

AFM-L
Compatible With
Arris 331e
Line Extender

AFM-E
Compatible With
Arris 900
Line Extender

AFM-T / B
Compatible With
Arris 901e
FMB/FMT

ASEM™ Replacement Upgrade RF Modules 1002 MHz For C-Cor™/Arris®

The ACI ASEM 1G RF replacement upgrade modules for C-Cor™/Arris® are now offered with the Gallium Nitride (GaN) hybrid technology that allows for 3 dB higher output levels while maintaining close to the same specifications as the previous stations with the Gallium Arsenide (GaAs) hybrids. With this increase in the output level capabilities the cable operators are now able to extend the fiber deeper in their networks at a lower cost by reducing the number of active that are needed. The GaN hybrid technology is also extremely beneficial for use in the traditional HFC networks with the increase in station performance at the standard output levels over the GaAS hybrid stations.

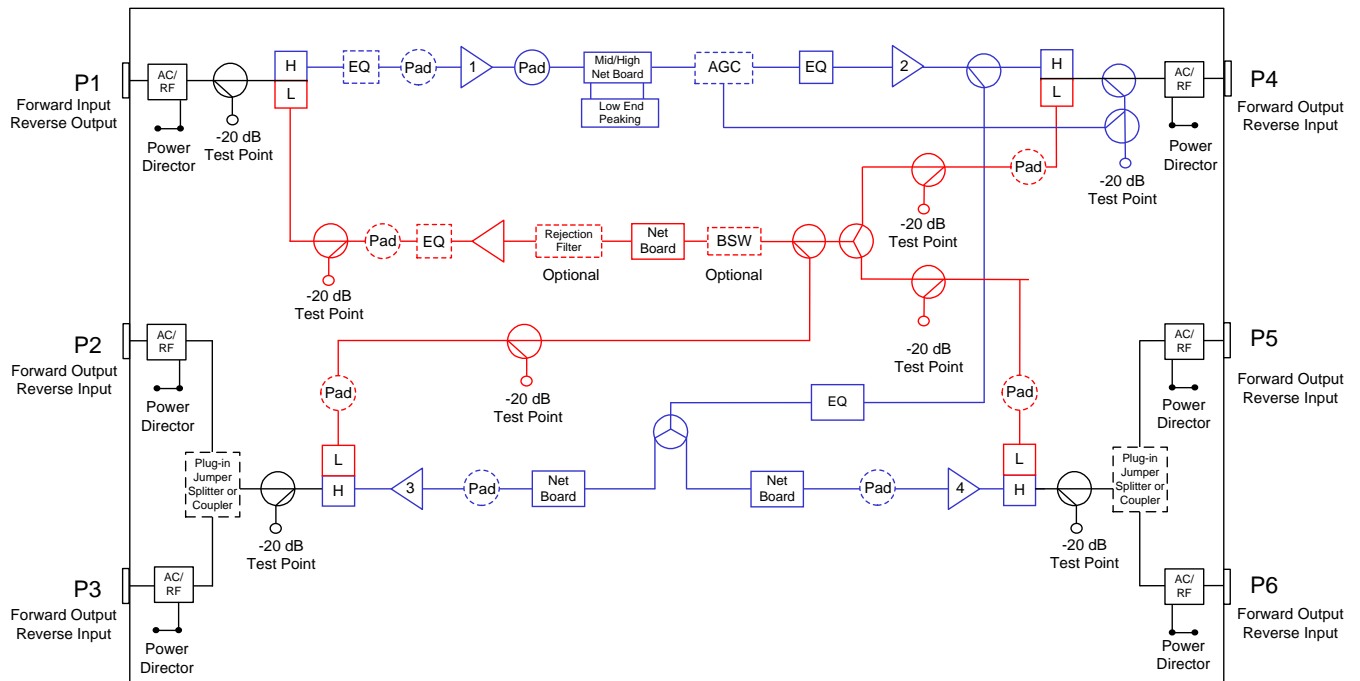
Features

- ◆ AFM-T Trunk is compatible with Arris 901e FMT and is a 1G drop-in replacement for the C-Cor FNT700, FNT800, FNT900
- ◆ AFM-B Bridger is compatible with Arris 901e FMB and is a 1G drop-in replacement for the C-Cor FNB700, FNB800, FNB900
- ◆ AFM-L Line Extender is compatible with Arris/C-Cor FM331e and is a 1G drop-in replacement for the C-Cor E6 and E7 Line Extender
- ◆ AFM-E Line Extender is compatible with Arris/C-Cor 900 LE
- ◆ Pad adjustable forward and return EQ's
- ◆ 5 to 42, 85 or 204 MHz reverse path
- ◆ Ideal for traditional HFC networks for increased performance & reliability
- ◆ Ideal for fiber deep networks with the extended reach of the amplifiers
- ◆ Patented DSIM® technology (Digital AGC)
- ◆ Increased reliability with higher surge protection in the GaN hybrids
- ◆ Lower power consumption than OEM amplifiers

Block Diagrams

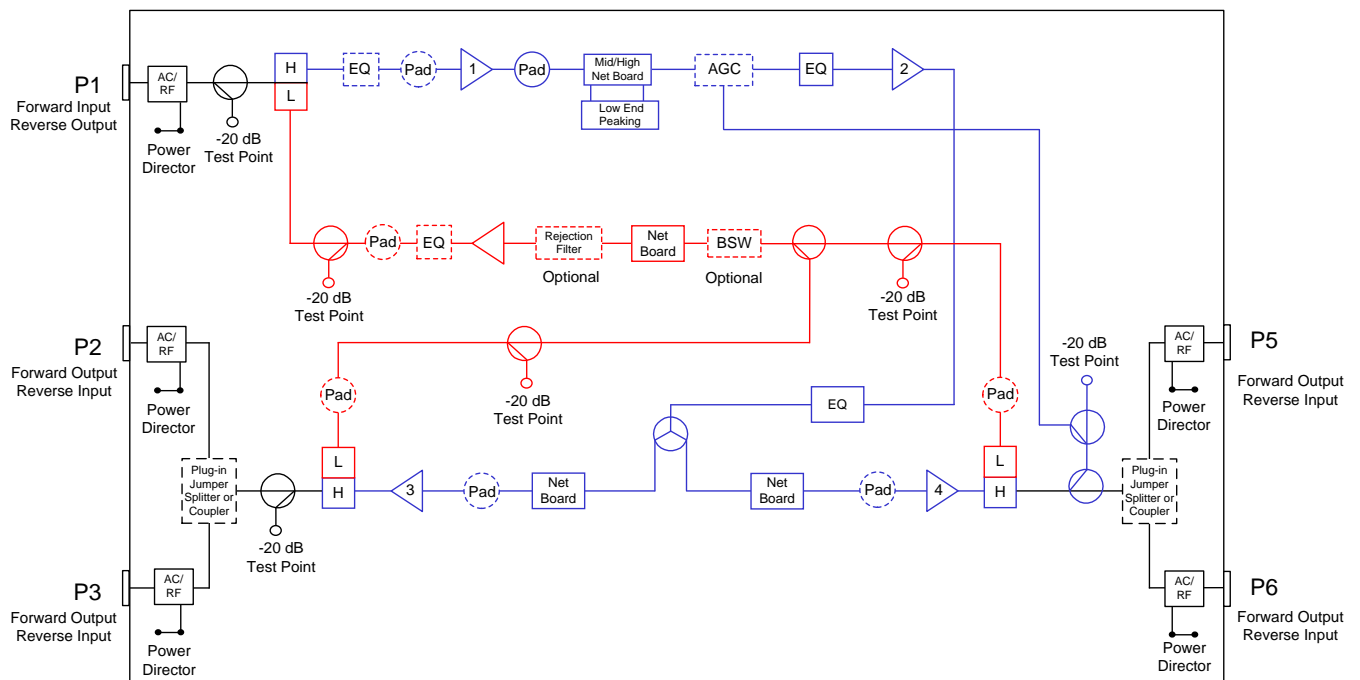
AFM-T

AFM-T 1 Trunk / 2 Bridger Outputs 1002 MHz GaN Amplifier Block Diagram



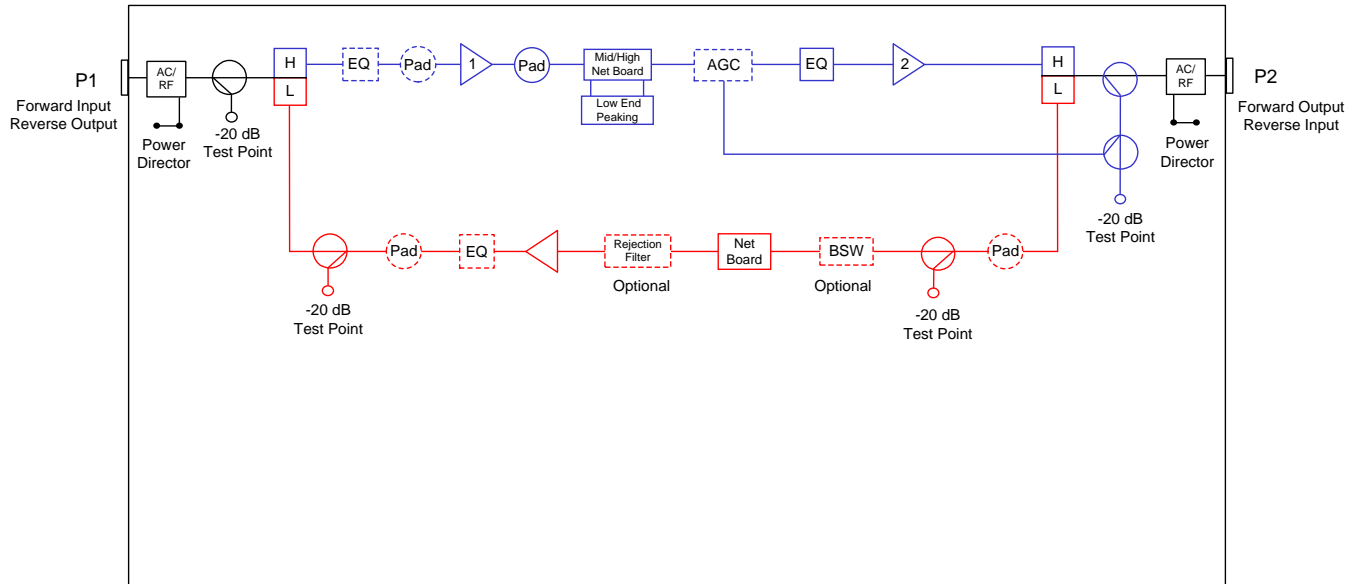
AFM-B

AFM-B 2 Bridger Outputs 1002 MHz GaN Amplifier Block Diagram



AFM-L & AFM-E

AFM-L & AMF-E 1 Output Line Extender 1002 MHz GaN Amplifier Block Diagram



Station Parameters 42/53 MHz

STATION PARAMETERS:		1002 MHz 42-53 MHz Split		ASEM C-Cor® / Arris® RF Modules 1002 MHz With GaN Hybrids							
		CONDITIONS	UNITS	SPECIFICATIONS							Notes
Housing passband			MHz	5 to 1002							
Max AC current		Continuous	Amps	15							
Max AC current		Surge	Amps	25							
Hum modulation		Time domain @ rated current above	-dBc	65 @ 5-42 MHz 70 @ 54-1002 MHz							
Return loss		Any port, worst case	dB	16.0							
Test Points											
Frequency range			MHz	5 to 42 (Reverse) / 54 to 1002 (Forward)							
Test point type		Directional coupler	N / A								
Test point level		Forward & reverse	-dB	20.0							
Test point accuracy		Forward & reverse	±dB	0.75							
Station Slope				AFM-T Trunk	AFM-T Trunk	AFM-B Bridger	AFM-L LE	AFM-E LE			
Internal Slope (Tilt)		± 0.5 dB	dB	T/B : 15/15	T/B : 8/15	15.0	15.0	15.0			
Slope control type		Cable equalizers	dB	Plug-in Pad Adjustable EQ's							
Slope control range		Includes cable equivalent	dB	-9.0 to +18							
Slope control steps		Equalizer value steps	dB	1.0							
Station Group Delay											
Group delay		Channel 2 (Std)	nSec / 3.58 MHz	40							
Group delay		Channel 3		16							
Group delay		Channel 4		10							
Group delay		Channel 5 & >		3							
AGC											
Pilot Channel Type			N / A	NTSC Analog or QAM							
Compensation Range			dB	System compensation input change ± 5.5 @ 1002 MHz							
Accuracy			±dB	0.5							
Nominal loss		@ 77 °F (25 °C)	dB	6.25							
Center frequency bandwidth				6 (MHz)							
Configuration				AFM-T Slope T/B : 15/15	AFM-T Slope T/B : 8/15	AFM-B	AFM-L	AFM-E			
Operational Specifications				Trunk	Bridger	Trunk	Bridger	Bridger	LE	LE	
Station passband			MHz	54 to 1002							
Station flatness		Normalized w / 0 dB slope	±dB	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Standard Operational Gain With AGC		Minimum @ 1002 MHz (Temperature stabilized)	dB	33.0	43.0	33.0	43.0	43.0	35.0	35.0	
Station Output Levels											
				AFM-T		AFM-T		AFM-B	AFM-L	AFM-E	
				Main	AUX	Main	AUX	Bridger	LE	LE	
Output Level @...	1002 MHz		dBmV	43.0	52.0	42.0	52.0	52.0	52.0	52.0	
	870 MHz			40.9	49.9	40.9	49.9	49.9	49.9	49.9	
	550 MHz			35.9	44.9	38.2	44.9	44.9	44.9	44.9	
	54 MHz			28.0	37.0	34.0	37.0	37.0	37.0	37.0	
Reference Output Slope (Tilt)		54-1002 MHz	dB	15.0	15.0	8.0	15.0	15.0	15.0	15.0	
Station Noise Figure											
Noise figure (w / 1 dB for input EQ loss)		Max	dB	AFM-T		AFM-T		AFM-B	AFM-L	AFM-E	
				9.1		9.1		9.1	9.0	9.0	
550 MHz analog channel loading, 79 channels +450 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier											
Station Distortions (Worse Case)											
Composite Triple Beat			-dBc	79	75	82	75	75	75	74	
Cross Modulation			-dBc	72	67	75	67	67	71	69	
Composite Second Order High Side			-dBc	77	73	78	73	73	74	79	

Reverse Station Specifications 5-42 MHz

REVERSE SPECTRUM: For 42/53 Split							
REVERSE - CHANNEL LOADING - Typically 23 each, 1.5 MHz wide QPSK channels.							
Reverse - General		CONDITIONS	UNITS	SPECIFICATION			
Station passband			MHZ	5 to 42			
Station flatness		Normalized w / 0 dB slope	±dB	0.5			
Reverse - Station Gain			AFM-T	AFM-B	AFM-L	AFM-E	
Gain		Minimum	dB	20.0	20.0	21.0	21.0
Gain control type				Plug-in pads			
Gain control range			dB	12.0			
Gain control steps		Pad value steps	dB	0.5			
Reverse - Station Slope							
Slope control type		Cable equalizers	N / A	Plug-in EQs			
Slope control range			dB	0 to 12.0			
Slope control steps		Equalizer value steps	dB	1.0			
Reverse - Station Output Levels							
@ Forward input port		Average	dBmV	35.0			
Reverse - Station Distortions							
Composite Second Order		6 channel loading	-dBc	78.0			
Composite Tripe Beat				78.0			
Cross Modulation				80.0			
Reverse - Station Group Delay							
Group delay		5 MHz	nSec / 1.5 MHz	36			
Group delay		7 MHz		16			
Group delay		10 MHz		4			
Group delay		35 MHz		10			
Group delay		38.5 MHz		25			
Reverse - Noise Figure			AFM-T	AFM-B	AFM-L	AFM-E	
Station noise figure (w / EQ)		Max	dB	12.5	12.5	10.5	10.0

Station Parameters 85/105 MHz

STATION PARAMETERS:		1002 MHz 85-105 MHz Split		ASEM C-Cor® / Arris® RF Modules 1002 MHz With GaN Hybrids							
		CONDITIONS	UNITS	SPECIFICATIONS							Notes
Housing passband			MHz	5 to 1002							
Max AC current		Continuous	Amps	15							
Max AC current		Surge	Amps	25							
Hum modulation		Time domain @ rated current above	-dBc	65 @ 5-85 MHz 70 @ 54-1002 MHz							
Return loss		Any port, worst case	dB	16.0							
Test Points											
Frequency range			MHz	5 to 85 (Reverse) / 105 to 1002 (Forward)							
Test point type		Directional coupler	N / A								
Test point level		Forward & reverse	-dB	20.0							
Test point accuracy		Forward & reverse	±dB	0.75							
Station Slope				AFM-T Trunk	AFM-T Trunk	AFM-B Bridger	AFM-L LE	AFM-E LE			
Internal Slope (Tilt)		± 0.5 dB	dB	T/B : 14/14	T/B : 7/14	14.0	14.0	14.0			
Slope control type		Cable equalizers	dB	Plug-in Pad Adjustable EQ's							
Slope control range		Includes cable equivalent	dB	-9.0 to +18							
Slope control steps		Equalizer value steps	dB	1.0							
Station Group Delay											
109.25 MHz			nSec / 3.58 MHz	25							
115.25 MHz				16							
121.25 MHz				10							
127.25 MHz				3							
AGC				DSIM-A Single Pilot Channel AGC							
Pilot Channel Type			N / A	NTSC Analog or QAM							
Compensation Range			dB	System compensation input change ± 5.5 @ 1002 MHz							
Accuracy			±dB	0.5							
Nominal loss		@ 77 °F (25 °C)	dB	6.25							
Center frequency bandwidth				6 (MHz)							
Configuration				AFM-T Slope T/B : 14/14	AFM-T Slope T/B : 7/14	AFM-B	AFM-L	AFM-E			
Operational Specifications				Trunk	Bridger	Trunk	Bridger	Bridger	LE	LE	
Station passband			MHz	105 to 1002							
Station flatness		Normalized w / 0 dB slope	±dB	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Operational Gain - With AGC		Minimum @ 1002 MHz (Temperature stabilized)	dB	33.0	43.0	33.0	43.0	43.0	35.0	35.0	
Note1											
Station Output Levels				AFM-T		AFM-T		AFM-B Bridger	AFM-L LE	AFM-E LE	
				Main	AUX	Main	AUX				
Output Level @...	1002 MHz		dBmV	42.0	52.0	43.0	52.0	52.0	52.0	52.0	
	870 MHz			41.0	50.1	41.1	50.1	50.1	50.1	50.1	
	550 MHz			38.7	45.3	36.3	45.3	45.3	45.3	45.3	
	105 MHz			35.0	38.0	29.0	38.0	38.0	38.0	38.0	
Reference Output Slope (Tilt)		105-1002 MHz	dB	14.0	14.0	7.0	14.0	14.0	14.0	14.0	
Note 2											
Station Noise Figure				AFM-T		AFM-T		AFM-B	AFM-L	AFM-E	
Noise figure (w / 1 dB for input EQ loss)		Max	dB	9.1		9.1		9.1	9.0	9.0	
NTSC/550 MHz analog channel loading, 71 channels +450 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier											
Station Distortions (Worse Case)				Main	AUX	Main	AUX				
Composite Triple Beat			-dBc	79	75	82	75	75	75	74	
Cross Modulation			-dBc	72	67	75	67	67	71	69	
Composite Second Order High Side			-dBc	77	73	78	73	73	74	79	

Reverse Station Specifications 5-85 MHz

REVERSE SPECTRUM: For 85/105 Split							
REVERSE - CHANNEL LOADING - Typically 23 each, 1.5 MHz wide QPSK channels.							
Reverse - General		CONDITIONS	UNITS	SPECIFICATION			
Station passband			MHZ	5 to 85			
Station flatness		Normalized w / 0 dB slope	±dB	0.5			
Reverse - Station Gain			AFM-T	AFM-B	AFM-L	AFM-E	
Gain		Minimum	dB	20.0	20.0	21.0	21.0
Gain control type				Plug-in pads			
Gain control range			dB	12.0			
Gain control steps		Pad value steps	dB	0.5			
Reverse - Station Slope							
Slope control type		Cable equalizers	N / A	Plug-in EQs			
Slope control range			dB	0 to 12.0			
Slope control steps		Equalizer value steps	dB	1.0			
Reverse - Station Output Levels							
@ Forward input port		Average	dBmV	35.0			
Reverse - Station Distortions							
Composite Second Order		12 channel loading	-dBc	78.0			
Composite Tripe Beat				78.0			
Cross Modulation				80.0			
Reverse - Station Group Delay							
Group delay		5 MHz	nSec / 1.5 MHz	36			
Group delay		7 MHz		16			
Group delay		10 MHz		4			
Group delay		80.5 MHz		10			
Group delay		83.5 MHz		25			
Reverse - Noise Figure			AFM-T	AFM-B	AFM-L	AFM-E	
Station noise figure (w / EQ)		Max	dB	12.5	15.5	10.5	10.0

Station Parameters 204/258 MHz

STATION PARAMETERS:		1002 MHz 204-258 MHz Split								ASEM C-Cor® / Arris® RF Modules 1002 MHz With GaN Hybrids	
		CONDITIONS	UNITS	SPECIFICATIONS						Notes	
Housing passband			MHz	5 to 1002							
Max AC current		Continuous	Amps	15							
Max AC current		Surge	Amps	25							
Hum modulation		Time domain @ rated current above	-dBc	65 @ 5-204 MHz 258 @ 54-1002 MHz							
Return loss		Any port, worst case	dB	16.0							
Test Points											
Frequency range			MHz	5 to 204 (Reverse) / 258 to 1002 (Forward)							
Test point type		Directional coupler	N / A								
Test point level		Forward & reverse	-dB	20.0							
Test point accuracy		Forward & reverse	±dB	0.75							
Station Slope											
Internal Slope (Tilt)		± 0.5 dB	dB	T/B : 11.5/11.5	T/B : 4.5/11.5	11.5	11.5	11.5			
Slope control type		Cable equalizers	dB	Plug-in Pad Adjustable EQ's							
Slope control range		Includes cable equivalent	dB	-9.0 to +18							
Slope control steps		Equalizer value steps	dB	1.0							
Station Group Delay											
Group delay		Channel 30	nSec / 3.58 MHz	30							
Group delay		Channel 31		16							
Group delay		Channel 32		10							
Group delay		Channel 33 & up		3							
AGC											
Pilot Channel Type			N / A	DSIM-A Single Pilot Channel AGC							
Compensation Range			dB	NTSC Analog or QAM							
Accuracy			±dB	System compensation input change ± 5.5 @ 1002 MHz							
Nominal loss		@ 77 °F (25 °C)	dB	0.5							
Center frequency bandwidth				6 (MHz)							
Configuration											
				AFM-T Slope T/B : 11.5/11.5		AFM-T Slope T/B : 4.5/11.5		AFM-B	AFM-L	AFM-E	
Operational Specifications											
				Trunk	Bridger	Trunk	Bridger	Bridger	LE	LE	
Station passband			MHz	258 to 1002							
Station flatness		Normalized w / 0 dB slope	±dB	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Operational Gain - With AGC		Minimum @ 1002 MHz (Temperature stabilized)	dB	33.0	43.0	33.0	43.0	43.0	35.0	35.0	
Station Output Levels											
				AFM-T		AFM-T		AFM-B	AFM-L	AFM-E	
				Main	AUX	Main	AUX	Bridger	LE	LE	
Output Level @...	1002 MHz		dBmV	42.0	52.0	43.0	52.0	52.0	52.0	52.0	
	870 MHz			41.2	50.0	41.0	50.0	50.0	50.0	50.0	
	550 MHz			39.3	45.0	36.0	45.0	45.0	45.0	45.0	
	258 MHz			37.5	40.5	31.5	40.5	40.5	40.5	40.5	
Reference Output Slope (Tilt)		105-1002 MHz	dB	11.5	11.5	4.5	11.5	11.5	11.5	11.5	
Station Noise Figure											
Noise figure (w / 1 dB for input EQ loss)		Max	dB	9.1		9.1		9.1	9.0	9.0	
292 MHz analog channel loading, 58 channels + 660 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier											
Station Distortions (Worse Case)											
				Main	AUX	Main	AUX				
Composite Triple Beat			-dBc	79	75	82	75	75	75	74	
Cross Modulation			-dBc	72	67	75	67	67	71	69	
Composite Second Order High Side			-dBc	77	73	78	73	73	74	79	

Reverse Station Specifications 5-204 MHz

REVERSE SPECTRUM: For 204/258 Split							
REVERSE - CHANNEL LOADING - Typically 23 each, 1.5 MHz wide QPSK channels.							
Reverse - General		CONDITIONS	UNITS	SPECIFICATION			
Station passband			MHZ	5 to 204			
Station flatness	Normalized w / 0 dB slope		±dB	0.5			
Reverse - Station Gain			AFM-T	AFM-B	AFM-L	AFM-E	
Gain	Minimum		dB	20.0	20.0	21.0	21.0
Gain control type				Plug-in pads			
Gain control range			dB	12.0			
Gain control steps	Pad value steps		dB	0.5			
Reverse - Station Slope							
Slope control type	Cable equalizers		N / A	Plug-in EQs			
Slope control range			dB	0 to 12.0			
Slope control steps	Equalizer value steps		dB	1.0			
Reverse - Station Output Levels							
@ Forward input port	Average		dBmV	35.0			
Reverse - Station Distortions							
Composite Second Order	31 channel loading		-dBc	78.0			
Composite Tripe Beat				78.0			
Cross Modulation				80.0			
Reverse - Station Group Delay							
Group delay	5 MHz		nSec / 1.5 MHz	36			
Group delay	7 MHz			16			
Group delay	10 MHz			4			
Group delay	199 MHz			10			
Group delay	202.5 MHz			25			
Reverse - Noise Figure			AFM-T	AFM-B	AFM-L	AFM-E	
Station noise figure (w / EQ)	Max		dB	12.5	15.5	10.5	10.0

Power & Environmental

POWER & ENVIRONMENTAL							
Power Requirements:							
Configuration				AFM-T	AFM-B	AFM-L	AFM-E
	With DSIM-A	Includes reverse (Worst case)	W	53.5	45.5	28.0	25.9
AC Voltage							
	Input ranges		VAC	40-90			
Current Draw (with DSIM AGC)				AFM-T	AFM-B	AFM-L	AFM-E
	@ 40 VAC	Maximum	A	1.40	1.45	0.79	0.77
	@ 50 VAC		A	1.04	1.06	0.67	0.68
	@ 60 VAC		A	0.87	0.89	0.60	0.63
	@ 70 VAC		A	0.78	0.78	0.54	0.58
	@ 80 VAC		A	0.73	0.74	0.51	0.53
	@ 90 VAC		A	0.69	0.68	0.45	0.50
Weight				AFM-T	AFM-B	AFM-L	AFM-L
	Weight		lbs. (kg)	5.3 (2.4)	5.3 (2.4)	4.0 (1.8)	5.0 (2.3)
Environmental							
	Operating temperature		°F (°C)	-40 to +140 (-40 to +60)			

Notes:

1. The AFM-T & B operational gain – with AGC are based on the amplifier configured with jumper at DC/SP 3 (port 3) and DC/SP 2 (port 6) as a 2 output Bridger.
2. When using the DC/SP plug-ins SDA1G-SPLTR3.5, SDA1G-DC7, SDA1G-DC10 and SDA1G-DC12, levels will derated accordingly based on the accessory specification.

Accessory Ordering Information:

The ordering matrix provides the part number information to order the configured stations. This page contains the ordering information for the required accessories that will be needed to make the stations functional in the field or the optional accessories that can be ordered separately.

Required Accessories

Description	Part Numbers (Where XX.X = dB value)
JXP style attenuator pads <ul style="list-style-type: none"> • 1 Required for forward input • 1 Required for reverse output • 1 Required for forward input Equalizer • 1 Required for reverse output Equalizer 	JXP138-XX (0 to 20 dB in 1.0 dB steps)

Optional Accessories

Description	Part Numbers
Digital Station Intelligence Manager - Single Pilot AGC Module (Analog or Digital)	DSIM-A-MDL-02
Digital Station Intelligence Manager -Controller	DSCT-xxx-yyy xxx = Pilot Channel Number yyy = Channel Type IRC = Analog IRC Spacing DIG = Digital / QAM
DSIM Bluetooth Dongle Apple iOS or android	DSIM-DONGLE-02
Digital Station Intelligence Manager - Cable Assembly For Computer Interface	240327-01
Cable assembly DSIM adaptor to connect controller	240330-01
Pad Adjustable Equalizer JXP Platform 0-18 dB	AEQDA1G
Pad Adjustable Cable Equivalent Equalizers JXP Platform Low Range 0-8 dB	ACEQ1G
Pad Adjustable Cable Equivalent Equalizers JXP Platform High Range 9-15 dB	ACEQH1G
Pad Adjustable Reverse Equalizers 5-42, 85 and 204 MHz JXP Platform 0-12 dB (5 Pin)	AREQDA42 AREQDA85 AREQDA204
Splitter, 3.5 dB, 1GHz	SDASPLTR3.5
Directional Coupler, 7 dB, 1GHz	SDADC7
Directional Coupler, 10 dB, 1GHz	SDADC10
Directional Coupler, 12 dB, 1GHz	SDADC12
Reverse Rejection Filter 14 MHz	RPRFLTR-14
Reverse Rejection Filter 8 MHz	RPRFLTR-8
Reverse Rejection Filter by-pass	RPRFLTR-JMP
Test Probe (5.5" Long)	100685-01
Test Probe (1.57" / 4 cm Long)	TP-7504
Power Supply Adaptor Cable 9 to 12 Pin Connectors	240336-01
Conversion Kit, 85/105 ASEM C-Cor AFM-L LE	120597-01
Conversion Kit, 85/105 ASEM C-Cor AFM-B Bridger	120598-01
Conversion Kit, 85/105 ASEM C-Cor AFM-T Trunk	120599-01

Ordering Matrix

ASEM™ For C-Cor™ / Arris® Product Configuration Worksheet

Customer: _____

Created By: _____ Order Date: _____

ORDERING MATRIX

April 1, 2021

Position	1	2	3	4	5	6	7	8	9	10	11	12	13
PART NUMBER	A	F	M	-									

5 STATION TYPE

- T = AFM-T 1 Trunk / 2 Briger Outputs (User configurable to 4 outputs)
- B = AFM-B 2 Output Bridger (User configurable to up to 4 outputs)
- L = AFM-L 1 Output Line Extender (Compatible with Arris FM331e LE)
- E = AFM-E 1 Output Line Extender (Compatible with Arris 900-LE)

6 BANDPASS SPLIT

- 4 = 5-42 MHz / 54-1002 MHz
- 2 = 5-204 MHz / 258-1002 MHz
- 8 = 5-85 MHz / 105-1002 MHz

7,8 STATION GAIN (Forward) - For 0.5 dB gain values, use the first two digits listed in the part number

Amplifier Model	AFM-L		AFM-E		AFM-B		AFM-T		AFM-T	
For Slope Call Out	A		A		A		E		F	
Standard / High	Std	High	Std	High	Std	High	Std	High	Std	High
Max gain with DSIM	35.0	37.0	35.0	37.0	43.0	45.0	33.0	35.0	33.0	35.0

9 FORWARD GAIN CONTROL TYPE

- D = Digital Station Intelligence Manger

10 STATION SLOPE

Call Out	Station	42/54	85/105	240/258
A =	FML, FME & FMB	15	14	11.5
E =	FMT (T/B)	15/15	14/14	11.5/11.5
F =	FMT (T/B)	8/15	7/14	4.5/11.5

Note: T/B for Trunk/Bridger Ports

11 STATION GAIN (Reverse)

- B = 20 dB min (AFM-T & B Only)
- R = 21 dB min (AFM-L & E Only)

12 CUSTOM OPTIONS

- 0 = NONE
- A = Seizure Assemblies with Standoffs (AMF-L Only)
- X = Determined by Product Management

Generic Order Form: Not all configurations are available



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