



# NVIDIA NB106-N NGFF WWAN MODULE SUMMARY DATASHEET

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**Datasheet**



## DOCUMENT CHANGE HISTORY

DS028

Version	Date	Authors	Description of Change
1.0	24 Mar 2014	shixiangc	Initial release
1.1	25 Mar 2014	shixiangc	New photo with IC number for Figure 3
1.2	13 Apr 2014	shixiangc	New photo for Figure 3, re-wording Section 1.2.2, and added Appendix on test antenna
1.3	29 Apr 2014	shixiangc	New photo for Figure 2, new introduction and new gain figures in Appendix on test antenna

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# 1.0 NVIDIA NB106-N NGFF WWAN MODULE

NVIDIA NB106-N NGFF WWAN module is a 2G/3G/4G mobile broadband data-only module. It is primarily designed for North and Latin America, but can also be used in other parts of the world. It is in PCIe M.2 form factor and will be powered by batteries.

## 1.1 GENERAL FEATURES

- ▶ LTE FDD : Band 2/4/5/7/17
- ▶ DC-HSPA+/HSPA+/HSPA/UMTS: Band 1/2/4/5
- ▶ GSM/GPRS/EDGE: 1900/1800/900/850 MHz
- ▶ LTE DL 2\*2 MIMO
- ▶ Receive diversity in all DC-HSPA+/HSPA+/LTE bands
- ▶ Transmit Power:
  - LTE: +23dBm (3GPP TS 36.101 R8 Power Class 3)
  - DC-HSPA+/HSPA+: +23dBm (3GPP TS 34.121 Power Class 3)
  - EDGE 900M/850MHz: +26dBm (3GPP TS 45.005 Power Class E2)
  - EDGE 1900MHz/1800MHz: +25dBm (3GPP TS 45.005 Power Class E2)
  - GSM/GPRS 900M/850MHz: +32dBm (3GPP TS 45.005 Power Class 4)
  - GSM/GPRS 1900MHz/1800MHz: +29dBm (3GPP TS 45.005 Power Class 1)
- ▶ AT commands:
  - 3GPP TS 27.007 and 27.005
  - NVIDIA proprietary AT commands
- ▶ Power supply:

- 3.2 V to 4.6V
- ▶ Temperature range:
  - 10°C to 55°C
- ▶ Dimensions:
  - PCIe M.2 Type 3042 form factor
  - 42 mm x 30 mm x 2.3 mm

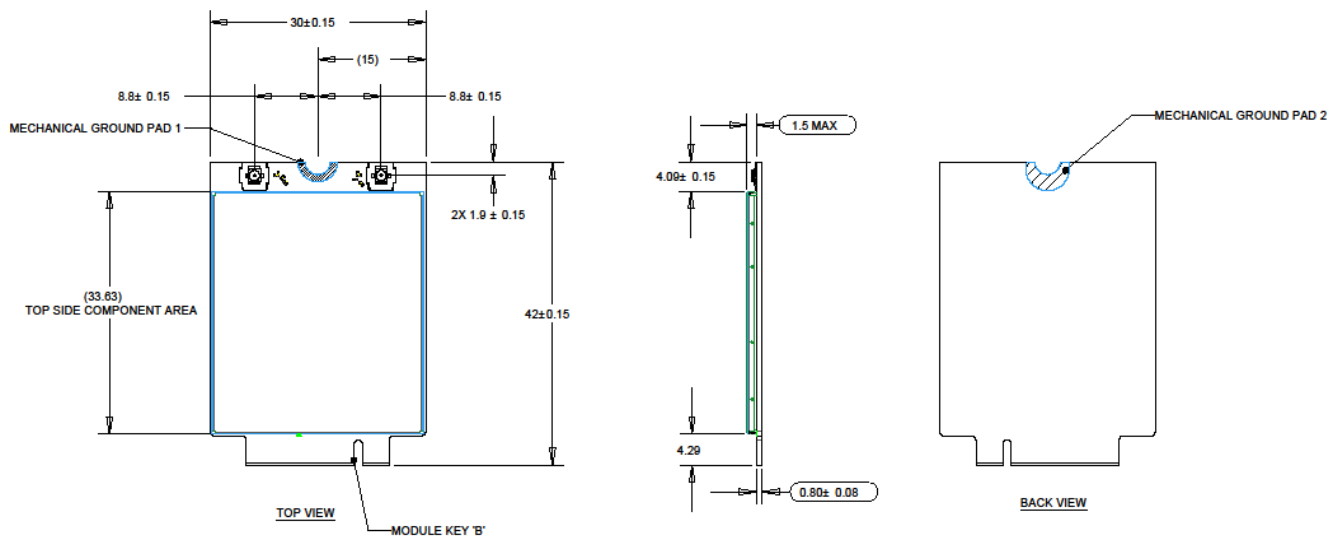


Figure 1: Module mechanical drawing based on PCIe M.2 Type 3042 specification

- ▶ Weight: 6g
- ▶ USB driver:
  - CDC-ACM
  - CDC-NCM
  - MBIM
- ▶ Data Features:
  - LTE UL (50 Mbps)/DL (100 Mbps) (CAT3)
  - DC-HSPA+ :UL (5.76 Mbps)/DL (42 Mbps)
  - HSPA+ :UL (5.76 Mbps)/DL (21 Mbps)
  - WCDMA PS: UL (384 kbps)/ DL (384 kbps)
  - EDGE: UL (236.8 kbps)/ DL (236.8 kbps)
  - GPRS: UL (85.6 kbps)/ DL (85.6 kbps)

- ▶ SMS
  - MO / MT PDU mode
- ▶ Location based services
  - eCID
  - SUPL2.0 (requires 3rd party SW & HW platform integration)
- ▶ Additional features
  - SAR sensor: 2 proximity sensors are supported for PA power backoff
  - SIM hot-plug
- ▶ Interface
  - PCIe M.2 75 pins
  - HSIC or USB data interface
  - 2 Antenna ports (main and diversity):
    - 50 Ohm low profile standard MHF4 coaxial connectors per PCIe M.2 spec
  - SIM card interface (1.8/3.0V) plus SIM detect signal line
  - SAR GPIO
  - OC (over current notification)
  - I2S for audio
  - GPIOs
  - Power supply
  - Reset
- ▶ Approval and Certifications
  - FCC
  - Industry Canada
  - PTCRB
  - RoHS Compliant

## 1.2 STATEMENTS

### 1.2.1 Federal Communications Commission (FCC) Statements

#### **Federal Communications Commission (FCC) Statements:**

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 any interference that may cause undesired operation of the device.

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.

**FCC Warning:** The FCC requires that you be notified that any changes or modifications to this device not expressly approved by the manufacturer could void the user's authority to operate the equipment.

#### **RF Radiation Exposure Statement:**

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Only those antennas with same type and lesser gain filed under this FCC ID number can be used with this device.

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 module.

**Required end product labeling:**

Any device incorporating this module must include an external, visible, permanent marking or label which states: “Contains FCC ID: VOB-E1729.”

## 1.2.2 Industry Canada (IC) Statements

**Industry Canada (IC) Statements:**

This device complies with Industry Canada license-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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

**RF Radiation Exposure Statement:**

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

**Déclaration d'exposition aux radiations:**

Cet appareil est conforme aux limites d'exposition aux rayonnements définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 centimètres entre le radiateur et votre corps.

**Required end product labeling:**

Any device incorporating this module must include an external, visible, permanent marking or label which states: “Contains IC:7361A-E1729.”



## 1.3 PRODUCT IMAGES



Figure 2: NVIDIA NB106-N module top view



Figure 3: NVIDIA NB106-N module bottom view

## Appendix A: Antenna Used in NB106-N WWAN Module FCC and IC Tests

NB106-N WWAN module does not have its own transmitting antenna. Transmitting power is delivered to the connector of the main antenna. In the tests on NB106-N NGFF WWAN module for FCC and IC certification, a dipole antenna is used and connected to the main antenna connector.

The antenna gains listed in the following table are the maximum permissible ones that comply with ERP/EIRP and MPE Limit.

<b>2G/3G Operation Band</b>	Cellular	PCS Band	3G Band 2	3G Band 4	3G Band 5
<b>Frequency (MHz)</b>	824 - 849	1850 - 1910	1850 - 1910	1712.4 - 1752.6	824 - 850MHz
<b>Antenna Gain (dBi)</b>	5.95	4.51	10.30	6.56	12.60
<b>LTE Operation Band</b>	Band 2	Band 4	Band 5	Band 7	Band 17
<b>Frequency (MHz)</b>	1850 - 1910	1,710 - 1,755	824 - 849	2,500 - 2,570	704 - 716
<b>Antenna Gain (dBi)</b>	8.25	5.78	9.51	9.25	10.90

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