

## OHPC3G-Txx10xCR

MSA Compliant 3G-SDI Digital Video SFP Single Channel Optical Transmitter, CWDM 1271nm-1611nm, 10km

### Features

- SMPTE 297-2006 Compatible Features
- Speed from 50 Mbps to 3Gbps
- Distance up to 10km for 3G-SDI over Single-mode Fiber
- Support Video Pathological Patterns for SD-SDI, HD-SDI & 3G-SDI
- 18 Wavelength CWDM DFB Transmitter
- Hot-pluggable SFP
- Digital Diagnostic functions available through the I2C interface
- Pinout compliant with SFP MSA
- Single +3.3V power supply
- Low Power Consumption
- RoHS compliant
- Operating case temperature: 0 to +70°C



### Applications

- SMPTE 424M/297M (2.97Gb/s)
- SMPTE 292M/297M (1.485Gb/s)
- SMPTE 259M/297M (270/360Mb/s)
- High-density Video Router
- Broadcast cameras

### Description

The OHPC3G-Txx10xCR are high performance, cost effective CWDM optical modules for single channel video transmission application over single mode fiber (SMF). The CWDM optical transmitter module is designed for data rates from 50Mbps to 2.97Gbps and is specifically designed for robust performance in the presence of SDI pathological patterns for SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 424M serial rates. It provide maximum transmission distance of 10km over single mode fiber under worst case conditions and 3Gbps pathological signals. The OHPC3G-Txx10xCR uses a CWDM DFB laser transmitter with wavelength options from 1271nm to 1611nm to provide error-free transmission of signals from 50Mbps to 2.97Gbps. It help the system designer and end user save much more fiber cables. This 3G SDI CWDM video SFP transmitter need use with CWDM Multiplexer/Demultiplexer (CWDM Mux/Demux) that is separately sold by Optcore. The Pin definition of OHPC3G-Txx10xCR is MSA compliant.

The OHPC3G-Txx10DCR provides extensive operational status monitoring (also called DDMI) through an I2C interface. Output optical power, bias current, supply voltage and operating temperature are monitored. If a parameter monitored is outside the pre-defined range, the alarm flag associated with the parameter will be raised. The OHPC3G-Txx10xCR is Class 1 laser product per FDA 21CFR 1040.10, 1040.11 and IEC-60825 standards.

### Absolute Maximum Ratings

| Parameter             | Symbol | Min. | Max. | Units | Note                     |
|-----------------------|--------|------|------|-------|--------------------------|
| Storage Temperature   | Ts     | -40  | 85   | °C    | -                        |
| Power Supply Voltage  | Vcc    | -0.5 | 4    | V     | -                        |
| Soldering Temperature | -      | -    | 260  | °C    | 10 seconds on leads only |
| Input Voltage         | Vin    | GND  | Vcc  | V     | -                        |

### Recommended Operating Conditions

| Parameter             | Symbol | Min. | Typ. | Max. | Units |
|-----------------------|--------|------|------|------|-------|
| Power Supply Voltage  | Vcc    | 3.1  | 3.3  | 3.5  | V     |
| Operating Temperature | Top    | 0    | -    | 70   | °C    |
| Data Rate             | -      | -    | 2970 | -    | Mbps  |
| Power Supply Current  | Icc    | -    | 200  | 300  | mA    |

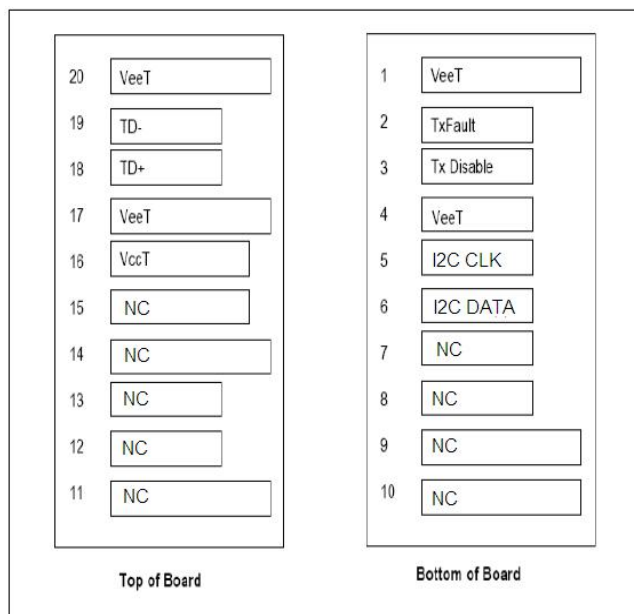
### Transmitter Specifications ( 0°C < Top < 70°C, 3.1V < Vcc < 3.5V)

| Parameter                       | Symbol                           | Min.          | Typ.      | Max.            | Units  |
|---------------------------------|----------------------------------|---------------|-----------|-----------------|--------|
| <b>Optical</b>                  |                                  |               |           |                 |        |
| Optical Transmit Power          | PO                               | -5            | -2        | 0               | dBm    |
| Optical Center Wavelength       | $\lambda_C$                      | $\lambda-6.5$ | $\lambda$ | $\lambda+6.5$   | nm     |
| Spectral Width (-20dB)          | $\sigma$                         | -             | -         | 1               | nm     |
| Extinction Ratio                | ER                               | 6             | -         | -               | dB     |
| Optical Rise Time/Fall Time     | tr/tf                            | -             | -         | 135             | Ps (1) |
| <b>Electrical</b>               |                                  |               |           |                 |        |
| Differential Input Voltage      | V <sub>IH</sub> -V <sub>IL</sub> | 0.3           | -         | 2.2             | V      |
| TX Disable Input Voltage--Low   | T <sub>DIS,L</sub>               | 0             | -         | -0.8            | V      |
| TX Disable Input Voltage--High  | T <sub>DIS,H</sub>               | 2.0           | -         | V <sub>CC</sub> | V      |
| TX Disable Assert Time          | T <sub>ASSERT</sub>              | -             | -         | 10              | μs     |
| TX Disable Deassert Time        | T <sub>DEASSERT</sub>            | -             | -         | 1               | ms     |
| TX Fault Output Voltage -- Low  | T <sub>FAULT,L</sub>             | 0             | -         | -0.8            | V      |
| TX Fault Output Voltage -- High | T <sub>FAULT,H</sub>             | 2.0           | -         | V <sub>CC</sub> | V      |

Note:

1. 20%~80%, Measured @2.97Gb/s and differential input data

### Pin Assignment



### Pin Descriptions

| Pin No. | Name       | Function                     | Plug Seq. | Notes |
|---------|------------|------------------------------|-----------|-------|
| 1       | VeeT       | Transmitter Ground           | 1         |       |
| 2       | TX Fault   | Transmitter Fault Indication | 3         | 1     |
| 3       | TX Disable | Transmitter Disable          | 3         | 2     |
| 4       | VeeT       | Transmitter Ground           | 3         | 3     |
| 5       | I2C CLK    | SCL Serial Clock Signal      | 3         | 3     |
| 6       | I2C DATA   | SDA Serial Data Signal       | 3         | 3     |
| 7       | N.C.       | Not Connected                | 3         |       |
| 8       | N.C.       | Not Connected                | 3         |       |
| 9       | N.C.       | Not Connected                | 1         |       |
| 10      | N.C.       | Not Connected                | 1         |       |
| 11      | N.C.       | Not Connected                | 1         |       |
| 12      | N.C.       | Not Connected                | 3         |       |
| 13      | N.C.       | Not Connected                | 3         |       |
| 14      | N.C.       | Not Connected                | 1         |       |
| 15      | N.C.       | Not Connected                | 2         |       |
| 16      | VccT       | Transmitter Power            | 2         |       |
| 17      | VeeT       | Transmitter Ground           | 1         |       |
| 18      | TD+        | Transmit Data In             | 3         |       |

|    |      |                      |   |  |
|----|------|----------------------|---|--|
| 19 | TD-  | Inv Transmit Data In | 3 |  |
| 20 | VeeT | Transmitter Ground   | 1 |  |

**Notes:**

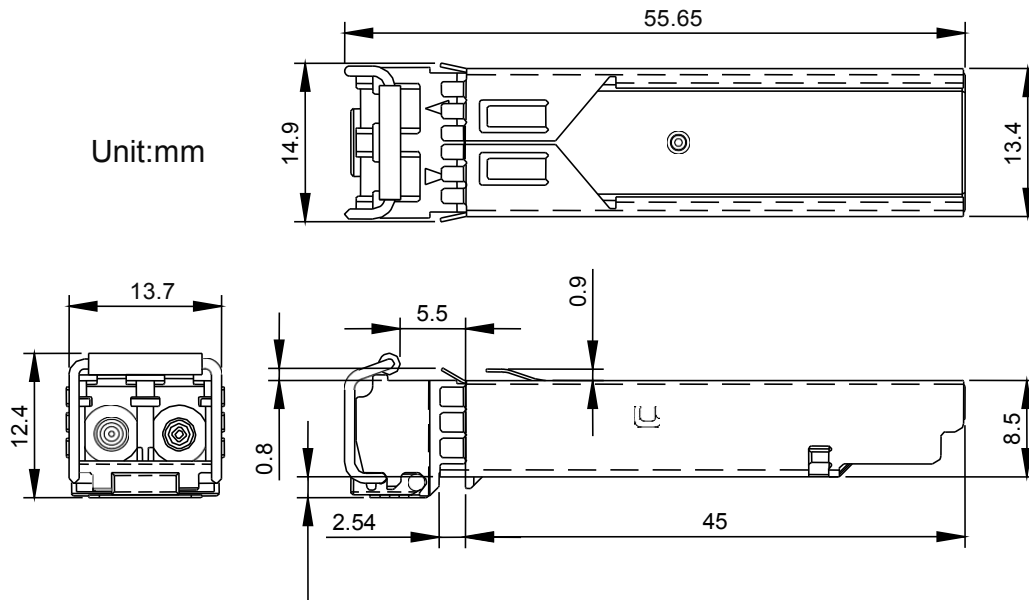
1. TX Fault is an open collector output, which should be pulled up with a 4.7K~10KΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to <0.8V.
2. TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7K~10KΩ resistor. Its states are:  
Low (0~0.8V): Transmitter on  
(>0.8V, <2.0V): Undefined  
High (2.0~3.465V): Transmitter Disabled  
Open: Transmitter Disabled.
3. TD-/+ : These are the differential transmitter inputs. They are AC coupled differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on host board.

**EEPROM Serial ID Memory Contents (A0h)**

| Data Address | Size (Bytes) | Name of Field   | Contents(Hex)                                   | Description                              |
|--------------|--------------|-----------------|-------------------------------------------------|------------------------------------------|
| 0            | 1            | Identifier      | 03                                              | SFP                                      |
| 1            | 1            | Ext. Identifier | 04                                              | SFP function is defined by serial IDonly |
| 2            | 1            | Connector       | 07                                              | LC Connector                             |
| 3-10         | 8            | transmitter     | xx                                              | transmitter codes                        |
| 11           | 1            | Encoding        | 03                                              | NRZ                                      |
| 12           | 1            | BR, nominal     | 1E                                              | 3Gbps                                    |
| 13           | 1            | Reserved        | 00                                              |                                          |
| 14           | 1            | Length(9um)-km  | xx                                              | transmitter distance                     |
| 15           | 1            | Length (9um)    | xx                                              |                                          |
| 16           | 1            | Length (50um)   | xx                                              |                                          |
| 17           | 1            | Length (62.5um) | xx                                              |                                          |
| 18           | 1            | Length (copper) | 00                                              |                                          |
| 19           | 1            | Reserved        | 00                                              |                                          |
| 20-35        | 16           | Vendor name     | 4F 50 54 43 4F 52 45 20 20 20 20 20 20 20 20 20 | OPTCORE (ASC II )                        |
| 36           | 1            | Reserved        | 00                                              |                                          |
| 37-39        | 3            | Vendor OUI      | 00 00 00                                        |                                          |
| 40-55        | 16           | Vendor PN       | xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx | part number                              |
| 56-59        | 4            | Vendor rev      | xx xx xx xx                                     | ASC II                                   |
| 60-61        | 2            | Wavelength      | xx xx                                           | transmitter wavelength                   |
| 62           | 1            | Reserved        | 00                                              |                                          |

|         |     |                  |                                                       |                                                          |
|---------|-----|------------------|-------------------------------------------------------|----------------------------------------------------------|
| 63      | 1   | CC BASE          | xx                                                    | Check sum of bytes 0-62                                  |
| 64-65   | 2   | Options          | 00 1A                                                 | LOS, TX_FAULT and TX_DISABLE                             |
| 66      | 1   | BR, max          | 00                                                    |                                                          |
| 67      | 1   | BR, min          | 00                                                    |                                                          |
| 68-83   | 16  | Vendor SN        | xx xx xx xx xx xx xx xx xx<br>xx xx xx xx xx xx xx xx | SN: xxxxxxxxxx (ASC II )                                 |
| 84-91   | 8   | Vendor date code |                                                       | Year (2 bytes), Month (2 bytes), Day (2 bytes) (ASC II ) |
| 92      | 1   | Diagnostic type  | 68                                                    |                                                          |
| 93      | 1   | Enhanced option  | 90                                                    |                                                          |
| 94      | 1   | SFF-8472         | xx                                                    |                                                          |
| 95      | 1   | CC_EXT           | xx                                                    | Check sum of bytes 64 - 94                               |
| 96-127  | 32  | Vendor specific  |                                                       | Vendor Specific EEPROM                                   |
| 128-255 | 128 | Reserved         |                                                       | Reserved for future use.                                 |

### Mechanical Dimensions



### Ordering information

#### 3G-SDI Video SFP CWDM Single Channel Optical Transmitter (without DDMI)

| Part number     | Description                                                                 |
|-----------------|-----------------------------------------------------------------------------|
| OHPC3G-T2710NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1271nm |
| OHPC3G-T2910NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1291nm |
| OHPC3G-T3110NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1311nm |
| OHPC3G-T3310NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1331nm |
| OHPC3G-T3510NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1351nm |

|                 |                                                                             |
|-----------------|-----------------------------------------------------------------------------|
| OHPC3G-T3710NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1371nm |
| OHPC3G-T3910NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1391nm |
| OHPC3G-T4110NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1411nm |
| OHPC3G-T4310NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1431nm |
| OHPC3G-T4510NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1451nm |
| OHPC3G-T4710NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1471nm |
| OHPC3G-T4910NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1491nm |
| OHPC3G-T5110NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1511nm |
| OHPC3G-T5310NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1531nm |
| OHPC3G-T5510NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1551nm |
| OHPC3G-T5710NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1571nm |
| OHPC3G-T5910NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1591nm |
| OHPC3G-T6110NCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1611nm |

### 3G-SDI Video SFP CWDM Single Channel Optical Transmitter (with DDMI)

| Part number     | Description                                                                 |
|-----------------|-----------------------------------------------------------------------------|
| OHPC3G-T2710DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1271nm |
| OHPC3G-T2910DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1291nm |
| OHPC3G-T3110DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1311nm |
| OHPC3G-T3310DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1331nm |
| OHPC3G-T3510DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1351nm |
| OHPC3G-T3710DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1371nm |
| OHPC3G-T3910DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1391nm |
| OHPC3G-T4110DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1411nm |
| OHPC3G-T4310DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1431nm |
| OHPC3G-T4510DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1451nm |
| OHPC3G-T4710DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1471nm |
| OHPC3G-T4910DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1491nm |
| OHPC3G-T5110DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1511nm |
| OHPC3G-T5310DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1531nm |
| OHPC3G-T5510DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1551nm |
| OHPC3G-T5710DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1571nm |
| OHPC3G-T5910DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1591nm |
| OHPC3G-T6110DCR | 3G-SDI Video SFP CWDM Single Channel Optical Transmitter,SMF,10km,LC,1611nm |

**Warnings**

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

For more product information, visit us on the web at [www.optcore.net](http://www.optcore.net)



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