

Part Type: 3HE09329AA-FL  
3HE09329AA-FL-EXT  
3HE09329AA-FL-IND

### Quick Spec:

Form Factor:	SFP+
TX Wavelength:	1550nm
Reach:	80km
Cable Type:	SMF
Rate Category:	10GBase
Interface Type:	ZR
DDM:	Yes
Connector Type:	Dual-LC
Power Budget:	24.dB
TX Power Min/Max:	0.00 to 3.00
RX Power Min/Max:	-24.00 to -7.00



### Features

- Data rate selectable  $\leq 4.25$ Gbps or 9.95Gbps to 10.3Gbps bit rates
- Cooled EML transmitter and APD receiver
- Low Power Dissipation 2W Maximum
- Operating Case Temperature
  - Standard 0°C to +70°C
  - Extended -5°C to +85°C
  - Industrial -40°C to +85°C
- Single 3.3V power supply
- Voltages, laser bias current, transmit optical power, receive optical power (DDM)

### Applications

- 10GBASE-ZR at 10.3125Gbps
- 10GBASE-ZW at 9.953Gbps
- Other Optical Links

### Electrical Characteristics (Condition: Ta=TOP)

Parameter	Symbol	Min.	Typ	Max.	Unit	Notes
CML Inputs(Differential)	Vin	150		1200	mV p-p	AC coupled inputs
Supply Current	ICC		400	600	mA	
Input Impedance (Differential)	Zin	85	100	115	ohm	Rin > 100 kohm @ DC
Tx_Disable Input Voltage – Low	VIL	0		0.8	V	
Tx_Disable Input Voltage – High	VIH	2.0		3.45	V	
Tx_Fault Output Voltage – Low	VOL	0		0.5	V	
Tx_Fault Output Voltage – High	VOH	2.0		Vcc+0.3	V	
CML Outputs (Differential)	Vout	350		700	mV pp	AC coupled outputs
Output Impedance (Differential)	Zout	85	100	115	ohms	
Rx_LOS Output Voltage- Low	VOL	0		0.5	V	
Rx_LOS Output Voltage- High	VOH	2.5			V	

### Optical Characteristics (Condition: Ta=TOP)

TX						
Parameter	Symbol	Min	Typ	Max	Unit	
Data Rate		-	10.3	-	Gb/s	
9µm Core Diameter SMF			10		Km	
Centre wavelength	$\lambda_c$	1530	1550	1565	nm	
Output Spectral Width(-20dB)	$\Delta\lambda$	-	-	1	nm	
Average Output Power	P <sub>out</sub>	0	-	+3	dBm	
Extinction Ratio	ER	6	-	-	dB	
Average Power of OFF Transmitter				-30	dBm	
Side Mode Suppression Ratio	SMSR	30			dB	
Input Differential Impedance	Zin	90	100	110	$\Omega$	
TX Disable	Disable		2.0	Vcc+0.3	V	
	Enable		0	0.8		
TX Fault	Fault		2.0	Vcc+0.3	V	
	Normal		0	0.8		
Tx Disable Assert Time	t <sub>off</sub>			10	us	

RX					
Parameter	Symbol	Min	Typ	Max	Unit
Center Wavelength	$\lambda_c$	1530		1565	nm
Receive Sensitivity	$P_{in}$	-	-	-24	dBm
Maximum Input Power	$P_{MAX}$	-7.0		-	dBm
Signal Detect Threshold-Assertion:	$SD_{HIGH}$	-	-	-25	dBm
Signal Detect Threshold-Deassertion:	$SD_{LOW}$	-30	-	-	dBm
Output Differential Impedance	$P_{in}$	90	100	110	$\Omega$
Receiver Overload	$P_{max}$	0.5			dBm
Optical Return Loss	ORL			-27	dB
LOS	High	2.0		$V_{cc}+0.3$	V
	Low	0		0.8	

### Absolute Maximum Ratings ( $T_c=25^\circ C$ )

Parameter	Symbol	Min	Max	Unit
Storage Temperature	$T_{ST}$	-40	+85	$^\circ C$
Operating Temperature (Standard)	$T_{IP}$	0	+70	$^\circ C$
Operating Temperature (Industrial)	$T_{IP}$	-40	+85	$^\circ C$
Input Voltage	$T_{CC}$	0	5	V

### Recommend Operation Environment

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	$V_{CC}$	+3.15	3.3	+3.45	V
Operating Temperature (Standard)	$T_{OP}$	0	-	+70	$^\circ C$
Operating Temperature (Industrial)	$T_{OP}$	-40		+85	$^\circ C$