



FEATURES

1003 MHz Enhanced Gallium Arsenide (E-GaAs) power doubling technology

High gain

High output level

Multiple diplex filter options

N-split (5 to 85 MHz/104 to 1003 MHz) available

Ease-of-use ergonomics

16 dB return loss

60/90 V powering

Meets Telcordia GR-1098-Core voltage surge requirements using IEEE C62.41 surge waveforms

FCC, CENELEC, and CCC approved

RoHS-compliant

Standard FTEC transient surge protection included

Bode equalization (thermal or auto controlled)

15 A AC capability

Optional return path ingress control and status monitor

Power factor corrected power supply

Directional coupler -20 dB test points

STARLINE® Series MBV3 1 GHz Mini-Bridger® Amplifier

Motorola's 1 GHz STARLINE® MBV3 Mini-Bridger® amplifier leads the industry in features and performance, and is designed to meet the needs of today's expanding broadband communication networks. This two-way-capable triple-output amplifier offers high gain, three balanced high-output levels, ergonomics, superior distortion performance, multiple diplex filter options, 16 dB return loss, and Bode equalization. The MBV3 also provides optional advanced features such as ingress control switching and status monitoring. The MBV3 can be used as a direct replacement for the MBE87 amplifier with proper attenuation to create a trunk output.

High Gain

The MBV3 offers high gain, allowing the operator to hold existing amplifier locations during system upgrades, reducing maintenance, installation, and powering costs.

Forward Path

The operational gain of the MBV3 is 42 dB, with 16 dB return loss. Output level control is achieved through the use of an interstage Bode equalizer, which compensates for coaxial cable attenuation changes due to temperature. Equalization may be controlled manually, with a thermal drive unit (TDU), or with a single-pilot closed-loop automatic drive unit, model ADU-* (analog pilot) or QADU-* (QAM pilot). Both the ADU and QADU boards are new to the STARLINE family of amplifiers, and are unique to the MBV3 design as a vertical plug-in module. ADUs use Surface Acoustic Wave (SAW) filters for determining pilot frequency, improving amplifier stability over temperature.

To further ensure system flexibility, installation ease, and maintenance, the amplifier is engineered for

compatibility with standard accessories, such as attenuators, equalizers, return amplifiers, automotive fuses, and FTEC crowbar circuits.

The MBV3 uses modular diplex filters, which can be changed for a different frequency split as required. The following filters are available for use with all US-style Motorola RF distribution amplifiers (models BLE, MB, and BT):

- S-split (5 to 40 MHz return and 52 to 1003 MHz forward band)
- K-split (5 to 42 MHz/54 to 1003 MHz)
- J-split (5 to 55 MHz/70 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

High-gain return amplifier kits providing 17 dB minimum station gain are available. Return path equalizers from 0 dB to 12 dB can be selected. Thermal compensation is an optional feature, available as a plug-in JXP-TH*C, which stabilizes gain and match over temperature extremes.

DATA SHEET

STARLINE MBV3 1 GHZ MINI-BRIDGER AMPLIFIER



Enhanced Gallium Arsenide

The MBV3 uses second-generation Enhanced Gallium Arsenide (E-GaAs) hybrid technology to provide superior distortion performance in CTB and CSO over the standard silicon and competing GaAs technologies. E-GaAs distortion performance remains linear at significantly higher output levels, allowing the operator to maximize system performance and reduce system costs. Motorola encourages customers to contact their Motorola Account Representative to determine optimal system levels.

Motorola's STARLINE 1 GHz MBV3 amplifiers are available with Gallium Nitride (GaN) Output Hybrids to allow for an increased drive level while maintaining existing specifications. Contact your sales representative to learn the system design cost benefits when using GaN products and design implementation.

Ingress Control Switching (ICS) in three states is also available. This pin diode attenuator circuit can lower levels by 6 dB or by 38 dB with a controlled slew rate for minimum bit errors. The LIFELINE® Mini-Bridger amplifier transponder (available directly from AM Networks) is required to operate the Ingress Control Switch from a remote location.

Backward Compatibility

The MBV3 electronics package can be made backward compatible with the 10 A MB*/* housing by installing the MB-15A Kit or the MB-15A Kit II. These kits contain 50 mil gold-plated platform assemblies, enabling the amplifier to carry 15 A continuous through the input or output ports.

Distortions					
		Units	Bridger Out	Trunk Out (-9dB)	Notes
NTSC	Reference Frequency	MHz	1003/550/52	1003/550/52	8
	Output Level		45/44/37	36/35/28	
	Channel Loading		79 NTSC	79 NTSC	
	Data Loading	MHz	450	450	
	CTB	dBc	76.5	86	9,16,17
	CSO	dBc	71	76	10,16
	XM	dB	68.5	78	9,11,16
	CIN	dBc	70	70	12
PAL-B/G	Reference Frequency	MHz	1003/599/48	1003/599/48	8
	Output Level		45/45/37	36/36/28	
	Channel Loading		65 B/G	65 B/G	
	Data Loading	MHz	400 MHz	400 MHz	
	CTB	dBc	76.5	86.5	9,16,17
	CSO	dBc	71	76	10,16
	XM	dB	68.5	78.5	9,11,16
	CIN	dBc	65	70	12
PAL-D/K	Reference Frequency	MHz	1003/599/112	1003/599/112	8
	Output Level		45/45/38	36/36/29	
	Channel Loading		61 D/K	61 D/K	
	Data Loading	MHz	400 MHz	400 MHz	
	CTB	dBc	76.5	86.5	9,16,17
	CSO	dBc	71	76	10,16
	XM	dB	68.5	78.5	9,11,16
	CIN	dBc	65	70	12

See next page for notes





Specifications

	Units	Forward	Return (RA-Kit/H)
Passband ¹	MHz	52–1003	5–40
Flatness ²	dB	±0.5	±0.5
Minimum Full Gain ³	dB	46	NA
Operational Gain ⁴	dB	42	20
Manual Bode Slope Control Range ⁵	dB	±4	NA
Interstage Equalizer Slope ⁶	dB	14±1	NA
Noise Figure 40/52/1003 MHz ⁷	dB	NA/10/10	8/NA/NA
Test Point (all) ⁸	dB	20±1	
Return Loss ⁹	dB	16	
Hum Modulation ^{10,15}	dBc	60	
DC Voltage ¹¹	VDC	24.0±0.25	
Current DC ¹²	mA	1900	
DC Ripple	mV	15 P-P	
Power Consumption	W	62	

	Units	Forward	Return (RA-Kit/H)
AC Input Voltage Range	VAC	38–90	
AC Current Draw ¹³		Forward only	
@90 VAC	A	0.64	
@75 VAC	A	0.8	
@60 VAC	A	1.0	
@53 VAC	A	1.13	
@45 VAC	A	1.35	
@38 VAC	A	1.65	
AC Bypass Current ¹³	A		15
Group Delay ¹⁴			
55.25 to 59.68 MHz	nSec	32	NA
5.0 to 6.5 MHz	nSec	NA	45
10.0 to 11.5 MHz	nSec	NA	10
33.5 to 35.0 MHz	nSec	NA	12
38.5 to 40.0 MHz	nSec	NA	32
Housing Dimensions		15.4 in L x 5.5 in W x 9.6 in D (39.1 cm x 13.97 cm x 24.3 cm)	
Weight		15 lb (6.8 kg)	
Ambient Operating Temperature		–40 °F to 140 °F (–40 °C to 60 °C)	

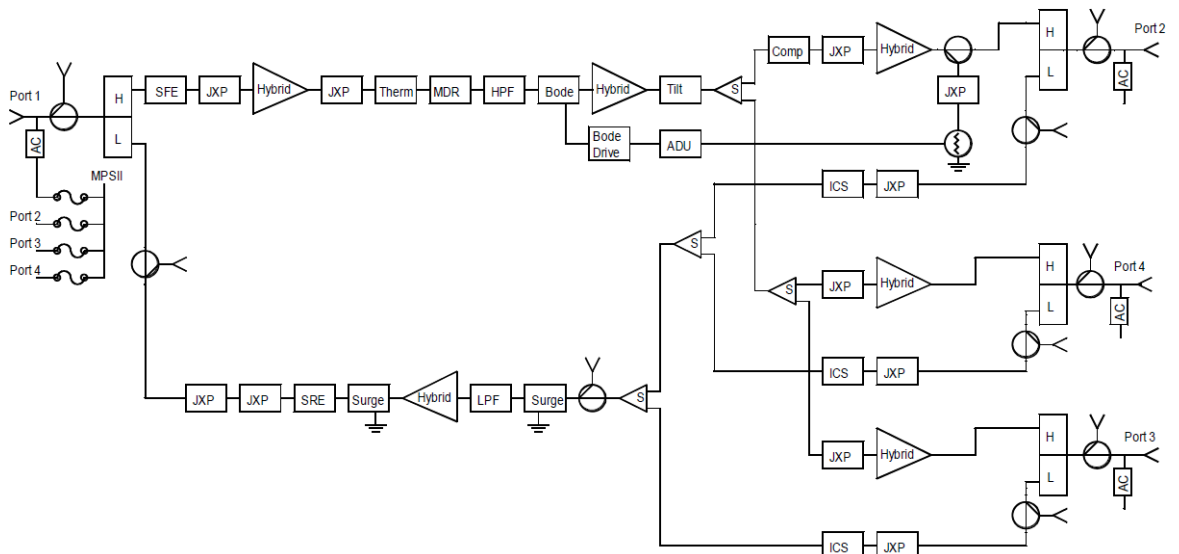
All specifications are stated as worst-case over temperature unless otherwise noted.

- Operating passband of station. Diplex filters are plugged into the electronic chassis.
- Referenced to the average gain across the passband.
- 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.
- Includes loss of slope reserves as well as equalizer.
- From midpoint (typical setting is –4 dB at 1003 MHz @ 20 °C). This control should not be used for gain reduction.
- Amount of slope created and cable equivalence of fixed, plug-in interstage equalizer.
- Specified at the housing cable entry facility and includes the loss of 1 dB for the pre-stage equalizer. The return noise figure includes the station loss preceding the RF hybrid.
- Test points should be used with GFAL adapter.

- Match measurement at the station input and output, cable-entry facilities, at the specified passbands for operational gain.
- Measured with the AC bypass current.
- Measured at the power connector.
- Current draw at 24 VDC.
- Stated in RMS continuous. A 10 A compatible electronics package is also available for installing into older 10 A housings during upgrades.
- 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.
- Worst-case over temperature in a cascade.
- The compressed data loading is QAM carriers and are –6 dB relative to the analog CVW carriers.
- CTB (Composite Triple Beat). At the specified channel loading, Enhanced Gallium Arsenide performance varies on a two point three-for-one (2.3:1) basis with amplifier output level.

* Specifications are compliant with the test methods as stated in NCTA Recommended Practices For Measurements On Cable Television Systems.

Block Diagram



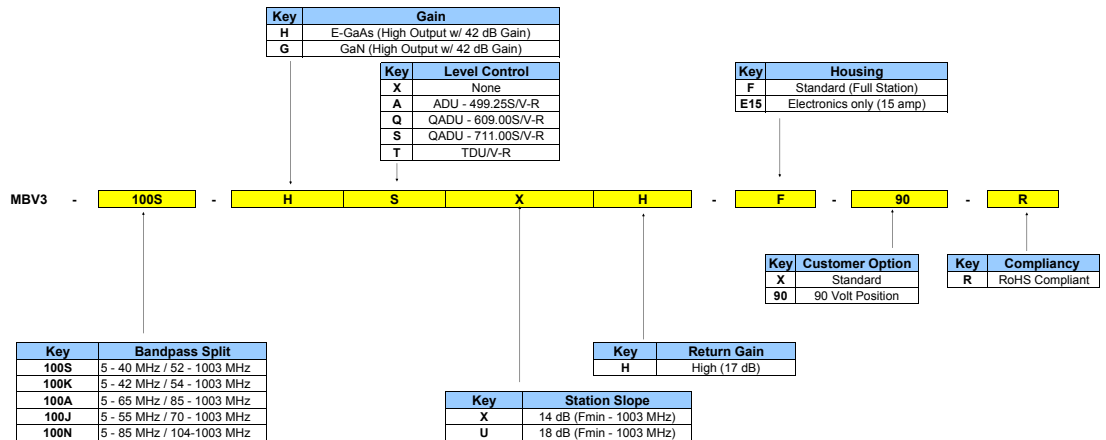


Order Information

Part Number	Model	Description
831000-001-00	MBV3-100K-HXXH-F-90-R	STARLINE ergonomic 1 GHz MB with 5–42 MHz/54–1003 MHz K-split, 3-output, 42 dB operational gain, manual gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station—90 V configured, RoHS-compliant
831000-002-00	MBV3-100S-HSXH-F-X-R	STARLINE ergonomic 1 GHz MB with 5–40 MHz/52–1003 MHz S-split, 3-output, 42 dB operational gain, QAM ADU 711 MHz gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station, RoHS-compliant
831000-003-00	MBV3-100K-HXXH-F-X-R	STARLINE ergonomic 1 GHz MB with 5–42 MHz/54–1003 MHz K-split, 3-output, 42 dB operational gain, manual gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station, RoHS-compliant
831000-004-00	MBV3-100A-HXXH-F-X-R	STARLINE ergonomic 1 GHz MB with 5–65 MHz/85–1003 MHz A-split, 3-output, 42 dB operational gain, manual gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station, RoHS-compliant
831000-005-00	MBV3-100A-HXXH-E15-X-R	STARLINE ergonomic 1 GHz MB with 5–65 MHz/85–1003 MHz A-split, 3-output, 42 dB operational gain, manual gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, 15 A electronics module only (no housing), RoHS-compliant
831000-006-00	MBV3-100N-HXXH-F-X-R	STARLINE ergonomic 1 GHz MB with 5–85 MHz/104–1003 MHz N-split, 3-output, 42 dB operational gain, manual gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station, RoHS-compliant
831000-007-00	MBV3-100N-HXXH-E15-X-R	STARLINE ergonomic 1 GHz MB with 5–85 MHz/104–1003 MHz N-split, 3-output, 42 dB operational gain, manual gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, 15 A electronics module only (no housing), RoHS-compliant
831000-008-00	MBV3-100S-HXXH-F-90-R	STARLINE ergonomic 1 GHz MB with 5–40 MHz/52–1003 MHz S-split, 3-output, 42 dB operational gain, manual gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station—90 V configured, RoHS-compliant
831000-009-00	MBV3-100S-HAXH-F-90-R	STARLINE ergonomic 1 GHz MB with 5–40 MHz/52–1003 MHz S-split, 3-output, 42 dB operational gain, ADU 499.25 MHz gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station—90 V configured, RoHS-compliant
831000-010-00	MBV3-100K-HAXH-F-90-R	STARLINE ergonomic 1 GHz MB with 5–42 MHz/54–1003 MHz K-split, 3-output, 42 dB operational gain, ADU 499.25 MHz gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station—90 V configured, RoHS-compliant
831000-011-00	MBV3-100S-HSXH-F-90-R	STARLINE ergonomic 1 GHz MB with 5–40 MHz/52–1003 MHz S-split, 3-output, 42 dB operational gain, QAM ADU 711 MHz gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station—90 V configured, RoHS-compliant
831000-012-00	MBV3-100K-HSXH-F-90-R	STARLINE ergonomic 1 GHz MB with 5–42 MHz/54–1003 MHz K-split, 3-output, 42 dB operational gain, QAM ADU 711 MHz gain control, 14 dB internal slope, high gain return, 20 A fuses, FTEC surge protector, full station—90 V configured, RoHS-compliant

Order Information (continued)

Part Number	Model	Description
535723-001	SFE-100-0-R	STARLINE Forward 1003 MHz equalizer (0 dB) -or-
531124-001 to -022	SFE-100-1-R to -22-R	STARLINE Forward 1003 MHz equalizer (values 1 to 22 dB in 1 dB steps) -or-
531161-001 to -010	SCS-1-R to SCS-10-R	STARLINE Cable Simulator (values 1 to 10 dB in 1 dB steps)
531163-XXX-00	SRE-*-*-R	STARLINE Return Equalizer, 5–40 MHz (S-split), 5–42 MHz (K-split), 5–55 MHz (J-split), 5–65 MHz (A-split), values 0–12 dB in 1 dB steps for S-split (2 dB steps for all other frequency splits)
531186-XXX-00	JXP-*-B-R	Plug-in attenuator/pad (values 0–26 dB in 1 dB steps)
535723-001	SFE-100-0-R	STARLINE Forward 1003 MHz equalizer (0 dB) -or-
558958-001-00	QADU-609/V-R	QADU-609.00S/V-R,MBV3 vertical automatic drive unit which uses QAM channel as pilot signal. SAW filter design, configurable option, 609 MHz frequency, RoHS-compliant
558958-002-00	QADU-711/V-R	QADU-711.00S/V-R,MBV3 vertical automatic drive unit which uses QAM channel as pilot signal. SAW filter design, configurable option, 711 MHz frequency, RoHS-compliant
558958-003-00	ADU-499.25/V-R	ADU-499.25S/V-R,MBV3 vertical automatic drive unit which uses analog channel as pilot signal. SAW filter design, configurable option, 499.25 MHz frequency, RoHS-compliant



- Notes:**
- 1) Not all combinations in the model guide are available. This is a guide only. Please see list of available models in Customer Print Sheet.
 - 2) FTECs are included in all models as standard, except for the "vanilla" models, MB2-100*H, which contain the standard gas tube surge arrester.
 - 3) 20A fuses are included in all amplifiers as standard.
 - 4) ICS and status monitor transponders will continue to be customer configurable options.
 - 5) For RoHS models, add "-R" to the end of the configuration string.

