

40 Gb/s 1:4 Demultiplexer Module

Features

- Half rate clock
- High Input Sensitivity
- Wide Operating Range, 2.6-44 Gb/s
- Low Output Jitter
- Low Power Consumption
- Fast Output Rise/Fall Times



Description

The MD1S4V1M is a 1:4 demultiplexer. The module accepts input data rates from 2.6 to 44 Gb/s with an input sensitivity less than 200mV-se. Differential data inputs are DC coupled and terminated with 50 ohm resistors to minimize reflections. The single-ended, half rate clock input is AC coupled and operates with low input power. The module features single-ended AC coupled outputs with ECL compatible signal levels. Data outputs, clock input, and high-speed inputs are accessed via high quality 2.9mm (K) connectors.

Applications

The MD1S4V1M can be used in SONET/SDH applications operating at transmission speeds within the demultiplexer's 2.6-44Gb/s input rate. Broadband test systems will benefit from the low power dissipation, precision connectors, and excellent output waveform characteristics. The compact size of the module allows the MD1S4V1M to be placed at the measurement plane, reducing or eliminating artifacts related to long cables.

Operating Conditions

Parameter	Minimum	Typical	Maximum	Units
Vee	-3.7	-3.6	-3.5	V

Key Specifications @ 25°C

Vee = -3.6V, Iee = 290mA, Zo = 50Ω

Parameter	Minimum	Typical	Maximum	Units
Data Input				
Bit Rate	2.6	-	44	Gb/s
Amplitude (Single-Ended)	150	-	1000	mVpp
Clock Input				
Frequency	1.3	-	22	GHz
Amplitude	200	-	1400	mVpp
Power	-10	-	+7	dBm
Data Output				
Bit Rate	0.65	-	11	Gb/s
Amplitude	210	240	270	mVpp
Jitter RMS	-	0.8	1.2	psec
Jitter Pk-Pk	-	6	8	psec
Rise Time	-	8	10	psec
Fall Time	-	8	10	psec
SNR	10	-	-	dB

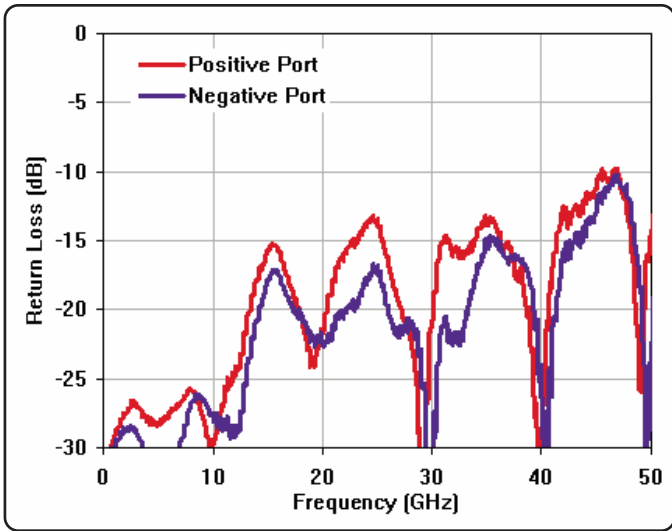


Figure 1: Data Input Return Loss

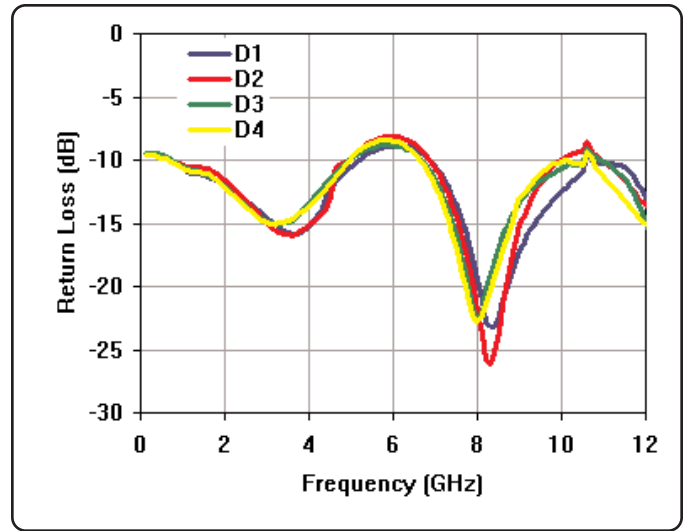


Figure 2: Data Output Return loss

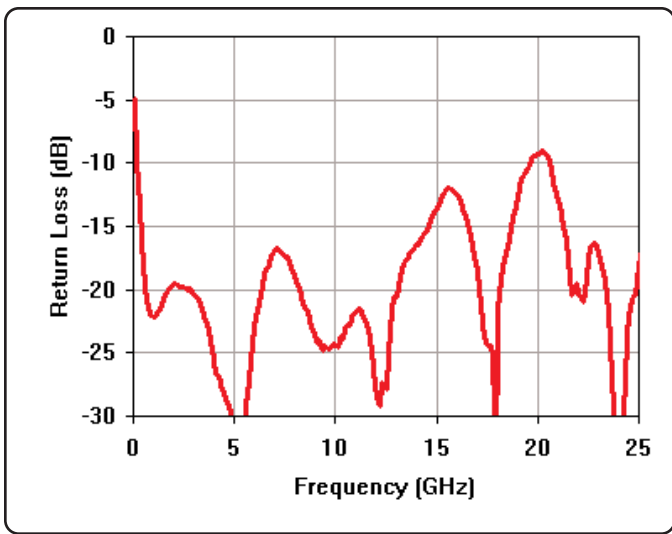


Figure 3: Clock Input Return Loss

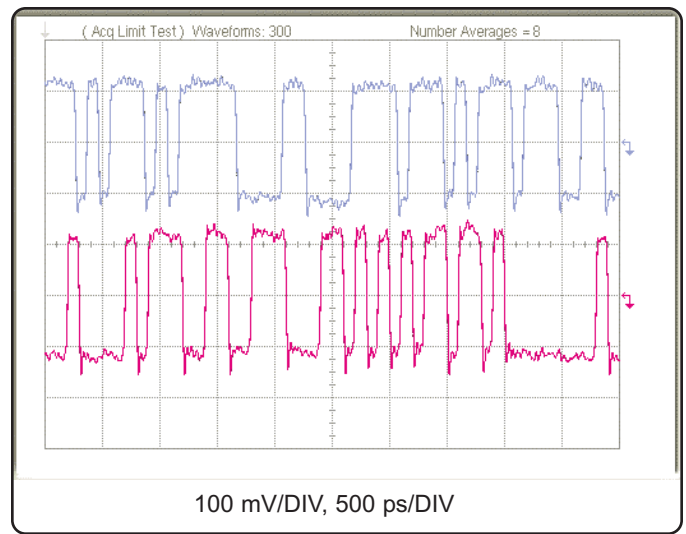


Figure 4: Data Output Waveforms @ 10Gb/s
Top: D3, Bottom: D4

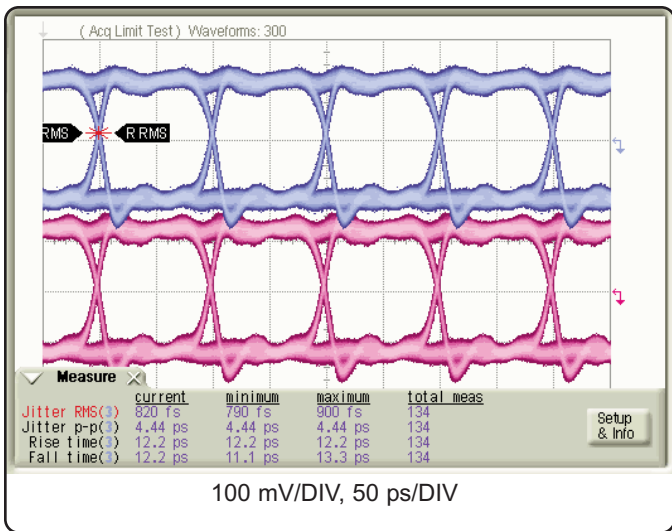


Figure 5: Data Output Eye Diagrams @ 10Gb/s
Top: D1, Bottom: D2

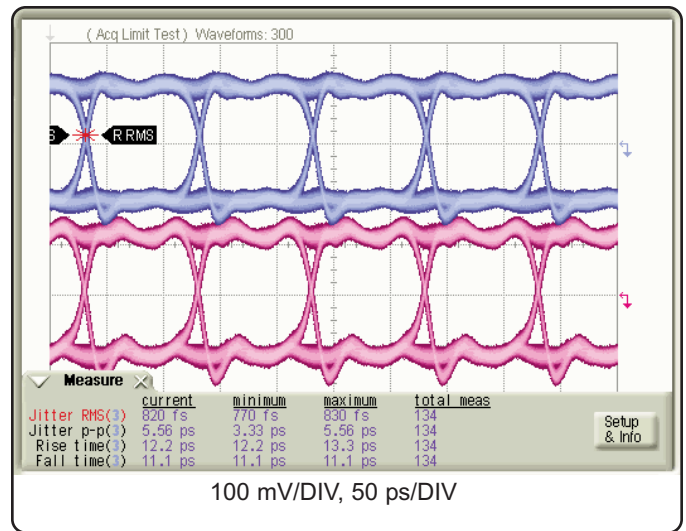


Figure 6: Data Output Eye Diagrams @ 10Gb/s
Top: D3, Bottom: D4

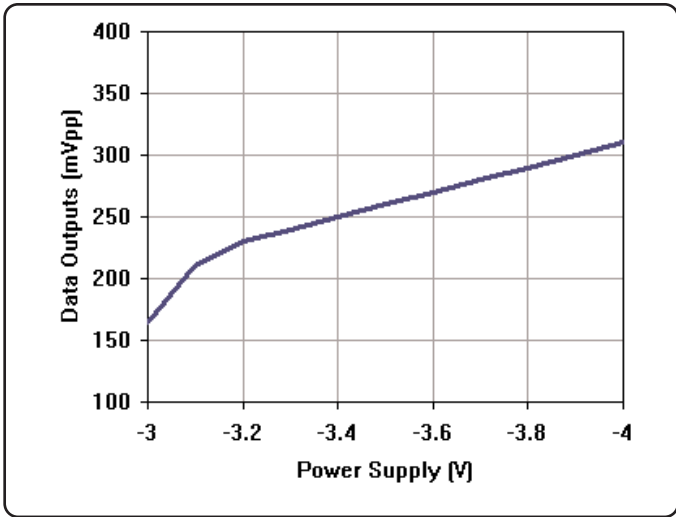


Figure 7: Data Output Amplitude vs Power Supply Level
Output Data Rate @ 10Gb/s

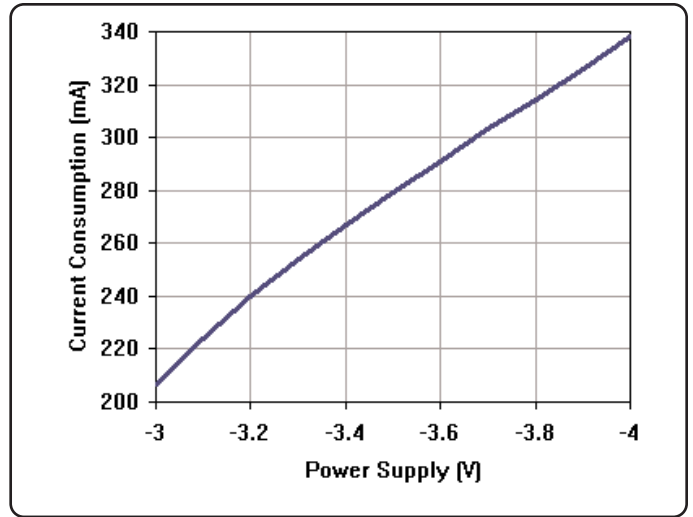


Figure 8: Total Current Consumption vs Power Supply Level

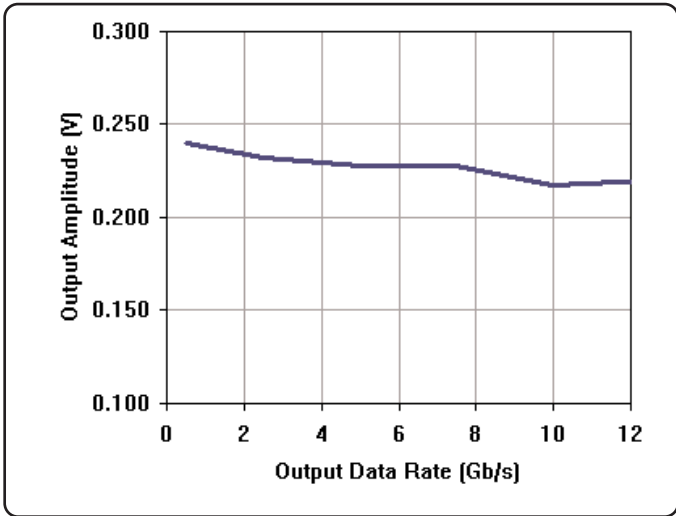


Figure 9: Data Output Amplitude vs Data Rate
Power Supply @ -3.6V

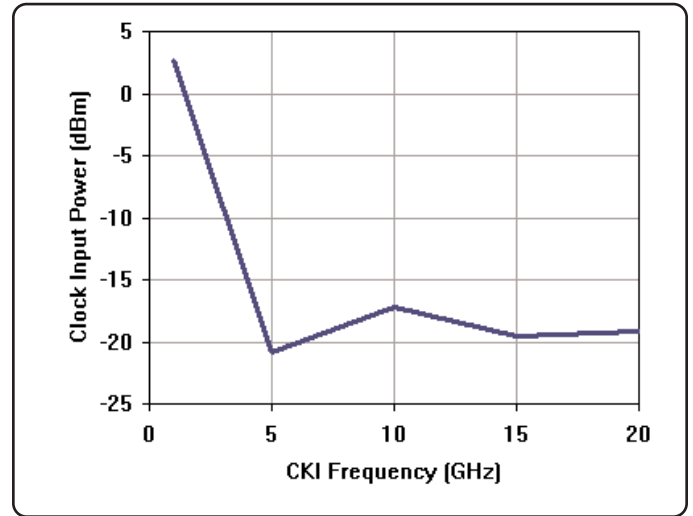
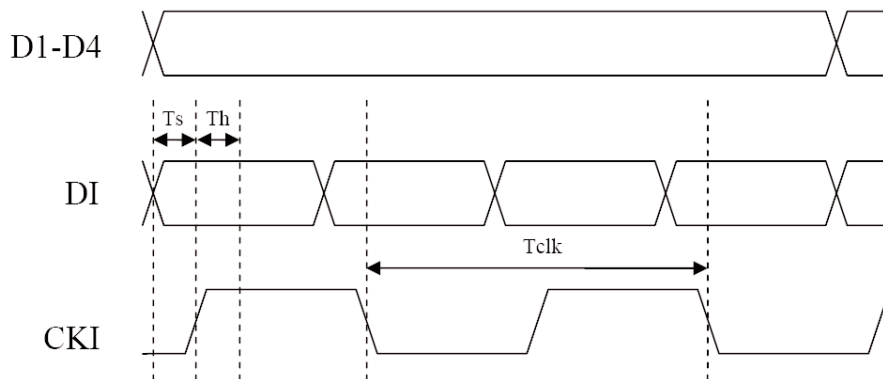


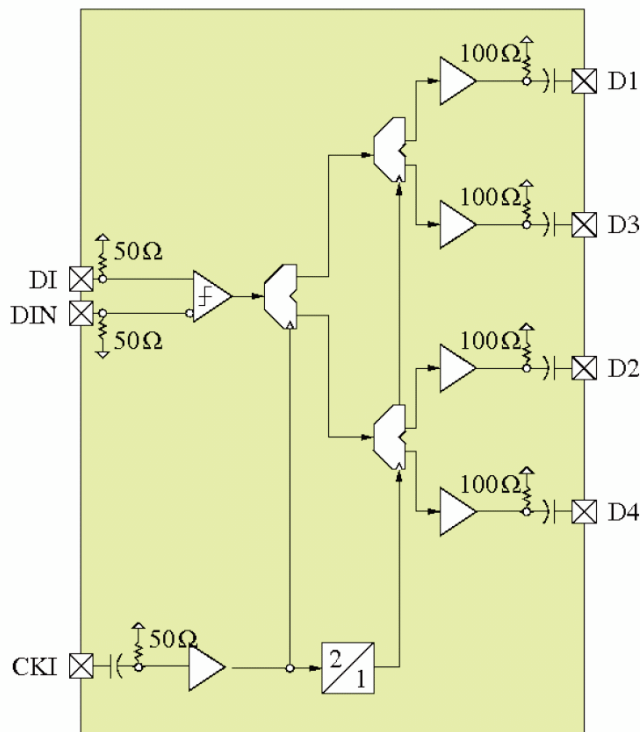
Figure 10: Clock Input Sensitivity vs Frequency
Power Supply @ -3.6V

Timing Diagram

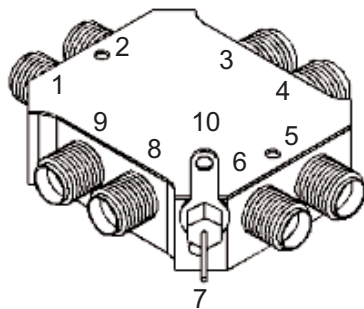


Parameter	Description	Minimum	Typical	Maximum
T_s (ps)	Setup Time	4	-	-
T_h (ps)	Hold Time	4	-	-
DI (Gb/s)	Input Data	2.6	-	44
D1-D4 (Gb/s)	Output Data	0.5	-	11
CKI (GHz)	Input Clock	1	-	22

Functional Block Diagram



Module Outline



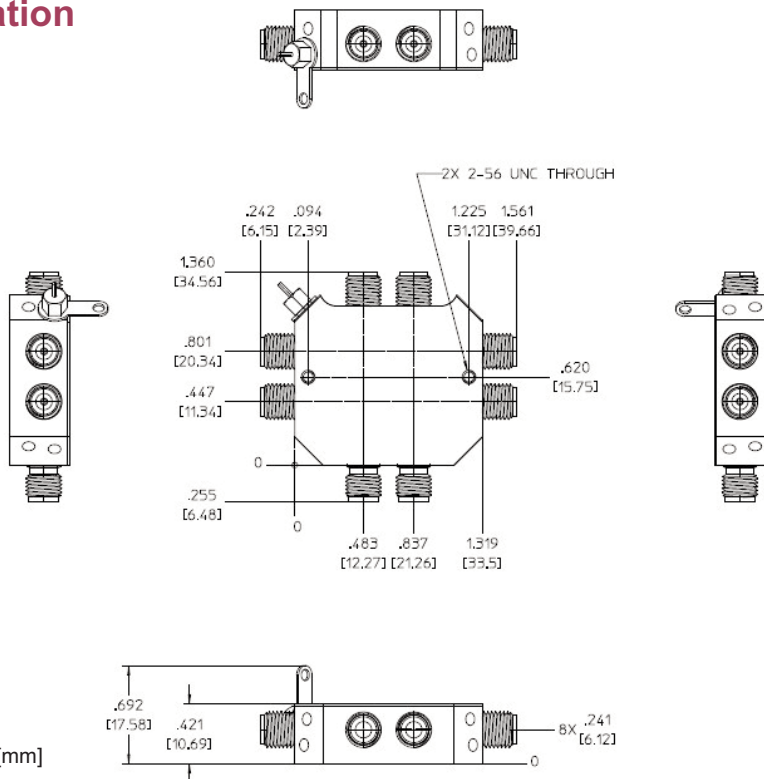
Absolute Maximum Ratings

Parameter	Value	Unit
Supply Voltage (VEE)	-4.0	V
Data Input (DI, DIN)	2.0	V _{pp}
Clock Input Power (CKI)	+10	dBm
DC voltage (CKI, DI, DIN)	±0.5	V
Operating Temperature	-40 to 85	°C
Storage Temperature	-85 to 150	°C

Pin Description

Name	PIN	DESCRIPTION	NOTE	CONNECTOR
D1	1	Data Channel Output - Bit Position 1	Leading/First serial data bit	2.92 mm (K)
D3	2	Data Channel Output - Bit Position 3	Third Bit	2.92 mm (K)
DI	3	Data Channel Input	Positive Terminal of Differential Input	2.92 mm (K)
DIN	4	Data Channel Input	Negative Terminal of Differential Input	2.92 mm (K)
D4	5	Data Channel Output - Bit Position 4	Trailing/Last Bit	2.92 mm (K)
D2	6	Data Channel Output - Bit Position 2	Second Bit	2.92 mm (K)
VEE	7	Negative Supply Voltage	DC pin, -3.6V @290mA	-
CKI	8	Clock Input	Half of Bit Rate, ie: 20GHz for 40Gb/s Single-ended input	2.92 mm (K)
VCC	10	RF & DC Ground	Chassis/Module Connection	-
NC	9	No Connect	-	-

Packaging Information



Note: all measurements in inches [mm]