DATA SHEET

Headend Optics Platform (CH3000)

HT3540H Series

Double-Density Full Spectrum
DWDM Transmitter System

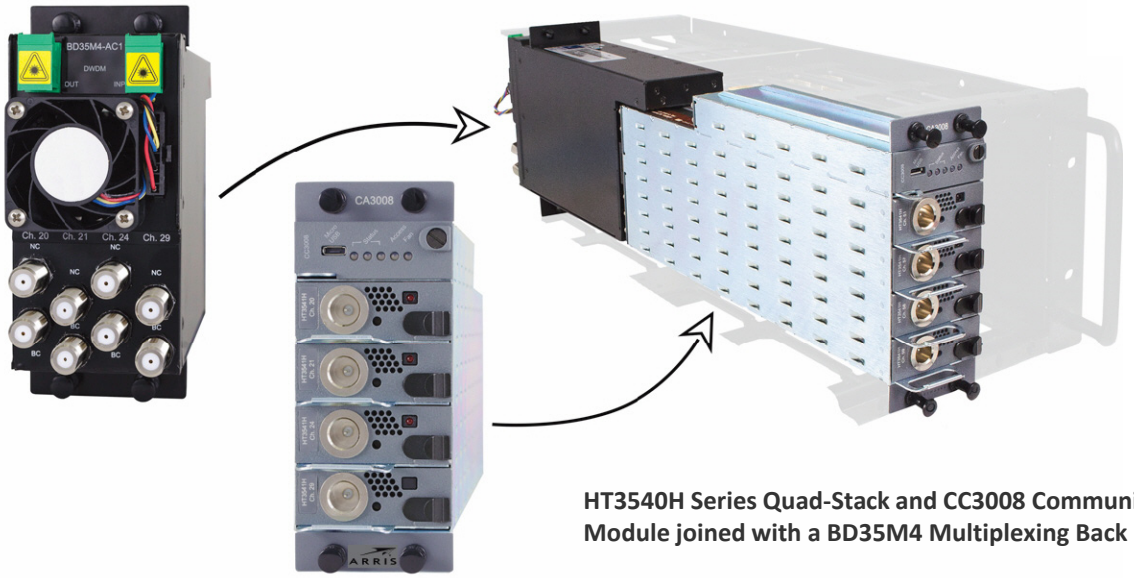
FEATURES

- Available in 40 wavelengths on ITU 100 GHz grid
- Hot plug-in/out, individually replaceable transmitter modules
- Optimized for full spectrum loading
- Analog loading up to 552 MHz plus QAM loading
- Manual or Automatic Gain Control (AGC) modes
- Low power consumption
- High rack density: 24 transmitters per 3RU chassis, with redundant power supplies and optical multiplexing
- Front panel -20 dB input test point
- Front panel laser On/Off switch
- Local and remote status monitoring features

The CommScope HT3540H Series Double-Density Full Spectrum Dense Wave Division Multiplexing (DWDM) Transmitter System provides high performance and a high rack density forward path transmission solution for Cable TV service providers.

The high-density packaging design allows up to four (4) HT3540H series high performance transmitters plus a CC3008 Communications Control Module to be stacked vertically and contained by the CA3008 module carrier, requiring only two chassis slots of a 3RU chassis. The compact solution supports up to 24 transmitters in a CH3000 chassis, including redundant power supplies.

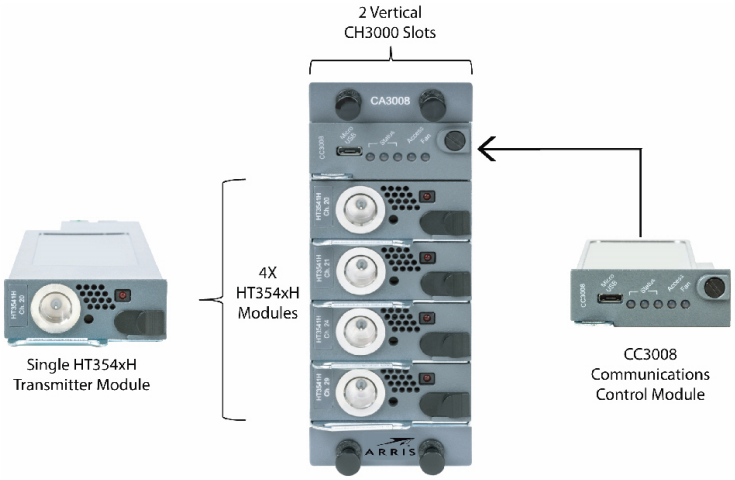
When installed in the chassis, the transmitters interface to a “zero-slot” back plate, providing support for up to four HT3540H series transmitters. The figure below shows a fully loaded carrier mated to the BD35M4 Double-Density multiplexing back plate that supports optical combining of four DWDM wavelengths in the forward path.



HT3540H Series Quad-Stack and CC3008 Communications Module joined with a BD35M4 Multiplexing Back Plate

The CC3008 Communications Module installed at the top of a HT3540H series transmitter stack provides the communications interface between the transmitters and the CH3000 mid-plane bus, allowing complete configuration and management control of the stack, both local and remote.

HT3540H Series Double Density Full Spectrum DWDM Transmitters (1.2 GHz Passband)



CommScope HT3540H Series Double-Density Full Spectrum DWDM Transmitters are a key element of the CommScope HFC and Fiber Deep architectures in support of the evolution to all QAM transmission. These high-performance transmitters are designed for Dense Wave Division Multiplexing (DWDM) applications for point-to-point forward path transmission of full spectrum broadcast and narrowcast services.

HT3541H series transmitters are designed for “light” analog channel loading from 0 to 30 analog channels (up to 258 MHz) plus QAM channel loading, or for all QAM loading. They are also designed for QAM-only loading for digital services as part of a BC/NC overlay system.

HT3542H series transmitters are designed for “full” analog channel loading from 0 to 79 analog channels (up to 552 MHz) plus QAM channel loading.

HT3543H series transmitters are designed for all QAM loading.

These transmitters incorporate advanced dispersion compensation circuitry to enable transmission of high-quality signals over maximum distances.

The above figure shows a front view of the CA3008 carrier components: a single HT354xH Double-Density Transmitter (left); a single CC3008 Communications Module (right), and a fully loaded “stack” (center) providing four (4) DWDM transmitters, requiring only 2 vertical slots of a CH3000 Chassis. A fully loaded CH3000 chassis supports 24 Double-Density DWDM transmitters and redundant power supplies.

Features

- DWDM transmitter: 40 wavelengths on the ITU grid
- Manual or Automatic Gain Control (AGC) modes
- RF input amplification up to +6 dB
- Optimized for full spectrum loading
- HT3541H: Analog loading up to 258 MHz plus QAM loading, or all QAM loading.
- HT3542H: Analog loading up to 552 MHz, plus QAM loading
- HT3543H: All QAM loading
- Hot plug-in/out, individually insertable
- Low power consumption
- Industry’s highest DWDM rack density: 24 transmitters per 3RU chassis, with redundant power supplies
- Front access -20 dB input test point
- Front panel laser On/Off interlock switch
- Local and remote status monitoring

HT3540H SERIES SPECIFICATIONS

Characteristics		Specification					
Physical							
Dimensions		11.5” D x 0.8” H x 2.0” W (29.2 x 2.0 x 5.1 cm)*					
Weight		0.75 lbs. (0.34 kg)					
		* Four (4) transmitter units designed to be vertically stacked, plus a CC3008 Communications Module, and installed inside a CA3008 Module Carrier. The combination occupies two slots in a 3RU CH3000 Chassis.					
Environmental							
Operating		-20° to +65°C (-4° to 149°F)					
Storage		-40° to +85°C (-40° to +185°F)					
Humidity		5% to 95% non-condensing					
RF and Optical Interface							
RF Input		F-type male located on BD31A4 or BD35M4 Back Plates					
Input RF Test Point		G-type male (located at front panel, -20 dB)					
Optical Connector		SC/APC located on BD31A4 or BD35M4 Back Plates					
Power Requirements							
Input Voltage		12 V_{DC}					
Power Consumption		10 W (per transmitter) including controller and back plate cooling fan					
General							
		Hot plug-in/out					
		Manual gain alignment					
Channel Loading							
		HT3541H: 0–30 Analog channels (up to 258 MHz), plus QAM channels HT3542H: 0–79 Analog channels (up to 552 MHz), plus QAM channels HT3543H: All QAM channels					
Optical							
Optical Output Power		10 ± 0.25 dBm					
Wavelength		See DWDM ITU Channel Plans description					
Fiber Length		HT3541H and HT3543H: 60 km max. (Dispersion Compensation adjustable in 5 km steps) HT3542H: 40 km max. (Dispersion Compensation adjustable in 1 km steps) Compatible with external dispersion compensation for some applications					
Electrical							
Passband		45 to 1218 MHz					
Frequency Response (Flatness including Slope)		• ± 1.0 dB (BC input @ 25°C) • ± 0.5 dB (NC input relative to BC input)					
Nominal RF Input Levels (Input Attenuator = 0 dB)		HT3541H: • 16.2 dBmV/ch for 30 analog channels into BC input • 10.2 dBmV/ch for 256-QAM channels into BC input, or 16.2 dBmv/ch into NC input HT3542H: • 15 dBmV/ch for 79 analog channels into BC input • 9 dBmV/ch for 256-QAM channels into BC input, or 15 dBmv/ch into NC input HT3543H: • 10.7 dBmV/ch for 154 256-QAM channels into BC input, or 16.7 dBmV/ch into NC input					
RF Input Impedance		75 Ω, nom					
RF Input Return Loss		18 dB, min					
RF Input Attenuator/Amplify Range (Manual Mode)		-6.0 to +5.0 dB Normal mode. High-gain mode (+5.5, +6.0 dB) supports BC RF input port, NC RF input is terminated.					
RF Input Attenuator Step Size		0.5 dB					
AGC Mode		Maintains RF level to within ± 3 dB of the learned RF value					
Level Stability (Typical)		± 0.5 dB (-1 worst case relative to 25°C)					
256-QAM BER		< 10^{-5} (pre-FEC, ITU-C)					
MER		> 37 dB to 50°C; > 36 dB to 65°C					
Link Performance		HT3541H		HT3542H		HT3543H	
	Loading	30A + 124 QAM		79A + 75 QAM		154 QAM	
	Length (km)	40	60	30	40	40	60
	CNR* (dB):	52	50	51	50	See MER	See MER
	CSO (dB):	61	58	60	58	-	-
	CTB (dB):	65	65	65	65	-	-
		* max 1 dB degradation at temperature extremes					
		An HT3541H transmitter can also be used as a narrowcast transmitter. For example, in BC/NC overlay systems, it would have the performance of an AT3535G-xx-1-AS transmitter. For more information about BC/NC overlay system performance and evolution from low NC 256-QAM channel loading to full spectrum 256-QAM channel loading, or for information about full spectrum multiwavelength applications with up to 40 DWDM wavelengths, please contact your CommScope representative.					
DWDM ITU Channel Plans							
		CommScope supports DWDM network architectures with a variety of products on the standard DWDM ITU Grid (ITU-T G.694.1). For a more complete description, please refer to the CommScope DWDM ITU Grid Channel Plan data sheet.					

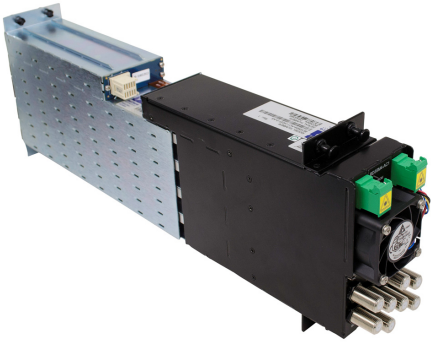
BD35M4-AC Double-Density Back Plates

The CommScope BD35M4-AC Family of back plates is a 100 GHz grid spacing Double-Density Mux Back Plate that multiplexes the output of four HT3540H Double-Density Full Spectrum Transmitters.

This back plate provides connections for a group of four HT3540H Series Transmitters installed in the same CA3008 Module Carrier, along with the CC3008 Communications Control Module.

These 4-channel mux back plates (for which outputs can be cascaded from one back plate to another) may be ordered for various channel groups.

BD35M4-ACX-H02F-Y-AS Back Plate



BD35M4-AC BACK PLATE SPECIFICATIONS

Characteristics	Specification	
Physical		
Dimensions	7.2” D x 5.2” H x 2.0” W* (18.2 x 13.2 x 5.1 cm)	
Weight	2.0 lb. (0.91 kg)	
Environmental		
Operating	-20° to +65°C (-4° to 149°F)	
Storage	-40° to +85°C (-40° to +185°F)	
Humidity	5% to 95% non-condensing	
Power Requirements		
Input Voltage	12 V_{DC}	
Power Consumption	5 W max (2.5 W Typ), including the replaceable cooling fan	
Optical Interface		
Optical Connectors	SC/APC (2)	
	• DWDM INP (input from previous mux back plate) • DWDM OUT (output to network or next mux back plate)	
RF Interface		
8 F-Type Connectors	• 4 BC and 4 NC (1 BC/NC pair per transmitter)	
Optical		
Channel Spacing	100 GHz	
Channel Plan	See ITU Channel Plans description	
Insertion Losses, Including Connectors	Typ	Max
• DWDM Input to DWDM Output	1.0 dB	1.2 dB
• Ch. yy Input to DWDM Output	1.4 dB	1.6 dB
Uniformity, Including Connectors		
• Module Uniformity	0.7 dB	1.0 dB
• Paired Uniformity	0.4 dB	0.6 dB
Return Loss, min	45 dB	
Directivity, min	55 dB	
Passband @ 0.2 dB		
• Ch. yy Input to DWDM Output	± 0.125 nm	
• DWDM Input to DWDM Output	Passes 1423.5 through 1617.5 with a notch at the channel add/drop band. WDL for the passband is within ± 0.15 dB	
Ripple Within Passband	0.5 dB max	
Polarization Dependent Loss, max	0.1 dB (typically < 0.05 dB)	
Power Handling, max (Any Input Port)	21.8 dBm	

BD31A4-100 Double-Density Back Plates

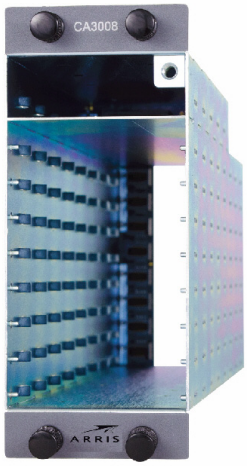
The BD31A4 is a double-density back plate that provides a choice of 4 separate BC and 4 separate NC RF inputs, or 1 common BC and 4 separate NC RF inputs, for four HT3541H Transmitters.

The BD31A4-100 provides RF input and optical connections to or from the HT3541H transmitters.

BD31A4-100-H12F-0-AS is a double density back plate that provides 4 separate BC inputs and 4 separate NC RF inputs for four HT3541H Transmitters. Also supports four separate optical output SC/APC connectors.

BD31A4-100-H10F-0-AS is a double density back plate that provides 1 common BC input and 4 separate NC RF inputs for four HT3541H Transmitters. Also supports four separate optical output SC/APC connectors.

BD31A4-100-H12F-0-AS Back Plate



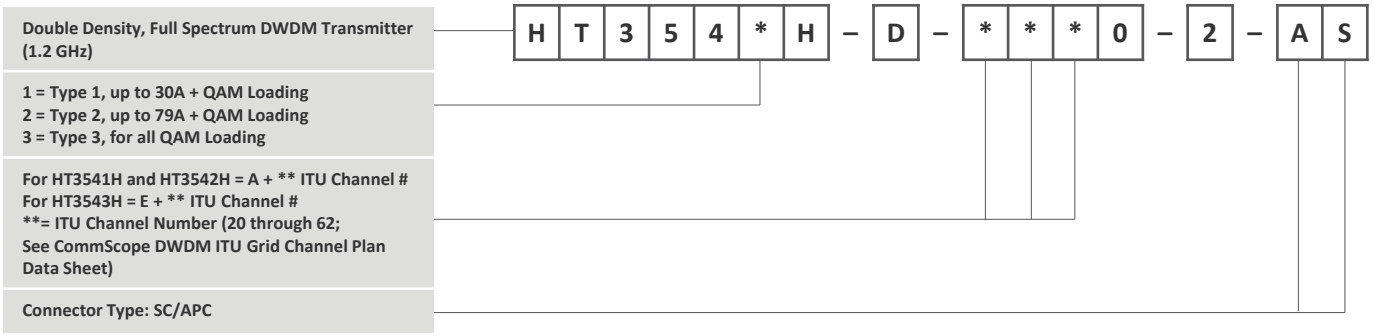
CA3008 Module Carrier

BD31A4-100 BACK PLATE SPECIFICATIONS

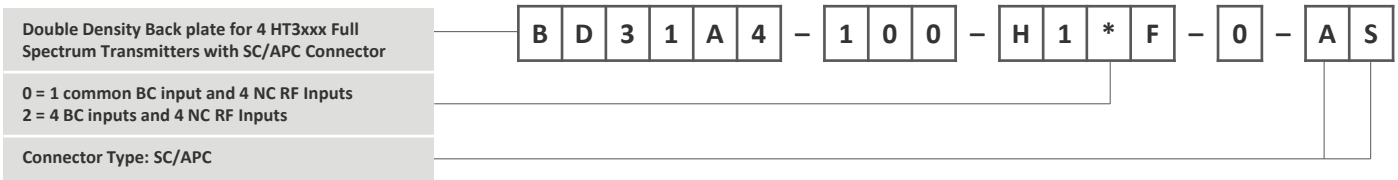
Characteristics	Specification
Physical	
Dimensions	7.2” D x 5.2” H x 2.0” W* (18.2 x 13.2 x 5.1 cm)
Weight	2.0 lb. (0.91 kg)
Environmental	
Operating	-20° to +65°C (-4° to 149°F)
Storage	-40° to +85°C (-40° to +185°F)
Humidity	5% to 95% non-condensing
Power Requirements	
Input Voltage	12 V_{DC}
Power Consumption	5 W max (2.5 W Typ), including the replaceable cooling fan
Optical	
	Through 4 SC/APC connectors, the BD31A4-100 provides optical pass-through from the HT354xH transmitter.
Optical Insertion Loss	0.2 dB Typ; 0.4 dB Max
	Refer to the HT354xH product specifications for more information.
RF Interface	
	The BD31A4-100 provides RF to the HT354xH transmitter through F-type RF connectors. • 4 BC and 4 NC (BD31A4-100-H12F-0-AS) • 1 BC and 4 NC (BD31A4-100-H10F-0-AS)

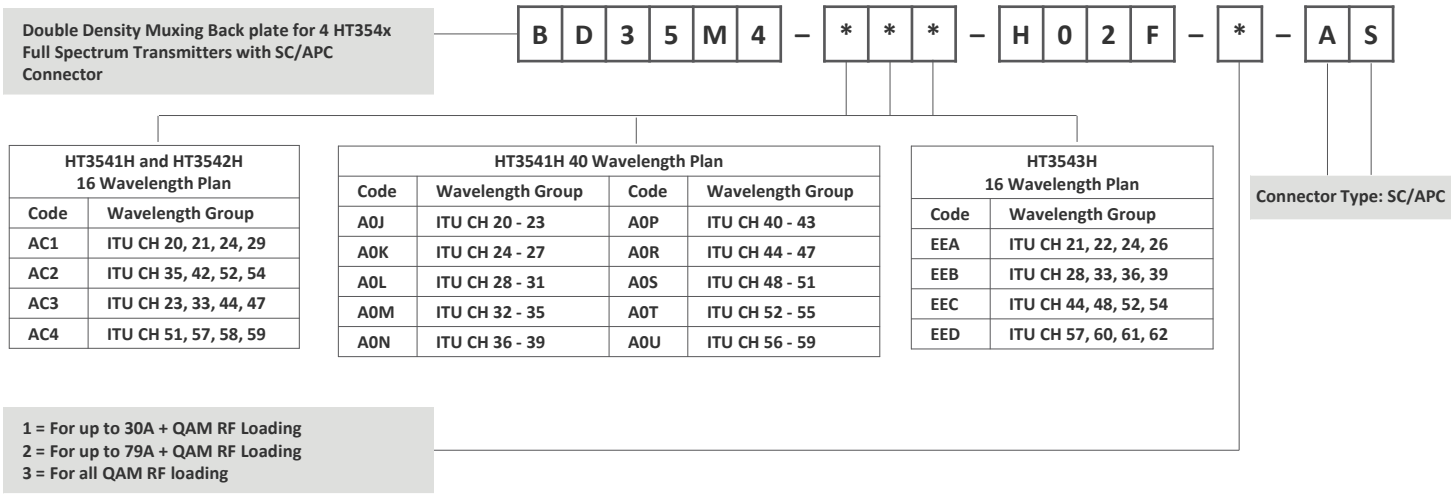
ORDERING INFORMATION

HT354xH Transmitter



Back Plates





HT3541H and HT3542H 16 Wavelength Plan	
Code	Wavelength Group
AC1	ITU CH 20, 21, 24, 29
AC2	ITU CH 35, 42, 52, 54
AC3	ITU CH 23, 33, 44, 47
AC4	ITU CH 51, 57, 58, 59

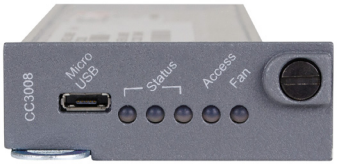
HT3541H 40 Wavelength Plan			
Code	Wavelength Group	Code	Wavelength Group
A0J	ITU CH 20 - 23	A0P	ITU CH 40 - 43
A0K	ITU CH 24 - 27	A0R	ITU CH 44 - 47
A0L	ITU CH 28 - 31	A0S	ITU CH 48 - 51
A0M	ITU CH 32 - 35	A0T	ITU CH 52 - 55
A0N	ITU CH 36 - 39	A0U	ITU CH 56 - 59

HT3543H 16 Wavelength Plan	
Code	Wavelength Group
EEA	ITU CH 21, 22, 24, 26
EEB	ITU CH 28, 33, 36, 39
EEC	ITU CH 44, 48, 52, 54
EED	ITU CH 57, 60, 61, 62

ORDERING INFORMATION

System Accessories

Communications Control Module	CC3008
Module Carrier	CA3008
Filler Module for Double-Density Slots	HT3FILD



RELATED PRODUCTS

CH3000 Chassis	Optical Patch Cords
Optical Transmitters	Optical Passives
Digital Return	Installation Services

Contact Customer Care for product information and sales:

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

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Note: Specifications are subject to change without notice.

87-10845-RevT_HT3540_Double-Density-Transmitter-System