



NOVATEL WIRELESS

Novatel Wireless, Inc. PCI Express Mini-card

Installation Guidelines – Expedite E362

Version 3.1

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Document Revision History

Rev.	Date	Brief Description of Change	Originator	Approved by
1.0	September 29, 2010	Initial Draft	Todd Gallagher	
2.0	October 26, 2010	Updates based on TCB review.	Todd Gallagher	
3.0	February 15, 2011	Updates based on FCC recommendations following KDB pub 616217 Supplemental	Todd Gallagher	
3.1	February 24, 2011	Additional updates to antenna gain tables. Added new information relating to the collocation of transmitting antennas.	Todd Gallagher	

E362 Module Installation and Collocation Guidelines for Host Devices

1.0 Introduction

This document provides module and antenna installation guidelines for notebook computers to be authorized for use with the E362 module through a FCC Class I or Class II Permissive Change process. As the grantee Novatel Wireless is responsible for all integrations and must be consulted on all regulatory matters involving the E362.

The module was originally granted by the FCC as a mobile device with respect to RF Exposure compliance. This document outlines what RF Exposure considerations are required when integrating the E362 into a laptop type device.

The following installation host configurations are addressed in this document.

- 1) The E362 module can be installed as a standalone transmitter in notebooks meeting the following conditions:
 - a. Mobile notebooks where $>20\text{cm}$ separation distance is provided between the E362 transmitting antenna and the end user. The technical parameters for mobile measurements are defined in Section 2.1.
 - b. Portable notebooks where $\leq 20\text{cm}$ separation distance is provided between the E362 transmitting antenna that meet the technical parameters defined in Section 3.0. Devices require SAR evaluation and consultation by the grantee (Novatel Wireless) is required.
- 2) Collocated transmitters that can operate simultaneously with the E362 module is only allowed if the technical requirements defined in Section 3.0 are satisfied.
- 3) Should end-user installation be available module/notebook Two-Way Authentication is required. Please contact Novatel Wireless and section 2.4.1 for additional details.
- 4) The FCC and Industry Canada IDs must be permanently affixed on the exterior of the notebook or readily accessible under a panel or battery pack of the host device that cannot be separated from the host device itself.

The label must state: **This device contains FCC ID: PKRNVWE362**

- 5) **These installation guidelines are not applicable to non-notebook host devices or tablet PCs. The installation guidelines are applicable for notebook computers where the E362 and collocated antennas are located in the display portion of a notebook computer. SAR evaluation is completed with the display open at a ninety-degree angle as defined in KDB pub 616217 and Section 4 of KDB pub 447498.**

2.0 Module Installation Guidelines

This section defines host installation limitations for mobile and portable hosts.

2.1 Installation Guidelines

2.1.1 Mobile Hosts (WWAN to user separation distance >20cm)

The E362 module can be installed for use in any authenticated mobile host device as long as the antenna gain of the host antenna does not exceed the gain listed in table 1. (See section 4.0 for the measurement guidelines of separation between the transmitting antenna and the user.) The modem must not be collocated with other antennas or transmitters unless the guidelines are followed within this document. Please section 3 for collocated information.

The maximum E362 conducted power and host antenna gain is listed in Table 1.

Table 1

Technology	Frequency (MHz)	Maximum Conducted Power (dBm)	Conducted Power (W)	Maximum Antenna Gain (dBi)
LTE Band 13 (5MHz)	779.5	24.25	0.266	
LTE Band 13 (5MHz)	784.5	24.25	0.266	
LTE Band 13 (10MHz)	782	24.25	0.266	
GPRS 1 UL	824	33.00	1.99	
CDMA2000	824	24.50	0.282	
UMTS	824	24.50	0.282	
GPRS 1 UL	1850	30.00	1.0	
CDMA2000	1850	24.50	0.282	
UMTS	1850	24.50	0.282	

2.1.2 Portable Hosts (WWAN to user separation distance ≤20cm)

The E362 module can be installed for use in a portable host device with the WWAN antenna limitation. This type of installation requires a Class II permissive change specifically if the antennas are not documented or if the conditions in section 1, 5) are not met. RF Exposure compliance is required using KDB pub 447498 or KDB pub 616217 methods. See section 4 to determine the antenna measurement of the laptop to define the device as 'portable'.

2.1.4 End User Installation

Two-way authentication documentation is required to be submitted as part of a Class II or Class I permissive change allowing end-user installation into notebooks that utilize the method of authentication.

2.1.5 User Instructions

Installers and end user must be provided with specific information to satisfy FCC RF exposure requirements for Mobile or portable devices.

3.0 Collocated Installation Guidelines

3.1 Collocated transmitters in mobile applications

Collocated transmitters can be operated simultaneously with the E362 module in mobile configurations, provided the technical parameters listed in KDB pub 447498 section 8 are met. These procedures apply to antennas in the display screen for laptop devices.

These parameters are:

- a) Transmitters and modules certified for mobile or portable exposure conditions and categorically excluded by § 2.1091(c) can be incorporated in mobile host devices without further testing or certification when:
 - i. The closest separation among all simultaneous (radiating) transmitting antennas is $\geq 20\text{cm}$, or
 - ii. The antenna separation distance and MPE compliance boundary requirements that enable all simultaneous transmitting antennas incorporated within the host to comply with MPE limits are specified in the application filing of at least one of the certified transmitters incorporated in the host device. In addition, when transmitters certified for portable use are incorporated in a mobile host device the antenna(s) must be $\geq 5\text{ cm}$ from all other simultaneous transmitting antennas.
- b) All transmitters in the final product must be at least 20cm from users and nearby persons. For antenna distance instructions please see section 4.0.

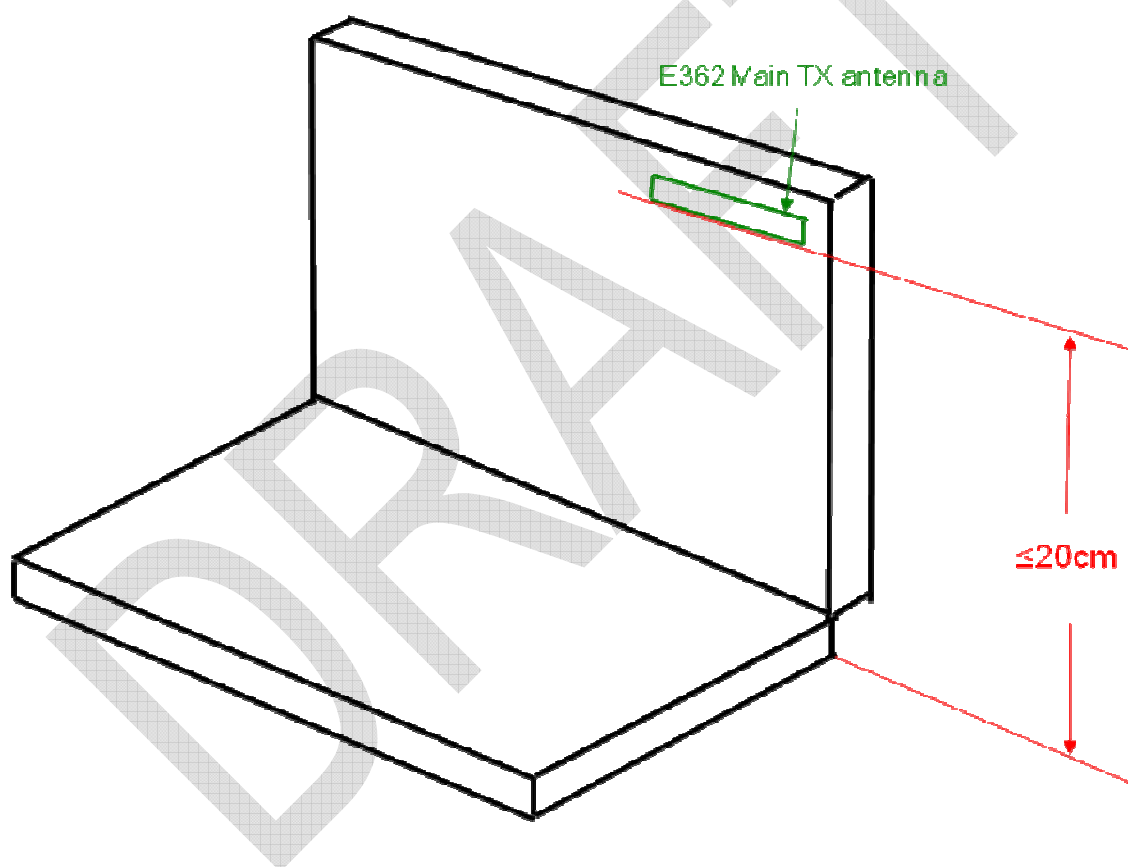
3.2 Collocated transmitters in portable applications

When multiple transmitters are being utilized in a portable configuration all possible combinations of antennas and transmitters needs to be considered with respect to RF Exposure. Detailed analysis must be considered when evaluating the affects of multiple transmitters in close proximity to the end user. Any design that provides multiple transmitters in a portable exposure condition must be evaluated be Novatel Wireless before integrating the E362.

4.0 Individual SAR Evaluation

Portable RF exposure evaluation must be completed evaluated on notebook computers that provide ≤ 20.0 cm of separation distance between the WWAN antenna and the end user. This distance is measured and is required to be maintained with the display orientated at 90 degrees as illustrated in Figure 1.

Figure 1-1
Determining Portable Antenna Locations



Mobile Device – The E362 antenna is located at a distance greater than 20cm from the user.

Portable Device - The E362 antenna is located at a distance ≤ 20 cm from the user.

6.0 Regulatory Statements - Federal Communications Commission Notice (FCC—United States)

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.
- Contact your service provider for help.

Notice to Consumers: Changes or modifications made to this equipment not expressly approved by Novatel Wireless may void the FCC authorization to operate this equipment.

This device complies with Part 15 of the FCC Rules and with Industry Canada ICES-003.

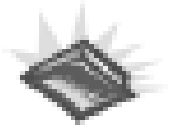
Operation is subject to the following two conditions:

- (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 E362 is compliant to the relevant sections of the FCC rules:

- FCC CFR47 Part 2 (General Rules and Regulations, RF Exposure Evaluation)
- FCC CFR47 Part 15 (All Radio Frequency Devices)
- FCC CFR47 Part 24 (Narrow and wideband PCS modules)
- FCC CFR47 Part 22 (Cellular Service)
- FCCCFR47 Part 27 (Wireless Communications Services)

7.0 Technical Support Contacts



WWW: <http://www.nvtl.com/support/index.html>

Email: support@novatelwireless.com

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