RAMP Modules

RM024

RAMP MODULES

Laird Technologies RAMP (Range Amplified MultiPoint) modules are designed to provide robust wireless communications for any number of applications requiring a wireless transport for serial data. RAMP modules feature a Frequency Hopping Spread Spectrum (FHSS) protocol for excellent interference and multipath immunity. RAMP modules Server/Client architecture allows for more than 16 million clients to be addressed and communicating within the network.

RM024

The RM024 RAMP module is based on Laird Technologies LT2510 core technology, enhanced with a new RF front end for improved sleep, improved link budget and a switchable antenna output. The RM024 is available in two versions, one with 125 mW maximum conducted output power and approved for North American and similar markets and one with 10 mW maximum conducted output power and approved for European and similar markets. These modules are identical except for output power, transmit power consumption, and the number of RF Channels available. Differences between the two versions, where applicable, will be denoted based on part number.

Enhanced API commands provide packet routing control and network intelligence. With its field-proven FHSS air interface protocol, the RM024 rejects RF noise, excels in multipath scenarios, allows for co-located systems, and provides an extremely reliable communication link. It also provides a more robust, but simpler, link than ZigBee for RF applications that do not require a mesh topology.

With a throughput of up to 280 Kb/s, RM024 delivers speedy data rates. In addition, variable output power options (up to +21 dBm) enable communication over distances that aren't achievable with competing technologies. At the same time, a range of ultra-low power modes plus low Tx/Rx power consumption make the RM024 ideal for power-restrictive or battery-operated applications. The mini SMT package is well-suited for space-constrained designs and is available in pick-and-place packaging for volume manufacturing.

Features & Benefits

RoHS

- Retries and acknowledgements
- Configurable network parameters
- Multiple generic I/O
- 280 kbps or 500 kbps RF data stream
- Idle current draw of 9.5 mA, sleep current of .38 uA
- Software selectable interface baud rates from 1200 bps to 230.4 kbps
- Upgradable FW through serial port
- Low cost, low power, and small size ideal for high volume, portable, and battery powered applications

Application Areas

- All modules are qualified for Industrial temperatures (-40°C to 85°C)
- Advanced configuration available using AT commands
- Easy to use Configuration & Test Utility software
- Switchable antenna output, either integrated antenna or external antenna through U.FL

The details contained within this document are subject to change. Download the product specification from http://www.lairdtech.com/ramp for the most current specification.

global solutions: local support

USA: +1.800.492.2320
Europe: +44.1628.858.940
Asia: +852.2923.0610

wirelessinfo@lairdtech.com
http://www.lairdtech.com/ramp

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CATEGORY	FEATURE	IMPLEMENTATION		
General	Form Factor	SMD-ANT+U.FL, Pluggable-ANT+U.FL, SMD-U.FL, Pluggable-U.FL		
	Antenna	External antenna through U.FL connector or dual antenna with integrated antenna and U.FL		
	Serial Interface Data Rate	Baud rates from 1200 bps to 230400 bps. Non-standard baud rates are also supported.		
	Channels	FCC: 42 or 78 selectable channels, CE: 42 selectable channels		
	Security	Channelization, System ID, and Vendor ID		
	Min. Flash (EEPROM) Memory Endurance	1000 Write/Erase Cycles		
Transceiver	Frequency Band	2400 – 2483.5 MHz		
	RF Data Rate (Raw)	280 kbps or 500 kbps selectable		
	Hop Bin Spacing	900 kHz over 79 hops, 1500 kHz over 43 hops		
	RF Technology	Frequency Hopping Spread Spectrum		
	Modulation	MSK		
	Maximum Output Power Conducted	FCC: +5 to +21 dBm selectable, CE: +3.5 to +18 dBm selectable		
	Supply Voltage	2.3 – 3.6 V ± 50 mV ripple		
	Current Draw	RM024 Version	FCC (125 mW)	CE (10 mW)
		100% Tx	136 mA	40 mA
		1/8 Tx (when selected)	40 mA	40 mA
		100% Rx	36 mA	36 mA
		Rx average (idle current)	9.5 µA	9.5 mA
		Deep sleep	.38 µA	.38 µA
	Receiver Sensitivity (1% PER)	-95 dBm at 280 kbps RF Data Rate, -94 dBm at 500 kbps RF Data Rate		
	Range (based on external 2.0 dBi antenna at 280 kbps RF Data Rate		Outdoor (line-of-sight)	Indoor (estimated)
		FCC	2.5 miles (4 km)	1300 ft. (400 m)
		CE	0.6 miles (1.0 km)	328 ft (100 m)

Ordering Information

RM024-S125-C-01	SMT	125 mW	u.FL Jack	RM024125C01
RM024-S125-M-01	SMT	125 mW	Chip Antenna	RM024125M01
RM024-P125-C-01	Pluggable	125 mW	u.FL Jack	RM024125C01
RM024-P125-M-01	Pluggable	125 mW	Chip Antenna	RM024125M01
RM024-S10-C-20	SMT	10 mW (CE)	u.FL Jack	RM02410C01
RM024-S10-M-20	SMT	10 mW (CE)	Chip Antenna	RM02410M01
RM024-P10-C-20	Pluggable	10 mW (CE)	u.FL Jack	RM02410C01
RM024-P10-M-20	Pluggable	10 mW (CE)	Chip Antenna	RM02410M01

Development Kits

Part #	Description	Regulatory
DVK-RM024-P125-M	Full Development Kit with one USB Eval Board and one RS-232 Eval Board containing the RM024-P125-M-01 radios	FCC/IC
DVK-RM024-P10-M	Full Development Kit with one USB Eval Board and one RS-232 Eval Board containing the RM024-P10-M-01 radios	FCC/IC/CE/Japan