



## CHP Max5000™ 1 GHz CWDM Forward Path Transmitters (CHP-GFXx-1xxx) Technical Specification

### Implementation Requirements for Two Wavelength Applications

Implementation Requirements	Two Wavelength Application
<b>Unique Requirements</b>	
Recommended wavelengths (Note 1)	1291 and 1311 nm
Maximum launch power/wavelength	7 dBm
<b>Common Requirements</b>	
Analog broadcast content	Must use identical analog content
Digital broadcast content	Can use different, digitally modulated narrowcast content
Analog RF input level	13 to 15 dBmV/channel
Digital RF input level	7 to 9 dBmV/channel
Maximum RF input cable length difference to TXs	100 feet

#### Notes

- ARRIS recommends to deploy 1311 nm as the first wavelength.
- An optical attenuator may be required for the CHP-GFXV-1291-08-S transmitters.

### Specifications

#### Optical

Optical Wavelength	1291, 1311 nm $\pm$ 4 nm
Optical Output Power	See CNR vs. Link Budget Tables

#### RF

Bandwidth	
Operational Range	54 to 1002 MHz
Analog Channel Range	54 to 550 MHz
Digital Channel Range	550 to 1002 MHz
Response Flatness, P-V, typ./max.	1.0/2.0 dB
Input Return Loss	16 dB
Port-to-Port Isolation	$\geq$ 60 dB, 54 to 870 MHz $\geq$ 50 dB, 870 to 1002 MHz
Port-to-Port Gain Variation, typ./max.	$\pm$ 0.5 dB/ $\pm$ 1.0 dB

# Technical Specifications

## Specifications

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### Powering

Power Consumption, max. 17.4W

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### Performance

Channel Plan 79 NTSC channels and up to 75 256-QAM channels

#### Input RF Power

Analog Channels (Notes 1 and 2) 15 dBmV/ch

Digital QAM Channels 9 dBmV/ch

Composite Second Order, typ. (Notes 1 and 3) -63 dBc

Composite Triple Beat, typ. (Note 1) -70 dBc

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### Mechanical

Optical Connector SC/APC

RF Connector F-type

RF Input Testpoint (Note 4) -20 ± 1.0 dB

Dimensions (W x H x D) in (cm) (Note 5) 1.25 x 3.4 x 18.5 in (3.2 x 8.7 x 47.0 cm)

Weight 2.75 lbs (1.24 kg)

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### Environmental

Operational Temperature (Note 6) 32 to 122°F (0 to 50°C)

Storage Temperature -40 to 158°F (-40 to 70°C)

Humidity, noncondensing, max. 85%

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#### Notes:

1. Distortions are measured using only CW analog carriers per SCTE recommendation by standard RF test methods. Performance shown represents typical performance for ≥85% of production units tested over typical Corning SMF-28 fiber (or equivalent). For minimum CSO and CTB, subtract 2 dB from typical. CSO performance is for the transmitter only. CSO specifications for 1291 nm transmitter is obtained with 15 km fiber. Typical system CSO is -60 dBc, assuming 7 dBm launch power per wavelength into fiber for a 1291 and 1311 nm system.
2. OMI is 3.9% at 79 NTSC channel loading.
3. CSO performance for NTSC channels is for the in-band (high-side) beats.
4. Relative to main port with 0 dB pad and 0 dB EQ.
5. Includes handles and connectors.
6. Temperature measured at transmitter module's air inlet.

**CNR vs. Link Budget: CHP-GFXx-1311 Series Dual-Input 1 GHz Transmitters**

	CHP-GFXV-1291/1311 (Note 1)					CHP-GFX-1311		
	-04	-06	-08	-10	-12	-13	-14	-15
<b>Output Power Tunable Range (dBm)</b>	2.0 to 4.0	4.0 to 6.0	6.0 to 8.0	8.0 to 10.0	10.0 to 12.0	—	—	—
<b>Output Power (dBm)</b>	4.0	6.0	8.0	10.0	12.0	13.0	14.0	15.0
<b>Fiber Length (km)</b>	7.0	13.0	15.0	15.0	15.0	20.0	20.0	20.0
<b>Optical Loss Budget (dB)</b>	<b>CNR (dB) for part fiber/part passive link (typical)</b>							
<b>2</b>	—	—	—	—	—	—	—	—
<b>3</b>	55.0	—	—	—	—	—	—	—
<b>4</b>	54.2	—	—	—	—	—	—	—
<b>5</b>	53.6	54.0	—	—	—	—	—	—
<b>6</b>	—	53.5	—	—	—	—	—	—
<b>7</b>	—	52.8	53.8	—	—	—	—	—
<b>8</b>	—	—	53.2	—	—	—	—	—
<b>9</b>	—	—	52.6	53.8	—	—	—	—
<b>10</b>	—	—	—	53.2	—	—	—	—
<b>11</b>	—	—	—	52.6	53.9	—	—	—
<b>12</b>	—	—	—	—	53.2	53.4	—	—
<b>13</b>	—	—	—	—	52.6	52.8	53.4	—
<b>14</b>	—	—	—	—	—	52.2	52.8	53.4
<b>15</b>	—	—	—	—	—	51.5	52.2	52.8
<b>16</b>	—	—	—	—	—	50.6	51.5	52.2
<b>17</b>	—	—	—	—	—	—	50.6	51.5
<b>18</b>	—	—	—	—	—	—	—	50.6

Notes:

1. CHP-GFXV-1291 transmitter is only available with a variable output power of 8dBm.
2. Optical output power specified before transmitter's bulkhead.
3. CNR variation is ±0.5 dB within the tunable range if the receiver optical input power is adjusted to the same power level.
4. The variable optical output power range can be extended 0.5 dB above and below the specified range, but distortions, as specified on the previous page, are not guaranteed in this extended range.
5. CNR is measured using CW analog carriers per SCTE test procedures. Performance shown is ambient. Subtract 0.5 dB for performance over full temp. range.
6. OMI is automatically maintained within the tunable range except when operating in the custom manual mode.
7. Specifications measured using typical receiver with 0.85 mA/mW, 7 pA/Hz<sup>0.5</sup> performance.
8. All performance specified for 79 NTSC channels at 15 dBmV/channel and 450MHz of digital loading at 6 dB below equivalent video channels.
9. Multiple forward wavelengths on a single fiber requires specific application considerations, please contact ARRIS for system design guidance.

