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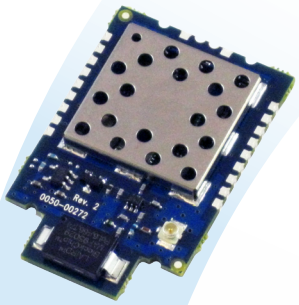
Laird TECHNOLOGIES

Innovative **Technology** for a **Connected** World

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 50 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

- 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 50 uA
- Software selectable interface baud rates from 1200 bps to 460.8 kbps
- Upgradable FW through serial port
- Low cost, low power, and small size ideal for high volume, portable, and battery powered applications
- 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

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Laird TECHNOLOGIES

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RAMP Modules
RM024

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 460800 bps. Non-standard baud rates are also supported.		
Channels	FCC: 43 or 79 selectable channels, CE: 43 selectable channels		
Security	Channelization, System ID, and Vendor ID		
Minimum 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	100% Tx	166 mA	85 mA
	1/8 Tx (when selected)	40 mA	40 mA
	100% Rx	36 mA	36 mA
	Rx average (idle current)	9.5 mA	11.6 mA
	Deep sleep	50 µA	50 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	1.5 miles (2.4 km)	790 ft (240 m)

PRODUCT PART NUMBERS

PART NUMBER	FORM FACTOR	MAXIMUM Tx POWER	ANTENNA	EEPROM PRODUCT ID
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-S50-C-01	SMT	50 mW (CE)	u.FL Jack	RM02450C01
RM024-S50-M-01	SMT	50 mW (CE)	Chip Antenna	RM02450M01
RM024-P50-C-01	Pluggable	50 mW (CE)	u.FL Jack	RM02450C01
RM024-P50-M-01	Pluggable	50 mW (CE)	Chip Ant	RM02450M01

EWS-DS-RM024 1012