



BSR 64000 DECOUPLED DOWNSTREAM MODULE

The TXPlus module takes the next step in the evolution of QAM density for the BSR 64000 I-CMTS to meet the continuously increasing demand for downstream bandwidth. Operating in a BSR 64000 chassis with an SRM10G control plane and routing module, a single TXPlus delivers up to 2.5 Gbps over DOCSIS. The TXPlus module doubles bandwidth capacity, without requiring RF re-wiring, and utilizes the same footprint as the existing TX32 hardware. Built to meet the needs of a next-generation CMTS, this module is fully DOCSIS 3.0 compliant for delivery of IP video and ultra broadband solutions. Like the entire BSR 64000 product line, the TXPlus provides full, hot-swappable redundancy and industry-leading power, efficiency, and performance.

Product Summary

The TXPlus belongs to the family of evolutionary products that make up the BSR 64000. Combined with the SRM10G module, TXPlus modules provide a 300-percent increase in BSR 64000 DOCSIS QAM density in a simple I-CMTS architecture.

The TXPlus is provided in BSR Release 7.1 or later and is backward-compatible as a TX32 (32 QAMs) with earlier versions of the software. The combination of SRM10G with TXPlus DOCSIS 3.0 downstream and RX48 upstream modules offers industry-leading capacity in an integrated CMTS.



Product Features

Fully hot-swappable N:1 redundancy.

Enables support of up to 512 DOCSIS downstreams per BSR 64000, or 384 DOCSIS downstreams with full RF redundancy.

Up to 64 Annex B or 48 Annex A DOCSIS channels across 8 RF ports.

Doubles downstream capacity per serving group without RF rewiring.

High-performance architecture ensures autonomy between the control plane and forwarding plane.

DOCSIS 3.0 compliant.

Downstream QAM licensing to manage capital expense and expansion challenges.

Downstream Port Density

Each of the eight physical downstream ports can support six Annex A or eight Annex B DOCSIS channels. This represents a 50 to 100 percent bandwidth increase over the TX32 module, addressing the continuing need for greater downstream channels per serving group without operational challenges such as re-wiring or port combining.

Increase in Chassis Density

Combined with the SRM10G, the TXPlus increases chassis downstream density by 300 percent for a fully redundant configuration, and 260 percent for non-redundant configurations. At maximum configuration, the BSR 64000 has 512 downstream DOCSIS channels for a total raw bandwidth capacity of 20 Gbps.

I-CMTS

The BSR 64000 supports an I-CMTS architecture, with the TXPlus providing dramatically more downstream bandwidth to residential and commercial subscribers. By deploying the TXPlus in a BSR 64000 platform, cable operators gain the flexibility to independently expand downstream offerings without the overhead of increased upstream capacity associated with alternative coupled downstream and upstream DOCSIS modules offered by other vendors. This I-CMTS approach allows cable operators to benefit from a protected module in a protected system that provides the lowest cost of operation for increasing downstream capacity.

Channel Bonding

Cable operators can bond up to eight physical channels to leverage the high bandwidth gains provided by channel bonding technologies and provide ultra-broadband services to residential and commercial subscribers. Additionally, TXPlus hardware will support the Motorola development plans for bonding groups of up to 32 channels, reaching 1-Gbps service tiers.

Investment Protection

In addition to gaining more than 32 downstream QAM channels on newly purchased TXPlus hardware, cable operators can flexibly upgrade existing TX32 1-GHz modules to take advantage of this improved density. Software licensing allows cable operators to upgrade hardware as required to meet growing demand without burdensome capital investment. The ability to upgrade existing hardware significantly lowers the cost of growing downstream capacity, while reducing capital costs typically associated with 50 to 100 percent downstream expansion.

RF Redundancy

The BSR 64000 I-CMTS solution provides N:1 redundancy for up to six TXPlus modules when using the new 7-slot rear I/O module. The TXPlus provides a dramatic increase in protected downstream capacity. It is a cost-effective solution for RF bandwidth protection and supports uninterrupted service delivery or hitless RF redundancy.



Ordering Information

To order the following products and services, contact your sales representative.

TXPlus Hardware Modules				
Part Number	Description			
537806-003-00	TXPlus DOCSIS/EuroDOCSIS 3.0 active I-CMTS module set HW base			
537807-003-00	TXPlus DOCSIS/EuroDOCSIS 3.0 active I-CMTS front resource module HW			
	base			
537812-002-00	TXPlus DOCSIS/EuroDOCSIS 3.0 redundant I-CMTS front resource module			
TX Redundant Capable I/O Modules				
537809-001-00	TX32 3-slot rear I/O module			
537811-002-00	TX32 5-slot rear I/O module			
589207-001-00	TX32 7-slot rear I/O module			
Downstream DOCSIS QAM Software License				
536358-001-00	BSR 64000 software license TXPlus 1 QAM downstream			

BSR Documentation

For complete user documentation and additional information on the features described above, access the Motorola documentation center at http://motorola.com/doccenter.

Motorola Support

For technical assistance with the BSR 64000, contact the Technical Response Center (TRC).

United States: 1-888-944-HELP

(1-888-944-4357)

International: +1-215-323-0044

The TRC is on call 24 hours a day, 7 days a week.



Specifications

FLEXIBLE CONFIGURATIONS

Eight downstream RF ports

Integrated eight-channel QAM modulation and RF blockup-conversion per RF port

Up to eight adjacent DOCSIS downstream channels per RF port

Maximum of 64 downstream QAMs per module

Configurable DOCSIS, J-DOCSIS, and EuroDOCSIS operation

Deployable with existing SRM, HSIM, and 2:8 DOCSIS/EuroDOCSIS modules for use of up to 32 downstream QAM channels. Requires SRM10G to use more than 32 downstream QAM channels per module.

STANDARDS-BASED INTEROPERABILITY

DOCSIS 1.x-, 2.0-, and 3.0-compliant

 $\label{eq:compatible} Compatible with \mbox{ DOCSIS, J-DOCSIS, and EuroDOCSIS specifications}$

Based on Broadcom BCM3215 Octal Downstream DOCSIS 3.0 Core MAC chip

MANAGEMENT

Compatible with all relevant BSR 64000 CLI commands

Supports all relevant DOCSIS 1.x, 2.0, and 3.0 $\ensuremath{\mathsf{MIBs}}$

Enables downstream per-flow queuing

RF

Downstream Frequency Range	•			
DOCSIS	88 to 1 GHz			
EuroDOCSIS	108 to 1 GHz			
Downstream Modulation	64 and 256 QAM			
Downstream Per-Channel Bit R	ates			
DOCSIS	27 to 38 Mbps			
EuroDOCSIS	36 to 56 Mbps			
Output Level	44 to 60 dBmV			
Bandwidth				
DOCSIS	6 MHz			
EuroDOCSIS	≤8 MHz			
Typical Modulation Error Rate	47			
Output Load Impedance	75 Ω			
PHYSICAL				
Characteristics				
Occupies a single slot in the	BSR 64000 chassis			
Hot-swappable with redund	lant rear I/O module			
F-type connector on rear I/C) module for RF			
Diagnostic port	DB-9			
LEDs	Fail, Status, Alarm, Link, Fault			
Dimensions	5.0 in x 15.0 in x 0.12 in (38.1 cm x 38.1 cm x 0.3 cm)			
Weight	6.8 lb			

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ENVIRONMENTAL	
Operating Temperature	0 °C to 40 °C
	(32 °F to 104 °F)
Storage Temperature	–20 °C to 60 °C (–4 °F to 140 °F)
Operating Humidity	10% to 90% non-condensing
Storage Humidity	5% to 95% non-condensing
REGULATORY COMPLIAN	CE
Safety	
UL60950-1:2003 1st Ed.	
CSA C22.2 No. 60950-1-	03 1st Ed.
IEC 60950-1:2001, 1st Ec	1.
EN 60950-1:2002, 1st Ed	
2006/95/EC	
Electromagnetic Emission	s
EN 300386 V 1.3.1: 2005	, Telecom Centers
IEC CISPR 22: 2003 Clas	s A
CFR 47 Part 15, Subpart	B, Class A
VCCI V3: 2005, Class A	
AS/NZS CISPR 22: 2002	Class A
RRL Notice 2006-67, Cla	ss A
2004/108/EC	
Electromagnetic Immunity	/
EN 300386 V 1.3.1: 2005	, Telecom
RRL Notice 2005-130	
Environmental	
RoHS,WEEE	
2005/95/EC	
Physical	
Designed for NEBS GR-6	3-CORE Level 3 requirements
ETS 300 019 Part 1-1 Cla	ss 1.1, Part 1-2 Class 2.2, Part 1-3
Class 3.1	
POWER	
Unit power	155 W (typical)

Note: All features, functionality, and other product specifications are subject to change without notice or obligation.

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