

3.3V 160pin MSA 2.5Gbps Long-Haul Transponder Module ***RTXM163***

Features

- *2.488 Gbps optical transmitter and receiver with 16-channel 155.52 Mbps multiplexer/demultiplexer*
- *With 1550nm DFB laser transmitter and APD receiver for long haul applications(Up to 80km)*
- *Pigtailed low-profile package*
- *Reference frequency of 155.52 MHz*
- *Differential LVPECL data interface*
- *Automatic transmitter optical power control*
- *Laser bias monitor output*
- *Optical transmitter disable input*
- *Loss of signal, loss of sync, loss of framing alarms*
- *Diagnostic loopback mode*
- *Line loopback operation*

Applications

- **Telecommunications:**
Inter-and intra office SONET/SDH
Subscriber loop
Metropolitan area networks
- **High-Speed Data Communications**

Standards

- **2.5G MSA**
- **ITU-T G.825 & G957**

Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	T _s	°C	-20	85
Relative Humidity	RH	%	-	85
Power Supply Voltage	V _{cc}		-0.5	5.5
Lead solder temperature	-	°C	-	260
Lead solder duration	-	S	-	10
Fiber yield strength	-	Kgf	-	1
Fiber bend radius	-	Mm	10	-

Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Case Operating Temperature Range	T _c	°C	0	-	70
Power Supply Voltage	V _{cc}		0	-	+4.0
Relative Humidity	RH	%	-	-	85

Specifications *(T = 25oC, BOL, unless otherwise noted)*

Parameter	Symbol	Unit	Min	Typ	Max	Test condition
Electrical Characteristics						
Operating Voltage	V _{op}	V	+3.13	+3.30	+3.47	
Supply current	I _{cc}	mA	-	1400	1800	
LVPECL	Input High Lever	-	V _{cc} -1.25	-	V _{cc} -0.55	-
	Input Low Lever	-	V _{cc} -2.0	-	V _{cc} -1.40	-
Input	Set up Time	-	ns	1.5	-	-
	Hold Time	-	ns	1	-	-
LVPECL	Input High Lever	-	V _{cc} -1.1	-	V _{cc} -0.8	External 270Ω DC resistance to

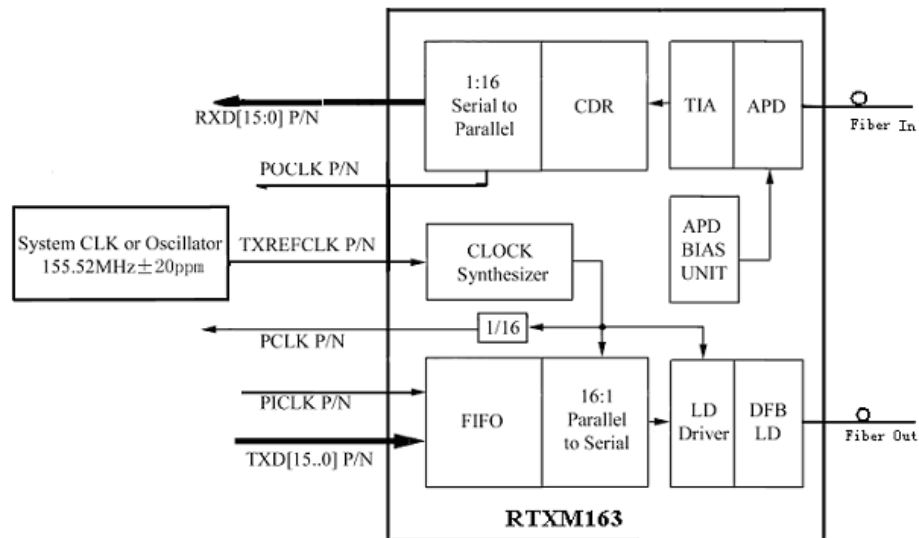
08	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
09	TxD11P	I	LVPECL	Transmitter 155 Mbps Data Input
10	TxD11N	I	LVPECL	Transmitter 155 Mbps Data Input
11	TxD09P	I	LVPECL	Transmitter 155 Mbps Data Input
12	TxD09N	I	LVPECL	Transmitter 155 Mbps Data Input
13	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
14	TxD07P	I	LVPECL	Transmitter 155 Mbps Data Input
15	TxD07N	I	LVPECL	Transmitter 155 Mbps Data Input
16	TxD05P	I	LVPECL	Transmitter 155 Mbps Data Input
17	TxD05N	I	LVPECL	Transmitter 155 Mbps Data Input
18	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
19	TxD03P	I	LVPECL	Transmitter 155 Mbps Data Input
20	TxD03N	I	LVPECL	Transmitter 155 Mbps Data Input
21	TxD01P	I	LVPECL	Transmitter 155 Mbps Data Input
22	TxD01N	I	LVPECL	Transmitter 155 Mbps Data Input
23	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
24	PIC _{LK} P	I	LVPECL	Byte-Aligned Parallel Input Clock at 155 MHz
25	PIC _{LK} N	I	LVPECL	Byte-Aligned Parallel Input Clock at 155 MHz
26	LOCKDET	O	LVTTTL	Lock Detect
27	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
28	Tx3.3D	I	SUPPLY	Transmitter 3.3 V Digital Supply
29	Tx3.3D	I	SUPPLY	Transmitter 3.3 V Digital Supply
30	TxAGND	I	SUPPLY	Supply Transmitter Analog Ground
31	Tx3.3A	I	SUPPLY	Transmitter 3.3 V Analog Supply
32	Tx3.3A	I	SUPPLY	Transmitter 3.3 V Analog Supply
33	TxAGND	I	SUPPLY	Supply Transmitter Analog Ground
34	LPM	O	ANALOG	Analog Laser Power Monitor
35	LSRALRM	O	ANALOG	Laser Degrade Alarm
36	LSRBIAS	O	ANALOG	Transmitter Laser Bias Output
37	NC	-	-	No User Connection Permitted
38	DLOOP	I	LVTTTL	Diagnostic Loopback
39	NC	-	-	No User Connection Permitted
40	FP	O	LVPECL	Frame Pulse
41	FRAMEN	I	LVTTTL	Frame Enable
42	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
43	Rx3.3D	I	SUPPLY	Receiver 3.3 V Digital Supply
44	Rx3.3D	I	SUPPLY	Receiver 3.3 V Digital Supply
45	NC	-	-	No User Connection Permitted
46	RxAGND	I	SUPPLY	Receiver Analog Ground
47	RxAGND	I	SUPPLY	Receiver Analog Ground
48	Rx3.3A	I	SUPPLY	Receiver 3.3 V Analog Supply

49	RxAGND	I	SUPPLY	Receiver Analog Ground
50	RxAGND	I	SUPPLY	Receiver Analog Ground
51	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
52	NC	-	-	No User Connection Permitted
53	NC	-	-	No User Connection Permitted
54	NC	-	-	No User Connection Permitted
55	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
56	RxQ14P	O	LVPECL	Receiver 155 Mbps Data Output
57	RxQ14N	O	LVPECL	Receiver 155 Mbps Data Output
58	RxQ12P	O	LVPECL	Receiver 155 Mbps Data Output
59	RxQ12N	O	LVPECL	Receiver 155 Mbps Data Output
60	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
61	RxQ10P	O	LVPECL	Receiver 155 Mbps Data Output
62	RxQ10N	O	LVPECL	Receiver 155 Mbps Data Output
63	RxQ08P	O	LVPECL	Receiver 155 Mbps Data Output
64	RxQ08N	O	LVPECL	Receiver 155 Mbps Data Output
65	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
66	RxQ06P	O	LVPECL	Receiver 155 Mbps Data Output
67	RxQ06N	O	LVPECL	Receiver 155 Mbps Data Output
68	RxQ04P	O	LVPECL	Receiver 155 Mbps Data Output
69	RxQ04N	O	LVPECL	Receiver 155 Mbps Data Output
70	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
71	RxQ02P	O	LVPECL	Receiver 155 Mbps Data Output
72	RxQ02N	O	LVPECL	Receiver 155 Mbps Data Output
73	RxQ00P	O	LVPECL	Receiver 155 Mbps LSB Data Output
74	RxQ00N	O	LVPECL	Receiver 155 Mbps LSB Data Output
75	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
76	NC	-	-	No User Connection Permitted
77	NC	-	-	No User Connection Permitted
78	NC	-	-	No User Connection Permitted
79	NC	-	-	No User Connection Permitted
80	FGND	I	SUPPLY	Frame Ground
81	FGND	I	SUPPLY	Frame Ground
82	RESET	I	LVTTTL	Master Reset
83	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
84	TxREFCLKP	I	LVPECL	Transmitter 155 Mbps Reference Clock Input
85	TxREFCLKN	I	LVPECL	Transmitter 155 Mbps Reference Clock Input
86	TxD14P	I	LVPECL	Transmitter 155 Mbps Data Input
87	TxD14N	I	LVPECL	Transmitter 155 Mbps Data Input
88	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
89	TxD12P	I	LVPECL	Transmitter 155 Mbps Data Input

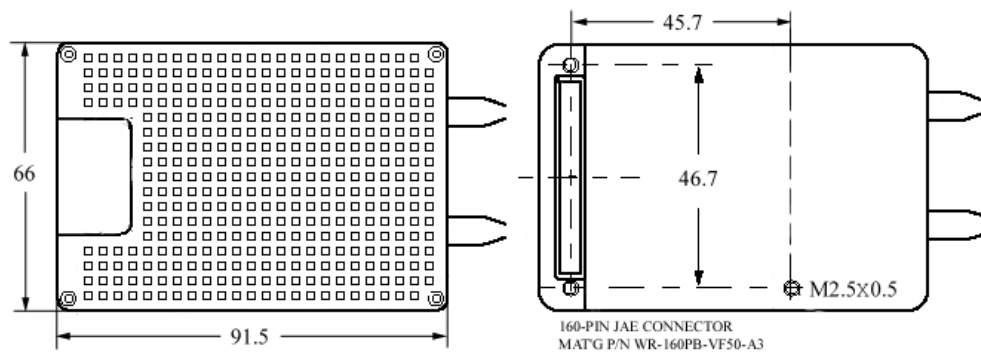
90	TxD12N	I	LVPECL	Transmitter 155 Mbps Data Input
91	TxD10P	I	LVPECL	Transmitter 155 Mbps Data Input
92	TxD10N	I	LVPECL	Transmitter 155 Mbps Data Input
93	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
94	TxD08P	I	LVPECL	Transmitter 155 Mbps Data Input
95	TxD08N	I	LVPECL	Transmitter 155 Mbps Data Input
96	TxD06P	I	LVPECL	Transmitter 155 Mbps Data Input
97	TxD06N	I	LVPECL	Transmitter 155 Mbps Data Input
98	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
99	TxD04P	I	LVPECL	Transmitter 155 Mbps Data Input
100	TxD04N	I	LVPECL	Transmitter 155 Mbps Data Input
101	TxD02P	I	LVPECL	Transmitter 155 Mbps Data Input
102	TxD02N	I	LVPECL	Transmitter 155 Mbps Data Input
103	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
104	TxD00P	I	LVPECL	Transmitter 155 Mbps LSB Data Input
105	TxD00N	I	LVPECL	Transmitter 155 Mbps LSB Data Input
106	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
107	PCLKP	O	LVPECL	Transmitter Parallel Reference Clock Output
108	PCLKN	O	LVPECL	Transmitter Parallel Reference Clock Output
109	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
110	TxDGND	I	SUPPLY	Supply Transmitter Digital Ground
111	Tx3.3D	I	SUPPLY	Supply Transmitter Digital 3.3 V Supply
112	Tx3.3A	I	SUPPLY	Supply Transmitter Analog 3.3 V Supply
113	NC	-	-	No User Connection Permitted
114	PHINIT	I	LVPECL	Phase Initialization
115	TxDIS	I	TTL	Transmitter Disable
116	NC	-	-	No User Connection Permitted
117	PHERR	O	LVPECL	Phase Error
118	LLOOP	I	LVTTTL	Line Loopback (active-low)
119	LOS	O	LVTTTL	Loss of Signal
120	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
121	OOF	I	LVTTTL	Out of Frame (enable frame detection)
122	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
123	Rx3.3D	I	SUPPLY	Receiver 3.3 V Digital Supply
124	Rx3.3A	I	SUPPLY	Receiver 3.3 V Analog Supply
125	SEARCH	O	LVTTTL	A1, A2 Frame Search Output
126	RxAGND	I	SUPPLY	Receiver Analog Ground
127	RxAGND	I	SUPPLY	Receiver Analog Ground
128	Rx3.3A	I	SUPPLY	Receiver Analog 3.3 V Supply
129	POC _{LK} P	O	LVPECL	Byte-Aligned Parallel Output Clock at 155 MHz
130	POC _{LK} N	O	LVPECL	Byte-Aligned Parallel Output Clock at 155 MHz

131	NC	-	-	No User Connection Permitted
132	NC	-	-	No User Connection Permitted
133	NC	-	-	No User Connection Permitted
134	NC	-	-	No User Connection Permitted
135	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
136	RxQ15P	O	LVPECL	Receiver 155 Mbps Data Output
137	RxQ15N	O	LVPECL	Receiver 155 Mbps Data Output
138	RxQ13P	O	LVPECL	Receiver 155 Mbps Data Output
139	RxQ13N	O	LVPECL	Receiver 155 Mbps Data Output
140	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
141	RxQ11P	O	LVPECL	Receiver 155 Mbps Data Output
142	RxQ11N	O	LVPECL	Receiver 155 Mbps Data Output
143	RxQ09P	O	LVPECL	Receiver 155 Mbps Data Output
144	RxQ09N	O	LVPECL	Receiver 155 Mbps Data Output
145	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
146	RxQ07P	O	LVPECL	Receiver 155 Mbps Data Output
147	RxQ07N	O	LVPECL	Receiver 155 Mbps Data Output
148	RxQ05P	O	LVPECL	Receiver 155 Mbps Data Output
149	RxQ05N	O	LVPECL	Receiver 155 Mbps Data Output
150	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
151	RxQ03P	O	LVPECL	Receiver 155 Mbps Data Output
152	RxQ03N	O	LVPECL	Receiver 155 Mbps Data Output
153	RxQ01P	O	LVPECL	Receiver 155 Mbps Data Output
154	RxQ01N	O	LVPECL	Receiver 155 Mbps Data Output
155	RxDGND	I	SUPPLY	Supply Receiver Digital Ground
156	NC	-	-	No User Connection Permitted
157	NC	-	-	No User Connection Permitted
158	NC	-	-	No User Connection Permitted
159	NC	-	-	No User Connection Permitted
160	FGND	I	SUPPLY	Frame Ground

Block Diagram



Package Outline



Ordering Information

Part No.	Specification								Application
	Package	Datarate	Laser	Optical Power	Detector	Sensitivity	Temp	Reach	
RTXM163	160pin	2.5G	1550nm DFB	-2 ~ +3dBm	APD	-31dBm (Max)	0~70°C	80km	SDH/SONET

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