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**OPTICAL**

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**SYSTEMS**

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**DESIGN**

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**OPERATOR MANUAL**

**OSD2053P SERIES**  
**MICRO 10/100Base-T to 100Base-X**  
**MEDIA CONVERTER**  
**WITH PoE SOURCE**



# OPTICAL SYSTEMS DESIGN

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## 1 TECHNICAL SUMMARY

### 1.1 BRIEF DESCRIPTION

#### 1.1.1 OVERVIEW

The OSD2053P is designed to convert between 10/100Base-T copper cabling and 100Base-X fiber cabling with the added feature of Link Loss Forwarding. It has one RJ45 copper PoE port and one SFP port which can be specified by the user for one or two fiber configuration.

The unit will operate on either singlemode or multimode fiber. Operation over at least 2km of multimode fiber or 50km of singlemode fiber is possible by use of the appropriate optical device.

A major benefit of the OSD2053P is its reliable operation over the -20°C to +75°C temperature range which allows it to be used in environments such as roadside cabinets, mine sites and factories.

The OSD2053P module is intended for isolated use and requires an external power source.

#### 1.1.2 APPLICATIONS

- ▲ Any network utilising a mix of copper and fiber
- ▲ Extremely space constrained environments
- ▲ Industrial IP communications
- ▲ Networks using Power over Ethernet devices such as cameras, intercoms, access control, telephones, etc

#### 1.1.3 FEATURES AND BENEFITS

- ▲ One 10/100Base-T RJ45 ports and one SFP fiber port
- ▲ Supports IEEE802.3af Alternative B cable wiring
- ▲ Complies with IEEE802.3af standard including compliant powered device (PD) signature detection and classification
- ▲ Provides up to 15.4W PoE
- ▲ Supports network traffic of 10 or 100Mbps
- ▲ Auto MDI/MDIX
- ▲ Automatic TP setup: no need for crossover cables
- ▲ Auto-sensing of half or full duplex operation
- ▲ Automatic setup for 10 or 100Mbps on copper side
- ▲ A very compact design that fits in the camera housing
- ▲ Available for singlemode, multimode operation over a variety of link budgets
- ▲ Available for operation over 1 or 2 fibers.
- ▲ Powered by non-critical 10 to 36VDC or optionally 48V<sub>DC</sub> supplies
- ▲ Operates over the temperature range of -20 to +75°C
- ▲ Utilises 100Base-X SFP transceivers that can be selected according to specific length or fiber requirements without changing the whole unit
- ▲ DIN rail mounting
- ▲ SFP sold separately

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## 1.2 TYPICAL CONFIGURATION

Figure 1 below indicates the typical set-up for an OSD2053P system.

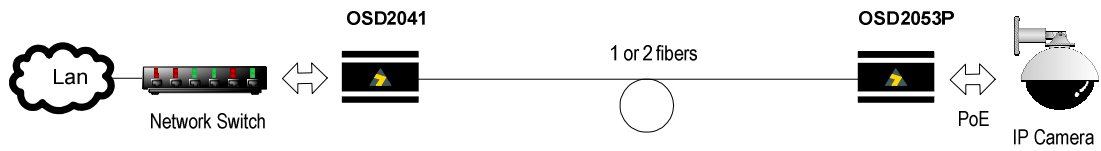


FIGURE 1: OSD2053P TYPICAL CONFIGURATIONS

# OPTICAL SYSTEMS DESIGN

## 1.3 TECHNICAL SPECIFICATIONS

TABLE 1: TECHNICAL SPECIFICATIONS

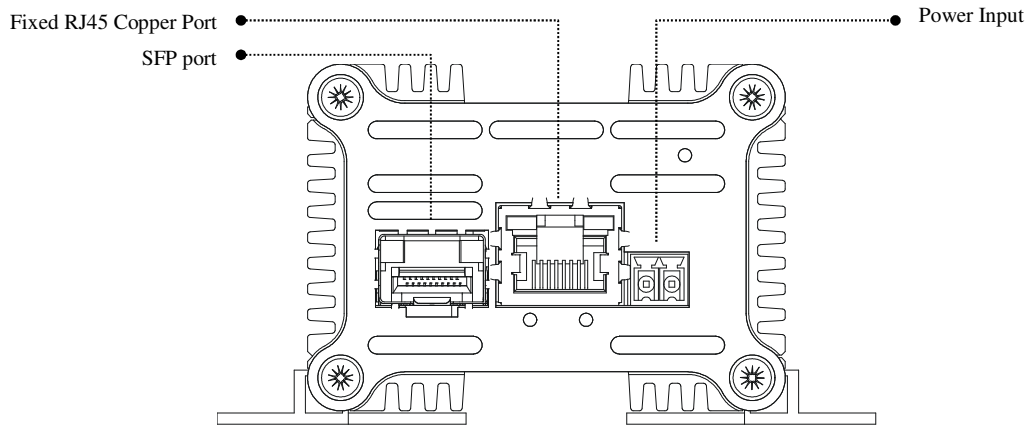
| SPECIFICATION                | PERFORMANCE   |
|------------------------------|---|
| Electrical Data Interface    | IEEE802.3 Ethernet  |
| Electrical Data Rate         | 10/100Mbps  |
| Operating Mode               | Half or full duplex   |
| Electrical Data Connector    | RJ45 mounted on the front panel   |
| PoE                          | IEEE802.3af   |
| Operating Modes              | Alternative B (Pins 4/5 and 7/8)  |
| Optical Interface            | 100Base-Fx/Sx   |
| Optical Port Connector       | SFP (LC connectors for 2-fiber operation and SC for 1-fiber operation)  |
| SFP Options                  | Short haul, long haul, single fiber operation, etc<br>Please consult OSD datasheet #1021000XX or contact OSD                                      |
| Transit Optical Power        | -15 to -8dBm into singlemode fiber (See SFP datasheet for details)  |
| Receiver Sensitivity         | <-33dBm   |
| Receiver Saturation          | >-3dBm  |
| Standard Optical Link Budget | >18dB: >10km on multimode fiber @ 1310nm<br>>40km on singlemode fiber @1310nm   |
| Operating Temperature        | -20°C to +75°C  |
| Relative Humidity            | 0 to 95% non-condensing   |
| Power Requirements           | +10VDC to +35VDC @ 3W plus up to an extra 20VA for PoE operation<br>(attached powered device dependant. Use of isolated power supply recommended) |
| Power Connector              | 2-way 3.5mm terminal block on the module  |
| Dimensions (mm)              | 90W x 58D x 49H   |
| Weight (kg)                  | 0.3   |

1022053P04

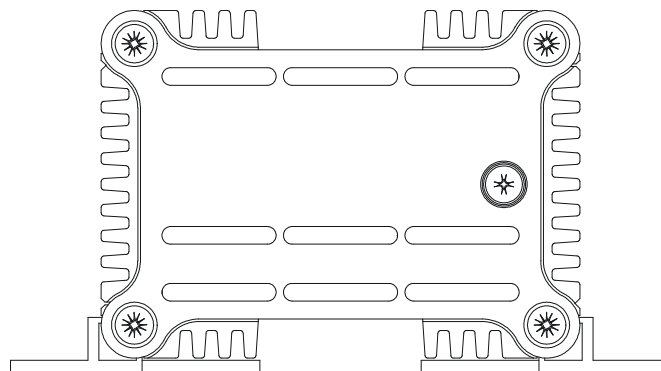
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## 1.4 OSD2053P FRONT AND REAR PANELS

There is one fixed copper port for 10/100Base-T, one SFP port and a 2-way terminal block power connector on the front panel. The SFP device is sold separately giving the user choice to use either one or two fiber communications with various optical power outputs depending on the distance required.



**OSD2053P Front Panel**



**OSD2053P Rear Panel**

FIGURE 2: OSD2053P CONNECTORS

## 2 INSTALLATION AND OPERATION

### 2.1 INTRODUCTION

This section outlines the methods required to install and operate the OSD2053P successfully. It should be studied carefully if damage to the equipment or poor results are to be avoided.

This equipment has been fully tested prior to dispatch and is ready for immediate operation. However it is advisable to check for external transportation damage before operation. If damage is evident, return the unit with the packaging to your supplier immediately.

### 2.2 INSTALLATION

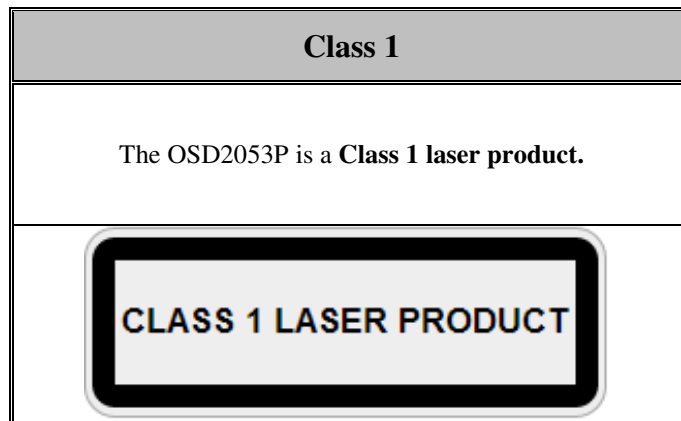
#### 2.2.1 WARNING AND PRECAUTIONS

##### ▲ ELECTROMAGNETIC COMPATIBILITY

**WARNING:** This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

##### ▲ OPTICAL OUTPUT OPERATION

**WARNING: Laser Safety:** Class 1 Laser Product per IEC/EN 60825-1:2014 standard.



#### PRECAUTIONS

- ▲ All service personnel should be provided training as to the hazards of direct viewing of laser radiation and of the precautionary measures during servicing of equipment
- ▲ Areas where laser products are installed should be restricted in access to trained service personnel only and appropriate warning signs posted in the work area.
- ▲ All laser apertures should be covered by protective covers when not connected to optical fibers. Never leave outputs uncovered.
- ▲ Laser equipment should be positioned above or below eye level where possible. Apertures should be positioned away from personnel.
- ▲ Protective eyewear should be worn in the vicinity of laser equipment.



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## 2.2.2 OSD2053P DRAWINGS AND DIMENSIONS

The standard OSD2053P is designed to be mounted on an even surface and to be secured by means of M4 or smaller screws. All dimensions are in mm. The unit also can be mounted on a standard DIN rail with the OSD2053P DIN Rail bracket.

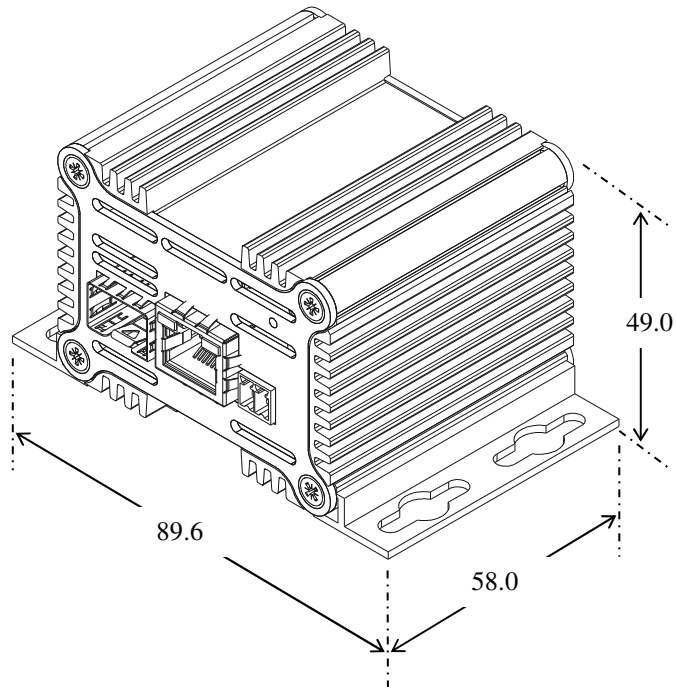


FIGURE 3: OSD2053P DIMENSIONS

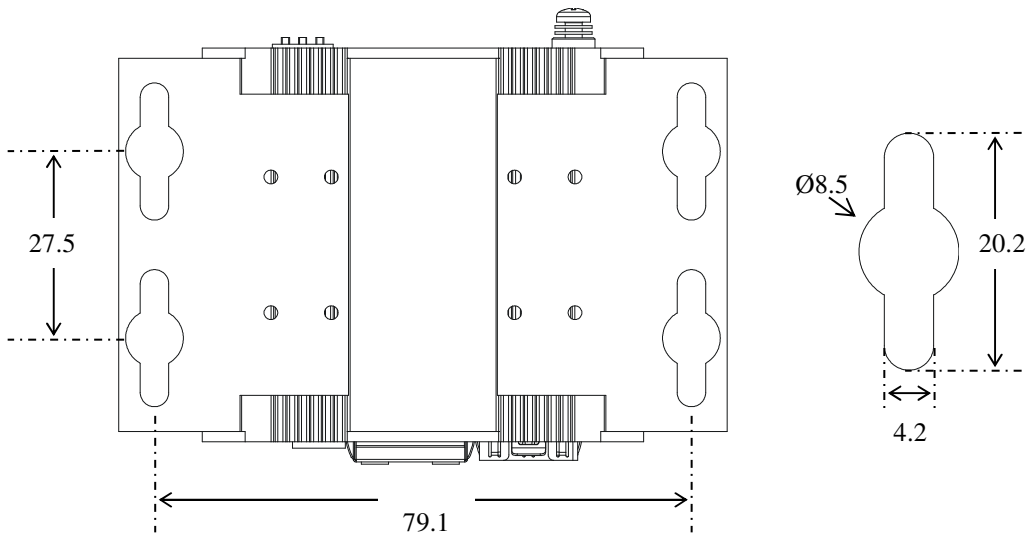


FIGURE 4: OSD2053P MOUNTING DIMENSIONS

# OPTICAL SYSTEMS DESIGN

## 2.2.3 POWER SUPPLY CONNECTIONS

The OSD2053P requires external DC power. The voltage range of the OSD2053P is +10VDC to +36VDC and for the OSD2053P/48VDC is +46VDC to +56VDC. Power should be connected to the 2-way terminal block located on the front panel as indicated in Table 2.

TABLE 2: POWER CONNECTION

| External Power Pin | OSD2053P         | OSD2053P/48VDC   |
|--------------------|------------------|------------------|
| +                  | +10VDC to +36VDC | +46VDC to +56VDC |
| -                  | 0V               | 0V               |

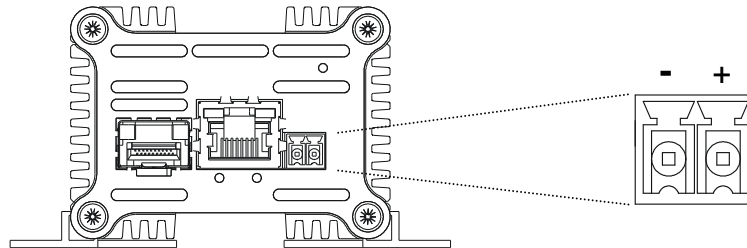


FIGURE 5: MODULE POWER SUPPLY CONNECTIONS

## 2.2.4 FIXED RJ45 COPPER PORT PIN ASSIGNMENTS

The OSD2053P complies with IEEE802.3af, Mode A standard to supply 15.4W power on the same pair as the data signaling. These pairs terminate on pins 1, 2, 3, & 6 of the RJ45.

Figure 6 shows the pin configuration for the fixed RJ45 copper port.

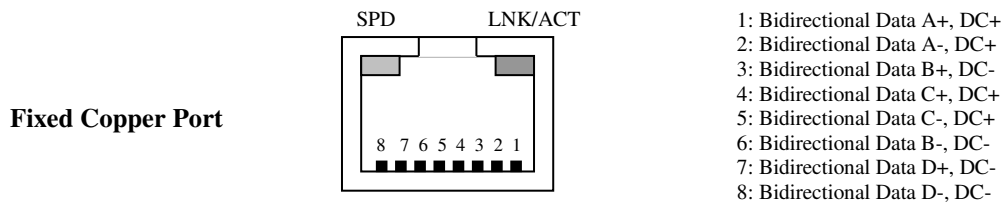


FIGURE 6: FIXED RJ45 ETHERNET CONNECTORS

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## 2.2.5 LED INDICATORS

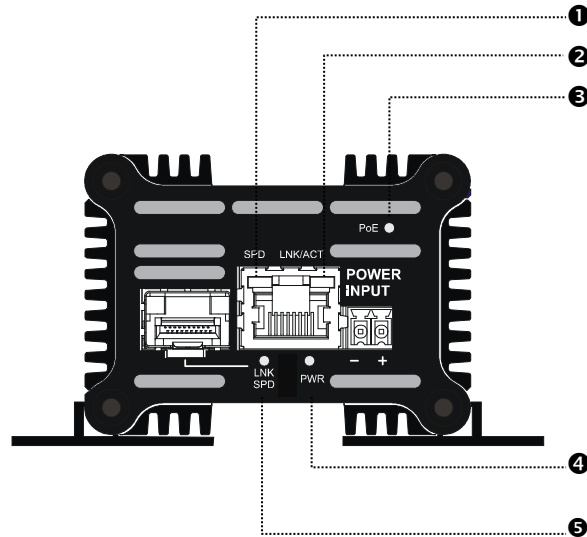


FIGURE 7: LED INDICATORS

TABLE 3: LED FUNCTION

| No | FUNCTION  |                                      |            |                 |                         |
|----|-----------|--------------------------------------|------------|-----------------|-------------------------|
|    | Indicator | On                                   | LED Colour | Off             | Blinking                |
| ❶  | SPD       | Copper Speed:<br>10/100Mbps          | Yellow     | N/A             | -                       |
| ❷  | LNK/ACT   | Copper Link Activity                 | Amber      | No Copper Link  | Activity <sup>(1)</sup> |
| ❸  | PoE       | PoE Enable                           | Green      | No PoE          | -                       |
| ❹  | PWR       | Power On                             | Green      | Power Off       | -                       |
| ❺  | LNK SPD   | Fiber Speed:<br>100Mbps: 3 Times/Sec | Green      | No Optical Link | Activity <sup>(1)</sup> |

Note: (1) Activity indicates traffic for both copper and fiber port.

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## 2.2.6 FITTING SFP CONNECTORS

Care should be taken when inserting/removing the SFP connectors from the SFP port as SFP modules are Electrostatic (ES) sensitive and Electrostatic Discharge (ESD) precautions should be taken when installing. Ensure that the SFP is fully engaged and latched into position.

**Inserting SFP** – Ensure that the SFP lever is in the locked position and insert into appropriate SFP port. Gently push the SFP until it locks into place. Remove plastic/rubber dust cap and fit appropriate fiber cable.

**Removing SFP** – Remove fiber connector. Pull the SFP lever down to unlock SFP from housing. Using the lever, gently pull the SFP out.

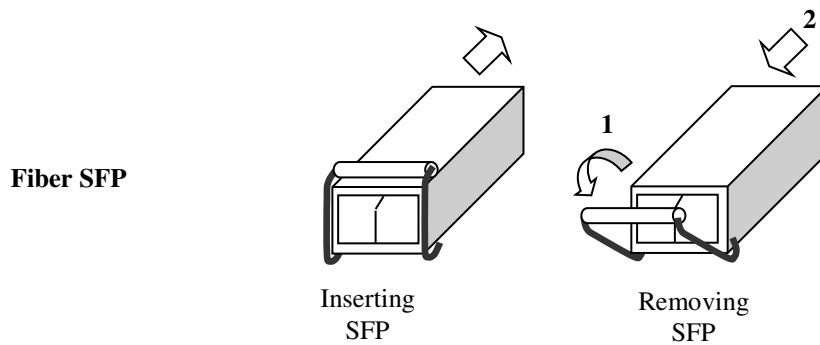
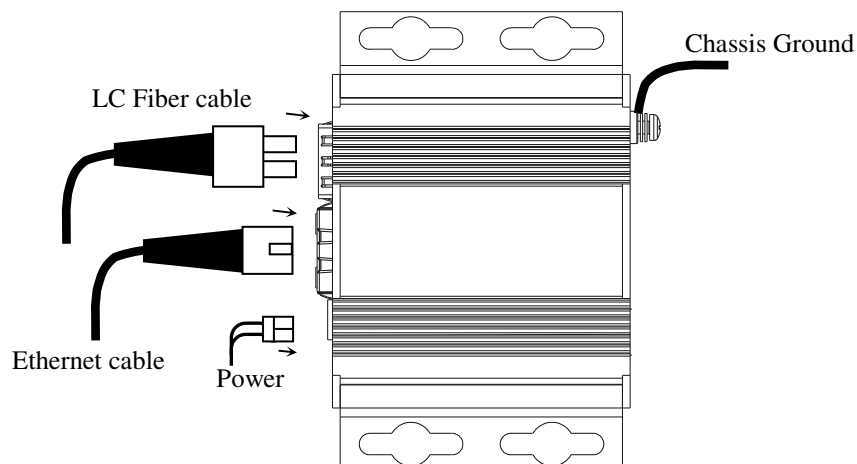


FIGURE 8: FITTING/REMOVING SFP CONNECTORS

## 2.2.7 BASIC CONNECTIONS

Figure 9 shows basic user connections to the OSD2053P.



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FIGURE 9: BASIC CONNECTIONS

## 3 MAINTENANCE

### 3.1 INTRODUCTION

The following section outlines the fault-finding procedure for the OSD2053P modems. Please take note of the following:

- ▲ Personnel without appropriate training should not attempt any maintenance except that outlined below.
- ▲ If further maintenance is attempted you are warned that every care should be taken to ensure that internal measurements made while the equipment is operational are taken carefully as some components within the unit are expensive and may be damaged by failure of any portion of their support circuitry.
- ▲ Some components within the unit are Electrostatic (ES) sensitive and Electrostatic Discharge (ESD) precautions should be taken when performing maintenance upon the unit.

### 3.2 EXTERNAL INSPECTION

Visually check for the following:

- ▲ Check that the correct power source is connected to the power socket.
- ▲ Check that the Ethernet cables are connected to the modem correctly and that the distant OSD2053P modem has been connected correctly to any external equipment.
- ▲ Inspect the optical connectors (for fiber SFP option) for any contamination and clean using isopropyl alcohol and a lint free tissue if any contamination is detected.

### 3.3 ROUTINE MAINTENANCE

- ▲ There is no routine maintenance required with the OSD2053P.

## 4 WARRANTY

Thank you for purchasing equipment designed, manufactured and serviced by Optical Systems Design (OSD). OSD warrants that at the time of shipment, its products are free from defects in material and workmanship and conforms to specifications. Our Warranty conditions are outlined below:

### 4.1 WARRANTY PERIOD

For warranty period, please call your local OSD distributor.

### 4.2 REPAIRS

Optical Systems Design reserves the right to repair or replace faulty modules/units. Please obtain a "Return Material Authorisation" (RMA) form and number before returning goods.

Goods must be returned in adequate packing material to Optical Systems Design, Warriewood or its nominated authorised representative, for all repairs.

#### 4.2.1 WARRANTY REPAIRS

Return shipments to OSD shall be at customer's expense and freight back to the customer will be at OSD expense.

#### 4.2.2 OUT-OF-WARRANTY REPAIRS

OSD reserves the right to repair or replace any faulty goods. Freight costs and insurance for both journeys are met by the user. All equipment repaired by OSD will have a 3-Month Warranty from the date of dispatch.

#### 4.2.3 SITE REPAIRS

By agreement site repairs may be undertaken for which out of pocket, hotel and travel expenses will be charged.

#### 4.2.4 EXCLUSIONS

This warranty does not apply to defects caused by unauthorized modifications, misuse, abuse or transport damage to the equipment. All modifications to OSD's standard product will need written authorization and will be charged at normal repair rates. All modifications are to be carried out by OSD Technicians. Warranty is void if unauthorized removal and/or tampering with serial number and/or repair labels is evident.

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