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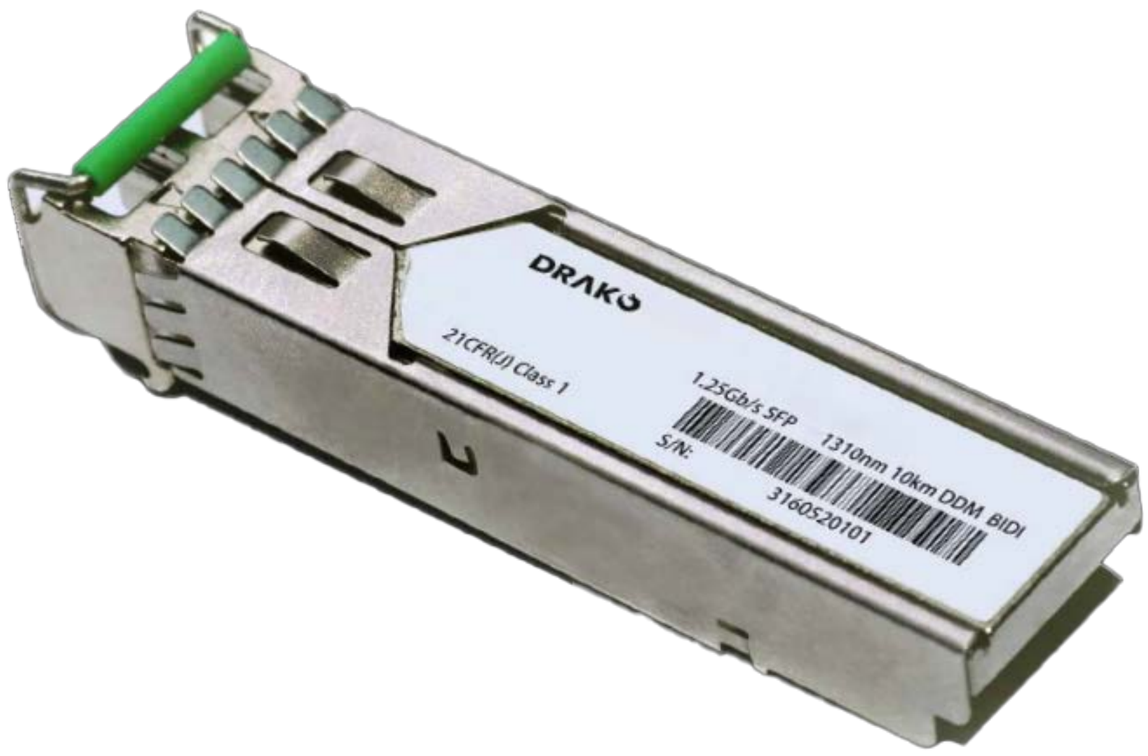
Transceivers - TRA013
Technical Specification

Overview

DRAKO Model No. TRA013 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
TRA013	1310nm FP	- 11 ~3 dBm	PIN	< 24 dBm 10k	10km	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	VER	--	--	10^{-12}		--
Operating Temperature	T_C	0	--	70	°C	3
Relative Humidity	RH	5	--	95	%	--
Supply Current	ICC	--	175	300	mA	5
Input Voltage	VCC	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	PTX	-11	--	-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	PTX_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	TDP	--	--	3,3	dB	--

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
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	--	--	--	-24	dBm	--
OMA Rx Sensitivity	S_{OMA}	--	--	-22	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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