BLE 5 MODULE
DB809S
Product Manual

Version	Update Time	Editor
V1.00	2019-3-15	Alan Jiao
V1.10	2019-4-17	Jack Wang
V1.11	2019-4-22	Jack Wang
V1.12	2020-6-16	Allen.Hu
V1.13	2020-7-10	Joe .Zhou
V1.14	2020-8-17	Allen Hu

Contents

1. Product Introduction

1.1　Product Overview

　　DB809S is made by nRF52805 which is the baseline member of the nRF52 Series SoC family. It is built around an ARM® Cortex™-M4 CPU running at 64 MHz. It meets the challenge of bringing Bluetooth 5 feature sets and protocol concurrency to applications at a price point that makes adding Bluetooth 5 connectivity to an application compelling. It is an ideal candidate for less complex applications and also as a Bluetooth 5 connectivity processor in larger applications.

　　DB809S is SMD package，the rapid production of can be realized through the standard SMT equipment. It can give customers high reliability connection, especially suitable for automation, large-scale modern mode of production, low cost, convenient application in all kinds of Internet of things terminal hardware.
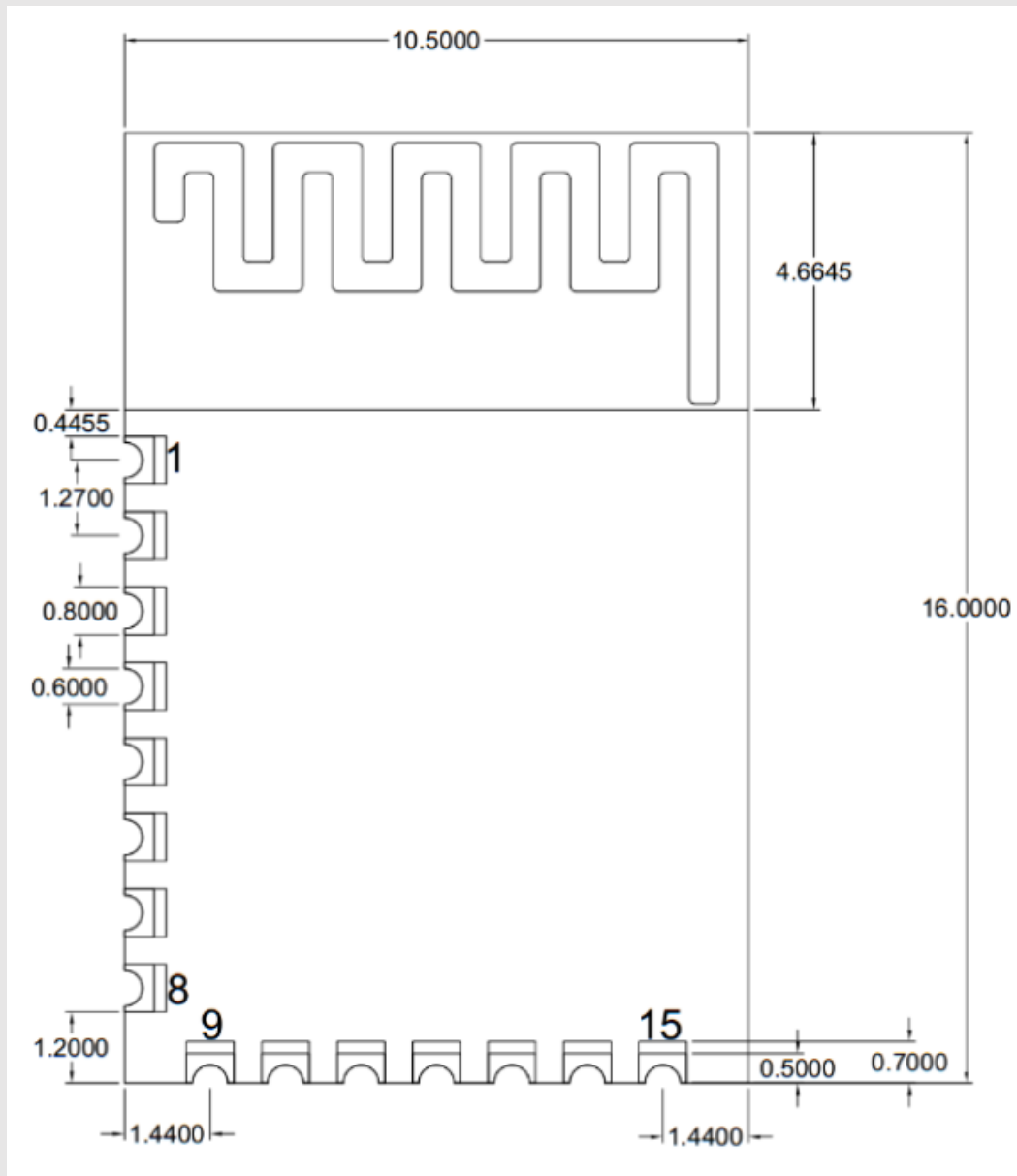
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2. Detail Param

2.1 Performance

Form 1:   Performance

Module	DB809S
Soc	nRF52805 WLCSP
FLASH	192KB
RAM	24KB
VDD	1.7V to 3.6V
PIN Num	15
Working FRQ	2402MHz-2480MHz (BLE)/2360MHz-2500MHz(nRF Private mode)
GPIO	10
ADC	12-bit, 200 kbps, 2 channels
PWM	4 Channels
PDM	1
TIMER/RTC	3 x 32bit(Count mode)/2
SPI/I2C/UART	1 (Master or Slave mode)/ 1 (Master or Slave mode)/1
AES	Hardware
RNG	1
Comparator	64 level* 2 Channels
Watch Dog	1
TX Power	-20 to +4 dbm, 4db steps
RF PHY	1Mbps, 2Mbps BLE mode/1M, 2Mbps Nordic nRF Private mode
Current (Chip reference)	TX：4.6 mA peak current (0 dBm) RX: 4.6 mA peak current 0.3uA (3V VDD) in System OFF mode, no RAM retention
Working Temperature	-40℃~85℃
Storage Temperature	22℃~28℃
Package Size	10.5*16*3mm

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2.2 Mechanical specifications

Picture 1 is the PCB mechanical specifications of the module.

Picture 1: PCB Mechanical Specifications

dimensions in millimeters

Form 2

Length	Width	PCB Height	PAD Size（Bottom）	PIN Gap
10.5mm	16mm	2.33mm	0.7mm*0.8mm	1.27mm

2.3 PIN Description

Form 3 Module PIN Description

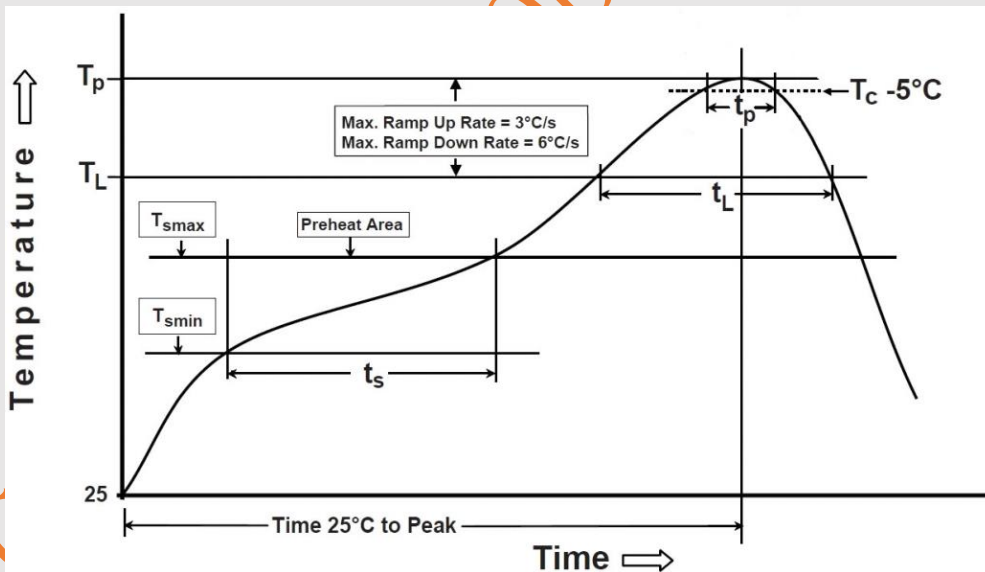| PIN	PIN On nRF52	Description
1	GND	GND
2	SWDIO	Serial wire debug I/O for debug and programming
3	SWCLK	Serial wire debug clock input for debug and programming
4	P0.21/NRESET	Digital I/O / Configurable as pin reset
5	P0.20	Digital I/O
6	P0.18	Digital I/O
7	P0.16	Digital I/O
8	P0.12	Digital I/O
9	P0.14	Digital I/O
10	P0.05/AIN3	Analog input /Digital I/O
11	P0.04/AIN2	Analog input /Digital I/O
12	P0.01/XL2	General purpose I/O Connection for 32.768 kHz crystal (LFXO)
13	P0.00/XL1	General purpose I/O Connection for 32.768 kHz crystal (LFXO)
14	VDD	1.7 V ~3.6V（Recommended voltage range）
15	GND	GND

Note：Input voltage higher then VCC will destroy the module.

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2.4   Soldering Reflow Guidelines

Form 4 and picture 2 are reflow conditions and profile.

Profile feature	Pb-free assembly
Preheat/soak	
Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200 °C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Ramp-up rate ($T_{L\ to}\ T_P$)	3 °C/ second max.
Liquidous temperature (T_L)	217 °C
Time (t_L) maintained above T_L	60-150 seconds
Peak package body temperature (T_p)	T_p must not exceed 260 °C
Time (t_p)* within 5 °C of the specified classification temperature (T_c), see *Figure 2 "Reflow profile"* on page 4.	30* seconds
Ramp-down rate (T_p to T_L)	6 °C/ second max.
Time 25 °C to peak temperature	8 minutes max.

Form4: Reflow conditions

Picture 2:   Reflow profile

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3. Attentions

1、This module contains CMOS devices, need be protected from ESD.

2、Module needs to connect GND well, to reduce parasitic inductance.

3、If module needs reflow, pay attention to reflow profile.

4、Area below the ANT of this module, should not use polygon.

5、ANT of this module should be far away from other circuit.

6、Module should be placed as far as possible away from the other low frequency circuits or digital circuits.

7、Module is plugged into a power supply for recommend the use of magnetic beads in isolation.

8、If there are other internal band wireless module in your product, frequency should be reasonable planning, take the shielding measures, such as reduce the influence of harmonic interference and intermodulation interference.

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4. Sales And Service Network

4.1   Headquarter

Shenzhen Headquarter

Add ：Rm.1502,FIYTA Tech Building,#002 No.1 SouthernRd,Hi-Tech,Nanshan District,Shenzhen 518057,P.R.China

Tel ： 86-755-86018818

Fax ： 86-755-86018808

4.2   North China

Beijing Office

Add ： Room1006,QuantumPlaza,No.23ZhiChunRoad,HaiDianDistrict,Beijing

Tel ： 86-10-82358601/2/3/4

Fax ： 86-10-82358605

4.3   East China

Shanghai Office

Add :Rm.2005,MingshenCenterBuilding,No.3131,KaixuanRoad,XuhuiDistrict,Shanghai200030,P.R.China

Tel ： 86-21-54071701

Fax ： 86-21-54071702

4.4   Southwest China

Chengdu Office

Add ：Room1402,Bldg#2,ShuduCenter,No.138,TianfuNo.2Street,MidSection,TianfuAvenue,High-TechDistrict,ChengduCity

Tel ： 86-28-85355251

Fax ： 86-28-85350890

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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 or more 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 radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your 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.

The device has been evaluated to meet general RF exposure requirement. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.