
# PC3220 Product Specification

**Rev 1.5**

# Table of Contents

# 1 INTRODUCTION

## 1.1 Scope

This document describes the functions and performance specifications of the AirPrime PC3220 PC Card for notebook and handheld computers.

## 1.2 Overview

The PC3220 is a CDMA PC Card that provides wireless data functionality to notebook computers. It has the following key characteristics:

- A Type II PCMCIA card supporting the CardBus interface.
- Operation in both the North American Cellular (800 MHz) and PCS (1900 MHz) bands.
- Based on the Qualcomm MSM5100 chip set.
- Support for IS-95A/B and cdma2000 1XRTT Release 0.
- Data rates of up to 153.6 kbps on the forward and reverse links.
- Qualcomm gpsOne functionality is not supported.
- No support for voice is included.
- Includes PC software for the connection manager, SMS, and IOTA client

## 1.3 Document Outline

Section 2 – Standards Compliance: Describes the PC3220's compliance with industry standards and test/certification requirements.

Section 3 – Hardware Interface: Details the specifications of the Card's hardware interface.

Section 4 – Power Consumption: Summarizes the power consumption of the PC3220 in its various operating modes.

Section 5 – Software Specification: Provides a high level description of the OS support and software applications for the PC Card.

Section 6 – Environmental Specification: Summary of the environmental specifications for the Card.

Section 7 – Physical Specification: Describes the physical attributes of the PC3220.

## 1.4 References

### 1.4.1 AirPrime Documents

[1] "PC3220 Diamond UI Specification", V0.7

[2] "PC3220 SMS Specification", V0.1

### 1.4.2 TIA/EIA Standards

[3] TIA/EIA/IS-2000.1 through 6, “cdma2000 Standards for Spread Spectrum Systems, Release 0” April 2000.

[4] TIA/EIA/IS-2000.1-1 through .6-1, “cdma2000 Addendum 1”, April 2000

[5] TIA/EIA/IS-2000.1-2 through .6-2, “cdma2000 Addendum 2”, Jun 2001

[6] TIA/EIA/95-B, “Mobile Station-Base Station Compatibility Standard for Dual-Mode Spread Spectrum Systems” Dec. 4, 1998

[7] TIA/EIA/IS-707-A, “Data Service Options for Wideband Spread Spectrum Systems”, March 2000

[8] TIA/EIA/IS-134, “Facsimile Digital Interfaces – Amendments to TIA/EIA-592 to Support ITU-T T.30-1993”, October 1994

[9] TIA/EIA-592, “Asynchronous Facsimile DCE Control Standard – Service Class 2”, April 1998

[10] TIA/EIA-617, “Data Transmission Systems and Equipment for In-Band DCE Control”, January 1996

[11] TIA/EIA-637-A, “Short Message Service for Spread Spectrum Systems”, September 1999.

[12] TIA/EIA/IS-683-A, “Over-the-Air Service Provisioning of Mobile Stations in Spread Spectrum Systems”, June 1998.

[13] TIA/EIA/IS-683-B, “Over-the-Air Service Provisioning of Mobile Stations in Spread Spectrum Systems”, August 2001.

[14] TIA/EIA/IS-835, “Wireless IP Network Standard”, June 2000

[15] TIA/EIA/IS-870, “Test Data Service Option (TDSO) for cdma2000 Spread Spectrum Systems”, 2001

[16] TIA/EIA/IS-98-D, “Recommended Minimum Performance Standards for Dual-Mode Spread Spectrum Mobile Stations”.

[17] TIA/EIA-126-D, “Mobile Station Loopback Service Options Standard”, 2001.

[18] TIA/EIA TSB 58C, “Administration of Parameter Value Assignments” May 2000

[19] TIA/EIA TSB 50, “User Interface for Authentication Key Entry”, March 1993.

### 1.4.3 CDG Standards

[20] CDG 22, “Stage 2 Interoperability Tests (TIA/EIA/IS-95-A)”, V 8.0 September 2000

[21] CDG 53, “Stage 2 Interoperability Tests (TIA/EIA-95-B) “, V 2.0 June 2000

[22] CDG 57, “Stage 2 Interoperability Tests (TIA/EIA/IS-2000)”, V 0.7 February 2001

[23] CDG 36, “Markov Service Options for Wideband Spread Spectrum Systems”

[24] CDG 56, “IP-based over the air Handset Configuration Management”, Nov 2001, V4.0

### 1.4.4 PC Card Standards

[25] “PC Card Standard Release 8.0,” PCMCIA, April 2001.

[26] “PC 2001 System Design Guide- Chapter 13 Modems and Chapter 14 Network Communications,” Intel Corporation and Microsoft Corporation”

[27] “Design guidelines for PC Card and CardBus,” Intel Corporation and Microsoft Corporation, version 1.1, April 12, 2000.

[28] “WHQL Test Specification,” Microsoft Corporation, July 16, 2001.

[29] "Universal Serial Bus Specification 1.1", Compaq, Microsoft, Intel, and NEC, September 23, 1998

[30] "Open Host Controller Interface Specification for USB V1.0a", Compaq, Microsoft and National Semiconductor, September 14, 1999

### 1.4.5 Agency Standards

[31] FCC 47 CFR – Part 15 "Radio Frequency Devices", January 2001

[32] FCC 47 CFR – Part 22 "Cellular Radiotelephone Services" October 1998

[33] FCC 47CFR- Part 24 "Personal Communications Services", October 1998

[34] FCC OET 65 Supplement C, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", December 1997.

[35] IEEE-ANSI C95.1-1992, "Human Exposure to Microwaves and Other Radio Frequency Electromagnetic Fields", 1992.

[36] Industry Canada ICES-003, "Interference-Causing Equipment Standard – Digital Apparatus", November 22, 1997.

[37] Industry Canada RSS-129 "800MHz Dual-Mode CDMA Cellular Telephones," Issue 2, September 25, 1999.

[38] Industry Canada RSS-133 "2 GHz Personal Communications Services," September 25, 1999.

[39] Industry Canada RSS-102, "Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields", September 25, 1999.

[40] "CTIA Certification Program Management Document, " Rev 1.0, Oct 2001

[41] "CTIA Certification Program Method of Measurement for Radiated RF Power and Receiver Performance", Rev 1.0, Oct 2001

### 1.4.6 Other Standards

[42] "Openwave_IOTA_Protocol_v2.0_Specifications_doc_v2.04", Feb 2002

## 1.5 Acronyms

| | |
|---|---|
| 1xRTT | Single Carrier (1x) Radio Transmission Technology |
| API | Application Programming Interface |
| CDG | CDMA Development Group |
| CDMA | Code Division Multiple Access |
| CNAP | Calling Name Presentation |
| CTIA | Cellular Telecommunication & Internet Association |
| DCE | Data Communications Equipment |
| DM | Diagnostic Monitor |
| DMSS | Dual-Mode Subscriber Software |
| EIRP | Effective Isotropic Radiated Power |
| ERP | Effective Radiated Power |
| ESD | Electro-Static Discharge |
| FCC | Federal Communications Commission |
| GPS | Global Positioning System |
| IS | Interim Standard |
| LED | Light Emitting Diode |
| MIO | Module Input/Output |
| MIME | Multipurpose Internet Mail Extensions |
| MMC | Mobile Management Command |
| MSM | Mobile Station Modem |
| NAM | Number Assignment Module |
| OEM | Original Equipment Manufacturer |
| OTAPA | Over the Air Parameter Administration |
| OTASP | Over the Air Service Provisioning |
| PACA | Priority Access and Channel Assignment |
| PC | Personal Computer |
| PCMCIA | Personal Computer Memory Card International Association |
| PCS | Personal Communications Services |
| PPP | Point to Point Protocol |
| P-REV | Protocol Revision |
| PRL | Preferred Roaming List |
| PSD | Product Specification Document |
| PST | Product Support Tools |
| QNC | Quick Net Connect |
| RC | Radio Configuration |
| RLP | Radio Link Protocol |
| SAR | Specific Absorption Rate |
| SMS | Short Message Service |
| SSL | Secure Socket Layer |
| TIA/EIA | Telecommunications Industry Association / Electronics Industry Association |
| UI | User Interface |
| USB | Universal Serial Bus |
| WHQL | Windows Hardware Quality Laboratory |
| XML | Extensible Markup Language |

# 2 STANDARDS COMPLIANCE

This section describes the compliance of the PC3220 to the standards outlined in Section 1.4.

Appendix A summarizes the service options supported by the PC3220.

## 2.1 General Compliance

### 2.1.1 Mobile Station Class

The output power and band class features of the PC3220 are summarized in Table 1.

Table 1 - Band and Power Class Features

| Band Class | Mobile Station Class | Supported? |
|---|---|---|
| 0 (North American Cellular) | Class III | Yes |
| 1 (North American PCS) | Class II | Yes |
| 2 (TACS) | N/A | No |
| 3 (JTACS) | N/A | No |
| 4 (Korean PCS) | N/A | No |
| 5 (NMT 450) | N/A | No |
| 6 (IMT-2000) | N/A | No |

### 2.1.2 Protocol Revision Support

The PC3220 supports all protocol revisions through P_REV 6. See section 2.2.1 and section 2.3.2 for more detail.

## 2.2 TIA/EIA-95B

The PC3220 is compliant to TIA/EIA-95B with exceptions as noted in this section.

### 2.2.1 Protocol Revision (P_REV) 5 Feature Support

P_REV 5 feature support is defined in Table 2.

Table 2 – PC3220 Support for P_REV 5 Features

| Feature | Supported? |
|---|---|
| Access Entry Handoff | Yes |
| Access Probe Handoff | Yes |
| Channel Assignment into Soft Handoff | Yes |
| Mobile Assisted Hard Handoff | Yes |
| Network Directed System Selection | Yes |
| Calling Name Presentation (CNAP) | NA |
| Priority Access and Channel Assignment (PACA) | No |
| Power-Up Function (PUF) | No |
| AMPS Improvements (IS-553-A) | No |
| Supplemental Code Channels (MDR) | No |
| Hopping Pilot Beacon | No |
| IS-95B Wireless Local Loop (WLL) Features | No |

## 2.3 TIA/EIA/IS-2000 Release 0

The PC3220 support for TIA/EIA/IS-2000 features is defined by the capabilities of the Qualcomm MSM5100 hardware and DMSS5100 software.

### 2.3.1 Radio Configurations

The PC3220 supports all mandatory Radio Configurations. Detailed Channel and Radio Configuration support is shown in Table 3.

Table 3- PC3220 Channel and Radio Configuration Support

| Feature | Supported? | Data Rate (kbps) |
|---|---|---|
| Quick Paging Channel (F-QPCH) | Yes | |
| Fundamental Channel (FCH) | | |
| Rate Set 1 RCs (fwd: 1,3,4 rev: 1,3 ) | Yes | 9.6 |
| Rate Set 2 RCs (fwd: 2,5 rev: 2,4) | Yes | 14.4 |
| Supplemental Channel (SCH) | | |
| Rate Set 1 RCs (fwd: 3,4 rev: 3) | Yes | 153.6/153.6 |
| Rate Set 2 RCs (fwd: 5 rev: 4) | Yes | 115.2/115.2 |
| Dedicated Control Channel (DCCH)[1] | | |
| Rate Set 1 RCs (fwd: 3,4 rev: 3) | Yes | 9.6 |
| Rate Set 2 RCs (fwd: 5 rev: 4) | No | 14.4 |
| Reverse Pilot Channel (R-PICH) | Yes | |

*[1]– 20ms frames only*

### 2.3.2 P_REV6 Feature Support

The PC3220 supports all mandatory P_REV 6 features. Additional support for P_REV 6 features is outlined in Table 4.

At this time no P_REV 7 features (Release A) are supported.

Table 4- PC3220 Support for P_REV 6 Features

| Optional P_REV 6 Feature | Supported? |
|---|---|
| Simultaneous Maximum Data rates on Forward and Reverse Channels | Yes[1] |
| Quasi Orthogonal Functions (QOF) | Yes |
| Turbo encoding/decoding | Yes |
| Quick Paging Channel | Yes |
| Slotted Mode Timer | Yes |
| Orthogonal Transmit Diversity (OTD) | No |
| Reverse Pilot Gating | Yes |
| 1/8 Rate Traffic Channel Gating | Yes |
| Mobile Assisted Burst Operation (MABO) | No |
| Traffic Channel Control Hold | Yes |
| Short Data Bursts | No |
| 5ms, 10ms Frame sizes | No |

*[1] – See Section 2.4.1 for details. 153.6kbps (SCH) is the max allowable rate for Release 0.*

### 2.3.3 System Selection

The PC3220 meets customer's system selection requirements.

## 2.4 CDMA Data Services

The PC3220 supports the data features of IS-707-A as outlined in Table 5.

Table 5 - IS-707-A Data Features

| CDMA Data Service | IS-707-A Section | Supported? |
|---|---|---|
| RLP | IS-707.2 | Yes[1] |
| AT Command Set | IS-707.3 | Yes |
| Asynchronous Data and Fax at 9.6kbps and 14.4 kbps | IS-707.4 | Yes[2] |
| Packet Data Service | IS-707.5 | Yes |
| STU-III | IS-707.6 | No |
| Analog Fax | IS-707.7 | No |
| Radio Link Protocol Type 2 (RLP2) | IS-707.8 | Yes[1] |
| High Speed Packet Data (Medium Data Rate - MDR) | IS-707.9 | No |
| Radio Link Protocol Type 3 (RLP3) | IS-707.10 | Yes[1] |
| CDMA2000 High Speed Packet Data | IS-707.12 | Yes |

*[1] – Encrypted mode and Non-transparent modes are NOT supported*
*[2] – Asynchronous Fax is NOT supported*

### 2.4.1 Data Rate Support

The PC3220 supports simultaneous maximum data rates of 153.6kbps (for Release 0) on the forward and reverse channel. The following data rate configurations are supported:

Rate Set 1 RC Simultaneous Forward/Reverse Channel Data Rates

- Forward Channel: 153.6kbps SCH and 9.6kbps FCH
- Reverse Channel: 153.6kbps SCH and 9.6kpbs FCH

Rate Set 2 RC Simultaneous Forward/Reverse Channel Data Rates

- Forward Channel: 115.2kbps SCH and 14.4kbps FCH
- Reverse Channel: 115.2kbps SCH and 14.4kpbs FCH

### 2.4.2 Additional Data Features

Table 6 outlines PC3220 support for additional data features (beyond IS-707).

Table 6- PC3220 Data Features

| Feature | Supported? |
|---|---|
| Quick Net Connect | Yes |
| Pre-arrangement for incoming Asynchronous data or fax | No |
| In-Band DCE Control (TIA/EIA-617) | Yes |
| Facsimile Digital Interfaces (TIA/EIA/IS-134) | No |
| Asynchronous facsimile DCE Control Standard (TIA/EIA-592) | No |
| Mobile IP (TIA/EIA/IS-835) | Yes |
| Simple IP | Yes |

## 2.5 CDMA Voice Services

The PC3220 does not support voice capabilities.

## 2.6 CDMA Short Message Service (SMS)

Table 7 summarizes the PC3220 compliance with the SMS features per TIA/EIA-637-A [11]. Additional features are discussed in the PC Card SMS Specification [2].

Table 7- PC3220 SMS Features

| Feature | Supported? |
|---|---|
| Mobile Terminated SMS | Yes |
| Mobile Originated SMS | Yes |
| Point-to-Point Messaging | Yes |
| Broadcast Messaging | No |
| Acknowledge Messaging | Yes |
| Analog Mode SMS | No |
| Wireless Paging Teleservice | Yes |
| Wireless Messaging Teleservice | Yes |
| Voice Mail Notification | No |
| Wireless Application Protocol SMS | No |

## 2.7 Over the Air Service Provisioning (OTASP)

### 2.7.1 IS-683 Features

The PC3220 does not support TIA/EIA/IS-683-A or TIA/EIAIS-683-B over the air messages for OTASP.

### 2.7.2 Internet Over The Air (IOTA) Features

The PC3220 supports IOTA via an Openwave compliant (as specified in [42]) IOTA thin client running on the host. The IOTA thin client communicates to the PC Card via tunneled TIA/EIA/IS-683-A and TIA/EIA/IS-683-B messages.

Table 8- PC3220 IOTA Features

| Feature | Supported? |
|---|---|
| Bootstrap Provisioning (Optional) | No |
| Network Initiated Provisioning using WAP Push | Yes |
| Reassembly of Multiple IOTA Trigger Messages | Yes |
| HTTP and SSL Support (Download Agent) | Yes |
| MMC XML and MIME Parser / Assembler | Yes |
| IS-683-A/B Tunneling | Yes |
| WBXML Parser / Assembler | No |
| Bearer Selection Table Provisioning | No |
| User NAI Profiles and CDMA Objects | Yes |

## 2.8 Position Location

The PC3220 does not support any Position Location features.

## 2.9 Additional Standards

The following additional standards required for CDMA operation shall also be supported:

- TIA/EIA-126-D, “Mobile Station Loopback Service Options Standard” - Specifies loopback service options used during test and certification for IS-95-B.
- TIA/EIA TSB-50, “User Interface for Authentication Key Entry“ - Specifies method for A-Key Entry from the device user-interface. Note: Requires host support for compliance.
- TIA/EIA TSB-58C, “Parameter Value Assignments” - Assigns values to reserved parameters and specifies which are standard and which may be used for proprietary (manufacturer specific) values.
- CDG 36, “Markov Service Option” - Specifies the function of specific service options used for one-way over-the-air testing of mobiles.
- TIA/EIA/IS-870, “Test Data Service Option (TDSO) for cdma2000 Spread Spectrum Systems” – Defines a test data service option for testing of cdma2000 mobile units.

## 2.10 CDMA Certification Requirements

### 2.10.1 CDMA Parametric Performance

The PC3220 meets or exceeds TIA/EIA IS-98-D specifications for performance.

### 2.10.2 CDG Interoperability

The PC3220 complies with the following CDG Interoperability Standards:

- CDG 22 - Stage 2 Interoperability Tests (TIA/EIA/IS-95-A)
- CDG 53 - Stage 2 Interoperability Tests (TIA/EIA-95-B)
- CDG 57 - Stage 2 Interoperability Tests (TIA/EIA/IS-2000)

Certain tests within these standards are not applicable, as the corresponding features are not supported by the PC3220.

## 2.11 FCC and Industry Canada Type Acceptance

The PC3220 complies with the agency certifications specified in Table 9.

Table 9- US and Industry Canada Compliance Requirements

| Compliance Area | US regulation | Industry Canada regulation |
|---|---|---|
| Emissions | FCC Part 15 | ICES-003 |
| Licensed transmission | FCC Part 22, 24 | RSS-133, RSS-129 |
| SAR | - IEEE/ANSI C95.1-1992<br>- OET Bulletin 65, Edition 97-01 supplement C | RSS-102 |

# 3 HARDWARE INTERFACE

The PC3220 supports the 32-bit PC Card CardBus interface as defined in Volume 2 Section 5 of [25].

## 3.1 Host Interface

- Host interface: The PC3220 supports the CardBus interface through the PC Card standard 68 pin connector defined in [25].
- Voltage level: The PC3220 operates at 3.0-3.6 V. It does not support other voltage levels.
- Power: The PC3220 draws all power its needs from the PC/PDA host. Current consumption specifications are described in Section 4.
- Power Management: The PC3220 supports D0 (on), D1 (light sleep), D2 (suspend) and D3 (off) states
- Standards Compliance: The PC3220 complies with
    - Open Host Controller Interface Spec Version 1.0 [30],
    - USB Specification Version 1.1 [29],
    - PCI Local Bus Specification Version 2.1 [25] and
    - PCI Bus Power Management Interface V1.1.
- USB Support: The PC3220 supports bulk/interrupt/control transfer over USB and also supports USB suspend and resume, and remote-wakeup.

## 3.2 Battery

The PC3220 does not contain a battery.

## 3.3 LED

The PC3220 supports a single dual color LED indicator to indicate the state of the module. The LED behavior is defined in Table 10.

Table 10- PC3220 LED Status Indications

| LED Behavior | Status |
|---|---|
| Off | Unit is off |
| Slow Blink Green (period ~5 seconds) | Unit is on, service available |
| Slow Blink Red (period ~5 seconds) | Unit is on, no service available |
| Fast Blink Green (period ~0.5 seconds) | Data transmission in progress |
| Solid Red | Unit is on, card is initializing |

## 3.4 Antenna

The PC3220 has a flip up dual band antenna.

## 3.5 RF Test Port

The PC3220 has an RF test port suitable for performance measurements or an external antenna connection.

- Connector impedance: 50Ω
- Connector type: Radiall R199-005-233

# 4 POWER CONSUMPTION

The PC3220 does not have its own power source and depends on the host computer for power. Table 11 summarizes the DC power consumption of the PC3220 in various modes.

Table 11 - DC Power Consumption

| Signal | Description | Min | Typ | Max | Units | Notes |
|---|---|---|---|---|---|---|
| VCC (3.3V nominal) | IS-95 Typical Transmit current (PCS) | - | 405 | - | mA | +10dBm at RF connector, 100% full rate transmission, SO2 |
| | IS-95 Typical Transmit Current (Cellular) | - | 430 | - | mA | |
| | IS-95 Maximum Transmit current (PCS/Cellular) | - | - | 950 | mA | Max RF output power, 100% full rate transmission, SO2 |
| | IS-95 Standby current | - | - | 47 | mA | CDMA modem in standby, PC Card interface active, SCI =2, Reg Period = 15 min |
| | IS-2000 Typical Transmit current (PCS) | - | 420 | - | mA | +10dBm at RF connector, 100% full rate transmission, SO32 |
| | IS-2000 Typical Transmit current (Cellular) | - | 450 | - | mA | |
| | IS-2000 Maximum Transmit current (PCS/Cellular) | - | - | 950 | mA | Max RF output power, 100% full rate transmission, SO32 |
| | IS-2000 Standby current (Without Quick Paging Channel) | - | - | 47 | mA | CDMA modem in standby, PC Card interface active, SCI =2, Reg Period = 15 min |
| | IS-2000 Standy current (With Quick Paging Channel) | - | - | 45 | mA | |
| | PC Card OFF leakage current | - | - | 0 | µA | |

All specifications in the table above are preliminary.

# 5 SOFTWARE SPECIFICATION

## 5.1 Host Platform

The PC3220 supports host platforms with following system requirements:

- At least 1 PCMCIA Type II card socket that supports the Cardbus interface.
- Windows Operating Systems listed in section 5.2.
- Pentinum II 120 MHz or higher.
- Memory: 32 MB or more.
- Free Disk Space: 20 MB or more.
- CD ROM Disk Drive

## 5.2 Supported Operating Systems

The PC3220 is compatible with the following operating systems:

- Windows XP (Home and Professional Edition)
- Windows 2000 (Home and Professional Edition)
- Windows Millennium
- Windows 98SE

## 5.3 Software Applications

The following applications are supported for all compatible operating systems.

### 5.3.1 SMS Client

The SMS client allows users to receive and send short messages. Messages are organized into multiple folders: Inbox, Outbox, Draft, Sent and Trash. Users can manage their short messages in various folders. Refer to [2] for detailed specification of the SMS client.

### 5.3.2 Connection Manager

The Connection Manager serves the following functions as described in [1]:

- Installation Wizard that guides user through the PC Card installation process.
- Activation Wizard that guides the user through the PC Card activation process.
- Skinnable User Interface in for Full View, Compact View and system tray modes. The Full View Mode UI supports the following functionalities:
    - Indicator area that displays the status information of the PC3220
        - Signal Strength
        - Roaming Status
        - Data Compression
        - Connection Time
        - Byte Counts
        - Service Status
    - Action area that allows user to perform various functions:
        - Power button
        - Connection Profile

- Connect / Disconnect
- SMS
- Call Logs
- Settings
- Help
- Switch to compact mode
- Close window

  - Navigation Area that allows user to switch between Full and Compact modes and exit the UI

- Settings that provides end user and advanced settings, and ##hidden windows.
  - End user settings include:
  - Advanced settings include:
  - ##hidden windows used for manual activation

### 5.3.3 IOTA Client

The Openwave compliant IOTA client supports IS-683-A/B tunneled messages as defined in [42]. See section 2.7.2 for details on supported features. .

## 5.4 Support Tools

The PC3220 supports the following third-party support tools:

- CDMA Air Interface Tool (CAIT) from Qualcomm
- QXDM from Qualcomm
- Universal Diagnostic Monitor (UDM) from Spirent Communications
- Universal Product Support Tool (UPST) from Spirent Communications

Third party support tools may be used in either of two modes:

- Host Resident – The tool runs on the same Host PC that contains the PC3220. Operation of support tools shall not interfere with the concurrent normal operation of the PC Card.

- Pass Through Mode – In this case the support tools runs on a separate PC from the Host PC that contains the PC3220. Support tool information is passed from the PC3220 through the Host PC out an external serial port to the PC running the support tool.

# 6 ENVIRONMENTAL RESISTANCE SPECIFICATION

The PC3220 shall support the environmental requirements for PC Cards as specified in volume 3, section 9 of the PC Card Standard in reference [25].

## 6.1 Operating Environment

- Operating Temperature: -20°C / '+60°C
- High Temperature Operating: +55°C / 96 hours
- Low Temperature Operating: -20°C / 96 hours
- Humidity Operating: +60°C @ 15-95% R.H.

## 6.2 Non-Operating Environment

- Storage Temperature: -30°C / +65°C
- High Temperature Storage: +65°C @ 90-95% R.H. / 96 hr
- Low Temperature Storage: -30°C / 96 hr
- Thermal Shock:
  - Temp Range -30°C / +65°C
  - Dwell Time 20 minutes at each extreme
  - Transition Time 5 minutes, shall not exceed
  - Cycles Total 100 cycles

## 6.3 Mechanical Testing

### 6.3.1 Sinusoidal Vibration

- Peak Acceleration 15 g
- Sweep Range 10-2000 Hz
- Sweep Rate 20 minutes per / cycle
- Repeat Cycles 12 X,Y,Z axis / 36 Total Cycles

### 6.3.2 Mechanical Shock

- Peak Acceleration 50 g
- Pulse Duration 11 miliseconds
- Impacts Total 6x3 X,Y,Z +/- axis / 18 Total Shocks

### 6.3.3 Free Fall Drop

- Distance: 1 meter
- Drops Total: 6x3 X,Y,Z +/- axis / 18 Total (Vinyl Surface)

### 6.3.4 Insertion / Extraction

- Cycles 10,000 cycles
- Insertion Force 3 kg
- Extraction Force 680 g

### 6.3.5 Inverse Insertion

- 6 kg, 1 minute, 25mm/minute
- Repeat Cycles: 5 times

### 6.3.6 PC Card Bend Force

- 2 kg, 1 minute
- Repeat Cycles: 5 times in each direction

6.3.7 PC Card Torque Force

- 126 g/m, 5 minutes
- Repeat Cycles: 5 times in each direction

6.3.8 Electrostatic Discharge (ESD)

- Contact Discharge: +/-1.5kV
- Air Discharge: +/-15kV

6.3.9 Antenna Cycling

- 10000 cycles

# 7 PHYSICAL SPECIFICATION

## 7.1 Form Factor

The PC3220 is an extended type II PC Card as specified in Volume 3 Section 11 of [25]. The PC Card shall be keyed for low voltage operation only. The PC3220 provides a grip feature to help with PC Card extraction as shown in Figure 1. A Zinc Die-cast housing is used for upper and lower shields. A bi-color (green and red) LED is provided on the top of the PC Card. The PC3220 has an external flip up antenna on top of the extension housing.

- Weight: ~64g

## 7.2 Dimensions

- Length: 116.8mm (Extends out beyond the PC Card slot housing by 30.8 mm)
- Width: 54.0mm
- Thickness (w/ label): 5.1mm
- Thickness of the antenna extension: 11.0mm

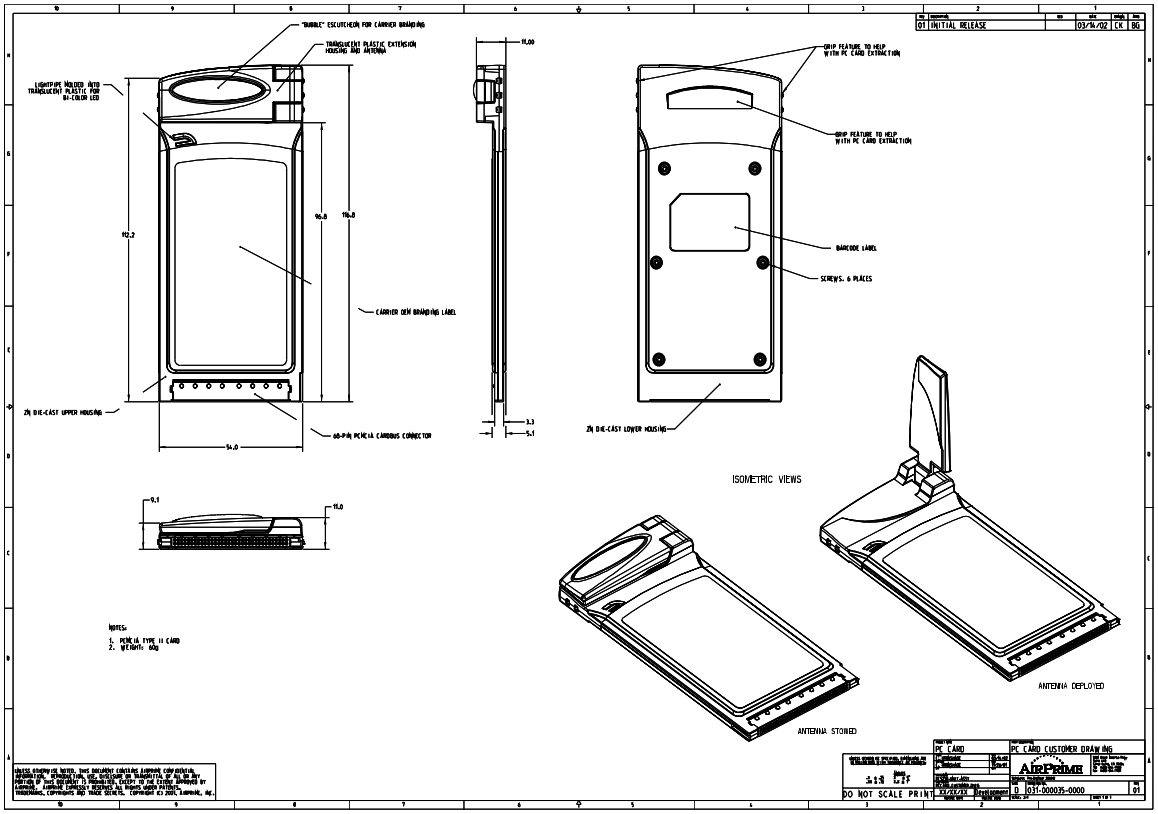


Figure 1: PC3220 PC Card Mechanical Drawing

## 7.3 Labeling

The PC3220 will be labeled on both the top and bottom side.

### 7.3.1 Top Side Label

- Size: 70mm x 40mm (max)
- Non-Removable
- Contents:
    - OEM Logo
    - Product Name

### 7.3.2 Bottom Side Label

- Size: 40mm x 20mm
- Non-Removable
- Contents:
    - OEM Part Number
    - FCC ID
    - Manufacturing Date Code
    - Qualcomm license acknowledgement: ” Qualcomm 3G CDMA”

## 7.4 Packaging

The PC3220 will comply with customer’s packaging requirements.

# A. APPENDIX A – SERVICE OPTION SUPPORT

Table 12- Service Option Support

| Service Option (SO) | Description | Supported? |
|---|---|---|
| 1 | Basic Variable Rate Voice Service | No |
| 2 | Mobile Station Loopback (RS1) | Yes |
| 3 | Enhanced Variable Rate Voice Service (8kbps) | No |
| 4, 4100 | Asynchronous Data Service (RS1) | Yes |
| 5, 4101 | Group 3 Facsimile (RS1) | No |
| 6 | Short Message Services | Yes |
| 7, 4103 | Packet Data Service (IP Stack Only) | No |
| 9 | Mobile Station Loopback (RS2) | Yes |
| 12 | Asynchronous Data Service (RS2) | Yes |
| 13 | Group 3 Facsimile (RS2) | No |
| 14 | Short Message Services | Yes |
| 15 | Packet Data Service (IP Stack Only) | No |
| 17, 32768 | High Rate Voice Service (13K) | No |
| 18-19 | Over-the-Air Service Administration | No |
| 20-21 | Group 3 Analog Facsimile | No |
| 22-25 | High Speed Packet Data Services | No |
| 30-31 | Supplemental Code Channel Loopback | No |
| 32 | Test Data Service Option (TDSO) | Yes |
| 33 | 1X High Speed Packet Data Services | Yes |
| 35-36 | Location Services | No |
| 54 | Markov Service Option (MSO) | Yes |
| 55 | Loopback Service Option (LSO) | Yes |
| 32798 | Markov Calls (RS1) | Yes |
| 32799 | Markov Calls (RS2) | Yes |