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## 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

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

- 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 I<sup>2</sup>C 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 <sup>-12</sup> measured with a 2 <sup>7</sup> -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



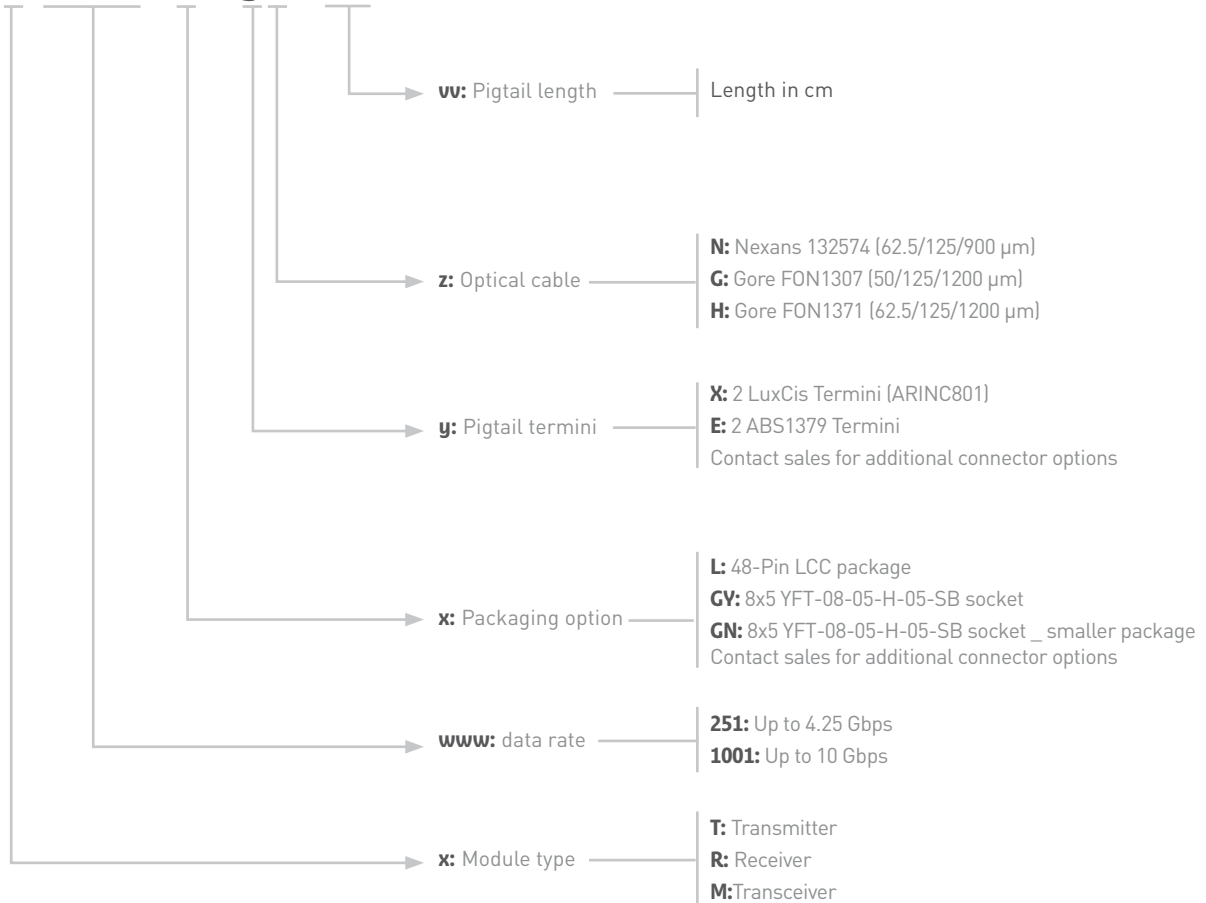
For any additional information, please contact your local Radiall representative.

S-Light

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

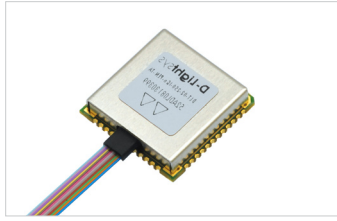
**PART NUMBER BUILDER**

**SLx-ww-ix-Pyz-Lvv**



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 <sup>-12</sup> measured with a 2 <sup>7</sup> -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.

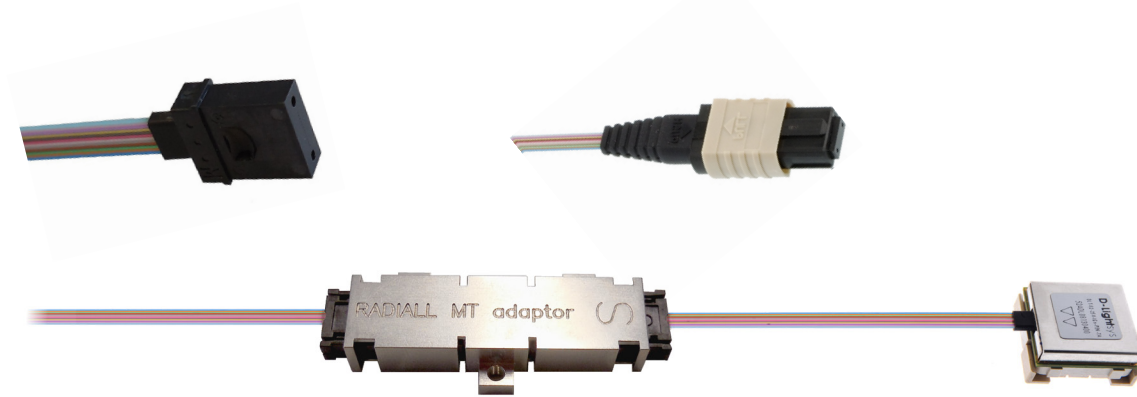
For any additional information, please contact your local Radiall representative.

## 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)

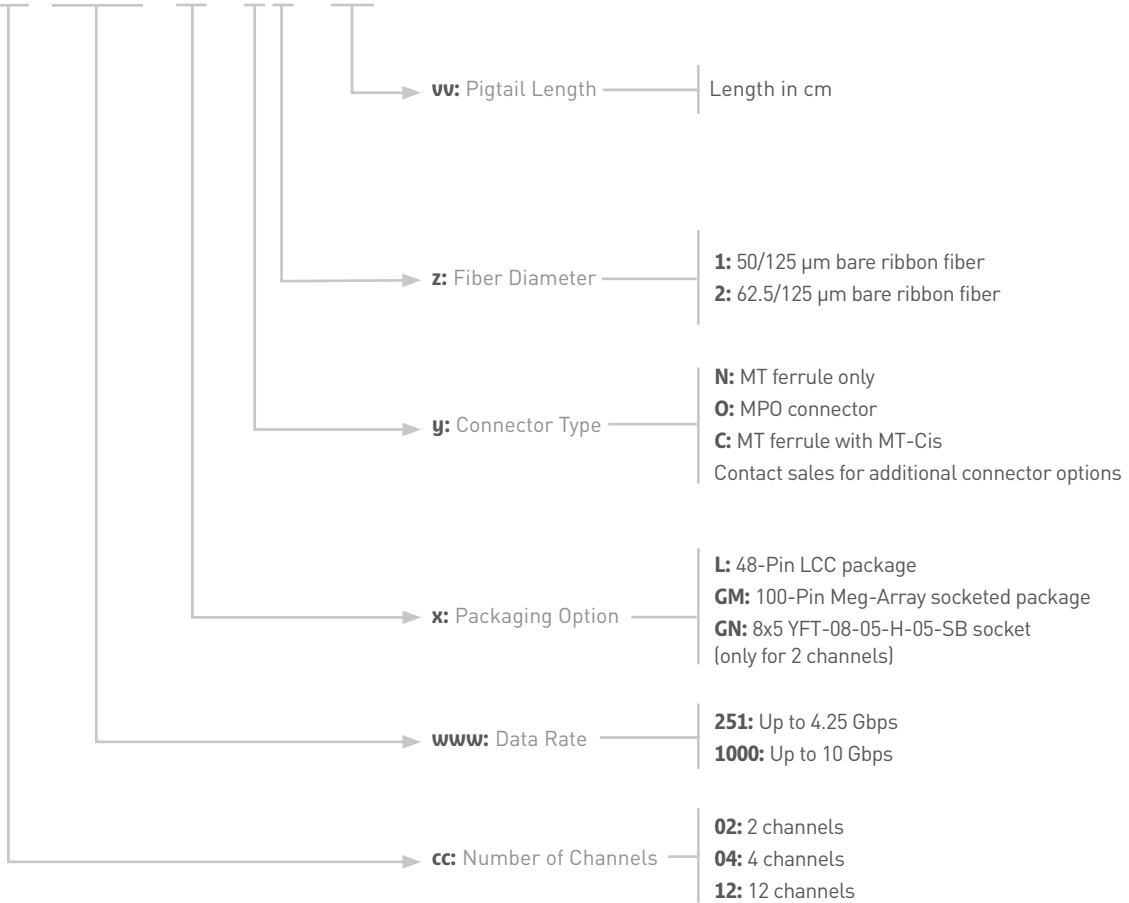
For any additional information, please contact your local Radiall representative.

D-Light

MULTI-CHANNEL OPTICAL TRANSMITTERS FOR HARSH ENVIRONMENTS

PART NUMBER BUILDER

DLT-cc-www-Ix-Pyz-Lvv



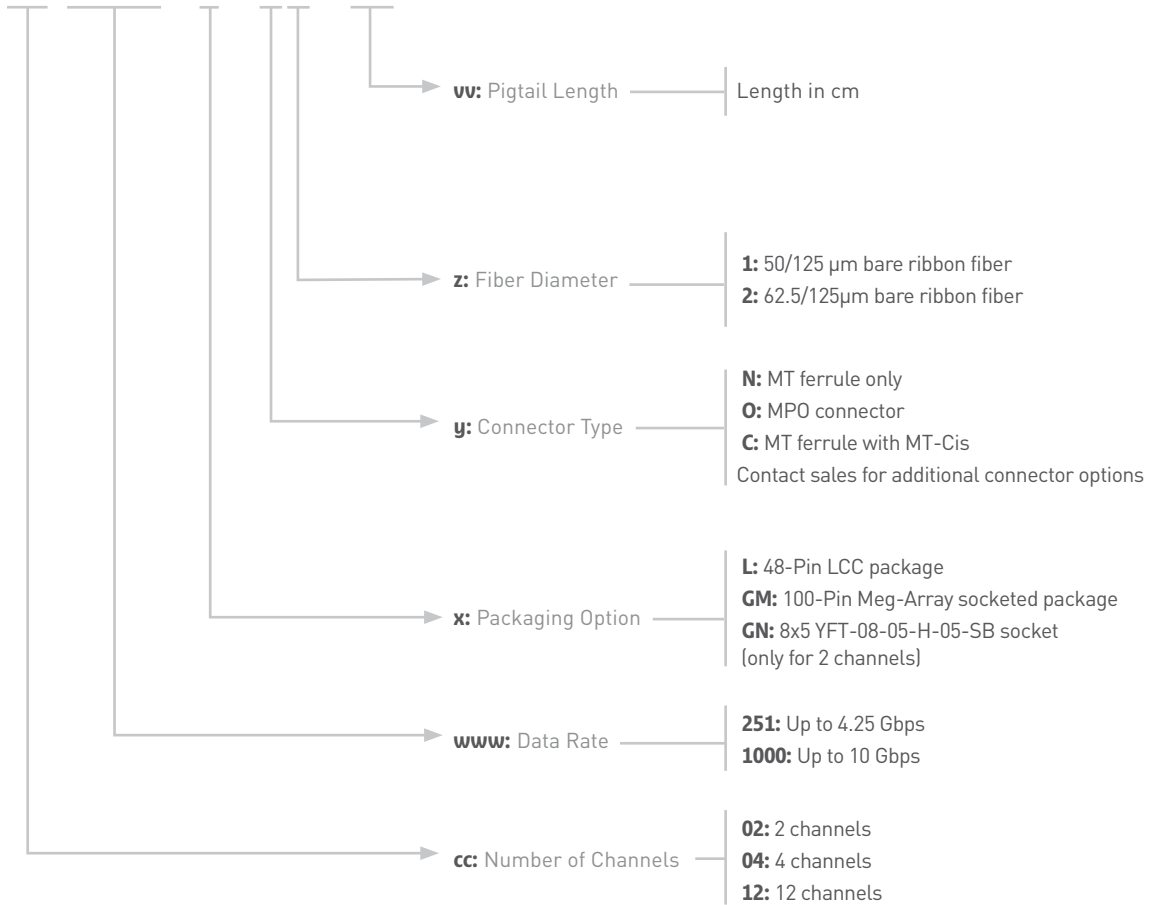
To validate your part number please contact your local Radiall representative. Technical datasheets are available upon request.



## MULTI-CHANNEL OPTICAL RECEIVERS FOR HARSH ENVIRONMENTS

### PART NUMBER BUILDER

## DLR-cc-www-Ix-Pyz-Lvv



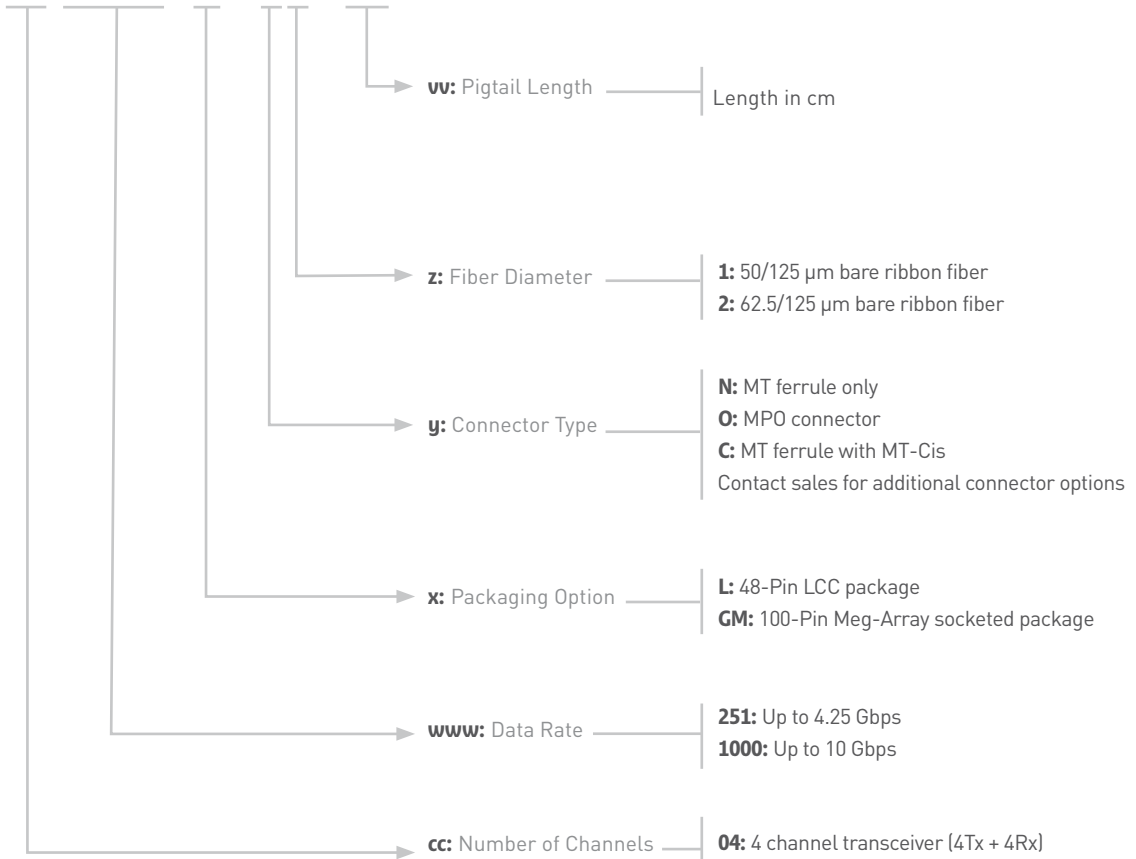
To validate your part number please contact your local Radiall representative. Technical datasheets are available upon request.

D-Light

MULTI-CHANNEL OPTICAL TRANSCEIVERS FOR HARSH ENVIRONMENTS

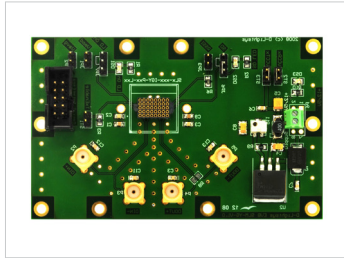
PART NUMBER BUILDER

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

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