User Guide for OEM Integration

Model : DLM108

Brand : Doodle Labs

DLM108 is an Industrial grade 1000 mW Tx power mini-PCI radio module. It is designed for the ISM frequency band 902 MHz ~ 928 MHz. It sports advanced filtering and noise reduction design techniques for high interference immunity from the neighboring Pager transmitters.

Applications

- Long Range Outdoor Broad band wireless applications
- Back hauls
- Access points & High Performance CPEs
- Mesh Wireless Infra structure applications
- Industrial applications

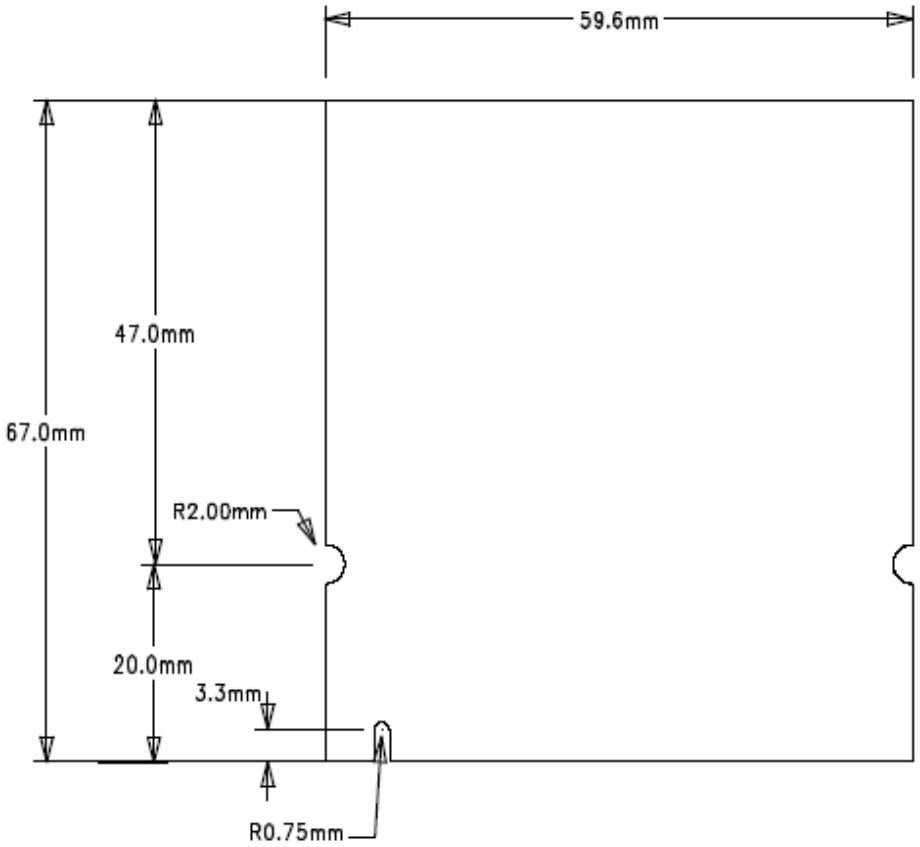
RADIO SYSTEM INFORMATION	
Model No*	DLM108
MAC and Baseband	Atheros AR5414A
Interface	32bits, 33MHz miniPCI Type III A
Operation Voltage	3.3V
Radio Frequency Band	902 MHz - 928 MHz
Data Rates	54, 48, 36, 24, 18, 12, 9, 6 Mbps (Auto fall back)
Channel Bandwidth	5, 10, or 20 MHz
Available Drivers	Open Source MADWiFi for Linux, Windows 2000, XP and Vista

Tx/Rx Specification	Data Rate	Modulation	Tx Power* (± 1 dBm)	Rx Sensitivity (± 2 dBm)
5 MHz Channel BW (QUARTER RATE) 907 MHz, 912 MHz, 917 MHz & 922 MHz	1.5 Mbps	BPSK/COFDM	30 dBm	-97 dBm
	2.25 Mbps	BPSK/COFDM	30 dBm	-97 dBm
	3 Mbps	QPSK/COFDM	30 dBm	-95 dBm
	4.5 Mbps	QPSK/COFDM	30 dBm	-93dBm
	6 Mbps	16QAM/COFDM	30 dBm	-90 dBm
	9 Mbps	16QAM/COFDM	29 dBm	-86 dBm
	12 Mbps	64QAM/COFDM	28 dBm	-81 dBm
	13.5 Mbps	64QAM/COFDM	27 dBm	-78 dBm

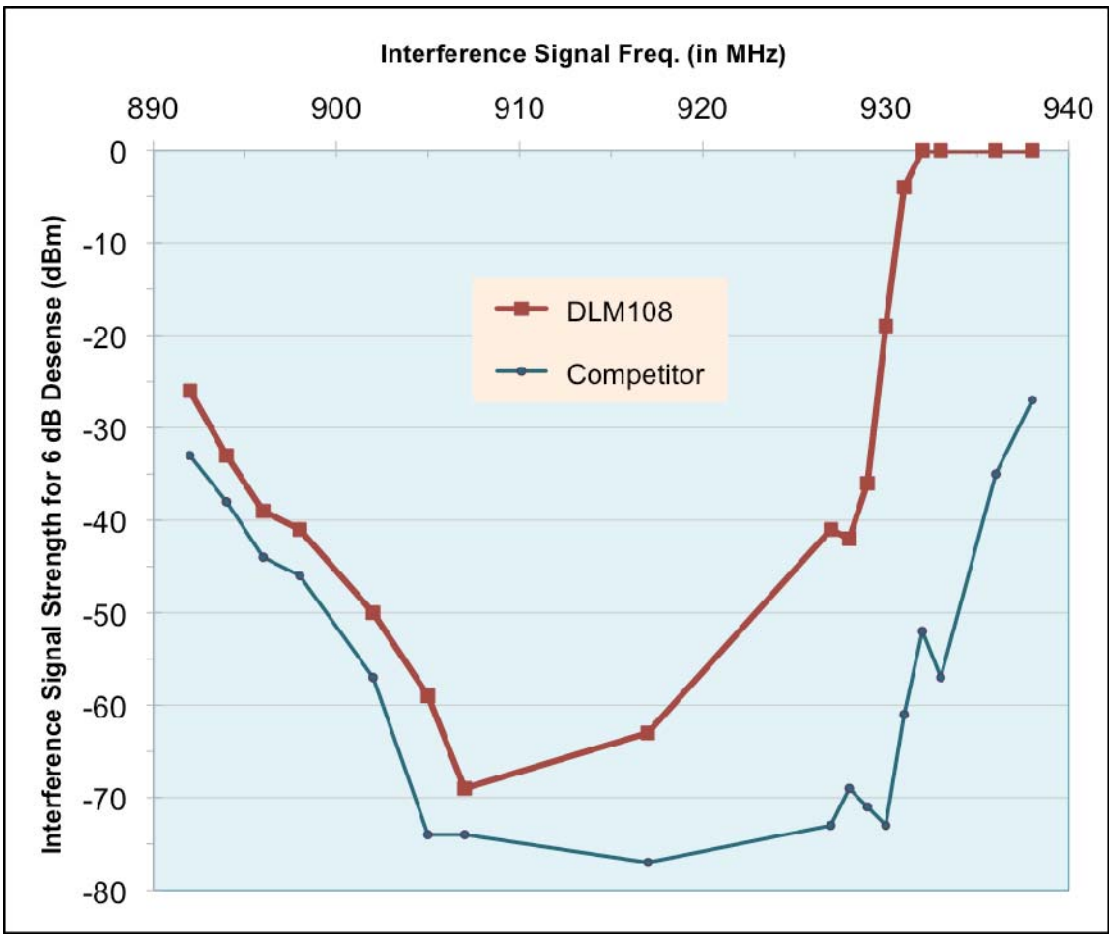
Tx/Rx Specification	Data Rate	Modulation	Tx Power* (± 1 dBm)	Rx Sensitivity (± 2 dBm)
10 MHz Channel BW (HALF RATE) 907 MHz, 912 MHz, 917 MHz & 922 MHz	3 Mbps	BPSK/COFDM	30 dBm	-95 dBm
	4.5 Mbps	BPSK/COFDM	30 dBm	-95 dBm
	6 Mbps	QPSK/COFDM	30 dBm	-93 dBm
	9 Mbps	QPSK/COFDM	30 dBm	-91 dBm
	12 Mbps	16QAM/COFDM	30 dBm	-88 dBm
	18 Mbps	16QAM/COFDM	29 dBm	-84 dBm
	24 Mbps	64QAM/COFDM	28 dBm	-79 dBm
	27 Mbps	64QAM/COFDM	27 dBm	-76 dBm

Tx/Rx Specification 20 MHz Channel BW (FULL RATE) 912 MHz & 917 MHz	Data Rate	Modulation	Tx Power* (± 1 dBm)	Rx Sensitivity (± 2 dBm)
	1 Mbps	DBPSK/DSS	30 dBm	-97 dBm
	2 Mbps	DQPSK/DSS	30 dBm	-95 dBm
	5.5 Mbps	CCK/DSS	30 dBm	-92 dBm
	11 Mbps	CCK/DSS	30 dBm	-90 dBm
	6 Mbps	BPSK/COFDM	30 dBm	-93 dBm
	9 Mbps	BPSK/COFDM	30 dBm	-93 dBm
	12 Mbps	QPSK/COFDM	30 dBm	-91 dBm
	18 Mbps	QPSK/COFDM	30 dBm	-89 dBm
	24 Mbps	16QAM/COFDM	30 dBm	-86 dBm
	36 Mbps	16QAM/COFDM	29 dBm	-82 dBm
	48 Mbps	64QAM/COFDM	28 dBm	-77 dBm
	54 Mbps	64QAM/COFDM	27 dBm	-74 dBm

PHYSICAL, ENVIRONMENTAL AND OTHER SPECIFICATIONS					
Antenna Ports*	Two MMCX Ports				
Power Consumption Matrix (@3.3V)	**DBPSK/DSS**	**BPSK/COFDM**	**QPSK/COFDM**	**16QAM/COFDM**	**64QAM/COFDM**
Max. Throughput test condition	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	2.36" x 2.63" (60 x 67 mm), approx. 0.04 lb (0.02 kg)				



Interference Signal Desensitization Measurements



DLM108 Operating Freq = 917 MHz, 20 MHz Channel, BPSK/COFDM Modulation

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 21cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions:

1. The antenna must be installed such that 21 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna,

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 21 cm may be maintained between the antenna and users.

The final end product must be labeled in a visible area with the following: “Contains FCC ID: XP8DLM108”.