DS-32G-IR-Dxxxx

SFP28, 32/16/8G FC, DWDM 100GHz grid, 192.00 - 196.00THz (41ch), 10km, 7dB, LC, D2955-D6142

OVERVIEW

The DS-32G-IR-Dxxxx is a versatile DWDM transceiver in SFP28 form-factor supporting a wide range of Fiber Channel (FC) services (8G to 32G). The transceiver is provided in versions covering all C-band channels in the 100GHz DWDM grid as specified in the ITU-T G.694.1 standard. The transceiver has been layer-1 tested and approved by Cisco.

The transceiver has an inbuilt 3-mode CDR (Clock Data Recovery) function;
- High data rate mode for 32G FC
- Low data rate mode for 16G FC
- Bypass mode for 8 GFC

The optical performance provides a bridgeable distance of up to 10km (without dispersion compensation) for 32G FC.
This transceiver provides digital diagnostic functions via a 2-wire serial interface as defined by the SFF-8472 specification.

The transceiver module is compliant to RoHS-6/6.

TECHNICAL DATA

Parameter	Value
Technology	DWDM 100GHz SFP28
Transmission media	SM (2x LC)
Typical reach	10km
Nominal wavelengths	192.00 - 196.00THz
Bit rate support	28.05Gbps
	14.025Gbps
	8.500Gbps
Protocol support	32GFC
	16GFC
	8GFC
Power budget	0 – 7.0dB
Dispersion tolerance	-170 to +170ps/nm
Power consumption	< 2.0W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

Parameter	Value
Transmitter data:	
Output power	Min: -3.0dBm [2]
	Max: +2.0dBm [2]
Transmit wavelengths	192.00 - 196.00THz
	100GHz (ITU-T G.694.1)
Receiver data:	
Minimum input power	-10.0dBm [1] [2]
Overload (max power)	+2.0dBm [1] [2]
Wavelength range	1480 - 1580nm
DDM	Yes
MSA compliance	SFP28 MSA
	SFF-8402

[1] @ 28.05 Gbps (32G FC) and BER < 10^{-6} using PRBS 2^{31}-1

[2] Average power

Safety/regulatory compliance:
TUV/UL/FDA (contact Smartoptics for latest certification information)
RoHS compliance

Note: Optical BER performance is specified at a BER 1E-6 implying that Reed Solomon RS-FEC encoding/decoding shall be used to provide sufficient BER performance.

RATE SELECT OPERATION

The DS-32G-IR-Dxxxx supports high data rates 25.78G/28.05G with CDR engaged and Low data rate 14.025G with CDR half-rate engaged, 8.5G with CDR bypassed.

RS0	RS1	Rx data rate	Tx data rate
High/1	High/1	28.05Gbps	28.05Gbps
Low/0	Low/0	14.025/8.5Gbps	14.025/8.5Gbps

LOOPBACK CONFIGURATION

E-wrap Loopback: User can configure e-wrap loopback by writing 0x01 to byte 111 of A2H. The default value of byte 111 of A2H is 0x00. Please note that the changed value will not be saved at power-off.

O-wrap Loopback: User can configure e-wrap loopback by writing 0x04 to byte 111 of A2H. The default value of byte 111 of A2H is 0x00. Please note that the changed value will not be saved at power-off.

ORDERING INFORMATION

Ordering number	Frequency THz	Wavelength nm
DS-32G-IR-D6142	192.00	1561.42
DS-32G-IR-D6061	192.10	1560.61
DS-32G-IR-D5979	192.20	1559.79
DS-32G-IR-D5898	192.30	1558.98
DS-32G-IR-D5817	192.40	1558.17
DS-32G-IR-D5736	192.50	1557.36
DS-32G-IR-D5655	192.60	1556.55
DS-32G-IR-D5575	192.70	1555.75
DS-32G-IR-D5494	192.80	1554.94
DS-32G-IR-D5413	192.90	1554.13
DS-32G-IR-D5333	193.00	1553.33
DS-32G-IR-D5252	193.10	1552.52
DS-32G-IR-D5172	193.20	1551.72
DS-32G-IR-D5092	193.30	1550.92
DS-32G-IR-D5012	193.40	1550.12
DS-32G-IR-D4932	193.50	1549.32
DS-32G-IR-D4851	193.60	1548.51
DS-32G-IR-D4772	193.70	1547.72
DS-32G-IR-D4692	193.80	1546.92
DS-32G-IR-D4612	193.90	1546.12
DS-32G-IR-D4532	194.00	1545.32
DS-32G-IR-D4453	194.10	1544.53
DS-32G-IR-D4373	194.20	1543.73
DS-32G-IR-D4294	194.30	1542.94
DS-32G-IR-D4214	194.40	1542.14
DS-32G-IR-D4135	194.50	1541.35
DS-32G-IR-D4056	194.60	1540.56
DS-32G-IR-D3977	194.70	1539.77
DS-32G-IR-D3898	194.80	1538.98
DS-32G-IR-D3819	194.90	1538.19
DS-32G-IR-D3740	195.00	1537.40
DS-32G-IR-D3661	195.10	1536.61
DS-32G-IR-D3582	195.20	1535.82
DS-32G-IR-D3504	195.30	1535.04
DS-32G-IR-D3425	195.40	1534.25
DS-32G-IR-D3347	195.50	1533.47
DS-32G-IR-D3268	195.60	1532.68
DS-32G-IR-D3190	195.70	1531.90
DS-32G-IR-D3112	195.80	1531.12
DS-32G-IR-D3033	195.90	1530.33
DS-32G-IR-D2955	196.00	1529.55

GENERAL DEFINITIONS

Parameter	Description
Technology	Grey; Transceiver type for non-WDM applications. Electrical or optical. CWDM; Transceiver type for CWDM applications using G.694.2 channel grid. DWDM; Transceiver type for DWDM applications using G.694.1 channel grid. BiDi; Transceiver pair using two different wavelength channels operating on a single-fiber. DAC: Direct Attach Cable. Electrical cable with attached connectors. AOC: Active Optical Cable. Optical cable with attached connectors.
Transmission Media	Type of fiber, e.g. Multimode (MM) or Singlemode (SM). Number of and connector type within brackets (e.g. 2x LC, 1x MPO).
Typical reach	Nominal distance performance based on typical fiber dispersion, fiber loss and power budget properties, i.e. w/o dispersion compensation and optical amplification. Actual distance is dependent on actual optical path loss and dispersion properties.
Bit rate range	Supported bit rate range in Gigabit or Megabit per second (Gbps or Mbps).
Protocols	Protocols within supported bit rate range.
Nominal wavelength	Typical wavelength(s) from transmitter.
Interface standards	Referenced interface standards or MSA's, e.g. IEEE 802.3 standard for 10GbE services or 100G 4WDM-10 etc.
Power budget	Min and max power budget between Transmitter and Receiver w/o optical path penalties.
Dispersion tolerance/penalty	Maximum amount of tolerated dispersion and required reduction of power budget to maintain stipulated Bit Error Rate (BER) and at a given bit rate.
Temperature range	Max operating case temperature range. Standard temperature range (C-temp): 0°C to +70°C (32°F to +158°F) Extended temperature range (E-temp): typically -20°C to +75°C (-4°F to +167°F) Industrial temperature range (I-temp): -40°C to +85°C (-40°F to +185°F)
Power consumption	Worst case power consumption. Will vary over temperature.
Transmitter Output power	Average output power. Provided in min and max values.
Receiver minimum input power	Minimum average input power at specified BER, normally $1E^{-12}$. Note that some protocols require FEC to achieve sufficient BER.
Receiver max input power	Maximum average input power giving a BER, normally $1E^{-12}$.
DDM	Digital Diagnostic Monitoring functionality as defined in e.g. SFF-8472 MSA.