



BCM6020 SCALABLE DSL TRANSCEIVER

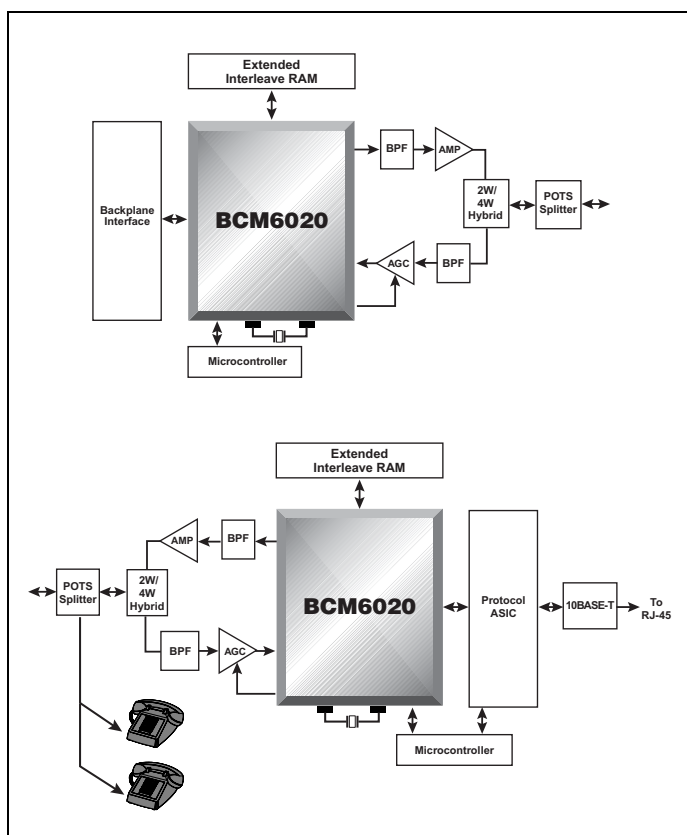
FEATURES

- The Broadcom BCM6020 is a single-chip QAM, twisted-pair, scalable, digital subscriber line (DSL) transceiver that is optimized for low-cost, low-power, and high-density applications on both shielded and unshielded telephone wiring.
- **General**
 - Supports bit rates to 52 Mbps and baud rates to 13 Mbaud
 - Less than 1W power consumption
 - Integrated carrier and clock recovery loops for ease of use
 - Programmable 4–256 QAM constellations
 - Single 3.3V supply operation
 - On-chip A/D and D/A converters
 - On-chip clock generation
 - Adjustable upstream and downstream center frequencies
 - Extensive power management features
 - JTAG test interface
 - Small 100-pin PQFP form factor
- **Transport interfaces**
 - Complete ATM UTOPIA Level 1 and 2
 - Rate matching and cell delineation
 - Bit-synchronous or byte-synchronous modes
 - Programmable frame formats
 - Coded/uncoded payload support
- **Transceiver**
 - Transmit notching for amateur radio band compatibility
 - On-chip and off-chip RAM interleaving
 - Reed-Solomon FEC
 - Packet scrambling
 - Digital square root Nyquist filters
 - $x/\sin x$ transmit pre-emphasis
 - Enhanced adaptive decision feedback equalizer

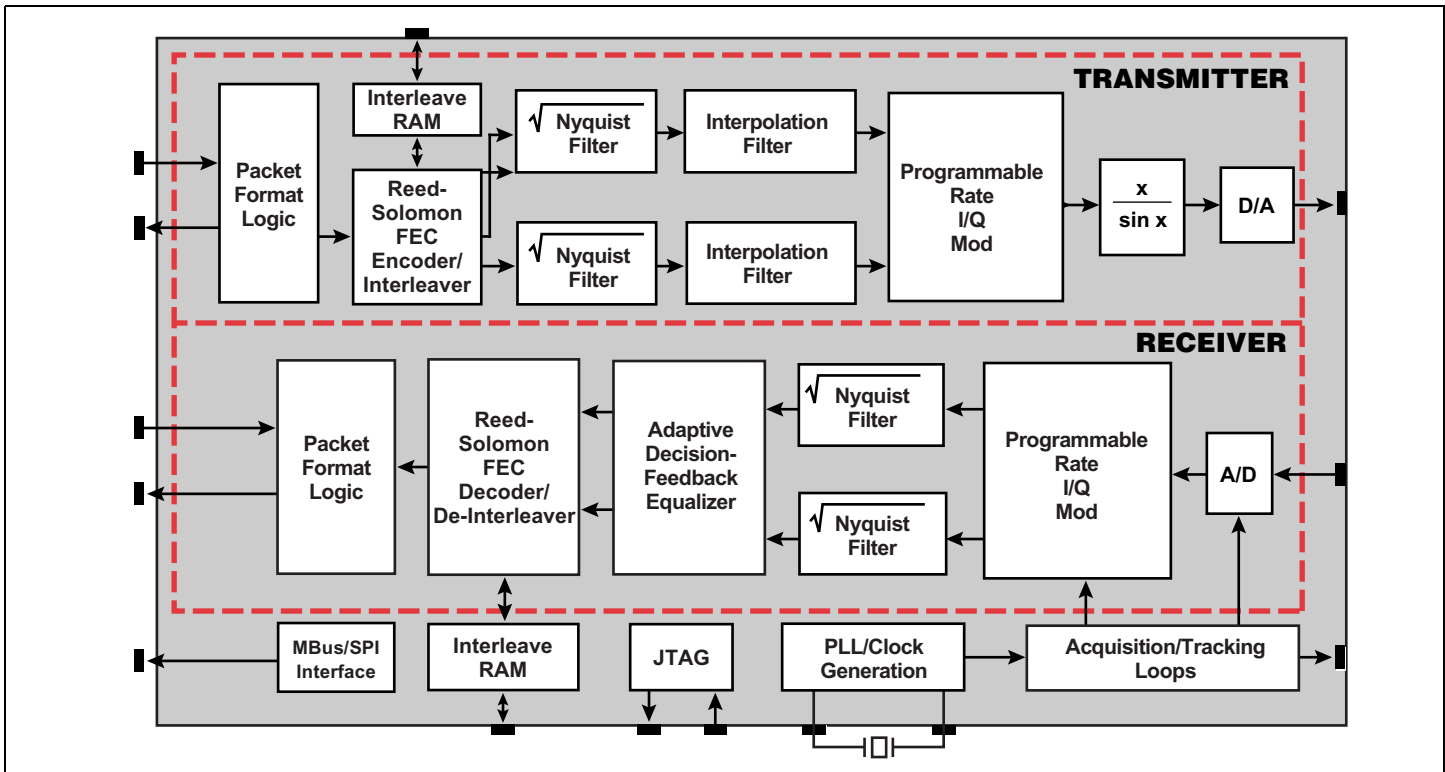
SUMMARY OF BENEFITS

- Operates up to 52 Mbps fully symmetric.
- Supports symmetric and asymmetric services.
- Operates on shielded and unshielded distribution cables.
- Suitable for CO, HDT, ONU, and CPE applications.
- Small size and low power enables high port-densities.
- Simple spectrum control through register programming.
- Supports frame-based and cell-based transport streams.

Central Office Linecard Block Diagram



OVERVIEW



The BCM6020 is the first single-chip VDSL solution to offer support for unshielded telephone distribution cable through the use of on-chip advanced digital filtering, precoding, and equalization techniques. The BCM6020 offers DSL system vendors an unmatched capability for the provision of high-speed data transmission services on twisted-pair copper wire supporting applications such as Internet access, LAN extensions, work-at-home, remote office, and switched digital video. Rates of up to 52 Mbps are supported fully-symmetric. The BCM6020 can also be configured to support full-speed ADSL and G.Lite data rates. The BCM6020 has been designed for any DSL application where low cost, low power, and compact size are paramount. It is especially suited for use in frame-based applications such as Ethernet transport and bridging over long-reach telephone-grade wiring. Spectral compatibility is assured by virtue of its programmable center frequency and baud rate. With its small footprint, the BCM6020 is ideal for use in NIC, PC card, and Mini PCI CPE modem designs. Robustness (to even severe bursty ingress) is guaranteed through support of on-chip and off-chip

interleaving memory. This feature is useful for industrial applications where such ingress can be a problem. The BCM6020 also supports UTOPIA Level 1 and Level 2 interfaces, and can easily be connected to industry-standard ATM segmentation and reassembly engines. This facilitates the delivery of multiple virtual circuits and traffic classes. Its flexible frame structure enables transport of FEC encoded and uncoded traffic, and an embedded operations channel protocol is supported. Automatic rate-adaptive software is available for support of symmetric and asymmetric links. The BCM6020 employs an enhanced adaptive decision feedback equalizer. Because the equalizer tap length is programmable, it effectively combats intersymbol interference over a wide range of symbol rates. The BCM6020 is also ideal for WAN connections to SOHO routers and integrated access devices. Supporting multi-megabit symmetric data rates in excess of HDSL, SDSL, and G.Lite, it represents the next step in broadband WAN access to small businesses.

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BROADCOM CORPORATION
16215 Alton Parkway, P.O. Box 57013
Irvine, California 92619-7013

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Phone: 949-450-8700
Fax: 949-450-8710
E-mail: info@broadcom.com
Web: www.broadcom.com