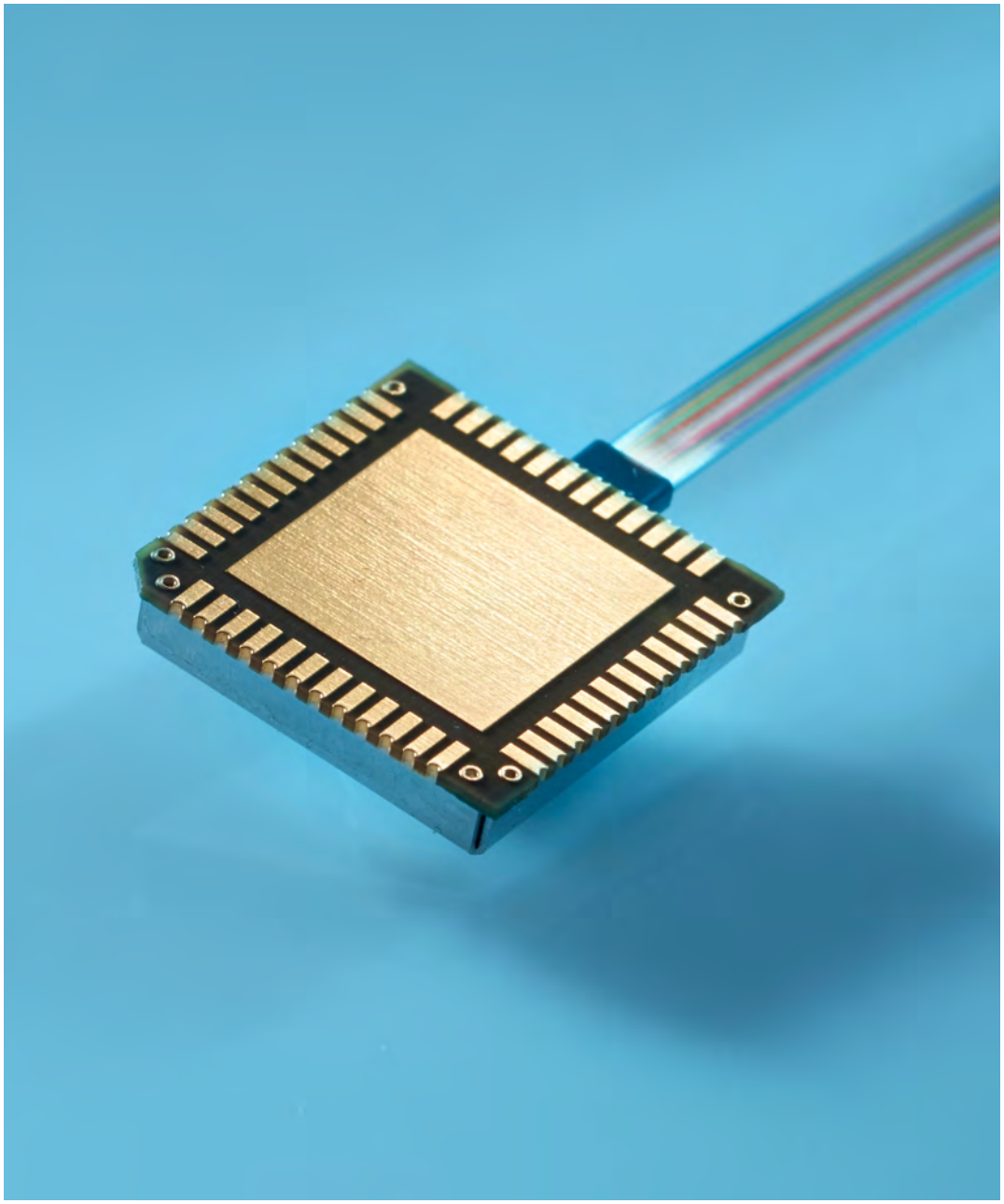
SECTION 10



Active Optics

ROJONE PTY. LTD.

Australian Representatives
ROJONE, PTY LTD.
Tel: 02 9829 1555
E: sales@rojone.com.au
www.rojone.com.au

Contents

Introduction

With its D-Lightsys® range, Radiall offers optical transceiver components dedicated to harsh environments within the aerospace, space and defense markets. The optoelectronic D-Lightsys® modules are among the best performing in the world with very low power consumption and a minimum footprint. A complete range, from the transceiver to multichannel products, allows these devices to meet performance requirements in a large number of stringent applications.

They are dedicated to high speed data communications and provide data rates from 0.1 to 10 Gbps. D-Lightsys® modules offer high performance at very low consumption levels. Operational temperature from -55°C to +125°C and highly resistant to shock and vibrations, they can withstand the most demanding environments with unrivaled reliability. Modules are qualified per various MIL-AERO standards (ARINC 804) and are 100% tested over the whole operating temperature range. A full range of evaluation boards are also available for testing the D-Lightsys® modules.

MARKETS AND APPLICATIONS

Aerospace Defense Industrial Medical

D-Lightsys® devices are robustly designed for use in harsh environment applications such as:

Civil Aerospace
Airframe, avionics, In-Flight Entertainment (IFE), Heads Up Display (HUD), Power and flight management, pressurized/unpressurized areas transmissions, sensors

Military Aerospace
Avionics, weapons systems, power and flight management, sensors

Data Transmissions
High speed data networking

Radars
Remote antennas, phase array radar, satellite

Navy & Shipboard
Missile systems, communication

Geophysics
Oil and gas, mining, exploration with streamers arrays, roofers and shearing equipment

INTERNATIONAL STANDARD DOCUMENTS COMPLIANCE

RoHS COMPLIANT

ISO 9001 Certified
AS/EN/JISQ9100-ISOTS 16949-ISO-14001

- IEEE standard 802.3z Gigabit Ethernet 1000 Base-Sx PMD
- ARINC 804, 815, and 818 standards
- Control and monitoring compliant with SFF-8472 standard

FEATURES AND BENEFITS

- Data rate up to 10 Gbps
- Use 850 nm VCSEL emitters
- Control and monitor compliant with MSA SFF-8472
- Monitoring of the optical power of emitters over the temperature range
- Low power consumption
- Standard electrical SMT interface or solderless interface option
- Pigtailed optical interconnect solutions (MultiMode fibers)
- Very small form factor

PRODUCT RANGE OVERVIEW

D-lightsys® products are divided in two main families:
- S-light: single channel modules
- D-light: multichannel modules

S-Light

The S-Light range includes single channel optical transceivers for harsh environment applications available in transmitter, receiver and transceiver modules. Several package options are offered from surface mount, pluggable and custom packages.

FEATURES

- Uses 850 nm VCSEL'S
- Controls and monitoring compliant with SFF-8472 standard
- Monitoring of the optical power over the temperature range
- Standard electrical SMT interface or pluggable interface option
- Provided with 50/125 µm or 62.5/125 µm optical fiber

All the D-Lightsys® devices can be fully monitored and/or controlled through a I²C 2-wire serial interface and are suitable for a variety of applications:

- Average and modulation currents of the VCSEL laser are both digitally programmable through the 2-wire serial interface.
- A versatile input stage allows 100 Ω differential or 50 Ω to ground termination resistors to comply with CML or LVDS signaling levels.
- Analog outputs allow the monitoring of the module state and performance.

KEY PARAMETERS

Parameters	Value	Units	Notes
Data rate (max)	10	Gbps	2 ranges available 0.1-4.25 Gbps 0.5-10 Gbps
Transceiver case operating temperature	-55/+125	°C	Qualified temperature range -40°C/+90°C
Power supply voltage	3.3	V	
Transceiver power consumption (max)	<300	mW	Over the full temperature range
Average output power (min)	-4	dBm	S-Light family transmitters are Class 1M laser products according to IEC 60825-1 standard
Optical extinction ratio	9	dB	@2.5 Gbps ER= 5 dB @10 Gbps
Optical sensitivity	-20	dBm	@2.5 Gbps, for BER=10^{-12} measured with a 2^7 -1 PRBS signal -10 dBm @ 10 Gbps

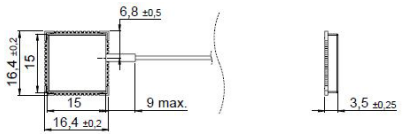
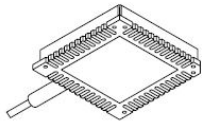
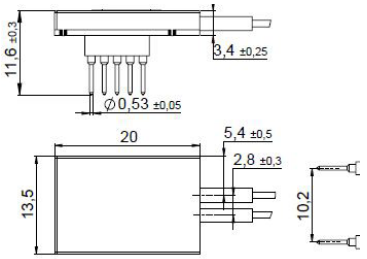
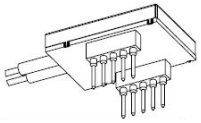
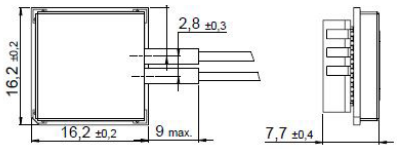
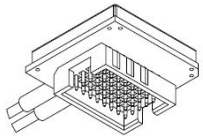
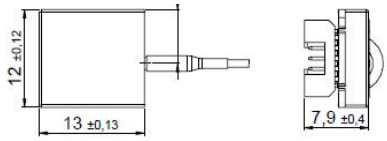
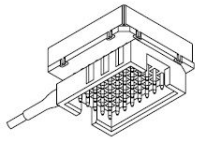
Detailed technical datasheets are available upon request. Please contact your local representative.

AVAILABLE OPTIONS

Part Definition	Available Options	Description
Module type	Transmitter	1 emitting channel (1 fiber)
	Receiver	1 receiving channel (1 fiber)
	Transceiver	1 emitting channel + 1 receiving channel (2 fibers)

For any additional information, please contact your local Radiall representative.
Reliability and qualification reports are available upon request.

S-Light

Available Package Options	Dimensions	
48 pin LCC package (Direct board soldering)		
10 pin SFF package		
40 pin SAMTEC YFT (Socket pluggable)		
40 pin SAMTEC YFT (Narrow socket)		

AVAILABLE TERMINI/CONNECTORS:

- LuxCis® ARINC 801/EN4639
- ABS1379/EN4531
- LC
- FC
- ST
- SC

AVAILABLE OPTICAL FIBERS:

- MultiMode 50/125 µm OM2
- MultiMode 62.5/125 µm

For any additional information, please contact your local Radiall representative.

S-Light

SINGLE-CHANNEL OPTICAL TRANSMITTERS, RECEIVERS AND TRANSCEIVERS FOR HARSH ENVIRONMENTS

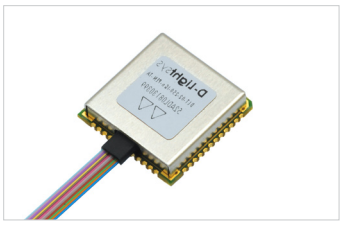
PART NUMBER BUILDER

SLx-www-Ix-Pyz-Lvv

- **vv:** Pigtail length
  - Length in cm
- **z:** Optical cable
  - **N:** Nexans 132574 (62.5/125/900 µm)
  - **G:** Gore FON1307 (50/125/1200 µm)
  - **H:** Gore FON1371 (62.5/125/1200 µm)
- **y:** Pigtail termini
  - **X:** 2 LuxCis Termini (ARINC801)
  - **E:** 2 ABS1379 Termini
  - Contact sales for additional connector options
- **x:** Packaging option
  - **L:** 48-Pin LCC package
  - **GV:** 8x5 YFT-08-05-H-05-SB socket
  - **GN:** 8x5 YFT-08-05-H-05-SB socket _ smaller package
  - Contact sales for additional connector options
- **www:** data rate
  - **251:** Up to 4.25 Gbps
  - **1001:** Up to 10 Gbps
- **x:** Module type
  - **T:** Transmitter
  - **R:** Receiver
  - **M:**Transceiver

To validate your part number please contact your local Radiall representative.
Technical datasheets are available upon request.

D-Light



The D-Light range includes multi channel optical transceivers for harsh environment applications available in transmitter, receiver and transceiver modules with 4 channels (4 Rx + 4 Tx). Several package options are offered from surface mount to pluggable packages.

KEY PARAMETERS

Parameters	Value	Units	Notes
Data rate (Max)	10	Gbps	Several ranges available For emitters & receivers: 0.1-4.5 Gbps (per channel) 0.5-10 Gbps (per channel) For transceivers: 0.1-3.25 Gbps (per channel) 0.5-10 Gbps (per channel)
Transceiver case operating temperature	-55/+100	°C	Qualified temperature range -40°C/+85°C
Power supply voltage	3.3	V	
Transceiver power consumption (Max)	125	mW	Over the full temperature range per channel
Average output power (min/channel)	-4	dBm	D-Light family transmitters are Class 1M laser products according to IEC 60825-1 standard
Optical extinction ratio	9	dB	@2.5 Gbps
Optical sensitivity	-19	dBm	@2.5 Gbps, for BER=10^{-12} measured with a 2^7 -1 PRBS signal -16 dBm @ 3.25 Gbps -12 dBm @ 10Gbps

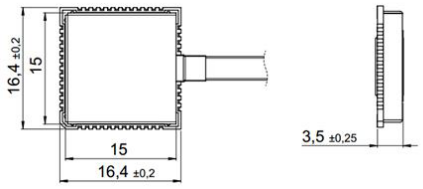
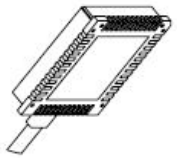
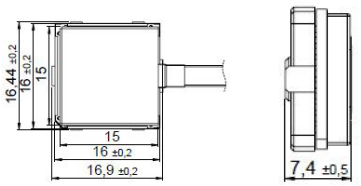
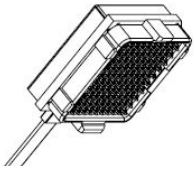
AVAILABLE OPTIONS

Part Definition	Available Options	Description
Module type	Transmitter	2 or 12 emitting channels
	Receiver	2 or 12 receiving channels
	Transceiver	4 emitting channels + 4 receiving channels

Reliability and qualification reports are available upon request.

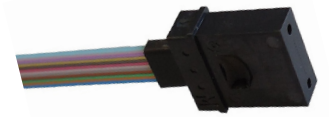
For any additional information, please contact your local Radiall representative.

D-Light

Available Package Options	Dimensions	
48 pin LCC package		
100 pins package		

AVAILABLE TERMINI/CONNECTORS:

- 12 channels optical connector: MPO and/or connector compliant with IEC Standard 61754-7 and TIA 604-5
- 12 channels optical ferrule: MT ferrule only or MT ferrule with Radiall MT cartridge



AVAILABLE OPTICAL FIBERS:

- MultiMode 50/125 µm OM2 - ribbon 12 fibers (single fiber cable is available for DLR-02/DLT-02)
- MultiMode 62.5/125 µm - ribbon 12 fibers (single fiber cable is available for DLR-02/DLT-02)

For any additional information, please contact your local Radiall representative.

D-Light

MULTI-CHANNEL OPTICAL TRANSMITTERS FOR HARSH ENVIRONMENTS

PART NUMBER BUILDER

DLT-cc-www-Ix-Pyz-Lvv

- **vv:** Pigtail Length
  - Length in cm
- **z:** Fiber Diameter
  - **1:** 50/125 µm bare ribbon fiber
  - **2:** 62.5/125 µm bare ribbon fiber
- **y:** Connector Type
  - **N:** MT ferrule only
  - **O:** MPO connector
  - **C:** MT ferrule with MT-Cis
  - Contact sales for additional connector options
- **x:** Packaging Option
  - **L:** 48-Pin LCC package
  - **GM:** 100-Pin Meg-Array socketed package
  - **GN:** 8x5 YFT-08-05-H-05-SB socket (only for 2 channels)
- **www:** Data Rate
  - **251:** Up to 4.25 Gbps
  - **1000:** Up to 10 Gbps
- **cc:** Number of Channels
  - **02:** 2 channels
  - **04:** 4 channels
  - **12:** 12 channels

To validate your part number please contact your local Radiall representative.
Technical datasheets are available upon request.

MULTI-CHANNEL OPTICAL RECEIVERS FOR HARSH ENVIRONMENTS

PART NUMBER BUILDER

DLR-cc-www-Ix-Pyz-Lvv

- **vv:** Pigtail Length
  - Length in cm
- **z:** Fiber Diameter
  - **1:** 50/125 µm bare ribbon fiber
  - **2:** 62.5/125µm bare ribbon fiber
- **y:** Connector Type
  - **N:** MT ferrule only
  - **O:** MPO connector
  - **C:** MT ferrule with MT-Cis
  - Contact sales for additional connector options
- **x:** Packaging Option
  - **L:** 48-Pin LCC package
  - **GM:** 100-Pin Meg-Array socketed package
  - **GN:** 8x5 YFT-08-05-H-05-SB socket (only for 2 channels)
- **www:** Data Rate
  - **251:** Up to 4.25 Gbps
  - **1000:** Up to 10 Gbps
- **cc:** Number of Channels
  - **02:** 2 channels
  - **04:** 4 channels
  - **12:** 12 channels

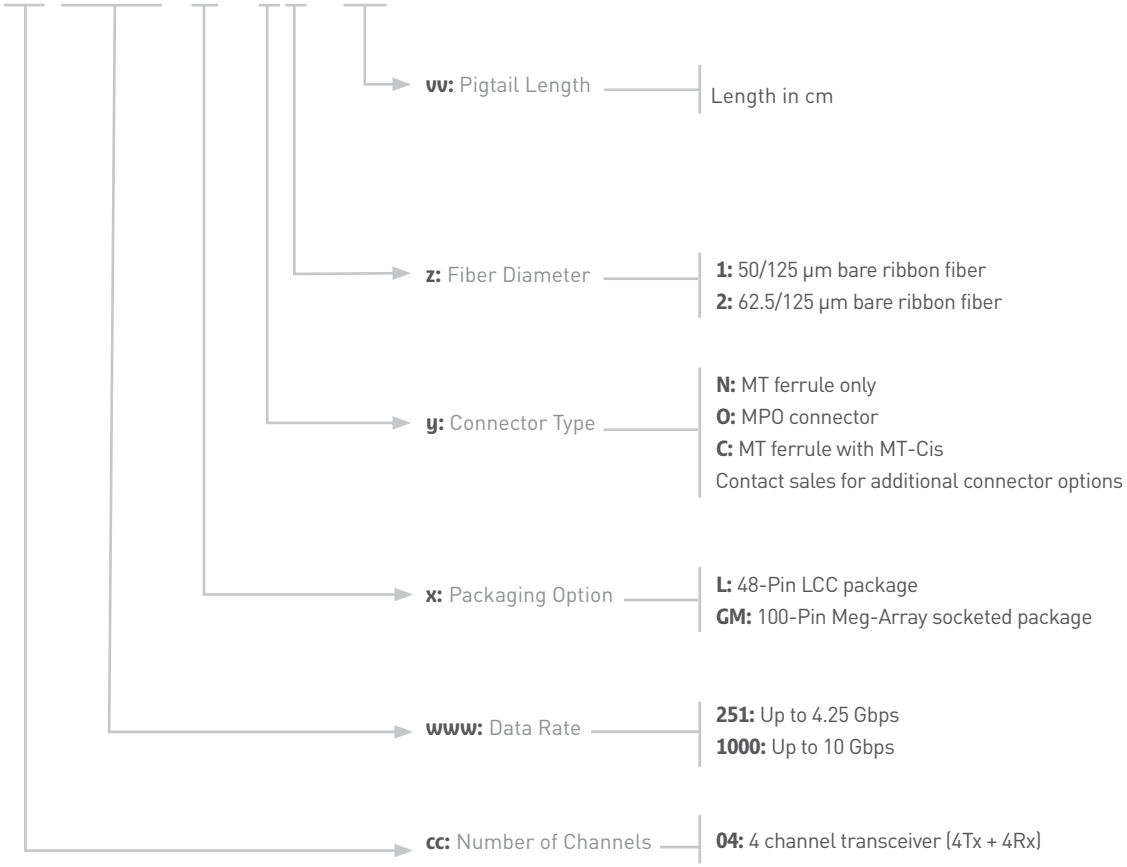
To validate your part number please contact your local Radiall representative.
Technical datasheets are available upon request.

D-Light

MULTI-CHANNEL OPTICAL TRANSCEIVERS FOR HARSH ENVIRONMENTS

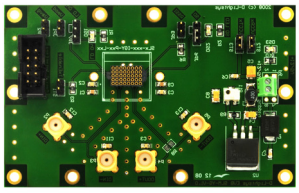
PART NUMBER BUILDER

DLM-cc-www-Ix-Pyz-Lvv



To validate your part number please contact your local Radiall representative.
Technical datasheets are available upon request.

Evaluation Boards and Tooling



Radiall offers a full range of evaluation boards enabling full monitoring of S-Light and D-Light modules, either for the pluggable package or for the LCC package.

A Windows PC-Based software is available for complete module monitoring and control.

Application notes for layout considerations are also available. Please contact your local representative for more information.

GENERAL EVALUATION BOARD SPECIFICATIONS

Parameter	Symbol	Min	Type	Max	Unit
External supply voltage	VCC	1.2	7.0	15	V
Supply voltage noise	NVCCx	-	-	150	mV
Supply current (Tx + Rx)	ICC	-	-	500	mA
Operating temperature	Top	-40	-	+100	°C

NOTES

Notes