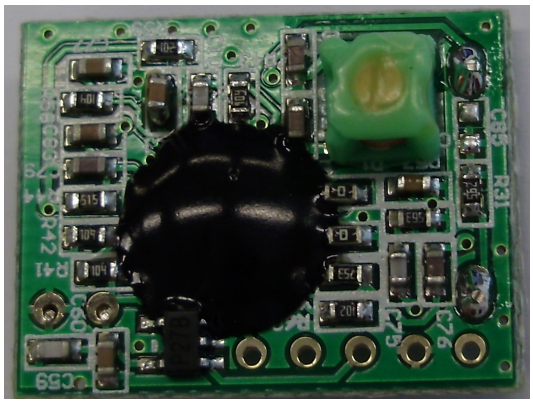
1.0 Introduction



The LW103M is a 300MHz to 450MHz receiver module employing super-regenerative amplitude-shift-keying (ASK) modulation (or On-Off keying, OOK). Customer can specify the receiving frequency. With our innovative design, the module can meets the FCC and ETSI EMI/EMC compliance requirements including the latest ETSI blocking requirement. Working together with LW203M, a transmitter module, LW103M will achieve a communication range of 150 meter at open field. LW103M is designed to operate for low power device (LPD) applications.

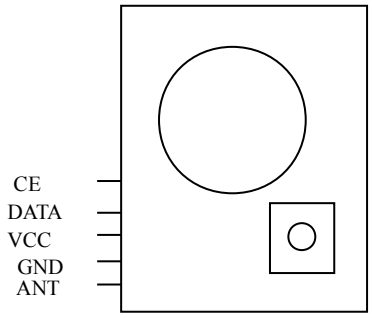
2.0 Features

- Frequency range from 300 MHz to 450 MHz
- High sensitivity
- Small size (24mm x 19mm)
- Low power consumption
- Operate from -20 °C to 70 °C
- Low cost
- Low RF emission
- FCC and ETSI - compliant

3.0 Applications

- Remote controllers
- Security systems such as car alarm
- Wireless door bells
- Garage openers
- Radio controlled toys
- Monitoring systems
- RFID

4.0 Pin Description



Pin no.	Symbol	Description
1	ANT	Antenna input
2	GND	RF ground
3	VCC	Power supply
4	DATA	Data output
5	CE	Chip Enable

5.0 Electrical Characteristics

5.1 Maximum ratings

Rating	Symbol	Value	Unit
Power Supply Voltage	V_{BATT}	6	Vdc
RF Input Power	P_{max}	-20	dBm
Junction Temperature	T_J	125	℃
Storage Temperature Range	T_{STg}	-55 to 125	℃

5.2 Recommended Operating Conditions

Characteristics	Value	Unit
Supply voltage	2.5 – 5.5	V
RF frequency range	300 - 440	MHz
Max data rate	5	Kbps

5.3 DC Electrical Characteristics

Characteristics	Minimum	Typical	Maximum	Unit
Standby current	1	-	10	μA
Operating current				
With LNA	1.5	-	3	mA
Without LNA	0.7	-	2	
Input Low Voltage	0.8*Vdd	-	Vdd	V
Input High Voltage	Vss	-	0.1*Vdd	V

5.4 AC Electrical Characteristics

Characteristics	Minimum	Typical	Maximum	Unit
Sensitivity (500Hz)	-	-108	-	dBm
(1KHz)	-	-105	-	dBm
Stabilization time	-	-	50	ms

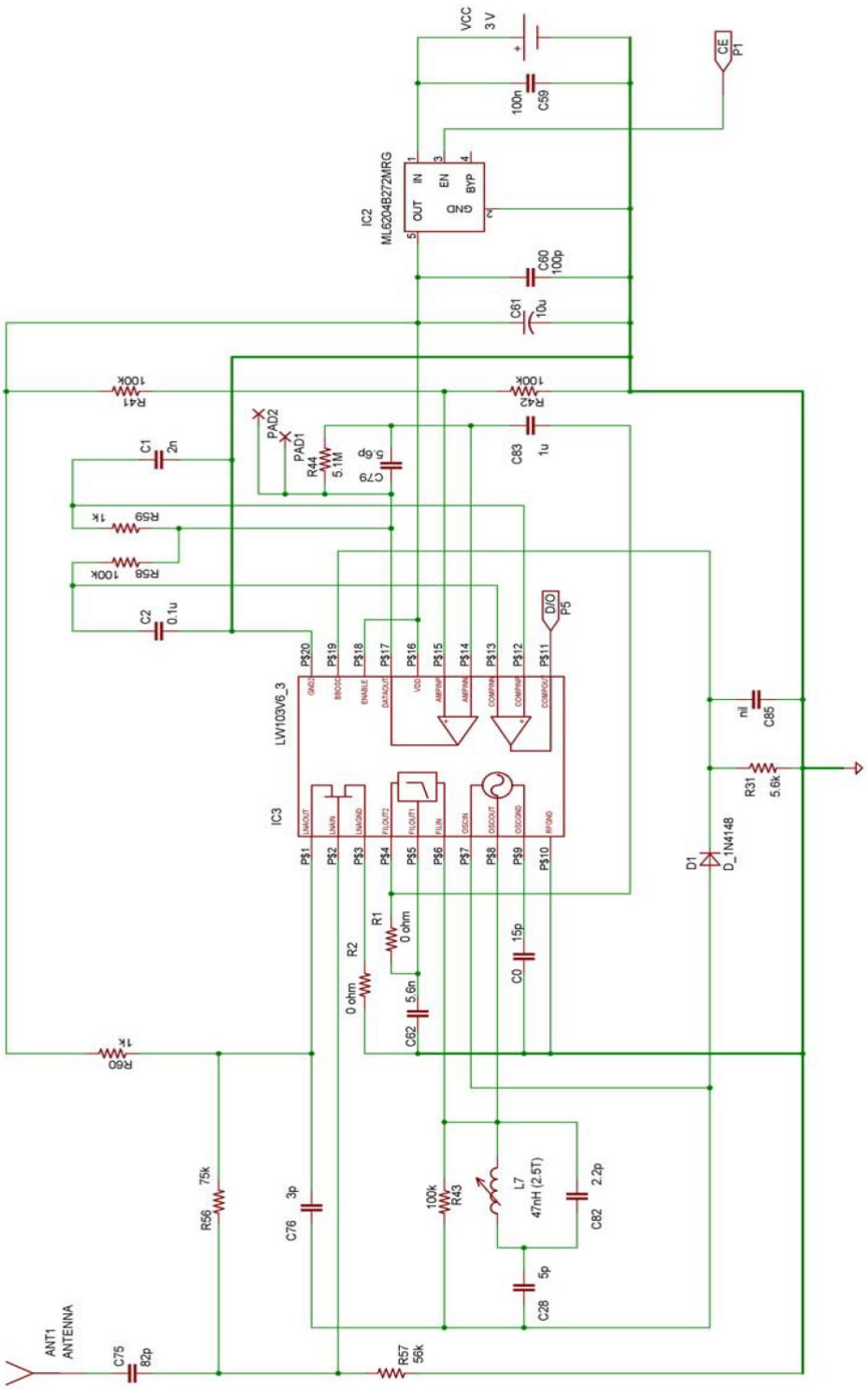
6.0 Functional Descriptions

LW103M is a super-regenerative receiver module. It employs Lexiwave's receiver RFIC LW103 as the core component in the module. The heart of the chip is an oscillator operating in super-regenerative mode. The demodulated baseband signal is filtered by a low pass filter. The filtered signal is then amplified by an operational amplifier. The amplified signal is compared with reference voltage at a data comparator. The transmitted "0" and "1" will be exported at the DATA output.

A bandgap reference is implemented inside the chip for stable operation over temperature and supply voltages. In addition, our unique design approach allows the module to operate normally from 2.5V to 5.5V and remain stable at component variations. The chip is thus ideal for mass production applications of which no tight tolerance components are required.

LW103M makes use of the internal Low Noise Amplifier (LNA) to achieve higher sensitivity and isolation to meet emission requirements. At the time when oscillation frequency of the super-regenerative oscillator is affected by a closing object, (hand effect), LNA will offer signal isolation and minimize receiver sensitivity degradation.

7.0 Schematic Diagram



Evaluation Board

External Components:

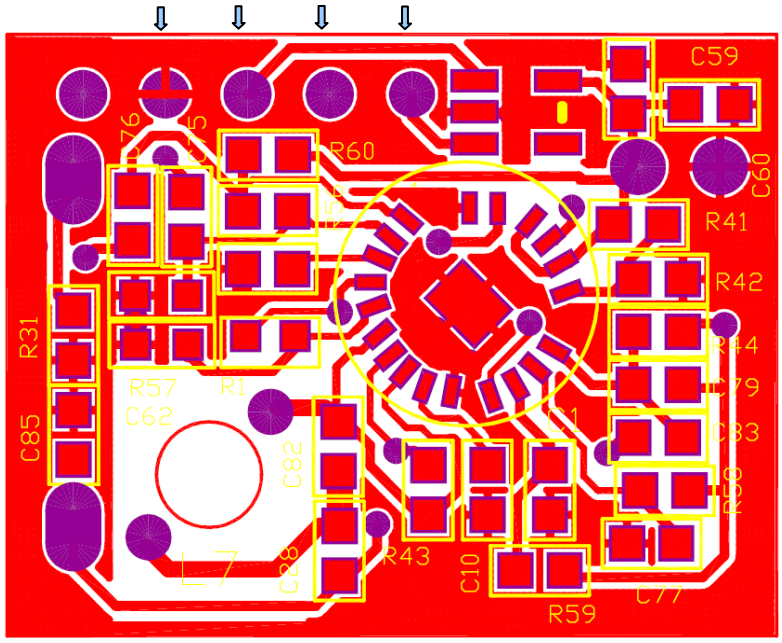
Part	Value	Package
C76	2 pF	0603
C82	2.2 pF	0603
C28	5 pF	0603
C79	5.6 pF	0603
C0	15 pF	0603
C75	82 pF	0603
C60	100 pF	0603
C1	2 nF	0603
C62	5.6 nF	0603
C59,C2	100 nF	0603
C83	1 uF	0603
C61	10 uF	0805
R2	0 Ω	0603
R59,R60	1 kΩ	0603
R31	5.6 kΩ	0603
R1	22 kΩ	0603
R57	56 KΩ	0603
R41,R42,R43,R58	100 kΩ	0603
R56	150 kΩ	0603
R44	5.1 MΩ	0603
IC3	LW103	
L7	47 nH	2.5T for 433MHz
D1	1N4148	Lead or SMD
IC2	ML6204	LDO SMD
X29	---	Antenna

Remark: The suggested component values are optimized for 1KHz datarate. C1, C2 and C83 may be adjusted for different datarate and power-up settling time requirement. For detailed design information, please contact Lexiwave.

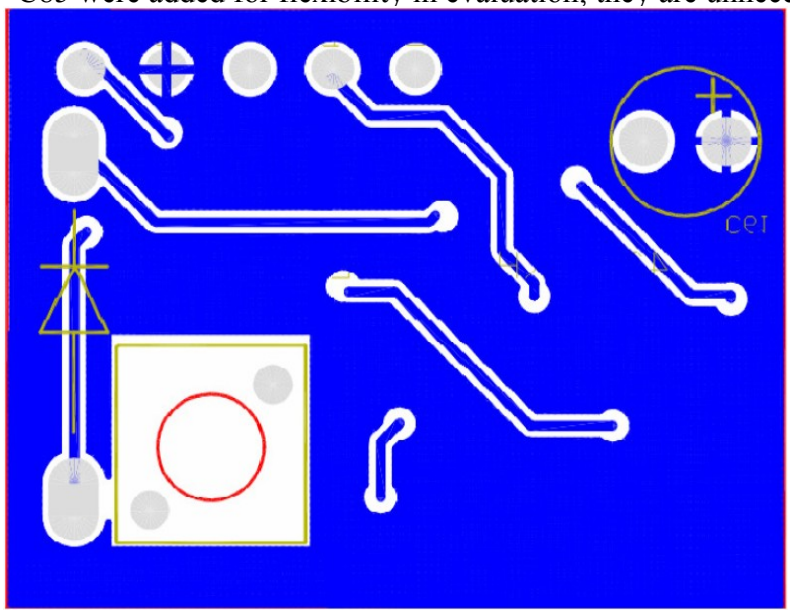
8.0 PCB Layout

LW103D_LS-b2106K7 PCB Top Layer (23.3 x 18.5 x 1 mm)

Antenna, GND, VCC ,DATA, CE



Note: C85 were added for flexibility in evaluation; they are unnecessary.



LW103M-LW-433-1K-EQ-N-0A (23.3 x 18.5 x 1 mm)

9.0 IMPORTANT NOTICE

The information presented in this document does not form part of any quotation or contract. Lexiwave Technology (Hong Kong) Limited (Lexiwave) does not assume any responsibilities for use of any circuitry described and no circuit patent licenses are implied. No liability will be accepted by Lexiwave for any consequence of its use. Lexiwave reserves the right to make changes to its products or to discontinue any integrated circuit products or services without notice.

A few applications using integrated circuit products may involve potential risks of death, personal injury, or severe property or environmental damage. Lexiwave's integrated circuit, module or any other products are not designed, intended, authorized, or warranted to be suitable for use in life-support applications, devices or systems or other critical applications. Use of Lexiwave's products in such applications is understood to be at the full risk of the customer.