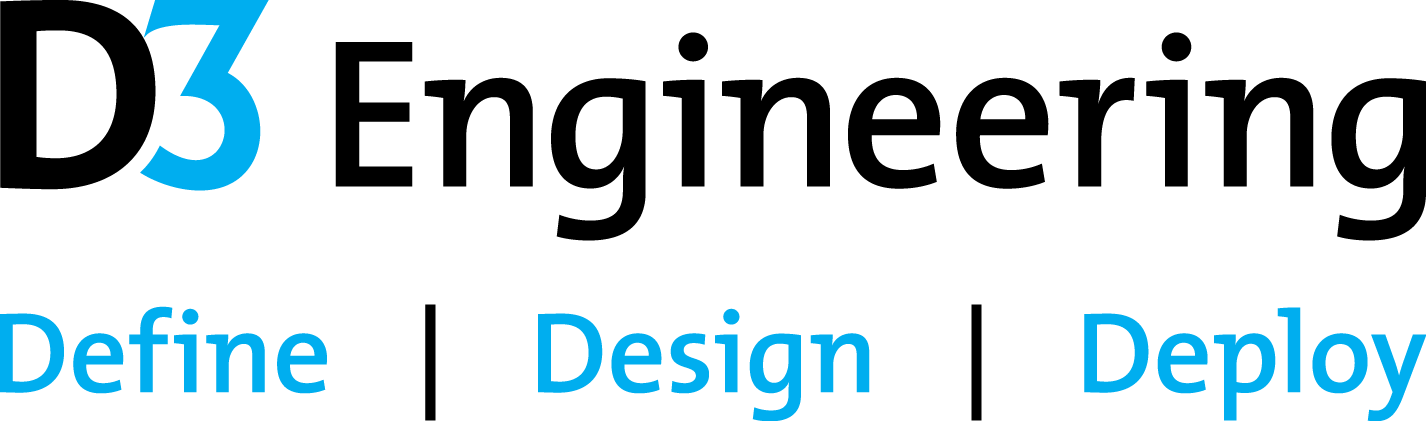
****

**Texas Instruments OPT8241 CDK**

**Assembly Instructions**

**Texas Instruments**

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# Purpose

This document is intended to present the instructions to assemble a complete Texas Instruments OPT8241 CDK unit.

Aesthetics is paramount.

# Paint

1. Paint FAB-0019 and FAB-0020 flat black and let dry.

# Diffuser mount assembly ASY-0005

1. With FAB-0019 diffuser mount bottom side up place a very, very, small amount of MSC-0019 (NOA-87) adhesive on the back side of the top aperture of FAB-0019 using a 27G dispensing needle.
2. Install OPD-0008 diffuser glass into FAB-0019 diffuser mount such that the smooth undiffused side will face out the aperture of FAB-0019.
3. Cure MSC-0019 (NOA-87) adhesive with UV wand per manufactures recommendation.

# Illumination Board assembly ASY-0006

1. Place PN ASY-0005 diffuser mount assembly on laser diodes D11, D12, D13 and D16.
2. Place PN FAB-0020 diffuser retainer on to PN ASY-0005 diffuser mounts.
3. Secure PN FAB-0020 diffuser retainer with PN HRW-0020-010 screw and PN HRW-0007-ZN nut to illumination board using Loctite 243.
4. Secure PN ASY-0005 diffuser mount assemblies with a fillet of NEA 123 to the laser diodes D11, D12, D13, D16 and the circuit board in 2 places per diffuser mount.
5. Cure locations with UV wand per manufacturer’s recommendation.

# Sensor Board assembly ASY-0007

1. Clean sensor U3 on the sensor board with Acetone and a lens cleaning swab.
2. Install PN FAB-0021 Lens mount to the sensor board with PN HRW-0006-012 screw and PN HRW-0022-ZN nut. Make sure that the mount is snug to the board but will still allow some lateral movement for alignment in section 9 Alignment.
3. Install PN FAB-0022 Tripod mount to bottom of sensor board with PN HRW-0023-008 screws using Loctite 243.
4. Install PN OPD-0010 Lens into PN FAB-0021 Lens mount.

# Stack Assembly for focus and alignment

1. Assemble Illumination board to Sensor board with PN HRW-0023-016 screw, PN HRW-0021-010 spacer and PN HRW-0014-ZN nut in only 2 places diagonal from each other in order to allow of easy disassembly in section 10 Final Assembly.
2. Install PN CBL-0008 cable between J1 on the illumination board and J1 on the sensor board, such that the red stripe on the cable is towards the top edge of the boards.

# Program Firmware

1. Refer to CDK-OPT8241 -FX2 firmware upgrade document.

# Focusing

1. Setup board on tripod 1m away from 1951 USAF resolution target printed on 11x17 paper.
2. Apply power to board and connect USB to PC.
3. Start Voxel Viewer.
4. Right Click the point cloud and select to view the Amplitude image.
5. Use the amplitude image to focus on the checkerboard.

# Alignment

1. Setup board on tripod 1m away from1951 USAF resolution target printed on 11x17 paper.
2. Apply power to board and connect USB to PC.
3. Start Voxel Viewer.
4. Right Click the point cloud and select to view the Amplitude image.
5. Use the amplitude image to align the lens mount.
6. Adjust PN FAB-0021 lens mount such that the image is centered.
7. Carefully apply Loctite 222 thread locker to PN HRW-0006-012 screw and/or PN HRW-0022-ZN nut and tighten.
8. Verify that the image is still centered and the lens is still in focus, readjust if needed.

# Final Assembly ASY-0008

1. Remove Illumination board from Sensor board.
2. Seal around the perimeter of PN FAB-0021 Lens mount by applying Loctite 480 instant adhesive.
3. Cure Loctite 480 using Loctite 7452 ensuring that the lens remains free from contaminants.
4. Apply three small fillets of black RTV between PN OPD-0010 Lens and PN FAB-0021Lens mount, care shall be taken not to drastically affect the threads on the lens.
5. Fold cable CBL-0008 such that it tucks in between both boards.
6. Reinstall Illumination board to Sensor board with PN HRW-0023-016 screw, PN HRW-0021-010 spacer, PN 3122 nylon washer and PN HRW-0014-ZN nut in 4 places using Loctite 222

# Testing

1. Test per Test Documents

# Packaging

1. Place tested board stack in PKG-0002 static bag.
2. A fix LBL-0004 to Static bag.

# Reference BOMs

## Diffuser Assembly ASY-0005

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item Number** | **Part Number** | **Description** | **Unit of Measure** | **QTY** |
| 0001 | FAB-0019 | Diffuser Mount | each | 1 |
| 0003 | MSC-0019 | NOA-87 | as needed | 0.0001 |
| 0002 | OPD-0009 | Diffuser | each | 1 |

## Illumination board Assembly ASY-0006

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item Number** | **Part Number** | **Description** | **Unit of Measure** | **QTY** |
| 0001 | OPT8241-IB | Tin Tin Illumination Board | each | 1 |
| 0002 | ASY-0005 | Tin Tin Diffuser Assembly | each | 4 |
| 0003 | FAB-0020 | Retainer, Diffuser Mount | each | 1 |
| 0004 | HRW-0020-010 | Screw, SHC, M2, Black Oxide, 10MM | each | 1 |
| 0005 | MSC-0017 | Thread Lock, Medium strength | as needed | 1 |
| 0006 | HRW-0007-ZN | Nut, Hex, M2, Zn pltd steel | each | 1 |
| 0007 | MSC-0020 | NEA-123 | as needed | 4 |

## Sensor board Assembly ASY-0007

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item Number** | **Part Number** | **Description** | **Unit of Measure** | **QTY** |
| 0001 | OPT8241-SB | Tin Tin Sensor Board | each | 1 |
| 0002 | FAB-0021 | Mount, Lens, M10 | each | 1 |
| 0003 | HRW-0006-012 | Screw, SHC, M1.6, Black Oxide, 12MM | each | 2 |
| 0004 | HRW-0022-ZN | Nut, Hex, M1.6, Zn pltd Steel | each | 2 |
| 0005 | MSC-0017 | Thread Lock, Medium strength | as needed | 1 |
| 0006 | OPD-0010 | Lens, M10 | each | 1 |
| 0007 | FAB-0022 | Mount, Board to Tripod | each | 1 |
| 0008 | HRW-0023-008 | Screw, SHC, M3, Black Oxide, 8MM | each | 2 |
| 0009 | 3122 | Keystone Electronics nylon washer | each | 4 |

## OPT8241 board stack ASY-0008

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item Number** | **Part Number** | **Description** | **Unit of Measure** | **QTY** |
| 0001 | ASY-0007 | Tin Tin Sensor board Assembly | each | 1 |
| 0002 | ASY-0006 | Tin Tin Illumination board Assembly | each | 1 |
| 0003 | CBL-0008 | Cable, Ribbon, 24 conductor, 2" | each | 1 |
| 0004 | HRW-0021-010 | Spacer, 4.5 Rnd, M3 Clearance, 10MM | each | 4 |
| 0005 | HRW-0023-016 | Screw, SHC, M3, Black Oxide, 16MM | each | 4 |
| 0006 | HRW-0014-ZN | Nut, Hex, M3, Zn pltd Steel | each | 4 |
| 0007 | MSC-0017 | Thread Lock, Medium strength | as needed | 1 |

## OPT8241 CDK

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item Number** | **Part Number** | **Description** | **Unit of Measure** | **QTY** |
| 0001 | ASY-0008 | Tin Tin Board Stack | each | 1 |
| 0002 | PKG-0002 | Tin Tin Static Bag 4'x6' | each | 1 |
| 0003 | LBL-0004 | Label, Laser | each | 1 |

# Revision History

Rev 0.1 Pre-Release 1

Rev 0.2 Pre-Release 2 post pilot build

Rev 1.0 Production release

Rev 1.1 Cleaned up release