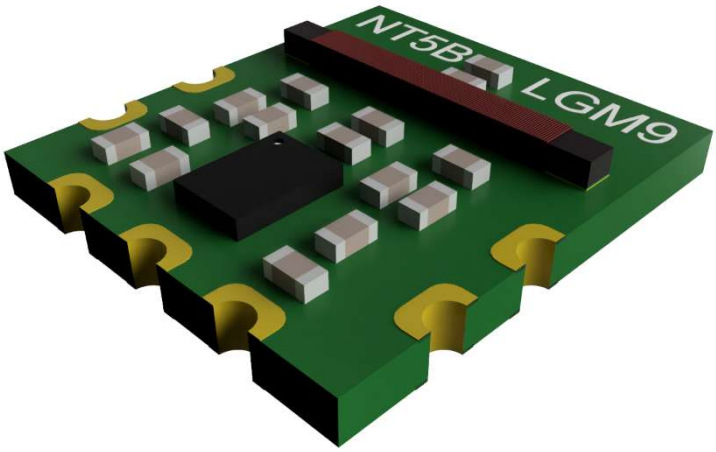

NT5B_LGM9 ver. 1.0

Miniature NFC Module
Datasheet

Ver. 1.2
10/2025

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Contents

1 Introduction

The NT5B_LGM9 is a miniature NFC module integrating an NXP NTA5332 (NTAG 5 Boost) chip and a built-in coil antenna in an ultra-compact SMT form factor. It is designed to enable secure, high-performance NFC connectivity in space-constrained applications such as IoT devices, consumer electronics and industrial products.

The module supports ISO/IEC 15693 and NFC Forum Type 5 Tag standards and features Active Load Modulation (ALM) for an extended read range with its compact antenna. It offers 2048 bytes of EEPROM, 256 bytes of SRAM for fast data transfer, and AES-128 mutual authentication for robust security.

The NT5B_LGM9 operates as I²C slave device. Additional features include configurable GPIOs, event detection and support for low-power modes for battery-powered designs.

With its small dimensions (11.43 mm x 10.16 mm x 1.83 mm) and easy surface-mount integration, the NT5B_LGM9 provides an ideal solution for applications requiring secure NFC connectivity, low power consumption, and minimal PCB footprint.

2 Technical specifications

Table 1: Technical specification

NFC interface:	ISO/IEC 15693 and NFC Forum Type 5 Tag compliant
User Memory (EEPROM)	2048 Bytes
Bit rate from reader to tag	Max. 26 kbps
Bit rate from tag to reader	Max. 53 kbps
Communication Interface:	I2C standard (100 kHz) and fast (400 kHz) mode
Digital I/O:	2 x GPIOs as multiplexed I2C lines 1 x Event detection pin
Security:	Optional 64-bit password protection from NFC perspective 128-bit AES authentication ECC-based reprogrammable originality signature
Power Supply:	1.62 ÷ 3.6 V
Power Consumption:	max. 60 mA at 3.3V
Operating Temperature:	-20 °C to +85 °C
Package Type:	7 pin surface mount package SMT compatible
Dimensions:	11.43mm L x 10.16mm W x 1.83mm H

3 Pin Designation

The module features seven castellated edge pins for straightforward surface-mount assembly (SMT) onto a host PCB. Its compact design with an integrated antenna minimizes board space requirements while ensuring reliable NFC performance. The figure below provides a top view of the module with numbered pin assignments for easy reference.

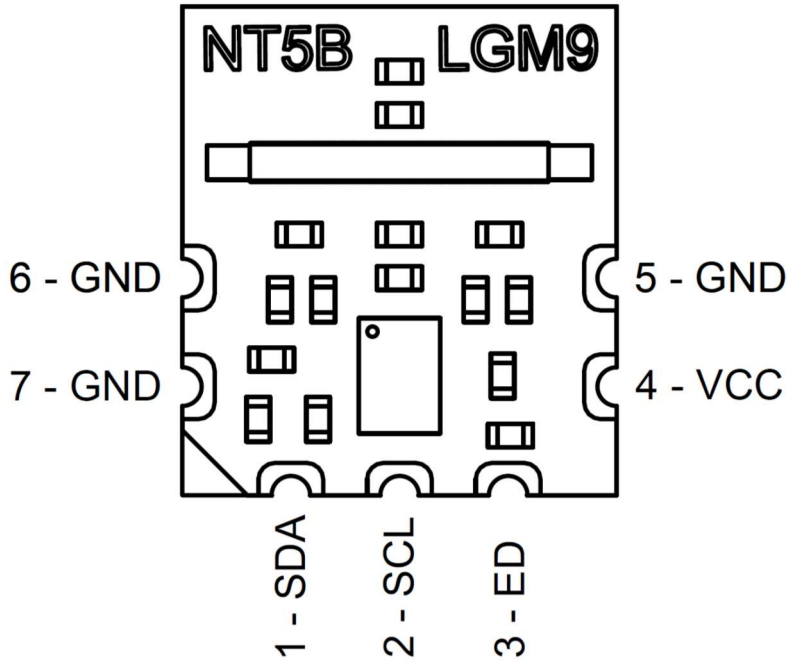

Figure 1: NT5B_LGM9 module top view

Table 2: Pin descriptions

Pin Number	Pin Name	Description	Notes
1	SDA/GPIO1/PWM1	Multiplexed serial data I2C, GPIO1 and PWM1	10 kOhm internal pull-up
2	SCL/GPIO0/PWM0	Multiplexed serial clock I2C, GPIO0 and PWM0	10 kOhm internal pull-up
3	ED/PWM0	Multiplexed event detection and PWM0	10 kOhm internal pull-up
4	VCC	Power supply	
5	GND	Ground supply	
6	GND	Ground supply	
7	GND	Ground supply	

4 Electrical Specifications

Table 3: Absolute Maximum Ratings

Parameter	Min.	Max.	Unit	Conditions
Supply voltage VCC	-0.5	7.15	V	
Input voltage (SDA, SCL, ED)	-0.5	7.15	V	
V_{ESD}	-2	2	kV	
Storage temperature	-65	150	ºC	

Table 4: Operating Conditions

Parameter	Min.	Typ.	Max.	Unit	Conditions
Supply	1.62		3.6	V	
Temperature	-20		85	ºC	

Table 5: Supply Current Specifications

Parameter	Max.	Unit	Conditions
Active mode	60	mA	VCC = 3.3 V
Idle mode	750	uA	
Standby mode	40	uA	

Table 6: NFC Specifications

Parameter	Min.	Typ.	Max.	Unit	Conditions
Input frequency	13.553	13.56	13.567	MHz	ISO/IEC 15693

Table 7: Digital Interface Specification

Parameter	Min.	Max.	Unit	Conditions
General Purpose I/O – Inputs Parameters				
V_{IL}		0.3*VCC	V	
V_{IH}	0.7*VCC		V	

5 Mechanical Specifications

The drawings below show the typical dimensions of the NT5B_LGM9 module. All dimensions are in millimetres (mm).

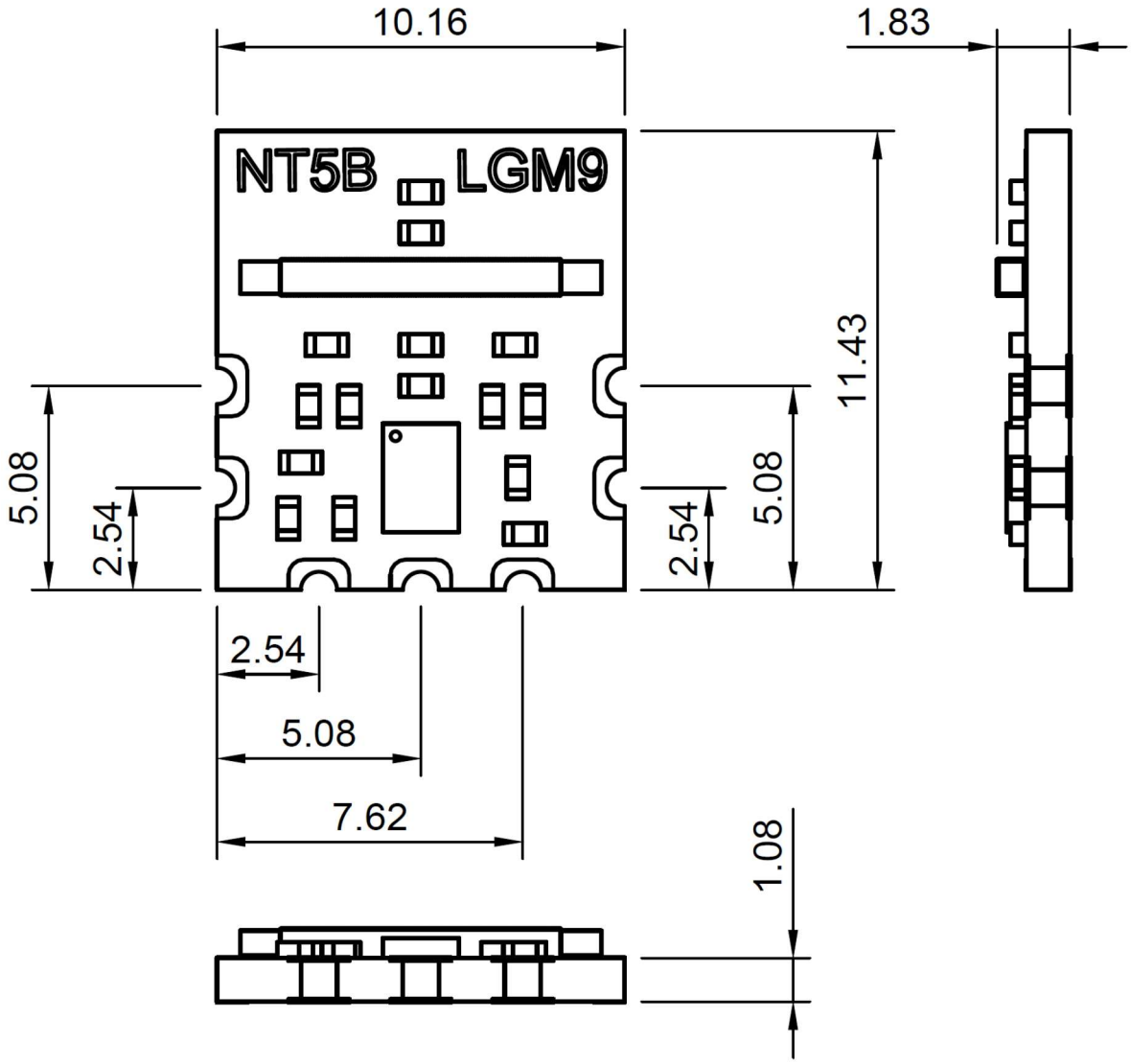

Figure 2: NT5B_LGM9 dimensions (top and side views)

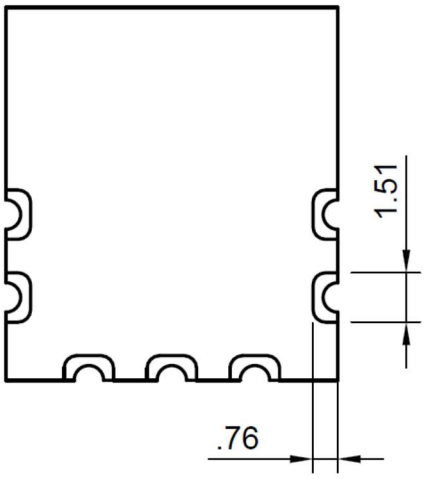

Figure 3: NT5B_LGM9 dimensions (bottom view)

5.1 Recommended footprint

The illustration below shows the recommended host board footprint. All dimensions are in millimetres (mm).

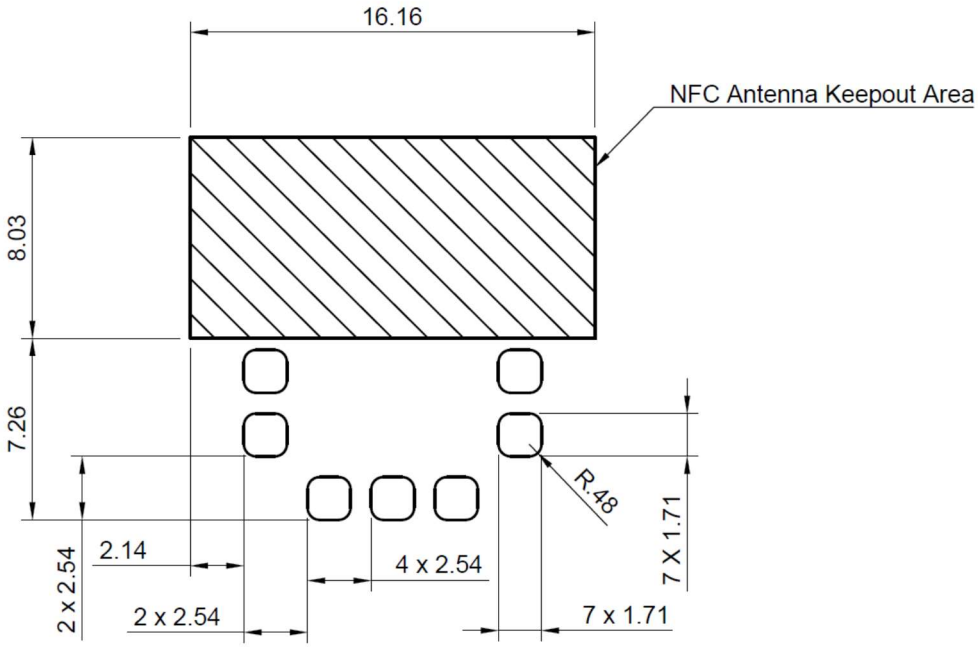

Figure 4: NT5B_LGM9 recommended footprint

6 Module connections

An example of the NT5B_LGM9 module connections for an embedded application is shown in Figure 5.

Required connections:

- VCC and GND supply power to the NT5B_LGM9 module.
- SDA and SCL provide I²C host communication for module control.
- ED can be used as an event detection output to trigger an external device (e.g., a microcontroller).

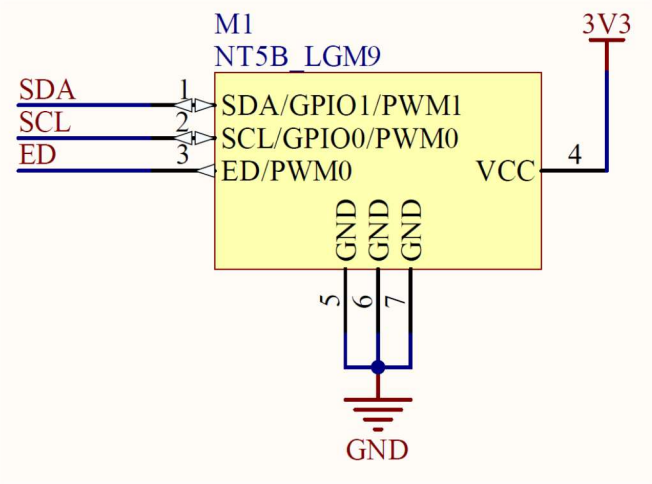

Figure 5: Default NT5B_LGM9 connections

7 Example measurements

Measurements were performed using NFC-enabled mobile phones, including the Samsung Galaxy S23 Ultra, Samsung Galaxy A16 5G, and Apple iPhone 16 Pro. The red mark indicates the exact point above which the measurement was taken.

Samsung Galaxy S23 Ultra | Samsung Galaxy A16 5G | Apple iPhone 16 Pro

Figure 6: NFC-enabled mobile phones

The table below presents the measured communication distances between NFC-enabled mobile phones and the NT5B_LGM9 module. For these measurements, the module was powered by a 3.3V power source directly through the VCC (#4) and GND (#5) pins, without being mounted on a host PCB.

Table 8: Measurement results

Mobile phone model	Communication distance
Samsung Galaxy S23 Ultra	55 mm
Samsung Galaxy A16 5G	30 mm
Apple iPhone 16 Pro	45 mm

The communication distance measurements were taken on the second tap, as the phone's embedded NFC controller uses the Low Power Card Detect (LPCD) feature. This feature identifies nearby NFC tags by monitoring changes in the reader antenna's impedance. Because of the compact size of the NT5B_LGM9 module, its influence on the reader antenna is minimal. We expect the detection distance to increase once the module is integrated into the final application together with the complete electronic system.

8 References

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9 Revision History

Version	Date	Description
1.0	22.08.2025	Initial version
1.1	30.09.2025	Grammar corrections and practical measurement results added.
1.2	01.10.2025	DC characteristics specified, reference document added

Disposal of the product

Do not dispose the product in municipal or household waste. Please check your local regulations for proper disposal and/or recycling of electronic products.