MG117 BLE Transceiver

Data Sheet

Revision History:

Rev. No.	History	Issue Date	Remark
0.1	Initial issue	Sep 19, 2016	Preliminary

Table of Contents

1. Overview

MG117 chip is a single mode BLE RF transceiver with embedded packet handling engine, and designed for ultra low power Bluetooth Smart Devices.

Internal voltage regulators ensure a high Power Supply Rejection Ratio (PSRR) and a wide power supply range(1.9~3.6V).

The BLE advertising packets are configured in OTP.

1.1 Features

- Radio

Worldwide 2.4GHz ISM band operation with 2MHz channel spacing

GFSK modulation

1Mbps air data rate

- Transmitter

Programmable output power: -50~4 dBm, without an external RF PA

20mA at 0dBm output power

- Baseband

Dedicated logic performs:

Cyclic redundancy check

Data whitening

Access code correlation

- Power Management

Integrated voltage regulator

1.9 to 3.6V supply range

Idle modes with fast start-up times for advanced power management

3uA in sleep mode

- Low cost BOM

Provides a single-ended RF port pin

No matching components needed

Built-in 32.768KHz oscillator, no need external RTC crystal

Support low cost crystal(16MHz)

1.2 Typical Application

- Beacon
- Remote Controller

1.3 Block Diagram

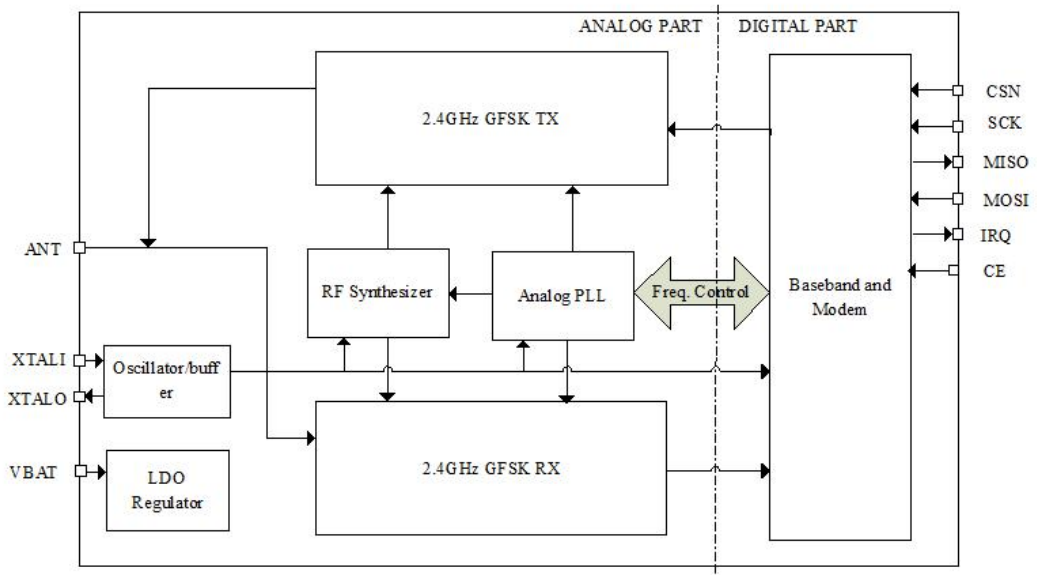


Figure1.3.1 Block Diagram

2. Pin Description

Pin No.	Symbol	I/O	Function Description
1	GPI2	DI	Input pin, OTP programming Clock
2	DVDD	Power	Digital VDD 1.2v Output
3	GPI3	DI	Input pin, OTP programming data
4	XTALO	AO	Crystal Pin
5	XTALI	AI	Crystal Pin
6	ANT	RF	Antenna interface
7	VBAT	Power	Power Supply
8	VPP	Power	Power supply for OTP Programming
9	GPI0	DI	Test use only
10	GPI1	DI	Input pin, OTP programming select
11	GND	Power	*Down bonding to Ground(0V)

Table2.1 MG127 Pin Description

3. Example Application Schematic

MG117 with single ended RF output, crystal and decoupling capacitors.

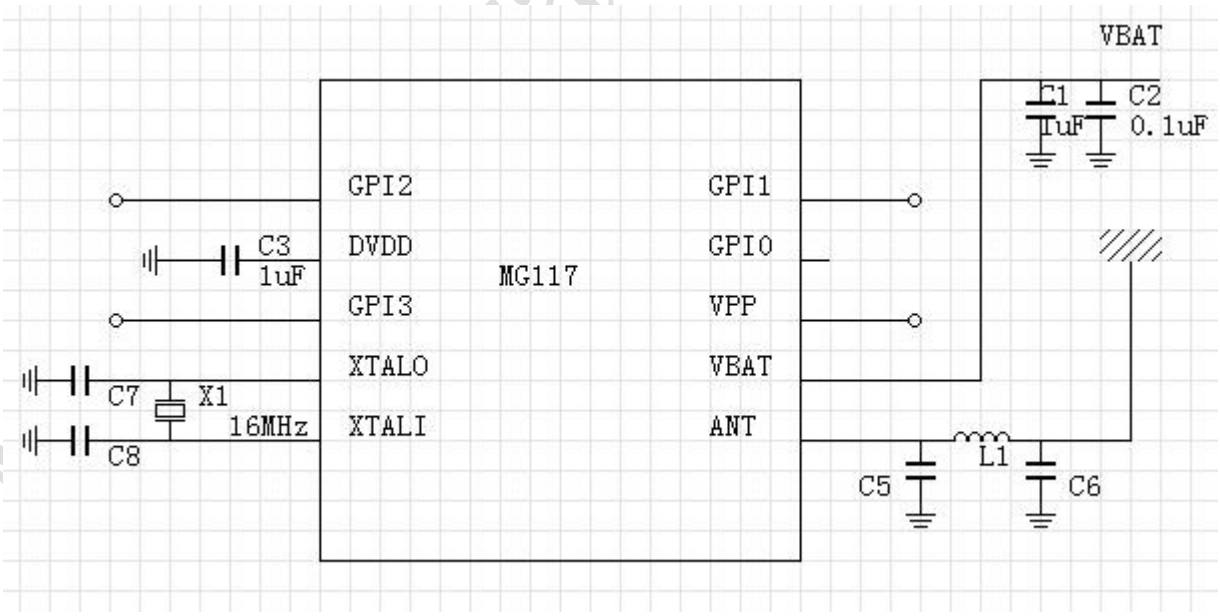


Figure 3.1 Example Application Schematic

4. Electrical Characteristic

Conditions: VDD = +3V, VSS = 0V, TA = - 40ºC to + 85ºC

Symbol	Parameter	Notes	Min.	Typ.	Max.	Unit
	Operating Conditions					
VDD	Supply voltage		1.9	3.0	3.6	V
TEMP	Operating Temperature		-40	+27	+85	℃
	General RF condition					
f_{OP}	Operating frequency		2402		2480	MHz
	Transmitter Operation condition					
P_{RF}	Maximum output power				+4	dBm

Table 4.1 Electrical Specification

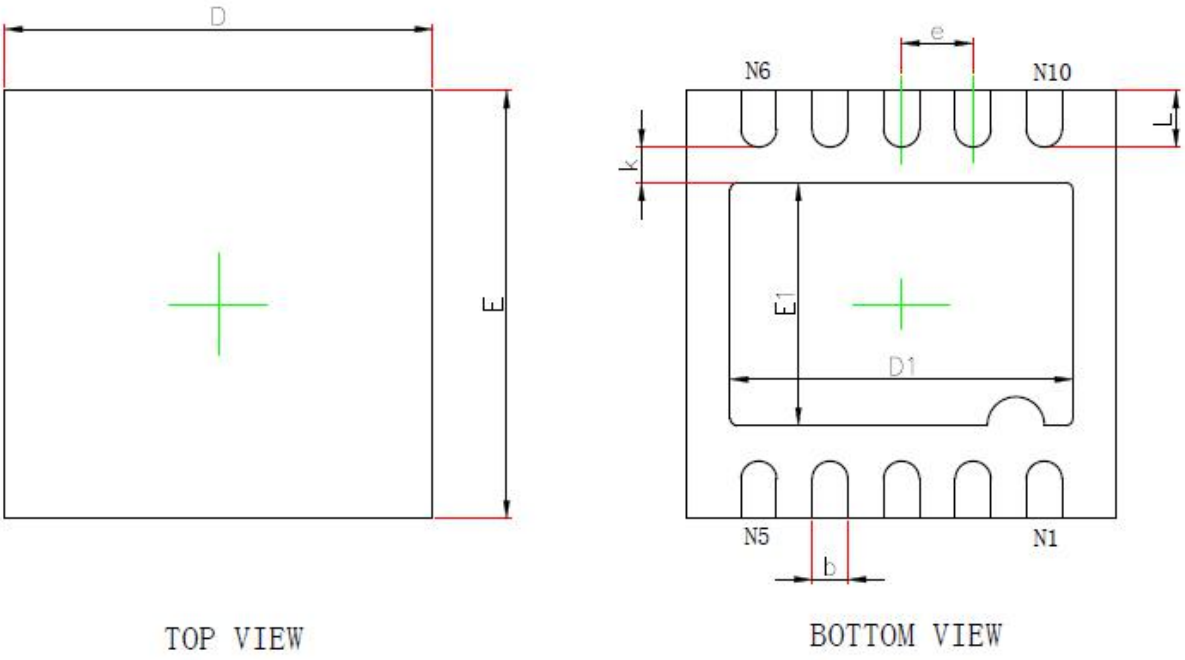
5. Current Consumption

Table 5.1 shows total typical current consumption measured at the battery.

Mode	Description	Total Typical Current at 3.0v
sleep	Sleep. wakeup through SPI command	3 uA
TX active	In transmitting	20 mA @ 0dBm output power

Table 5.1 Current Consumption

6. Package Information

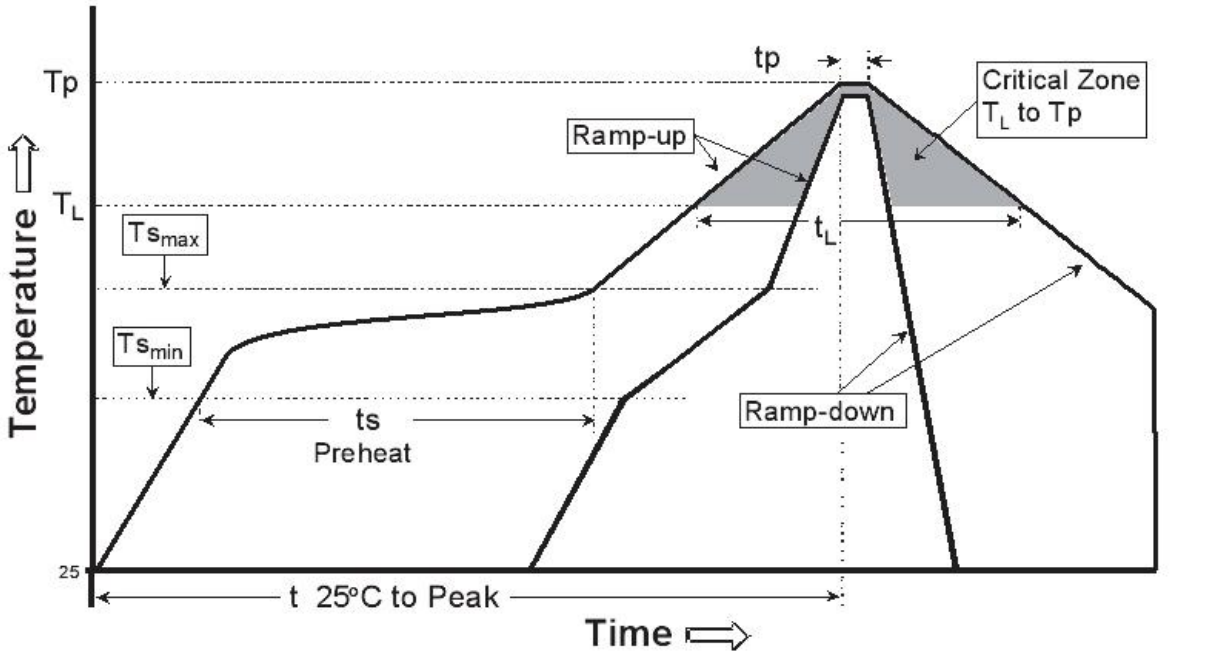


Symbol	Dimensions in Milimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
D/E	2.924	3.076	0.115	0.121
D1	2.300	2.500	0.091	0.098
E1	1.600	1.800	0.063	0.071
k	0.200 MIN.		0.008 MIN.	
b	0.200	0.300	0.008	0.012
e	0.500 TYP.		0.020 TYP.	
L	0.324	0.476	0.013	0.019

Table 6.1 DFN3x3-10 Package outline

7. Reflow Profile

Follow：IPC/JEDEC J-STD-020 C



IPC-020c-5-1

IPC/JEDEC J-STD-020C July 2004

Table 5-2 Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-Up Rate (Ts_{max} to Tp)	3 °C/second max.	3° C/second max.
Preheat – Temperature Min (Ts_{min}) – Temperature Max (Ts_{max}) – Time (ts_{min} to ts_{max})	 100 °C 150 °C 60-120 seconds	 150 °C 200 °C 60-180 seconds
Time maintained above: – Temperature (T_L) – Time (t_L)	 183 °C 60-150 seconds	 217 °C 60-150 seconds
Peak/Classification Temperature (Tp)	See Table 4.1	See Table 4.2
Time within 5 °C of actual Peak Temperature (tp)	10-30 seconds	20-40 seconds
Ramp-Down Rate	6 °C/second max.	6 °C/second max.
Time 25 °C to Peak Temperature	6 minutes max.	8 minutes max.

Note 1: All temperatures refer to topside of the package, measured on the package body surface.