

## APPROVAL SHEET

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| Smart Approach P/N  | SN-NSVG7-C01 |
| Product Description | RFID Module  |

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# Macaron N Series

SN-NSVG7-C01

NFC Controller Module

Datasheet Version 1.2

Smart Your Life, Approach Your Heart.



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## Revision History

This section describes the changes that were implemented in this document. The changes are listed by revision, starting with the most current publication.

### Revision 1.0

Revision 1.0 of this datasheet was published in Apr. 2023. This was the first publication of the document.

### Revision 1.1

Revision 1.1 of this datasheet was published in Jun. 2023. This was added suspend mode for FW version (FW Version : V1.04).

### Revision 1.2

Revision 1.2 of this datasheet was published in Sep. 2023. Add a description of the supported card types.

## 1 Introduction

This document consists of descriptions and specifications for both functional and physical aspects of the SN-NSVG7-C01 PC/SC smart card reader module.

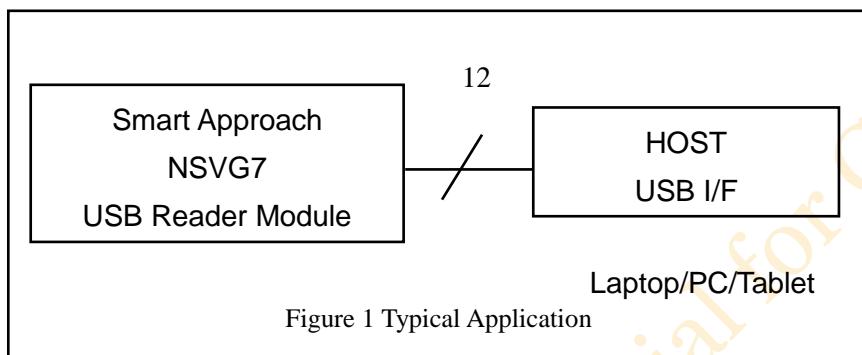
The SN-NSVG7-C01 embeds a USB device interface that enumerates as CCID class. This Class allows SN-NSVG7-C01 be recognized and the driver automatically installed by the host computer, if this CCID driver is available.

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## 2 Product Overview

SN-NSVG7-C01 is highly integrated transceiver module for contactless reader/writer communication at 13.56MHz.

The following illustration shows a high-level, generic view of a SN-NSVG7-C01 application.



### 2.1 Features

This section Tables key aspects of the SN-NSVG7-C01 module functionality and design that distinguish it from similar products:

- NXP NFC Controller
- NFC tag support (type 2, type 3, type 4A and type 4B, type5)
- Compliant with ISO/IEC 14443 A/B
- MIFARE classic card
- Compliant with ISO/IEC 15693/18092
- Sony Felica
- Antenna pairing could be customized
- USB interface

\*All card types and it's protocol shall follow NXP's and NFC forum recommendation.

The verified cards are as follows. Other cards that comply with the protocol shall be subject to actual measurement by the host.

- NXP Mifare Ultralight
- Sony Felica Lite
- NXP DESFire EV1 4K
- NXP ICOED SLIX2
- Tag-it PRO 256

## 2.2 Application

Suggested applications for the SN-NSVG7-C01 module include:

- NFC writer
- NFC reader
- NFC identification

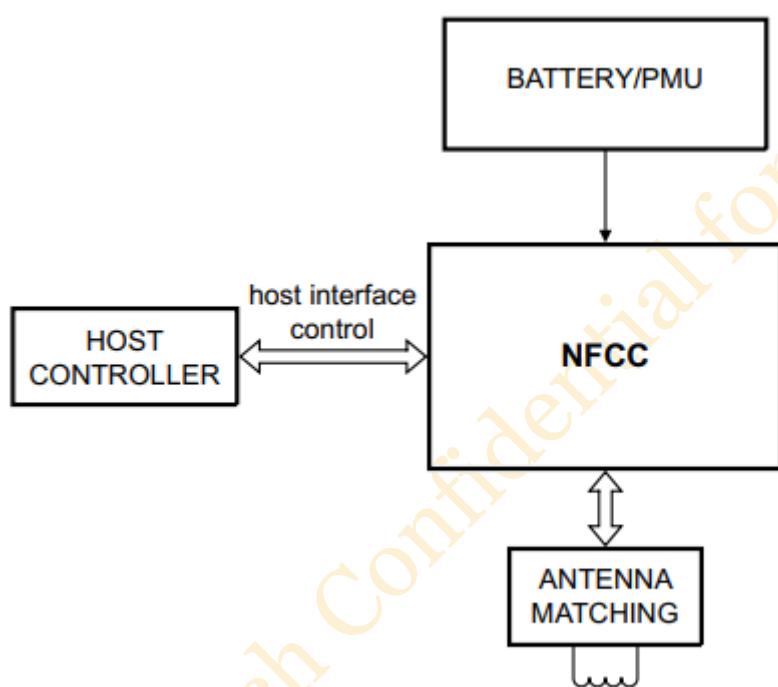


Figure 2 Typical Application II

SN-NSVG7-C01 can be connected on a host controller through USB interfaces. The protocol between the host controller and SN-NSVG7-C01 on top of this physical link is the CCID protocol. Moreover, SN-NSVG7-C01 provides flexible and integrated power management unit in order to preserve energy supporting Powered by the Field.

### 3 Functional Descriptions

This section provides detailed information about how SN-NSVG7-C01 module works, what configurations and operational features are available.

The following illustration shows the primary functional blocks of SN-NSVG7-C01 module.

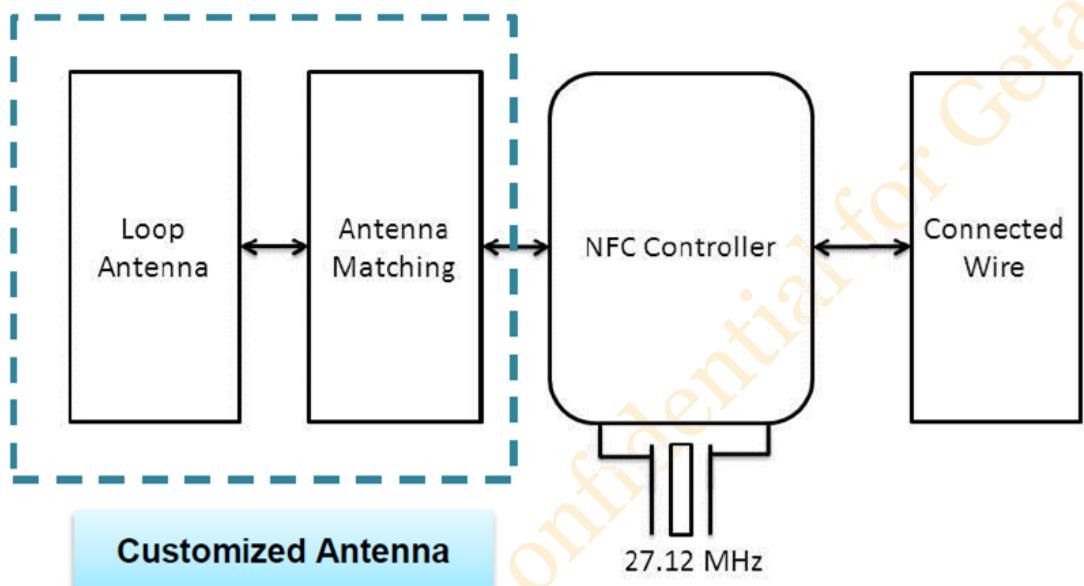


Figure 3 Module Block Diagram

## 4 Electrical Specifications

This section provides the DC characteristics, AC characteristics, recommended operating conditions.

### 4.1 Pin Description

The following Table shows the pin description for SN-NSVG7-C01 module.

The connection ground is internally connected and should be connected to GND on the main board as well.

Table 1 Module Pin Description

| PIN No. | Name             | Description                        | Power Reference | P/I/O |
|---------|------------------|------------------------------------|-----------------|-------|
| 1       | V <sub>BAT</sub> | Pad Supply Voltage                 | 5V              | P     |
| 2       | V <sub>BAT</sub> | Pad Supply Voltage                 | 5V              | P     |
| 3       | DM               | USB D-                             | -               | I/O   |
| 4       | DP               | USB D+                             | -               | I/O   |
| 5       | MOD_GND          | Module Ground                      | GND             | P     |
| 6       | MOD_GND          | Module Ground                      | GND             | P     |
| 7       | MOD_GND          | Module Ground                      | GND             | P     |
| 8       | PWRON            | NFC Module Power Switch            | 3.3V/0V         | I     |
| 9       | FLASHON          | Default H (Fireware Download Mode) | 3.3V/0V         | I     |
| 10      | ID Select        | Module Ground                      | GND             | P     |
| 11      | Non              | Unused pin could be floating       | -               | -     |
| 12      | Non              | Unused pin could be floating       | -               | -     |

## 4.2 Temperature Maximum Ratings

Thermal specifications for this module have been modeled using a two-layer test board.

Table 2 Temperature Maximum Ratings

| Symbol         | Definition            | Value |     | Units |
|----------------|-----------------------|-------|-----|-------|
|                |                       | Min   | Max |       |
| T              | Operating Temperature | -32   | 63  | °C    |
| T <sub>s</sub> | Storage Temperature   | -40   | 100 | °C    |

## 4.3 DC Electrical Parameters

DC Electrical specifications for this module have been modeled using a two-layer test board.

Table 3 DC Electrical Specification

| Symbol            | Definition         | Value |     |      | Units | Note |
|-------------------|--------------------|-------|-----|------|-------|------|
|                   |                    | Min   | Typ | Max  |       |      |
| P <sub>VDD</sub>  | Pad Supply Voltage | 4.85  | 5   | 5.15 | Volts |      |
| I <sub>VBAT</sub> | DC Current         | 13    | 15  | 19   | mA    | (1)  |

**Note:**

- (1). Continuous polling average current consumption at 5V (FW Version : V1.04).
- (2). Polling time (FW Version : V1.04)
  - A. Suspend mode : 600ms
  - B. Run mode : 300ms



# Thank you

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## Installation Guidance

### RFID Module

FCC ID: QYLSNNSVG7C01B, IC ID: 10301A-SNNSVG7C01B

- Colocation with other transmitter modules will be addressed through filings for those co-located transmitters when necessary or that colocation of other transmitters will be according to applicable KDB guidelines including those for RF exposure
- The final system integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter
- Appropriate labels must be affixed to the product that complies with applicable regulations in all respects. The regulatory label on the final system must include the statement: "Contains FCC ID: QYLSNNSVG7C01B and/or IC: 10301A-SNNSVG7C01B".
- A user's manual or instruction manual must be included with the product that contains the text as required by applicable law shall be provided to the Host manufacturer integrators. They may include:

### 1. USA—Federal Communications Commission (FCC)

#### FCC COMPLIANCE STATEMENT:

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.

#### INFORMATION TO USER:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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. If not installed and used in accordance with the instructions, it 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 tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the distance between the equipment and the receiver.
- Connect the equipment to outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**FCC Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

The final host manual shall include the following regulatory statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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. If not installed and used in accordance with the instructions, it 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 tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna

- Increase the distance between the equipment and the receiver.
- Connect the equipment to outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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.

## 2. Canada - Industry Canada (IC)

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

French:

Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes: (1) il ne doit pas produire de brouillage et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

### FCC Rule parts 15.225

The modular transmitter is only FCC authorized for the specific rule parts 15.225 listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

The modular transmitter does not have its own RF shielding, and was tested inside a specific platform (FCC model:B360, B360 Pro, B360G3, B360 ProG3, B360Y (Y= 10 characters, Y can be 0-9, a-z, A-Z, "-", "\_" or blank for marketing purpose and no impact safety related critical components and constructions.; Brand: Getac)

(IC model:B360, B360 Pro, B360G3, B360 ProG3; Brand: Getac)

### The Antenna information

| Antenna     | Antenna Manufacturer | Antenna Model No. | Antenna Type |
|-------------|----------------------|-------------------|--------------|
| NFC Antenna | Smart Approach       | SR-RGB36-001      | Loop Antenna |

Information on test modes and additional testing requirements, this transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification. Additional testing, Part 15 Subpart B disclaimer This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable. As long as all conditions above are met, further transmitter test will not be required. **IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the Host manufacturer/integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization. **Manual Information To the End User** The Host manufacturer/integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's

manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual. Host manufacturer responsibilities Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment FOR PORTABLE DEVICE USAGE Radiation Exposure Statement: The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

#### **Information on test modes and additional testing requirements**

This module does not contain shielding, and each host integration is required to comply with a Class II Permissive Change. In addition to RF exposure evaluation based on the exposure conditions and the co-located transmitters, RF/EMC evaluation needs to be performed as detailed in the table below.

|  | FCC Rule Part       | EUT Tx configuration     |
|--|---------------------|--------------------------|
| AC Conducted Emission                  | 15.207              | NFC Link with AC Adapter |
| Field strength of Fundamental Emission | 15.225(a)(b)(c)     | NFC Link                 |
| Radiated Spurious Emission             | 15.255(d)<br>15.209 | NFC Link                 |

#### **How to make changes**

Only Grantees are permitted to make permissive changes. Please contact us if the host integrator expects the module to be used differently than as granted:

Company Name: Getac Technology Corporation.

Company Address: 5F., Building A, No. 209, Sec.1, Nangang Rd., Nangang Dist., Taipei City 115018, Taiwan, R.O.C.

Tel. no.: +886-2-2785-7888