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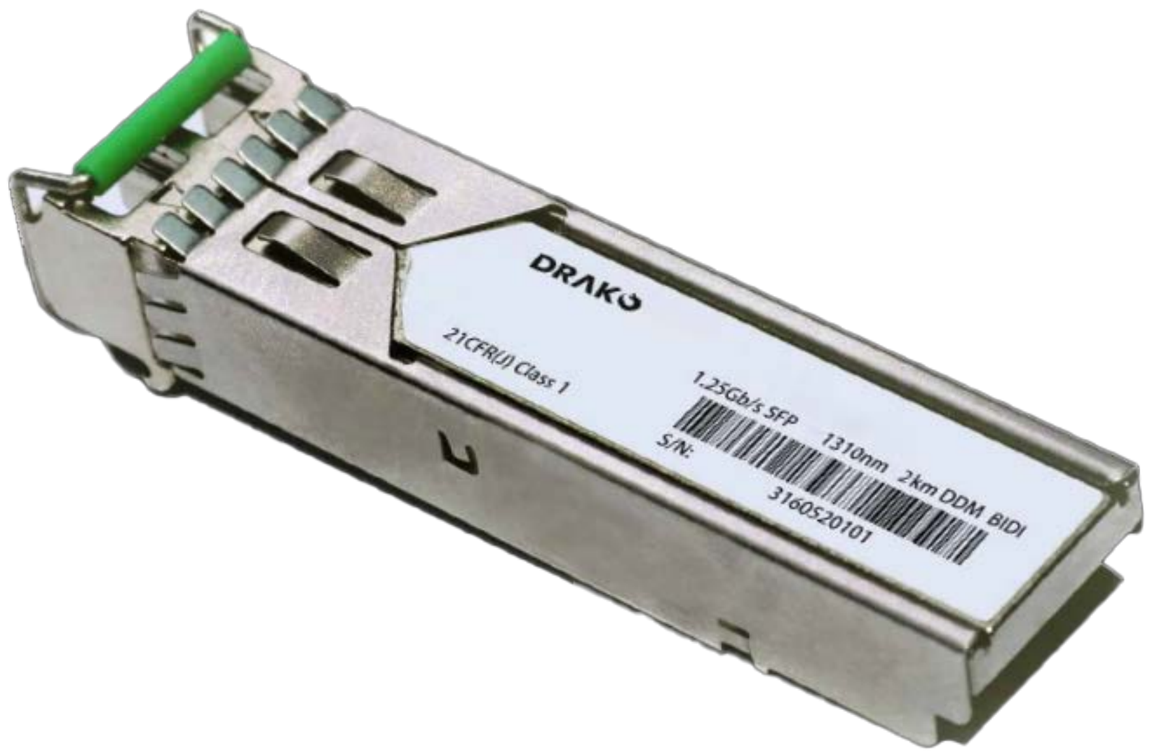
Transceivers - TRA012
Technical Specification

Overview

DRAKO Model No. TRA012 optical transceivers are based on the Gigabit Ethernet IEEE 802.3 standard and Fibre Channel FC-PI Rev.5.0,providing a fast and reliable interface for GE/FC applications The product implements digital diagnostics via a 2-wire serial bus compliant with the INF-8074i Small Form Factor Pluggable Multi-Source Agreement (MSA) and SFF-8472 standard.

Product Features

- Supports data rates of 1.25Gb/s
- Compliant with SFP MSA
- Hot pluggable SFP footprint
- 1310nm FP laser transmitter
- Duplex LC connector
- Built in digital diagnostic functions
- Up to 1 0km on 9/125um SMF
- Single power supply 3.3V
- RoHS Compliant
- Clas s 1 laser product complies with EN 60825 1
- Operating temperature range: 0 ° C to 70 ° C



Applications

- 1.25Gb/s Gigabit Ethernet
- 1.063Gb/s Fiber Channel

Package Information

Ordering Information

Table 1. Ordering Information

Part Number	Transmitter	Output Power	Receiver	Sensitivity	Reach	Temp	DDM	RoHS
TRA012	1310nm FP	-9.5~ -3dBm	PIN	< -18 dBm	2km	0~ 70°C	Available	Compliant

Absolute Maximum Ratings

Table 2. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Storage Temperature	Ts	-40	--	85	°C	1
Relative Humidity	Rh	5	--	95	%	--
Supply Voltage	Vcc	-0,5	--	4,0	V	--

Notes:

1. Ambient temperature

Recommended Operating Conditions

Table 3. Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Rate	DR	--	1,25	--	Gb/s	1
	DR	--	1,062	--	Gb/s	2
Bit Error Rate	BER	--	--	10^{-12}		--
Operating Temperature	T_C	0	--	70	°C	3
Relative Humidity	RH	5	--	95	%	--
Supply Current	I_{CC}	--	175	300	mA	5
Input Voltage	V_{CC}	3,14	3,3	3,46	V	--

Notes:

2. IEEE 802.3
3. FC-PI-2 Rev 5
4. Case temperature
5. For electrical power interface

Transmitter Optical Characteristics

Table 4. Transmitter Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Output Optical Power	P_{TX}	-9.5	--	-3	dBm	1
Optical Center Wavelength	λ_C	1270	--	1355	nm	--
Optical Modulation Amplitude	OMA	174	--	--	µW	2
Extinction Ratio	ER	9	--	--	dB	--
Tx Disabled Power	P_{TX_DIS}	--	--	-45	dBm	--
Spectral Width (RMS)	$\Delta\lambda$	--	--	3	nm	--
Optical Rise/Fall Time (20%-80%)	t_r / t_f	--	150	260	ps	--
Transmitter dispersion penalty	RIN	--	--	-120	dB/Hz	--

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Relative Intensity Noise	RIN	--	--	-120	dB/Hz	--
Generated Jitter (peak to peak)	GJ_{PP}	--	--	0,15	UI	--
Optical Return Loss Tolerance	ORL	--	--	12	dB	--
Output Eye	Compliant with IEEE802.3z standard					

Notes:

1. Class 1 Product, The optical power is launched into SMF.
2. Equivalent extinction ratio specification for FC

Receiver Optical Characteristics

Table 5. Receiver Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Receiver Overload	P_{OL}	-3	--	--	dBm	--
Optical Center Wavelength	λ_C	1260	--	1360	nm	--
Receiver Sensitivity	--	--	--	-18	dBm	--
Optical Return Loss	T_{ORL}	12	--		dB	--
Receiver Reflectance	R_{REFL}	--	--	-12	dB	--
Generated Jitter(peak to peak)	RJp−p	--	--	0,15	UI	--
LOS Assert	LOS-A	-35	--		dBm	--
LOS De-Assert	LOS-D	--	--	-27	dBm	--
LOS Hysteresis	LOS-H	0,5	--		dB	--

Transceiver Electrical Characteristics

Table 6. Transceiver Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter						
Input differential impedance	R_{IN}	--	100	--	Ω	--
Single ended data input swing	$V_{IN\ PP}$	250	--	1200	mV	--
Transmit disable voltage	V_D	V_{CC}-1.3	--	VCC	V	--
Transmit enable voltage	V_{EN}	VEE	--	V_{EE}+0.8	V	--
Transmit disable assert time	--	--	--	10	μs	--
Receiver						
Single ended data output swing	$V_{OUT\ PP}$	300		800	mV	--
Data output rise/fall time (20%-80%)	t_r / t_f	--	--	300	PS	--

Parameter		Symbol	Min	Typ	Max	Unit	Notes
RX_LOS	Loss of signal (LOS)	V_{OH}	V_{CC}-0.5		$V_{CC\ HOST}$	V	--
	Normal Operation	V_{OL}	V_{EE}		V_{EE}+0.5	V	--

Pin Description

Table 7. Pin Description

Parameter	Symbol	Description	Notes
1	V_{EET}	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter Fault. Not supported	--
3	TX_DISABLE	Transmitter Disable. Laser output disabled on high or open	2
4	MOD_DEF(2)	Module Definition 2. Data line for serial ID	3
5	MOD_DEF(1)	Module Definition 1. Clock line for serial ID	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module	3
7	Rate Select	No connection required	--
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	4
9	V_{EER}	Receiver ground (common with transmitter ground)	1
10	V_{EER}	Receiver ground (common with transmitter ground)	1
11	V_{EER}	Receiver ground (common with transmitter ground)	1
12	RD-	Receiver Inverted DATA out. AC coupled	--
13	RD+	Receiver Non-inverted DATA out. AC coupled	--
14	V_{EER}	Receiver ground (common with transmitter ground)	1
15	V_{CCR}	Receiver power supply	--
16	V_{CCT}	Transmitter power supply	--
17	V_{EET}	Transmitter ground (common with receiver ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	--
19	TD-	Transmitter Inverted DATA in. AC coupled	--
20	V_{EET}	Transmitter ground (common with receiver ground)	1

Notes:

1. Circuit ground is isolated from chassis ground
2. Disabled:TDIS>2Vor open, Enabled: TDIS<0.8V
3. Should Be pulled up with 4.7k 10k ohm on host board to a voltage between 2V and 3.6V
4. LOS is o pen collector output

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