

POINT-TO-POINT AND  
POINT-TO-MULTIPOINT  
SOLUTIONS

APPLICATIONS

Canopy 5 GHz modules enable service providers to quickly deploy reliable, high quality broadband access networks while requiring significantly lower capital investment and operating deployment costs than other broadband technologies. Network operators can:

- **Extend Broadband Network Coverage** to meet subscriber demand. Subscribers can be added to the network quickly with a minimum additional investment in equipment and labour.
- **Establish Low Cost E1/T1 Links** below the cost of monthly service fees. Replace existing E1/T1 services with cost effective Canopy point-to-point backhaul links.

CANOPY SYSTEM BENEFITS

- **Interference Tolerance** – Canopy's industry leading Carrier to Interference (C/I) ratio of <3 dBm on 10 Mbps radios and 8 dBm on 20 Mbps radios ensures reliable service when other transmitters are present.
- **Scalability** – GPS synchronisation allows network operators to re-use frequencies and add capacity without affecting the quality of service to existing customers.
- **Security** – The Canopy system's unique synchronisation and signal modulation technique enhance the multiple layers of encryption and authentication to restrict access from unauthorised users. Modules have DES (Data Encryption Standard) 56-bit encryption and are available with AES (Advanced Encryption Standard) 128-bit encryption. Canopy is the only broadband wireless system with U.S. National Institute of Standards and Technology (NIST) Federal Information Processing Standards (FIPS) 197 certification.
- **Return on Investment** – The cost of network extensions can be recouped in months because Canopy does not require significant investments in network build-outs or operator licenses.
- **Ease of Deployment** – Modules are small and draw little power, installation is easy, and the built-in audio and visual feedback indicators reduce the time and cost of installation.
- **Adjustable Power** – Power can be adjusted from 0 dBm to 25 dBm in 1dB increments to meet the specific requirements of the installation.

CANOPY SYSTEM 5 GHZ COMPONENTS



Access Point (AP) Cluster



Subscriber Module (SM)



Backhaul with Passive Reflector

# 5 GHz System

Motorola Canopy™ Wireless Broadband

## Wireless Broadband Access for Building a Licence Exempt Network

Deploy reliable, secure broadband wireless in the 5 GHz band. Thousands of Canopy point-to-point and point-to-multipoint modules have been field proven in more than 100 countries around the world. Now available at 5 GHz, these modules can be deployed to provide fast, cost effective broadband service. Carriers can extend their network to reach new business residential and business subscribers.

With industry leading interference tolerance, the Canopy system provides consistent and reliable service to all subscribers in the network. The 5 GHz Canopy system is comprised of point-to-point links and point-to-multipoint access networks which are easily configured to meet specific performance and cost requirements.

## 5 GHz MODULE PERFORMANCE

Operating range and data throughput of wireless communication are dependent on terrain, foliage and background RF energy, among other conditions. Motorola strongly recommends network operators perform a physical and radio frequency site survey to take these factors into account.

<b>POINT-TO-POINT LINKS</b>	<b>10 Mbps BH</b>	<b>10 Mbps BH with reflectors</b>	<b>20 Mbps BH</b>	<b>20 Mbps BH with reflectors</b>
Signalling Rate	10 Mbps	10 Mbps	20 Mbps	20 Mbps
Aggregate Throughput	7.5 Mbps	7.5 Mbps	14 Mbps	14 Mbps
5.4 + 5.2 Typical LoS Range @ 1 W EIRP	3.2 km (2 miles) @ 1 W	16 km (10 miles)	1.6 km (1 mile) @ 1 W	8 km (5 miles)
5.7 Typical LoS Range	3.2 km (2 miles) @ 1 W	56 km (35 miles) @ 63 W	1.6 km (1 mile) @ 1 W	56 km (35 miles) @ 63 W
5.7 Connectorised	Dependant on antenna gain			

<b>POINT-TO-MULTIPOINT NETWORKS</b>	<b>Canopy AP</b>	<b>Canopy Advantage AP</b>	<b>Canopy Advantage AP &amp; SM</b>
<b>Canopy SM</b>			
Signalling Rate	10 Mbps	10 Mbps	20 Mbps
Aggregate Throughput	6.2 (3 – 4 Mbps downlink)	7.0 Mbps	14 Mbps
Latency	20 msec	5 – 7 msec	5 – 7 msec
Typical LoS Range @ 1 W	3.2 km (2 miles)	3.2 km (2 miles)	1.6 km (1 mile)
5.4, 5.2, 5.7 Typical LoS Range @ 1 W	3.2 km (2 miles) @ 1 W		
5.7 Passive Reflector	16 km (10 miles)		8 km (5 miles)

## ADDITIONAL SPECIFICATIONS

<b>Category</b>	<b>Performance Specification</b>
Frequency Range of Band	U-NII 5240-5350 MHz, 5470-5725 MHz, 5725-5850 MHz
Channel Width	20 MHz
Channel Spacing	The Canopy system uses 20 MHz channels in the allowable spectrum as assigned in 5 MHz increments.
Modulation Type	<ul style="list-style-type: none"> <li>AP, SM and 10 Mbps BH: High Index 2-level Frequency Shift Keying (FSK) optimised for interference rejection</li> <li>Advantage AP &amp; SM 20 Mbps BH: High Index 4-level Frequency Shift Keying (FSK) optimised for interference rejection</li> </ul>
Encryption	DES, FIPS 197 certified AES
Carrier to Interference Ratio (C/I)	<ul style="list-style-type: none"> <li>AP, SM, and 10 Mbps BH: &lt;3</li> <li>20 Mbps BH: &lt;10</li> </ul>
Antenna Beam Width	<ul style="list-style-type: none"> <li>SM/AP/BH: 3 dB antenna beam width 60 degrees, Azimuth and Elevation</li> <li>SM/BH with reflector: 3 dB antenna beam width 6 degrees, Azimuth and Elevation</li> </ul>
Weight	.45 kg (1 lb), 3.0 kg (6.5 lbs) with passive reflector
Interface	10/100 Base T, half/full duplex. Rate auto negotiated (802.3 compliant)
Protocols Used	IPV4, UDP, TCP, ICMP, Telnet, HTTP, FTP, SNMP
Network Management	HTTP, TELNET, FTP, SNMP Version 2c



**5.7 Connectorised**



For more information about how the Canopy system can extend your network and services, provide competitive advantage and outstanding ROI, call 001-800-795-1530 internationally or visit us at [www.motorola.com/canopy](http://www.motorola.com/canopy)

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