

Sun Ray 3 Series Clients Product Guide

ORACLE

E25355-07
June 2012

Sun Ray 3 Series Clients Product Guide

Copyright 2010, 2012, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners. Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark licensed through X/Open Company, Ltd.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Abstract

This document provides a detailed description of the Sun Ray 3, Sun Ray 3i, and Sun Ray 3 Plus Clients.

Document generated on: 2012-06-29 (revision: 126)

Table of Contents

1. Description	1
2. Sun Ray 3 Client	3
2.1. Part Numbers	3
2.2. Features	3
2.3. Ports	3
2.4. Chassis	4
2.5. Graphics	4
2.6. Network Interfaces	5
2.7. Power Supply	5
2.8. MTBF, Reliability, and Other Standards	5
2.9. Operating Conditions	6
2.10. LED Indicators	6
3. Sun Ray 3 Plus Client	11
3.1. Part Numbers	11
3.2. Features	11
3.3. Ports	12
3.4. Chassis	12
3.5. Graphics	13
3.6. Network Interfaces	14
3.7. Power Supply	15
3.8. MTBF, Reliability, and Other Standards	15
3.9. Operating Conditions	16
3.10. LED Indicators	16
4. Sun Ray 3i Client	19
4.1. Part Numbers	19
4.2. Features	19
4.3. Ports	20
4.4. Chassis	20
4.5. Flat Panel Display	21
4.6. Graphics	21
4.7. Network Interfaces	21
4.8. Power Supply	21
4.9. MTBF, Reliability, and Other Standards	21
4.10. Operating Conditions	22
4.11. LED Indicators	22
5. Environmental Data	25
5.1. Environmental Standards and Certifications	25
5.2. Restrictions on Materials and Substances	25
5.3. Energy Efficiency	26
5.4. Recyclability	27
5.5. Packaging	27
5.6. End of Life Management	28
5.7. Corporate Responsibility	28
6. Compliance and Regulations	29

Chapter 1. Description

Oracle's award-winning Sun Ray 3 Series Clients offer an interoperable, zero-administration desktop client solution to reduce the maintenance, upgrade, and operational costs commonly associated with PC environments. Designed for secure virtualized desktop environments, they feature full support for the Oracle desktop virtualization portfolio. All models are ultra-secure, ultra-reliable, ENERGY STAR qualified, and EPEAT Silver registered. Since Sun Ray 3 Series Clients have no local operating system and require no local management, they eliminate the complexity, expenses, and security vulnerabilities associated with other thin client and PC solutions.

Three models are available:

- The sleek and compact Sun Ray 3 Client is designed for secure, cost-effective environments. With very low power consumption, it is one of the most eco-friendly desktops on the market today. For technical details, see [Chapter 2, *Sun Ray 3 Client*](#).
- The Sun Ray 3 Plus Client, designed for secure, high-performance environments, builds on the capabilities of the Sun Ray 3 Client by adding industry-leading features such as built-in fiber-optic networking and native dual-display support. For technical details, see [Chapter 3, *Sun Ray 3 Plus Client*](#).
- The Sun Ray 3i Client is an all-in-one unit that includes a high-performance 21.5-inch HD widescreen display. For technical details, see [Chapter 4, *Sun Ray 3i Client*](#).

This document provides detailed information about the similarities and differences.

Chapter 2. Sun Ray 3 Client

This chapter lists the features and technical specifications of the Sun Ray 3 Client.

2.1. Part Numbers

Marketing Part Number: TC3-00Z-00

Oracle Part Number: 602-4962-01

2.2. Features

The following table summarizes the main features of the Sun Ray 3 Client.

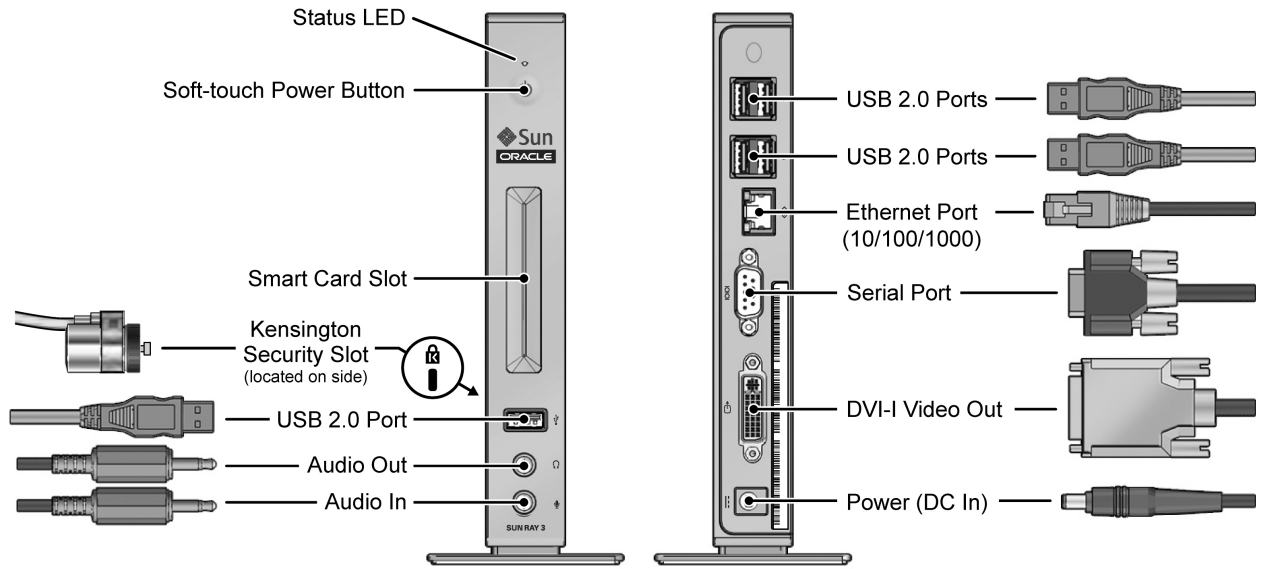
Table 2.1. Sun Ray 3 Client Features

Feature	Details
Ethernet Port	10/100/1000 Megabit per second (RJ45)
Serial Port	Single 16550 compatible serial port (DB9)
USB	Five USB 2.0 compliant ports, one on front panel, four on rear panel
Video Graphics Resolutions	Support for graphics resolutions of up to 1920x1200 via a single-link DVI-I video connector.
Audio	<ul style="list-style-type: none">• Stereo headphone output jack (1/8" mini-jack)• Microphone input jack (1/8" mini-jack)• Internal 2 Watt monaural speaker
Power Status LED	Off/Green/Amber (Off/On/Fault)
ON/OFF Switch	Capacitance-sensing, soft-touch Power ON/OFF switch
Smart Card Reader	<ul style="list-style-type: none">• Lighted Smart Card slot indicates Smart Card access activities• Supports ISO 7816 T=0 and T=1 interface smart cards (synchronous cards not supported)• Dual-sided reader socket• Supported card voltages: 1.8V, 3V, 5V• Maximum card baud rate: 230 K
System Security Lock	Security Lock Slot
ENERGY STAR Compliance	Version 5.0, Category A
MTBF	200,000 hours minimum at 25C (calculated)

2.3. Ports

The following diagram illustrates and labels the Sun Ray 3 Client ports.

Figure 2.1. Sun Ray 3 Client Ports



2.4. Chassis

The Sun Ray 3 Client enclosure provides passive cooling and can be used in a vertical position, supported by its base. There are no user accessible items or moving parts.

Table 2.2. Sun Ray 3 Client Mechanical Dimensions

Dimension	Detail
Width	28 mm (1.10 in.)
Depth	158 mm (6.22 in.)
Height (without base)	190 mm (7.48 in.)
Height (with base)	196 mm (7.72 in.)
Weight (without base)	500 g (1.10 lb.)
Weight (with base)	660 g (1.46 lb.)

2.5. Graphics

The Sun Ray 3 Client supports the following monitor timings and resolutions for high-resolution graphics:

- 640x480 60 Hz
- 640x480 75 Hz
- 640x480 85 Hz
- 800x600 60 Hz
- 800x600 75 Hz
- 800x600 85 Hz
- 1024x768 60 Hz

- 1024x768 75 Hz
- 1024x768 85 Hz
- 1152x900 66 Hz
- 1152x900 76 Hz
- 1280x800 60 Hz
- 1280x1024 60 Hz
- 1280x1024 66 Hz
- 1280x1024 75 Hz
- 1280x1024 76 Hz
- 1280x1024 85 Hz
- 1400x1050 60 Hz
- 1440x900 60 Hz
- 1600x1200 60 Hz
- 1680x1050 60 Hz
- 1920x1080 60 Hz
- 1920x1200 60 Hz



Note

Although the Sun Ray 3 Client can produce both analog (HD15) and digital video (DVI) output, a DVI cable is always recommended to ensure the best performance and should be used whenever possible.

2.6. Network Interfaces

The Sun Ray 3 Client connects to networks via one copper Gigabit 10/100/1000-Base T Fast Ethernet port.

2.7. Power Supply

The power supply unit (PSU) is a 36W AC/DC external power adapter that meets the specifications for external power adapters as listed in the EPA document, *ENERGY STAR Program Requirements for Computers Version 5.0*. Power supply inputs and outputs are listed in the following table.

Table 2.3. Sun Ray 3 Client PSU Inputs and Outputs

AC Input socket	IEC 60320 Type C8 (matches C7 plug)
DC Output	12 Volts DC at 3.0 Amps

2.8. MTBF, Reliability, and Other Standards

The calculated mean time between failures is 200,000 hours minimum at 25C. Compliance with reliability and other standards is documented in the following table.

Table 2.4. Sun Ray 3 Client Reliability and Other Standards

IEC 60068-1	Environmental Testing - Part 1: General and guidance
IEC 60068-2-1	Environmental Testing - Part 2: Tests A: Cold -50
IEC 60068-2-2	Environmental Testing - Part 2: Tests B: Dry heat +140
IEC 60068-2-3	Environmental Testing - Part 2: Test Ca: Damp heat
IEC 60068-2-6	Environmental Testing - Part 2: Test Fc and guidance: Vibration (sinusoidal)
IEC 60068-2-13	Environmental Testing - Part 2: Test M: Low air pressure
IEC 60068-2-27	Environmental Testing - Part 2: Test Ea and guidance: Shock
IEC 60068-2-31	Environmental Testing - Part 2: Test Ec: Drop and topple, primarily for equipment-type specimens
IEC 60068-2-32	Environmental Testing - Part 2: Test Ed: Free fall
IEC 60068-2-56	Environmental Testing - Part 2: Test Cb: Damp heat, steady state, primarily for equipment
IEC 60068-2-64	Environmental Testing - Part 2: Test Fh: Vibration, broad-band random (digital control) and guidance
ASTM D3332	Standard Test Methods for Mechanical-Shock Fragility of Products, Using Shock Machines
U.S. CFR1194	Section 508 of the U.S. Rehabilitation Act of 1986, as amended by the Workforce Investment Act of 1998

2.9. Operating Conditions

The Sun Ray 3 Client operates within the ranges specified in the following tables.

Table 2.5. Sun Ray 3 Client Operating Conditions

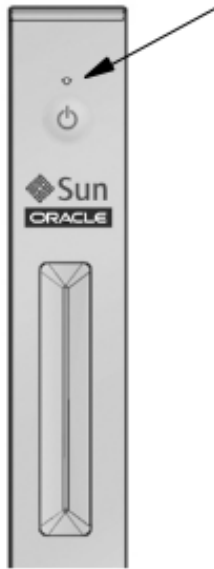
Temperature	0 to 40C
Humidity	5% to 93% RH
Altitude	3 km (9,842 feet)
Acoustic Noise Emissions	Less than 20dBA for any case, at 0.25m from the case in any direction per ISO 9296, 7779, and 9295

Table 2.6. Sun Ray 3 Client Non-Operating Conditions

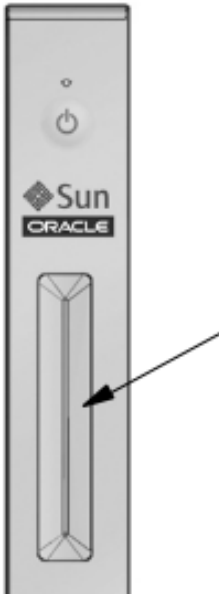
Temperature	-20 to 60C
Humidity	5% to 93% RH
Altitude	12 km (39,370 feet)

2.10. LED Indicators

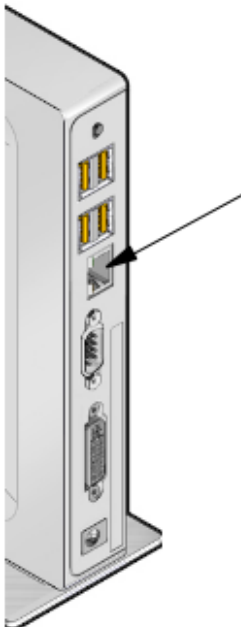
The LED indicator is located just above the soft-touch power switch, as shown in the following figure. LED colors and states are described in the table below it. If the Status LED is green, the unit is functioning normally.

Figure 2.2. Sun Ray 3 Client Status LED**Table 2.7. Sun Ray 3 Client Status LED States**

State	Meaning
Off	<p>The unit is not plugged in or not powered on.</p> <ul style="list-style-type: none"> To turn the unit off, touch the power button. To save energy, the unit turns off automatically when idle for 30 minutes. <p>Note: Turning the unit off or removing a smart card does not affect users' sessions.</p>
Green	<p>The unit is powered on and is functioning normally.</p> <ul style="list-style-type: none"> When the unit is first plugged in, it turns on automatically. To turn the unit on manually, touch the power button, located below the LED, or insert a smart card.
Amber	<p>The LED lights for 2-3 seconds or less at power-on while the unit performs diagnostic tests.</p> <p>If the LED remains amber or becomes amber at any other time, the unit may be inoperable and should be reset. To reset the unit, power off and power on the unit by using the power button or by unplugging and replugging the power cord. If the LED remains amber, continue to reset the unit two more times.</p> <p>If the LED remains amber after three resets, the unit is inoperable. Contact your system administrator to replace the unit.</p>

Figure 2.3. Sun Ray 3 Client Smart Card LED**Table 2.8. Sun Ray 3 Smart Card LED States**

State	Meaning
Off	No smart card is inserted or detected.
On	The smart card has been inserted correctly.
Blinking	The smart card is being accessed or the firmware inside the smart card interface is being updated. A firmware update takes 30 to 40 seconds.

Figure 2.4. Sun Ray 3 Client Network Connector LEDs

The Ethernet port LEDs indicate network activity and connectivity. The top LED shows activity on the link; the bottom LED represents the status of the link. In the diagram, the arrow points to the Ethernet port rather than to the LEDs.

Table 2.9. Sun Ray 3 Client Network Connector LED States

State	Meaning
Top LED Flashing Orange	Packets are being received from the network.
Top LED Off	No packets are being received.
Bottom LED Green On	Link up
Bottom LED Green Off	Link down

Chapter 3. Sun Ray 3 Plus Client

The Sun Ray 3 Plus Client offers high-performance with industry-leading features and ultra-low power consumption. The chassis uses eco-friendly and recyclable materials. This chapter lists its features and technical specifications.

3.1. Part Numbers

- Marketing Part Numbers:
 - TC3-P0Z-00
 - TC3-PTZ-00 (TAA Compliant)
- Oracle Part Numbers:
 - 602-4936-01
 - 602-4937-01 (TAA Compliant)

3.2. Features

The following table summarizes the main features of the Sun Ray Plus Client.

Table 3.1. Sun Ray 3 Plus Client Features

Feature	Details
Ethernet Port	10/100/1000 Megabit per second (RJ45)
Serial Port	Single 16550 compatible serial port (DB9)
USB	Four USB2.0 compliant ports, two on front panel, two on rear panel
Video Graphics Resolutions and Performance	Support for graphics resolutions of up to 2560x1600 per display on two displays via two DVI-I dual-link video connectors.
Audio	<ul style="list-style-type: none">• Stereo headphone output jack (1/8" mini-jack)• Microphone input jack (1/8" mini-jack)• Internal 1.2 Watt monaural speaker
Status LED	Power ON/OFF (Amber/Green) indicator
ON/OFF Switch	Capacitance sensing soft-touch Power ON/OFF switch
Smart Card Reader	<ul style="list-style-type: none">• Lighted Smart Card slot indicates Smart Card access activities• Supports ISO 7816 T=0 and T=1 interface smart cards (synchronous cards not supported)• Dual-sided reader socket• Supported card voltages: 1.8V, 3V, 5V• Maximum card baud rate: 230 K
SFP Module Socket	On-board SFP socket capable of supporting

Feature	Details
	1000 Base SX SFP modules
System Security Lock	Security Lock Slot
ENERGY STAR Compliance	Version 5.0, Category B
MTBF	200,000 hours minimum at 25C (calculated)

3.3. Ports

The following figure shows the locations of the Sun Ray 3 Plus Client ports and LEDs, with a legend.

Figure 3.1. Sun Ray 3 Plus Ports

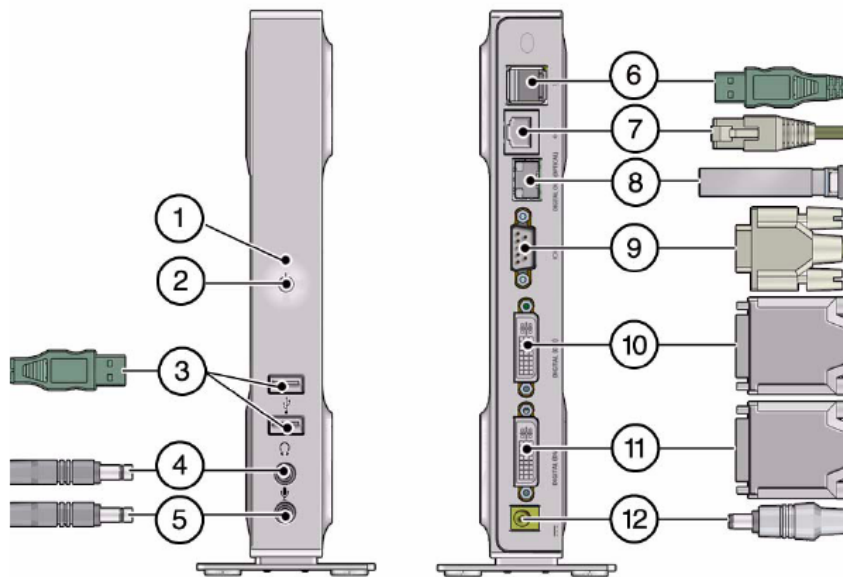


Figure Legend

- 1 Status LED
- 2 Soft-touch Power Button
- 3 USB 2.0 Ports
- 4 Audio Out
- 5 Audio In
- 6 USB 2.0 Ports
- 7 Ethernet Port (10/100/1000)
- 8 SFP Module Socket (1 Gigabit/SGMII only)
- 9 Serial Port
- 10 DVI-I Video Out (Primary)
- 11 DVI-I Video Out (Secondary)
- 12 Power (DC in)

3.4. Chassis

Table 3.2. Sun Ray 3 Plus Client Mechanical Dimensions

Dimension	Detail
Width (minimum/maximum)	28.00 mm (1.10 in.)/33.5 mm (1.32 in.)
Width (including stand)	75.00 mm (2.95 in.)

Dimension	Detail
Depth	180.00 mm (7.09 in.)
Height (without stand)	215.00 mm (8.47 in.)
Height (including stand)	221.20 mm (8.71 in.)
Weight (without stand)	750 g (1 lb. 10 oz.)
Weight (including stand)	1 kg (2.2 lb.)

3.5. Graphics

A high-performance graphics chip provides high-resolution graphics on dual analog or digital displays, using Dual-Link DVI-I connectors, with the following resolutions and timings for each port:

- 640x480x60
- 640x480x75
- 640x480x85
- 800x600x60
- 800x600x75
- 800x600x85
- 1024x768x60
- 1024x768x75
- 1024x768x85
- 1152x900x66
- 1152x900x76
- 1280x800x60
- 1280x1024x60
- 1280x1024x66
- 1280x1024x75
- 1280x1024x76
- 1280x1024x85
- 1400x1050x60
- 1440x900x60
- 1600x1024x60
- 1600x1200x60
- 1600x1200x75
- 1680x1050x60
- 1920x1080x60

- 1920x1080x70
- 1920x1080x72
- 1920x1200x60
- 1920x1200x70
- 2560x1600x60



Note

The maximum display resolution is 2560x1600 at 24 bits per pixel.

Although the Sun Ray 3 Plus Client can produce both analog (HD15) and digital video (DVI) output, a DVI cable is always recommended to ensure the best performance and should be used whenever possible.

3.6. Network Interfaces

Sun Ray 3 Plus Clients can connect to networks via:

- One copper Gigabit 10/100/1000-Base T Fast Ethernet port
- One SFP socket to support optional fiber-optic networking modules

If both fiber-optic and copper interfaces are connected, the fiber-optic link is checked first. If the fiber-optic link is not valid, copper interface link is checked.

The Sun Ray 3 Plus Client includes an empty SFP (Small Form-factor Pluggable) network module slot in the back of the unit. This slot is intended to support commercial 1 Gb or 100 Mb optical fiber SFP network modules for customers who require optical network support.

- The SFP slot is intended for fiber-optic module use only. The client already includes a built-in copper Gigabit 10/100/1000-Base T Fast Ethernet port.
- Most 1000-X (Gb speed) compatible optical modules, such as 1000-SX or 1000-LX, should work unless they require a vendor-specific custom initialization.
- Certain 100-FX (100 Mb speed) optical modules should work with the following restrictions:
 - Each must have an SGMII (Serial Gigabit MII) interface. Many 100-FX SFP modules are designed only for direct 100 Mb slots, so they do not have an SGMII interface.
 - None can require a vendor-specific custom initialization.
- To connect to the SFP slot on a Sun Ray 3 Plus Client with an MT-RJ cable, use an MT-RJ to LC adapter. The following MT-RJ to LC adapters have been tested:
 - Fiber Optic Cable Shop FC-MTLC-MD6-1/6M
 - Cables To Go 3318x LC MTRJ DUP 62.5/125

The following table contains a partial list of fiber-optic modules that have been successfully tested.

Table 3.3. Fiber-Optic Modules Tested for Sun Ray 3 Plus Clients

SFP Module Type	Tested Devices
1000-SX	<ul style="list-style-type: none"> • Avago (Agilent) AFBR-5710LZ

SFP Module Type	Tested Devices
	<ul style="list-style-type: none"> • Cisco GLC-SX-MM • Finisar FTLF8524P2BNL (850 nm) • Netgear AGM731F • Opnext TRF2716AALB200
1000-LX	<ul style="list-style-type: none"> • Avago (Agilent) AFCT-5710LZ • Finisar FTLF1324P2BTV (1310 nm)
100-FX with SGMII	<ul style="list-style-type: none"> • Cisco GLC-GE-100FX (100-FX for Gb ports) • Opnext TRF5325ANLB200 (100-FX with SGMII) • Memory Dealers "Cisco GLC-GE-100FX compatible"

3.7. Power Supply

The power supply unit (PSU) is a 36W AC/DC external power adapter that meets the specifications for external power adapters as listed in the EPA document, *ENERGY STAR Program Requirements for Computers Version 5.0*. Power supply inputs and outputs are listed in the following table.

Table 3.4. Sun Ray 3 Plus Client PSU Inputs and Outputs

AC Input	90-264V, 47-63 Hz
AC Input socket	IEC320 Type C7 (matches C8 plug)
DC Output	12 Volts VDC at 3.0 Amps

3.8. MTBF, Reliability, and Other Standards

The calculated mean time between failures is 200,000 hours minimum at 25C. Compliance with reliability and other standards is documented in the following table.

Table 3.5. Sun Ray 3 Plus Client PSU Reliability and Other Standards

IEC 60068-1	Environmental Testing - Part 1: General and guidance
IEC 60068-2-1	Environmental Testing - Part 2: Tests A: Cold -50
IEC 60068-2-2	Environmental Testing - Part 2: Tests B: Dry heat +140
IEC 60068-2-3	Environmental Testing - Part 2: Test Ca: Damp heat
IEC 60068-2-6	Environmental Testing - Part 2: Test Fc and guidance: Vibration (sinusoidal)
IEC 60068-2-13	Environmental Testing - Part 2: Test M: Low air pressure
IEC 60068-2-27	Environmental Testing - Part 2: Test Ea and guidance: Shock
IEC 60068-2-31	Environmental Testing - Part 2: Test Ec: Drop and topple, primarily for equipment-type specimens
IEC 60068-2-32	Environmental Testing - Part 2: Test Ed: Free fall
IEC 60068-2-56	Environmental Testing - Part 2: Test Cb: Damp heat, steady state, primarily for equipment
IEC 60068-2-64	Environmental Testing - Part 2: Test Fh: Vibration, broad-band random (digital control) and guidance

ASTM D3332	Standard Test Methods for Mechanical-Shock Fragility of Products, Using Shock Machines
U.S. CFR1194	Section 508 of the U.S. Rehabilitation Act of 1986, as amended by the Workforce Investment Act of 1998

3.9. Operating Conditions

The Sun Ray 3 Plus Client enclosure provides passive cooling and is designed to be used in a vertical position, supported by its stand. There are no user accessible items or moving parts.



Note

The Sun Ray 3 Plus Client must be attached to the provided stand to ensure that the unit is mounted vertically. The ventilation screens must not be covered.

The Sun Ray 3 Plus Client operates within the ranges specified in the following tables.

Table 3.6. Sun Ray 3 Plus Operating Conditions

Temperature	0 to 35C
Humidity	5% to 93% RH
Altitude	3 km (9,842 feet)
Acoustic Noise Emissions	Less than 20dBA for any case, at 0.25m from the case in any direction per ISO 9296, 7779, and 9295

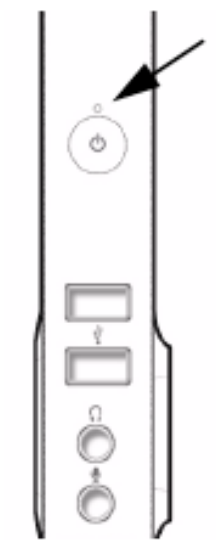
Table 3.7. Sun Ray 3 Plus Non-Operating Conditions

Temperature	-20 to 60C
Humidity	5% to 93% RH
Altitude	12 km (39,370 feet)

3.10. LED Indicators

The Sun Ray 3 Plus power LED is illustrated in the following figure.

Figure 3.2. Sun Ray 3 Plus Power LED



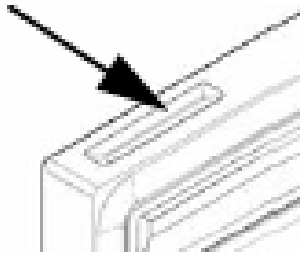
LED colors and states are described in the following table. If the Power LED is green, the unit is functioning normally.

Table 3.8. Sun Ray 3 Plus LED Indicators

State	Meaning
Off	The unit is not plugged in or not turned on. When the plug is reconnected, the unit is automatically turned On. To turn the unit on manually, touch the ON/OFF switch, located below the LED, or insert a smart card. To turn it off, touch the ON/OFF switch. Note: Turning the unit off or removing a smart card does not affect users' sessions.
Green	The unit is powered on and is functioning normally.
Amber	The LED lights for 2-3 seconds or less at power-on while the unit performs diagnostic tests. If the LED remains amber or becomes amber at any other time, the unit may be inoperable and should be reset. To reset the unit, power off and power on the unit by using the power button or by unplugging and replugging the power cord. If the LED remains amber, continue to reset the unit two more times. If the LED remains amber after three resets, the unit is inoperable. Contact your system administrator to replace the unit.

The Sun Ray 3 Plus Smart Card LED is illustrated in the following figure.

Figure 3.3. Sun Ray 3 Plus Smart Card LED

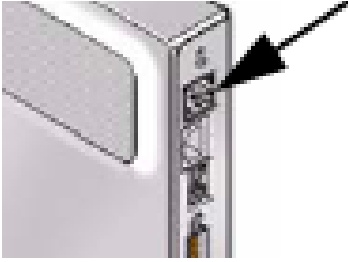


Smart Card LED insertion states are described in the following table.

Table 3.9. Sun Ray 3 Plus Smart Card Insertions States

State	Meaning
Off	No smart card is inserted or detected.
On	The smart card has been inserted correctly.
Blinking	Firmware inside the smart card interface is being updated. This update takes 30 to 40 seconds.

The Sun Ray 3 Plus Network Connector LEDs are illustrated in the following figure.

Figure 3.4. Sun Ray 3 Plus Network Connector LEDs

The Ethernet port LEDs indicate network connectivity and speed. The top LED represents the speed of the twisted pair link; the bottom LED shows activity on the link.

Table 3.10. Ethernet Port LED States

State	Meaning
Top LED Orange	1 Gbps
Top LED Green	100 Mbps
Top LED Off	10 Mbps
Bottom LED Flashing Green	Packets are being received from the network.
Bottom LED Off	No packets are being received.

Chapter 4. Sun Ray 3i Client

This chapter lists the features and technical specifications of the Sun Ray 3i Client.

4.1. Part Numbers

Marketing Part Number: TC3-I0Z-00

Oracle Part Number: 602-4977-01

4.2. Features

The following table summarizes the main features of the Sun Ray 3i Client.

Table 4.1. Sun Ray Client 3i Features

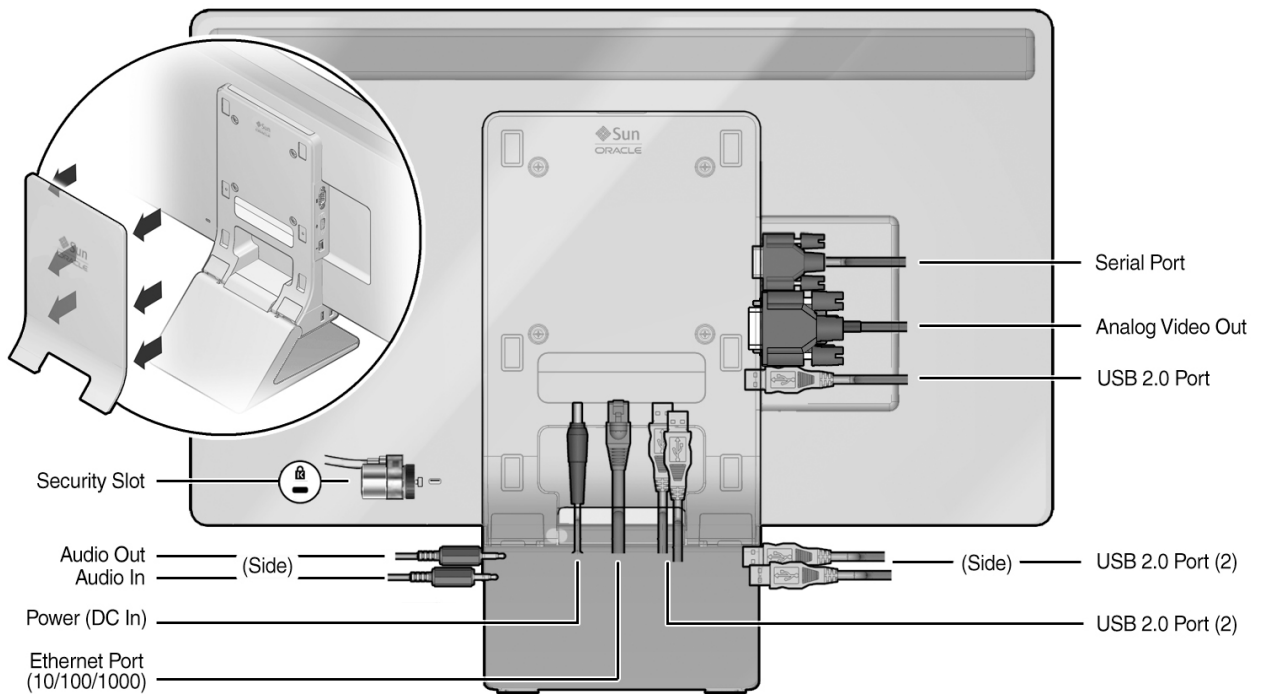
Feature	Details
Ethernet Port	10/100/1000 Megabit per second (RJ45)
Serial Port	Single 16550 compatible serial port (DB9)
USB	Five USB 2.0 compliant ports, two on the left side of the front panel, one on the left rear panel, and two on the center rear panel.
Integrated Flat Panel Display	<ul style="list-style-type: none">• 21.5-inch color AM-TFT-LCD• Display format (fixed resolution): 1920x1080 pixels• Contrast ratio: 1000:1 (typical)• Luminance: 250 cd/m² (typical)• Response time: 5.0 ms (total response time, typical)• Horizontal viewing angle: ± 85 degrees (for CR>10) (typical)• Vertical viewing angle: ± 80 degrees (for CR>10) (typical)• 2-lamp cold cathode fluorescent lamp backlight
Base	Tilt adjustment and manual swivel only
Analog Video Out	Supports a fixed graphics resolution of 1920x1080@60Hz via an HD-15 (VGA) analog video port
Audio	<ul style="list-style-type: none">• Stereo headphone output jack (1/8" mini-jack)• Microphone input jack (1/8" mini-jack)• Internal 2 Watt monaural speaker
Power Status LED	Off/Green/Amber (Off/On/Fault)
ON/OFF Switch	Capacitance-sensing, soft-touch Power ON/OFF switch
Brightness Control	Luminance intensity (brightness) control switch
Smart Card Reader	<ul style="list-style-type: none">• Lighted Smart Card slot indicates Smart Card access activities• Supports ISO 7816 T=0 and T=1 interface smart cards (synchronous cards not supported)

Feature	Details
	<ul style="list-style-type: none"> • Dual-sided reader socket • Supported card voltages: 1.8V, 3V, 5V • Maximum card baud rate: 230 K
System Security Lock	Security lock slot
ENERGY STAR Compliance	Version 5.0, Category A
MTBF	75,000 hours minimum at 25C (calculated)

4.3. Ports

The Sun Ray 3i Client ports and sockets are illustrated and labeled in the following diagram.

Figure 4.1. Sun Ray 3i Client Ports



4.4. Chassis

The Sun Ray 3i Client enclosure provides passive cooling and can be used in portrait orientation, supported by its base or mounted to the wall using the VESA-compliant mount feature located on the rear of the enclosure. There are no user accessible items or moving parts.

Table 4.2. Sun Ray 3i Client Mechanical Dimensions

Dimension	Detail
Width	517.40 mm (20.37 in.)
Depth (with rear cover)	48.50 mm (1.91 in.)
Height (without base)	308.80 mm (12.16 in.)
Height (with base)	407.90 mm (16.06 in.)

Dimension	Detail
Weight (without base and rear cover)	4.22 kg (9.30 lb.)
Weight (with base)	5.45 kg (12.02 lb.)

4.5. Flat Panel Display

The Sun Ray 3i Client supports an integrated 21.5-inch high-resolution color LCD panel with 2-Lamp Fluorescent backlight. It supports full High Definition (HD), with a fixed 1920(H) x 1080(V) screen format and 6-bits/color with Hi-FRC to simulate 16.7M colors.

4.6. Graphics

The Sun Ray 3i Client features a high-performance integrated graphics engine embedded in the CPU to provide high-resolution graphics to the LCD panel, as well as one analog external monitor or projector that can support 1920x1080 @ 60Hz as an input resolution. The output resolution is always locked to the resolution of the internal display (1920x1080 @ 60Hz), and the internal display resolution cannot be changed.



Note

Use of an analog external device requires a DVI-I to HD-15 adapter (not supplied with the unit).

4.7. Network Interfaces

The Sun Ray 3i Client can connect to networks via one copper Gigabit 10/100/1000-Base T Fast Ethernet port.

4.8. Power Supply

The power supply unit (PSU) is a 65W AC/DC external power adapter that meets the specifications for external power adapters as listed in the EPA document, *ENERGY STAR Program Requirements for Computers Version 5.0*. Power supply inputs and outputs are listed in the following table.

Table 4.3. Sun Ray 3i Client PSU Inputs and Outputs

AC Input	100-240 V, 50-60 Hz
AC Input socket	IEC320 Type C7 (matches C8 plug)
DC Output	19 Volts VDC at 3.42 Amps

4.9. MTBF, Reliability, and Other Standards

The calculated mean time between failures is 75,000 hours minimum at 25C. Compliance with reliability and other standards is documented in the following table.

Table 4.4. Sun Ray 3i Client Reliability and Other Standards

IEC 60068-1	Environmental Testing - Part 1: General and guidance
IEC 60068-2-1	Environmental Testing - Part 2: Tests A: Cold -50
IEC 60068-2-2	Environmental Testing - Part 2: Tests B: Dry heat +140
IEC 60068-2-3	Environmental Testing - Part 2: Test Ca: Damp heat
IEC 60068-2-6	Environmental Testing - Part 2: Test Fc and guidance: Vibration (sinusoidal)

Operating Conditions

IEC 60068-2-13	Environmental Testing - Part 2: Test M: Low air pressure
IEC 60068-2-27	Environmental Testing - Part 2: Test Ea and guidance: Shock
IEC 60068-2-31	Environmental Testing - Part 2: Test Ec: Drop and topple, primarily for equipment-type specimens
IEC 60068-2-32	Environmental Testing - Part 2: Test Ed: Free fall
IEC 60068-2-56	Environmental Testing - Part 2: Test Cb: Damp heat, steady state, primarily for equipment
IEC 60068-2-64	Environmental Testing - Part 2: Test Fh: Vibration, broad-band random (digital control) and guidance
ASTM D3332	Standard Test Methods for Mechanical-Shock Fragility of Products, Using Shock Machines
U.S. CFR1194	Section 508 of the U.S. Rehabilitation Act of 1986, as amended by the Workforce Investment Act of 1998

4.10. Operating Conditions

The Sun Ray 3i Client operates within the ranges specified in the following tables.

Table 4.5. Sun Ray 3i Client Operating Conditions

Temperature	0 to 40C
Humidity	5% to 93% RH
Altitude	3 km (9,842 feet)
Acoustic Noise Emissions	Less than 30dBA for any case, at 0.25m from the case in any direction per ISO 9296, 7779, and 9295

Table 4.6. Sun Ray 3i Client Non-Operating Conditions

Temperature	-20 to 60C
Humidity	5% to 93% RH
Altitude	12 km (39,370 feet)

4.11. LED Indicators

Sun Ray 3i LED indicators are illustrated in the following figure. If the Status LED is green, the unit is functioning normally.

Figure 4.2. Sun Ray 3i Client Smart Card Slot

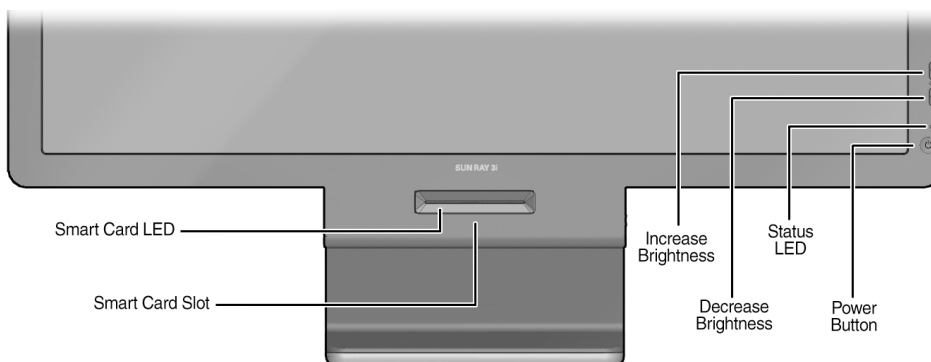


Table 4.7. Sun Ray 3i Status LED

State	Meaning
Off	<p>The unit is not plugged in or not powered on.</p> <ul style="list-style-type: none"> To turn the unit off, touch the power button. To save energy, the unit turns off automatically when idle for 30 minutes. <p>Note: Turning the unit off or removing a smart card does not affect users' sessions.</p>
Green	<p>The unit is powered on and is functioning normally.</p> <ul style="list-style-type: none"> When the unit is first plugged in, it turns on automatically. To turn the unit on manually, touch the power button or insert a smart card.
Amber	<p>The LED lights for 2-3 seconds or less at power-on while the unit performs diagnostic tests.</p> <p>If the LED remains amber or becomes amber at any other time, the unit may be inoperable and should be reset. To reset the unit, power off and power on the unit by using the power button or by unplugging and replugging the power cord. If the LED remains amber, continue to reset the unit two more times.</p> <p>If the LED remains amber after three resets, the unit is inoperable. Contact your system administrator to replace the unit.</p>

Table 4.8. Sun Ray 3i Client Smart Card LED

State	Meaning
Off	No smart card is inserted or detected.
On	The smart card has been inserted correctly.
Blinking	Firmware inside the smart card interface is being updated. This update takes 30 to 40 seconds.

The Ethernet port LEDs indicate connectivity and network activity. The left LED represents the status of the link; the right LED shows activity on the link.

Table 4.9. Sun Ray 3i Client Network Connector LEDs

State	Meaning
Left LED Green On	Link up
Left LED Green Off	Link down
Right LED Flashing Orange	Packets are being received from the network.
Right LED Off	No packets are being received.

Chapter 5. Environmental Data

The Sun Ray 3 Series Clients are designed specifically to be sensitive to a spectrum of environmental concerns and standards, from materials to manufacturing processes to shipping, operation, and end of life.

5.1. Environmental Standards and Certifications

The Sun Ray 3 Series Clients comply with the following environmental standards and certifications:

- ENERGY STAR 5.0 (U.S. Environmental Protection Agency)
 - Category A (Sun Ray 3 Client and Sun Ray 3i)
 - Category B (Sun Ray 3 Plus Client)
- [EPEAT](#) (Electronic Product Environmental Assessment Tool) - EPEAT Silver in all countries.
- WEEE (Waste Electrical and Electronic Equipment) Directive - 2002/96/EC
- Global Reporting Initiative (GRI) - Corporate Responsibility Report
- ISO 14000/14001
- California Proposition 65
- RoHS (Restriction of Hazardous Substances) Directive - 2002/95/EC (RoHS-6)



Note

The term "RoHS-6" does not have an industry standard definition. Sun Ray 3 Series Clients are RoHS-6 compliant using the Oracle definition, which means that the Lead Solder for Servers Exemption 7(b) is not used (shown below). If you need additional information, see the Oracle policy for [RoHS and REACH](#).

From EU Commission Decision - D009293/01/EN: "7(b) - Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunications." This exemption currently has no expiration date in the decision.

5.2. Restrictions on Materials and Substances

All materials used meet the RoHS compliance specification. This product does not contain any of the following substances in excess of regulatory limits:

- Beryllium Oxide
- Cadmium
- Silicone
- Mercury
- Lead
- Asbestos

- Formaldehyde
- Polyvinyl Chloride (PVC)
- Certain Brominated Flame Retardants
- Chlorinated Paraffins
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Naphthalenes (PCN)
- Polychlorinated Triphenyl (PCT)
- Polybrominated Biphenyl Ethers/Oxides (PBBE/PBBO)
- Tetrabrominated Biphenyl A (TBBA)

Sun Ray 3 Series Clients require no batteries of any kind.

None of the following materials are used in the manufacturing processes:

- Chloroflourocarbons (CFC)
- Class 1 ozone depleting substances (Annex A and Annex B of the Montreal Protocol)

5.3. Energy Efficiency

All Sun Ray 3 Series Clients are highly energy efficient, using power management features designed to meet the specifications for Thin Clients in ENERGY STAR Program Requirements for Computers Version 5.0, published by the U.S. Department of Energy.

The following tables list the power requirements for Sun Ray 3 Series Clients.

Table 5.1. Sun Ray 3 Client Operational Mode Power Requirements

Mode	ENERGY STAR Requirement (Category A)	Typical Usage for Sun Ray 3 Client
Off Mode	≤ 2 W	0.5 W
Idle State	≤ 12 W	6 W

Table 5.2. Sun Ray 3 Plus Client Operational Mode Power Requirements

Mode	ENERGY STAR Requirement (Category B)	Typical Usage for Sun Ray 3 Plus Client
Off Mode	≤ 2 W	0.31 W
Idle State	≤ 15 W	14.2 W

Table 5.3. Sun Ray 3i Client Operational Mode Power Requirements

Mode	ENERGY STAR Requirement (Category A)	Typical Usage for Sun Ray 3i Client
Off Mode	≤ 2 W	0.39 W
Idle State	≤ 12 W	5.38 W

5.4. Recyclability

The material choices and design of the Sun Ray 3 Series Clients maximize ease of disassembly, safe recycling, and transportation efficiency. Assessment results are summarized in the following tables. Weights listed exclude the keyboard and mouse.



Note

Sun Ray 3 Series Clients contain 0% recycled materials (by weight).

Table 5.4. Sun Ray 3 Client Recyclability

Product Recyclability Assessment	Category sub-total Weights (g)	Actual (%)	WEEE Recyclability Requirements (%)
Recyclable	765	92%	≥ 65%
Waste to Energy	50	6%	≤ 10%
Landfill	13	2%	≤ 25%
Total Weight	828	100%	--

Table 5.5. Sun Ray 3 Plus Client Recyclability


Product Recyclability Assessment	Category sub-total Weights (g)	Actual (%)	WEEE Recyclability Requirements (%)
Recyclable	1,086	90%	≥ 65%
Waste to Energy	105	9%	≤ 10%
Landfill	15	1%	≤ 25%
Total Weight	1,206	100%	--

Table 5.6. Sun Ray 3i Client Recyclability

Product Recyclability Assessment	Category sub-total Weights (g)	Actual (%)	WEEE Recyclability Requirements (%)
Recyclable	5,518	98%	≥ 65%
Waste to Energy	59	1%	≤ 10%
Landfill	40	1%	≤ 25%
Total Weight	5,617	100%	--



Note

 The internal fluorescent lamps in Sun Ray 3i Client displays contain mercury. Handle the display and the complete unit with care and dispose according to state or local laws.

5.5. Packaging

The packaging materials for Sun Ray 3 Series Clients are designed for maximum recyclability as well as assuring product protection during shipment. The packaging contains at least 90% (by weight) post-consumer recycled content and is 100% recyclable when disposed of properly.

These packaging materials can be recycled in your local recycling infrastructure. Use the following web sites to locate recycling options near you:

- United States - <http://www.recyclingcenters.org>
- Canada - <http://earth911.com/location/international/canada>

If there is not a recycling option near you, please contact your Oracle representative for more information about arranging for packaging shipment.

5.6. End of Life Management

Oracle offers Sun Ray Client customers full asset recovery and end-of-life management for these products at competitive prices.

- To find out more about Oracle's e-waste compliance and product take-back solutions for value recovery and recycling of old products, go to [Oracle's International Electronic Waste Compliance](#)
- For a copy of the Selective Treatment List for Waste Electrical and Electronic Equipment (WEEE), click the WEE Selective Treatment List link on the same page.
- For a copy of the WEEE Disassembly Report, contact your Oracle representative.

Translations of the last two documents are also available through your Oracle representative.

5.7. Corporate Responsibility

The following links provide more information about Oracle's commitment to the environment.

- [Oracle Solutions for Enabling the Eco-Enterprise](#)
- [Oracle Solutions for Enabling the Eco-Enterprise](#)
- [Environmental Health & Safety Management System](#)
- [Oracle's International Electronic Waste Compliance](#)

Chapter 6. Compliance and Regulations

Sun Ray 3 Series Clients' compliance with all applicable US and international standards and regulations is summarized in the following tables.

Table 6.1. Safety Standards

Country	Requirement	Test Standard
Argentina	S-Mark	IEC 60950-1: 2005 2nd Edition
Canada	CSA	C22.2 No. 60950-1-07, 2nd Edition
CB Members Countries	CB	CB Report IEC 60950-1:2005 (2nd Edition); including all amendments and full worldwide deviations
China	CCC	GB9254:2008
European Union	CE	CE Marked to European Union Low Voltage Directive 2006/95/EC EN60950-1:2006 +A11:2009
Russia	GOST R	GOST R IEC 60950-1-2005 and Hygienic Certification
Taiwan	BSMI	CNS 14336:2005
US	UL	UL 60950-1, 2nd Edition

Table 6.2. Ergonomics

Country	Requirement	Test Standard
Germany	GS	EK-ITB 2000-2010

Table 6.3. EMC

Country	Requirement	Test Standard
Australia/New Zealand	AS/NZS	AS/NZS CISPR22:2006
Canada	CAN/CSA	ICES-003 Issue 4 (2004) Class B
European Union	CE	CE Marked to European Union EMC Directive 2004/108/EC, Class B, EN55022:2006 +A1:2007 Class B
Japan	VCCI	VCCI V-3/2004.04 (Class B)
Korea	KCC	KN22:2008
Russia	GOST R	GOST R 51318.22-99
Taiwan	BSMI	CNS 13438:2006
US	FCC	47 CFR 15B (Code of Federal Regulations, Part 15, Subpart B) Class B

Table 6.4. Immunity

Country	Requirement	Test Standard
European Union	CE	CE Marked to European Union EMC Directive 2004/108/EC, EN55024:1998 +A1:2001 +A2:2003
Korea	KCC	KN24:2008
Russia	GOST R	GOST R 51318.24-99

