NVIDIA NB106-N NGFF WWAN MODULE SUMMARY DATASHEET

DS028 | April 13, 2014
NVIDIA CONFIDENTIAL | Prepared and Provided Under NDA

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

TABLE OF CONTENTS

1.0 NVIDIA NB106-N NGFF WWAN MODULE 4
1.1 General features 4
1.2 Statements 7
1.2.1 Federal Communications Commission (FCC) Statements 7
1.2.2 Industry Canada (IC) Statements 8
1.3 Product images 9

APPENDIX A: ANTENNA USED IN NB106-N WWAN MODULE FCC AND IC TESTS 10

LIST OF FIGURES

Figure 1**:** Module mechanical drawing based on PCIe M.2 Type 3042 specification 5

Figure 2: NVIDIA NB106-N module top view 9

Figure 3: NVIDIA NB106-N module bottom view 9

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

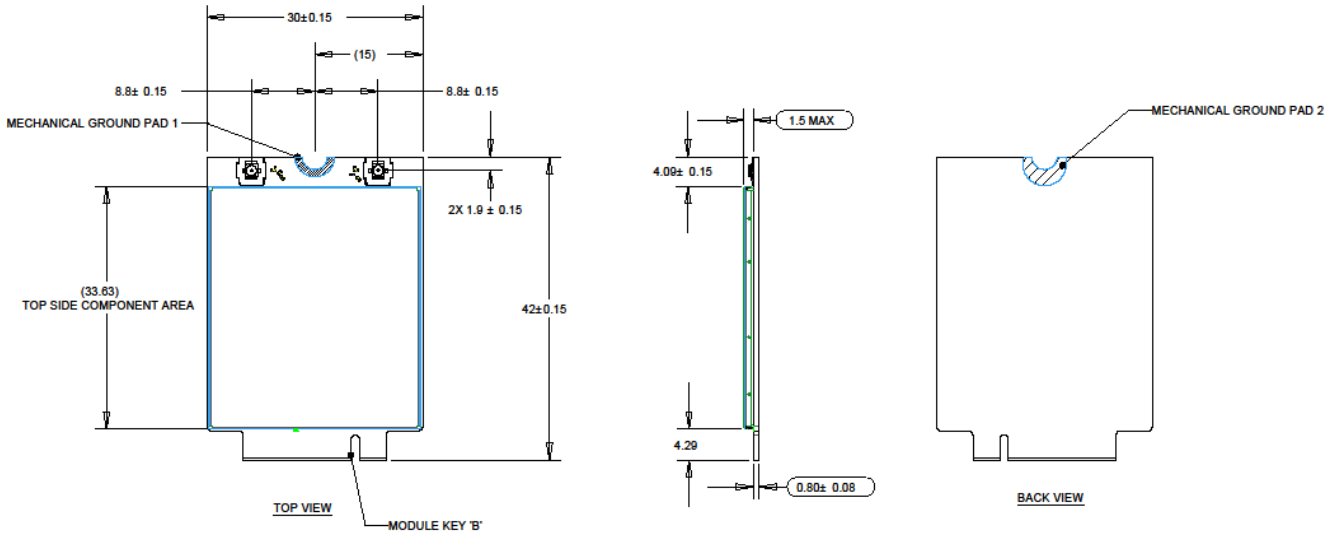

Figure 1: Module mechanical drawing based on PCIe M.2 Type 3042 specification

- 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.

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

Notice

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS, AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY, OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE.

Information furnished is believed to be accurate and reliable. However, NVIDIA Corporation assumes no responsibility for the consequences of use of such information or for any infringement of patents or other rights of third parties that may result from its use. No license is granted by implication of otherwise under any patent rights of NVIDIA Corporation. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all other information previously supplied. NVIDIA Corporation products are not authorized as critical components in life support devices or systems without express written approval of NVIDIA Corporation.

ROVI Compliance Statement

NVIDIA Products that are ROVI-enabled can only be sold or distributed to buyers with a valid and existing authorization from ROVI to purchase and incorporate the device into buyer's products.

This device is protected by U.S. patent numbers 6,516,132; 5,583,936; 6,836,549; 7,050,698; and 7,492,896 and other intellectual property rights. The use of ROVI Corporation's copy protection technology in the device must be authorized by ROVI Corporation and is intended for home and other limited pay-per-view uses only, unless otherwise authorized in writing by ROVI Corporation. Reverse engineering or disassembly is prohibited.

Trademarks

NVIDIA and the NVIDIA logo are trademarks or registered trademarks of NVIDIA Corporation in the U.S. and other countries. Other company and product names may be trademarks of the respective companies with which they are associated.

Icera, the Icera logo, Deep Execution, Adaptive Wireless, IceClear, IceLink and DXP are trademarks and/or registered trademarks of Icera Inc in the U.S. and other countries.

Copyright

© 2014 NVIDIA Corporation. All rights reserved.