

# HPL-72015-xx

## 25Gb/s 1310nm 40km SFP28 Transceiver

### Product Description

The 72015-xx is a 25Gbps enhanced small form factor pluggable SFP28 optical transceiver. It's designed for use in 25-Gigabit Ethernet and other ultra high speed optical links up to 40km over dual strand Single Mode fiber.

### Features

- 25GBase-ER
- Bitrate 25.78Gb/s
- Up to 40km in 9/125 $\mu$ m SMF
- 1310nm DFB laser and APC receiver
- Duplex LC Connector
- Hot-pluggable
- Single 3.3V power supply
- Power Consumption < 1.2W
- Digital Diagnostic Monitor (DDM)



### Applications

- 25GBase-ER
- Propriety 25G optical links

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	V <sub>cc</sub>	-0.5	4	V
Storage Temperature	T <sub>s</sub>	-40	85	°C
Operating Case Temperature	T <sub>c</sub>	-5	70	°C
Operating Relative Humidity	RH	-	85	%

## Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V <sub>cc</sub>	3.13	3.3	3.47	V
Power Supply Current	I <sub>cc</sub>			350	mA
Data Rate High speed		24.3	25.78	26.5	Gb/s
Power dissipation	PD			1.2	W
Max Link Length on 9/125μm SMF	L <sub>max</sub>			40	km

## Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
<b>Transmitter</b>					
Centre Wavelength	$\lambda_c$	1295	1310	1325	nm
Spectral Width (-20dB)	$\sigma$			1	nm
Average Output Power	P <sub>out</sub>	0		6	dBm
Extinction Ratio	ER	4			dB
Optical Modulation Amplitude	OMA	-4		2.2	dBm
Launch power in OMA minus TDP (min)	OMA_TDP	-5			dBm
Side Mode Suppression Ratio	SMSR	30			dB
Average Launch Power, Laser Off	P <sub>off</sub>			-30	dBm
Transmitter dispersion penalty	TDP			2.7	dB
Optical Return Loss Tolerance	ORLT			20	dB
<b>Receiver</b>					
Centre Wavelength	$\lambda_c$	1200	1310	1600	nm
Receiver Sensitivity (OMA)	P <sub>IN</sub>			-18.0	dBm
Stress sensitivity (OMA)				-16.0	dBm
Receiver Overload	P <sub>in max</sub>	3			dBm
Reflectance	Ref			-12	dB
LOS De-Assert	LOS <sub>D</sub>			-22	dBm
LOS Assert	LOS <sub>A</sub>	-26			dBm
LOS Hysteresis		0.5		4	dB

## Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
<b>Transmitter (module input)</b>					
Differential Data Input	Vin P-P	90		800	mVpp
Differential termination				5	%
Tx Disable Normal	VIL	-0.3		0.8	V
Tx Disable	VIH	2		VCC+0.3	V
<b>Receiver (module input)</b>					
Differential Data Output	Vout P-P	185		425	mVpp
Differential termination				5	%
Rx-Los Fault	Vlf	Vcc-0.2			V
Rx-Los Normal	Vln			0.2	V
Output rise and fall time	Tr, Tf	12			ps

## DDM Thresholds

	Low Alarm	Low Warn	High Warn	High Alarm
Temperature	-5°C	-0°C	70°C	75°C
Voltage	3V	3.1V	3.6V	3.7V
Tx Bias	10mA	15mA	90mA	100mA
Tx Power	-4dBm	-3dBm	7dBm	8dBm
Rx Power	-22.01dBm	-20dBm	-4dBm	-3dBm

**For safety and reliability reasons, please read the following information carefully.**

Light Budget is one of the key items for designing fiber optic network. In order to create a product that will meet application requirements. To adequately characterize the budget loss, the following key parameters are generally considered:

- Transmitter: Output power, temperature and aging
- Fiber connections: Active connection and splices
- Fiber Cable: fiber attenuation and temperature effect
- Receiver: Detector sensitivity
- Others: Safety margin and repairs

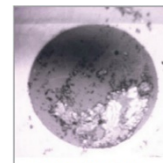
When one of the above-listed variables fails to meet specifications, the performance of the network can be greatly affected or worse, the degradation can lead to network failure. Unfortunately, not all the variables can be controlled with ease during the deployment of the network or the maintenance stage; however, there exists one component—the connector—that is too-often overlooked, sometimes overused (test jumpers) but that can be controlled using the proper procedure.



This is a Class 1 Laser Product according to IEC 60825-1:2014 compatible with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).



This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



Dirt / debris

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination. In a study by NTT-Advanced Technology, 98% of installers and 80% of network owners reported that issues with connector contamination were the greatest cause of network failures.

## CE EU declaration of conformity

The CE marking is mandatory for this category of products. It is the manufacturer's declaration that the product meets the requirements of the applicable EU directives required to allow free movement and sale of the product throughout the European Economic Area.

### Equipment Specific part number extension

-51	Cisco	-59	Alcatel (Nokia)
-52	Ericsson	-60	Combo code
-53	Huawei	-61	H3C (HP)
-54	Juniper	-62	Brocade
-55	Generic (MSA)	-63	AristaNetworks
-56	HP	-64	Adva
-57	Extreme	-65	Microsens
-58	3COM (HP)	-66	DELL
		-67	Intel