



MG117 BLE Transceiver
Data Sheet

Revision History:

Rev. No.	History	Issue Date	Remark
0.1	Initial issue	Sep 19, 2016	Preliminary
0.2	Add tape and reel info	April 6, 2017	Preliminary
1.0	Update Electrical Characteristic	Jan 29, 2018	

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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

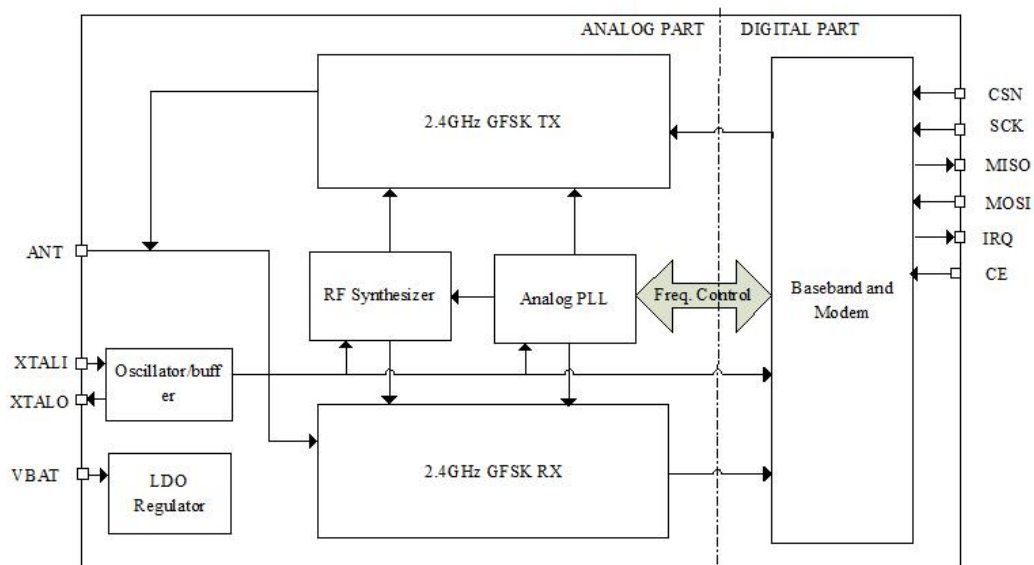


Figure1.3.1 Block Diagram



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.

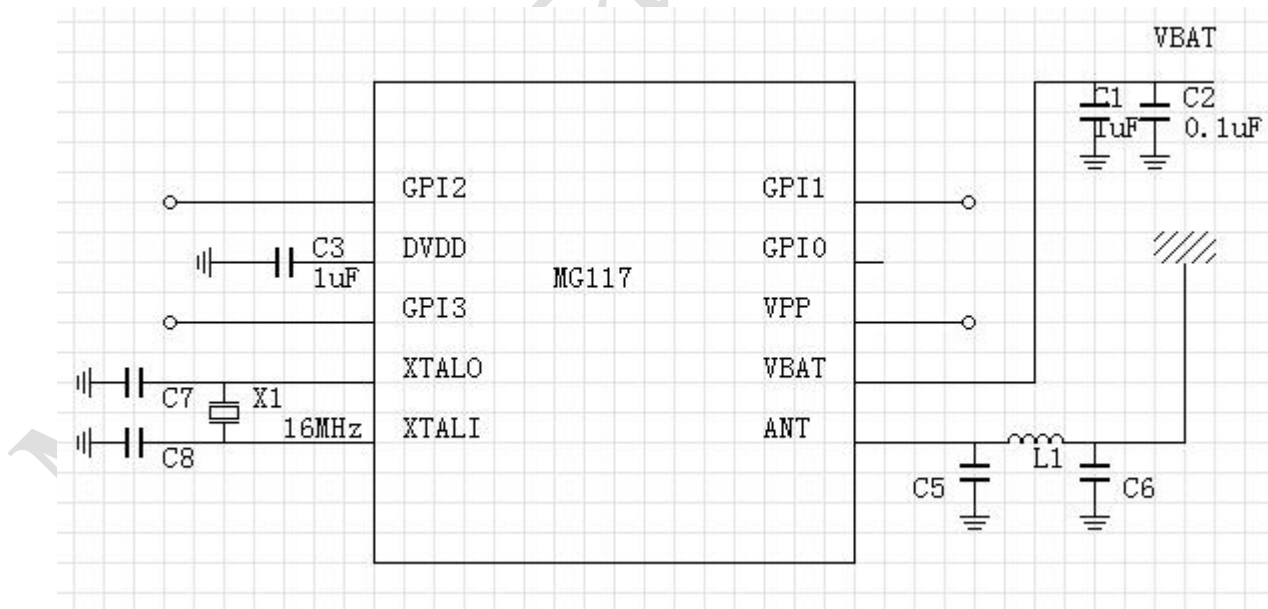


Figure 3.1 Example Application Schematic



4. Electrical Characteristic

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

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	°C
General RF condition						
f _{OP}	Operating frequency		2402		2480	MHz
Transmitter Operation condition						
P _{RF}	Maximum output power			0	+4	dBm

Table 4.1 Electrical Specification

Absolute Maximum Ratings

Symbol	Parameter	Condition	Min.	Max.	Unit
T _s	Storage temperature		-55	+150	°C
ESD	Human-body model	All pin	2000		V
	Machine model	All pin	200		V
	Charged-device model	All pin	800		V

Table 4.2 Absolute Maximum Ratings

5. Current Consumption

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

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

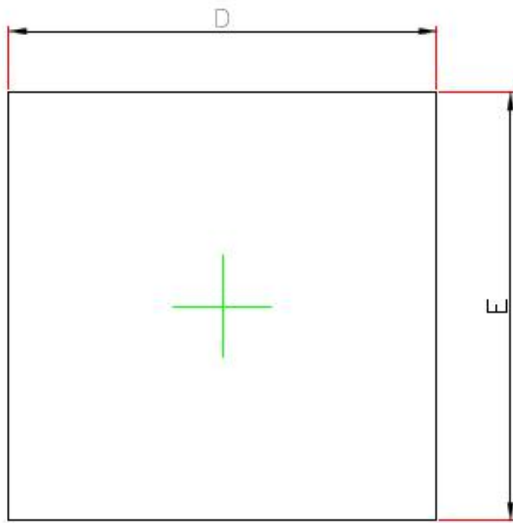
Table 5.1 Current Consumption



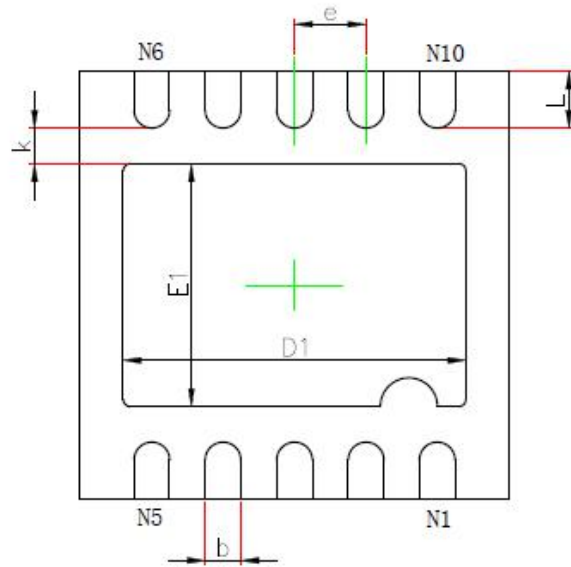
6. Ordering Information

Part Number	Package	MOQ
MG117	3x3 mm Body [DFN10]	3,000 pcs

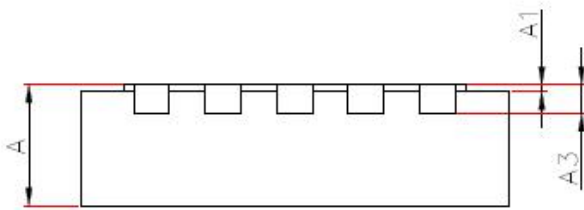
7. Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions in Millimeters		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

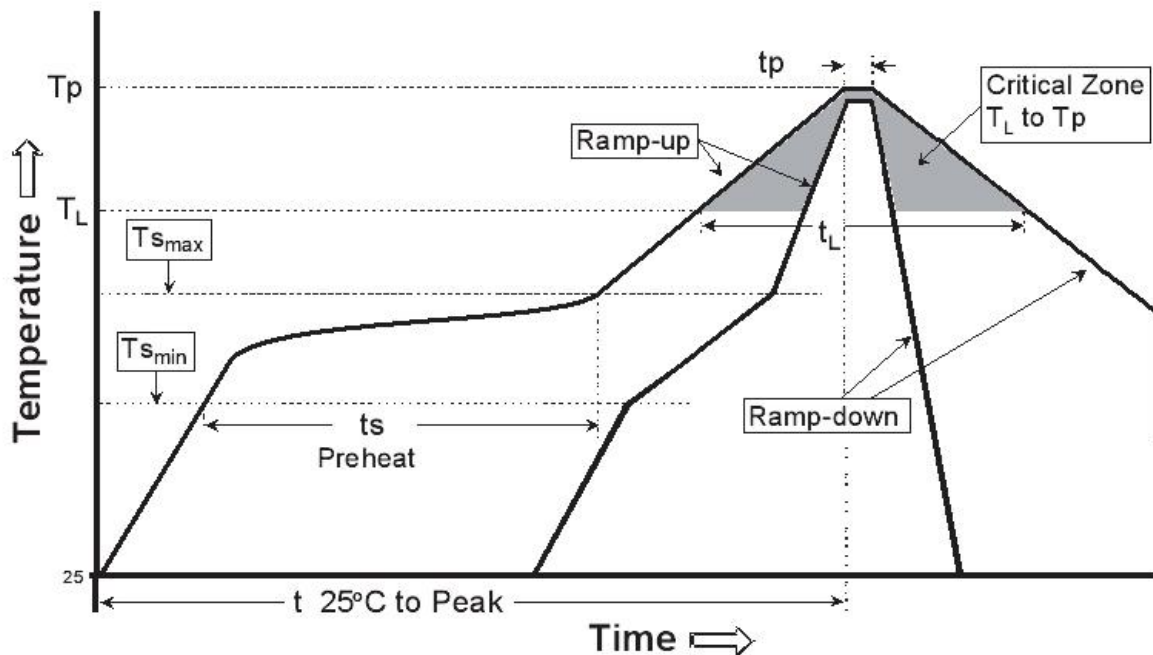


E1	1.600	1.800	0.063	0.071
k	0.200 MIN.		0.008 MIN.	
b	0.200	0.300	0.008	0.012
e	0.500 TYP.		0.020 TYP.	
L	0.324	0.476	0.013	0.019
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203 REF		0.008 REF	

Table 7.1 DFN3x3-10 Package outline

8. Reflow Profile

Follow: IPC/JEDEC J-STD-020 C



IPC-020c-5-1



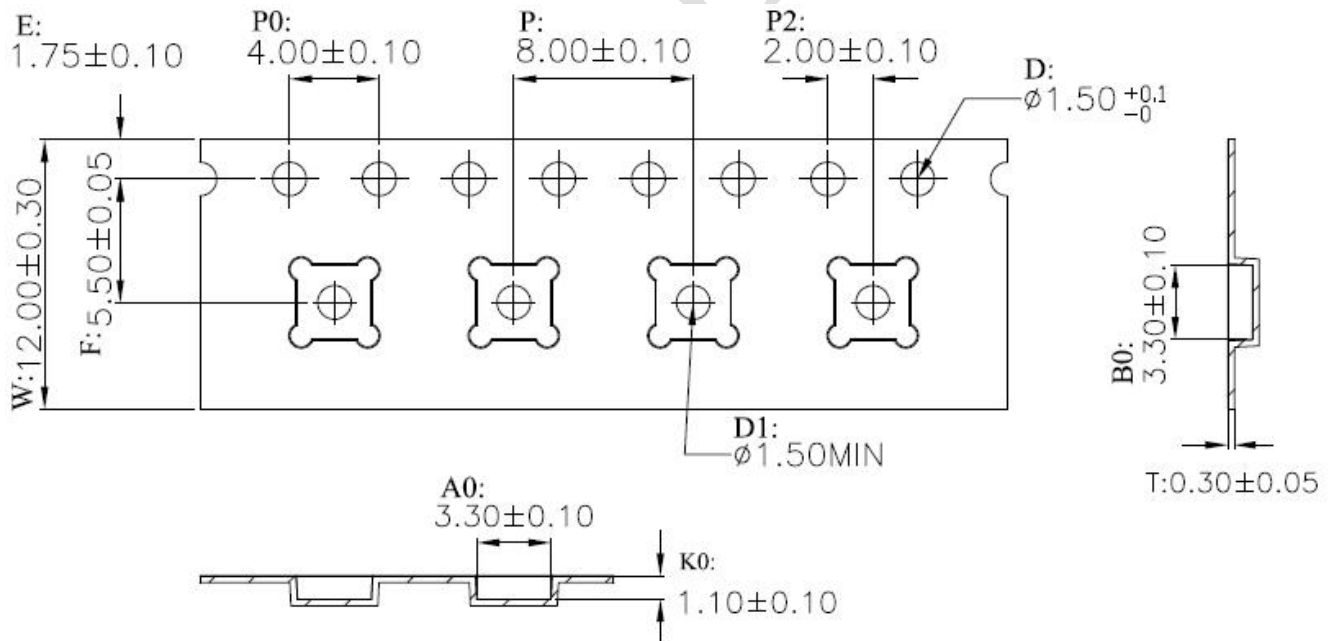
Table 5-2 Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-Up Rate ($T_{s_{max}}$ to T_p)	3 °C/second max.	3° C/second max.
Preheat - Temperature Min ($T_{s_{min}}$) - Temperature Max ($T_{s_{max}}$) - Time ($t_{s_{min}}$ to $t_{s_{max}}$)	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 (T_p)	See Table 4.1	See Table 4.2
Time within 5 °C of actual Peak Temperature (t_p)	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.

9. Tape and Reel Information

9.1 Tape information

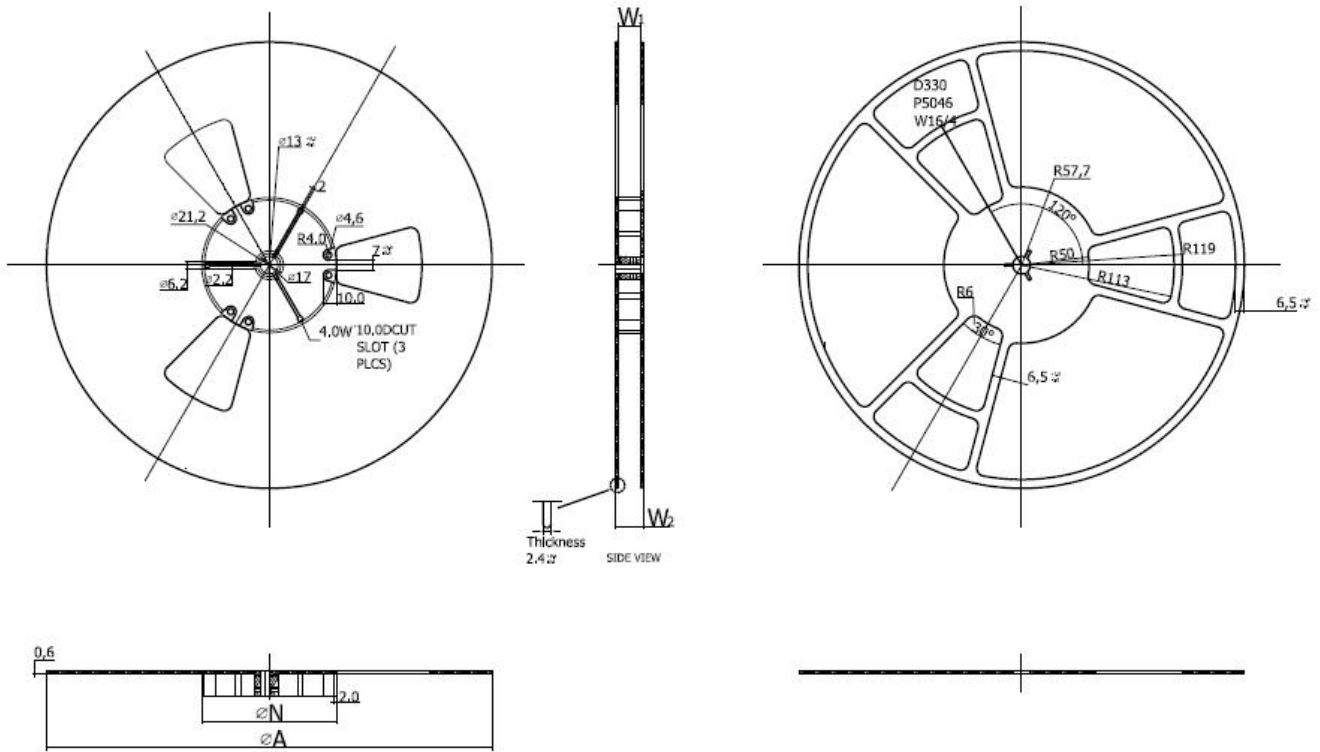


W	12.00 ± 0.30	mm
A0	3.30 ± 0.10	mm
B0	3.30 ± 0.10	mm



K0	1.10 ±0.10	mm
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9.2 Reel information



Package Type	Tape Width	ϕA	ϕN	W1	W2max
3x3x0.8mm DFN	12 mm	330 mm	100 mm	12.8 mm	18.2 mm