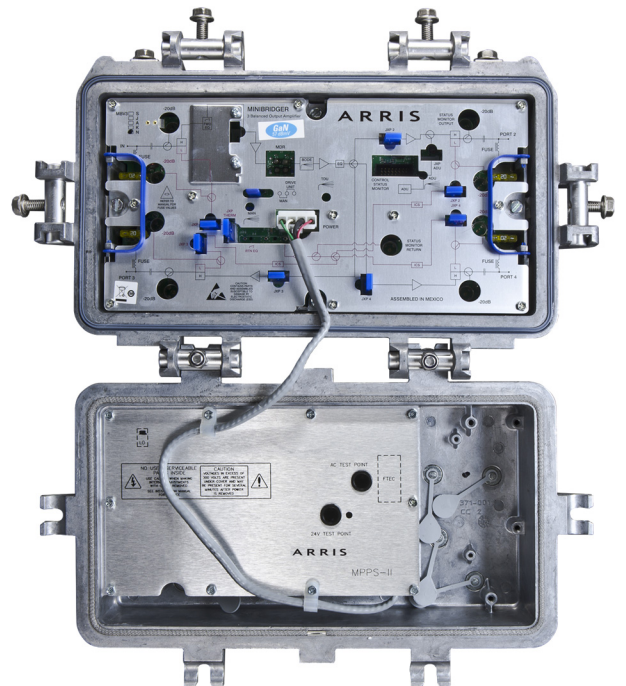


# STARLINE Series

## MBV3 1 GHz Amplifier

### FEATURES

- Simplify plant upgrades with modular RF design and 1.2 GHz capable housing
- Improve amplifier reach with optional GaN technology and increased station tilt
- Maintain current amplifier spacing with high output GaAs technology
- Expand return path bandwidth with plug-in diplex filter support to 85 MHz
- Minimize RF drift over temperature with optional analog or QAM ADU



### PRODUCT OVERVIEW

For cable operators looking to ensure maximum backwards compatibility and scalability and protect network investments, ARRIS offers solutions that deliver new services with minimal CAPEX, enhance network efficiency, and increase subscriber satisfaction.

The ARRIS 1 GHz MBV3 Mini-Bridger Amplifier enables cable operators to increase forward capacity while maintaining current amplifier spacing of existing 750 and 870 MHz systems. The MBV3 is available as a complete unit for greenfield deployments or as drop-in RF module for 1 GHz upgrades to legacy STARLINE MB75 and MB87 amplifiers.

### Forward Path

The standard MBV3 configuration is equipped with second-generation Enhanced Gallium Arsenide (E-GaAs) technology, which provides superior distortion performance over standard silicon and competing GaAs technologies. If operators require longer reach, the MBV3 can be configured with optional Gallium Nitride (GaN) hybrid technology, which allows for a 3 dB increase in output level over the standard GaAs option.

To provide additional system flexibility, easy installation and maintenance, the MBV3 is compatible with standard accessories such as attenuators, equalizers, ADUs or QADUs, automotive fuses, and FTEC crowbar circuits. The amplifier maintains output level via an optional plug-in drive unit. In addition, operators can control level manually, thermally with the TDU (thermal drive unit) accessory, or electronically with the vertical automatic drive unit (VADU). The VADU can support either analog or QAM pilot channels.

The MBV3 uses modular diplex filters, which operators can change to increase return bandwidth. The following filters are available for use with all US-style STARLINE RF distribution amplifiers (models BLE, MB/MBV3, BT):

- K-split (5 to 42 MHz/54 to 1003 MHz)
- A-split (5 to 65 MHz/85 to 1003 MHz)
- N-split (5 to 85 MHz/104 to 1003 MHz)

### Return Path

The MBV3 comes standard with a high-gain return amplifier. Operators can select return path equalizers ranging from 0 to 12 dB.

### Backward Compatibility

Operators can make MBV3 electronics package backward compatible with the 10-Amp MB\*/\* housing by installing the MB-15All Kit. These kits contain 50 mil gold plated platform assemblies, which make it possible for the amplifier to carry 15 Amperes continuous through its input or output ports.

COMPATIBILITY					
Platform	MB-550	MB-750D	MB-750SH	MB86	MB87
Upgrade to MB100	No	No	Yes*	Yes*	Yes
* Requires MB-15All Kit					

RELATED PRODUCTS	
VADU/VQADU	MB100
BLE100	BT100
SFE/SRE EQ	Installation Services
Flex Max® RF Amplifiers	

Specifications – E-GaAs

Specifications	Units	Forward	Return
Frequency split <sup>1</sup>	MHz	K (54 –1003) A (85 –1003) N (104 –1003) <sup>19</sup>	K (5 – 42) A (5 – 65) N (5 – 85)
Flatness <sup>2,19</sup>	dB	± 0.75	± 0.5
Minimum Full Gain <sup>3</sup>	dB	46	17
Operation Gain <sup>4</sup>	dB	42	NA
Manual Bode Slope Control Range <sup>5</sup>	dB	± 4	NA
Noise Figure <sup>6</sup>	dB	10	8
Standard Slope Reference Frequency	MHz	1003/550/54	35 (flat)
Reference Output Level	dBmV	51/44/37	—
Operating Station Slope <sup>7</sup>	dB	14 ± 1	NA
Standard Slope Distortion			
Channels, Number of NTSC <sup>17</sup>		79	
Composite Triple Beat (CTB) <sup>8,16</sup>	dBc	73.5	80
Cross Modulation (XM) <sup>9,16</sup>	dBc	68.5	70
Composite Second Order (CSO) <sup>8,10,16</sup>	dBc	71	81
Carrier to Intermodulation Noise (CIN) <sup>21</sup>	dB	65	—
Channels, Number of 256 QAM		154	—
Carrier to Intermodulation Noise (CIN) <sup>20,21</sup>	dB	65	—
Test Point <sup>11</sup>	dB	20 (± 1.0 dB)	20 (± 1.0 dB)
Return Loss <sup>12</sup>	dB	16	14
Hum Modulation @ 12A	dBc	< 60	< 60
Hum Modulation @ 15A <sup>18</sup>	dBc	< 60	< 60
DC Voltage	VDC		24
Current DC Max. <sup>13</sup>	mA		2000
Power Consumption Max.	W		66
AC Input Voltage Range	VAC		38–90
AC Current Draw Max.	A		
@ 90 VAC			0.74
@ 60 VAC			1.17
@ 38 VAC			1.85
AC Bypass Current (all ports) <sup>14</sup>	A		15
Group Delay <sup>15</sup>			
K-split			
55.25 to 58.83 MHz	nSec	52	NA
Group Delay <sup>15</sup>			
A-split			
86.25 to 90.68 MHz	nSec	28	
Group Delay <sup>19</sup>			
N-split			
104 to 110 MHz	nSec	38	NA
Operating Temperature Range	°C °F		–40 to +60 –40 to +140
Housing Dimensions, L x W x D	inches mm		15.4 x 9.6 x 5.5 292 x 244 x 140
Weight	lb kg		15 6.8

## Specifications – E-GaN

Specifications	Units	Forward	Return
Frequency split <sup>1</sup>	MHz	K (54 –1003) A (85 –1003) N (104 –1003) <sup>19</sup>	K (5 –42) A (5 – 65) N (5 – 85)
Flatness <sup>2,19</sup>	dB	± 0.75	± 0.5
Minimum Full Gain <sup>3</sup>	dB	46	NA
Operation Gain <sup>4</sup>	dB	42	17
Manual Bode Slope Control Range <sup>5</sup>	dB	± 4	NA
Noise Figure <sup>6</sup>	dB	10	8
Ultra Slope Reference Frequency <sup>7</sup>	MHz	1003/550/54	35 (flat)
Reference Output Level	dBmV	57/48/39	—
Operating Station Slope	dB	18 ± 1	NA
Ultra Slope Distortion			
Channels, Number of NTSC <sup>17</sup>		79	
Composite Triple Beat (CTB) <sup>8,16</sup>	–dBc	70	80
Cross Modulation (XM) <sup>9,16</sup>	–dBc	62	70
Composite Second Order (CSO) <sup>8,10,16</sup>	–dBc	69	81
Carrier to Intermodulation Noise (CIN) <sup>21</sup>	dB	65	—
Channels, Number of 256 QAM			—
Carrier to Intermodulation Noise (CIN) <sup>20,21</sup>	dB	65	—
Standard Slope Reference Frequency <sup>7</sup>	MHz	1003/550/54	35 (flat)
Reference Output Level	dBmV	51/44/37	—
Operating Station Slope <sup>6</sup>	dB	14 ± 1	NA
Standard Slope Distortion			
Channels, Number of NTSC <sup>17</sup>		79	
Composite Triple Beat (CTB) <sup>8,16</sup>	dBc	73.5	80
Cross Modulation (XM) <sup>9,16</sup>	dBc	68.5	70
Composite Second Order (CSO) <sup>8,10,16</sup>	dBc	71	81
Carrier to Intermodulation Noise (CIN) <sup>21</sup>	dB	65	—
Channels, Number of 256 QAM		154	—
Carrier to Intermodulation Noise (CIN) <sup>20,21</sup>	dB	65	—
Test Point <sup>11</sup>	dB	20 (± 1.0 dB)	20 (± 1.0 dB)
Return Loss <sup>12</sup>	dB	16	14
Hum Modulation @ 12A	dBc	< 60	< 60
Hum Modulation @ 15A <sup>18</sup>	dBc	< 60	< 65
DC Voltage	VDC		24
Current DC Max. <sup>13</sup>	mA		2000
Power Consumption Max.	W		66
AC Input Voltage Range	VAC		38–90

Specifications – E-GaN (continued)

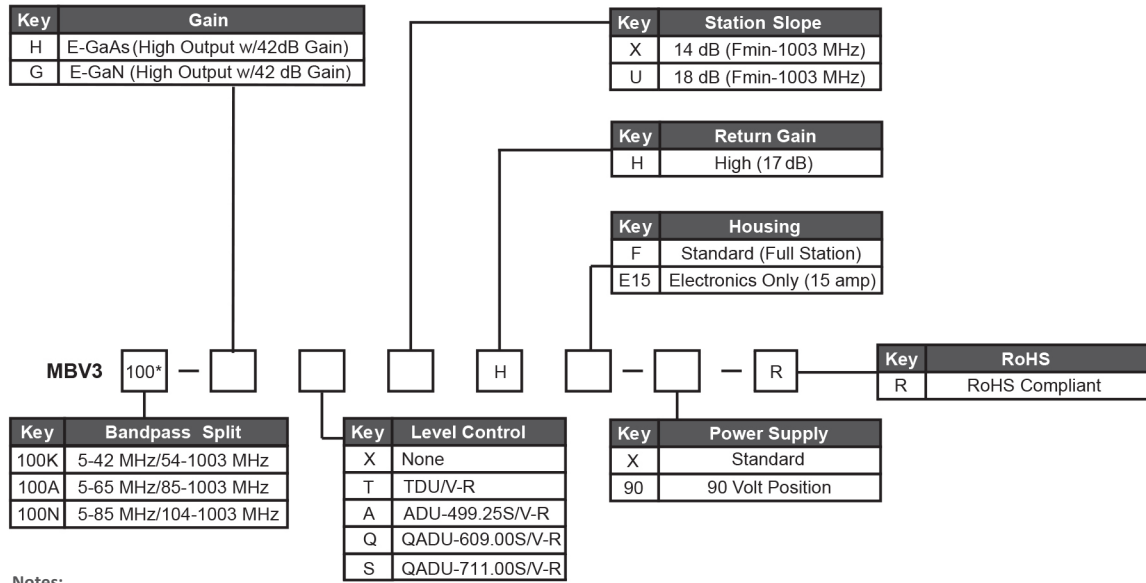
Specifications	Units	Forward	Return
AC Current Draw Max. @ 90 VAC @ 60 VAC @ 38 VAC	A		0.74 1.17 1.85
AC Bypass Current (all ports) <sup>14</sup>	A		15
Group Delay <sup>15</sup> K-split 55.25 to 58.83 MHz	nSec	52	NA
Group Delay <sup>15</sup> A-split 86.25 to 90.68 MHz	nSec	28	NA
Group Delay <sup>19</sup> N-split 104 to 110 MHz	nSec	14	NA
Operating temperature range	°C °F		-40 to +60 -40 to +140
Housing dimensions, L x W x D	inches mm		15.4 x 9.6 x 5.5 292 x 244 x 140
Weight	lb kg		15 6.8

Notes:

1. Operating passband of station. Diplex filters are plugged into the electronic chassis.
2. Referenced to the average gain across the passband.
3. Minimum full gain at 1003 MHz includes loss of equalizer but Bode slope reserves have not been set. Return gain includes loss of SRE-\*-4 return equalizer. Measured at Fmax return.
4. Includes loss of gain reserves as well as equalizer.
5. From midpoint (typical setting is -4 dB at 1003 MHz @ 25 °C). This control should not be used for gain reduction.
6. Specified at the housing cable entry facility over temperature and includes the loss of 1 dB for the pre-stage equalizer. The return noise figure includes the station loss preceding the RF hybrid.
7. Amount of slope created and cable equivalence of fixed, plug-in interstage equalizer.
8. Measured with CW carriers and spectrum analyzer over specified temperature range. References the worst-case channel.\*
9. Measured with wave analyzer and synchronous, 100% depth modulated channels. References the worst-case channels over specified temperature range.\*
10. Refers only to beat clusters that fall 0.75 MHz and 1.25 MHz above the subject picture carrier.
11. Test points should be used with GFAL adapter.
12. Match measurement at the station input and output, cable- entry facilities, at the specified passbands for operational gain.
13. Current draw at 24 VDC.
14. Stated in RMS continuous.
15. Specified for standard NTSC video, where delay is the delta from picture carrier to 3.58 MHz color subcarrier. Reverse delay is in a 1.5 MHz bandwidth.
16. Worst-case over temperature in a cascade.
17. NTSC 79 Channel forward, 75 QAM carriers -6dB relative to analog CW carriers. 6 Channel return.
18. Specification is 55 from 5 to 10MHz at 15A.
19. For N-split (5-85/104-003MHz) roll-off from 105 MHz to 102 MHz < 1.0 dB. Group delay from 103.25 MHz to 105.25 MHz is < 22 ns.
20. 154 QAM carriers 54-1002 MHz. Carriers are -6dB relative to virtual analog levels.
21. Room temperature performance.

\* Specifications are compliant with the test methods as stated in NCTA Recommended Practices for Measurements on Cable Television

# 1 GHz MBV3 Ordering Guide



- Notes:**
1. Not all combinations in the ordering guide are available. This is a guide only.
  2. FTECs are included in all models as standard.

## Required Accessories

Part Number	Model	Description
535723-001-00	SFE-100-0	Forward 1003 MHz equalizer (0 dB) -or-
531124-001 to -022	SFE-100-1 to -22	Forward 1003 MHz equalizer (values 1 to 22 dB 1n 1 dB steps) -or-
531161-001 to -010	SCS-1 to SCS-10	Cable simulator (values 1 to 10 dB in 1 dB steps)
531163-XXX-00	SRE-*-*	Return equalizer, 5-42 MHz (K-split), 5-65 (A-split), 5-85 (N-split), values 0 to 12 dB 1n 2 dB steps
531186-XXX-00	JXP-*B	Plug-in attenuator/pad (values 0 to 26 dB in 1 dB steps)

## Optional Accessories

Part Number	Model	Description
558958-001-00	QADU-609.00S/V-R	609.00 MHz Vertical QAM Automatic Drive Unit for use in MBV3
558958-002-00	QADU-711.00S/V-R	711.00 MHz Vertical QAM Automatic Drive Unit for use in MBV3
558958-003-00	ADU-499.25S/V-R	499.25 MHz Vertical Automatic Drive Unit for use in MBV3
531344-001-00	MB-15AII-KIT	15 Amp kit to upgrade 10 Amp platforms

**Note:** Specifications are subject to change without notice.

## Customer Care

Contact Customer Care for product information and sales:

- United States: 866-36-ARRIS
- International: +1-678-473-5656

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