ethertronics INNOVATE

PRODUCT DATA SHEET: EtherModule 1.0™

EtherModule 1.0™

700MHz to 2700MHz

Ethertronics' EtherModule 1.0™ plug-and-play active antenna system module addresses the challenges facing today's M2M product designers. Using EtherChip 1.0™ tunable capacitor with AIRFDC™ (Air InteRFace Digital Conditioning™) technology, EtherModule 1.0™ allows characteristics of the antenna and RF performance to be adapted to the environment experienced by the antenna; providing optimal connectivity in a less than ideal RF environment.

EtherModule 1.0™ can be used in a variety of applications including:

- WiFi
- M2M
- ISM 2.4GHz, 868MHz, 915MHz
- Smart Meters / Smart grid Systems
- Other Wireless Devices

TECHNOLOGY ADVANTAGES

Ethertronics' EtherModule 1.0™ product includes EtherChip 1.0™ utilizing AIRFDC™ (Air InteRFace Digital Conditioning) technology, employing active impedance matching techniques to provide tuning capacitance for the antenna system. EtherModule 1.0 active antenna system module can seamlessly adjust the characteristics of a cellular antenna for its dynamic requirements including:

- Making a wideband antenna by correcting the impedance mismatch.
- Retuning the antenna for frequency shifts.
- Offsetting hand, head and environmental effects.

Antenna performance can be significantly improved by applying these techniques or other applications using AIRFDC™.

KEY BENEFITS

Features

Operation Frequency

- Operation Frequency is 700MHz ~ 2700MHz.

Compact Package

- Typical package size is 33x15x3mm for 2.4 GHz applications and 33x15x10mm for others.

END USER ADVANTAGES

Low Minimum RF power

- RF Tx transmission power from the radio to the module can be as low as –5dBm.

Burst Detection

- EtherModule 1.0 detects Tx power bursts from the radio system it is connected to and optimizes the overall link quality when data is transmitted.

Improved Connectivity

- Utilizes EtherChip 1.0 tunable capacitor's ability to dynamically re-tune the antenna for frequency shifts or loading effects (hand/ head/ environmental).

Patented IMD Antenna Technology

- Provides superior RF field containment resulting in less interaction with surrounding components—improves RF performance and simplifies and shortens design-in time.

RoHS Compliant

- Ethertronics' antennas are fully compliant with the European RoHS Directive 2002/ 95/ EC.

SERVICE AND SUPPORT

Extensive RF Experience

- EtherModule 1.0™ is supported by documentation, and when needed, by the expertise of RF engineers who have integrated hundreds of antenna and RF system designs into wireless devices.

Global Operations & Design Support

- Ethertronics' global operations encompass an integrated network of design centers that provide local customer support.

Preliminary—specifications subject to change and are dependent upon actual implementation.

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Ethertronics' Module Specifications
Below are the typical specs for a product application.

Operating Ranges

Parameter	Symbol	Min	Typ.	Max	Unit
Supply Voltage	VDD	2.5	2.8	3.1	V
Power Supply Current	IDD		32		mA
Minimum RF input Power			-5		dBm
Maximum RF input Power			33		dBm
Operating Temperature	TOP	-40		85	℃
Storage Temperature	TST	-65		150	℃

Operational Characteristics*
Typical Characteristics

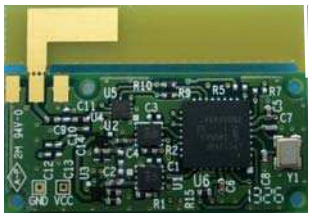
Protocols*	Supported
WiFi 802.11a,b,g,n	Yes
ISM	Yes
ZigBee	Yes

*Contact Ethertronics for additional protocols.

EtherModule 1.0 Versions	Typical Application	Frequency Tuning Range			
		Min	Typ.	Max	Unit
Part No.: EM1010200	WiFi, Bluetooth® & ISM 2.4 GHz applications	2200		2900	MHz
Part No.: EM1020300	ISM 868 MHz applications	800		950	MHz
Part No.: EM1010410	WiFi, Bluetooth® & ISM 2.4 GHz applications with standard break away antenna	2200		2900	MHz

Mechanical Specifications

Dimensions (PCB Module)	Part No. EM1000100: 33mm x 15mm x 3mm
Dimensions (Module with Antenna)	Part No. EM1010200: 33mm x 15mm x 3mm (2.4GHz applications) Part No. EM1020300: 33mm x 15mm x 11mm (868MHz applications) Part No. EM1010410: 33mm x 23mm x 3mm (2.4GHz applications, printed breakaway antenna) *Contact Ethertronics with your frequency requirements. Overall dimension will vary depending on the antenna selection.
Antenna Connection Options	1) Printed break-out antenna (2.4GHz applications pictured at right) 2) Pads for custom antenna 3) U.FL compatible connector output
Cable/ connector	U.FL compatible connector. Contact Ethertronics for details. Cable diameter 1.13mm
Cable Length	Dependent upon implementation.
Packaging	Tray
Power Input	Option 1: 8 pin connector (2 pins are used for power) Option 2: DC bias Tee RF connector. Contact Ethertronics for details.
Weight	2.7g



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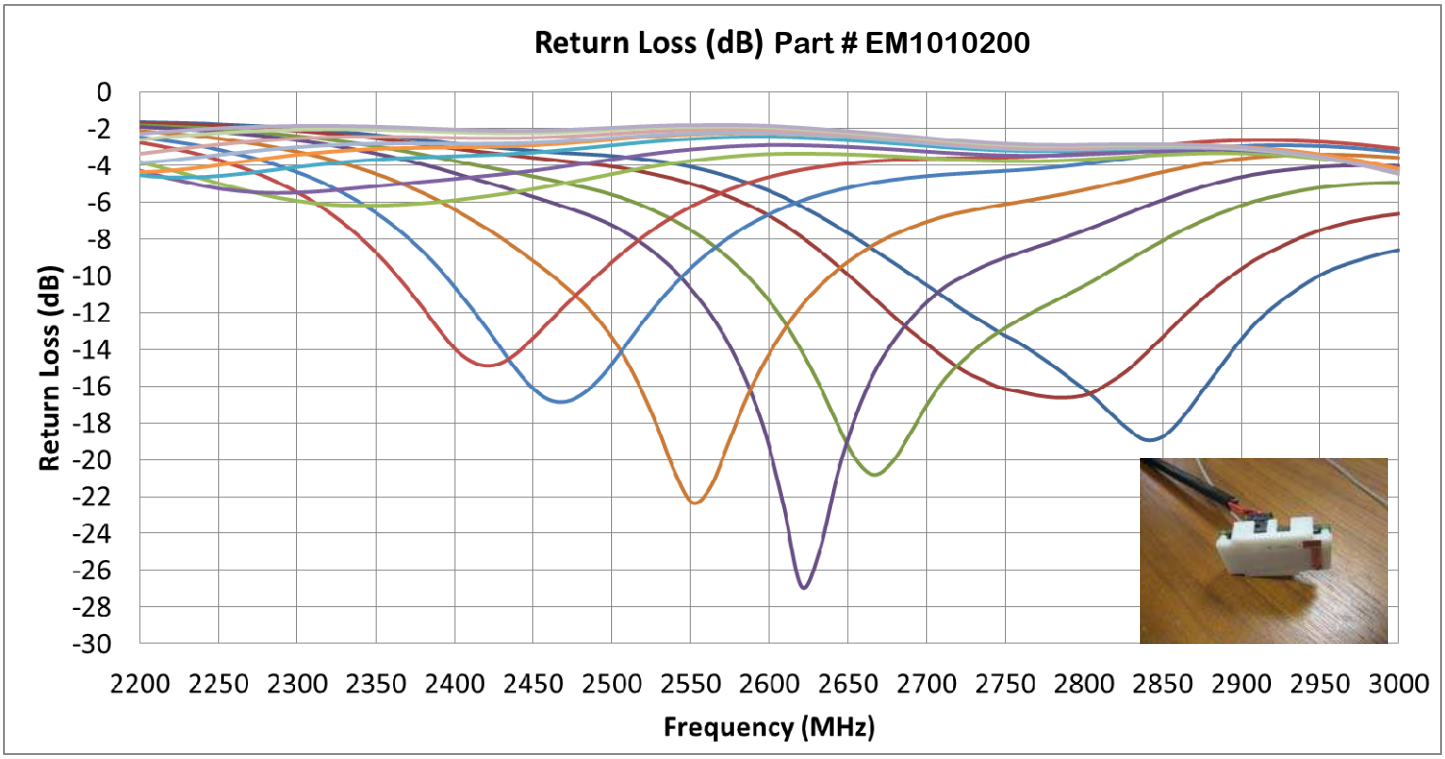
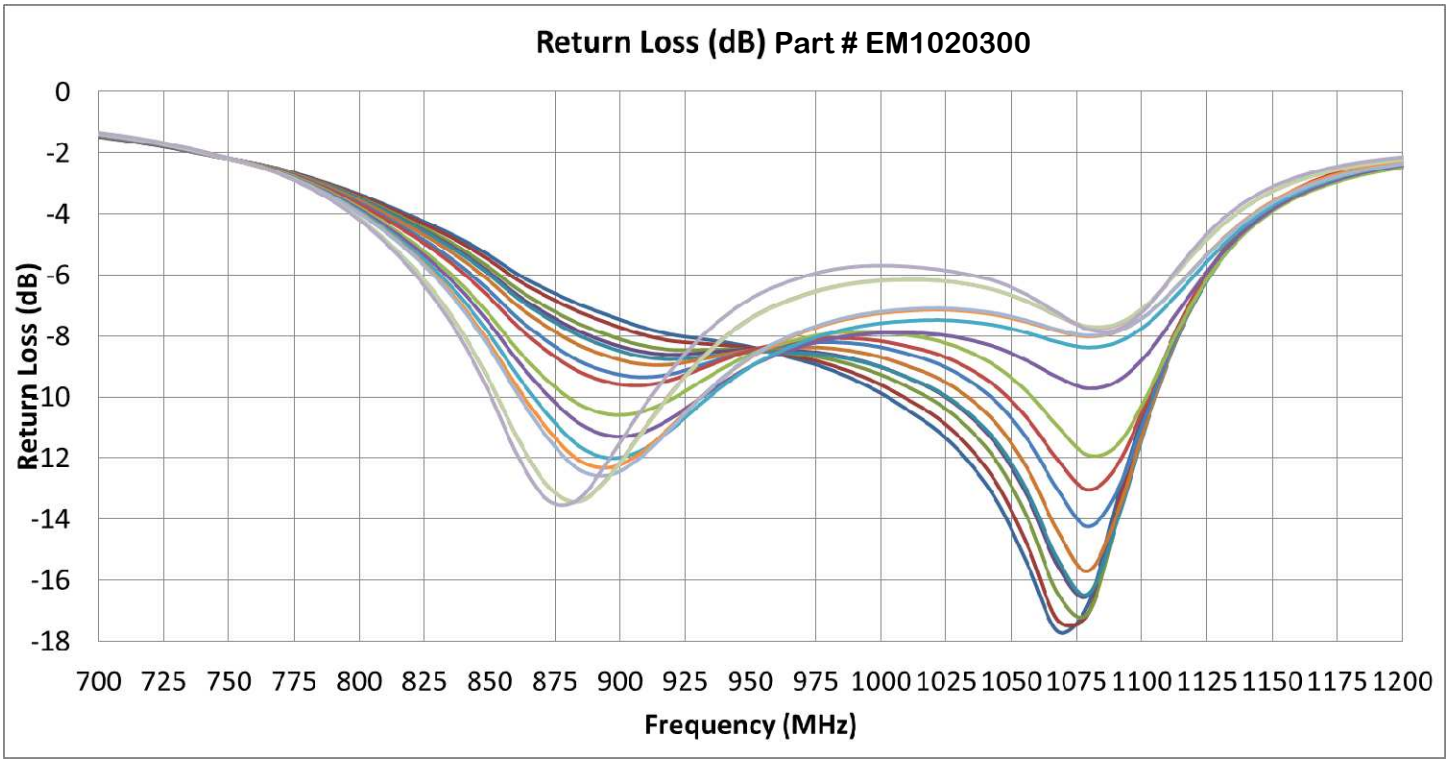
EtherModule 1.0™ typically provides a very wide tunable frequency band, allowing the module to withstand very large detuning effects from the environment.





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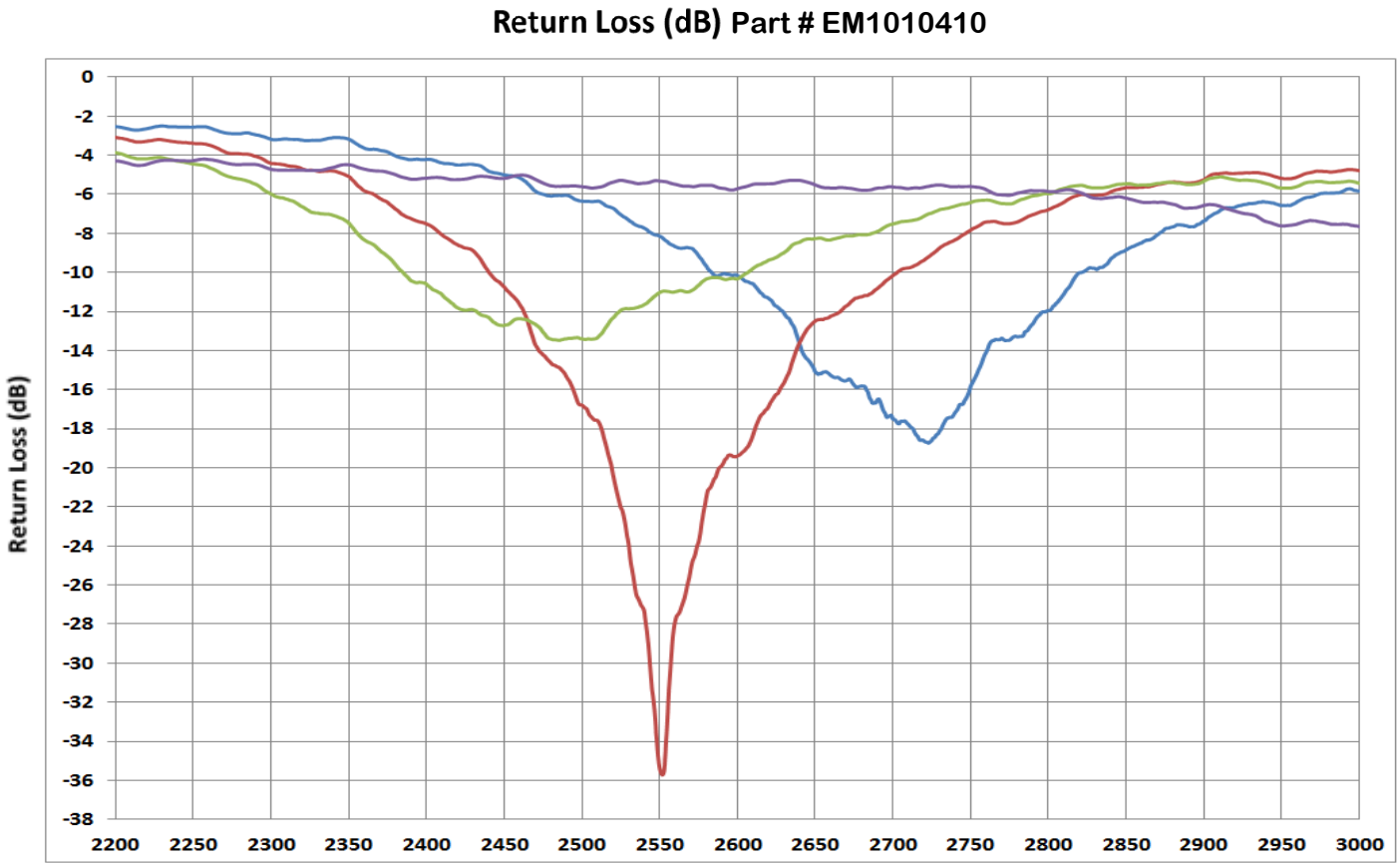
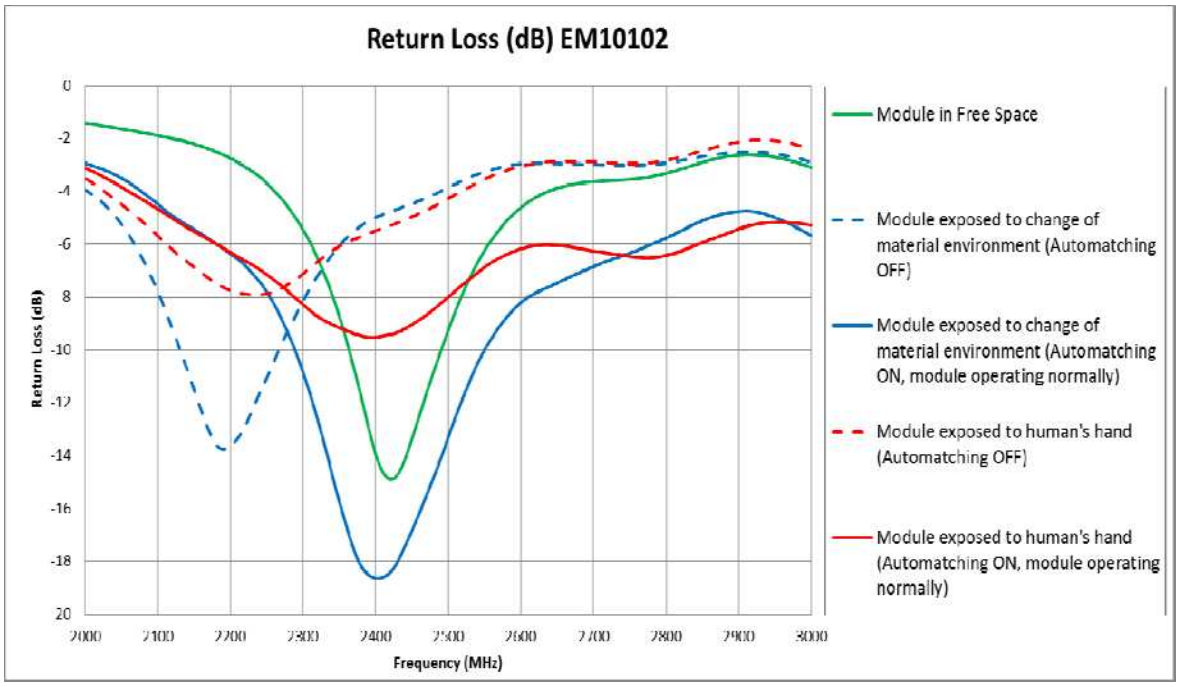


Typical Behavior and Benefits



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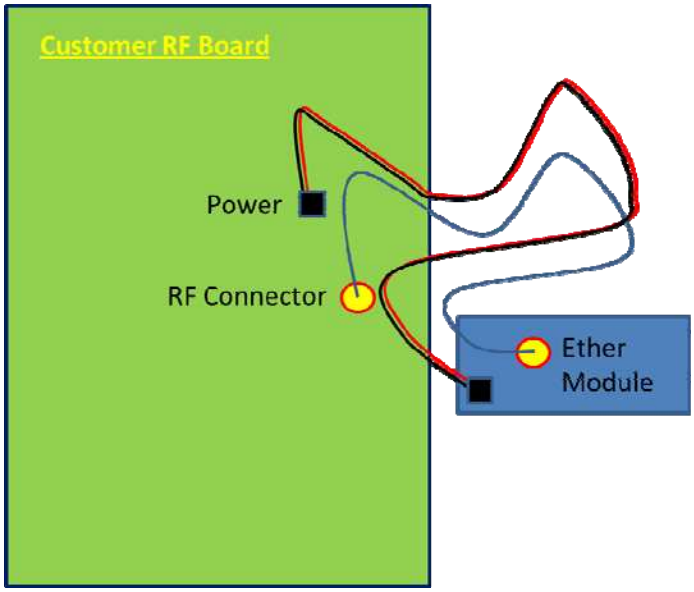
Application for Tunable Antenna

EtherModule **1.0™**



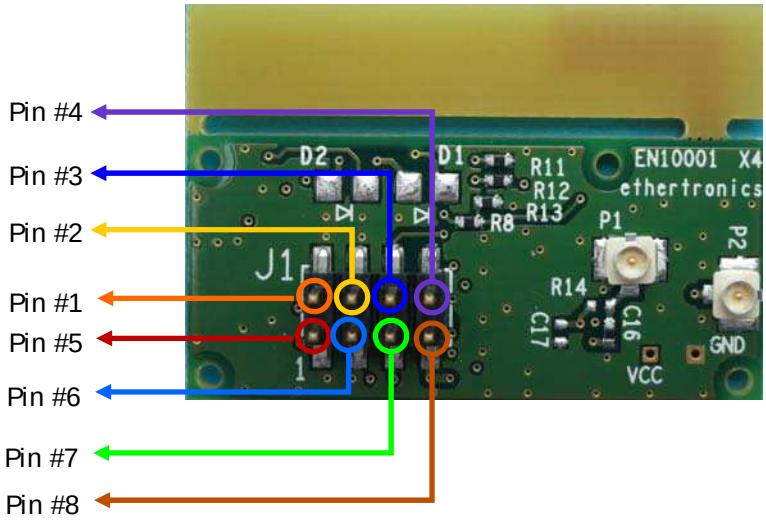
EtherModule 1.0™is designed as a plug-and-play tunable antenna solution connected with a U.FL compatible connector, to be used in place of a standard passive antenna.

The 3.3V DC power can be provided either via the RF cable or via an independent power cable.

Line Bridge to Connect to U.FL Compatible Connector

EtherModule 1.0™can be connected to an external antenna via a U.FL compatible connector. The selection between the U.FL external antenna connector or the pads for the breakaway antenna and FPC + carrier antenna is done using 0ohm resistors. Contact Ethertronics for the correct 0ohm resistor placement or for more information.

Antenna Pin Layout



Pin	Description
1	UART TXCD
2	JTAG SWDIO
3	JTAG SWCLK
4	GND
5	UART RXD
6	
7	JTAG RESET
8	VDD

Operation Mode	Pin Configuration
Normal	GND + VVD
Normal + Monitoring	GND + VDD + UART TXCD + UART RXD
Programming the Microcontroller	GND + VDD + JTAG SWDIO + JTAG SWCLK + JTAG RESET

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