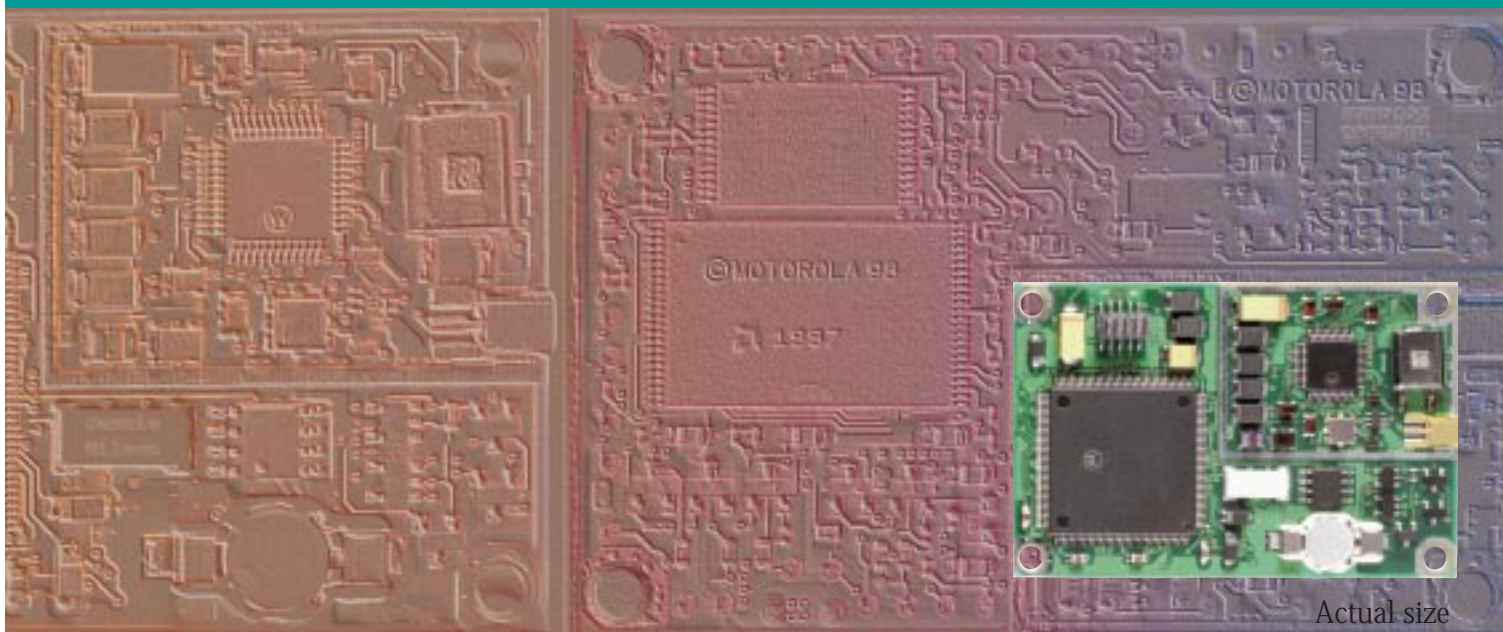




# M12 Oncore™ GPS Module

M12 ONCORE GPS RECEIVER



There's only one name for quality and performance in GPS technology: Oncore. The Oncore family is a full line of GPS receivers developed and built by Motorola for the OEM and systems integrator.

The M12 Oncore is one of the newest members of the successful Oncore family, developed for a wide range of positioning applications. The M12 Oncore adds more features at both a lower cost and smaller size, and it is available in unlimited quantities. Expanding the Oncore line with a 12-channel design, the new M12 is a small 40 x 60 x 10mm with enhanced foliage and urban canyon performance, one of the fastest TTFF (time to first fix) in the industry, and split second reacquisition time.

Our M12 Oncore receiver is built utilizing Motorola's custom radio frequency integrated circuit, MRFIC1504, and the ultra-low power MCORE based MMC2003, a 32-bit RISC microcontroller. The M12 Oncore also has a 2.75 to 3.2 supply voltage and includes support capability for inverse differential GPS, which allows for improved positioning at a central base station to support services requiring higher accuracy such as automotive and telematics applications. Other features, in addition to increased embedding flexibility, include RTCM differential GPS support, NMEA 0183 output, two communications ports, a user-controlled velocity filter, and an antenna sense circuit. A right-angle power/data connector allows for space saving vertical mounting and an optional straight power/data connector is available for a flat mount against the host circuit board.

The Oncore family of GPS receivers demonstrates Motorola's quest for product and service excellence, and is further evidenced by our QS-9000 certification and Six Sigma quality achievements. Understand Motorola's reliability, responsive support and long-term commitment and you understand why Oncore is the receiver of choice. After all, it's not where you are; it's where you're going.



**MOTOROLA**



# M12 Oncore™ GPS Module

## General Characteristics

## Performance Characteristics

## Serial Communication

## Electrical Characteristics

## Environmental Characteristics

## Miscellaneous

Receiver Architecture	<ul style="list-style-type: none"> <li>• 12 parallel channel</li> <li>• L1 1575.42 MHz</li> <li>• C/A code (1.023 MHz chip rate)</li> <li>• Code plus carrier tracking (carrier aided tracking)</li> </ul>
Tracking Capability	<ul style="list-style-type: none"> <li>• 12 simultaneous satellites</li> </ul>
Dynamics	<ul style="list-style-type: none"> <li>• Velocity: 515 m/s (1000 knots); &gt; 515 m/s at altitudes &lt; 18,000 m</li> <li>• Acceleration: 4 g</li> <li>• Jerk: 5 m/s<sup>3</sup></li> <li>• Vibration: 7.7G per Military Standard 810E</li> </ul>
Acquisition Time (Time To First Fix, TTFF) (Tested at -30 to +85°C)	<ul style="list-style-type: none"> <li>• &lt;15 sec. typical TTFF - Hot (current almanac, position, time, ephemeris)</li> <li>• &lt;40 sec. typical TTFF - Warm (current almanac, position and time)</li> <li>• &lt;60 sec. typical TTFF - Cold (No stored information)</li> <li>• &lt;1.0 sec. internal reacquisition (typical)</li> </ul>
Positioning Accuracy	<ul style="list-style-type: none"> <li>• 100 meters 2dRMS with SA as per DoD specification</li> <li>• Less than 25 meters, SEP without SA</li> </ul>
Timing Accuracy (1PPS) Antenna	<ul style="list-style-type: none"> <li>• &lt; 500 ns with SA on</li> <li>• Active micro strip patch Antenna Module</li> <li>• Powered by Receiver Module (15 mA @ 3 Vdc) (optional 5 Vdc available)</li> </ul>
Datum	<ul style="list-style-type: none"> <li>• WGS-84</li> <li>• One user definable datum</li> </ul>
Output Messages	<ul style="list-style-type: none"> <li>• Latitude, longitude, height, velocity, heading, time</li> <li>• Motorola binary protocol at 9600 baud</li> <li>• NMEA 0183 at 4800 baud (GGA, GLL, GSA, GSV, RMC, VTG, ZDA)</li> <li>• Software selectable output rate (continuous or poll)</li> <li>• TTL interface (0 to 3 V)</li> <li>• Second COM port for RTCM input</li> </ul>
Power Requirements	<ul style="list-style-type: none"> <li>• 2.75 to 3.2 Vdc; 50 mVp-p ripple (max.)</li> </ul>
"Keep-Alive" BATT Power	<ul style="list-style-type: none"> <li>• External 2.75 Vdc to 3.2 Vdc, 5µA (typical @2.7Vdc)</li> </ul>
Power Consumption	<ul style="list-style-type: none"> <li>• &lt;0.225 W @ 3 V without antenna</li> </ul>
Dimensions	<ul style="list-style-type: none"> <li>• 40.0 x 60.0 x 10.0 mm [1.57 x 2.36 x 0.39 in.]</li> </ul>
Weight	<ul style="list-style-type: none"> <li>• Receiver 25 g (0.9 oz.)</li> <li>• Active Antenna Module &lt; 40 g</li> </ul>
Connectors	<ul style="list-style-type: none"> <li>• Power/Data: 10 pin (2x5) unshrouded header on 0.050 in. centers (Available in right angle or straight configuration)</li> <li>• RF: Right Angle MMCX (subminiature snap-on)</li> </ul>
Antenna to Receiver Interconnection	<ul style="list-style-type: none"> <li>• Single coaxial cable with 6 dB Maximum loss at L1 (active antenna)</li> <li>• Antenna Sense Circuit</li> </ul>
Operating Temperature	<ul style="list-style-type: none"> <li>• -40°C to +85°C</li> </ul>
Humidity	<ul style="list-style-type: none"> <li>• 95% noncondensing +30°C to +60°C</li> </ul>
Altitude	<ul style="list-style-type: none"> <li>• 18,000 m (60,000 ft.) maximum</li> <li>• &gt; 18,000 m (60,000 ft.) for velocities &lt; 515m/s (1000 knots)</li> </ul>
Standard Features	<ul style="list-style-type: none"> <li>• Motorola DGPS corrections at 9600 baud on COM port one</li> <li>• RTCM SC-104 input Type 1 and Type 9 messages for DGPS at 2400, 4800 or 9600 baud on COM port two</li> <li>• NMEA 0138 output</li> <li>• Inverse DGPS support</li> </ul>
Optional features	<ul style="list-style-type: none"> <li>• Lithium battery</li> </ul>

For more information contact  
your local distributor



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