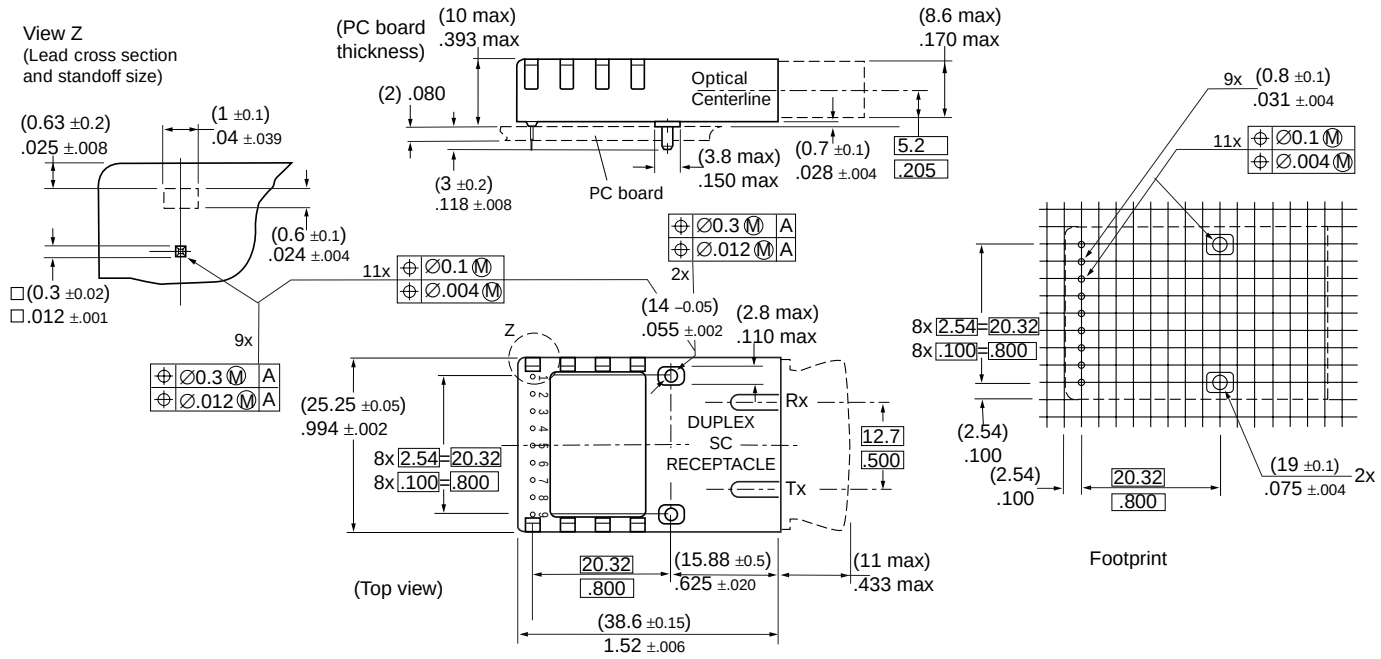
SIEMENS

10 dB V23809-C8-C10
8 dB V23809-C8-C11

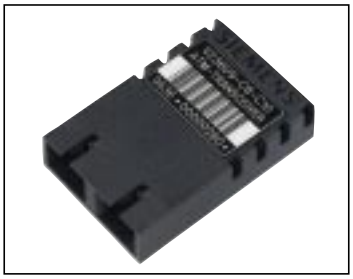
Multimode 1300 nm LED ATM 155/194 MBd Transceiver

Dimensions in (mm) inches



FEATURES

- **Fully compliant with all major standards**
- **Compact integrated transceiver unit with duplex SC receptacle**
- **Single power supply with 3.0 V to 5.5 V range**
- **Extremely low power consumption < 0.7 W at 3.3 V**
- **Excellent EMI performance**
- **PECL 100K compatible differential inputs and outputs**
- **System optimized for 62.5/50 µm graded index fiber**
- **Industry standard multisource footprint**
- **Very low profile for high slot density**
- **Wave solderable and washable with process plug**
- **Test board available**
- **UL-94 V-0 certified**
- **ESD Class 2 per MIL-STD 883 Method 3015**
- **Compliant with FCC (Class B) and EN 55022**
- **For distances of up to 2 km**



APPLICATIONS

- **ATM switches/bridges/ routers**
- **High speed computer links**
- **Local area networks**
- **High definition digital television**
- **Switching systems**

Maximum Ratings (Absolute maximum stress)

Exceeding any one of these values may destroy the device immediately. However, the electro-optical characteristics described in the following tables are only valid for use under the recommended operating conditions.

Package Power Dissipation (PD)
- 5 V ..... 1 W
- 3.3 V ..... 0.7 W

Supply Voltage (V_{CC}–V_{EE}) ..... –0.5 to 7 V
Data Input Levels (V_{IN}) PECL ..... V_{EE}–V_{CC} V
Differential Data Input Voltage ..... 3 V
Operating Case Temperature ..... 0 to 85°C
Storage Ambient temperature ..... –40°C to 85°C
Soldering Conditions Temp/Time
(T_{sold}) MIL-STD 883C, Method 2003 ..... 270/10°C/s.
ESD Resistance (all pins to V_{EE}, Human Body) ..... 1.5 kV

DESCRIPTION

This data sheet describes the Siemens ATM Transceiver, which belongs to the Siemens Multistandard Transceiver Family. It is fully compliant with the proposed Asynchronous Transfer Mode ATM OC-3 proposed standard.

ATM is being developed because of the need for multimedia applications, including real-time transmission. The data rate is scalable and the ATM protocol is the basis of the broadband public networks being standardized in the International Telegraph and Telephone Consultative Committee (CCITT). ATM can also be used in local private applications.

The Siemens low cost ATM transceiver is a single unit comprised of a transmitter, a receiver and an SC receptacle. This frees the customer from many alignment and PC board layout concerns. The modules are designed for low cost applications.

The inputs/outputs are PECL compatible and the unit operates from 3.0 V to 5.5 V power supply. As an option, the data output stages can be switched to static levels during absence of light, as indicated by the Signal Detect function. It can be directly interfaced with available chipsets.

The excellent performance of the Siemens Multistandard Transceiver Family is the result of long term experience. The reliability of our modules is proven by high volume production.

Recommended Operating Conditions

Parameter	Sym.	Min.	Typ.	Max.	Units
Ambient Temperature	T_C	0		70	°C
Power Supply Voltage	V_{CC}–V_{EE}	3		5.5	V
Supply Current 3.3 V	I_{CC}			190	mA
Supply Current 5 V(1)				210	
Transmitter					
Data Input High Voltage	V_{IH}–V_{CC}	–1165		–880	mV
Data Input Low Voltage	V_{IL}–V_{CC}	–1810		–1475	
Threshold Voltage	V_{bb}–V_{CC}	–1420		–1240	
Input Data Rise/Fall, 20–80%	t_R, t_F	0.4		1.3	ns
Data High Time(2)	t_{on}			1000	
Receiver					
Output Current	I_o			25	mA
Input duty Cycle Distortion	t_{DCD}			1.0	ns
Input Data Dependent Jitter	t_{DDj}				
Input Random Jitter	t_{Rj}			0.76	
Input Center Wavelength	I_C	1260		1380	nm
Electrical Output Load(3)	R_L		50		Ω

Notes:

1. For Vcc-Vee (min., max.) 50% duty cycle. The supply current (Icc2 + Icc3) does not include the load drive current (Icc1). Add max. 45 mA for the three outputs. Load is 50 Ω into V_{CC} –2V
2. To maintain good LED reliability, the device should not be held in the ON-state for more than the specified time. Normal operation should be done with 50% duty cycle
3. To achieve proper PECL output levels the 50 Ω termination should be done to V_{CC} –V. For correct termination see the application note.

Reliability (Qualification Results)

Test Temperature (HTB)	85°C / 358K
Reference Temperature	25°C / 298K
Duration of HTB Test	>5000 hrs
Activation Energy	0.7 eV
Confidence Level	60 %
Number of tested modules	>120

Transmitter Electro-Optical Characteristics

Transmitter	Sym.	Min.	Typ.	Max.	Units
Data Rate	DR			170	MBaud
Launched Power (Average) into 62.5µm Fiber for –C8–C10(1, 4)	P_O	–20	–16	–14	dBm
Launched Power (Average) into 62.5µm Fiber for –C8–C11(1, 4)		–22	–17		
Center Wavelength(2, 4)	λC	1270		1360	nm
Spectral Width (FWHM)(3, 4)	Δλ			170	
Output Rise/Fall Time, 10–90%(4, 5)	t_R, t_F	0.6		2.5	ns
Temperature Coefficient of Optical Optput Power	TCp			0.03	dB/°C
Extinction Ratio (dynamic)(4, 6)	ER			10	%
Duty Cycle Distortion(7)	t_{DCD}			0.6	ns
Data Dependent Jitter(7)	t_{DDJ}			0.3	
Random Jitter(7)	t_{RJ}			0.6	

Notes

1. Measured at the end of 5 meters of 62.5/125/0.275 graded index fiber using calibrated power meter and a precision test ferrule. Cladding modes are removed. Values valid for EOL and worst-case temperature.
2. Center wavelength is defined as the midpoint between the two 50% levels of the optical spectrum of the LED.
3. Spectral width (full width, half max) is defined as the difference between 50% levels of the optical spectrum of the LED.
4. The input data pattern is a 12.5 MHz square wave pattern.
5. 10 to 90% levels. Measured using the 12.5 MHz square wave pattern with an optoelectronic measurement system (detector and oscilloscope) having 3 dB bandwidth ranging from less than 0.1 MHz to more than 750 MHz.
6. Extinction Ratio is defined as PL/PH x 100%. Measurement system as in Note 5.
7. The test method is not yet mentioned in the ATM standard draft. The FDDI test routines apply as long as these are not changed.

Receiver Electro-Optical Characteristics

Receiver	Sym.	Min.	Typ.	Max.	Units
Data Rate	Dr	5		170	MBaud
Sensitivity (Average Power)(1)	P_{IN}		–32	–30	dBm
Sensitivity (Average Power) Center(2)			–35.5		
Saturation (Average Power)(2)	P_{SAT}	–14	–11		
Duty Cycle Distortion(3, 6)	t_{DCD}			1	ns
Deterministic Jitter(4, 6)	t_{DJ}			1	
Random Jitter(5, 6)	t_{RJ}				
Signal Detect Assert Level(7)	P_{SDA}	–42.5		–30	dBm
Signal Detect Deassert Level(8)	P_{SDD}	–45		–31.5	
Signal Detect Hysteresis	P_{SDA}–P_{SDD}	1.5			dB
Output LO Voltage(9)	V_{OL}–V_{CC}	–1810		–1620	mV
Output HI Voltage(9)	V_{OH}–V_{CC}	–1025		–880	
Output Data Rise/Fall Time, 20–80%	t_R, t_F			1.3	ns
Output SD Rise/Fall Time, 20–80%				40	

Notes

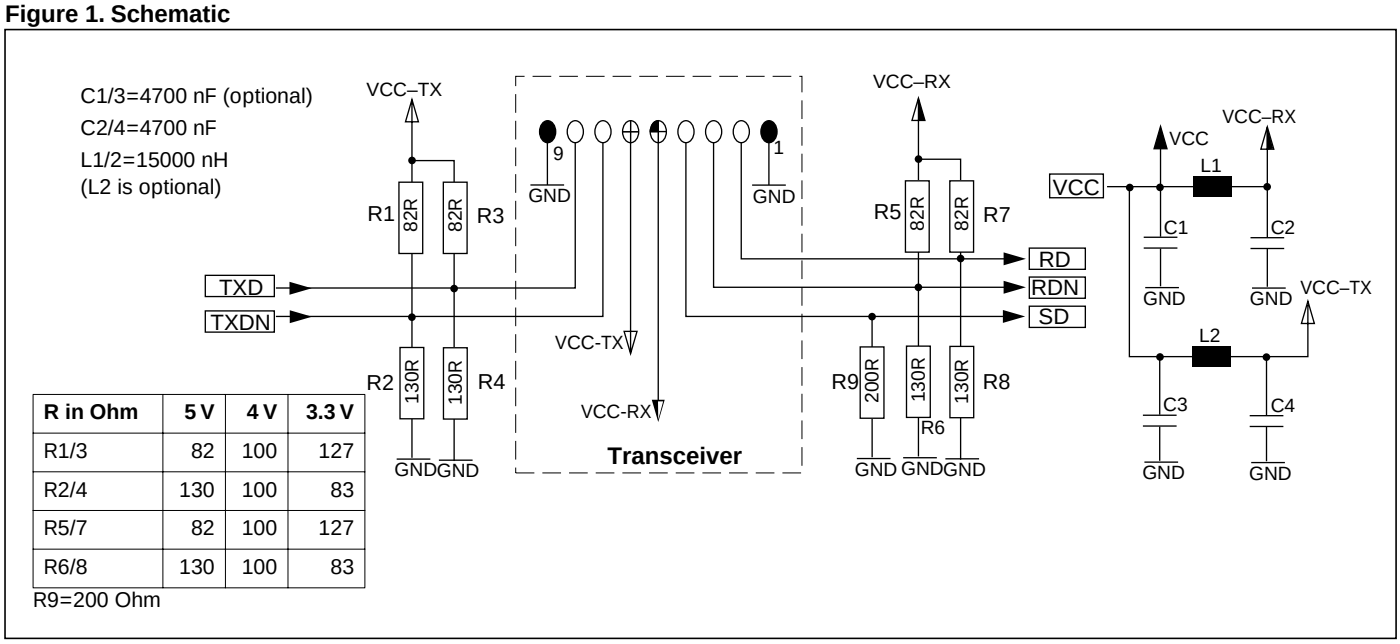
1. For a bit error rate (BER) of less than 1x10E-12 over a receiver eye opening of least 1.5 ns. Measured with a 2^7-1 PRBS at 194 MBd.
2. For a BER of less than 1x10E-12. Measured in the center of the eye opening with a 2^7-1 PRBS at 194 MBaud.
3. Measured at an average optical power level of -20 dBm with a 62.5 MHz square wave.
4. Measured at an average optical power level of -20 dBm .
5. Measured at -33 dBm average power.
6. All jitter values are peak-to-peak. RX output jitter requirements are not considered in the ATM standard draft. In general the same requirements as for FDDI are met.
7. An increase in optical power through the specified level will cause the SIGNAL detect output to switch from a LO state to a HI state.
8. A decrease in optical power through the specified level will cause the SIGNAL detect output to switch from a HI state to a LO state.
9. ECL 100K compatible. Load is 50 Ω into V_{CC} –2V. Measured under DC conditions. For dynamic measurements a tolerance of 50 mV should be added for V_{CC}=5 V.

PIN Description

Pin Name		Level/Logic	Pin#	Description
R_xV_{EE}	Rx Ground	Power Supply	1	Negative power supply, normally ground
RD	Rx Output Data	PECL Output	2	Receiver output data
RDn			3	Inverted receiver output data
RxSD	RX Signal Detect	PECL-Output active high	4	High level on this output shows there is an optical signal.
R_xV_{CC}	Rx +5 V	Power Supply	5	Positive power supply, +5V
T_xV_{CC}	Tx +5 V		6	
TxDn	Tx Input Data	PECL Input	7	Inverted transmitter input data
TxD			8	Transmitter input data
T_xV_{EE}	Tx Ground	Power Supply	9	Negative power supply, normally ground
Case	Support	Not Connected	S1/S2	Support stud, not connected

APPLICATION NOTE FOR 1X9 PIN ROW TRANSCEIVER

Figure 1. Schematic



The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module VCC-RX/VCC-TX.

A GND plane under the module is recommended for good EMI and sensitivity performance.