

APPENDIX F

APPENDIX F

Exemplary Evidence Showing Infringement of U.S. Patent No. 11,785,275 (“’275 Patent”)

The Accused Set-Top Box Products include Sagemcom set-top boxes that include a Broadcom BCM3390, BCM3384, BCM33843, or other SoC that features the same or substantially similar infringing functionality. Based on Entropic’s investigation to date, Entropic identifies the following non-limiting example of such products: the DGC1384 gateway.

As shown below in the chart with exemplary support, the Accused Set-Top Box Products infringe at least independent claims 1 and 11 of the ’275 Patent. The chart below uses the DGC1384 as a representative product. Each of the Accused Set-Top Box Products operates in substantially the same way for purposes relevant to infringement of the ’275 Patent because each includes a Broadcom BCM3390, BCM3384, BCM33843, or other SoC that contains the same functionalities and architectural elements recited herein. Sagemcom infringes the claims of the ’866 Patent directly, under 35 U.S.C. § 271(a), by making, using, selling, offering for sale, and/or importing the Accused Set-Top Box Products, and indirectly, under 35 U.S.C. § 271(b) and (c), by inducing or contributing to infringement by others.

Claim	Accused Set-Top Box Products
[1] A method for operating a television receiver, comprising:	The Accused Set-Top Box Products perform a method for operating a television receiver. For instance, the DGC1384 gateway, as shown below, includes a physical connection to a coaxial cable network from which they receive TV signals, and multiple outputs for connection to a television or other viewing device.
[1(a)] receiving, by an input terminal, an input signal comprising broadcast channels, the broadcast channels comprising a plurality of desired channels and a plurality of undesired channels, wherein the plurality of desired channels are non-contiguous;	The Accused Set-Top Box Products receive, by an input terminal, an input signal comprising broadcast channels, the broadcast channels comprising a plurality of desired channels and a plurality of undesired channels, wherein the plurality of desired channels are non-contiguous, as described below. For example, the DGC1384 includes a physical coaxial cable connection, shown in the picture below in blue, which receives an input signal from a cable network.

APPENDIX F

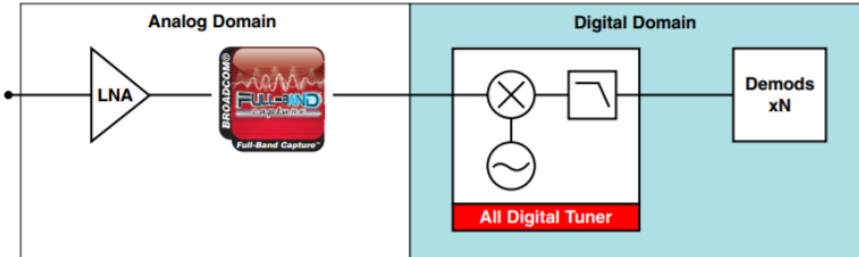
Claim	Accused Set-Top Box Products
	 The downstream signal received over a coaxial cable through the connection shown above comprises broadcast TV channels. The entire downstream signal includes both channels desired by a user (such as channels the user is or has recently been viewing) and those that are undesired. The channels desired by a user may be non-contiguous on the spectrum of the signal.
[1(b)] processing, by a radio front end coupled to the input terminal, the input signal to generate a processed input signal;	The Accused Set-Top Box Products process, by a radio front end coupled to the input terminal, the input signal to generate a processed input signal, as described below. For example, the DGC1384 includes the Broadcom BCM3384 SoC.

APPENDIX F

Claim	Accused Set-Top Box Products
	 The BCM3384 includes technology described by Broadcom as “Full-Band Capture (FBC) digital tuning technology”:¹ “The new BCM3384 DOCSIS®/Euro-DOCSIS™ 3.0 cable gateway SoC combines Broadcom’s Full-Band Capture (FBC) digital tuning technology with remote diagnostics, dual-band concurrent Wi-Fi, a custom, dedicated applications processor and integrated DECT 6.0 CAT-iq 2.0. . . . Broadcom is now sampling [as of Jan. 8, 2013] the BCM3384 and BCM33843.” (PR Newswire, Broadcom Launches Gigabit DOCSIS Cable Gateway Family (Jan. 8, 2013), https://www.prnewswire.com/news-releases/broadcom-launches-gigabit-docsis-cable-gateway-family-186004842.html.)

¹ PR Newswire, Broadcom Launches Gigabit DOCSIS Cable Gateway Family (Jan. 8, 2013), <https://www.prnewswire.com/news-releases/broadcom-launches-gigabit-docsis-cable-gateway-family-186004842.html>.

APPENDIX F

Claim	Accused Set-Top Box Products
	The BCM3384 Full-Band Capture architecture of the BCM3384 includes at least a low-noise amplifier (LNA) which is a radio front end coupled to the input terminal of the DGC1384. The LNA of the BCM3384 processes the input signal to generate a processed input signal. Full-Band Capture Digital Tuner Architecture  (Ex. J, Broadcom White Paper, Full-Band Capture Cable Digital Tuning (June 2011) at 3.)
[1(c)] digitizing, by an analog-to-digital converter (ADC) coupled to the radio front end, the processed input signal to generate a digitized signal;	The Accused Set-Top Box Products digitize, by an analog-to-digital converter (ADC) coupled to the radio front end, the processed input signal to generate a digitized signal, as described below. For example, the DGC1384 includes an ADC. As shown below, the DGC1384 includes a physical connection to a coaxial cable network, shown in the picture below in blue.

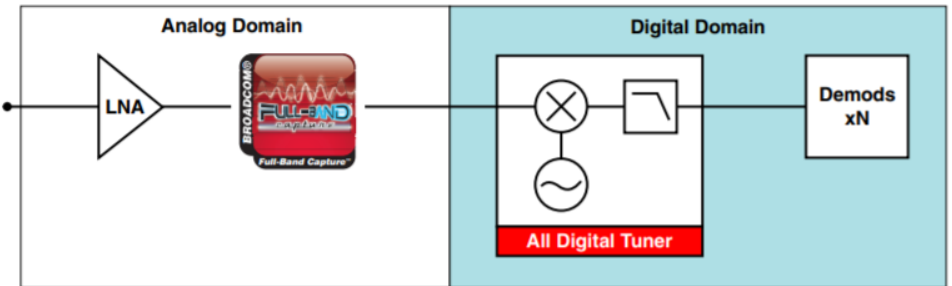
APPENDIX F

Claim	Accused Set-Top Box Products
	 The downstream signal received over a coaxial cable through the connection shown above is an analog RF signal. Further, the DGC1384 also includes outputs for connection to a television, including an HDMI output, shown above in green. HDMI is a type of interface used for, among other things, digital video or audio data. (HDMI Licensing Administrator, HDMI Specifications and Programs, https://www.hdmi.org/spec/index (last visited Apr. 8, 2025).) Accordingly, the DGC1384 includes an analog to digital converter to convert the analog signal received over the coaxial cable input to a digital signal that is then transmitted via the HDMI output. The analog to digital converter within the DGC1384 digitizes the processed input signal (which is analog) to generate a digitized signal. The DGC1384 includes the Broadcom BCM3384 SoC, as shown below.

APPENDIX F

Claim	Accused Set-Top Box Products
	 The BCM3384 digitizes cable signals: “The efficiency of Full-Band Capture converts the entire analog 1 GHz cable signal to a digital signal.” (Ex. J, Broadcom White Paper at 3.) “Full-Band Capture digital tuning technology and remote diagnostics: Integrated on-chip technology directly samples and digitizes the entire 1GHz downstream spectrum of a cable plant, providing access to any channel anywhere. Remote diagnostics provides real time, unobtrusive diagnostic and spectrum analysis capabilities, without effecting user service on any of the 24 downstream channels.” (PR Newswire, Broadcom Launches Gigabit DOCSIS Cable Gateway Family (Jan. 8, 2013), https://www.prnewswire.com/news-releases/broadcom-launches-gigabit-docsis-cable-gateway-family-186004842.html.)

APPENDIX F

Claim	Accused Set-Top Box Products
[1(d)] selecting, by a digital frontend (DFE) coupled to the ADC, the plurality of desired channels from the digitized signal; and	The Accused Set-Top Box Products select, by a digital frontend (DFE) coupled to the ADC, the plurality of desired channels from the digitized signal, as described below. For example, the DGC1384, including circuitry and/or software modules located in the BCM3384 SoC, comprises a digital frontend that uses Full Band Capture technology to select a plurality of desired channels from the digitized signal. For instance, the BCM3384 can “digitally tune multiple channels simultaneously”; “[e]ach digitally tuned channel then feeds the signal into a digital demodulator that outputs a transport stream” (Ex. J, Broadcom White Paper at 3.) Full-Band Capture Digital Tuner Architecture  (Ex. J, Broadcom White Paper at 3.) “The efficiency of Full-Band Capture converts the entire analog 1 GHz cable signal to a digital signal. This high-speed precision conversion replaces all the analog tuners in a system. With the entire RF signal in digital form, advanced digital signal processing techniques can be used to digitally tune multiple channels simultaneously at near instantaneous speeds. Each digitally tuned channel then feeds the signal into a digital demodulator that outputs a transport stream for use in DOCSIS or broadcast services. One Full-Band Capture Digital Tuner can service any number of demodulators. Each demodulator can access any frequency without restriction or relationship to other channels.” (Ex. J, Broadcom White Paper at 3.)

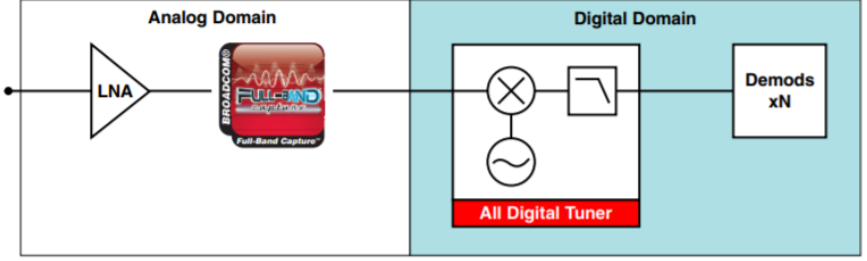
APPENDIX F

Claim	Accused Set-Top Box Products
	“Since Full-Band Capture scales easily in systems, operators can confidently design services that use increasing numbers of channels with 8, 16, or even 32 active channels at time.” (Ex. J, Broadcom White Paper at 5.) “Bandwidth flexibility: Supports DOCSIS and digital video on any frequency eliminating limitations of ‘block’ tuners. When combined with Broadcom’s set-top box SoC with fast acquisition technology, video channels can be pre-tuned and users can enjoy the experience of Broadcom’s FastRTV™ fast channel change technology.” (PR Newswire, Broadcom Launches Gigabit DOCSIS Cable Gateway Family (Jan. 8, 2013), https://www.prnewswire.com/news-releases/broadcom-launches-gigabit-docsis-cable-gateway-family-186004842.html.)

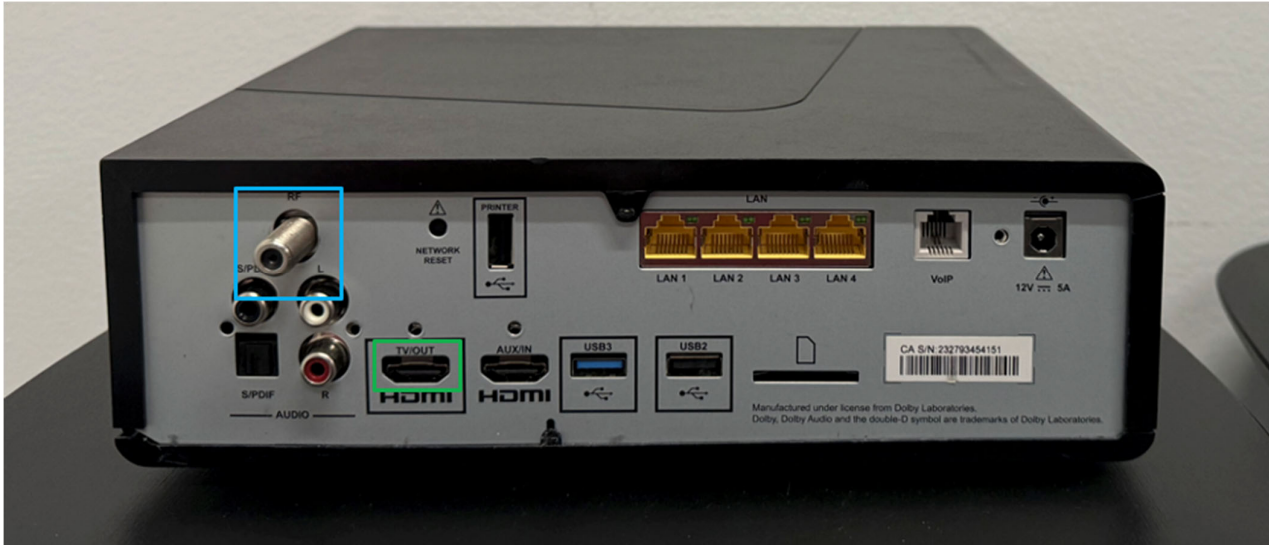
APPENDIX F

Claim	Accused Set-Top Box Products
	Fourth-generation DOCSIS® 3.0 System-on-a-Chip (SoC) capable of 1-Gb/s downstream speeds by bonding up to 24x8 DOCSIS channels. Broadcom's BCM3384 DOCSIS®/EuroDOCSIS™ 3.0 cable gateway SoC combines Broadcom's Full-Band Capture (FBC) digital tuning technology with remote diagnostics, dual-band concurrent Wi-Fi, a dedicated applications processor and integrated DECT 6.0 CAT-iq 2.0. Broadcom's DOCSIS technology enables advanced data, voice and video services throughout the home. When combined with Broadcom's set-top box SoC with fast-acquisition technology, video channels can be pretuned and users can enjoy the experience of Broadcom's FastRTV® fast-channel-change technology. Features • Features 24x8 DOCSIS channel bonding for breakthrough Internet speeds • Enables fastest whole-home connected solution when paired with 5G WiFi • Accelerates time to market with pin compatibility to Broadcom's DOCSIS 3.0 cable gateway SoC • Integrates DECT and turnkey software to deliver complete digital voice solution Applications • Set-Top Boxes • Home Gateways (Broadcom BCM3384 Overview, https://www.broadcom.com/products/broadband/cable/modems/bcm3384 (last visited Apr. 8, 2025).)

APPENDIX F

Claim	Accused Set-Top Box Products
[1(e)] outputting, by the DFE, the selected plurality of desired channels to at least one demodulator as a digital datastream, wherein the demodulator extracts information encoded in the digital datastream.	The Accused Set-Top Box Products output, by the DFE, the selected plurality of desired channels to at least one demodulator as a digital datastream, wherein the demodulator extracts information encoded in the digital datastream, as described below. For example, the DGC1384, including circuitry and/or software modules located in the BCM3384 SoC, comprises a DFE that is configured to output the selected plurality of desired channels to at least one demodulator as a digital datastream, labeled below as “Demods.” Full-Band Capture Digital Tuner Architecture  (Ex. J, Broadcom White Paper at 3.) The demodulators of the BCM3384 extract information encoded in the digital datastream: “The efficiency of Full-Band Capture converts the entire analog 1 GHz cable signal to a digital signal. This high-speed precision conversion replaces all the analog tuners in a system. With the entire RF signal in digital form, advanced digital signal processing techniques can be used to digitally tune multiple channels simultaneously at near instantaneous speeds. Each digitally tuned channel then feeds the signal into a digital demodulator that outputs a transport stream for use in DOCSIS or broadcast services. One Full-Band Capture Digital Tuner can service any number of demodulators. Each demodulator can access any frequency without restriction or relationship to other channels.” (Ex. J, Broadcom White Paper at 3.)

APPENDIX F

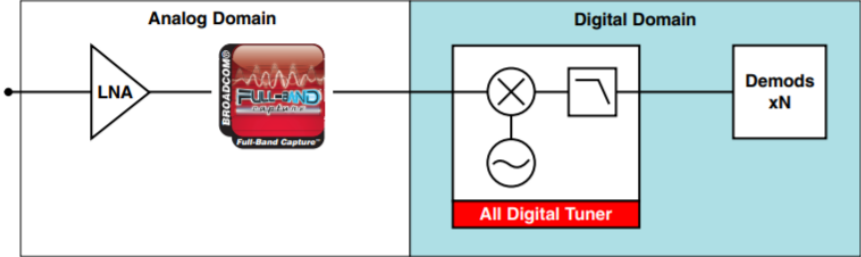
Claim	Accused Set-Top Box Products
[11] A television receiver device, comprising:	The Accused Set-Top Box Products are television receiver devices. For instance, the DGC1384 includes a physical connection to a coaxial cable network from which they receive TV signals, and multiple outputs for connection to a television or other viewing device.
[11(a)] an input terminal operable to receive an input signal comprising broadcast channels, the broadcast channels comprising a plurality of desired channels and a plurality of undesired channels, wherein the plurality of desired channels are non-contiguous;	The Accused Set-Top Box Products include an input terminal operable to receive an input signal comprising broadcast channels, the broadcast channels comprising a plurality of desired channels and a plurality of undesired channels, wherein the plurality of desired channels are non-contiguous, as shown below. For example, the DGC1384 includes a physical coaxial cable connection, shown in the picture below in blue, which receives an input signal from a cable network.  The downstream signal received over a coaxial cable through the connection shown above comprises broadcast TV channels. The entire downstream signal includes both channels desired by a user (such as

APPENDIX F

Claim	Accused Set-Top Box Products
	channels the user is or has recently been viewing) and those that are undesired. The channels desired by a user may be non-contiguous on the spectrum of the signal.
[11(b)] a radio front end, coupled to the input terminal, operable to process the input signal;	The Accused Set-Top Box Products include a radio front end coupled to the input terminal and operable to process the input signal. For example, the DGC1384 includes the Broadcom BCM3384 SoC, shown below.  The BCM3384 includes technology described by Broadcom as “Full-Band Capture (FBC) digital tuning technology”:² “The new BCM3384 DOCSIS®/Euro-DOCSIS™ 3.0 cable gateway SoC combines Broadcom’s Full-Band Capture (FBC) digital tuning technology with remote diagnostics, dual-band concurrent Wi-Fi, a custom,

² PR Newswire, Broadcom Launches Gigabit DOCSIS Cable Gateway Family (Jan. 8, 2013), <https://www.prnewswire.com/news-releases/broadcom-launches-gigabit-docsis-cable-gateway-family-186004842.html>.

APPENDIX F

Claim	Accused Set-Top Box Products
	dedicated applications processor and integrated DECT 6.0 CAT-iq 2.0. . . . Broadcom is now sampling [as of Jan. 8, 2013] the BCM3384 and BCM33843.” (PR Newswire, Broadcom Launches Gigabit DOCSIS Cable Gateway Family (Jan. 8, 2013), https://www.prnewswire.com/news-releases/broadcom-launches-gigabit-docsis-cable-gateway-family-186004842.html.) The BCM3384 Full-Band Capture architecture of the BCM3384 includes at least a low-noise amplifier (LNA) which is a radio front end coupled to the input terminal of the DGC1384. The LNA of the BCM3384 processes the input signal to generate a processed input signal. Full-Band Capture Digital Tuner Architecture  (Ex. J, Broadcom White Paper, Full-Band Capture Cable Digital Tuning (June 2011) at 3.)
[11(c)] an analog-to-digital converter (ADC), coupled to the radio front end, operable to digitize the processed input signal to generate a digitized signal; and	The Accused Set-Top Box Products include an analog-to-digital converter (ADC) coupled to the radio front end, to digitize the processed input signal to generate a digitized signal. For example, the DGC1384 includes an ADC. As shown below, the DGC1384 includes a physical connection to a coaxial cable network, shown in the picture below in blue.

APPENDIX F

Claim	Accused Set-Top Box Products
	 The downstream signal received over a coaxial cable through the connection shown above is an analog RF signal. Further, the DGCI384 also includes outputs for connection to a television, including an HDMI output, shown above in green. HDMI is a type of interface used for, among other things, digital video or audio data. (HDMI Licensing Administrator, HDMI Specifications and Programs, https://www.hdmi.org/spec/index (last visited Apr. 8, 2025).) Accordingly, the DGCI384 includes an analog to digital converter to convert the analog signal received over the coaxial cable input to a digital signal that is then transmitted via the HDMI output. The analog to digital converter within the DGCI384 digitizes the processed input signal (which is analog) to generate a digitized signal. The DGCI384 includes the Broadcom BCM3384 SoC, as shown below.

APPENDIX F

Claim	Accused Set-Top Box Products
	 The BCM3384 digitizes cable signals: “The efficiency of Full-Band Capture converts the entire analog 1 GHz cable signal to a digital signal.” (Ex. J, Broadcom White Paper at 3.) “Full-Band Capture digital tuning technology and remote diagnostics: Integrated on-chip technology directly samples and digitizes the entire 1GHz downstream spectrum of a cable plant, providing access to any channel anywhere. Remote diagnostics provides real time, unobtrusive diagnostic and spectrum analysis capabilities, without effecting user service on any of the 24 downstream channels.” (PR Newswire, Broadcom Launches Gigabit DOCSIS Cable Gateway Family (Jan. 8, 2013), https://www.prnewswire.com/news-releases/broadcom-launches-gigabit-docsis-cable-gateway-family-186004842.html.)

APPENDIX F

Claim	Accused Set-Top Box Products
[11(d)] a digital frontend (DFE), coupled to the ADC, operable to select the plurality of desired channels from the digitized signal and output the selected plurality of desired channels to at least one demodulator as a digital datastream, wherein the demodulator is operable to extract information encoded in the digital datastream.	The Accused Set-Top Box Products include a digital frontend (DFE) coupled to the ADC, operable to select the plurality of desired channels from the digitized signal and output such channels to a demodulator as a digital datastream. where the demodulator is operable to extract information from the digital datastream. For example, the DGC1384, including circuitry and/or software modules located in the BCM3384 SoC, comprises a digital frontend that uses Full Band Capture technology to select a plurality of desired channels from the digitized signal. For instance, the BCM3384 can “digitally tune multiple channels simultaneously”; “[e]ach digitally tuned channel then feeds the signal into a digital demodulator that outputs a transport stream” (Ex. J, Broadcom White Paper at 3.) Full-Band Capture Digital Tuner Architecture The diagram illustrates the Full-Band Capture Digital Tuner Architecture. It is divided into two main sections: the Analog Domain and the Digital Domain. In the Analog Domain, an input signal enters an LNA (Low Noise Amplifier) block, followed by a 'Full-Band Capture' block (represented by a red icon with the Broadcom logo). The signal then transitions into the Digital Domain, which is highlighted with a light blue background. Inside the Digital Domain, the signal passes through a block containing a multiplier (X) and a filter (represented by a square with a diagonal line). Below this block is a red label 'All Digital Tuner'. The output of this block then feeds into a 'Demods xN' block, representing multiple demodulators. (Ex. J, Broadcom White Paper at 3.) “The efficiency of Full-Band Capture converts the entire analog 1 GHz cable signal to a digital signal. This high-speed precision conversion replaces all the analog tuners in a system. With the entire RF signal in digital form, advanced digital signal processing techniques can be used to digitally tune multiple channels simultaneously at near instantaneous speeds. Each digitally tuned channel then feeds the signal into a digital demodulator that outputs a transport stream for use in DOCSIS or broadcast services. One Full-Band Capture Digital Tuner can service any number of demodulators. Each demodulator can access any frequency without restriction or relationship to other channels.” (Ex. J, Broadcom White Paper at 3.)

APPENDIX F

Claim	Accused Set-Top Box Products
	“Since Full-Band Capture scales easily in systems, operators can confidently design services that use increasing numbers of channels with 8, 16, or even 32 active channels at time.” (Ex. J, Broadcom White Paper at 5.) “Bandwidth flexibility: Supports DOCSIS and digital video on any frequency eliminating limitations of ‘block’ tuners. When combined with Broadcom’s set-top box SoC with fast acquisition technology, video channels can be pre-tuned and users can enjoy the experience of Broadcom’s FastRTV™ fast channel change technology.” (PR Newswire, Broadcom Launches Gigabit DOCSIS Cable Gateway Family (Jan. 8, 2013), https://www.prnewswire.com/news-releases/broadcom-launches-gigabit-docsis-cable-gateway-family-186004842.html.)

APPENDIX F

Claim	Accused Set-Top Box Products
	Fourth-generation DOCSIS® 3.0 System-on-a-Chip (SoC) capable of 1-Gb/s downstream speeds by bonding up to 24x8 DOCSIS channels. Broadcom's BCM3384 DOCSIS®/EuroDOCSIS™ 3.0 cable gateway SoC combines Broadcom's Full-Band Capture (FBC) digital tuning technology with remote diagnostics, dual-band concurrent Wi-Fi, a dedicated applications processor and integrated DECT 6.0 CAT-iq 2.0. Broadcom's DOCSIS technology enables advanced data, voice and video services throughout the home. When combined with Broadcom's set-top box SoC with fast-acquisition technology, video channels can be pretuned and users can enjoy the experience of Broadcom's FastRTV® fast-channel-change technology. Features • Features 24x8 DOCSIS channel bonding for breakthrough Internet speeds • Enables fastest whole-home connected solution when paired with 5G WiFi • Accelerates time to market with pin compatibility to Broadcom's DOCSIS 3.0 cable gateway SoC • Integrates DECT and turnkey software to deliver complete digital voice solution Applications • Set-Top Boxes • Home Gateways (Broadcom BCM3384 Overview, https://www.broadcom.com/products/broadband/cable/modems/bcm3384 (last visited Apr. 8, 2025).)