

# POD66525

## *User's Manual*

---

Program Development and Support Kit

**First edition:** August, 2000

- This manual contains precautions for the safe use of this product. Be sure to read before using.
- When using the POD66525, keep this manual handy for convenient reference.

## NOTICE

1. The information contained herein can change without notice owing to product and/or technical improvements. Before using the product, please make sure that the information being referred to is up-to-date.
2. The outline of action and examples for application circuits described herein have been chosen as an explanation for the standard action and performance of the product. When planning to use the product, please ensure that the external conditions are reflected in the actual circuit, assembly, and program designs.
3. When designing your product, please use our product below the specified maximum ratings and within the specified operating ranges including, but not limited to, operating voltage, power dissipation, and operating temperature.
4. Oki assumes no responsibility or liability whatsoever for any failure or unusual or unexpected operation resulting from misuse, neglect, improper installation, repair, alteration or accident, improper handling, or unusual physical or electrical stress including, but not limited to, exposure to parameters beyond the specified maximum ratings or operation outside the specified operating range.
5. Neither indemnity against nor license of a third party's industrial and intellectual property right, etc. is granted by us in connection with the use of the product and/or the information and drawings contained herein. No responsibility is assumed by us for any infringement of a third party's right which may result from the use thereof.
6. The products listed in this document are intended for use in general electronics equipment for commercial applications (e.g., office automation, communication equipment, measurement equipment, consumer electronics, etc.). These products are not authorized for use in any system or application that requires special or enhanced quality and reliability characteristics nor in any system or application where the failure of such system or application may result in the loss or damage of property, or death or injury to humans. Such applications include, but are not limited to, traffic and automotive equipment, safety devices, aerospace equipment, nuclear power control, medical equipment, and life-support systems.
7. Certain products in this document may need government approval before they can be exported to particular countries. The purchaser assumes the responsibility of determining the legality of export of these products and will take appropriate and necessary steps at their own expense for these.
8. No part of the contents contained herein may be reprinted or reproduced without our prior permission.
9. MS-DOS, Microsoft, Windows, and WindowsNT are registered trademarks of Microsoft Corporation.
10. ARM, EmbeddedICE, Multi-ICE, ARM7TDMI, ARMPOWERED, and AMBA are registered trademarks of ARM Ltd., UK.
11. NORTi is registered trademark of MiSPO Co., Ltd.
12.  $\mu$ ITRON is short for micro Industrial TRON.  
TRON is short for The Realtime Operating system Nucleus.

Copyright 2001 Oki Electric Industry Co., Ltd.

This manual describes how to connect the Ultra-66K/E502 Microprocessor Development System and use the “POD66525 Development and Support Kit” to develop programs for Oki Electric’s CMOS 16-bit ML66525 microcontroller.

Related manuals are listed below.

- Title: Ultra-66K/E502 Microprocessor Development User’s Manual
- Contents: Description of Oki Electric’s CMOS 16-Bit Microcontroller Development and Support System Operation
  
- Title: ML66525 User’s Manual
- Contents: Description of ML66525 Microcontroller Functions

# Contents

---

## Contents

<b>Introduction .....</b>	<b>0-1</b>
1. For Further Information .....	0-2
2. Important Safety Notes.....	0-3
2.1 Important Safety Notes .....	0-4
3. Notation .....	0-6
4. Configuration of this Manual.....	0-7
5. Verification.....	0-8
5.1 Verify Package Contents .....	0-8
 <b>Chapter 1 Overview .....</b>	 <b>1-1</b>
1. Overview of POD66525 Development and Support Kit.....	1-2
2. Configuration of POD66525 Development and Support Kit .....	1-3
3. POD66525 Board Layout and Component Description.....	1-5
 <b>Chapter 2 Functions .....</b>	 <b>2-1</b>
1. Functional Description .....	2-2
1.1 USB Evaluation Functions .....	2-2
1.2 VBUS Monitoring and USB Reset Functions.....	2-2
1.3 VBUS Detection Port Connection Function .....	2-3
1.4 USB Clock Multiplier Verification Function .....	2-3
1.5 Clock Switch Function.....	2-4
 <b>Chapter 3 Setup and Activation.....</b>	 <b>3-1</b>
1. Setting the Functions.....	3-2
2. Connecting the Emulator .....	3-3
3. Activating the Emulator .....	3-5
 <b>Chapter 4 Important Notes for Operation .....</b>	 <b>4-1</b>
1. Important Notes For Debugging .....	4-2
 <b>Appendix.....</b>	 <b>A-1</b>
1. Configuration of the Flexible User Cable.....	A-2
2. Ultra66525 Development System Power Supply Lines .....	A-3
3. POD66525 External Dimensions.....	A-5

# Introduction

---

# 1. For Further Information



Thank you for purchasing the POD66525 Development and Support Kit.

Please direct any questions or comments regarding this product to your Oki distributor or the nearest Oki Electric Sales Office.

## 2. Important Safety Notes

This User's Guide uses various labels and icons that serve as your guides to operating this product safely and properly so as to prevent death, personal injury, and property damage. The following table lists these labels and their definitions.

### Labels

 <b>Warning</b>	This label indicates precautions that, if ignored or otherwise not completely followed, could lead to death or serious personal injury.
 <b>Caution</b>	This label indicates precautions that, if ignored or otherwise not completely followed, could lead to personal injury or property damage.

### Icons



A triangular icon draws your attention to the presence of a hazard. The illustration inside the triangular frame indicates the nature of the hazard—in this example, an electrical shock hazard.



A circular icon with a solid background illustrates an action to be performed. The illustration inside this circle indicates this action—in this example, unplugging the power cord.















A circular icon with a crossbar indicates a prohibition. The illustration inside this circle indicates the prohibited action—in this example, disassembly.








## 2.1 Important Safety Notes

Please read this page before using the product.

 <b>Caution</b>	
<b>Use only the specified voltage.</b> Using the wrong voltage risks fire and electrical shock.	
<b>At the first signs of smoke, an unusual smell, or other problems, unplug the emulator and disconnect all external power cords.</b> Continued use risks fire and electrical shock.	
<b>Do not use the product in an environment exposing it to moisture or high humidity.</b> Such exposure risks fire and electrical shock.	
<b>Do not pile objects on top of the product.</b> Such pressure risks fire and electrical shock.	
<b>At the first signs of breakdown, immediately stop using the product, unplug the emulator, and disconnect all external power cords.</b> Continued use risks fire and electrical shock.	

 <b>Caution</b>	
<b>Do not use this product on an unstable or inclined base as it can fall or overturn, producing injury.</b>	
<b>Do not use this product in an environment exposing it to excessive vibration, strong magnetic fields, or corrosive gases.</b> Such factors can loosen or even disconnect cable connectors, producing a breakdown.	
<b>Do not use this product in an environment exposing it to temperatures outside the specified range, direct sunlight, or excessive dust.</b> Such factors risk fire and breakdown.	
<b>Use only the cables and other accessories provided.</b> Using non-compatible parts risks fire and breakdown.	
<b>Do not use the cables and other accessories provided with other systems.</b> Such improper usage risks fire.	

Please read this page before using the product.

 <b>Caution</b>	
<p><b>Do not exceed the rated input voltage for the user cable VDD and VDDI pins.</b> Doing so risks fire and breakdown.</p>	
<p><b>Always observe the specified order for turning equipment on and off.</b> Using the incorrect order risks fire and breakdown.</p>	
<p><b>Before connecting or disconnecting the POD66525 board and the Ultra-66K Emulator, the power source for the Ultra-66K Emulator must be turned OFF.</b> Connections or disconnections performed while the power source is ON risk fire and damage to the system.</p>	
<p><b>Do not touch the ICs on the POD66525 board.</b> Doing so risks breakdown.</p>	

## 3. Notation

This manual uses the following notational conventions for convenience.

<b>Classification</b>	<b>Notational symbol</b>	<b>Description</b>
Numeric values	xxh,xxH	Indicates hexadecimal numerals
	xxb	Indicates binary numerals
Units	Word, W	1 word = 2 bytes = 4 nibbles = 16 bits
	Byte, B	1 byte = 2 nibbles = 8 bits
	Nibble, N	1 nibble = 4 bits
	Mega, M	$10^6$
	Kilo, K	$2^{10} = 1024$
	kilo, k	$10^3 = 1000$
	milli, m	$10^{-3}$
	micro, $\mu$	$10^{-6}$
	nano, n	$10^{-9}$
Terminology	second, s	second
	High-level	The signal level of the high side of the voltage. Indicates the VDD voltage level.
	Low-level	The signal level of the low side of the voltage. Indicates the VSS voltage level.
Other	<b>■ Reference ■</b>	A “reference” provides information related to the current topic and indicates the page number of a related section of the manual.
	(note x)	“(note x)” is a reference to a numbered note “Note x:” that provides supplementary information lower on the same page.
	<b>■ Note x ■</b>	“Note x:” provides supplementary information related to the passage marked with “(note x).”
	<b>■ Important ■</b>	Indicates a section of the manual that requires special attention.

## 4. Configuration of this Manual

This manual consists of four chapters (Chapter 1 through Chapter 4) and an appendix. A brief summary of each chapter is listed below.

### **Chapter 1 Overview**

Description of the POD66525 Development and Support Kit.

### **Chapter 2 Functions**

Description of specifications and functions of the POD66525 Development and Support Kit.

### **Chapter 3 Setup and Activation**

Description of the required settings prior to connecting the POD66525 Development and Support Kit to the Ultra-66K/E502 Microprocessor Development System and how to activate.

### **Chapter 4 Important Notes for Operation**

Description of the limitations and precautions for using the POD66525 Development and Support Kit. This chapter must be read before using.

### **Appendix**

Description of components of the POD66525 Development and Support Kit.

# 5. Verification

## 5.1 Verify Package Contents

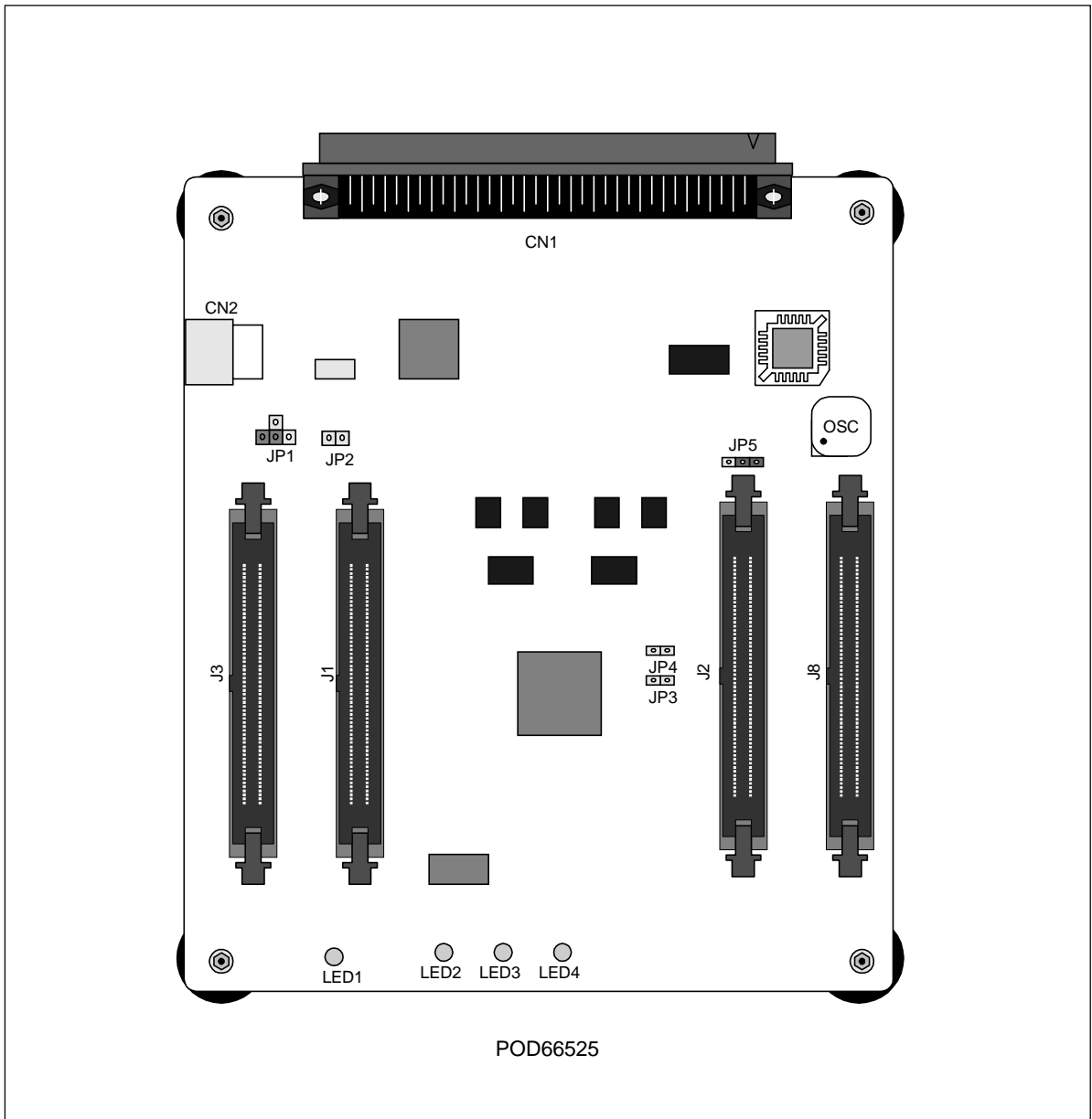
Upon receiving the POD66525 Development and Support Kit, verify that the package contains all the components shown on the next page.

Although every effort has been made to minimize damage and eliminate mistakes, please report any damaged or missing parts to your Oki distributor or the nearest Oki Electric sales office.

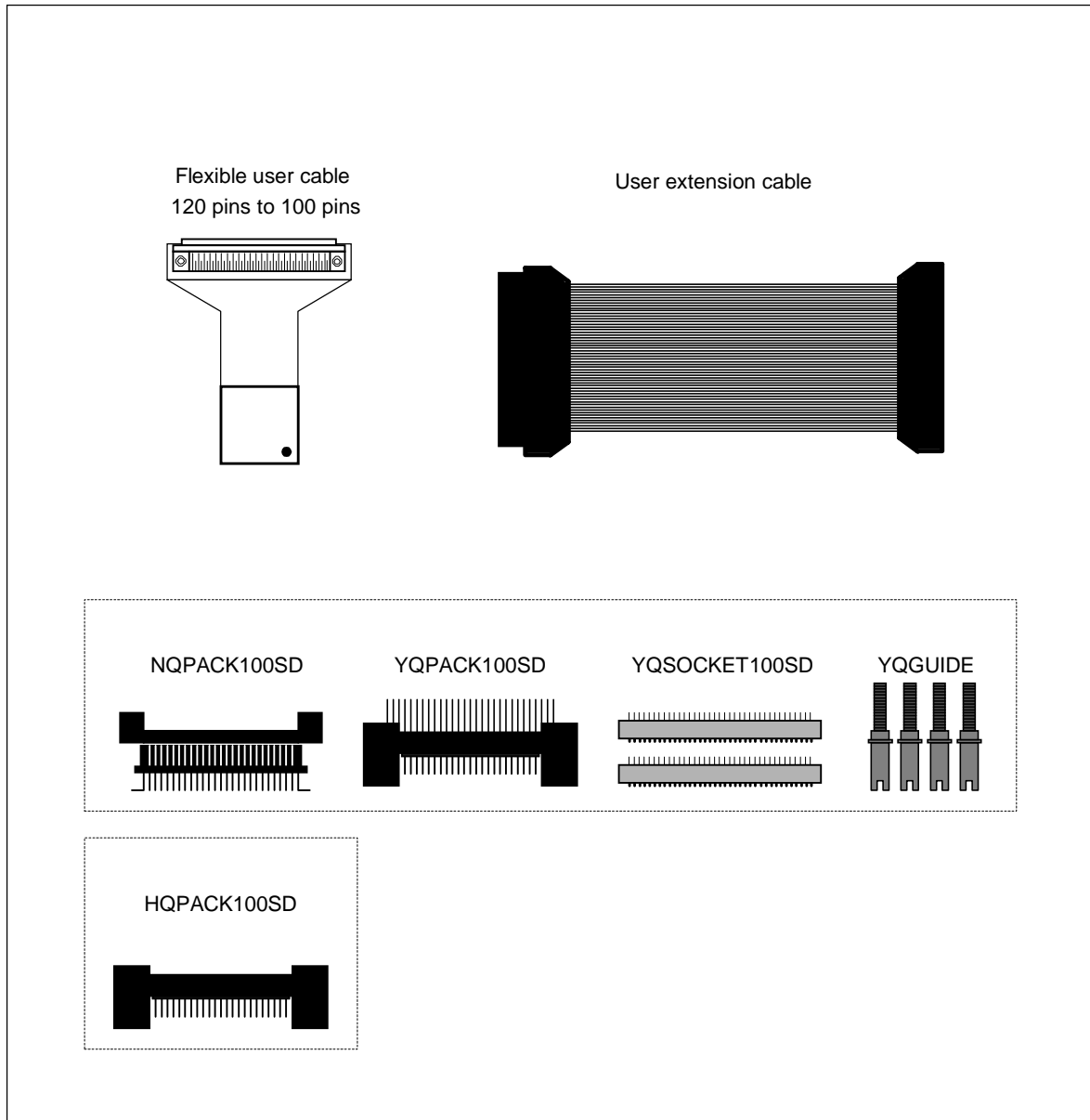
**Table 1 Packing List**

Item	Count
POD66525	1
POD66525 User's Manual (this document)	1
Flexible user cable	1
User extension cable	1
NQPACK100SD	1
YQPACK100SD	1
YQSOCKET100SD	2
YQGUIDE	4
HQPACK100SD	1

Hardware



Accessories



Each component is described below.

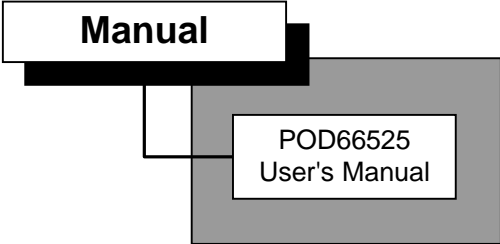
## Hardware



POD66525

The POD66525 board.

## Manual



POD66525  
User's Manual

A manual (this document) that describes the POD66525 Development and Support Kit.

## Accessories

Note 1



Flexible user cable

This cable connects the POD66525 and the user application system.

User extension cable

This cable extends the connection between the POD66525 and the target system.

NQPACK100SD

The NQPACK100SD is used to connect the target system to the development tools. It also can function as an adapter to mount an MSM66Q525. The NQPAC100SD is soldered to the target system board.

YQPACK100SD

The YQPACK100SD is an intermediate adapter used when the target system board is connected to the development tools.

YQGUIDE

The YQGUIDE is a guide screw used when connecting the NQPACK100SD, the YQPACK100SD, and the YQSOCKET100SD.

YQSOCKET100SD

This socket connects the YQPACK100SD to the flexible cable.

HQPACK100SD

The HQPACK100SD is used as a cover for the NQPACK100SD when an MSM66Q525 is mounted in a socket on the user board.



■ **Note 1** ■

For individual methods of connection and operation, refer to Chapter 3, section 2  
“Connecting the Emulator.”

---

 **Caution**

**Use only the cables and accessories provided.**

Use of non-compatible components risks fire and damage to the system.



**Do not use the provided cables and accessories with systems other than this system.**

Such use may result in fire.



# **Chapter 1 Overview**

---

# 1. Overview of POD66525 Development and Support Kit

The POD66525 Development and Support Kit connects to the Ultra-66K/E502 Microprocessor Development System and supports program development for Oki Electric's CMOS 16-bit microcontrollers: ML66525.

---

## ■ Important ■

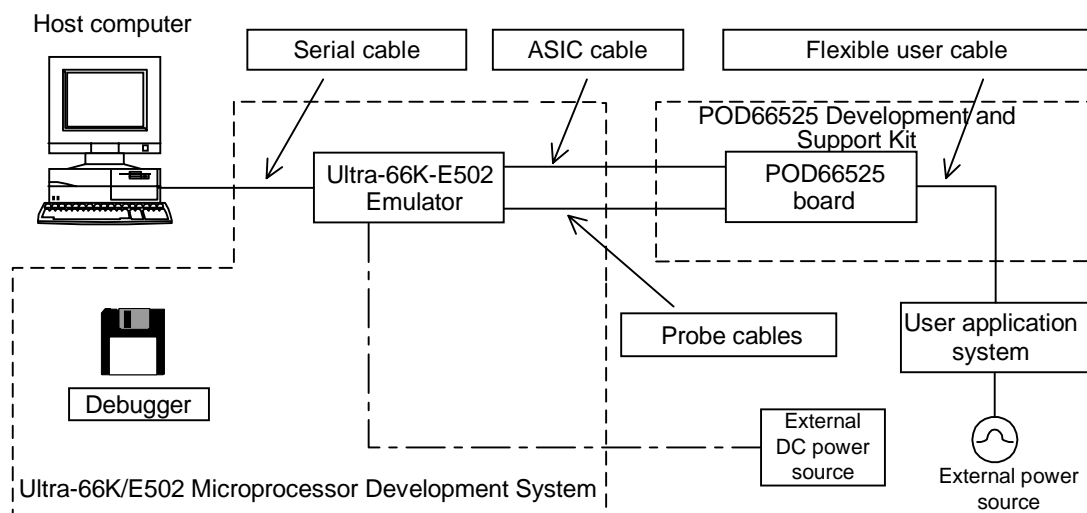
The POD66525 Development and Support Kit does not operate as a standalone unit. This kit must be connected to the Ultra-66K/E502 Microprocessor Development System before use.

---

## 2. Configuration of POD66525 Development and Support Kit

The POD66525 Development and Support Kit connects to the Ultra-66K/E502 Microprocessor Development System and supports program development for Oki Electric's CMOS 16-bit microcontrollers: ML66525.

The connected configuration of the POD66525 Development and Support Kit and the Ultra-66K/E502 Microprocessor Development System is shown below. Hereafter, this total system configuration will be referred to as the "Ultra66525 Development System."



**Figure 1-1 Ultra66525 Development System Connection Diagram**

### POD66525 Board

Connecting the POD66525 board to the ASIC cable provided with the Ultra-66K Emulator allows control of the POD66525 board's I/O circuitry.

### Flexible User Cable

This cable is used to connect the POD66525 board and the user application system. The cable inserts into the CN1 connector on the POD66525 board.

### ASIC Cable

This cable is provided with the Ultra-66K Emulator and inserts into the J8 connector on the POD66525 board. This connection allows control of the POD66525 board's I/O circuitry.

### **Probe Cables**

These cables are provided with the Ultra-66K Emulator. The upper cables connect the J2, J1 and J3 connectors of the POD66525 board.

### **Serial Cable**

This RS-232C cable for communications connects the Ultra-66K Emulator with the host computer.

---

### ■ Reference ■

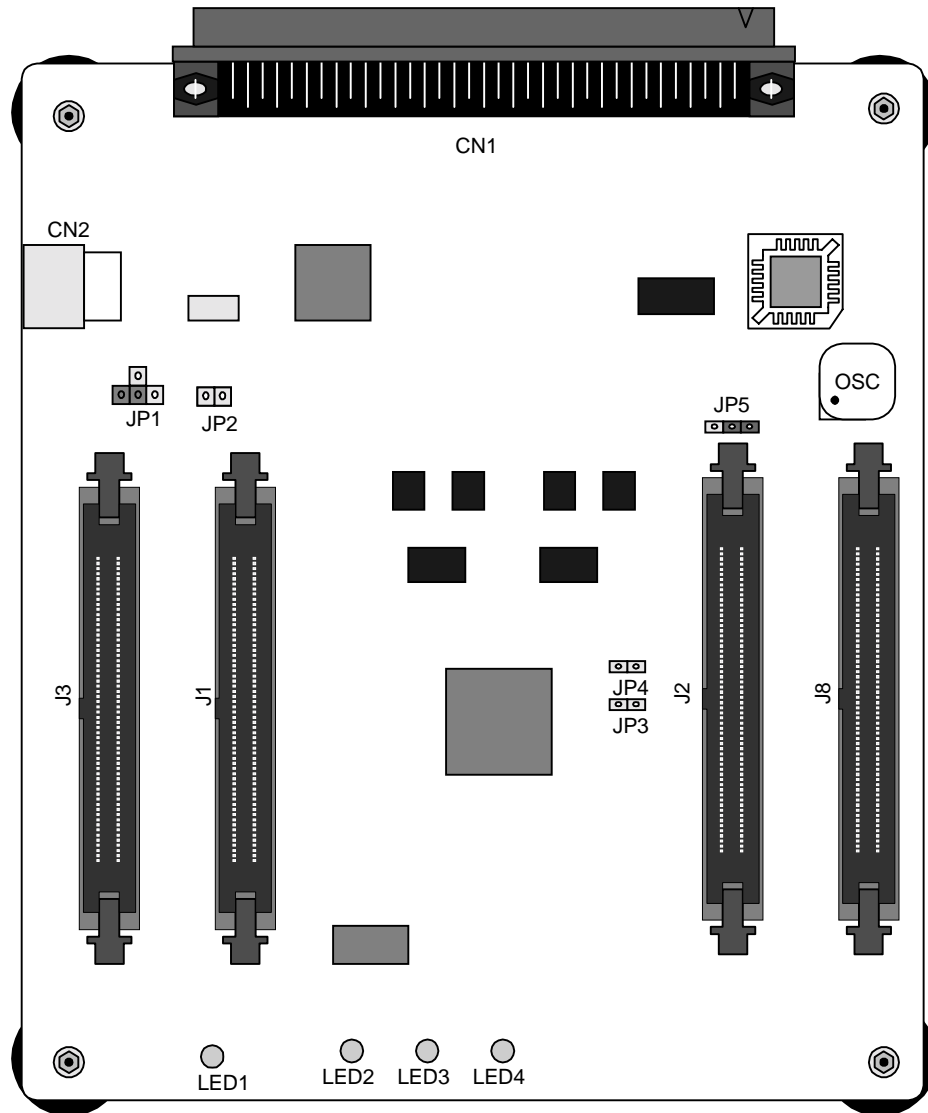
For further information regarding the Ultra-66K/E502 Microprocessor Development System, refer to the Japanese edition of the Ultra-66K/E502 Microprocessor Development System User's Manual.

---

 <b>Caution</b>
<b>Use only the cables and accessories provided. Use of non-compatible components risks fire and damage to the system.</b> 



### 3. POD66525 Board Layout and Component Description



#### 1. Probe connector (J3)

Connects the 4<sup>th</sup> cable from the top cable (provided with the Ultra-66K Emulator) to the POD66525 board.

#### 2. Probe connector (J1)

Connects the 3<sup>rd</sup> cable from the top cable (provided with the Ultra-66K Emulator) to the POD66525 board.

#### 3. Probe connector (J2)

Connects the 2<sup>nd</sup> cable from the top cable (provided with the Ultra-66K Emulator) to the

POD66525 board.

**4. ASIC connector (J8)**

Connects the top cable (provided with the Ultra-66K Emulator) to the POD66525 board.

**5. User connector (CN1)**

Used to connect to the target system using the 120-pin to 100-pin flexible user cable plus conversion adapter. This connector interfaces with user application system.

**6. USB connector (CN2)**

This connector conforms to the USB standard, type B. Use this connector during debugging to evaluate ML66525 USB operation. Refer to the section "USB Evaluation Functions" in chapter 2 for details.

**7. Crystal oscillator (OSC)**

Used as the ML66525 operating reference clock.

**8. Clock switching jumper (JP5)**

This jumper switches between the clock provided by the crystal oscillator mentioned above on the POD66525 and the clock supplied from the user application system. When shipped from the factory, the clock provided by the crystal oscillator on the POD66525 is selected. Refer to the "Clock Switching Function" section in chapter 2 for details.

**9. VBUS monitoring USB reset switching jumper (JP1)**

Setting that controls the ML66525 US function hardware reset and monitoring of the VCC pin on the POD66525 USB connector (CN2) and the ML66525 user pin VDD\_USB. When shipped from the factory, the monitoring and reset functions are disabled. Refer to the section "VBUS Monitoring and USB Reset Functions" in chapter 2 for details.

**10. PORT9\_0 to VBUS connection jumper (JP2)**

Setting that connects the VCC pin on the POD66525 USB connector (CN2) to the ML66525 PORT9\_0 pin. Refer to the section "VBUS Detection Port Connection Function" in chapter 2 for details.

**11. Other jumpers (JP3, JP4)**

The JP3 and JP4 jumpers are used for Ultra66K and POD66525 testing. Do not change the factory setting (open).

**12. Power supply LED (LED1)**

Indicates the state of the power supply. Power is supplied to the POD66525 from the Ultra66K.

**13. Frequency multiplier function check LEDs (LED2, LED3, and LED4)**

These LEDs verify the selection of the multiplier that multiplies the ML66525 reference clock (OSC0) to create 48 MHz USB clock. Refer to the section "USB Clock Multiplier Verification Function" in chapter 2 for details.





# **Chapter 2    Functions**

---

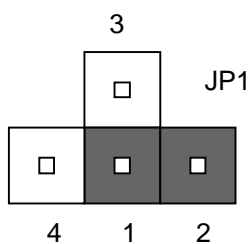
# 1. Functional Description

## 1.1 USB Evaluation Functions

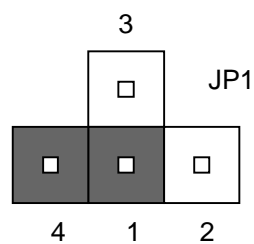
The operation of programs that use the ML66525 USB functions can be evaluated by using the USB connector (CN2) on the POD66525. USB operation on the target board through the user cable is not guaranteed under the Ultra66525 Development System. Verify USB operation on the target board with the on-chip flash memory version of the chip, the ML66Q525.

## 1.2 VBUS Monitoring and USB Reset Functions

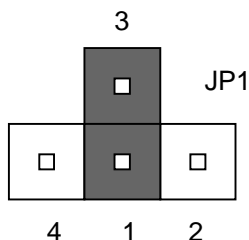
In the Ultra66525 Development System, the ML66525 user pin VDD\_USB is not connected to the USB block on the POD66525. Therefore, the USB function on the POD66525 will continue to operate even if a voltage is not supplied to the VDD\_USB pin. (This corresponds to the USB VBUS voltage not being supplied.) When debugging the USB bus powered mode, set JP1 (jumper 1) shown below so that the VCC pin (the VBUS pin) on the POD66525 USB connector (CN2) is monitored, and so the USB function is reset when the VBUS voltage drops. (See note 2-1.)



In this position, the VCC pin on the POD66525 USB connector (CN2) is monitored, and the ML66525 USB function is reset when the VCC pin voltage drops.



In this position, the VBUS monitoring and USB reset function is disabled.



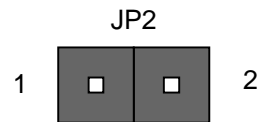
This position is only used for testing.

### ■ Note 2-1 ■

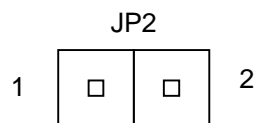
The USB is reset when the voltage supplied to the VDD\_USB pin falls below 1.5 V.

### 1.3 VBUS Detection Port Connection Function

JP2 (jumper 2) shown below can be set to connect the POD66525 USB connector (CN2) VCC pin (VBUS pin) to the ML66525 VBUS detection port pin, P9\_0, and allows the VBUS to be detected as an external interrupt.



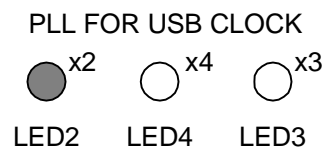
This setting connects the ML66525 PORT9\_0 user pin to the USB connector VCC pin on the POD66525.



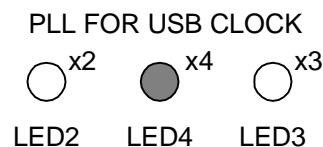
This setting disconnects the ML66525 PORT9\_0 user pin from the USB connector (CN2) VCC pin on the POD66525.

### 1.4 USB Clock Multiplier Verification Function

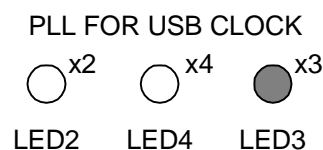
While the ML66525 provides a built-in function to multiply the reference clock and create the USB operating clock, the Ultra66525 Development System does not include such a clock frequency multiplying function. When debugging using the Ultra66525 Development System, the set state of the multiplier can be verified by checking the LEDs as described below. Verify the actual multiplier operation in the on-chip flash memory version of the chip, the ML66Q525.



Indicates that the ML66525 SFR (P5IO:25H) FSEL0 bit is 0 and FSEL1 bit is 0. This selects a multiplier of 2x. Use this setting when a 24 MHz reference clock frequency is used.



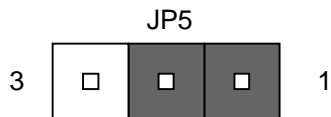
Indicates that the ML66525 SFR (P5IO:25H) FSEL0 bit is 1 and FSEL1 bit is 0. This selects a multiplier of 4x. Use this setting when a 12 MHz reference clock frequency is used.



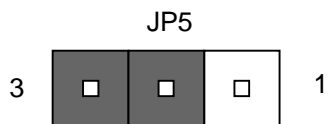
Indicates that the ML66525 SFR (P5IO:25H) FSEL0 bit is 0 and FSEL1 bit is 1. This selects a multiplier of 3x. Use this setting when a 16 MHz reference clock frequency is used.

## 1.5 Clock Switch Function

The Ultra-66K emulator clock source can be selected by setting the clock switching jumper on the POD66525. By setting the clock source of the Ultra-66K Emulator to “Target Clock” and the JP5 jumper on POD66525 board to the 1-2 side, a clock from the crystal oscillator (24MHz at shipping) on the POD66525 board is supplied to the Ultra-66K Emulator. If the JP1 jumper is set to the 2-3 side, the user application system’s clock is supplied to the Ultra-66K Emulator via pin 35 (OSC0) of CN1 on the POD66525 board.



The clock from the crystal oscillator on the POD66525 is supplied to the Ultra66K. (Factory setting)



The clock on the target system is supplied to the Ultra66K.

---

### ■ Reference ■

For further information regarding clock source settings of the Ultra-66K Emulator, refer to Chapter 4, section 4.7.2, “Clock” and section 4.7.5, “Processor Setup File” of the Ultra-66K/E502 Microprocessor Development System User’s Manual.

---

# **Chapter 3    Setup and Activation**

---

# 1. Setting the Functions

To use the POD66525 Development and Support Kit, the ML66525 must be set as the debug target device for the Ultra-66K Emulator. (See note 3-1.)

For further details regarding device setting methods, refer to Chapter 4, section 4.7.5, “Processor Setup File” of the Ultra-66K/E502 Microprocessor Development System User’s Manual.

---

■ **Note 3-1** ■

First connect the POD66525 board to the Ultra-66K Emulator, and then set the device.

---

# 2. Connecting the Emulator

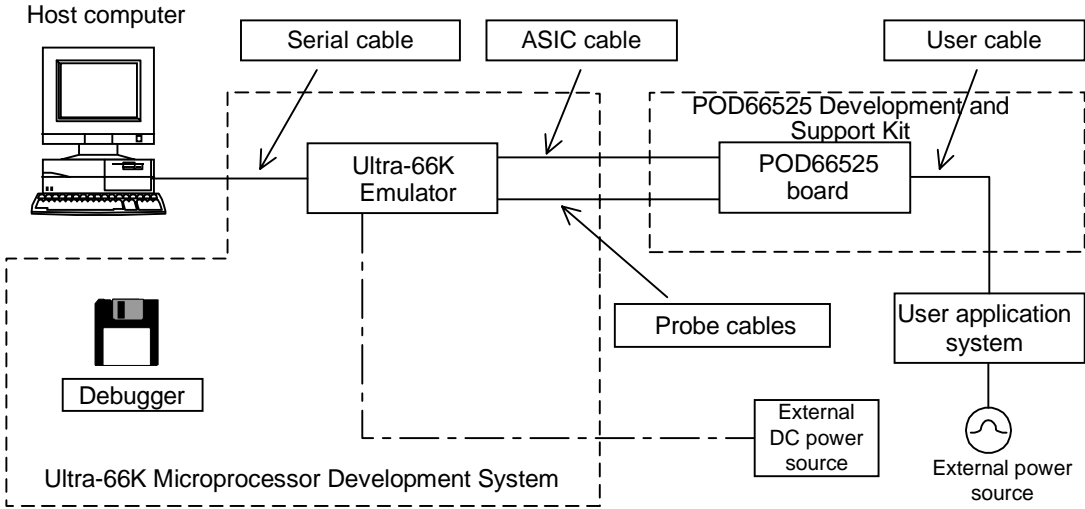


Figure 3-1 Connection Block Diagram

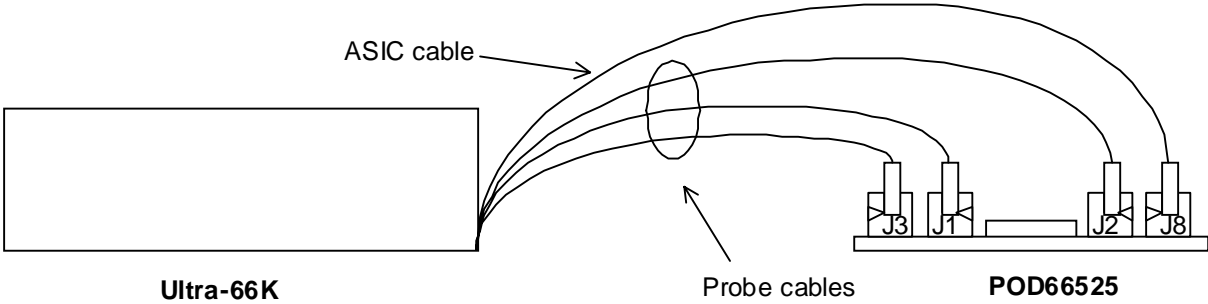


Figure 3-2 Ultra-66K ↔ POD66525 Connection Diagram



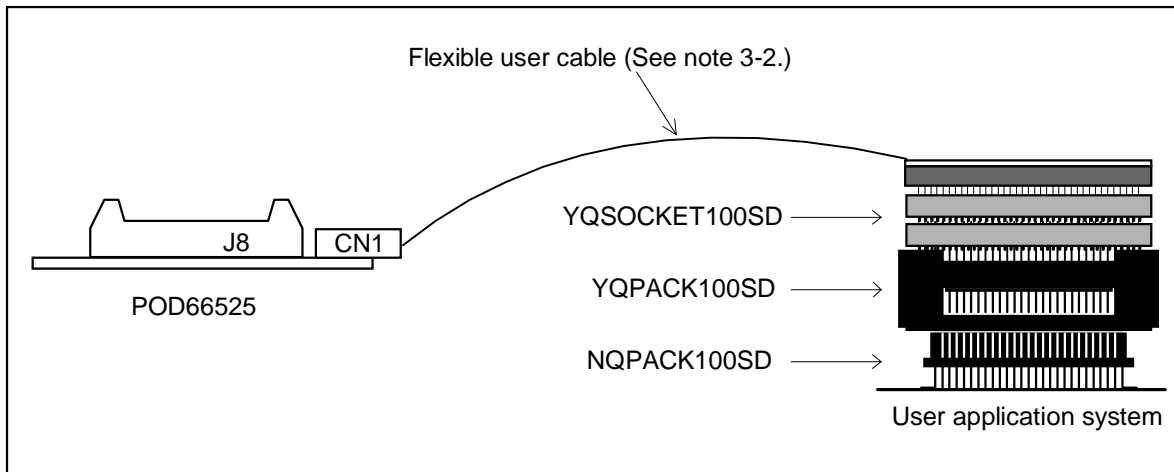


Figure 3-3 POD66525 ↔ User Application System Connection Diagram

■ Note 3-2 ■

Use the provided extension cable if required by the layout of components in the target system.

 **Caution**

**Before connecting or disconnecting the POD66525 board and the Ultra-66K Emulator, the power source for the Ultra-66K Emulator must be turned OFF.**

Connections or disconnections performed while the power source is ON risk fire and damage to the system.

**Use only the cables and accessories provided. Use of non-compatible components risks fire and damage to the system.**



## 3. Activating the Emulator

Pre-activation preparations are complete when connection of the Ultra-66K Emulator and host computer, connection of the Ultra-66K Emulator and POD66525 board, setting of the switches and jumpers on the POD66525 board, and connection of the POD66525 board and user application system have been performed. (See note 3-3.)

For the activation method, refer to Chapter 1, section 1.6, “Installation and Activation” and section 1.7, “Connection Verification” of the Ultra-66K/E502 Microprocessor Development System User’s Manual.

### ■ Note 3-3 ■

Although no problems will occur if the emulator is powered on when the target system is not connected, the emulator power must be turned off temporarily while making this connection if the target system is connected.

### Caution

**If the target system is connected to the POD66525, first turn the Ultra-66K emulator power on, and after that turn the target system power on. To power down the combined system, first turn the target system power off, and after that turn the Ultra-66K emulator and the POD66525 power off. The Ultra-66K emulator and the POD66525 may be damaged if the this sequence is not observed strictly.**





# **Chapter 4    Important Notes for Operation**

---

# 1. Important Notes For Debugging

## (1) Power Supply ON/OFF Sequence

To turn the power ON while a user application circuit is connected,, first turn power ON to the Ultra-66K Emulator and then ON to the user application system. To turn the power OFF, first turn power OFF to the user application system and then OFF to the Ultra-66K Emulator. If power is not turned ON/OFF in the above sequences, the Ultra-66K Emulator and he POD66525 board may be damaged.

## (2) Memory Mapping for the Ultra-66K Emulator

256KB and 128KB of memory are installed as the mapped memory corresponding to internal/external ROM (code memory) and the memory corresponding to internal/external RAM (data memory), respectively. This memory mapping allows the Ultra-66K Emulator to be compatible with other Oki 16-bit CMOS devices in addition to the ML66525. When the Ultra-66K emulator is started, its memory mapping is set up so that all of both code memory and data memory are mapped to the Ultra-66K emulator. This differs from ML66525 memory mapping. The memory mapping can be changed in the debugger. Change the mapping if required. (See note 4-1.)

For further details regarding the memory mapping, refer to Chapter 4, section 4.7.1, “Memory Mapping for the Emulator or Target” of the Ultra-66K/E502 Microprocessor Development System User’s Manual

## (3) Expanded (RAM) area mapping

Monitor the ML66525 expanded RAM area in the Various Window in the PathFinder-U66K debugger. Data in odd addresses in this area cannot be displayed in the Data Memory Window.

## (4) Switching

To change settings of the jumper switch described in chapter 2, first turn power OFF to the user application system and the Ultra-66K Emulator.

## (5) ML66525 power supply pins

The POD66525 CN1 VDD\_IO pin (pins 15, 30, 37, 51, and 88) are input pins. If the Ultra66525 Development System is operated from the target system power supply, power is supplied to the Ultra66K main unit through these pins. If the Ultra66525 Development System is operated from the target system power supply, set the operating voltage in the PathFinder-U66K debugger to "Target". (See reference 4-1.)

**(6) Differences between the Ultra66525 Development Support System and the ML66525**

- (1) If expanded RAM is accessed at an operating frequency higher than 12 MHz in the Ultra66525 Development System, insert at least one wait cycle in the access cycle with the XPDRDY register setting.
- (2) USB operation on the target board through the user cable from the user connector (CN1) on the POD66525 is not guaranteed under the Ultra66525 Development System. Use the USB connector on the POD66525 to debug the USB function. Verify USB operation on the target board with the on-chip flash memory version of the chip, the ML66Q525.
- (3) Power supply from the ML66525 VDD\_USB pin (pin 1) and the VDD\_CORE pins (pins 26, 53, and 75) is not supported under the Ultra66525 Development System. Use the on-chip flash memory version of the chip, the ML66Q525, for debugging with power supplied to these pins. The pins on the POD66525 user connector will be open. (See note 4-2.)
- (4) While the ML66525 provides a built-in function to multiply the reference clock and create the USB operating clock, the Ultra66525 Development System does not include such a clock frequency multiplying function. (A 48 MHz clock is always supplied to the USB block.) When debugging using the Ultra66525 Development System, verify the set state of the multiplier by checking the LEDs. (See reference 4-2.)
- (5) When accessing external data memory in 68K mode (STBSEL = 1) under the Ultra66525 Development System, the read signal output from the PORT3\_2 pin is delayed by a maximum of 15 ns with respect to the write signal output from the PORT3\_3 pin. Note that the PORT3\_2 pin is an output-only pin for both its primary and secondary functions.
- (6) The electrical characteristics of the PORT3\_2 pin (output-only) and the PORT10\_3 pin under the Ultra66525 Development System differ from those of the corresponding pins on the ML66525. These pins have the characteristics of the GAL16LV8D-3LJ (manufacturer: Lattice Semiconductors) PLD device mounted on the POD66525. (See note 4-3.)
- (7) The SFR register used for flash EEPROM control is not supported in the Ultra66525 Development System.
- (8) The Ultra66525 Development System does not support OSC clock oscillator operation with an external crystal element connected to the ML66525 OSC0 pin (pin 35) and OSC1 pin (pin 36). Use either the crystal oscillator on the POD66525 or an external clock from the target

board as the OSC clock. The POD66525 CN2 OSC1 pin (pin 36) is open.

---

■ **Note 4-1** ■

Set the expanded RAM area to be an external target area (Map to "Target").

---

---

■ **Note 4-2** ■

The POD66525 provides a function for monitoring the VDD\_USB pin and reset the ML66525 USB block accordingly. Use this function for debugging the USB bus power mode.

---

---

■ **Note 4-3** ■

For further information on the GAL16LV8D-3LJ, refer to the data sheet for the device itself. Refer to <http://www.latticesemi.com> on the Internet.

---

---

■ **Reference 4-1** ■

For further information regarding the Ultra-66K emulator clock source settings, refer to chapter 4, section 4.7.5, "Processor Settings File" in the Ultra-66K Microprocessor Ultra-66K/E502 Microprocessor Development System User's Manual.

---

---

■ **Reference 4-2** ■

For further information on these LEDs, refer to chapter 2, section 1.4, "USB Clock Multiplier Verification Function" in this document.

---

# Appendix

---



# 1. Configuration of the Flexible User Cable

The configuration of the flexible user cable is shown below. The flexible user cable connects to the CN5 connector of the POD66525 board.

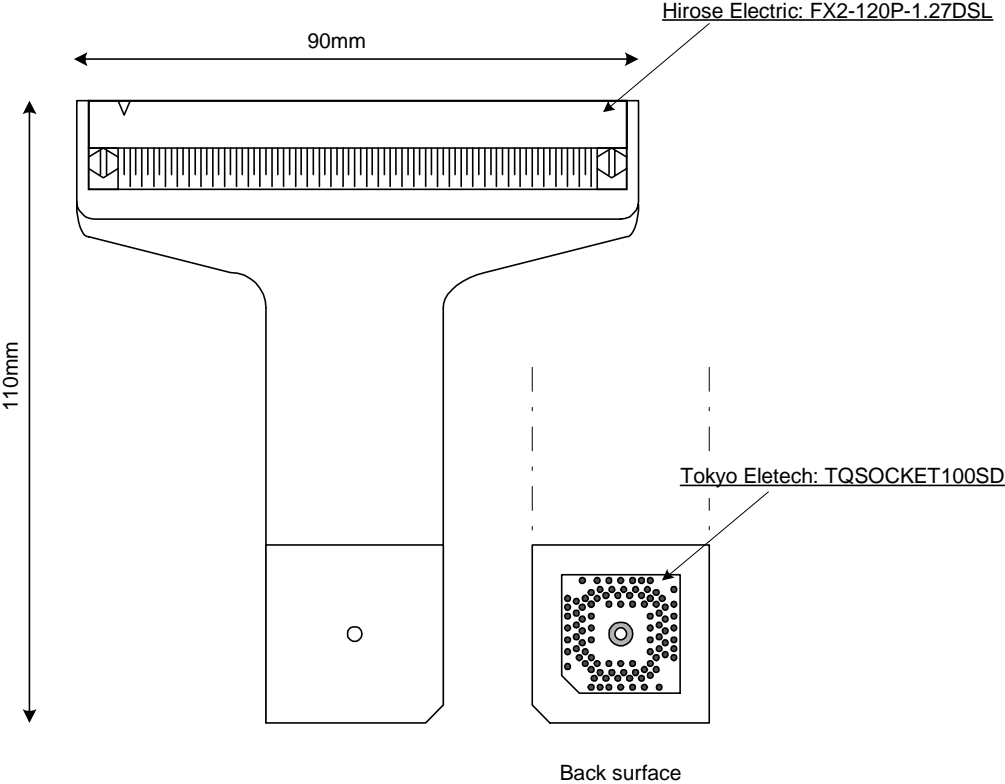


Figure A-1 Flexible User Cable

## 2. Ultra66525 Development System Power Supply Lines

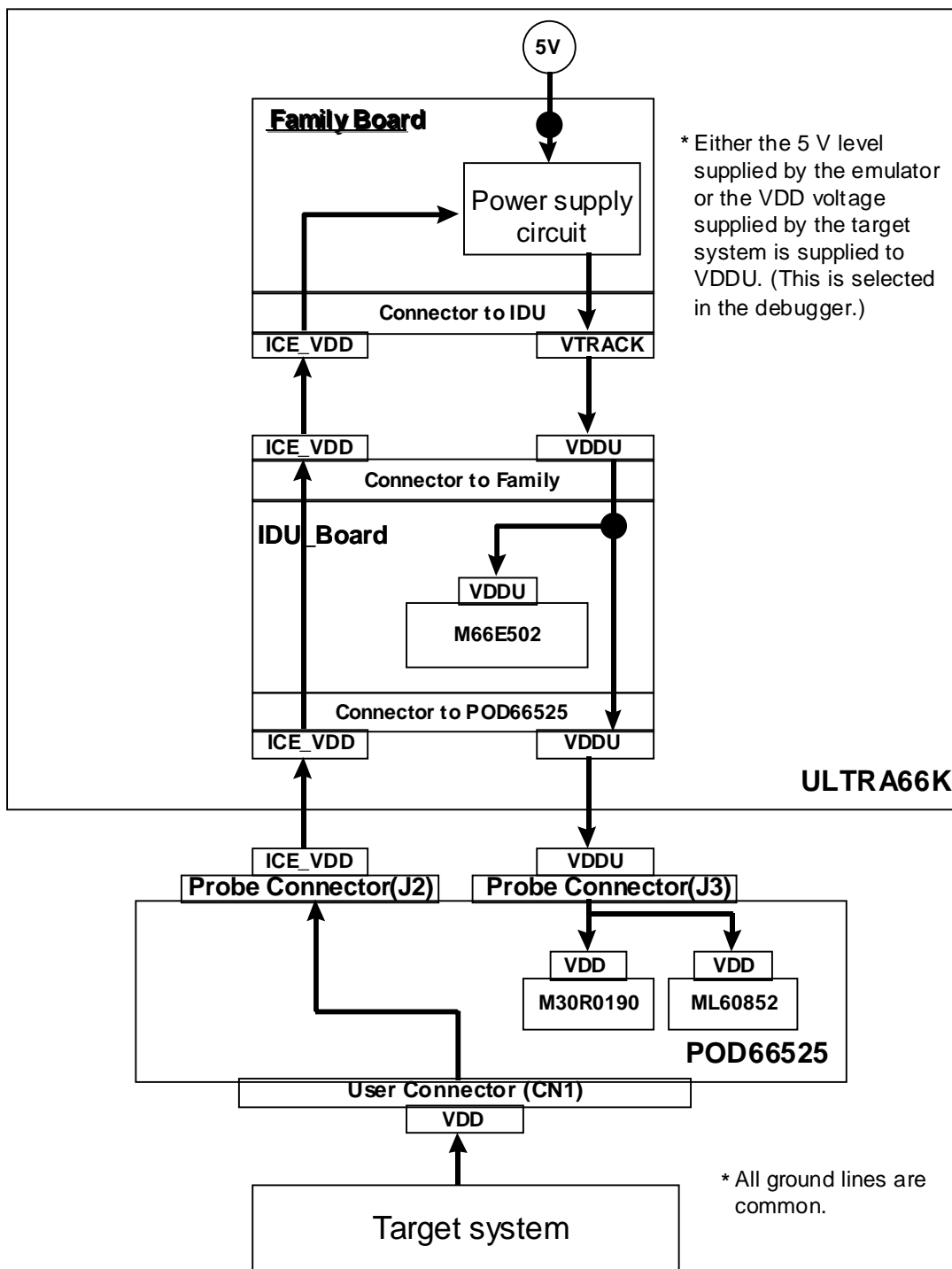


Figure A-2 Ultra66525 Power Supply Lines

In the Ultra66525 Development System, the ML66565 consists of (1) the nX-8/500S CPU core common evaluation chip (MSM66E502) that is included in the Ultra66K Development System, (2) the special-purpose evaluation chip (M30R0190) for the ML66525 that is included in the POD66525, and (3) the USB control IC (ML60852). The supply voltage selected for the PathFinder-U66K becomes the VDDU line voltage in figure A-2, and the operating voltage for the ML60852, the M30R0190 on the POD66525, and the MSM66E502.

The power supplied from the target system is supplied to the Ultra66K emulator from the POD66525 user connector (CN2) shown in figure A-2 through the ICE\_VDD line, and connected to the VDDU mentioned above by selecting "Target" in the PathFinder-U66K debugger. (See reference A-1.) (See note A-1.)

Ground lines are all common, from the target system through the Ultra66K emulator.

---

■ **Reference A-1** ■

For further information regarding the operating voltage setting, refer to chapter 4, section 4.7.5, "Processor Settings File" in the Ultra-66K Microprocessor Ultra-66K/E502 Microprocessor Development System User's Manual.

---

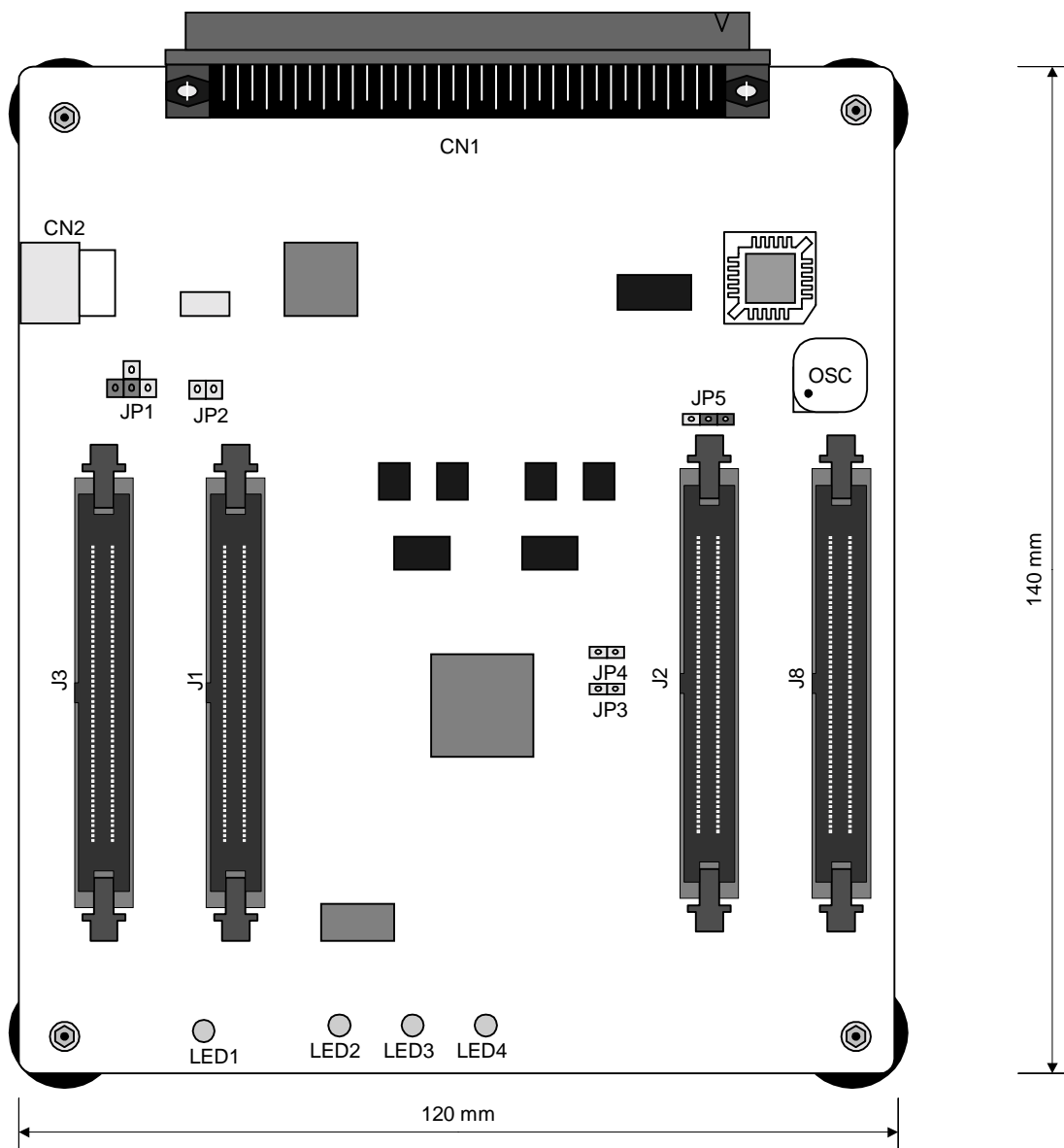
---

■ **Note A-1** ■

Do not select "Target" as the operating voltage in the state where the supply voltage is not supplied from the target system. This will result in the voltage (about 4 V) that is used to protect the Ultra66K emulator's internal circuits being applied to the MSM66E502, M30R0190, and ML60852. This may damage the M30R0190 and ML60852, which are 3 V devices.

---

### 3. POD66525 External Dimensions



◆ Mechanical specifications

**External dimensions:** 120 x 38 x 140 mm (WxHxD)