

## FLR9G30 DATASHEET

### 1000mW miniPCI



The **FLR9G30** is an industrial grade 1000mW TX power miniPCI radio module. It is designed for the 900MHz ISM license exempt frequency band to support high value applications. The **FLR9G30** assures low EVM (Error Vector Magnitude) at higher modulation rates to maintain low packet errors and maximizes data throughput. The design uses highly linear output power amplifiers in balanced mode to deliver linear power even at 64 QAM radio modulations while maintaining an EVM below 4%. With better RX sensitivity and high SNR (specs stated in field conditions), the **FLR9G30** is specially designed to deliver best performance in long range outdoor applications. The industrial grade design (-40°C - +85°C) and enhanced resilience to RF surges and ESD makes it ideal for deploying in harsh environments.

The noise level of FLR9G30 is extremely low due to advanced filtering, careful component selection and improved RF receive chain design. It is designed to work in noisy environments, amid powerful GSM base stations, where similar 900 MHz modules would be rendered non functional.

#### Applications

- Long range outdoor broad band wireless applications
- Access points and high performance CPEs
- Mesh wireless infrastructure applications
- Industrial applications

### Key Features

- High Power 30dBm (1000mW)
- Frequency range 902MHz to 928MHz
- High desensitization capability for out of band interfering signals from paging / GSM transmitters which avoids the need for expensive external cavity filters.
- Enhanced filtering and noise reduction design techniques for improved in-band and out-of-band interference tolerance
- High accuracy EVM maintains lowest packet errors to maximize data throughput at higher data modulation
- Support 5Mhz/10Mhz/20Mhz channel bandwidth maximizing spectrum efficiency
- Two MMCX connectors that offers flexibility to system designers with diversity or internal/external antenna selection options
- Accurate power control 0dBm – 30dBm range
- Industrial grade (-40°C - +85°C) design ensures durability in harsh operating environments and adverse weather conditions
- Integrated RF surge protection for enhanced ESD performance up to approximately 14 KV
- Supported by open source MadWiFi Linux kernel drivers for industrial and outdoor broadband wireless communications systems
- Compatible with OpenWRT and many other 3<sup>rd</sup> party wireless router operating systems
- Windows 2000/XP/Vista drivers offers easy integration into Industrial PCs

RADIO SYSTEM INFORMATION	
Model No	FLR9G30
Chipset & CPU	Atheros AR5414A
Interface	32bits, 33MHz miniPCI Type III A
Operation Voltage	3.3V
Radio Frequency Band	900 Mhz ISM (902MHz – 928MHz)
Data Rates	54, 48, 36, 24, 18, 12, 9, 6 Mbps (Auto fall back)
Channel Bandwidth	5, 10, 20 Mhz
Driver	Linux MadWiFi, Windows XP, Windows 2000

PHYSICAL, ENVIRONMENTAL AND OTHER SPECIFICATIONS					
Antenna ports	Two MMCX Ports				
Power consumption matrix	<b>DBPSK</b>	<b>BPSK</b>	<b>QPSK</b>	<b>16QAM</b>	<b>64QAM</b>
Continuous transmit at specified speeds	1.5A (5W)	1.5A (5W)	1.5A (5W)	1.5A (5W)	1.3A (4.3W)
Operating temperature	-40°F to +185°F (-40°C to +85°C)				
Dimension & Weight	2.36" x 2.63" (60 x 66 mm), approx. 0.04 lb (0.02 kg)				

RADIO SYSTEM INFORMATION				
Tx/Rx Specification	DATA RATE	MODULATION	TX POWER	RX SENSITIVITY
20MHz Channel Width 912MHz and 917MHz only	1Mbps	DBPSK/DSS	30dBm ± 1dBm	-97dBm ± 1dBm
	2Mbps	DQPSK/DSS	30dbm ± 1dBm	-95dBm ± 1dBm
	5.5Mbps	CCK/DSS	30dBm ± 1dBm	-92dBm ± 1dBm
	11Mbps	CCK/DSS	30dBm ± 1dBm	-90dBm ± 1dBm
	6Mbps	BPSK/COFDM	30dBm ± 1dBm	-93dBm ± 1dBm
	9Mbps	BPSK/COFDM	30dBm ± 1dBm	-93dBm ± 1dBm
	12Mbps	QPSK/COFDM	30dBm ± 1dBm	-91dBm ± 1dBm
	18Mbps	QPSK/COFDM	30dBm ± 1dBm	-89dBm ± 1dBm
	24Mbps	16QAM/COFDM	30dBm ± 1dBm	-86dBm ± 1dBm
	36Mbps	16QAM/COFDM	29dBm ± 1dBm	-82dBm ± 1dBm
	48Mbps	64QAM/COFDM	28dBm ± 1dBm	-77dBm ± 1dBm
	54Mbps	64QAM/COFMD	27dBm ± 1dBm	-74dBm ± 1dBm

RADIO SYSTEM INFORMATION				
Tx/Rx Specification	DATA RATE	MODULATION	TX POWER	RX SENSITIVITY
10MHz Channel Width 907MHz, 912MHz, 917MHz and 922MHz	3Mbps	BPSK/COFDM	30dBm ± 1dBm	-95dBm ± 1dBm
	4.5Mbps	BPSK/COFDM	30dBm ± 1dBm	-95dBm ± 1dBm
	6Mbps	QPSK/COFDM	30dBm ± 1dBm	-93dBm ± 1dBm
	9Mbps	QPSK/COFDM	30dBm ± 1dBm	-91dBm ± 1dBm
	12Mbps	16QAM/COFDM	30dBm ± 1dBm	-88dBm ± 1dBm
	18Mbps	16QAM/COFDM	29dBm ± 1dBm	-84dBm ± 1dBm
	24Mbps	64QAM/COFDM	28dBm ± 1dBm	-79dBm ± 1dBm
	27Mbps	64QAM/COFMD	27dBm ± 1dBm	-76dBm ± 1dBm

RADIO SYSTEM INFORMATION				
Tx/Rx Specification	DATA RATE	MODULATION	TX POWER	RX SENSITIVITY
5MHz Channel Width 907MHz, 912MHz, 917MHz and 922MHz	1.5Mbps	BPSK/COFDM	30dBm ± 1dBm	-97dBm ± 1dBm
	2.25Mbps	BPSK/COFDM	30dBm ± 1dBm	-97dBm ± 1dBm
	3Mbps	QPSK/COFDM	30dBm ± 1dBm	-95dBm ± 1dBm
	4.5Mbps	QPSK/COFDM	30dBm ± 1dBm	-93dBm ± 1dBm
	6Mbps	16QAM/COFDM	30dBm ± 1dBm	-90dBm ± 1dBm
	9Mbps	16QAM/COFDM	29dBm ± 1dBm	-86dBm ± 1dBm
	12Mbps	64QAM/COFDM	28dBm ± 1dBm	-81dBm ± 1dBm
	13.5Mbps	64QAM/COFMD	27dBm ± 1dBm	-78dBm ± 1dBm

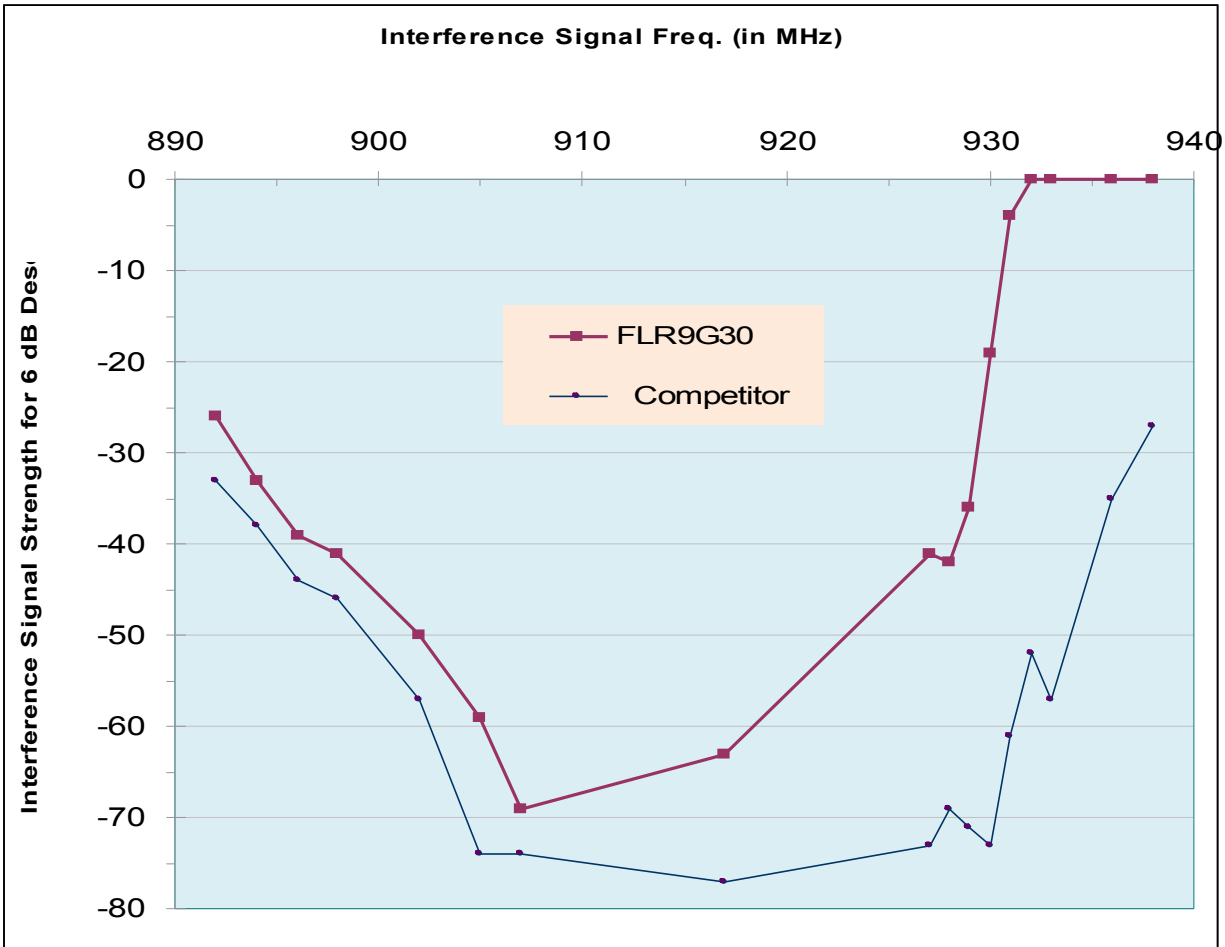
## Technical Information

The FLR9G30 has a 10dB TX power offset from the internal system registers. For example, in order to achieve a 30dBm transmit output power, the system should be set to 20dBm. It is also recommended not to override the calibrated power settings as this will increase the packet error rate due to increased EVM.

The FLR9G30 will be recognized by the operating system as a standard 802.11b/g card operating in the 2.4GHz band. This is by design and should be expected. Please refer to the following frequency conversion chart to determine the actual output carrier frequency.

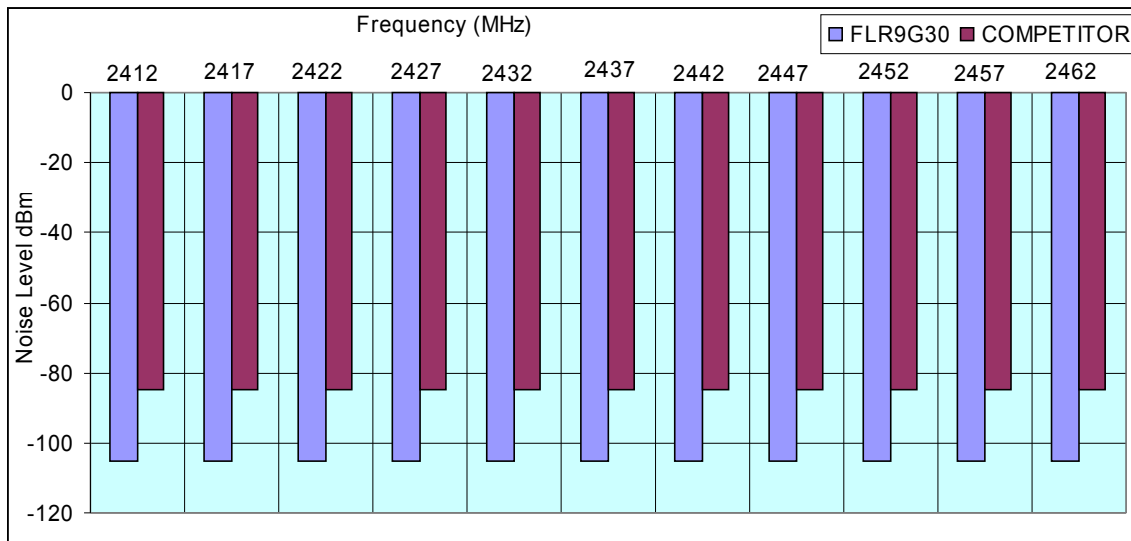
FLR9G30 FREQUENCY CHART			
802.11b/g Channel	802.11b/g Frequency	Carrier Frequency	Available Bandwidth Options
4	2427MHz	907MHz	5/10MHz
5	2432MHz	912MHz	5/10/20MHz
6	2437MHz	917MHz	5/10/20MHz
7	2442MHz	922MHz	5/10MHz

### Interference Immunity Measurements



\*\* Higher is better

### Noise Histogram



\*\* Lower is better