

# ODIN MIR4 02

Fiber Optic Receiver for MOST<sup>®</sup>

AIM DS



Never stop thinking.

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## ODIN MIR4 02

**Revision History: 2006-11-28**

V2

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Previous Version: V1

Page	Subjects (major changes since last revision)
all	capability to handle 3.3V and 5V added
Table 4	typical values for $t_{PUO}$ , $t_{PU}$ and $t_{LPM}$ updated; Footnote 3) updated
Table 4	Footnote 5) added for 2UI and 3UI pulses

For questions on technology, delivery and prices please contact the Infineon Technologies Offices in Germany or the Infineon Technologies Companies and Representatives worldwide: see our webpage at <http://www.infineon.com>

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### Edition 2006-11-28

**Published by Infineon Technologies AG,  
Am Campeon 1-12  
D-85579 Neubiberg, Germany**

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### ODIN MIR4 02

#### Features

Excellent solution for converting high speed data from Plastic Optical Fiber (POF) to digital output.

- **Operating @ 3.3V or 5V Power Supply**
- High speed receiver up to 25 Mbit/s net data rate (50 MBaud)
- 95°C operating temperature over whole life time
- Photo current sensing, network activity detection and Low Power Mode ( $I_{CC} < 10 \mu A$ )
- Signal detect and Status Output
- Low power consumption
- Pulse width control
- -25dBm guaranteed sensitivity @ 650nm for working in a low attenuation range of PMMA Fiber
- Fully compliant to "MOST® Specification of Physical Layer Rev 1.1"
- RoHS compliant (Lead free and halogen free)

#### Applications

- Optical Receiver for MOST Systems

#### Description

The 4-pin MOST Optical Receiver (ODIN MIR4 02) is a highly integrated CMOS IC combined with a high speed PIN diode designed to receive up to 25 Mbit/s optical data which is biphase coded (up to 50 MBaud) and convert this optical data to a rail-to-rail data stream. During the low power mode, the PIN diode is still being observed and if activity is detected, the receiver will switch to full power mode. A STATUS-pin indicates if modulated light is received (Light on -> STATUS = low). With the STATUS-pin the power supply of the whole MOST device can be switched ON. The power supply voltage is either 3.3V or 5V.

**Table 1 Absolute Maximum Ratings**

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply Voltage <sup>1)</sup>	$V_{CCMax}$	-0.5	6.0	V
Storage Temperature Range	$T_{STG}$	-40	100	°C
Soldering Temperature (>2.5 mm from case bottom $t \leq 10s$ )	$T_S$	–	260	°C
Voltage at any PIN		-0.5	$V_{CC} + 0.5$	V
Electrostatic Discharge Voltage Capability <sup>2)</sup>	$ESD$	–	2.0	kV

<sup>1)</sup> maximum supply voltage without causing damage

<sup>2)</sup> ESD Capability for all Pins HBM (human body model) according JESD22-A114B.

**Attention: Stresses above those listed here may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.**

**Table 2 Recommended Operating Conditions**

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply Voltage low	$V_{CC,l}$	3.135	3.465	V
Supply Voltage high	$V_{CC,h}$	4.75	5.25	V
Operating Temperature Range (ambient) <sup>1)</sup>	$T_A$	-40	95	°C

<sup>1)</sup> For details see application note "Handling, Storage, Operating and Processing Application Note of ODIN MOST4 Transceiver"

All the data in this specification refers to the operating conditions above and over life time unless otherwise stated.

**Table 3 Optical Signal Characteristics**  
(22.5 Mbit MOST Data,  $V_{CC} = 3.135 \dots 3.465$  V or  $4.75 \dots 5.25$  V)

Parameter	Symbol	Limit Values			Unit
		min.	typ.	max.	
Peak wavelength of input signal	$\lambda_{Peak}$	630	650	685	nm
FWHM of input signal	$\Delta\lambda$	–	–	30	
Receivable optical power range for data recovery <sup>1)2)</sup>	$P_{opt}$	-25	–	-2	dBm
Receivable optical power for switching to low power mode <sup>1)</sup>	$P_{OFF}$	-40	–	-25	dBm

- 1) Optical power data are average values when using a MxT4 xx optical transmitter, measured at the end of a plastic optical fiber with metal insert (diameter 2.90 +/- 0.02 mm). The transmitted data is biphase coded.
- 2) Measured with worst case pattern. A BER  $\leq 10^{-9}$  can be reached.

**Table 4 AC Electrical Characteristics**

Parameter	Symbol	Limit Values			Unit
		min.	typ.	max.	
Output Rise Time <sup>1) 4)</sup>	$t_r$	–	6	9	ns
Output Fall Time <sup>1) 4)</sup>	$t_f$	–	6	9	ns
Output Pulse Width Variation 1UI <sup>1) 2) 3) 4) 5)</sup>	$t_{PWV}$	16.5	–	31.0	ns
Output Average Pulse Width Distortion <sup>1) 2) 3) 4)</sup>	$t_{APWD}$	-3.3	–	7.0	ns
Data Dependent Link Jitter <sup>2) 3) 4)</sup>	$t_{DDJ}$	–	–	3.3	ns
Uncorrelated Link Jitter <sup>2) 3) 4)</sup>	$t_{UJ}$	–	–	1.0	ns
Power-up time at detection of rising $V_{CC}$	$t_{PUO}$	–	0.1	6	ms
Power-up time from low power mode	$t_{PU}$	–	0.5	6	ms
Low Power mode timer delay	$t_{LPM}$	–	0.005	2	ms

1) Capacitive Load is max. 10pF

2) MOST Data 44.1 kHz FS corresponds to a 45 Mbaud data stream.

3) The optical input signal has to fulfill following requirements:  $t_{PWV(\min)} = 20.0$  ns,  $t_{PWV(\max)} = 24.3$  ns,  $t_{APWD(\min)} = -1.4$  ns and  $t_{APWD(\max)} = 1.4$  ns,  $t_{DDJ(\max)} = 0.77$  ns,  $t_{UJ(\max)} = 0.33$  ns, Positive Overshoot within 0UI...2/3UI = -20...40%, Extinction Ratio min = 10dB. Variation within those limits does not significantly change  $t_{PWV}$

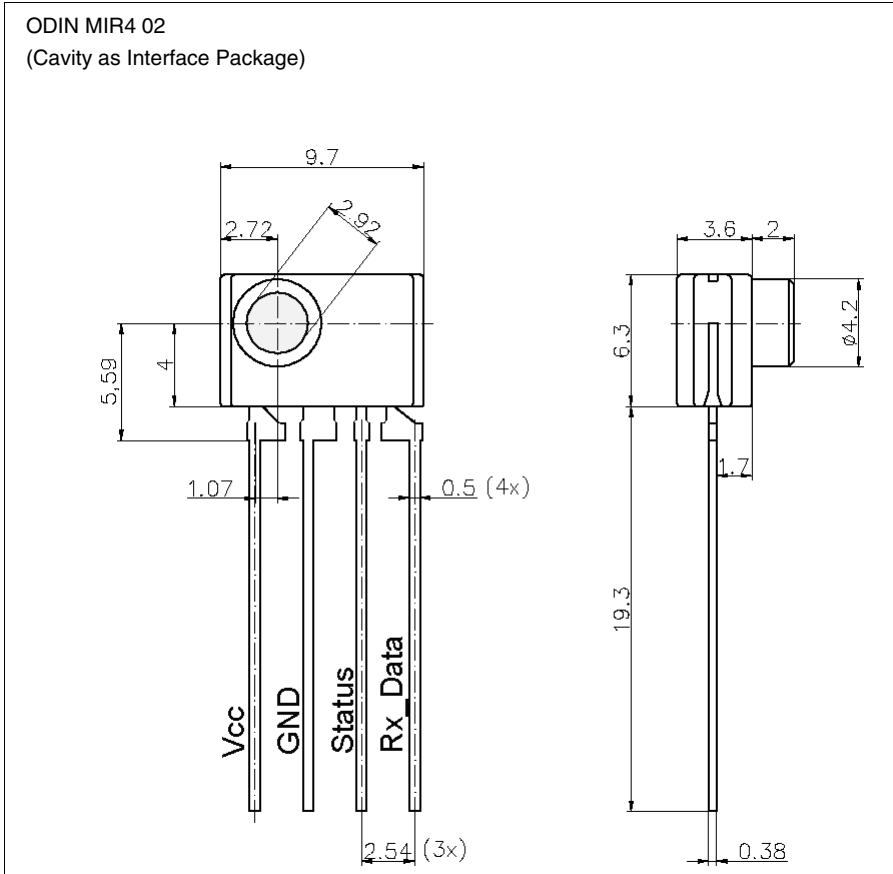
4) Characterized with Infineon Characterization Boards as described in the Application note "Application Note MOST circuit for Infineon ODIN Transceiver"

5) Limits for 2UI are 38.6 ... 53.1ns and for 3UI they are 60.8 ... 75.2ns

**Table 5 DC Electrical Characteristics**

Parameter	Symbol	Limit Values			Unit
		min.	typ.	max.	
Supply Voltage low	$V_{CC,l}$	3.135	3.3	3.465	V
Supply Voltage high	$V_{CC,h}$	4.75	5	5.25	V
Low Level Output Voltage Data and Status Pin <sup>1)</sup>	$V_{OL}$	–	–	0.4	V
High Level Output Voltage Data Pin <sup>1)</sup>	$V_{OH}$	2.5	3.3	3.7	V
High Level Output Voltage Status Pin <sup>1)</sup>	$V_{OH}$	2.5	–	$V_{CC}$	V
Supply Current Full Power Mode	$I_{CC,FPM}$	–	-	20	mA
Supply Current LowPower Mode	$I_{CC,LPM}$	–	-	10	$\mu$ A

1) Resistor load must not be smaller than 50kOhm



For a more detailed drawing please contact the Infineon Technologies offices in Germany or the Infineon Technologies companies and representatives worldwide.

Dimensions in mm

Notes: