Product Specifications
802.11b/g USB Embedded Module

Model Number: VNT6656G6A10/ VNT6656G6A40

Revision 1.4

March 28, 2007

VIA TECHNOLOGIES, INC.

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VIA Technologies, Inc.

Revision History

Release	Date	Revision	Initials
1.0	2006-02-27	Initial release	RTW
1.1	2006-03-31	Add the application note for pin definition and layout suggestion	RTW
1.2	2006-04-04	To modify the switch connection type of radio ON/OFF	RTW
1.3	2006-10-17	To add the mechanical drawing	RTW
1.4	2007-03-28	To modify the mechanical hole dimension	RTW

Table of Contents

1.0 Scope

1.1 Document

This document is to specify the product requirements for **802.11 b/g** USB embedded module(Model No.: VNT6656G6A10(for 3.3V version); VNT6656G6A40(for 5V version)). The USB embedded module is based on **VIA** MAC/BBP(VT6656) and Airoha(AL2230) chip solution. The VNT6656G6A10/40 product complied with IEEE 802.11b/g standard from 2.4~2.5GHz, and it can be used to provide up to 11Mbps for IEEE 802.11b and 54Mbps for 2.4GHz IEEE 802.11g to connect your wireless LAN.

VNT6656G6A10/40 offers absolute interoperability with different vendors' 802.11b/g access points through the wireless LAN with seamless roaming, fully interoperability, and advanced security with WEP/WPA1.0/WPA2.0 standard.

1.2 Product Features

- Compatible with IEEE 802.11g standard to provide wireless 54Mbps data rate
- Compatible with IEEE 802.11b standard to provide wireless 11Mbps data rate
- Operation at 2.4 ~ 2.5GHz frequency band to meet worldwide regulations
- Dynamic date rate scaling at 6, 9, 12, 18, 24, 36, 48, 54Mbps for IEEE 802.11g
- Dynamic date rate scaling at 1, 2, 5.5, 11Mbps for IEEE 802.11b
- Maximum reliability, throughput and connectivity with automatic data rate switching
- Supports wireless data encryption with 64/128 bit WEP for security
- Supports infrastructure networks via Access Point and ad-hoc network via peer-to-peer communication
- Supports WPA enhanced security
- Friendly user configuration and utilities
- Drivers support Windows 98SE, ME, 2K, and XP

2.0 Requirements

The following sections identify the detailed requirements of the VNT6656GEV00
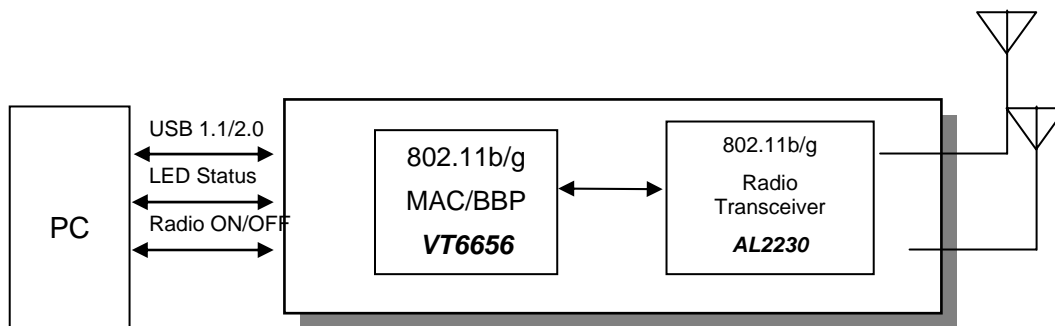
2.1 Functional Block Diagram

Fig. 2.1.1

2.2 General Requirements

2.2.1 IEEE 802.11b Section

Item	Feature	Detailed Description
2.2.1.1	Standard	• IEEE 802.11b
2.2.1.2	Radio and Modulation Schemes	• DQPSK, DBPSK, DSSS, and CCK
2.2.1.3	Operating Frequency	• 2400 ~ 2483.5MHz ISM band
2.2.1.4	Channel Numbers	• 11 channels for United States 13 channels for Europe/Japan Countries
2.2.1.5	Data Rate	• 11, 5.5, 2, and 1Mbps
2.2.1.6	Media Access Protocol	• CSMA/CA with ACK
2.2.1.7	Transmitter Output Power	• Typical 16dBm at 11, 5.5, 2, and 1Mbps at room temperature 25 degree C
2.2.1.8	Receiver Sensitivity	• Typical –80dBm for 11Mbps @ 8% PER
2.2.1.9	Throughput	• At least 5.1Mbps@ 11Mbps link rate, ideal environment

2.2.2 IEEE 802.11g Section

Item	Feature	Detailed Description
2.2.2.1	Standard	• IEEE 802.11g
2.2.2.2	Radio and Modulation Type	• BPSK, QPSK, 16QAM, 64QAM, OFDM
2.2.2.3	Operating Frequency	• 2400 ~ 2483.5MHz ISM band
2.2.2.4	Channel Numbers	• 11 channels for United States 13 channels for Europe/Japan Countries
2.2.2.5	Data Rate	• 6, 9, 12, 18, 24, 36, 48, 54Mbps
2.2.2.6	Media Access Protocol	• CSMA/CA with ACK
2.2.2.7	Transmitter Output Power	• Typical RF Output Power at each Data Rate and at room Temp. 25degree C • 15dBm at 54Mbps

Item	Feature	Detailed Description
2.2.2.8	Receiver Sensitivity	• Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate = 10% • –68dBm at 54Mbps
2.2.2.9	Throughput	• At least 16Mbps@ 54Mbps link rate, ideal environment

2.2.4 General Section

Item	Feature	Detailed Description
2.2.4.1	Antenna connector Type	• Two(2) coaxial cable antenna connectors
2.2.4.2	Operating Voltage	• 3.3 VDC +/- 10%(VNT6656G6A10) • 5 VDC +/- 10%(VNT6656G6A40)
2.2.4.3	Power Consumption	• 382 mA @ Tx mode/High speed • 305 mA @ Rx mode/High speed
2.2.4.4	Form Factor and Interface	• USB 1.1/2.0 interface

2.3 Software Requirements

The Configuration Software supports Microsoft Windows 98SE, ME, 2000, and XP. This configuration software includes the following functions:

- **Information**
  Information allows you to monitor network status.

- **Configuration**
  Configuration allows you to configure parameters for wireless networking.

- **Security**
  Supports enhanced security WEP, WPA1.0/2.0.

2.3.1 Information

Item	Feature	Detailed Description
2.3.1.1	General Information	• General Information shows the name of Wireless Adapter, Adapter MAC Address, Regulatory Domain, Firmware Version, and Utility Version.
2.3.1.2	Current Link Information	• Current Link Information shows the Current Setting ESSID, Channel Number, Associated BSSID, Network Type (infrastructure or Ad-hoc network), WEP Status (enable or disable), Link Status (Connect or Dis-connect), 802.11g Transmit Speed (6, 9, 12, 18, 24, 36, 48, 54Mbps), 802.11b Transmit Speed (1, 2, 5.5, 11Mbps), Signal Strength, and Link Quality.
2.3.1.3	Site survey	• To search the neighboring access points and display the information of all access points.

2.3.2 Configuration

Item	Feature	Detailed Description
2.3.2.1	ESS ID	• Input an SSID number if the roaming feature is enabled • Supports for ASCII printable characters.
2.3.2.2	Network Type	• Ad-hoc Mode and 802.11 Ad-hoc Mode for network configurations that do not have any access points • Infrastructure Mode for network configurations with access points
2.3.2.3	Power Save	• Extend the battery life of clients by allowing the client to sleep for short periods of time while the Access Point buffers the messages
2.3.2.4	RTS Threshold	• Set the number of bytes used for fragmentation boundary for messages
2.3.2.5	Fragment Threshold	• Set the number of bytes used for RTS/CTS boundary

Item	Feature	Detailed Description
2.3.2.6	Roaming	• Support Automatic or Manual Rescan to associate with access point.

2.3.3 Security

Item	Feature	Detailed Description
2.3.3.1	Encryption	• RC4 encryption algorithm • Support 64/128 bit WEP encryption • Support open system and shared key authentication
2.3.3.2	WEP Management	• Four WEP keys can be selected • STA with WEP off will never associate any AP with WEP enabled • WEP Key Format: Option for Hex/ASCII format
2.3.3.3	802.1x	• Support EAP-TLS,EAP-TTLS,EAP-PEAP and LEAP
2.3.3.4	WPA	• Support WPA-PSK and WPA-EAP • Support Cipher Mode TKIP

2.4 Mechanical Requirements

2.4.1 Information

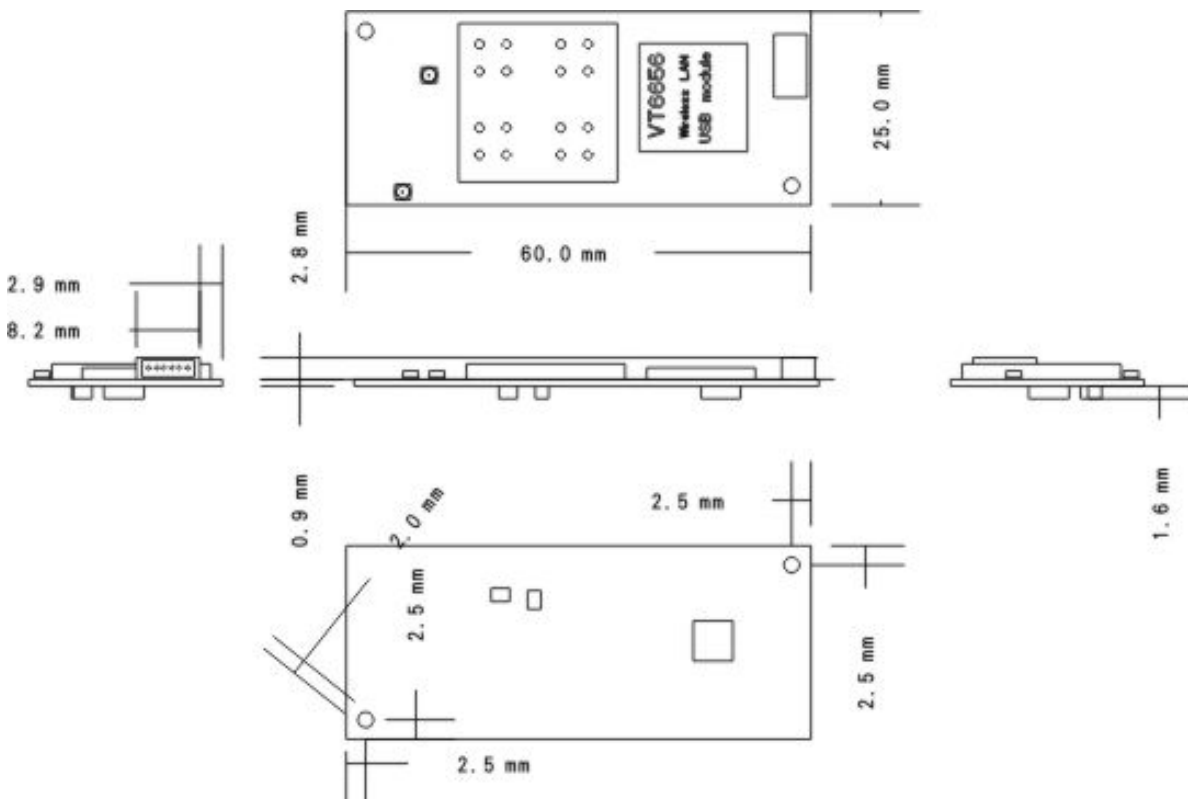| Item	Feature	Detailed Description
2.4.1	Length	• 60mm
2.4.2	Width	• 25mm
2.4.3	Height	• 5.52mm

2.4.2 Mechanical Drawing
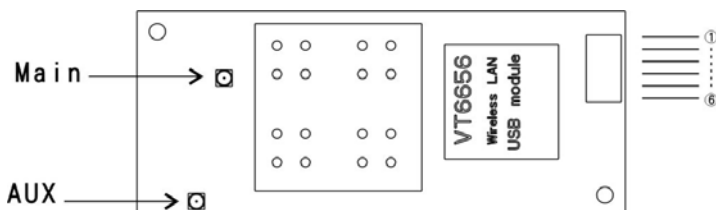
Module dimension:

2.5 Requirements of Reliability, Maintainability and Quality

Item	Feature	Detailed Description
2.5.1	MTBF	• Mean Time Between Failure > 30,000 hours
2.5.2	Maintainability	• There is no scheduled preventive maintenance required
2.5.3	Quality	• The product quality is followed-up by VNT factory quality control system

2.6 Environmental Requirements

Item	Feature	Detailed Description
2.6.1	Operating Temperature Conditions	• The product is capable of continuous reliable operation when operating in ambient temperature of 0 ℃ to +55℃.
2.6.2	Non-Operating Temperature Conditions	• Neither subassemblies is damaged nor the operational performance is degraded when restored to the operating temperature after exposing to storage temperature in the range of −20 ℃ to +75 ℃.
2.6.3	Operating Humidity conditions	• The product is capable of continuous reliable operation when subjected to relative humidity in the range of 10% and 90% non-condensing.
2.6.4	Non-Operating Humidity Conditions	• The product is not damaged nor the performance is degraded after exposure to relative humidity ranging from 5% to 95% non-condensing

2.7 Module Pin Definition and Schematic Suggestion
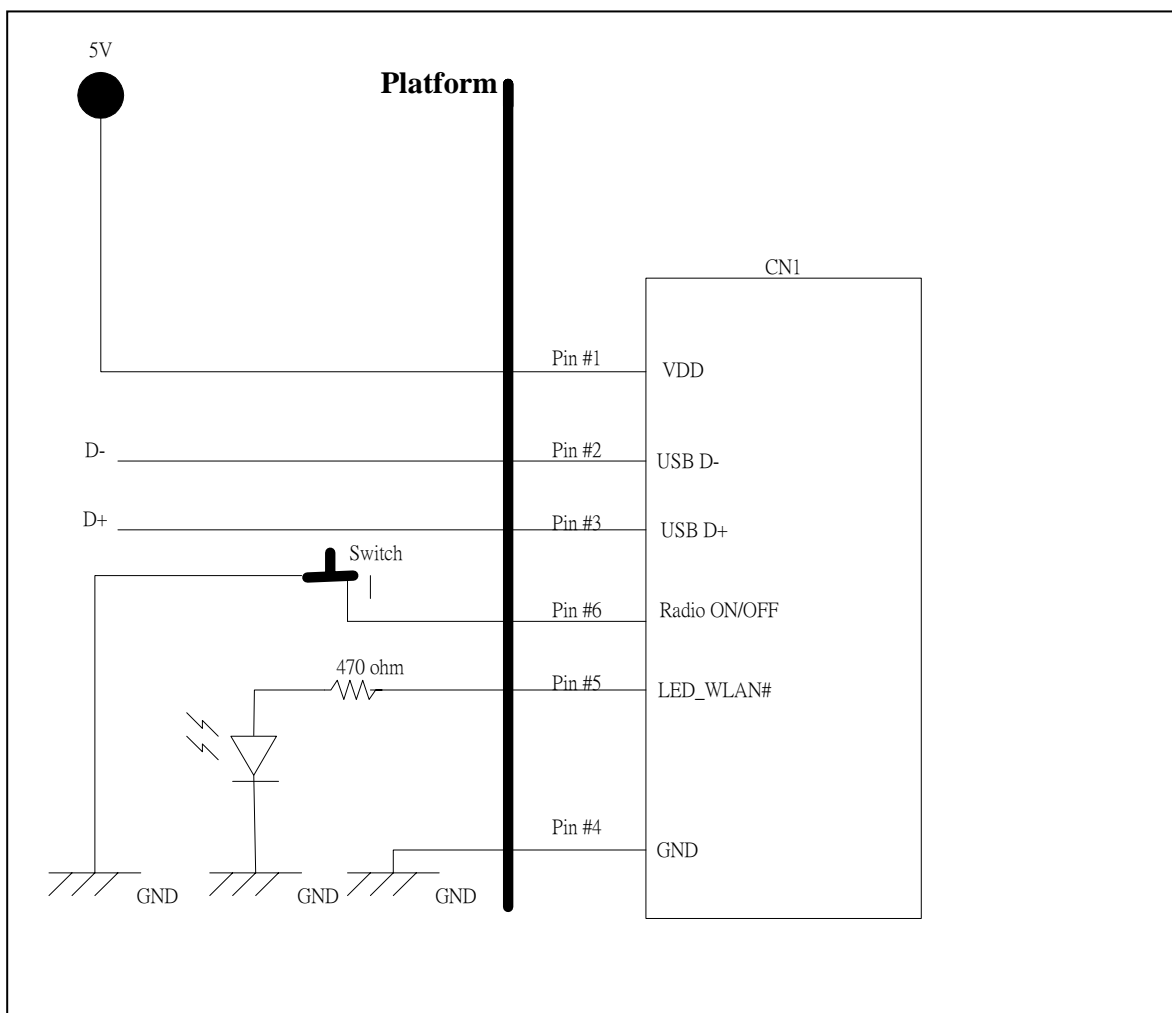
2.7.1 VNT6656G6A40

Fig. 2.7.1

2.7.2 VNT6656G6A10
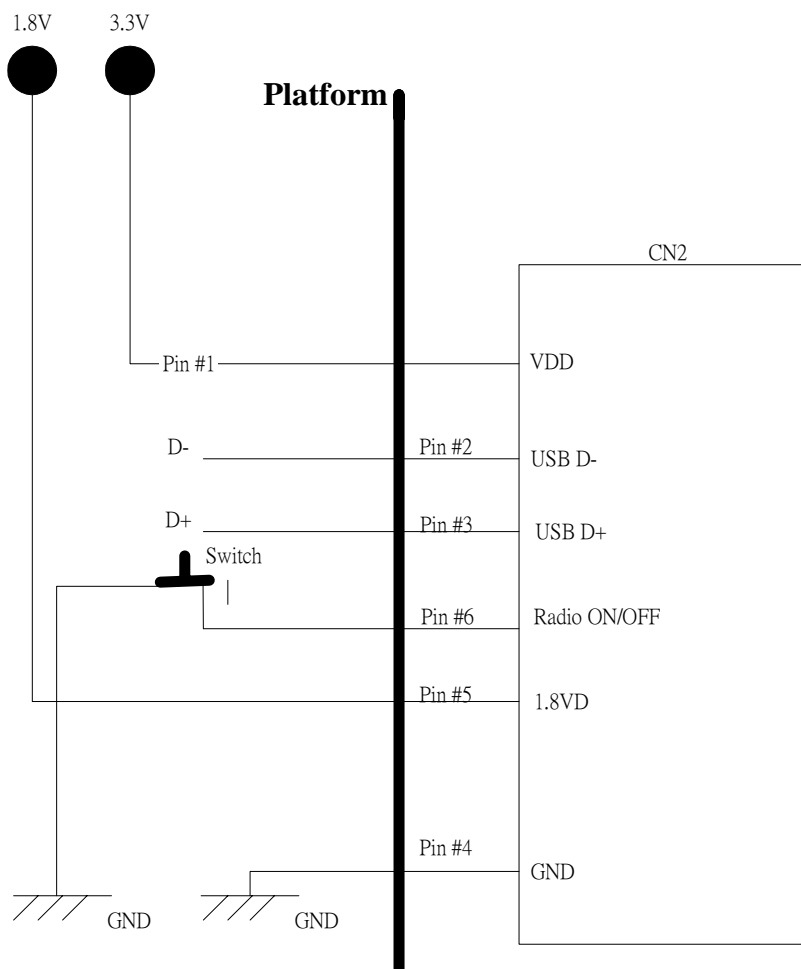
Fig. 2.7.2

Note:

1.   Pin#1 is defined the pin which is near the PCB border, and the shape of this soldering pad is rectangular.

3.0 Appendix

3.1 Compliance List of Antenna Kits

No.	Brand Name	Model No.	Gain(dBi)	Antenna Type	Antenna Connector
1	High-tek	T700(PEN)	0.05dBi	PIFA	I-PEX
2	ARISTOTLE	PCB013	1dBi	PCB	I-PEX
3	ARISTOTLE	C2H Series	2.5dBi	Monopole	I-PEX
4	Own design	MN003	1.29dBi	PCB	I-PEX

3.2 FCC/CE DoC Document

By:

Curtis-Straus LLC
527 Great Road
Littleton, MA 01460

Date of Grant: 03/27/2006

Application Dated: 03/27/2006

VIA Technologies Inc
8F, 533, Chung-Cheng Rd.
Hsin-Tien, Taipei,
Taiwan

Attention:

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: NCI-VNT6656G6A4X
Name of Grantee: VIA Technologies Inc
Equipment Class: Digital Transmission System
Notes: USB Embedded Module

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15C	2412.0 - 2462.0	0.068		

Output power listed is conducted. Modular Approval for mobile RF Exposure conditions, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Approval is limited to OEM installation only. OEM integrators must be provided with antenna installation instructions. OEM integrators and end-Users must be provided with transmitter operation conditions for satisfying RF exposure compliance. This grant is valid only when the device is sold to OEM integrators and the OEM integrators are instructed to ensure that the end user has no manual instructions to remove or install the device. The only antennas approved for use with this module are those documented in the filings under this FCC ID.

CERTIFICATE OF CONFORMITY

Equipment: USB Embedded Module
Brand Name: VIA
Test Model No.: VNT6656G6A10, VNT6656G6A40
Multiple Listing: NA
Applicant: VIA Technologies, Inc.
Test Report No.: RE950210H01

$C\epsilon$

We, **Advance Data Technology Corp.**, declare that the equipment above has been tested in our facility and found compliance with the requirement limits of applicable standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate under the standards herein specified.

EN 300 328 V1.6.1 (2004-11)

In accordance with the council directive 1999/5/EC

ilac-MRA   CNLA 0536   ACCREDITED No.: 2177-01

May Chen / Deputy Manager Hsinchu EMC / RF Lab. ADT CORP.

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