SURFboard® SBV6220
Digital Voice Modem with Integrated Battery Backup

Strengthen your broadband leadership — Count on Motorola's SURFboard DOCSIS® CPE to help you deliver innovative, ultra broadband IP voice and data services to your premium customers.

HIGHLIGHTS

- Compatible with Windows®, Macintosh®, and UNIX® computers

- Enhanced network management capabilities

- GigE (RJ-45) data port with Auto Negotiate and Auto MDIX

- Front Panel LEDs indicate status and simplify troubleshooting

- User-friendly online diagnostics

- Remotely configurable and monitorable using SNMP and TFTP

- 2 RJ-11 Telephony Ports

- Battery Option for Digital Voice service back up in the event of primary power failure

- Support for CLASS services (caller ID, call waiting, three-way calling, etc.)

The Motorola SURFboard Digital Voice Modem (SBV6220) is DOCSIS® 3.0 certified, PacketCable™ 1.5 Certified, and PacketCable 2.0 ready. It introduces channel bonding capability, for up to four downstream channels and four upstream channels, to our Digital Voice Product Portfolio. This allows operators to offer their customers advanced multimedia services with data rates of up to 160 Mbps in each direction without upgrading their HFC plan, in addition to offering a two-line VoIP service. The SBV6220 uses a field-replaceable battery to provide VoIP subscribers with primary line reliability. The SBV6220 supports all DOCSIS® 3.0 features, including channel bonding, IPv6, and Advanced Encryption Services.

HIGH VALUE AND INCREASED DATA RATES

Motorola's SBV6220 unlocks the potential of delivering primary line voice and innovative, next-generation high-bandwidth demanding multimedia services to an operator's premium customers.

Utilizing the power of DOCSIS® 3.0, the SBV6220 enables channel bonding for up to four downstream channels and four upstream channels, which allows an operator to offer their customers advanced multimedia services with data rates of up to 160 Mbps in each direction. The SBV6220's higher-speed services enable operators to:

- Protect their installed base of high-speed data customers
- Deliver high-bandwidth, multimedia services
- Offer Digital Voice Services bundled with high speed data service
- Deliver competitive, high-capacity commercial services to their business customers

SERVICE ASSURANCE AND RELIABILITY

Motorola's field-proven NBBS device management software platform provides the MSO with intelligent management and remote management features to improve accuracy, efficiency, and customer satisfaction. These value-adding features enable remote device administration for improved accuracy and reduced support costs. Motorola's NBBS platform is a scalable, carrier-grade software platform that enables cable operators to remotely access, configure, monitor, and troubleshoot their full portfolio of consumer devices, home networks, and services.

ECONOMIC AND FLEXIBLE

The Motorola SBV6220 SURFboard DOCSIS® 3.0 Cable Modem provides operators with an economic option for providing Ultra-Broadband services, with 4X the current maximum user data throughput peaking 160 Mbps in DOCSIS® mode*, without the need for hybrid fiber coax (HFC) plant upgrade. Maximizing an operator's current infrastructure investment, the SBV6220 can be deployed without service interruption.

The SBV6220 supports all DOCSIS® 3.0 features, is backwards compatible to DOCSIS® 1.0, 1.1 and 2.0, and also supports IPv4, IPv6, and Advanced Encryption Services.

HIGHLIGHTS, CONT.

- Automatic fax modem processing

- Certified PacketCable 1.5; Ready for PacketCable 2.0

- Network Call Signaling (NCS) and Session Initiation Protocol (SIP) support

- Support for GR909 test suite allows remotely diagnosing and troubleshooting wiring problems at the customer premises with Field-upgradeable software

- Configurable to meet multiple telco market standards ETSI harmonized impedance, 600 Ω

- Support for G.711, G.729, and other low-rate vocoders

- Support for Wide-band Audio

- Support for up to 16 Service IDs (SIDs) allows for future enhanced features

Motorola's Service Assured DOCSIS® 3.0 Solutions enable you to deliver increased bandwidth, enhance security, and cost-effectively deploy voice, data, and video services to your bandwidth-demanding consumers — all while maximizing current infrastructure investment and lowering capital spend.

As part of Motorola DOCSIS 3.0 Ultra-Broadband family of products, the SBV6220 includes an enhanced tuner that supports up to a 1 GHz downstream input, allowing operators to increase the frequency spectrum for deployment of new high-value services such as bandwidth on-demand, commercial services, interactive gaming, and IPTV to their customers. The SBV6220 features a 10/100/1000Base-T Ethernet (RJ-45) port, as well as intuitive, easy-to-read front-panel operational status LEDs. Operators can optionally activate dual-colored LEDs for their customer to have visual verification of bonded channels and GigE link use.

A SINGLE SOLUTION FOR INTELLIGENT CONVERGENCE
The SBV6220 enables:
- One infrastructure for communication services
- One bill for voice and data services
- Simultaneous use of phone lines and high-speed data services
- Support for a variety of CLASS features provided today by the telephone company, including caller ID, call waiting, and call forwarding

As part of Motorola's broadband family of telephony products, the SBV6220 combines voice and data on one network, in one product. By combining multiple services in one unit, consumers can enjoy an efficient solution that offers many advantages over competing technologies.

With Motorola's cable modems, high-speed Internet access has always been at your fingertips – always on and always connected. The SBV6220 is the ideal competitive solution for the high-end residential user, the small home office owner, and the medium to large business enterprise.

FAST, CONVENIENT, RELIABLE
The SBV6220 Digital Voice Modem has a field-replaceable Lithium-ion battery to provide backup powering in the event of a power outage. The SBV6220 uses industry-standard signaling protocols to provide high-speed Internet access and up to two lines of primary line voice-over-IP (VoIP) telephone service over cable's broadband connection to the home.

With 1Gig Ethernet data connectivity and two RJ-11 connectors, the SBV6220 is an intelligent, flexible, and convenient way to converge voice and data on one network. The SBV6220's integrated battery minimizes the likelihood that a consumer will lose telephone service during a power outage.

ECOMOTO™

Motorola Cares for the Environment

Motorola believes in "going green" — we have a global commitment to sustaining the environment. Motorola has been working for years to continually improve our environmental profile. We are in step with our customers and their increasing interest in partnering with a company that will help them reduce their carbon footprint, while offering compelling products that will help them grow their eco-conscious customer base.

Motorola Designed the SBV6220 to Minimize its Impact on the Environment

Motorola's modems comply with international environmental and energy efficient standards; including ENERGY STAR qualified power supplies, European Code of Conduct compliance for both the power supply and modem, and lead free circuit boards as certified by RoHS compliance.

Packaging

The SBV6220 uses Motorola's new, environmentally friendly package design – our modems ship in single pack boxes. By both eliminating the suspension plastic and reducing the box size, Motorola is helping to reduce the environmental impact of the SBV6220. As an even more impactful step, operators may choose to receive the products in a bulk package, thus reducing the extra waste and transport weight associated with single packages. Motorola's bulk packaging solutions eliminate excess installation CDs and USB cables. Additionally, customers have the option to reduce the number of cables shipped with each unit. The packaging is 100% recyclable. Our packaging is now labeled with standard recycling codes (such as ♲) to make it easier for our customers to identify recycling opportunities.

Specifications

GENERAL

Cable Interface	75Ω F-connector
CPE Network Interface	10/100/1000Base-T Ethernet (RJ-45
Telephony Interface	RJ-11 (x2)
Data Protocol	TCP/IP, UDP
Telephony Interfaces	ETSI harmonized impedance, 600 Ω
Line Mating	Line 1= Line 1, or Lines 1 and 2, Line 2 = Line 2
Dimensions	9.2 in x1.5 in x 6.1 in (23.36 cm x 3.81 cm x 15.49 cm)
Input Power	100 to 125 VAC, 60 Hz
Regulatory	UL listed (U.S. and Canada), CE, unit is RoHS compliant, ENERGY STAR V2 , COC V3, Compliant per the "Code of Conduct on Energy Consumption of Broadband Equipment", CMM

ENVIRONMENTAL

Operating Temperature	32 °F to 122 °F (0 °C to 50 °C)
Storage Temperature	–22 °F to 176 °F (–30 °C to 70 °C)
Storage Temperature with Battery Installed	14 °F to 140 °F (-10 °C to +60 °C)
Recommended Battery Storage at 25 °C for optimal storage life	
Operating Humidity	5 to 95% R.H. (non-condensing)

BATTERY

Type	Replaceable, Lithium-ion, Single piece construction
Options	2-Cell, 4-Cell

DATA COMPATIBILITY

PC	90496, Pentium, or later; Windows Vista™, 2000, or XP or Linux® with Ethernet connection (older versions of Windows, although not specifically supported, will work with this cable modem)
Macintosh	OS 10 or higher, Ethernet connection
UNIX	Ethernet connection
Home Networking	Ethernet router, or wireless access point with Ethernet connection

TELEPHONY

Line Type 2-wire	
Hook State Signaling Loop start	
Maximum Loop Length	1000 ft (AWG 26/0.4 mm @ 65 °C)
DTMF Level Sensitivity	
Range	0 to –20 dBm
Speech Coding 64 kbps PCM, µ-law or A-law companding; supports G.711 and low-rate vocoders; T.38 support	
Line Termination Configurable based on market needs	
Loss Plan Receive (D/A) 4 dB; transmit (A/D) 2 dB (configurable based on market needs)	
Loss Plan Tolerance ±1 dB (one-way)	
60/50 Hz Loss >20 dB (referenced to off-hook loss at 1004 Hz)	
Ringing Wave Form	
Sinusoidal Balanced Tracking mode 55 Vrms/48Vdc	
Trapezoidal Balanced Tracking mode 55 Vrms/48Vdc	
Sinusoidal Unbalanced Tracking 46 Vrms/70Vdc	
Sinusoidal Balanced Fixed mode 55Vrms/48Vdc	
Ringing Crest Factor 1.2<CF<1.6	
Ring Trip (maximum) 200 mS with 300 W termination	

Specifications (cont.)

DOWNSTREAM

Modulation	64 or 256 QAM
Capture Bandwidth	100 MHz (edge to edge)
Maximum Theoretical Data Rate**	
DOCSIS	171.537 Mbps (4 channels) / 42.884 (single channel) @ 256 QAM at 5.36 Msym/s
Bandwidth	DOCSIS ≤ 24 MHz
Symbol Rate	DOCSIS: 64 QAM 5.057 Msym/s; 256 QAM 5.361 Msym/s
Operating Level Range	–15 to 15 dBmV
Bonded Channel RF Level Tolerance	10dBmV
Input Impedance	75 Ω (nominal)
Frequency Range	108 to 1002 MHz (edge to edge)
Network Management	SNMP v2 & v3
Provisioning	Supports IP addressing using IPv4 and/or IPv6 (dual stack)

UPSTREAM

Modulation		QPSK and 8, 16, 32, 64, 128 QAM
Maximum Channel Rate**		
DOCSIS		131.072 Mbps (4 channels) / 32.768 Mbps (single channel): @ 128 QAM at 6.4 MHz
Channel Width		200 kHz, 400 kHz, 800 kHz, 1.6 MHz, 3.2 MHz, 6.4*** MHz
Symbol Rates		160, 320, 640, 1280, 2560, 5120*** ksym/s
Operating Level Range		Level range per channel (Multiple Transmit Channel mode disabled, or only Multiple Transmit Channel mode enabled with one channel in the TCS)
	DOCSIS	Pmin to +57 dBmV (32 QAM, 64 QAM)
		Pmin to +58 dBmV (8 QAM, 16 QAM)
		Pmin to +61 dBmV (QPSK)
	S-CDMA	Pmin to +56 dBmV (all modulations), where:
		Pmin = +17 dBmV, 1280 kHz modulation rate
		Pmin = +20 dBmV, 2560 kHz modulation rate
		Pmin = +23 dBmV, 5120 kHz modulation rate
Level range per channel (two channels in the TCS)		
	TDMA	Pmin to +54 dBmV (32 QAM, 64 QAM)
		Pmin to +55 dBmV (8 QAM, 16 QAM)
		Pmin to +58 dBmV (QPSK)
	S-CDMA	Pmin to +53 dBmV (all modulations), where:
		Pmin = +17 dBmV, 1280 kHz modulation rate
		Pmin = +20 dBmV, 2560 kHz modulation rate
		Pmin = +23 dBmV, 5120 kHz modulation rate
Level range per channel (three or four channels in the TCS)		
	TDMA	Pmin to +51 dBmV (32 QAM, 64 QAM)
		Pmin to +52 dBmV (8 QAM, 16 QAM)
		Pmin to +55 dBmV (QPSK)
	S-CDMA	Pmin to +53 dBmV (all modulations), where:
		Pmin = +17 dBmV, 1280 kHz modulation rate
		Pmin = +20 dBmV, 2560 kHz modulation rate
		Pmin = +23 dBmV, 5120 kHz modulation rate
Output Impedance		75 Ω (nominal)
Frequency Range		5 – 42 MHz (edge to edge)
Optional DOCSIS		5 – 65 MHZ

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