BF4MC series

△3 0.05 to 6.25 Gbps, Super small Connector Incorporating E/O and O/E converters

Specifications

Revision History

Rev.	Change
△0	First version for preproduction sample
△1	Modified pin description
△2	Correction of errors
△3	Correction of errors

Notes) In this document, "BF4MC-TX" means Tx (transmitter) plug,
and "BF4MC-RX" is RX (receiver) plug

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1. General description

This document defines the ratings and characteristics of Hirose BF4MC series, super small optical active connector.

2. Features

△3
- 6.25 Gbps high-speed transmission capability by using optical fiber
- Simplex, One-way data transmission
- VCSEL and VCSEL driver are incorporated in a connector (Tx)
- Photodiode and TIA/LA are incorporated in a connector (Rx)
- Low power consumption : 80 mW MAX. (Dual supply mode, Operating at room temperature)
  120 mW MAX. (Single supply mode, Operating at room temperature)
- SLVS-200 interface (LVDS tolerant)
- Power supply : [Tx (transmitter)] 2.5 V or 3.3 V
  [Rx (receiver)] 2.5 V and 1.5 V (Dual supply mode)
  3.3 V (Single supply mode)

3. Function description

3-1. Block diagram

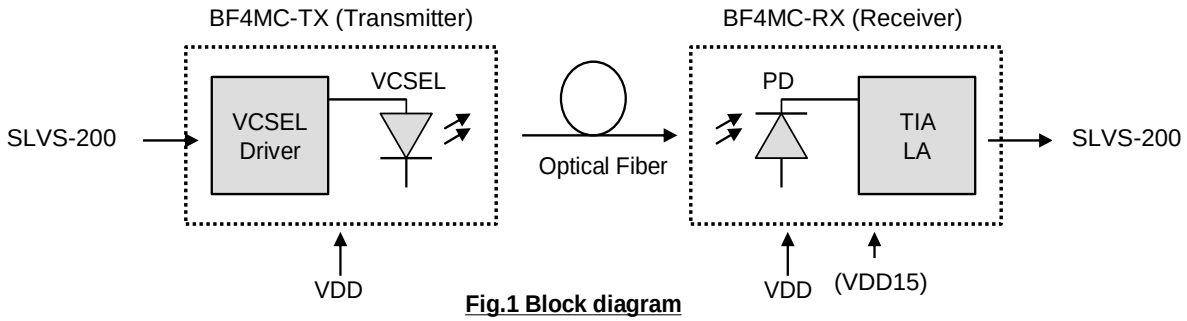


Fig.1 Block diagram

3-2. Pin assignment

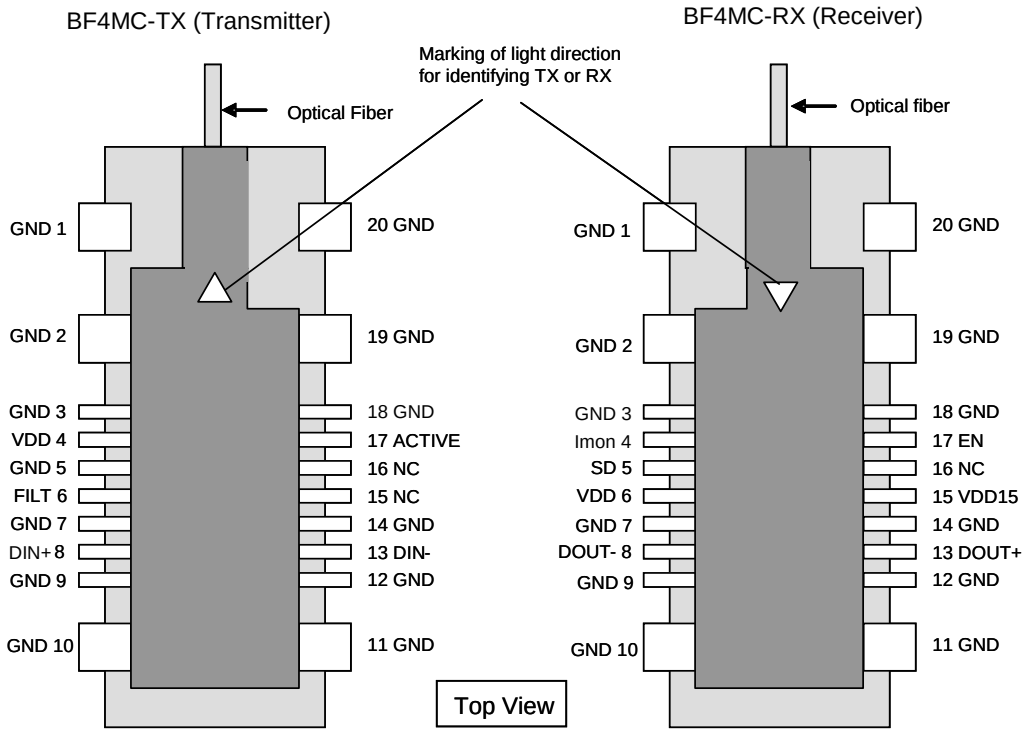


Fig2 Pin assignment

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4. Characteristics

4-1. Absolute maximum ratings

Table 1. BF4MC-TX maximum rating

	MIN.	MAX.	UNIT
VDD Voltage	- 0.5	4.5	V
DIN Voltage	- 0.5	1.8	V
FILT Voltage	- 0.5	2.8	V
ACTIVE Voltage	- 0.5	3.6	V

Table 2. BF4MC-RX maximum rating

	MIN.	MAX.	UNIT
VDD Voltage	-0.4	4.0	V
VDD15 Voltage	-0.4	1.6	V

4-2. Electrical characteristics

Table 3. BF4MC-TX electrical characteristics

	MIN	TYP	MAX	UNIT	NOTE
Transmission Speed(8B10B)	0.05		⚠3 6.25	Gbps	
VDD Voltage	2.25	2.5/3.3	3.6	V	
ACTIVE=H voltage	1.0		VDD	V	
DIN common mode voltage	150		340	mV	
DIN differential voltage	200		1400	mV	

Table4. BF4MC-RX electrical characteristics

	MIN	TYP	MAX	UNIT	NOTE
Transmission Speed(8B10B)	0.05		⚠3 6.25	Gbps	
VDD voltage	3.2	3.3	3.4	V	Single Supply Mode
VDD voltage	2.25	2.5	3.6	V	Dual Supply mode
VDD15 voltage	1.45	1.50	1.60	V	
DOUT common mode voltage	160		330	mV	
DOUT differential voltage	160		330	mV	
SD = H voltage	1.0	1.50	1.60	V	
Imon	20			uA	For Internal test

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4-3. Pin functions

Table 5. BF4MC-TX Pin function

SYMBOL	NAME	TYPE	DETAILS
VDD	Vsupply	Power	Power Supply DC2.5V or DC3.3V
GND	Ground	Ground	-
ACTIVE	Activate	Input	1:Active mode 0:Sleep mode
FILT	Filter	-	Decoupling capacitor connection contact, Connected via 0.01 uF capacitor
DIN+	Data input+	Input	SLVS Input
DIN-	Data input-	Input	SLVS Input
NC	No connect	-	Not connected

Table 6. BF4MC-RX Pin function

SYMBOL	NAME	TYPE	DETAILS
VDD	Vsupply	Power	Power Dual supply mode DC2.5V Single supply mode DC3.3V
VDD15	Vdd 1.5V	Power	Power for core Dual supply mode DC 1.5V Single supply mode Not connect or Connect decoupling capacitor
GND	Ground	Ground	-
SD	Signal Detect	Output	1:Detected 0:Not detected
Dout+	Data OUTPUT+	Output	SLVS Output
Dout-	Data OUTPUT-	Output	SLVS Output
EN	Regulator Enable	Input	For change supply mode Dual supply mode Not connected Single supply mode Connect VDD
Imon	Mirrored photodiode Current monitor	Output	For internal test. Not connected
NC	No connect	-	Not connected

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4-4. Operating condition of BF4MC-RX

4-4-1. Dual supply mode

BF4MC shall be connected referring to Table 7 when operating at dual voltage supply.

Table 7. BF4MC-RX Pin description for dual supply mode

SYMBOL	DETAILS
EN	Not connected (Open)
VDD	DC2.5V
VDD15	DC1.5V

4-4-2. Single supply mode

BF4MC shall be connected referring to Table 8 when operating at single voltage supply.

Table 8. BF4MC-RX Pin description for single supply mode

SYMBOL	DETAILS
EN	Connect VDD
VDD	DC3.3V
VDD15	Not connected or connect decoupling capacitor

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5. Application notes

5-1. Termination

100 Ohm termination is built in the differential input DIN of a transmitter connector, BF4MC-TX.

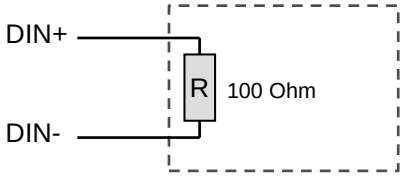


Fig.3 Built-in termination

5-2. DC balance

BF4MC connector shows excellent performance by signal input with well-considered DC balance. Therefore the coding at 8B/10B is recommended.

5-3. Connection with LVDS signal

BF4MC I/O conforms to SLVS-200.
Also, BF4MC is compatible to LVDS I/O signal by AC coupling and termination like Fig.4

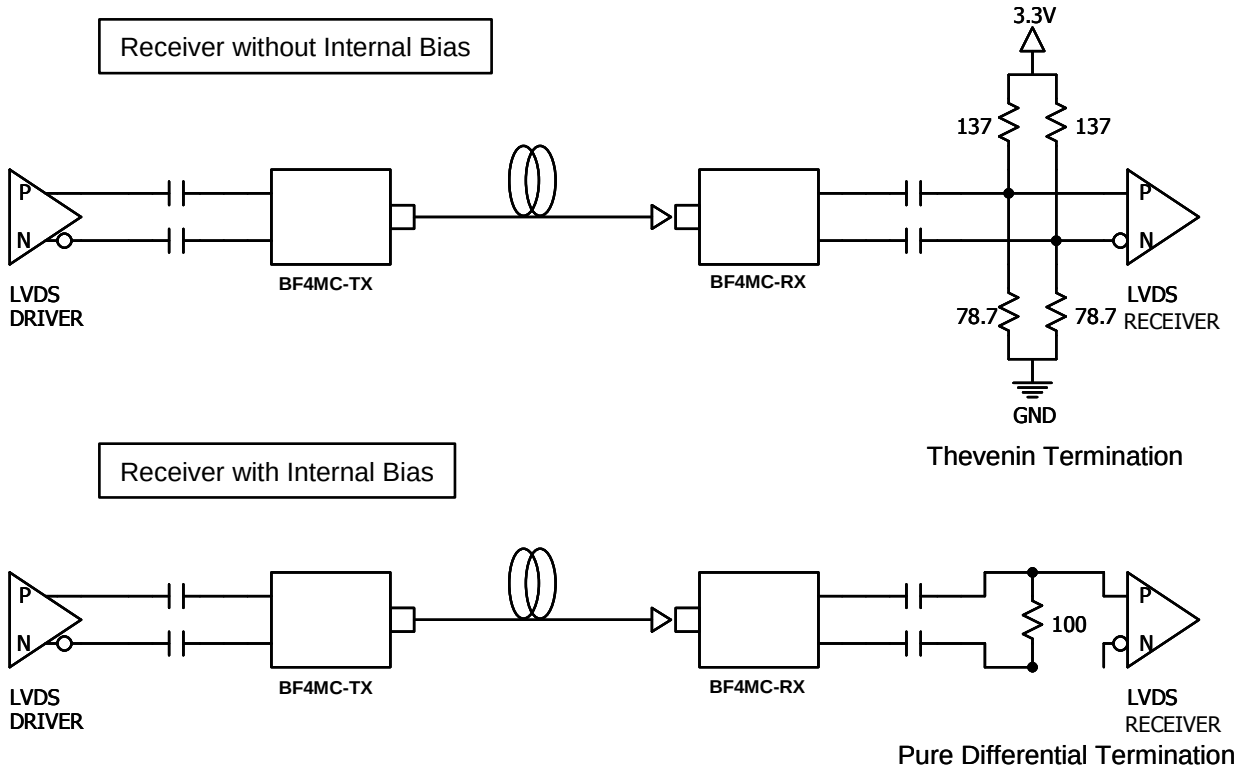


Fig.4 Example of connection with LVDS signal

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5-4. Peripheral circuits

To minimize noise leakage from digital circuit, power supply should be isolated by connecting inductor, chip beads, etc. for both BF4MC-TX and BF4MC-RX.
"SD" output level shall be converted when BF4MC-RX is connected to 3.3 V LVCMOS, because "SD" output level is 1.5 V. Example of "SD" level conversion using transistor is shown in Fig.5-1 and 5-2. But please take care that logic are inverted in this case.

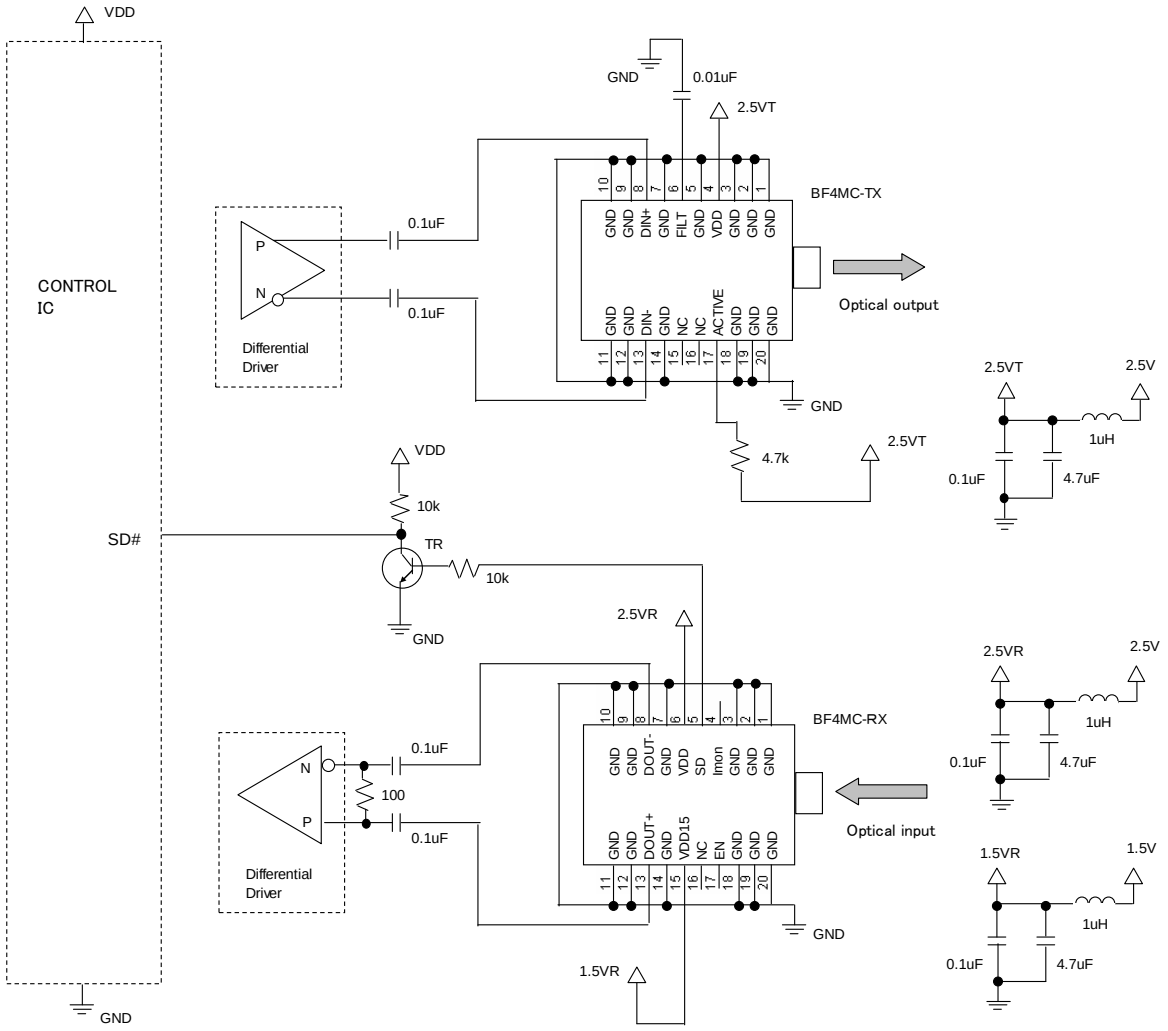


Fig.5-1 Peripheral circuits ~Dual supply mode~

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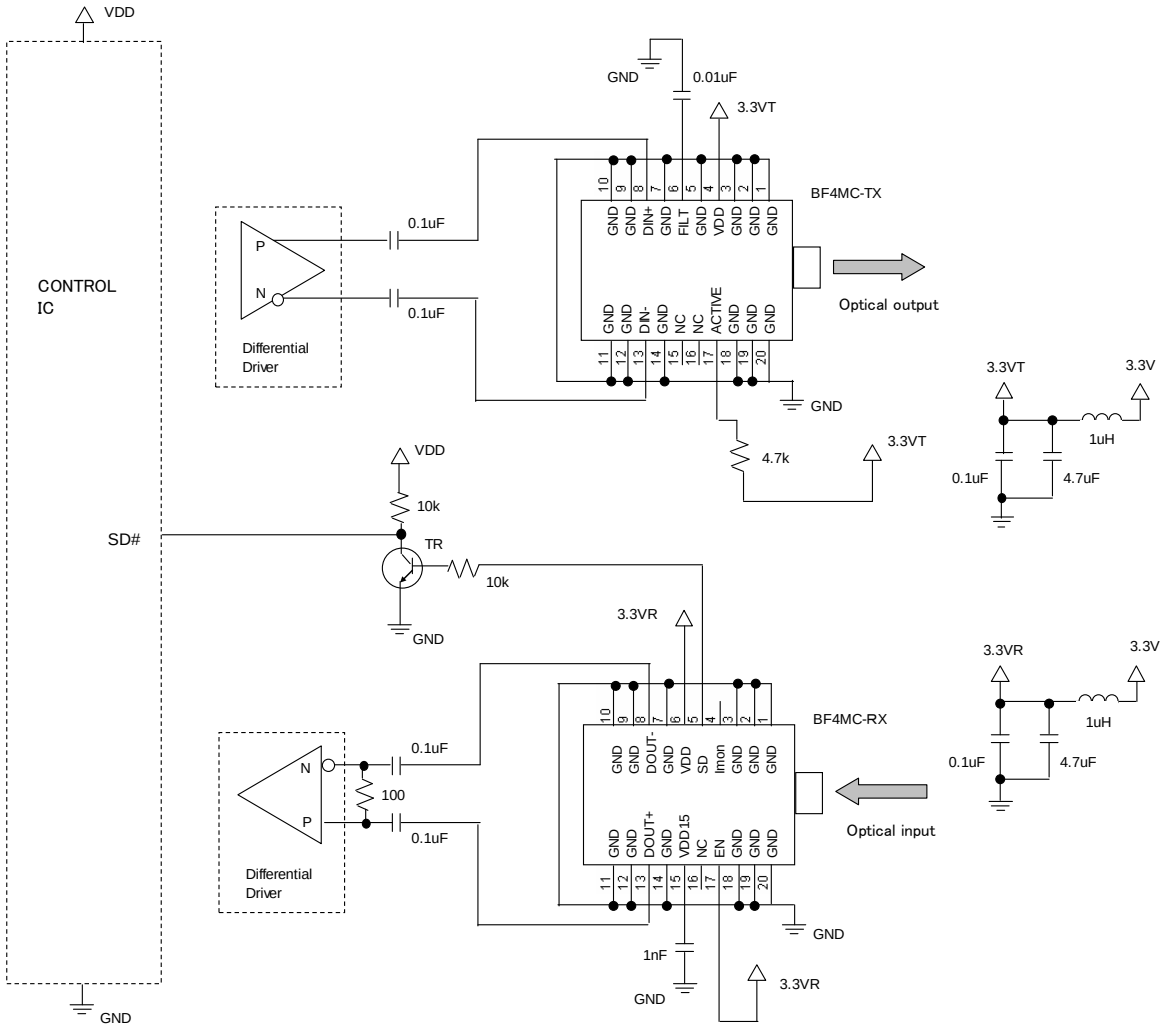


Fig.5-2 Peripheral circuits ~Single supply mode~

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5-5. Definition of differential and common voltage

The differential and common voltage in this specifications sheet is defined as Fig.6.

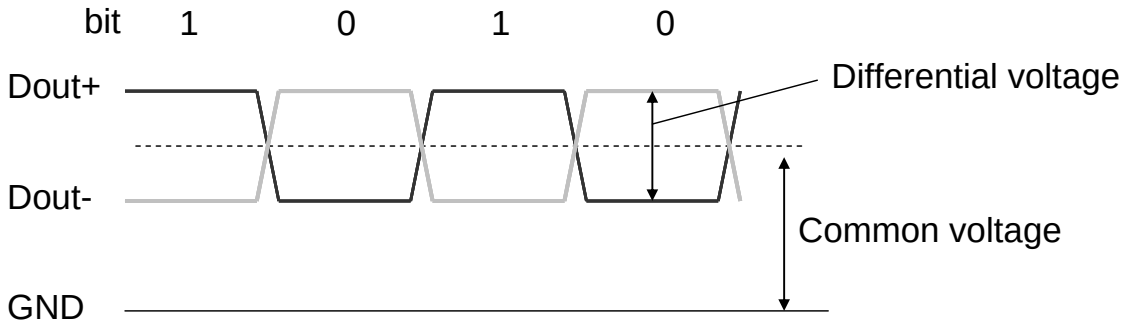


Fig.6 Differential and Common voltage

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