



PDK User's Guide

Preface Personal Media Device

**ADVANCE INFORMATION - Subject to Change
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Section 1. Introduction

1.1 Abstract

The NVIDIA® Preface Personal Media Display (PMD) product suite adds new capabilities to notebook and desktop computers and range of other applications, including appliances, picture frames, luggage, and wearable displays. The design employs an NVIDIA system-on-chip (SoC) controller with AS3514 integrated audio codec, and low-drop-out switching regulators supplying power to a dual, symmetric ARM7-based, core. The design incorporates product and firmware development environment, signal validation, lot testing, and manufacturing considerations.

The NVIDIA® Preface™ product suite provides the premier platform for Windows Vista Sideshow, containing the NVIDIA CPU, memory, flash, USB and Bluetooth components needed to implement Microsoft VISTA-compatible devices.

Preface is a fully qualified and certified solution on a small 1-inch x1.2-inch PCB.

This Guide describes the Product Development Kits (PDKs) that facilitate the design and integration of PMD systems into target systems.

1.2 Functional Overview

This Guide describes three PDKs used to integrate Preface PMDs into target systems. These kits include hardware and firmware targeted to various development activities. (For a complete list of PDK contents, see Section 1.3 on page 4.) The hardware provides an integrated platform for developing digital audio/video players. Firmware is available for a variety of development activities and applications.

The PMD hardware is powered by the host computer's battery, and therefore does not require a separate power cable for the PMD, enabling the PMD to continue to access the data in the host computer long after the battery stops powering the primary operating system and/or displaying the primary LCD.

1.2.1 Features and Benefits

The Preface PMD platform enables quick startup to access data in the host computer using the low-power PMD display instead of the notebook's primary display, thereby saving power while cutting time to boot the main operating system. Data transfer from the notebook is through USB.

The Preface PMD platform offers the following benefits:

- *Always on* display and user interface
- Instant access to applications, gadget data and media content
- Hundreds of hours of battery life for music playback on notebooks
- Customer visible product differentiation
- Microsoft SideShow gadget technologies and built-in multimedia capability. For details see Section 1.2.5 on page 3 and the following Web page:
www.microsoft.com/windowsvista/features/foreveryone/sideshow.msp
- Alarm function

- SMBus connectivity with the controller embedded in the host computer that supports the following operations:
 - Retrieval of notebook system state information
 - Notification of system software (BIOS and/or OS) about PMD related events

For more information, see the *Personal Media Display and Notebook Embedded Controller Interface Specification*. **Not an easy document to find.**

1.2.2 Hardware Resources

The Preface PMD platform supports the following:

- LCD display operating at 2.9 V with 15 V built-in backlight support (for details see Section 1.2.4)
- Seven-key keypad (for details see Section 1.2.4)
- NAND flash operating at 3.3 V
- Mobile SDRAM operating at 1.8 V
- 64-KB EEPROM for booting
- USB 2.0 interface
- UART connectors (For details see Section 2.4, “Establishing UART Connectivity”, on page 15.)
- 20-pin JTAG scan connector for debugging and in-circuit emulation
- DC power input connector
- Built-in DC regulator supply for 1.2 V, 1.8 V, 3.3 V, 2.9 V, and 15 V
- Li polymer battery (optional)
- ~~Pads for RS232 external DB9 connector module STRIKE??~~
- Connectors and solder pads for other I/O buses and signals (list all??)

Hardware resources depend on the Preface Module (PM). For details, see Section 1.4 on page 7.

1.2.3 Supported Functions

The PMD development platform supports the following:

- High-speed USB 2.0 Enhanced Host Controller Interface (EHCI) device mode
- Communication through USB with the host computer for data transfer
- Serial communication for infrared for remote control function
- I²S and I²C capability
- Alarms and alerts functions
- SMBus messaging support (BIOS Interface)
- Universal Remote Interface for Windows SideShow navigation keys
- Bluetooth:
 - Bluetooth certified, with Bluetooth ID and serial numbers
 - Multiprofile support
 - Class 1 support (range up to 300 feet)
- HID support on Bluetooth
- Expanded Universal Remote Interface to propagate signals to all keys
- Power on/off switch
- Reset switch

1.2.4 Human Interface Functions and Driver Support

- Keypad support
- Touchscreen support: 7-button, region-sensitive only
- Toppoly display drivers for 2.5-inch and 3.5-inch support
- Innolux display driver for 2.5-inch display
- TopSun display driver for 2.8-inch display
- Audio connector for headphone/audio out
- Fingerprint authentication

1.2.5 Supported Third-Party Gadgets

The Preface Gadget Bridge supports the following gadgets:

- CompanionLink:
 - RSS Viewer
 - Traffic Cameras
 - Security Cameras
 - Web Pictures
 - Countdown timer
 - Alarms & Alerts
 - Application Launcher
 - System Monitor
- Lagotek
 - Lighting/Scene Control
 - Music & Entertainment
 - Security Cameras
- Dr. Neil
 - Route Planner

In all, Preface supports:

- 608 Windows Live Gadgets
- 3,604 Yahoo! Widgets
- 2,621 Google Gadgets

1.2.6 PDK Overview

The PDKs are customized for specific development activities and target applications. The PDKs and their primary use are as follows:

- PDK1: Prototyping or gadget development
- PDK2: Hardware development and testing
- PDK3: Hardware and firmware development

The PDKs are described in more detail in Section 1.3 on page 4.

1.3 Product Development Kit Contents

1.3.1 Contents – All Kits

This section describes the standard contents for Product Development Kits (PDKs).

Documentation

- Application porting guide
- Quick Start Guide
- Welcome note
- Regional contact list
- NDA form

Hardware

- Baseboard containing either Preface Module 1 or Preface Module 2. (For module details, see Section 1.4 on page 7.)
- An LCD, either of the following:
 - 2.5-inch QVGA
 - 3.5-inch QVGA with touch screen
- Lithium polymer battery: **In a finished product, the PMD can derive its power from the host computer's battery; therefore, a dedicated PMD battery is optional. The baseboard contains such a battery. If needed, the SoC can support a charge out. PLEASE CHECK!!**
- USB input connector and cable
- Connectors and solder pads for other I/O buses and signals
- **Power on/off switch??**

Software

- FTP key to all common downloadables
- Gadgets and gadget bridge
- NVIDIA/CompanionLink gadget demo suite
- Standard embedded firmware

1.3.2 Contents – Individual Kits

In addition to the standard contents described above, the PDKs contain the specialized components described in this section.

PDK1

This PDK is primarily for prototyping or gadget development. It contains the following components:

- 724_A01 baseboard with PM1 or PM2
- External seven-key keypad
- FTP1 key

PDK2

This PDK is primarily for hardware development and testing. It contains the following components:

- 723_A03 baseboard with PM1 or PM2
- Built-in seven-key keypad
- Reset switch (in addition to power on/off switch)
- DC power input adapter
- 2 UART connectors
- JTAG connector
- FTP keys to all of the following:
 - FTP2
 - Software Development Kit (SDK)

PDK3

This PDK is primarily for hardware and firmware development. It contains the following components:

- 723_A03 baseboard with PM1 or PM2
- Built-in seven-key keypad
- Reset switch (in addition to power on/off switch)
- DC power input adapter
- 2 UART connectors
- JTAG connector
- FTP keys to all of the following:
 - PDKs 2 and 3
 - Firmware Development Kit (FDK)
 - Software Development Kit (SDK)
- Firmware library with Windows SideShow

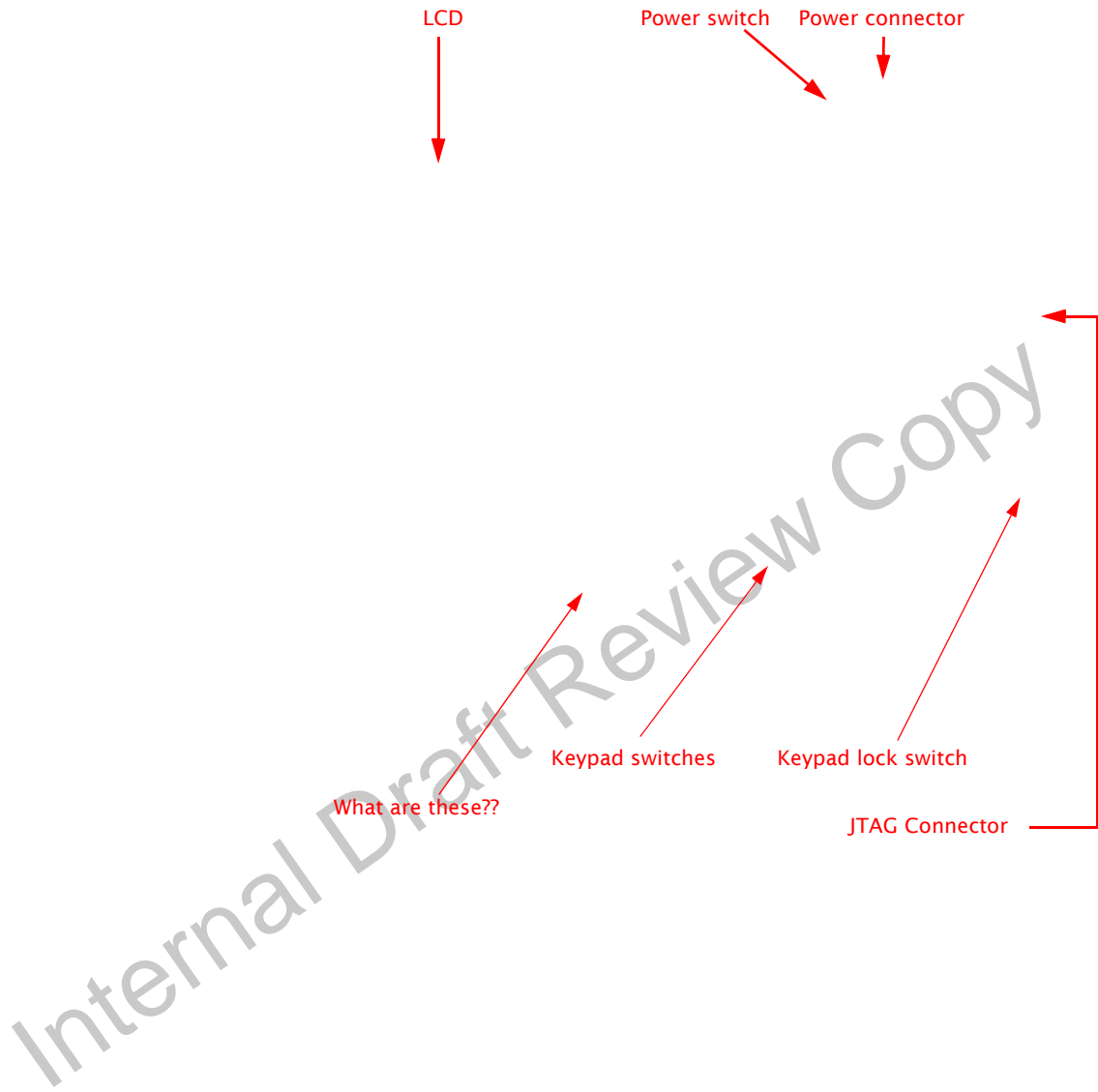
Figure 1 shows the top and bottom view of the hardware platform provided with PDK1.

Figure 1: Hardware Platform for PDK1



Figure 3 shows the top view only of the hardware platform provided with PDK2 and PDK3.

Figure 2: Hardware Platform for PDK2/3



1.4 Interchangeable Preface Modules

Each PDK is available with either of the following Preface Modules (PMs):

- “Preface Module 1”
- “Preface Module 2” on page 10

Table 1 compares the features of PM1 and PM2.

Table 1: Feature Comparison – PM1 & PM2

| Feature | PM1 | PM2 |
|--------------------------------|-----------------------|---------------------|
| SDRAM ¹ | 32 MB or 64 MB | 32 MB or 64 MB |
| Flash Memory ¹ | 4- or 8-MB NOR | 256-MB or 1-GB NAND |
| LCD Panel Support | Yes | Yes |
| Audio In | No | Yes |
| Audio Out ² | No | Yes |
| Battery | Optional ³ | Yes |
| Battery charger | Optional ³ | Yes |
| Bluetooth Class 1 ⁴ | Optional ³ | Yes |
| Keypad | Yes | Yes |
| Serial IR Interface | Yes | Yes |
| Touchscreen | Yes | Yes |
| UART | Yes | Yes |
| USB 2.0 | Yes | Yes |
| Vista Compliant | Yes | Yes |

1. The PMs are available with a choice of memory sizes, which may be offered with different SKUs, depending on customer demand.
2. Audio output requires headphones (not included).
3. Optional configurations may involve increased lead times to market due to component availability and testing.
4. Bluetooth configurations require a Bluetooth dongle (not included) that supports Microsoft Bluetooth drivers.

1.5 Bluetooth Support

The functionality of your Preface implementation will depend on whether the PM you choose supports Bluetooth, in addition to USB. Bluetooth support changes how SideShow protocol is supported, and adds functions that are not supported with USB alone. Table 2 shows how Bluetooth support affects Preface functionality.

Table 2: Bluetooth Support

| Functionality | PM without Bluetooth | | PM with Bluetooth | |
|---|----------------------|-----------|-------------------|-----------|
| | Supported? | Interface | Supported? | Interface |
| Music Transfer Protocol (MTP) for music, photograph and video formats | Yes | USB | Yes | USB |
| SideShow Protocol and Gadgets | Yes | USB | Yes | Bluetooth |
| Human Interface Device (HID) protocol | No | - | Yes | Bluetooth |
| Headset/handsfree with microphone | No | - | Yes | Bluetooth |
| Stereo headphone through Advanced Audio Distribution Profile (A2DP) | No | - | Yes | Bluetooth |

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1.5.1 Preface Module 1

This section describes the Preface Module 1 (PM1) target applications, and hardware and software components.

PM1 Target Applications

- Desktop computers, keyboard companion
- Remote control

PM1 Hardware Components

PM1 has the following hardware components and options:

- PP5022 SoC/SiP
- 32-MB SDRAM (3.3V) with optional upgrade to 64 MB
- 4-MB NOR flash, with optional upgrade to 8 MB
- EEPROM
- USB connectivity
- Bluetooth Class 1 (Optional)
- Power management: optional on-board

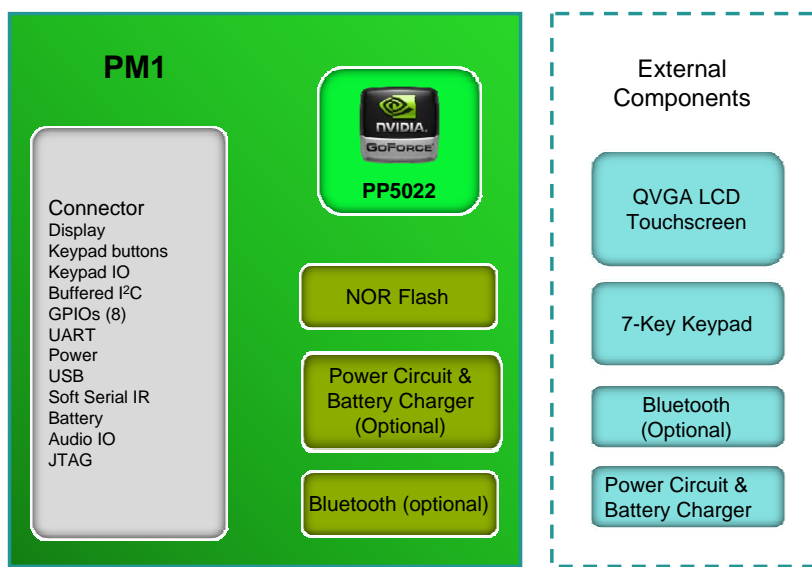
PM1 Software Components

PM1 comes with the following software components and options:

- Hardware drivers
- Preface framework
- Bluetooth drivers (optional)
- Preface GUI

Figure 3 contains a block diagram of PM1.

Figure 3: PM1 Module Block Diagram



1.5.2 Preface Module 2

This section describes Preface Module 2 (PM2) target applications, and hardware and software components.

PM2 Target Applications

- Notebook computers, in-lid companion, Sideshow devices

PM2 Hardware Components

PM2 has the following hardware components and options:

- PP5024 SoC/SiP processor
- 32-MB SDRAM (3.3 V) with optional upgrade to 64 MB
- 256-MB NAND flash, with optional upgrade to 1GB
- EEPROM
- USB connectivity
- Bluetooth Class 1
- Battery, Lithium polymer
- Battery charger
- Audio output, either of the following:
 - Stereo with headphone profile
 - Headset with mono hands-free profile
- On-chip power management

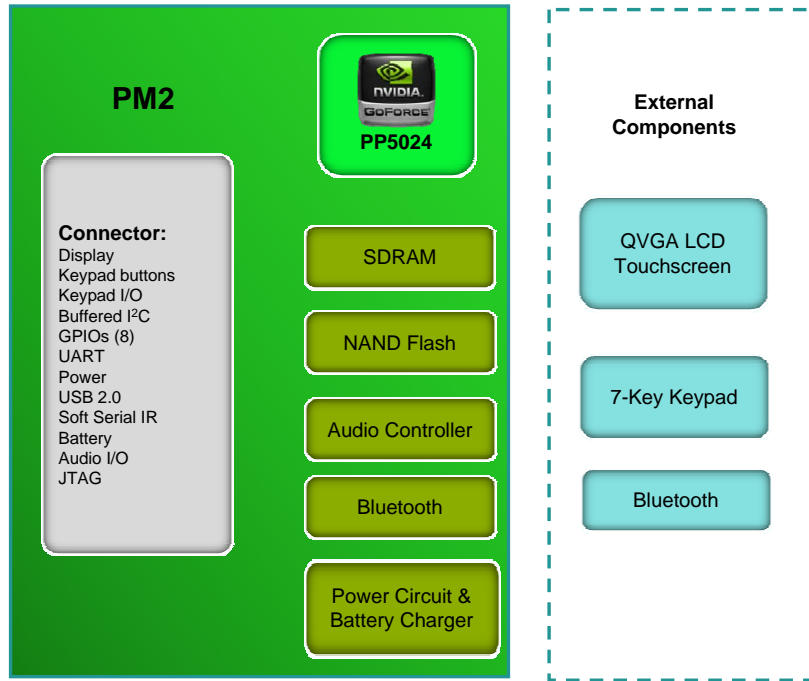
PM2 Software Components

PM2 comes with the following software components and options:

- Hardware drivers
- Preface framework
- Bluetooth drivers
- Bluetooth audio
- Preface GUI
- Photo viewer
- SideShow
- Music Player
- Skype Dialer
- NVIDIA Endpoints
- NVIDIA/CompanionLink gadget demo suite
- NVIDIA Gadget Bridge

Figure 4 contains a block diagram of PM2.

Figure 4: PM2 Module Block Diagram



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Section 2. Getting Started – PDK2/3 Only??

Note: For instructions on PDK1, refer to...

2.1 Powering up the Board

1. To power up the board, do either of the following:
 - Turn on your computer and plug in the supplied USB cable. (The board powers up on its own.)
 - Plug in the supplied DC adapter, turn on the power switch (move SW1 down) and press the power on/off switch (SW11). For details on the switches, see Table 3 on page 13.
2. Open the computer's Device Manager and verify that the Preface PMD is recognized by the system. The PMD should be listed under Windows SideShow. The computer may search for and install a driver automatically.
3. Open the SideShow Control Panel and click the Preface PMD icon.
- 4.
5. Test your connection to the PC by verifying whether the gadgets on the PC are downloaded to the Preface PMD.
- 6.

A **typical??** display after booting is shown in Figure 5.

Figure 5: Screen Display After Powering Up



Use the baseboard button switches, or the touch-sensitive LCD, to access the various menu options, as described in Section 2.2 on page 13.

2.2 Understanding the Baseboard Keypad Switches

This section describes the baseboard keypad switches shown in Figure 6. For details on how to use the switches, see the *NVIDIA® Preface™ Software Development Kit Built-in Applications Users' Guide*. [Does this document really exist??](#)

Figure 6: Baseboard Keypad Switches

The switches in Figure 6 are described in Table 3.

Table 3: Baseboard Keypad Switches

| Description | Reference Designator PDK1 | Reference Designator PDK2/3 | Comments |
|--------------------------|---------------------------|-----------------------------|---|
| DC Power On/Off | SW1 | | Powers the board on or off when the DC power input is connected. Off=Switch is up; On=Switch is down |
| System Reset | SW2 | | Press once to reset system |
| Keypad PREVIOUS/ LEFT | SW3 | | On the Play screen, skips to previous song. During manual SideShow player operation, returns to the previous slide. On other screens, returns to the previous menu. |
| Keypad UP | SW4 | | Scrolls up any list window. In the Music Player Play screen, increases the volume. |
| Keypad SELECT | SW5 | | Selects a highlighted choice. Plays selected media from the playlist. In the Music Player during playback, toggles pause on and off. |

Table 3: Baseboard Keypad Switches (Cont.)

| Description | Reference Designator PDK1 | Reference Designator PDK2/3 | Comments |
|-------------------|---------------------------|-----------------------------|--|
| Keypad RIGHT/NEXT | SW6 | | On the Play screen, skips to next song. During manual SideShow player operation, advances to the next slide SIDESHOW OR SLIDESHOW. Has no effect on HOME and PLAY screens. On screens other than Home and Play, has the same effect as the SELECT key. |
| Keypad DOWN | SW7 | | Scrolls down any list window. In the Music Player Play screen, decreases the volume. |
| Keypad MENU | SW8 | | Displays a Context menu with various options. |
| Keypad BACK | SW9 | | Returns to the previous menu in most screens. Cancels any Context menu. |
| N/A | SW10 | | Not stuffed?? ¹ |
| System On/Off | SW11 | SW11 | On=Press once; Off=Press and hold for 10 seconds |
| Keypad Lock | SW12 | SW12 | Unlock=Switch is up; Lock=Switch is down |

1. I added this because otherwise it looks like an omission..

2.3 Identifying Jumpers and Connectors

The baseboard switches in Figure 6 are described in Table 4.

Table 4: Connectors and Jumpers

| Description | Reference Designator | Comments |
|--------------------------------|----------------------|--|
| Battery connector | J2 | - |
| UART connector | J5 | - |
| Toppoly 2.5-inch LCD connector | J13 | - |
| Toppoly 3.5-inch LCD connector | J14 | - |
| Samsung 3.5-inch LCD connector | J16 | - |
| JTAG connector | J18 | - |
| Battery switch bypass | J19 | PM1: To set, install jumper on pins 2 and 3. PM2: To set, install jumper on pins 1 and 2. |
| TS_BUSY* signal select | J20 | To set, install jumper on pins 2 and 3. |
| USB_VBUS signal select | J21 | To set, install jumper on pins 2 and 3. |

2.4 Establishing UART Connectivity

The UART connectivity can be established on the baseboard to use the serial port message capture terminal for application debug messages. To do this, attach the DC power input and connect a UART module with a DB9 connector, as described below:

- Connect UART (J5) pin VCC to R56, right side. (Where is R56 physically on the board?? I think it is too small for a label.. Are you sure customers can do this??)
- Connect UART (J5) TX pin to B2B connector (J1) pin 15.
- Connect UART (J5) RX pin to B2B connector (J1) pin 16.
- Connect UART (J5) GND pin to B2B connector (J1) pin 20.

Note: DC power input is required for UART connectivity.

Figure 7 shows the UART connector.

Figure 7: UART Connections

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2.5 Transferring Files Using USB

Files can be transferred on the baseboard using the USB in the following modes:

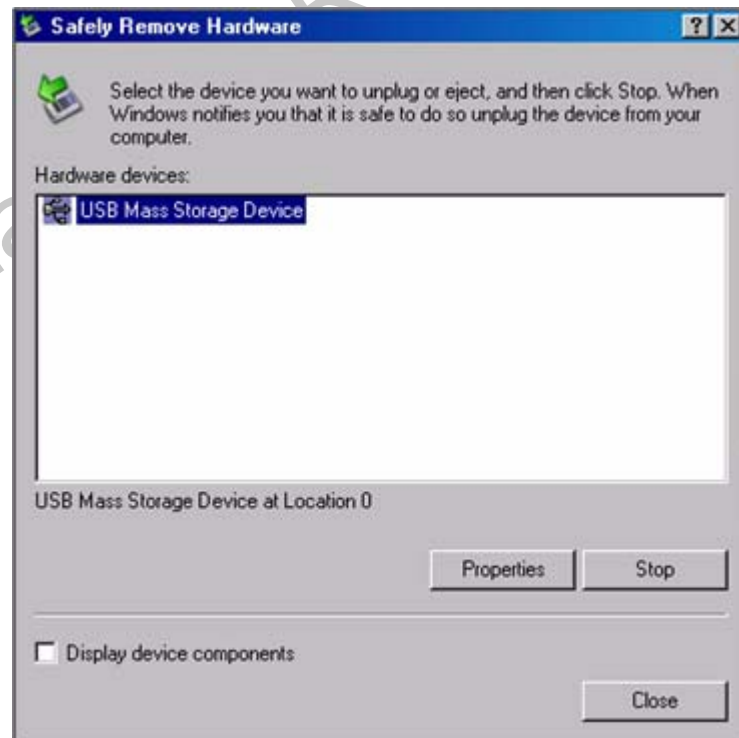
- “Mass Storage Class Mode” in Section 2.5.1
- “Media Transport Protocol Mode” in Section 2.5.2

2.5.1 Mass Storage Class Mode

Use the Mass Storage Class (MSC) mode for transferring files using USB to upgrade the firmware. Follow these instructions:

1. To see the primary boot loader menu options, reset the board by simultaneously pressing the reset switch and the SELECT key (SW5).
 2. Select the PREVIOUS key (SW7) for Upgrade Firmware option.
 3. Connect the USB cable, if not already done.
 4. A removable disk of 16-MB displays in Windows Explorer (see Figure 8 on page 16).
 5. Transfer (copy) the secondary boot loader and the firmware image (*.mi4) file.
 6. Safely remove the hardware from the PC by clicking the Safely Remove Hardware icon in the system tray and following the instructions in the operating system instructions.
- The device upgrades the firmware, resets automatically, and boots with the upgraded image. **Don't see the need for this--can we strike it??**

Figure 8: Using Mass Storage Class Mode



2.5.2 Media Transport Protocol Mode

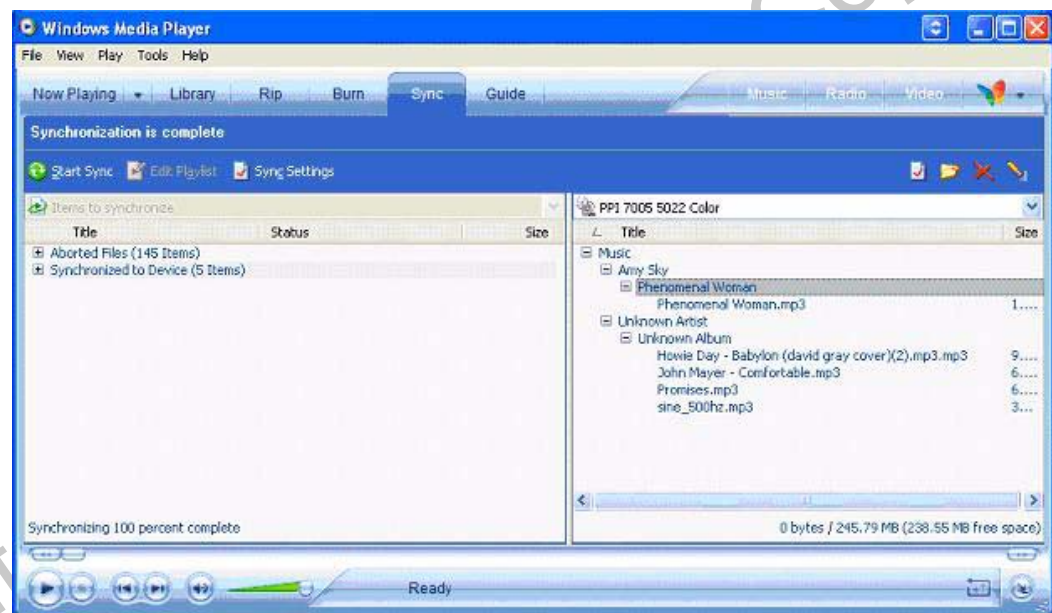
To synchronize files using Media Transport Protocol (MTP) mode, follow these instructions:

1. Open Microsoft® Windows Media® Player and click the Sync Tab.
2. Connect a USB cable from the baseboard to the PC.
A window displays with automatic and manual options.
3. Choose the automatic option to synchronize all media on your PC, or choose the manual option to drag and drop songs of your choice.
4. For the manual option, drag and drop songs to the Sync List on the left pane as shown in Figure 9 on page 17, and click Start Sync.

Synchronization of the songs starts, and the songs are displaying in the right pane.

Note: While transferring songs, playback is stopped. You may resume playback with the new content after the transfer is complete.

Figure 9: Synchronize Songs in Windows Media Player



Note: You can also add content through Windows Explorer to the MTP device. However, the content will not be displayed by Windows Media Player.

Note: Only content supported on the MTP device can be added to the baseboard using Windows Media Player.

Section 3. Using the Skype Gadget

The Preface™ Skype gadget enhances notebook computer, in-lid, PMD applications. The Skype gadget integrates the Voice-over-Internet Protocol (VoIP) capability with Windows Vista SideShow, enabling users to make and receive calls through Skype. The gadget uses USB to interface between the PMD and the notebook computer.

3.1 Introduction

This Preface™ Skype phone gadget interfaces with the notebook computer's Skype application, enabling feature-rich access to Windows Vista Sideshow and the following Skype functions:

- Access and browse the contacts list, including all details.
- View incoming call and caller information.
- Receive and make calls.
- Receive (but not send) instant messages or text messages.
- View call status, including connect time.

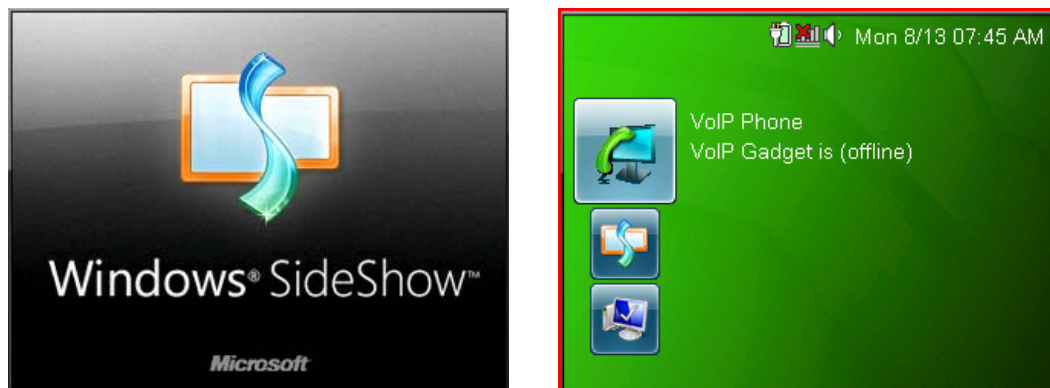
3.2 About Skype

Skype provides peer-to-peer Internet telephony networking and application software to broadband customers who want to integrate computer-based and phone-based communications. Skype offers instant messaging, file transfer, and voice and video conferencing.

3.3 Getting Started

When you start up the PMD, it displays the Windows SideShow splash screen, shown in Figure 10 (left), and then enters the Home screen, shown in Figure 10 (right). The Home screen contains icons for built-in applications and gadgets.

Figure 10: Windows SideShow Splash Screen and Home Screen



Understanding the Baseboard Keypad Switches

The switches are defined in Figure 6 and Table 3 on page 13. These switches are referred to by name throughout the remainder of Section 3.

Using the Home Screen

Use UP and DOWN to highlight the desired gadget icon. The icon is magnified and its name appears, followed by application-specific information. For example, Figure 10 (right) shows the Skype gadget icon, VoIP Phone, highlighted.

Note: Figure 10 (right) shows Skype gadget glance data shows that Skype is *offline*, which means the notebook computer's Skype application is not activated. Skype must be online for the gadget to work.

Using the Context Menu

Pressing MENU displays the Context menu, which differs from screen to screen based on the *context* of the screen already displayed when MENU is pressed. When the Context menu is displayed, use UP and DOWN to highlight the desired command. Press SELECT to execute the command.

3.4 Skype Gadget Functions

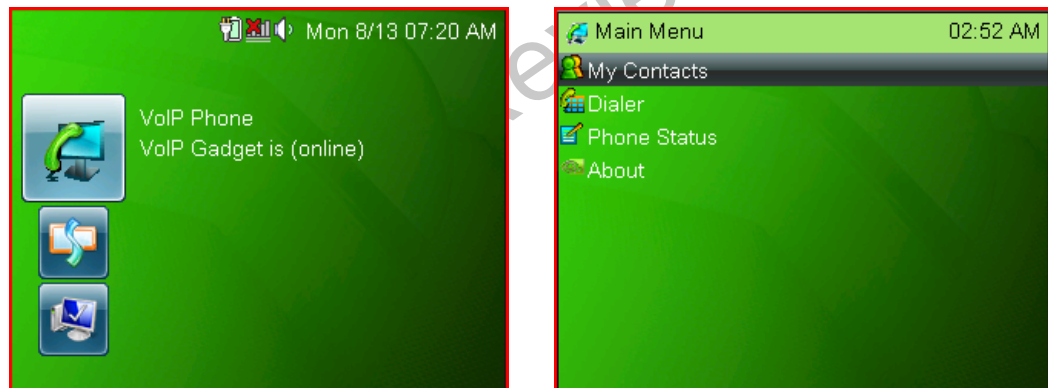
This section describes the following gadget functions:

- “To Activate a Skype Gadget” on page 20
- “To Browse Contacts” on page 20
- “To Make Calls Using Contacts” on page 21
- “To End a Call” on page 22
- “To Receive a Call” on page 23
- “To Receive a Text Message” on page 23
- “To Make a Call Using the Dialer” on page 24
- “To Show Phone Status” on page 24
- “To Lock or Unlock Keypad Buttons” on page 25
- “To Delete Cached Data” on page 25

To Activate a Skype Gadget

In the Home screen, use PREVIOUS or NEXT to highlight the Skype gadget icon, as shown in Figure 11 (left), then press SELECT. The Skype gadget menu is displayed, as shown in Figure 11 (right).

Figure 11: Skype Gadget Menu

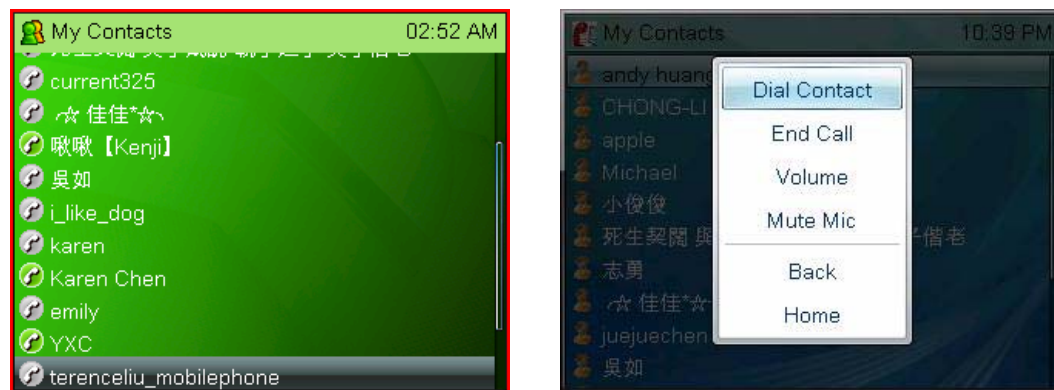


To Browse Contacts

In the Skype gadget menu, use UP and DOWN to highlight My Contacts, then press SELECT. The Contact list menu appears, as shown in Figure 12 (left).

Alternatively, press MENU, highlight View Contacts, and press SELECT. For more on contacts and making calls, see “To Make Calls Using Contacts” on page 21.

Figure 12: Contacts Menu and Contact Pop-up



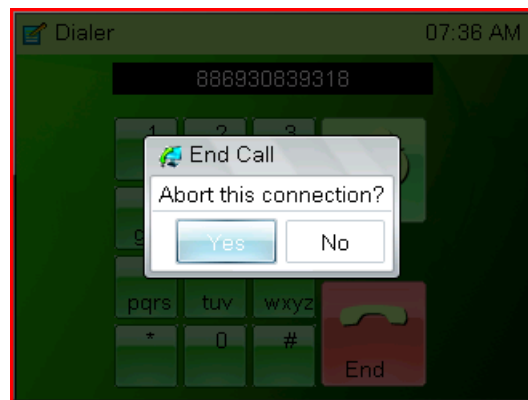
The Contact list displays the following types of contact status, as shown in **when you press MENU??:**

Graphic needed??

- Contact online
- Contact offline
- Phone redirect contact available

Figure 13: Contact Details and Abort Connection

Place Contact Details here.



To Make Calls Using Contacts

Use UP and DOWN to highlight a contact in the Contacts menu, shown in Figure 12 (left), then press SELECT. A pop-up menu appears, as shown in Figure 12 (right). Highlight Dial Contact and press SELECT.

If there already is a connection when you select the contact, the message *Abort current connection?* is displayed, as shown in Figure 13 (right). Select *Yes* to drop the current connection and initiate the new call. Select *No* to do nothing and return to the contact list.

When the call is initiated, the following information is displayed on the status screen, as shown in Figure 14 (left):

- Caller ID: Contact name
- Call Status: *Dialing, Connected, etc.*
- Call Duration
- If previous contact is connected, it will pop out message with “Abort current connection?” if you press “Yes”, it will drop current connection and initial the new contact dialing. No, do nothing, back to contact list.

Figure 14: Phone Call Status Menu – Connected



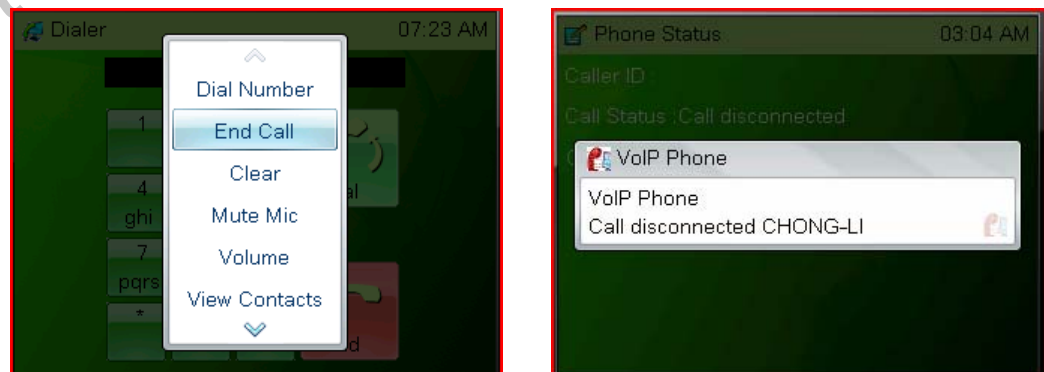
To Adjust the Call Volume

Press MENU and select Volume, as shown in Figure 14 (right). The volume control on the PC side is activated.

To End a Call

Any time you are in a call, press MENU and select End Call, as shown in Figure 15 (left). The display changes, as shown in Figure 15 (right).

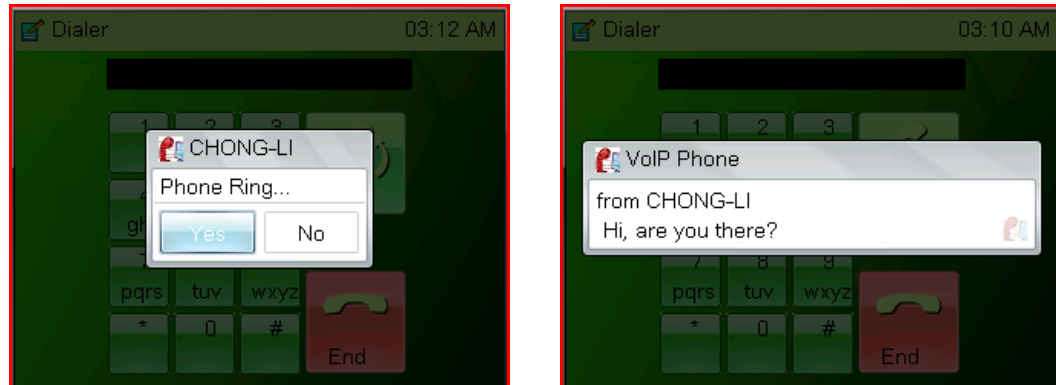
Figure 15: Phone Call Status Menu – Disconnected



To Receive a Call

When a call arrives, a pop-up showing the contact's name or caller ID is displayed, as shown in Figure 16 (left). Highlight Yes to answer the call or No to decline it, then press SELECT.

Figure 16: Receiving Calls and Text Messages



Note: When receiving an incoming call, music playback stops. If you want to continue listening to music after you respond to the call, either by answering or declining the call, you need to manually restart music playback.

To Receive a Text Message

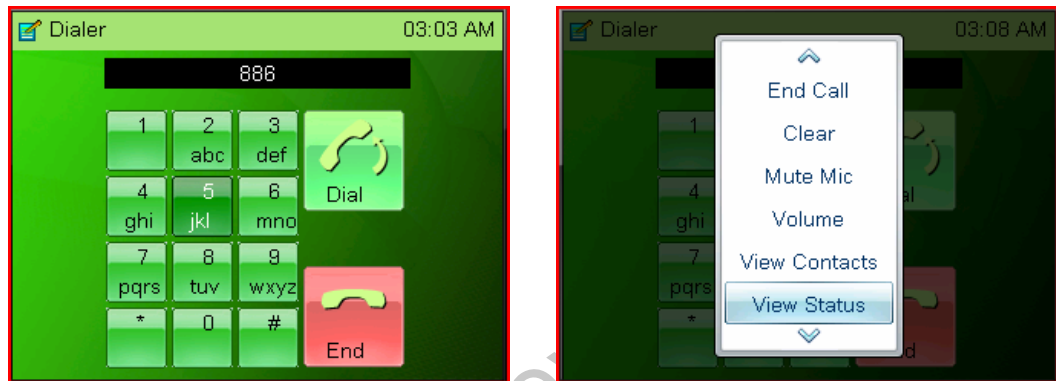
When a text message arrives, a pop-up containing the contact's name or caller ID and message is displayed, as shown in Figure 16 (right). You can read the message, but you cannot respond to the sender using text—you can call sender.

To Make a Call Using the Dialer

1. In the Main menu, use UP and DOWN to select Dialer, then press SELECT. The Dialer menu appears, as shown in Figure 17 (left).
2. Use UP, DOWN, LEFT, and RIGHT to highlight the desired numbers and press SELECT. The selected number is displayed above the dial pad.
3. When done, highlight the Dial key and press SELECT.

If you make a mistake, use press MENU and select Clear, shown in Figure 17 (right) to start over.

Figure 17: Dialer Menu



To Show Phone Status

In the **Main menu**, use UP and DOWN to highlight PC Status, then press SELECT, as shown in Figure 18 (left). Current phone connection status is displayed, including:

- Caller ID: Contact name
- Call status: *Disconnected / Connecting / Connected*
- Call Duration: Total duration of previous connection, or incremental counting for connected calls.

Figure 18: Main Menu



Add PC status screen

Information contained on the PC status screen are... as shown in Figure 18 (right):

To activate the Music Player

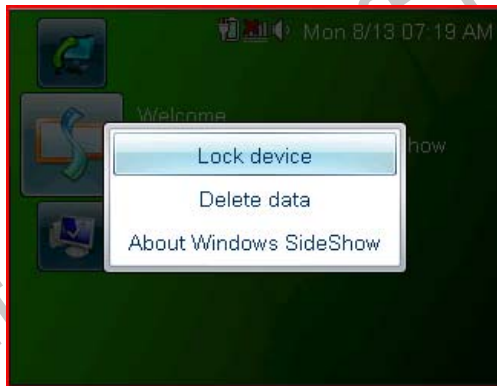
On the Home screen, press PREVIOUS or NEXT to highlight Music Player as shown in Figure 19, then press SELECT. The screen changes, as shown in Figure 19 (right)

Figure 19: Music Player Icon

Show Music player menu

To Lock or Unlock Keypad Buttons

From the Icon menu, press MENU. Use UP and DOWN to highlight Lock Device as shown in Figure 20 (left), then press SELECT.

Figure 20: Context Menu

Place Delete Data here.

An icon on the status bar shows that the keypad is locked. If you press a button while the device is locked, a message is displayed. To unlock the buttons, press the SELECT key.

To Delete Cached Data

From the Icon menu, press MENU. Use UP and DOWN to highlight Delete Data as shown in Figure 20 (right), then press SELECT. The message *Are you sure....?* is displayed. Highlight Yes and press SELECT to clear all the cached data associated with the gadget.

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Appendix A. Preface Part Numbers

Table 5 lists the part numbers for the PDKs and PMs.

Table 5: Preface Numbers

| Description | Part Number |
|--------------------------|---------------------|
| PDK1 | 940-10724-0002-000 |
| PDK2 | 940-10723-0002-300 |
| PDK3 | 940-10723-0003-300 |
| PM1 | 600-10722-0001-100 |
| PM2 | 600-10705-0000-200 |
| PM1 controller chip | PP5022 |
| PM2 controller chip | PP5024 |
| Baseboard for PDK1 | 600-10724-0000-100 |
| External keypad for PDK1 | PP7020 ¹ |
| Baseboard for PDK2/3 | 600-10723-0000-100 |

1. I added this. please check it.

Would it be helpful to add the schematic part numbers from the HW guide to this table??

Appendix B. Power Consumption

For these values, the UUT was a PM1 mounted on a 723_A01 baseboard. The resulting values contained here match or exceed expected values for most user applications.

B.1 PM1 Power Consumption

Table 6: Power Consumption While Plugged Into USB

| Conditions | Measured Current (mA) | Measured Voltage (V) | System Power Consumed ¹ (mW) | Module Power Consumed ² (mW) |
|---|-----------------------|----------------------|---|---|
| System Standby ³ | N/A | N/A | N/A | N/A |
| System Idle, display off | 151.6 | 5.07 | 768.6 | 688.0 |
| Normal operation with activity on the keypad ⁴ | 246.8 | 5.07 | 1251.3 | 670.4 |

1. Conditions: PM1 + Baseboard
2. Conditions: LCD and baseboard control circuits removed.
3. Standby not available in USB mode because PM1 uses no battery.
4. This condition represents a high-drain application.

Table 7: Power Consumption While Drawing From DC Input

| Conditions | Measured Current (mA) | Measured Voltage (V) | System Power Consumed ¹ (mW) | Module Power Consumed ² (mW) |
|---|-----------------------|----------------------|---|---|
| System Standby | 15.8 | 5.1 | 80.6 | 6.7 (max) |
| System Idle, display off | 195.6 | 5.1 | 997.6 | 416.7 |
| Normal operation with activity on the keypad ³ | 241.6 | 5.1 | 1232.2 | 651.3 |

1. Conditions: PM2 + Baseboard
2. Conditions: LCD and baseboard control circuits removed.
3. This condition represents a high-drain application.

B.2 PM2 Power Consumption

In this section, the following applies to all values:

- Music was stored in WMA format on a 8-Gb (1-GB) on-board NAND device and played using Creative SBS16-powered PC speakers.
- Some variance in measured current occurs due to the level of battery charge at the time of measurement. The more deeply discharged the battery, the more current is drawn to recharge it; therefore, overall current draw can fluctuate even though usage current remains unchanged.

Table 8: Power Consumption While Plugged Into USB

| Conditions | Measured Current (mA) | Measured Voltage (V) | System Power Consumed ¹ (mW) | Module Power Consumed ² (mW) |
|---|-----------------------|----------------------|---|---|
| System Standby | 73.73 | 4.93 | 363.49 | 348.58 |
| System Idle | 199.4 | 4.8 | 957.12 | 381.70 |
| Playing music from NAND flash + speaker out | 220.4 | 4.79 | 1055.72 | 479.11 |
| Charging empty battery + playing music from NAND + controlling the PC to play music through Bluetooth + SideShow ³ | 430.3 | 4.55 | 1407.73 | 1407.73 |

1. Conditions: PM2 + Baseboard
2. Conditions: LCD and baseboard control circuits removed.
3. This condition represents a high-drain application.

Table 9: Power Consumption While Drawing From Battery

| Conditions | Measured Current (mA) | Measured Voltage (V) | System Power Consumed ¹ (mW) | Module Power Consumed ² (mW) |
|--|-----------------------|----------------------|---|---|
| System Standby | 8.71 | 3.827 | 33.33 | 20.85 |
| System Idle (no Bluetooth) | 156.8 | 3.975 | 623.28 | 138.21 |
| System Idle (Bluetooth connected) | 171.3 | 3.86 | 661.22 | 188.83 |
| Playing music from NAND flash + speaker out (no Bluetooth) | 194.1 | 3.785 | 734.67 | 270.91 |
| Play music from NAND flash + speaker out (Bluetooth connected) | 215.3 | 3.82 | 822.45 | 354.83 |
| Bluetooth connected in searching mode + playing music from NAND + speaker out ³ | 245.7 | 3.9 | 958.23 | 481.79 |

1. Conditions: PM2 + Baseboard
2. Conditions: LCD and baseboard control circuits removed.
3. This condition represents a high-drain application.

Appendix C. Environmental Recommendations

Table 10 lists the recommended temperatures for Preface PDK hardware.

Table 10: Recommended Temperatures

| Parameter | Description | Specified Range | Units |
|-----------------------|-------------------------------|-----------------|-------|
| Operating Temperature | Baseboard with PM | 0 to 55 | C |
| Operating Temperature | Baseboard with PM and battery | 0 to 45 | C |
| Storage Temperature | PM only | -40 to 85 | C |
| Storage Temperature | Baseboard only, no battery | -25 to 80 | C |
| Storage Temperature | Baseboard only, with battery | -10 to 45 | C |

Other environmental specifications are TBD.



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