DTC-03-MM-H

OC-3/STM-1 Multimode Transceiver with Clock Recovery & PECL SIGNAL DETECT Output

Features

- ☑ *Designed for ATM/SONET/SDH OC-3/STM-1 Applications*
- ☑ *Multi-sourced 2x9 package style*
- ☑ *Duplex SC or ST or FC connector*
- ☑ *- 40°C to +85°C Operating Temperature*
- ☑ *Single +5 V supply & PECL interface*
- ☑ *Conductive Plastic or Metal Package*
- ☑ *Wave Solder & Aqueous Wash Process Compatible*

Description

The DTC-03-MM-H fiber optic transceivers with clock recovery offer a simple, convenient way to interface ATM/SONET/SDH OC-3/STM-1 PCBs to multimode fiber optic cables running at 1300 nm wavelength.

The transmit and receive functions are contained in a two-row, 18-pin (2x9) package with a Duplex SC or ST or FC connector interface. The transmitter uses a high performance InGaAsP LED and incorporates all the necessary driver circuit for converting PECL data to light. The receiver uses an InGaAs/InP PIN photodiode to convert the light signal into an electrical current which is amplified and resampled using internal clock recovery (PLL) to generate PECL-compatible data and clock.

The transceiver operates from a single +5V power supply over an operating temperature range of 0°C to +70°C ("B" option) or -40°C to +85°C ("A" option). The transceiver package is made of either *conductive* plastic (Duplex-SC version) or metal (FC and ST version) for good EMI shielding.

Another module with TTL SIGNAL DETECT output and opposite phasing of the CLOCK & DATA is also offered. Please refer to the DTC-03-MM data sheet.

Absolute Maximum Ratings

Parameter		Symbol	Minimum	Maximum	Units
Storage Temperature		T_{st}	- 40	+ 85	°C
Operating Temperature	"A" option	T_{op}	- 40	+ 85	°C
	"B" option		0	+ 70	
Supply Voltage		V_{CC}	0	+ 6.0	V
Input Voltage		V_{in}	0	V_{CC}	V
Output Current		I_O	-	50	mA
Lead Soldering Temperature & Time		-	-	260°C, 10 sec	

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Transmitter Performance Characteristics (over Operating Case Temperature Range)

Parameter	Symbol	Minimum	Typical	Maximum	Units
Data Rate	B	155	155.52	156	Mb/s
Optical Output Power [1]	P_o	- 19.0	- 16.0	- 14.0	dBm
Center Wavelength	λ_c	1270	-	1360	nm
Spectral Width (FWHM)	$\Delta\lambda_{FWHM}$	-	140	180	nm
Optical Rise and Fall Time (10% to 90%)	t_r, t_f	-	2.0	3.0	ns
Extinction Ratio	P_{hi} / P_{lo}	10	-	-	dB
Transmitter OFF Power (continuous logic LOW input)	P_{OFF}	-	-	- 45.0	dBm
Random Jitter (peak-to-peak)	RJ	-	-	0.52	ns
Duty Cycle Distortion (peak-to-peak)	DCD	-	-	0.6	ns

[1] Measured average power coupled into 62.5/125 μm, 0.275 NA graded-index multimode fiber. The minimum power specified is at Beginning-of-Life (BOL).

Receiver Performance Characteristics (over Operating Case Temperature Range)

Parameter		Symbol	Minimum	Typical	Maximum	Units
Data Rate		B	155	155.52	156	Mb/s
Receiver Sensitivity (10^{-10} BER) [1]		P_{min}	- 31.0	- 33.0	-	dBm
Maximum Input Optical Power (10^{-10} BER) [1]		P_{max}	- 13.0	-	-	dBm
Signal Detect Thresholds	Increasing Light Input	P_{sd+}	-	-	- 31.0	dBm
	Decreasing Light Input	P_{sd-}	- 45.0	-	-	dBm
Signal Detect Hysteresis		-	0.5	-	4.0	dB
Wavelength of Operation		λ	1100	-	1600	nm
Output Clock Jitter		CLK_J	-	-	0.01	UIrms
Jitter Tolerance & Transfer Function		compliant with ITU Recommendation G.958				

[1] Specified in Average Optical Input Power and measured at 1300 nm wavelength with 2^{23}-1 PRBS.

Transmitter Electrical Interface (over Operating Case Temperature Range)

Parameter	Symbol	Minimum	Typical	Maximum	Units
Input HIGH Voltage	V_{IH}	V_{CC} - 1.165	-	V_{CC} - 0.700	V
Input LOW Voltage	V_{IL}	V_{CC} - 1.890	-	V_{CC} - 1.475	V
Data Input Current - HIGH	I_H	-	-	350	μA
Data Input Current - LOW	I_L	-	-	250	μA

Receiver Electrical Interface (over Operating Case Temperature Range)

Parameter	Symbol	Minimum	Typical	Maximum	Units
Output HIGH Voltage	V_{OH}	V_{CC} - 1.200	-	V_{CC} - 0.700	V
Output LOW Voltage	V_{OL}	V_{CC} - 2.000	-	V_{CC} - 1.620	V
Output Current	I_O	-	-	25	mA

Electrical Power Supply Characteristics (over Operating Case Temperature Range)

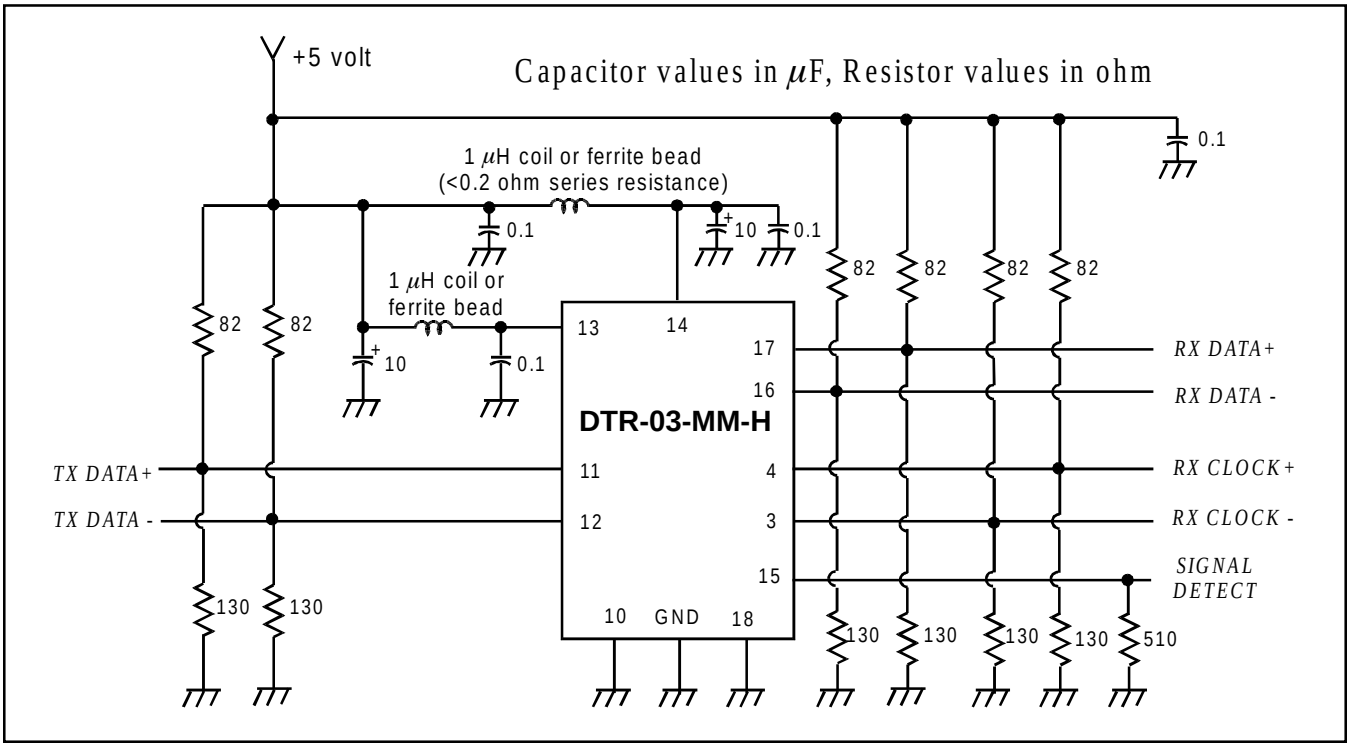
Parameter		Symbol	Minimum	Typical	Maximum	Units
Supply Voltage		V_{CC}	4.75	5.0	5.25	V
Supply Current	TX	I_{CC}	-	120	150	mA
	RX	I_{CC}	-	80	100	mA
Power Dissipation		P	-	1000	1300	mW

Application Notes

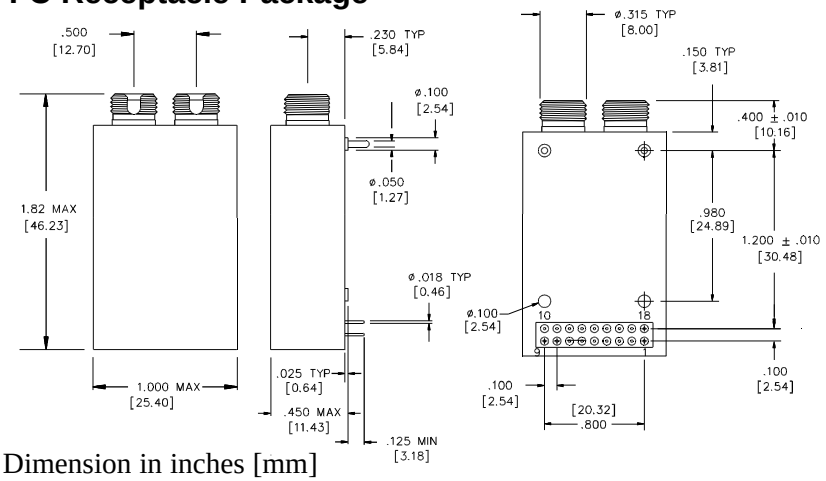
Transmitter: When the DATA+ input is at logic HIGH and DATA- input is at logic LOW, the LED is ON; and vice versa. In single-ended applications, the unused input pin should be biased to V_{CC} - 1.29 V.

Receiver: Both differential outputs (DATA+ and DATA-, CLOCK+ and CLOCK-) are PECL levels requiring termination (50 ohms to V_{CC} - 2 volts or 510 ohms to *GND* is recommended). For optimum performance, both outputs should be terminated in the same manner, even if only one is used.

The Signal Detect circuit monitors the level of the incoming optical signal and generates a logic LOW signal when insufficient photocurrent is produced. The SIGNAL DETECT output is PECL level requiring termination (510 ohms to *GND* is recommended).

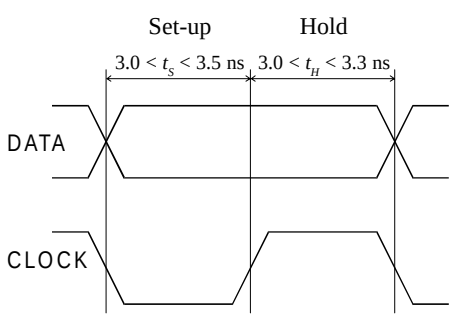


FC Receptacle Package



Dimension in inches [mm]

DATA & CLOCK Timing



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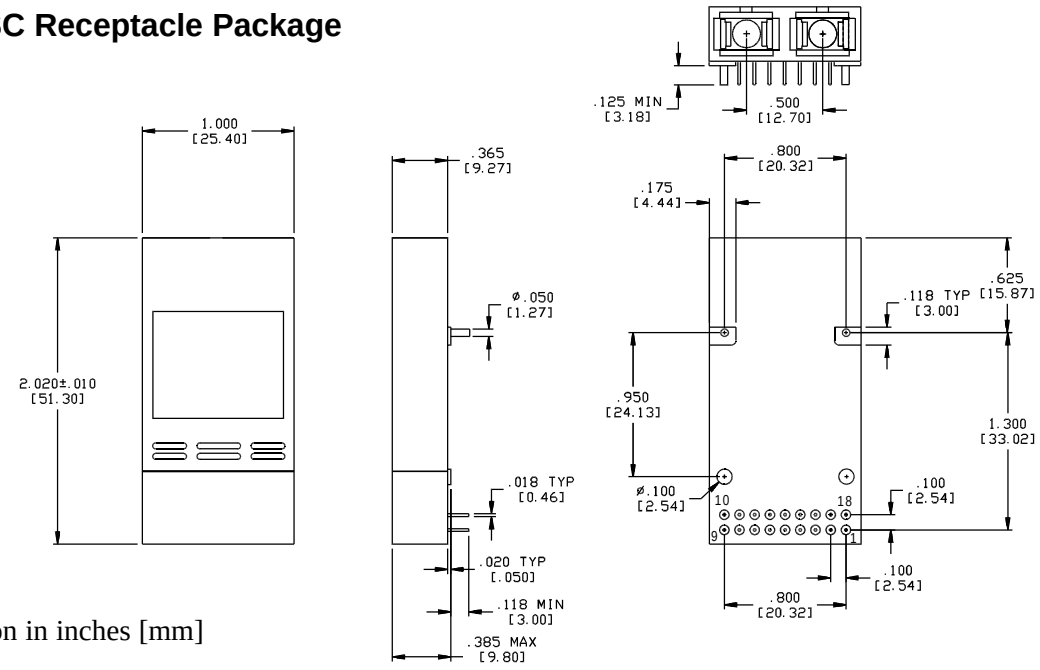
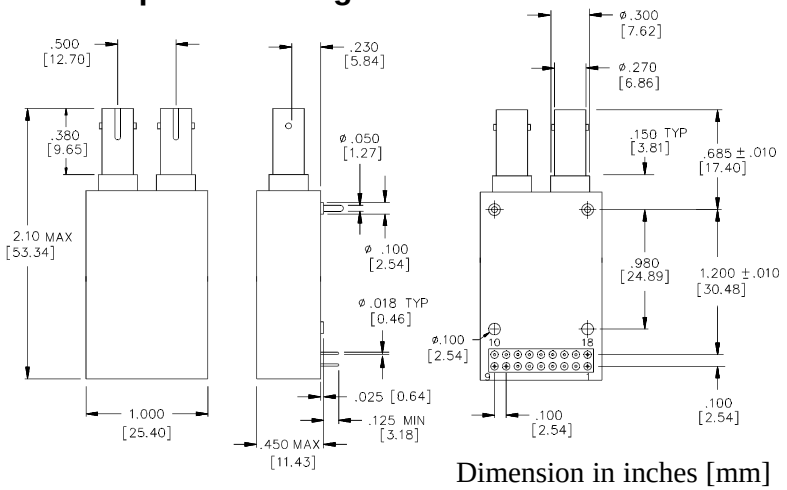
Duplex SC Receptacle Package



Dimension in inches [mm]

ST Receptacle Package



Dimension in inches [mm]

PIN	FUNCTION	PIN	FUNCTION
1	N/C	10	TX GND
2	N/C	11	TD+ (TX DATA IN +)
3	CLOCK -	12	TD- (TX DATA IN -)
4	CLOCK +	13	V_{CC}TX
5	N/C	14	V_{CC}RX
6	N/C	15	SD (RX SIGNAL DETECT)
7	N/C	16	RD- (RX DATA OUT -)
8	N/C	17	RD+ (RX DATA OUT +)
9	N/C	18	RX GND

Related Products

DTC-03-MM: OC-3 1300 nm LED Transceivers with Clock Recovery, TTL Signal Detect, opposite CLOCK phase

DTR-156: OC-3 1300 nm LED based Transceivers without Clock Recovery (1x9 package)

DTR-156-SM, DTR-156-SM2: OC-3/STM-1 Laser based Transceivers without Clock Recovery (1x9 or 2x9 pkg)

DTC-03, DTC-03-H: OC-3/STM-1 Laser based Transceivers with Clock Recovery (2x9 pkg)

STX-03, SRX-03, SRC-03: OC-3/STM-1 Transmitters & Receivers with or without Clock Recovery (20-pin DIP)

Ordering Information

DTC - 03 - MM - H - *XX* -*T*

Receptacle

Blank : SC Receptacle
ST : ST Receptacle
FC : FC Receptacle

Temperature Range

A: - 40°C to 85°C
B: 0°C to 70°C

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