	555-806/824-906
50	=	50 dB typical rejection
20	=	20 dB typical insertion loss
D	=	Dual (clamshell)
4	=	4.3-10 Female connectors
S	=	Auto DC Sense

FDDW6015D7-1C

FD	=	Diplexer
DW	=	1710-1880/1920-2170
60	=	60 dB typical rejection
15	=	15 dB typical insertion loss
D	=	Dual (clamshell)
7	=	7/16 Female connectors
1C	=	All DC Pass

ShareLite™ Multiplexers

RFS Portfolio of Diplexers, Triplexers and Quadplexers

Understanding Auto DC Sense in Multiplexers

To control Remote Electrical Tilts (RET) and Tower Mounted Amplifiers (TMA) on a tower, the DC/AISG signal is passed through a multiplexer in a specific path. Depending on the application, different bypass configurations are available. The correct bypass combination needs to be selected when ordering in order to ensure the proper control and configuration of the RETs/TMAs.

RFS' Auto DC Sense multiplexers make the selection of the correct combiner simpler, since there is no need to choose one fixed DC/AISG bypass version. The correct bypass is automatically detected, thereby enabling a safe and easy deployment of the auto-sense combiners in universal applications.

How Does an Auto-Sense Combiner Work?

- Automatic detection of DC voltage on the input port
- Short-circuit detection to acknowledge connected RETs/TMAs
- DC/AISG signal is bypassed to connected devices

Features / Benefits:

- Prevents installation mistakes
- Reduces warehouse stock – only one type of product needed for all situations
- Reduces ordering logistics and number of parts
- Eliminates the need for external DC stops
- Easy retrofitting of networks
- AISG and CWA functionality

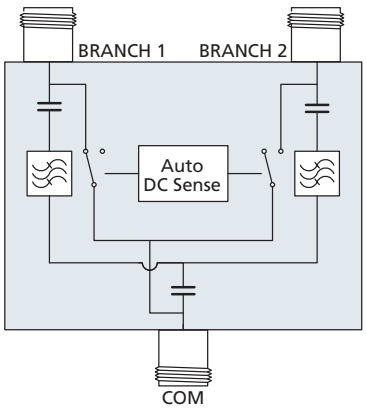
DC Sense Example

	Branch 1 555-806 MHz	Branch 2 824-960 MHz
Priority 1 (Highest)	**X**	
Priority 2 (Lowest)		**X**

In case of more than one port supplying DC/AISG signal:
- Higher Priority will automatically bypass to/from the COM port
- Lower Priority will not pass
- DC-Block Jumper can be used if DC Should not be passed per logic above

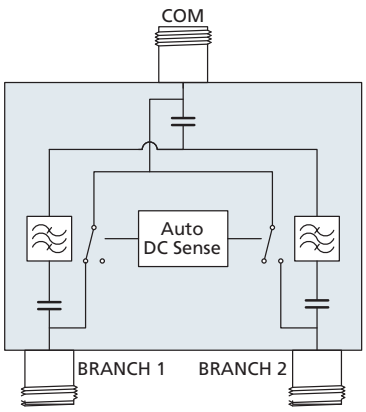
Diplexer Mode (Near Antenna)

- DC Blocks provide a DC open circuit, will not pass DC/AISG
- Antennas connected without a Bias-T provide a DC short circuit, will not pass DC/AISG
- To turn on port after it has been shut off due to short, reset unit by cycling the power



Standard Priority for Diplexer Mode

Combiner Mode (Near BTS)



Standard Priority for Combiner Mode

UltraAmp™ **Amplifiers**

UltraAmp™ Tower Mounted Amplifiers

Beyond Coverage Improvement

Tower Mounted Amplifiers (TMAs) are installed at the top of cell towers as close as possible to the antenna. The low noise amplifiers inside the TMA boost weak signals from mobile devices to let operators improve coverage and capacity without deploying new cells in locations where remote radio heads (RRHs) cannot be mounted near the antenna on the tower.

Boosting signals brings benefits

Operators can use TMAs to:

- Improve base station sensitivity to deliver better voice quality, drop fewer calls and increase customer satisfaction
- Improve bit-rate coverage for 3G, 4G and 5G data transmissions to enhance coverage, increase capacity and offer a higher quality user experience
- Enlarge cell sizes to optimize cell coverage and cell breathing to serve more customers from the same base station and ultimately generate more revenue

An extensive selection of flexible Tower Mounted Amplifiers to choose from

RFS is a leading supplier of TMAs in the North American market, supporting the largest operators and other equipment manufacturers (OEMs). RFS' broad TMA portfolio includes:

- Twin- and dual-band models that cover all major bands and applications
- Dual-band models with internal duplexing
- Variable gain models for low- and high-band applications
- A Current Window Alarm (CWA) base station interface or an AISG 2.0 / 3GPP-compliant interface for use with remote tilt antenna systems
- Flexible mechanical design for easy installation and versatile mounting options
- Complimentary power distribution units and bias-Ts as part of the RFS total solution

UltraAmp™ Tower Mounted Amplifiers

Beyond Coverage Improvement

Understanding Variable Gain in TMAs

Tower Mounted Amplifiers (TMAs) with Variable Gain are very effective in increasing uplink performance for Voice-Over-LTE (VoLTE) service and enhancing system flexibility.

TMAs are increasingly being deployed to overcome limitations of LTE. The LTE system takes advantage of the added uplink gain provided by a TMA, reducing overall interference. TMAs can also increase data rates without reducing capacity.

RFS' TMAs feature DC sense and DC/AISG bypass and are ready for antennas with integrated AISG Bias-Ts. The by-pass will allow operators to reduce the number of cables/jumpers on towers, lowering monthly leasing costs and minimizing connection points.

The new RFS units cover and allow for seamless transitions to new, expanded frequencies. Variable Gain TMAs feature best-in-class PIM of -160dBc for improved network performance. Exceptionally small and lightweight, they reduce tower loading to decrease monthly leasing costs, ease zoning and installation, and lower overall installation costs.

The RFS Advantage

With RFS tower mounted amplifiers, operators can:

- **Reduce tower loading and simplify installations** with extremely lightweight TMAs and a single feeder cable for the downlink and the uplink
- **Improve site coverage and capacity** with TMAs that feature very low noise figures
- **Increase downlink coverage** with low-insertion-loss transmit filtering
- **Improve receive and transmit isolation** with state-of-the-art filtering that reduces noise and interference
- **Reduce logistics and inventory requirements** with a common power supply

Portfolio Overview – Typical Frequency Combinations

Model Number	US 600 Band 71 617-652 663-698	US 700 Band 12 (Lower ABC) 698-716 728-746	US 700 Band 13 (Upper C) 746-756 777-787	CEL 850 Band 5 824-849 869-894	E-GSM 900 Band 8 880-915 925-960	AWS-4 Lower 1695-1710	AWS-1, 3 Band 66 1710-1780 2110-2200	DCS 1800 Band 3 1710-1785 1805-1880	PCS Band 2 1850-1910 1930-1990	IMT 2100 Band 1 1920-1980 2110-2170
Single Band TMAs										
ATM700 Series		Rx Tx								
ATM75D7 Series			Rx Tx							
ATM75D785 Bypass Series			Rx Tx	Bypass						
ATM900 Series					Rx Tx					
ATM181412 Series								Rx Tx		
ATM1900 Series									Rx Tx	
ATM2100 Series										Rx Tx
ATMA3D Series							Rx Tx			
ATMA4D Series						Rx	Rx Tx			
Dual Band TMAs										
ATM6T7 Series	Rx Tx	Rx Tx								
ATM7585D7 Series			Rx Tx		Rx Tx					
ATMA3P Series							Rx Tx		Rx Tx	
ATMA4P Series						Rx	Rx Tx		Rx Tx	
ATMA4P Bypass Series	Bypass	Bypass	Bypass	Bypass	Bypass	Rx	Rx Tx		Rx Tx	

UltraAmp™ Tower Mounted Amplifiers

RFS Portfolio of Tower Mounted Amplifiers

Tower Mounted Amplifier Product Specifications

			ELECTRICAL SPECIFICATIONS					MECHANICAL SPECIFICATIONS		
Model Number	Branch	Frequency Range, MHz	Gain, dB	Insertion Loss, Typ., dB	Noise Figure, Typ., dB	Group Delay, ns	PIM, dBc	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors
ATM6T7D4-1A20	Uplink (Rx)	663-698 (Band 71), 698-716 (Band 12)	0-12 +1.5, -1.0	-	<1.5 (Room Temp)	<245	-161	8.5 (18.8)	318 x 257 x 105 (12.5 x 10.1 x 4.1)	4.3-10 (F)
	Downlink (Tx)	617-652 (Band 71), 728-746 (Band 12)		<0.3		<50				
ATM6T7Q4-1A20	Uplink (Rx)	663-698 (Band 71), 698-716 (Band 12)	0-12 +1.5, -1.0	-	<1.5 (Room Temp)	<245	-161	17 (37.5)	318 x 257 x 213 (12.5 x 10.1 x 8.4)	4.3-10 (F)
	Downlink (Tx)	617-652 (Band 71), 728-746 (Band 12)		<0.3		<50				
ATM700LD-1A20	Uplink (Rx)	698-716	12 +/- 1	0.3	1.4	<195	-158	6 (13.3)	320 x 257 x 80 (12.6 x 10.1 x 3.1)	7/16 (F)
	Downlink (Tx)	728-746				<65				
ATM75D7-VA	Uplink (Rx)	777.5-787	3-12 +/- 1.0	0.3	1.3	<230	-158	5.9 (13)	320 x 257 x 80 (12.6 x 10.1 x 3.1)	7/16 (F)
	Downlink (Tx)	746-756				55				
ATM75D785BP-VA	Uplink (Rx)	777.5-787	3-12 +/- 1.0	-	1.6	<230	-161	6.8 (15)	335 x 320 x 79 (13.2 x 12.6 x 3.1)	7/16 (F)
	Downlink (Tx)	746-756		0.3	-	<60				
	Bypass	824-894		0.15	-	20				
ATM900D-1A20	Uplink (Rx)	880-915	12 +/- 1	0.4	1.2	200	-158	6 (13.2)	323 x 257 x 80 (12.7 x 10.1 x 3.1)	7/16 (F)
	Downlink (Tx)	925-960				80				
ATM181412D-1A20	Uplink (Rx)	1710-1785	12 +/-1	0.3	1.2	95	-159	3.8 (8.4)	256 x 220 x 71 (10.1 x 8.7 x 2.8)	7/16 (F)
	Downlink (Tx)	1805-1880				35				
ATM1900D-1A20	Uplink (Rx)	1850-1910	12 +/- 1	0.3	1.1	100	-159	3.8 (8.4)	256 x 220 x 71 (10.1 x 8.7 x 2.8)	7/16 (F)
	Downlink (Tx)	1930-1990				30				
ATM1900D-VA20	Uplink (Rx)	1850-1910	3-12 +/-1.0	0.3	1.3	95	-160	3.8 (8.4)	256 x 220 x 71 (10.1 x 8.7 x 2.8)	7/16 (F)
	Downlink (Tx)	1930-1990				50				
ATM2100D-1A20	Uplink (Rx)	1920-1980	12 +/- 1	0.25	1.2 -	45	-159	3.8 (8.4)	256 x 220 x 71 (10.1 x 8.7 x 2.8)	7/16 (F)
	Downlink (Tx)	2110-2170				20				
ATMA3D-1A20	Uplink (Rx)	1710-1780	12 +/- 1	-	<1.05	<35	-160	3.8 (8.4)	256 x 220 x 71 (10.1 x 8.7 x 2.8)	7/16 (F)
	Downlink (Tx)	2110-2180		0.4	-	<20				
ATMA4D-VA20	Uplink (Rx)	1695-1780	3-12 +/- 1.0	-	1.05	10	-160	3.8 (8.4)	256 x 220 x 71 (10.1 x 8.7 x 2.8)	7/16 (F)
	Downlink (Tx)	2110-2200		0.3	-	20				
ATM7585D7-VA	Uplink (Rx)	777.5-787 & 824-849	3-12 +/- 1.0	0.25	1.2-1.4 -	<300	-161	11.1 (24.5)	145 x 325 x 257 (12.8 x 10.1 x 5.7)	7/16 (F)
	Downlink (Tx)	746-756 & 869-894				55				
ATMA3P-1A20	Uplink (Rx)	1710-1780 (AWS), 1850-1910 (PCS)	12 +/-1	-	<1.05	<120	-160	3.8 (8.4)	256 x 220 x 71 (10.1 x 8.7 x 2.8)	7/16 (F)
	Downlink (Tx)	1930-1990 (PCS), 2110-2180 (AWS)		0.4	-	<20-42				
ATMA3P4-1A20	Uplink (Rx)	1710-1780 (AWS), 1850-1910 (PCS)	12 +/- 1	-	<1.2 (AWS), <1.3 (PCS)	<40 AWS, <100 PCS	-160	3.8 (8.4)	256 x 220 x 71 (10.1 x 8.7 x 2.8)	7/16 (F)
	Downlink (Tx)	1930-1990 (PCS), 2110-2180 (AWS)		0.2 (AWS), 0.3 (PCS)	-	<45 PCS, <20 AWS				
ATMA4P-VA20	Uplink (Rx)	1695-1780 (AWS), 1850-1910 (PCS)	3-12 +/- 1.0	-	1.1 (AWS), 1.2 (PCS)	35 (AWS), 100 (PCS)	-160	3.8 (8.4)	256 x 220 x 71 (10.1 x 8.7 x 2.8)	7/16 (F)
	Downlink (Tx)	2110-2200 (AWS), 1930-1990 (PCS)		0.25	-	35 (AWS), 100 (PCS)				
ATMA4P4-1A20	Uplink (Rx)	1695-1780 (AWS), 1850-1910 (PCS)	12 +/- 1	-	AWS: 1.1, PCS: 1.25	AWS: 30, PCS: 100	-160	3.49 (7.7)	284 x 203 x 79 (11.2 x 8.0 x 3.1)	7/16 (F)
	Downlink (Tx)	2110-2200 (AWS), 1930-1990 (PCS)		AWS:0.2, PCS: 0.3	-	AWS: 30, PCS: 100				
ATMA4P4-VA20	Uplink (Rx)	1695-1780 (AWS), 1850-1910 (PCS)	3-12 +/- 1.0	-	AWS: 1.1, PCS: 1.25	AWS: 30, PCS: 100	-160	3.49 (7.7)	284 x 203 x 79 (11.2 x 8.0 x 3.1)	7/16 (F)
	Downlink (Tx)	2110-2200 (AWS), 1930-1990 (PCS)		0.2 (AWS), 0.3 (PCS)	-	AWS: 30, PCS: 100				
ATMA4P4BP-1A20	Uplink (Rx)	1695-1780 (AWS), 1850-1910 (PCS)	12 +/- 1.0	-	AWS: 1.1, PCS: 1.25	AWS: 30, PCS: 100	-160	4.3 (9.5)	284 x 203 x 79 (11.2 x 8.0 x 3.1)	7/16 (F)
	Downlink (Tx)	2110-2200 (AWS), 1930-1990 (PCS)		0.2 (AWS), 0.3 (PCS), 0.1 (LB)	-	AWS: 30, PCS: 100				
	Bypass	555-960		0.1		5				

NOTE: For complete product specifications, please visit our eCatalog

UltraAmp™ Tower Mounted Amplifiers

RFS Portfolio of Tower Mounted Amplifiers

Tower Mounted Amplifier Product Specifications

			ELECTRICAL SPECIFICATIONS					MECHANICAL SPECIFICATIONS		
Model Number	Branch	Frequency Range, MHz	Gain, dB	Insertion Loss, Typ., dB	Noise Figure, Typ., dB	Group Delay, ns	PIM, dBc	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors
ATMA4P4BP-VA20	Uplink (Rx)	1695-1780 (AWS), 1850-1910 (PCS)	3-12 +/- 1.0	-	AWS: 1.1, PCS: 1.25	AWS: 30, PCS: 100	-160	4.3 (9.5)	284 x 203 x 79 (11.2 x 8.0 x 3.1)	7/16 (F)
	Downlink (Tx)	2110-2200 (AWS), 1930-1990 (PCS)		0.2 (AWS), 0.3 (PCS), 0.1 (LB)	-	AWS: 30, PCS: 100				
	Bypass	555-960		0.1		5				
ATMA4P4DBP-1A20	Uplink (Rx)	1695-1780 (AWS), 1850-1910 (PCS)	12 +/- 1	-	AWS: 1.1, PCS: 1.25	AWS: 30, PCS: 100	-160	7.2 (15.8)	284 x 203 x 126 (11.2 x 8.0 x 4.9)	7/16 (F)
	Downlink (Tx)	2110-2200 (AWS), 1930-1990 (PCS)		0.2 (AWS), 0.3 (PCS)	-	AWS: 30, PCS: 100				
	Bypass	555-960		0.1		5				
ATMA4P4DBP-VA20	Uplink (Rx)	1695-1780 (AWS), 1850-1910 (PCS)	3-12 +/- 1.0	-	AWS: 1.1, PCS: 1.25	AWS: 30, PCS: 100	-160	7.2 (15.8)	284 x 203 x 126 (11.2 x 8.0 x 4.9)	7/16 (F)
	Downlink (Tx)	2110-2200 (AWS), 1930-1990 (PCS)		0.2 (AWS), 0.3 (PCS), 0.1 (LB)	-	AWS: 30, PCS: 100				
	Bypass	555-960		0.1		5				

NOTE: For complete product specifications, please visit our eCatalog

Model Number Structure

ATM	1900	D	Blank	–1A20
PRODUCT TYPE	FREQUENCY, MHZ	CONFIGURATION	CONNECTOR TYPE	CONFIGURATION
ATM Tower Mounted Amplifier	6T 617-652 / 663-698	Blank Single	4 4.3-10 Female	1C Fixed Gain
	700 746-756 / 777-787	D Dual (two paths in a single housing or clamshell design)	Blank 7/16 Female	V Variable Gain
	700L / 70 698-716 / 728-746	BP Bypass	7 7/16 Female	A AISG
	700PS 758-768 / 788-798	Q Quad		A20 AISG 2.0 and 1.1
	75 746-756 / 777-787			
	85 824-849 / 869-894			
	900 880-915 / 925-960			
	A 1710-1755/2110-2155			
	A3 1710-1780/2110-2180			
	A4 1695-1780/2110-2200			
	P4 1850-1910 / 1930-1990 (dual diplexed with AWS)			
	181412 1710-1785 / 1805-1880			
	1900 1850-1910 / 1930-1990			
	2100 1920-1980 / 2110-2170			

Examples

ATM1900D-1A20

ATM	=	Tower Mounted Amplifier
1900	=	Amplified 1850-1910/1930-1990
D	=	Dual
Blank	=	7/16 Female connectors
1	=	Fixed gain
A20	=	AISG 2.0

ATMA4P4DBP-VA20

ATM	=	Tower Mounted Amplifier
A4	=	Amplified 746-756/777-787
P4	=	1850-1910/1930-1990
D	=	Dual
Blank	=	7/16 Female connectors
BP	=	Bypass 824-849/869-894
V	=	Variable Gain and DC Pass
A20	=	AISG 2.0

ATM75D785BP-VA

ATM	=	Tower Mounted Amplifier
75	=	Amplified 746-756/777-787
D	=	Dual
7	=	7/16 Female connectors
858P	=	Bypass 824-849/869-894
V	=	Variable Gain and DC Pass
A	=	AISG 2.0

Co-Location **Filters**

Filtering Solutions

Protect Your Network Investment With Customized Filter Designs

Co-location filters reduce interference and improve system performance when frequency bands are located close together and have smaller-than-ideal guard bands. They help operators maximize capacity and use their assigned frequency spectrum as efficiently as possible. As more frequency bands are added to address exploding demand for mobile services, the need for filters increases.

Tailored to protect network investments

RFS understands that co-location scenarios are complex and each operator faces unique filtering challenges. Our customized filter designs can be tailored for any requirement, including:

- Using FDD and TDD spectrums without interface
- Protecting a system from out-of-band emissions (OOBE) in a small cell application
- Stopping out-of-band emissions across geographic or political borders
- Mitigating interference in radar and microwave applications
- Improving the signal quality of television channels
- Reducing interference between operators providing services in the same frequency band
- Meeting government requirements for quality of service

A proven expert in filtering technology

RFS engages with customers at the earliest stages in a project to deliver innovation in design and efficient manufacturing techniques. Our customized filter designs incorporate proven building blocks that have been successfully deployed in filter solutions around the globe.

All RFS filtering solutions undergo rigorous testing for shock, vibration, temperature extremes, salt, fog and other environmental hazards. With state-of-the-art manufacturing capabilities, lean production methods and multiple locations around the world, RFS has everything needed for repeatability and fast turnaround times on custom filter designs.

The RFS Advantage

With RFS filtering solutions, network operators can:

- **Protect network investments** with a customized filtering solution that addresses their unique challenges
- **Save development time and money** with a filtering solution that is based on field-proven building blocks
- **Accelerate deployments** with quick turnaround times that are enabled by state-of-the-art manufacturing techniques
- **Ensure the highest quality system performance** with filters that feature low insertion loss, low group delay and narrow guard bands with long-lasting, extremely reliable filters that are built for harsh conditions

Custom Filters – RFS Case Studies

Challenge	RFS Solution
	**Utilizing both FDD and TDD spectrums without interference** • A frequency auction was held in Taiwan for four FDD and two TDD licenses in the 2.5/2.6 GHz spectrum. • It was critical that both LTE systems coexist without interfering with each other. • RFS designed and prototyped two distinct, low-cost, high-performance solutions in less than eight weeks. • RFS filters enabled FDD/TDD to operate in harmony and were the preferred solution due to the cost-effective pricing.
	**Protect a system from out-of-band LTE emissions in a small cell application** • A filtering solution was needed for LTE2600 to protect an adjacent system uplink from out-of-band LTE emissions. • The New York City small cell application required the filter be sized appropriately for easy concealment. • RFS designed a two-branch device using high-performance combline filter technology to minimize effect on pass-band. • RFS provided the solution quickly and remained in constant contact with the customer to accommodate changing spec requirements.
	**Out-of-band emissions at the Canadian / USA border** • An 800MHz LTE/ CDMA system on the US/ Canada border had out-of-band emissions above FCC requirements for the Business and Industrial Land Transportation (B/ILT) licensees. • Frequency points and rejections were non-negotiable and the filters had a firm weight requirement. • RFS engineered four ceramic filters utilizing common components across all filters and requiring only tuning variations to differentiate them. • RFS delivered on time with four low insertion loss filters brilliantly crafted to meet critical frequency points.
	**Government mandate prompts fast fix on interference issues in Uganda** • In Uganda, LTE Band 20 interference with CDMA850 prompted the government to mandate a fast fix. • RFS was selected over competing vendors and provided its Interference Mitigation Filter to solve the problem. • Within three months, RFS completed the design and supplied over 500 filters that are now being used at 200 sites in Uganda.

Filtering Solutions

Flexible Interference Mitigation Filter Platforms

Filter Product Specifications

				MECHANICAL SPECIFICATIONS				ELECTRICAL SPECIFICATIONS		
Model Number	Pass Band, MHz	Guard Band, MHz	Rejection Band, MHz	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	Ports	RF Connectors	Group Delay, ns	Typ. Insertion Loss, dB	Min. Rejection, dB
FIM1971A43D4-1C	1920-2170	-	1962-1980	3.0 (6.6)	207 x 162 x 64 (8.1 x 6.4 x 2.5)	2 in/2 out	4.3-10 (F)	-	<0.25-0.45	40
FIM2155A40SN-1C	2025-2109.5 & 2448-2502	1	2110.5-2200	5 (11)	62 x 247 x 216 (2.5 x 9.7 x 8.5)	2 in/2 out	N-Female	-	0.25-0.3	40
FIM2557A7389-NC	2630-2690	12	2496-2618	10 (22)	25 x 391 x 84 (8.8 x 15.4 x 3.3)	8 in/8 out	4.1/9.5 (F)	80	0.35	73
FIM2595A55SN-NC	2390-2484 & 5150-5725	16	2500-2690	1.5 (3.3)	113 x 93 x 37 (4.4 x 3.7 x 1.5)	1 in/1 out	Type N (F)	-	0.35	30-55
FIM2595A55SQ-NC	2390-2484 & 5150-5725	16	2500-2690	1.5 (3.3)	113 x 93 x 37 (4.4 x 3.7 x 1.5)	1 in/1 out	QMA Female (Single)	-	0.35	30-55
FIM2595A55TRQ-NC	2390-2484 & 5150-5725	16	2500-2690	1.5 (3.3)	113 x 93 x 37 (4.4 x 3.7 x 1.5)	3 in/3 out	QMA Female (6X)	-	0.35	30-55
FIM2650A55DN-NC	2390-2484 & 5150-5725	36	2520-2540 & 2640-2660	2 (4.4)	100 x 163 x 38 (3.9 x 6.4 x 1.5)	2 in/2 out	Type N (F)	-	<0.25-0.3	30-55
FIM2660A737Q7-NC	2496-2618	12	2630-2690	5.3 (11.7)	213 x 311 x 49 (8.4 x 12.3 x 1.9)	4 in/4 out	7/16 (F)	60	0.35	73
FIM3252A6089-1C	2496-2690	14	2704-3800	6 (13.3)	104 x 274 x 238 (4.1 x 10.8 x 9.3)	8 in/8 out	4.1/9.5 (F)	48	0.3	35-60
FIM709A90D4-1C	718.5-728	1	704-717.5	5.9 (13)	284 x 268 x 76 (11.2 x 10.6 x 3)	2 in/2 out	4.3-10 (F)	500	0.7	24-90
FIM709A90D7-1C	718.5-728	1	704-717.5	5.9 (13)	284 x 268 x 76 (11.2 x 10.6 x 3)	2 in/2 out	7/16 (F)	500	0.7	24-90
FIM723A28D7-1C	704-714 & 734-744	4 & 6	718-728	6 (13.2)	284 x 268 x 76 (11.2 x 10.6 x 3)	2 in/2 out	7/16 (F)	70 (Rx), 55 (Tx)	0.2	28
FIM800CAB-A1D	817-824 (Rx) & 864.725-869 (Tx)	25 & 0.825	849-861.35 & 861.35-863.9	24 (53)	386 x 245 x 208 (15.2 x 9.6 x 8.2)	2 in/2 out	7/16 (F)	60 & 750	0.5 (Rx) & 1.0 (Tx)	47 -52
FIM800CAB-C1D	817-824 (Rx) & 863.525-869 (Tx)	25 & 0.6	849-861.35 & 861.35-862.925	24 (53)	386 x 245 x 208 (15.2 x 9.6 x 8.2)	2 in/2 out	7/16 (F)	60 & 1150	0.5 (Rx) & 1.0 (Tx)	47 -52
FIM800CAB-C2D	817-824 (Rx) & 864.75-869 (Tx)	25 & 0.6	849-861.35 & 861.35-863.9	24 (53)	386 x 245 x 208 (15.2 x 9.6 x 8.2)	2 in/2 out	7/16 (F)	60 & 1225	0.5 (Rx) & 1.0 (Tx)	47 -52
FIM800CAB-C3S	817-824 (Rx) & 866-869 (Tx)	25 & 1.175	849-861.35 & 861.35-864.825	24 (53)	386 x 245 x 208 (15.2 x 9.6 x 8.2)	2 in/2 out	7/16 (F)	60 & 500	<0.5-1.0	47 -52
FIM850LTE1-1C	852-862 (Rx) & 811-821 (Tx)	3 & 8 & 7	824-834 & 834-844 & 869-894	9.5 (21)	378 x 258 x 81 (14.9 x 10.1 x 3.2)	2 in/2 out	7/16 (F)	220 & 135	<0.5-0.6	>40-60
FIM850LTE2R-1C	847-857 (Rx) & 806-816 (Tx)	8 & 3 & 12	824-834 & 834-844 & 869-894	9.5 (21)	378 x 258 x 81 (14.9 x 10.1 x 3.2)	2 in/2 out	7/16 (F)	220 & 135	<0.5-0.6	>12-50
FIM875A44D7-1C	882.5-915.0 (Rx) & 927.5-960 (Tx)	2.5 & 47.5	870-880	4.5 (9.9)	258 x 245 x 72 (10.1 x 9.6 x 2.8)	2 in/2 out	7/16 (F)	200	0.2 & 0.15	46 & 44
FIM875A70D7-1C	885-960	5	870-880	4.5 (10)	259 x 244 x 73 (10.2 x 9.6 x 2.9)	2 in/2 out	7/16 (F)	180	0.15-0.25	70
FIM887A50D4-1C	898.5-960	4.5	869-894	6 (13.2)	222 x 187 x 140 (8.7 x 7.3 x 5.5)	2 in/2 out	4.3-10 (F)	-	<0.65 max @898.5-900.0, <0.5 @ 900.0-906, <0.3 max @906-960	40
FIM891A32D7-NC	846.5-849 (Rx) & 891.555-893.925 (Tx)	0.055 & 0.075	891.4-891.5 & 894-894.1	8.2 (18)	311 x 237 x 111 (12.2 x 9.3 x 4.3)	1 in/1 out	7/16 (F)	-	0.15	891.4-891.5, >32dB; 894-894.1, >16 dB
FIM891A64D7-NC	846.5-849 (Rx) & 891.555-893.925 (Tx)	0.055 & 0.075	891.4-891.5 & 894-894.1	16 (35.3)	311 x 237 x 197 (12.2 x 9.3 x 7.7)	2 in/2 out	7/16 (F)	-	0.3	891.4-891.5, >64dB; 894-894.1, >32dB

NOTE: For complete product specifications, please visit our eCatalog

Filtering Solutions

Flexible Interference Mitigation Filter Platforms

Filter Product Specifications

				MECHANICAL SPECIFICATIONS				ELECTRICAL SPECIFICATIONS		
Model Number	Pass Band, MHz	Guard Band, MHz	Rejection Band, MHz	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	Ports	RF Connectors	Group Delay, ns	Typ. Insertion Loss, dB	Min. Rejection, dB
FIM899A50D7-1C	824-879	3.5	882.5-915	4.5 (10)	259 x 244 x 73 (10.2 x 9.6 x 2.9)	2 in/2 out	7/16 (F)	190	<0.15-0.35	50
FIM899A70D7-1C	824-879	3.5	882.5-915	9.0 (19.8)	411 x 315 x 84 (16.2 x 12.4 x 3.3)	2 in/2 out	7/16 (F)	300	<0.15-0.35	70
FIM900A70D7-1C	824-880	5	885-960	9.0 (19.8)	411 x 315 x 84 (16.2 x 12.4 x 3.3)	2 in/2 out	7/16 (F)	180	0.25-0.35	70
FIM906-1C	824-894	3.5	897.5-915	3.0 (6.6)	206 x 157 x 85 (8.1 x 6.2 x 3.3)	1 in/1 out	7/16 (F)	200	<0.3-1.2	50
FIMB382575-1C	2500-2570 & 2620-2690	5 & 5	2575-2615	8.2 (18)	348 x 351 x 56 (13.7 x 13.8 x 2.2)	2 in/2 out	7/16 (F)	110 & 110	0.4	40
FIMB72575-1C	2575-2615	10 & 10	2500-2565/ 2625-2690	5.4 (12)	264 x 256 x 56 (10.4 x 10.1 x 2.2)	2 in/2 out	7/16 (F)	60 & 1150	0.5	40
FIMBW2593-1C	2496-2565.4 & 2619.8-2690	16.6 & 10.8	2582-2609	14.4 (31.7)	207 x 346 x 174 (8.1 x 13.6 x 6.8)	8 in/8 out	Mini DIN (F)	8	0.5	60
FIMBW2593S-1C	2496-2565.4 & 2619.8-2690	16.6 & 10.8	2582-2609	4.1 (9.1)	346 x 211 x 71 (27 x 13.6 x 8.3)	2 in/2 out	4.1/9.5 (F)	8	0.5	>60
FIMG875H-1C	881.6-893.2 & 925-935	1.6	869-880	9.5 (20.9)	393 x 297 x 86 (15.5 x 11.7 x 3.4)	2 in/2 out	4.3-10 (F)	300	>0.3-0.5	40
FIMG900H-1C	887.5-900 & 932.5-945	1.105	869-886.395	9.5 (20.9)	393 x 297 x 86 (15.5 x 11.7 x 3.4)	2 in/2 out	4.3-10 (F)	470	<0.3- 0.5	40
FIMH874WD7-1C	890-915 (Rx) & 935-960 (Tx)	11	869-879	6 (13.2)	207 x 175 x 170 (8.1 x 6.9 x 6.7)	2 in/2 out	7/16 (F)	40	0.2	45
FIMH875D7-1C	882.5-960	12.5 & 80	870-880	6 (13.2)	207 x 175 x 170 (8.1 x 6.9 x 6.7)	2 in/2 out	7/16 (F)	40	<0.15-<1.25	44
FIMH877N-1C	880-960	2.5	870-877.5	3.0 (6.6)	207 x 175 x 83 (8.1 x 6.9 x 3.3)	1 in/1 out	7/16 (F)	325	<0.2-<1.25	40
FIMH881-1C	897.5-960	3.5	869-894	3.0 (6.6)	206 x 157 x 85 (8.1 x 6.2 x 3.3)	1 in/1 out	7/16 (F)	160	<0.3-1.0	50
FIMM1963-1C	2496-2550 & 2578-2690	8 & 10	2558-2568	9.5 (21)	324 x 407 x 71 (12.7 x 16 x 2.8)	8 in/8 out	N-Female	<8@2550-2578 & <4@2545-2583	0.5	>44
FIMM1963S-1C	2496-2550 & 2578-2690	8 & 10	2558-2568	2.9 (6.5)	175 x 178 x 112 (7.0 x 4.4 x 3.7)	2 in/2 out	4.1/9.5 (F)	8	0.85	>35
FIMW1965-1	1920-1950 (Rx) & 2110-2170 (Tx)	10 & 140	1960-1970	5 (11)	65 x 265 x 155 (2.6 x 10.4 x 6.1)	2 in/2 out	7/16 (F)	30 & 2	<0.3 (Rx) & <0.15 (Tx)	>61
FIMW1965H-1	1920-1958.8 (Rx) & 2110-2170 (Tx)	11.25 & 140	1961.25-1970	5 (11)	65 x 265 x 155 (2.6 x 10.4 x 6.1)	2 in/2 out	7/16 (F)	200 & 2	<1 (Rx) & <0.15 (Tx)	>45
FIMW1985-1C	1920-1960 & 2110-2170	23.25 & 120	1983.25-1990	3.0 (6.6)	207 x 162 x 64 (8.1 x 6.4 x 2.5)	2 in/2 out	4.3-10 (F)	18 & 7	<0.25-0.4	40
KIT-FIMH887N-1C-DL	880-960	4.5	870-877.5	6 (13.2)	207 x 175 x 170 (8.1 x 6.9 x 6.7)	2 in/2 out	7/16 (F)	<100	<0.2-1.25	40

NOTE: For complete product specifications, please visit our eCatalog

In-Band **Combiners**

In-Band Combiners

Support New Technology and Increase Network Capacity

In-band combiners, also known as same-band combiners, combine the same frequency band from different base stations into a single feeder cable or antenna. They give operators the flexibility to share equipment, support new technologies and increase capacity without the time, cost and complexity of installing new antennas and renegotiating lease agreements. Operators can use an in-band combiner to:

- Create a flexible path to an LTE overlay network by enabling LTE and CDMA base stations to share antenna ports.
- Increase bandwidth or capacity by enabling a single antenna port to support more carriers than a single remote radio head (RRH) can support.
- Increase the amount of power provided per carrier by combining multiple RRH ports into a single antenna port.

Customized for any requirement
RFS custom designs and manufactures in-band combiners to meet any requirement. With experience delivering in-band combiners for a variety of frequency bands and applications in more than 10,000 installations globally, RFS has the field-proven expertise network operators demand for network efficiency and reliability.

Designed for lasting performance
RFS designs exceptionally reliable, high-performance ceramic combiners with very low insertion loss, high power capability and high isolation between ports. All RFS in-band combiners easily integrate with RRH brackets and withstand severe weather conditions and temperature changes.

The RFS Advantage

With RFS in-band combiners, operators can:

- **Reduce installation time, costs and tower loading** by sharing feeders and antennas across the same frequency band
- **Keep performance high and link budgets down** with very low insertion loss
- **Support more carriers on a single antenna port** with high power capabilities
- **Maintain the quality of individual signals** with high isolation between ports
- **Reduce maintenance and replacement costs** with exceptional reliability

In-Band Combiners

Field-Proven Expertise to Meet Any Combining Requirement

In-Band Combiners Product Specifications

					MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS		
Model Number	Ports	Path	Frequency Range, MHz	Band	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Insertion Loss, dB max	Isolation, dB, min.	PIM, dBm
IBC1900AA-1	4 In / 2 Out	1- RRH1	1850-1854.375 & 1910-1915	PCS Rx A1-A3 & G	10 (22)	320 x 233 x 111 (12.6 x 9.2 x 4.3)	7/16 (F)	0.5	30	-155
		2 - RRH2	1959.375-1864.375	PCS Rx A8-A11						
		3 - RRH1	1930-1934.375 & 1990-1995	PCS Tx A1-A3 & G						
		4 - RRH2	1939.375-1994.375	PCS Tx A8-A11						
IBC1900AA-2	8 In / 4 Out	1 - RRH1	1850-1915, 1935.625-1944.375, 1990-1995	PCS Rx A-G, Tx A5-A11 & G	10 (22)	395 x 180 x 112 (15.6 x 7.1 x 4.4)	7/16 (F)	0.5	30	-155
		2 - RRH2	1930.625-1931.875	PCS Tx A1				0.6		
		3- RRH1	1850-1915, 1936.875-1944.375, 1990-1995	PCS Rx A-G, Tx A6-A11 & G				0.5		
		4- RRH2	1931.875-1933.125	PCS Tx A2				0.6		
		5 - RRH1	1850-1915, 1938.125-1944.375, 1990-1995	PCS Rx A-G, & Tx A7-A11 & G				0.5		
		6 - RRH2	1933.125-1934.375	PCS Tx A3				0.6		
		7 - RRH1	1850-1915, 1939.375-1944.375, 1990-1995	PCS Rx A-G, Tx A8-A11 & G				0.5		
		8 - RRH2	1934.375-1935.625	PCS Tx A4				0.6		
IBC1900AA-3	8 In / 4 Out	1 - RRH1	1850-1915 & 1990-1995	PCS Rx A-G & Tx G	10 (22)	391 x 240 x 107 (15.4 x 9.4 x 4.2)	7/16 (F)	0.5	30	-155
		2 - RRH2	1934.375-1944.375	PCS Tx A4-A11				0.6		
		3 - RRH1	1850-1915 & 1990-1995	PCS Rx A-G & Tx G				0.5		
		4 - RRH2	1934.375-1944.375	PCS Tx A4-A11				0.6		
		5 - RRH1	1850-1915 & 1930.625-1934.375	PCS Rx A-G & Tx A1-A3				0.5		
		6- RRH2	1939.375-1944.375	PCS Tx A8-A11				0.6		
		7 - RRH1	1850-1915 & 1930.625-1934.375	PCS Rx A-G & Tx A1-A3				0.5		
		8 - RRH2	1939.375-1944.375	PCS Tx A8-A11				0.6		
IBC1900AA-4	8 In / 4 Out	1 - RRH1	1850-1915 & 1990-1995	PCS Rx A-G & Tx G	10 (22)	391 x 240 x 107 (15.4 x 9.4 x 4.2)	7/16 (F)	0.5	30	-155
		2 - RRH2	1931.875-1941.875	PCS Tx A2-A9				0.6		
		3 - RRH1	1850-1915 & 1990-1995	PCS Rx A-G & Tx G				0.5		
		4 - RRH2	1931.875-1941.875	PCS Tx A2-A9				0.6		
		5 - RRH1	1850-1915 & 1930.625-1934.375	PCS Rx A-G & Tx A1-A3				0.5		
		6- RRH2	1939.375-1944.375	PCS Tx A8-A11				0.6		
		7 - RRH1	1850-1915 & 1930.625-1934.375	PCS Rx A-G & Tx A1-A3				0.5		
		8 - RRH2	1939.375-1944.375	PCS Tx A8-A11				0.6		
IBC1900BB-1	4 In / 2 Out	1- RRH1	1850-1874.375 & 1910-1915	PCS Rx, A, B8-B11 & Rx G	10 (22)	320 x 233 x 111 (12.6 x 9.2 x 4.3)	7/16 (F)	0.5	30	-155
		2 - RRH2	1879.375-1884.375	PCS Rx, B8-B11						
		3 - RRH1	1930-1954.375 & 1990-1995	PCS Tx, A, B1-B3 & Tx, G						
		4 - RRH2	1959.375-1964.375	PCS Tx, B8-B11						

NOTE: For complete product specifications, please visit our eCatalog

In-Band Combiners

Field-Proven Expertise to Meet Any Combining Requirement

In-Band Combiners Product Specifications

					MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS		
Model Number	Ports	Path	Frequency Range, MHz	Band	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Insertion Loss, dB max	Isolation, dB, min.	PIM, dBm
IBC1900BB-2	8 In / 4 Out	1 - RRH1	1850-1915, 1956.875-164.375, & 1990-1995	PCS Rx A-G &Tx B6-B11, G	10 (22)	395 x 180 x 112 (15.6 x 7.1 x 4.4)	7/16 (F)	0.5	30	-155
		2 - RRH2	1950.625-1953.125	PCS Tx B1-B2				0.6		
		3- RRH1	1850-1915, 1958.125-1964.375, & 1990-1995	PCS Rx A-G & Tx B7-B11, G				0.5		
		4- RRH2	1953.125-1954.375	PCS Tx B3				0.6		
		5 - RRH1	1850-1915, 1955.625-1964.375, & 1990-1995	PCS Rx A-G & Tx B5-B11, G				0.5		
		6 - RRH2	1950.625-1951.875	PCS Tx B1				0.6		
		7 - RRH1	1850-1915, 1959.375-1964.375, &1990-1995	PCS Rx A-G & Tx B8-B11, G				0.5		
		8 - RRH2	1954.375-1955.625	PCS Tx B4				0.6		
IBC1900BB-3	8 In / 4 Out	1 - RRH1	1850-1915 & 1990-1995	PCS Rx A-G & Tx G	10 (22)	391 x 240 x 107 (15.4 x 9.4 x 4.2)	7/16 (F)	0.5 0.6	30	-155
		2 - RRH2	1954.375-1964.375	PCS Tx B4 - B11						
		3- RRH1	1850-1915 & 1990-1995	PCS Rx A-G & Tx G						
		4- RRH2	1954.375-1964.375	PCS Tx B4 - B11						
		5 - RRH1	1850-1915 & 1950.625-1954.375	PCS RxA-G & Tx B1-B3						
		6 - RRH2	1959.375-1964.375	PCS Tx B8-B11						
		7 - RRH1	1850-1915 & 1950.625-1954.375	PCS Rx A-G & Tx B1-B3						
		8 - RRH2	1959.375-1964.375	PCS Tx B8-B11						
IBC1900CC-1	4 In / 2 Out	1- RRH1	1850-1980.625	PCS Rx, A1-A8	6.8 (15)	390 x 214 x 65 (15.3 x 8.4 x 2.6)	7/16 (F)	0.5	30	-155
		2 - RRH2	1984.375-1994.75	PCS Tx, C8-C11 & G				0.6		
		3 - RRH1	1850-1980.625	PCS Rx, A1-A8				0.5		
		4 - RRH2	1984.375-1994.75	PCS Tx, C8-C11 & G				0.6		
IBC1900DH-1	4 In / 2 Out	1- RRH1	1890.625-1915	PCS Rx, F, C & G	10 (22)	320 x 233 x 111 (12.6 x 9.2 x 4.3)	7/16 (F)	0.25	30	-155
		2 - RRH2	1864.375-1869.375	PCS Rx D				0.5		
		3 - RRH1	1970.625-1995	PCS F, C & G Tx				0.25		
		4 - RRH2	1944.375-1949.375	PCS Tx D				0.5		
IBC1900EH-1	4 In / 2 Out	1- RRH1	1850-1880.625 & 1910-1915	PCS Rx, A, D, G, & B Low	10 (22)	320 x 233 x 111 (12.6 x 9.2 x 4.3)	7/16 (F)	0.5	30	-155
		2 - RRH2	1885.625-1889.375	PCS Rx E						
		3 - RRH1	1930-1960.625 & 1990-1995	PCS Tx A, D, G, & B Low						
		4 - RRH2	1965.625-1969.375	PCS E Tx						
IBC1900HE-1	8 In / 4 Out	1 - RRH1	1850-1915 & 1990-1995	PCS Rx A-G & PCS Tx G	10 (22)	391 x 240 x 107 (15.4 x 9.4 x 4.2)	7/16 (F)	0.5	30	-155
		2 - RRH2	1954.375-1964.375	PCS Tx B4-B11				0.6		
		3 - RRH1	1850-1915 & 1930.625-1959.375	PCS Rx A-G & PCS Tx A1-A11 & B1-B7-B7				0.5		
		4 - RRH2	1965-1970	PCS Tx E				0.6		
		5 - RRH1	1850-1915 & 1990-1995	PCS Rx A-G & PCS Tx G				0.5		
		6- RRH2	1954.375-1964.375	PCS Tx B4-B11				0.6		
		7 - RRH1	1850-1915 & 1930.625-1959.375	PCS Rx A-G & PCS Tx A1-A11 & B1-B7				0.5		
		8 - RRH2	1965-1970	PCS Tx E				0.6		
IBC1900HE-2	8 In / 4 Out	1 - RRH1	1850-1915 & 1990-1995	PCS Rx A-G & PCS Tx G	10 (22)	391 x 240 x 107 (15.4 x 9.4 x 4.2)	7/16 (F)	0.5	30	-155
		2 - RRH2	1944.375-1954.375	PCS Tx D & B1-B3				0.6		
		3 - RRH1	1850-1915 & 1930.625-1959.375	PCS Rx A-G & Tx A1-A11 & B1-B7				0.5		
		4 - RRH2	1965-1970	PCS Tx E				0.6		
		5 - RRH1	1850-1915 & 1990-1995	PCS Rx A-G & PCS Tx G				0.5		
		6- RRH2	1944.375-1954.375	PCS Tx D & B1-B3				0.6		
		7 - RRH1	1850-1915 & 1930.625-1959.375	PCS Rx A-G & Tx A1-A11, B1-B7				0.5		
		8 - RRH2	1965-1970	PCS Tx E				0.6		

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In-Band Combiners

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In-Band Combiners Product Specifications

					MECHANICAL SPECIFICATIONS			ELECTRICAL SPECIFICATIONS		
Model Number	Ports	Path	Frequency Range, MHz	Band	Weight, kg (lb)	Dimensions, H x W x D, mm (in)	RF Connectors	Insertion Loss, dB max	Isolation, dB, min.	PIM, dBm
IBC1900HG-2 IBC1900HG-2A	4 In / 2 Out	1- RRH1	1850-1905 & 1930-1985	PCS Rx A-F & PCS Tx G	10 (22)	320 x 233 x 111 (12.6 x 9.2 x 4.3)	7/16 (F)	0.2	30	-160
		2 - RRH2	1910.25-1914.75 & 1990.25-1994.75	PCS Rx G & Tx G				0.5		
		3 - RRH1	1850-1905 & 1930-1985	PCS Rx A-F & PCS Tx G				0.2		
		4 - RRH2	1910.25-1914.75 & 1990.25-1994.75	PCS Rx G & Tx G				0.5		
IBC1900HG-2D	8 In / 4 Out	1 - RRH1	1850-1905 & 1830-1985	PCS Rx A, B, C1-C7 & PCS Tx A, B & C1-C7	21 (46)	508 x 225 x 219 (20 x 8.9 x 8.6)	7/16 (F)	0.2	30	-160
		2 - RRH2	1910.25-1914.75 & 1990.25-1994.75	PCS Rx G & Tx G				0.5		
		3 - RRH1	1850-1905 & 1830-1985	PCS Rx A, B, C1-C7 & PCS Rx A, B & C1-C7				0.2		
		4 - RRH2	1910.25-1914.75 & 1990.25-1994.75	PCS Rx G & Tx G				0.5		
		5 - RRH1	1850-1905 & 1830-1985	PCS Rx A, B, C1-C7 & PCS Tx A, B & C1-C7				0.2		
		6- RRH2	1910.25-1914.75 & 1990.25-1994.75	PCS Rx G & Tx G				0.5		
		7 - RRH1	1850-1905 & 1830-1985	PCS Rx A, B, C1-C7 & PCS Tx A, B & C1-C7				0.2		
		8 - RRH2	1910.25-1914.75 & 1990.25-1994.75	PCS Rx G & Tx G				0.5		
IBC1900HG-3	4 In / 2 Out	1- RRH1	1850-1903.125 & 1930-1983.125	PCS Rx A, B, C1-C6 & PCS Tx A1-A11	11.8 (28)	376 x 233 x 111 (14.8 x 9.2 x 4.3)	7/16 (F)	0.25	27	-155
		2 - RRH2	1904.375-1915 & 1984.375-1995	PCS Rx C8-C11, G & PCS Tx C8-C11, G				0.2		
		3 - RRH1	1850-1903.125 & 1930-1983.125	PCS Rx A, B, C1-C6 & PCS Tx A1-A11				0.25		
		4 - RRH2	1904.375-1915 & 1984.375-1995	PCS Rx C8-C11, G & PCS Tx C8-C11, G				0.2		
IBC1900HG-3D	8 In / 4 Out	1 - RRH1	1850-1903.125 & 1930-1983.125	PCS Rx A, B, C1-C6 & PCS Tx A1-A11	11.8 (28)	376 x 233 x 111 (14.8 x 9.2 x 4.3)	7/16 (F)	0.25	27	-155
		2 - RRH2	1904.375-1915 & 1984.375-1995	PCS Rx C8-C11, G & PCS Tx C8-C11, G				0.2		
		3 - RRH1	1850-1903.125 & 1930-1983.125	PCS Rx A, B, C1-C6 & PCS Tx A1-A11				0.25		
		4 - RRH2	1904.375-1915 & 1984.375-1995	PCS Rx C8-C11, G & PCS Tx C8-C11, G				0.2		
		5 - RRH1	1850-1903.125 & 1930-1983.125	PCS Rx A, B, C1-C6 & PCS Tx A1-A11				0.25		
		6- RRH2	1904.375-1915 & 1984.375-1995	PCS Rx C8-C11, G & PCS Tx C8-C11, G				0.2		
		7 - RRH1	1850-1903.125 & 1930-1983.125	PCS Rx A, B, C1-C6 & PCS Tx A1-A11				0.25		
		8 - RRH2	1904.375-1915 & 1984.375-1995	PCS Rx C8-C11, G & PCS Tx C8-C11, G				0.2		
IBC2115-1C	2 In / 1 Out	1 - RRH1	1920-1924.43, 1925.57-1935	UMTS	5.6 (12.3)	261 x 215 x 86 (10.2 x 8.4 x 3.3)	7/16 (F)	3	30	-155
		2 - RRH2	2110-2114.43, 2115.57-2125							

NOTE: For complete product specifications, please visit our eCatalog

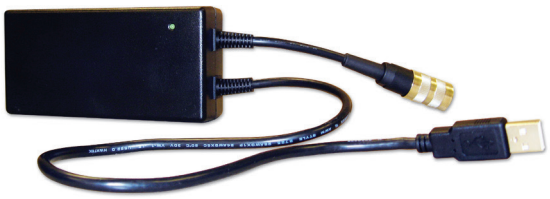
Accessories

Additional Products to Complete Your Network

Accessory Specifications

Model Number	Description
Bias-Ts	
BITUB-07	Ultra wideband Bias-T, 690-2700MHz, with 7/16 Female on RF Port; 7/16 Male on RF+DC port; TNC female on DC port, includes 25ft PDU cable
BITUB-09	Ultra wideband Bias-T, 690-2700MHz, with 7/16 Male on RF Port; 7/16 Female on RF+DC port; TNC female on DC port, includes 25ft PDU cable
BITUB4-4AL20	AISG 2.0 Bias-T with Surge Protection, 698-2690MHz, 4.3-10 Male on RF port; 4.3-10 Female on RF/DC/AISG port; AISG 2.0 Male on DC/AISG port
BITUB-4AL20	AISG 2.0 Bias-T with Surge Protection, 698-2690MHz, 7/16 Male on RF port; 7/16 Female on RF/DC/AISG port; AISG 2.0 Male on DC/AISG port
BITUB-5AL20	AISG 2.0 Bias-T with Surge Protection, 698-2690MHz, 7/16 Female on RF port; 7/16 Female on RF/DC/AISG port; AISG 2.0 Male on DC/AISG port
BITUB-6AL20	AISG 2.0 Bias-T with Surge Protection, 698-2690MHz, 7/16 Female on RF port; 7/16 Male on RF/DC/AISG port; AISG 2.0 Male on DC/AISG port
BITUB-7AL20	AISG 2.0 Bias-T with Surge Protection, 698-2690MHz, 7/16 Female on RF port; 7/16 Male on RF/DC/AISG port; AISG 2.0 Female on DC/AISG port
BITUB-8AL20	AISG 2.0 Bias-T with Surge Protection, 698-2690MHz, 7/16 Female on RF port; 7/16 Female on RF/DC/AISG port; AISG 2.0 Female on DC/AISG port
Power Distribution Units	
PDU-6A	Power Distribution Unit, indoor, 6 channels, automatic current sensing
CA25-P	Power Distribution Unit power cable
Protocol Adapters	
PA-USB/485-1	Optimizer RT® Protocol Adapter with CA015-1 cord (Europe and Asia)
PA-USB/485-2	Optimizer RT® Protocol Adapter with CA015-2 cord (North America)
PA-USB/485-3	Optimizer RT® Protocol Adapter with CA015-3 cord (Australia and New Zealand)
Software	
NEM-ALD-W	Network Element Software – real-time monitoring and control capabilities for tower-top components for operators
Mounting Hardware	
SEM2-1	Wall and Mast Mounting Kit for FDDW & FDGW Series
SEM2-2	Wall and Mast Mounting Kit, Bracket Set for ATM2018-series
SEM2-3	Assembly Kit used to mount a variety of RFS diplexers and filters. Consult the datasheet for specific applications
SEM2-4	Wall and Mast Mounting Kit, Bracket Set for FDDW & FDGW Series
SEM2-5	Wall and Mast Mounting Kit, Bracket Set for ATM2018-series
SEM4-P2IBC	Kit that assembles two IBC1900HG-3 units into a quad configuration
SEMW-1	Filter Mounting Kit

NOTE: For complete product specifications, please visit our eCatalog



Network Element Manager Software

Real-time Monitoring and Control Capabilities for Tower-Top Components

NEM-ALD-W

RFS' Network Element Manager software for Antenna Line Devices (NEM-ALD-W) gives operators real-time monitoring and control capabilities for tower-top components. With a user-friendly graphical interface, operators can monitor and control all of the components in the antenna system, either locally from the tower base or remotely from the operations and maintenance center (OMC).

The Windows-based NEM-ALD-W software is compliant with 3GPP and AISG 2.0 protocols and is delivered to RFS customers free upon request.

Simplifies network management

The NEM-ALD-W software discovers and collects data from every device in the ALD network. Once this is complete, operators can see views of the network, set antenna properties (such as beam tilt), and monitor antenna system components, including:

- Tower mounted amplifiers (TMAs)
- Remote electrical tilt (RET) control units
- Remote e-antenna extension (RAE) devices
- Mechanical tilt sensor (MTS) devices

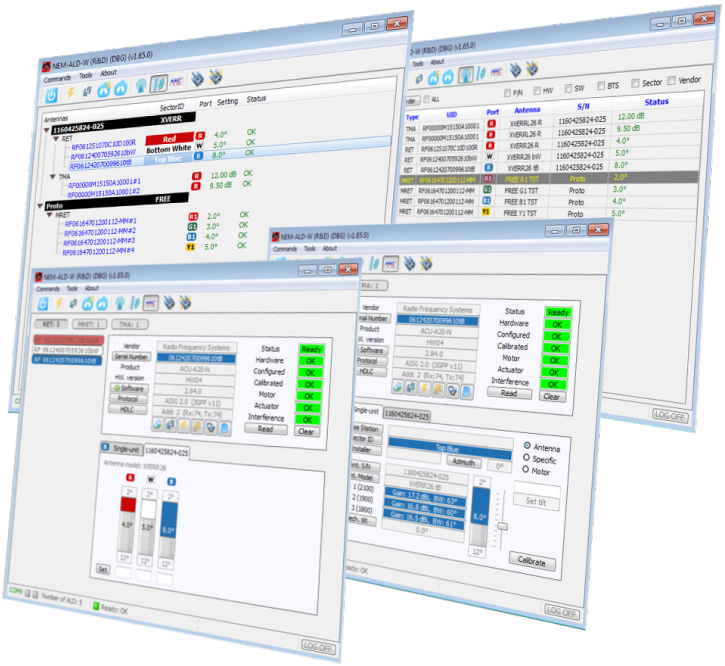
Key features include:

- Real-time progress indication during scans
- Device browsing while the database is building
- Support for all AISG devices, commands and features, including an integrated AISG sniffer log
- Support for parallel operations
- Easy software installation using a setup wizard
- Direct software support from RFS
- Vendor-specific high-speed downloads for RFS devices
- Support for up to 8 subunits per TMA or RET

The RFS Advantage

With the NEM-ALD-W software,operators can:

- **Reduce ALD management complexity** by simplifying ALD queries and streamlining every aspect of ALD network management
- **Improve network visibility** with a user-friendly, graphical view of the cell site, antennas and devices, and the ability to group single RET control units by antenna serial number
- **Reduce costs** with free network management software that includes full support
- **Increase flexibility** with local or remote management of 3GPP and AISG 2.0 devices and the ability to export the AISG network file for the site
- **Increase efficiency** by accurately monitoring and controlling all ALD components from a single location



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