



# SDI Video Portfolio



Product  
Selection  
Guide

**MACOM**<sup>™</sup>  
*Partners from RF to Light*

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## MACOM Serial Digital Interface (SDI) Video Products

### Optimizing the performance of equipment that supports SMPTE standards

MACOM SDI video products span a complete signal chain for an SDI link, including multi-rate equalizer and cable driver solutions for emerging ultra high-definition (UHD) TV standards and legacy 3G, HD, and SD.

MACOM's new 12G-SDI video solutions for 4K UHD broadcast video transport applications enhance next-generation system designs by providing higher density, lower power, and lower material cost for transporting high quality UHD images compared to lower speed solutions.

Typical applications include next-generation 4K/8K video production solutions, broadcast video routing and production switchers, video distribution amplifiers, video cameras and monitors.

All MACOM SDI products are fully compliant with the Society of Motion Picture and Television Engineers (SMPTE) standards.

#### SDI Cable Equalizers

- > Specifically designed to compensate for the losses that SDI video signals accumulate when transmitted across long 75Ω copper cables
- > Ideal for the receive path of HD and UHD video broadcast equipment

#### SDI Reclockers

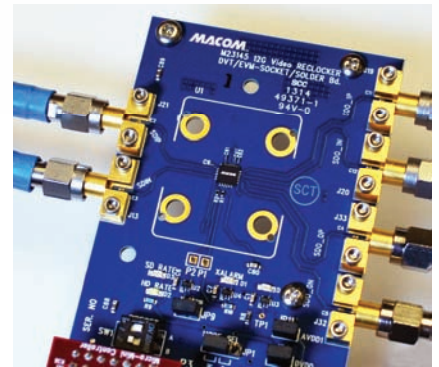
- > Enable robust video broadcast systems by removing jitter from SDI video signals
- > Products include innovative multi-channel and multi-rate reclockers
- > Ideal for HD and UHD video broadcast equipment

#### SDI Cable Drivers

- > Multi-channel and dual output designed to drive 75Ω copper cables
- > Ideal for the transmit path of HD and UHD video broadcast equipment

#### Crosspoints, Signal Conditioners, Redrivers

- > Channel counts range from 2x2 to 288x288
- > Data rates from 19 Mbps to 28 Gbps
- > Supports a variety of board materials and switching architectures by providing robust signal integrity margin
- > Applications include: video broadcast routers and switchers, HDMI switchers, and DWDM physical layer routers



MACOM's 12G-SDI Chipset was honored with a 2015 Studio Daily *Prime Award* and a 2014 Hollywood Post Alliance *Engineering Excellence Award*.



## SDI Cable Equalizers

Part Number	Description	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (mW)	Belden 1694A Reach (m)					Outputs (#)	Package
					12G	6G	3G	HD	SD		
MAEQ-23644	2nd Gen 12G Multi-rate Long Reach Equalizer with Reclocker	11.88	1.8	365	100	140	180	220	520	2	4 mm 24-pin LFGA
MAEQ-23654	2nd Gen 12G Multi-rate Long Reach Equalizer with Reclocker	11.88	1.8	365	100	140	180	220	520	2	5 mm 32-pin LFGA
MAEQ-23664	2nd Gen 12G Multi-rate Long Reach Equalizer with Reclocker	11.88	1.8	365	100	140	180	220	520	1	4 mm 16-pin LFGA
M23544	12G Multi-rate Long Reach Equalizer with Reclocker	11.88	2.5	400	75	100	220	265	530	2	4 mm 24-pin QFN
M23554	12G Multi-rate Long Reach Equalizer with Reclocker	11.88	2.5	400	75	100	220	265	530	2	5 mm 32-pin QFN
M23564	12G Multi-rate Long Reach Equalizer with Reclocker	11.88	2.5	400	75	100	220	265	530	1	4 mm 16-pin QFN
M22544	6G/3G/HD/SD-SDI Adaptive Cable Equalizer	5.94	2.5	130	—	120	140	140	400	2	4 mm 24-pin QFN
M22554	6G/3G/HD/SD-SDI Adaptive Cable Equalizer	5.94	2.5	130	—	120	140	140	400	2	5 mm 32-pin QFN
M22564	6G/3G/HD/SD-SDI Adaptive Cable Equalizer	5.94	2.5	130	—	120	140	140	400	1	4 mm 16-pin QFN
M21324	3G/HD/SDI-SDI Cable Equalizer	2.97	3.3	230	—	—	100	200	400	1	4 mm 16-pin QFN
M21424	3G/HD/SDI-SDI Dual Output Cable Equalizer	2.97	2.5/3.3	175	—	—	100	200	400	2	5 mm 32-pin QFN
M21544	3G/HD/SD-SDI Long Reach Equalizer*	2.97	2.5	145	—	—	200	200	400	2	4 mm 24-pin QFN
M21554	3G/HD/SD-SDI Long Reach Equalizer*	2.97	2.5	145	—	—	200	200	400	2	5 mm 32-pin QFN
M21564	3G/HD/SD-SDI Long Reach Equalizer*	2.97	2.5	145	—	—	200	200	400	1	4 mm 16-pin QFN
M21644	3G/HD/SD-SDI Long Reach Equalizer	2.97	2.5	120	—	—	200	200	400	2	4 mm 24-pin QFN
M21654	3G/HD/SD-SDI Long Reach Equalizer	2.97	2.5	120	—	—	200	200	400	2	5 mm 32-pin QFN
M21664	3G/HD/SD-SDI Long Reach Equalizer	2.97	2.5	105	—	—	200	200	400	1	4 mm 16-pin QFN
M31544	3G/HD/SD-SDI Long Reach Equalizer*	2.97	2.5	145	—	—	200	200	400	2	4 mm 24-pin QFN
M31564	3G/HD/SD-SDI Long Reach Equalizer*	2.97	2.5	145	—	—	200	200	400	1	4 mm 16-pin QFN

\*with Jitter Cleaner

## SDI Cable Reclockers

Part Number	Description	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (mW)	Channels (#)	Integrated Mux	Outputs (#)	Package
MARC-23285	12G Multi-rate Reclocker + CD with 4:1 Input Mux	11.88	1.8	250	1	4:1	2	5 mm 32-pin LFGA
MAXP-23002	Dual 12G Multi-rate Reclocker with Crosspoint	11.88	1.8	250	2	2 x 2 x PT	2	5 mm 32-pin LFGA
MAXP-23004	Quad 12G Multi-rate Reclocker with Crosspoint	11.88	1.8	500	4	4 x 4 x PT	4	7 mm 48-pin LFGA
M21260	3G/HD/SD-SDI Quad Reclocker External Rate Detection	3.2	1.2	0.56	4 x 4	4 x 4	4	10 mm 72-pin QFN
M21262	3G/HD/SD-SDI Reclocker with 4:1 Input Mux	3.2	1.2	0.56	4 x 1	4 x 1	1	10 mm 72-pin QFN
M21245	3G/HD/SD-SDI Low Power Reclocker	2.97	1.2/1.8/2.5/3.3	0.23	2	4:1	2	6 mm 40-pin QFN
M21350	3G/HD/SD-SDI Low Power Quad Reclocker with 4 x 4:1 mux	2.97	1.2/1.8/2.5/3.3	0.135	4	4:1 x 4	4	10 mm 72-pin QFN
M21355	3G/HD/SD-SDI Low Power Quad Reclocker	2.97	1.2/1.8/2.5/3.3	0.135	4	16 x 4 x PT	4	10 mm 72-pin QFN
M31245	3G/HD/SD-SDI Ultra Low Power Reclocker	2.97	2.5	70	1	4:1	2	4 mm 32-pin QFN
M31285	3G/HD/SD-SDI Ultra Low Power Reclocker with Cable Driver	2.97	2.5	160	1	4:1	2	4 mm 32-pin QFN

## SDI Bi-Directional Equalizers / Cable Drivers

Part Number	Description	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (mW)	Belden 1694A Reach (m)					Outputs (#)	Package
					12G	6G	3G	HD	SD		
MAEQ-21764	3G Bi-directional Equalizer / Cable Driver	2.97	2.5	400	—	—	210	260	520	1	6x7 mm 36-pin LFGA
MAEQ-23764	12G Bi-directional Equalizer / Cable Driver	11.88	2.5	400	65	100	210	260	520	1	6x7 mm 36-pin LFGA

## SDI Cable Drivers

Part Number	Description	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (mW)	Channels (#)	Outputs (#)	Package
MACD-23528	12G Multi-rate Dual Cable Driver	11.88	2.5	140	1	2	3 mm 16-pin LFGA
MARC-23285	12G Multi-rate Integrated Reclocker with Dual Cable Driver	11.88	1.8	250	1	2	5 mm 32-pin LFGA
M23428	12G Multi-rate Dual Cable Driver	11.88	2.5	135	1	2	3 mm 16-pin QFN
M22428	6G/3G/HD/SD-SDI Dual Cable Driver	5.94	2.5	125	1	2	3 mm 16-pin QFN
M21328	3G/HD/SD-SDI Cable Driver	2.97	3.3	144	1	1	4 mm 16-pin QFN
M21428	3G/HD/SD-SDI Dual Cable Driver	2.97	2.5/3.3	122	1	2	3 mm 16-pin QFN
M21518	3G/HD/SD-SDI Low Power Cable Driver	2.97	1.8/2.5/3.3	52	1	1	4 mm 24-pin QFN
M21528	3G/HD/SD-SDI Low Power Dual Cable Driver	2.97	1.8/2.5/3.3	40	2	2	4 mm 24-pin QFN
M31285	3G/HD/SD-SDI Reclocker with Dual Cable Driver	2.97	2.5	160	1	2	4 mm 32-pin QFN

## HDcctv Cable Equalizers

Part Number	Description	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (mW)	Channels (#)	Belden 1694A Reach (m)			Outputs (#)	Package
						3G	HD	SD		
M08016	HD/SD Digital Video Cable Equalizer	1.485	2.5/3.3	0.177	1	—	200	400	1	6 x 10 mm 16-pin SOIC
M08026	HD/SD Digital Video Cable Equalizer	1.485	3.3	0.23	1	—	200	400	1	4 mm 16-pin QFN
M08036	3G/HD/SD Digital Video Cable Equalizer	2.97	3.3	0.23	1	100	200	400	1	4 mm 16-pin QFN
M08046	3G/HD/SD Digital Video Cable Equalizer: Dual Output	2.97	2.5/3.3	0.175	2	100	200	400	2	5 mm 32-pin QFN

## HDcctv Reclockers

Part Number	Description	Max Data Rate (Gbps)	Supply Voltage	Power Consumption (mW)	Channels (#)	Integrated Mux	Outputs (#)	Package
M08035	HD/SD Digital Video Reclocker	1.485	1.2/1.8/2.5/3.3	0.23	2	4:01	2	6 mm 40-pin QFN
M08045	3G/HD/SD Digital Video Reclocker	2.97	1.2/1.8/2.5/3.3	0.23	2	4:01	2	6 mm 40-pin QFN

## HDcctv Cable Drivers

Part Number	Description	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (W)	Channels (#)	Outputs (#)	Output Return Loss (dB)	Package
M08018	HD/SD Digital Video Cable Driver	1.485	2.5/3.3	0.122	1	1	15	6 x 5 mm 8-pin SOIC
M08028	HD/SD Digital Video Cable Driver	1.485	3.3	0.144	1	1	15	4 mm 16-pin QFN
M08038	3G/HD/SD Digital Video Cable Driver	2.97	3.3	0.144	1	1	15	4 mm 16-pin QFN
M08048	3G/HD/SD Digital Video Cable Driver: Dual Output	2.97	2.5/3.3	0.122	2	2	10	3 mm 16-pin QFN

## Crosspoint Switches, Signal Conditioners/Redrivers

Part Number	Switch Matrix Size	Max Data Rate (Gbps)	Supply Voltage (V)	Channels (#)	Embedded CDR	Embedded SerDes	Package
M21004	2 x 2	3.2	1.2	2	No	No	4 mm 24-pin QFN
M21105	4 x 4	3.2	1.2	4	Yes	Yes	10 mm 72-pin QFN
M21111	17 x 17	3.2	—	17	No	No	23 mm 404-pin PBGA
M21121	34 x 34	3.2	—	34	No	No	34 mm 404-pin PBGA
M21131	72 x 72	3.2	1.2	72	Yes	No	35 mm 1156-pin BGA
M21151	144 x 144	3.2	1.2	144	Yes	No	35 mm 1156-pin BGA
M21156	144 x 144	3.2	1.2	144	No	No	35 mm 1156-pin BGA
M21172	200 x 288	3.2	1.2	288	No	No	50 mm 2389-pin BGA
M21171	288 x 200	3.2	1.2	200	No	No	50 mm 2389-pin BGA
M21170	288 x 288	3.2	1.2	288	No	No	50 mm 2389-pin BGA
M21043	8 ports (reconfigurable)	3.2	1.2	8	No	No	7 mm 48-pin QFN
M21115	20 x 20	3.8	2.5/3.3	20	No	No	35 mm 676-pin TEPBGA
M21125	40 x 40	3.8	2.5/3.3	40	No	No	35 mm 676-pin TEPBGA
M21330	4 x 4	4.25	1.2	4	No	No	6 mm 40-pin QFN
M21351	4 x 4	4.25	1.2	4	No	No	6 mm 40-pin QFN
M21352	8 x 8	4.25	1.2	8	No	No	10 mm 72 pin QFN
M21443	12 x 12	4.25	1.2	12	No	No	14 mm 100-pin TQFP
M21444	12 x 12	4.25	2.4	12	—	Yes	14 mm 100-pin TQFP
M21353	12 x 12	4.25	1.2	12	No	No	12 mm 88-pin QFN
M21141	72 x 72	4.25	1.2	72	Yes	Yes	35 mm 1156-pin BGA
M21161	144 x 144	4.25	1.2	144	Yes	Yes	35 mm 1156-pin BGA
M21362	8 x 8	5.5	1.7	—	Yes	Yes	10 mm 72-pin QFN
M21363	12 x 12	5.5	2.4	12	Yes	Yes	12 mm 88-pin QFN
M21462	8 x 8	6.25	1.2	8	Yes	No	10 mm 72-pin QFN
M21463	12 x 12	6.25	1.2	12	Yes	No	12 mm 88-pin QFN
M21450	2 x 2	6.5	1.2	2	No	No	6 mm 40-pin QFN
M21030	4 x 4	6.5	1.2	4	No	No	6 mm 40-pin QFN
M21451	4 x 4	6.5	1.2	4	No	No	6 mm 40-pin QFN
M21452	8 x 8	6.5	1.2	8	No	No	10 mm 72-pin QFN
M21453	12 x 12	6.5	1.2	12	No	No	12 mm 88-pin QFN
M23636	36 x 36	6.5	1.2	36	No	—	23 mm 484-pin BGA
M21148	48 x 48	6.5	1.2	48	No	No	27 mm 676 pin BGA
M21147	80 x 80	6.5	1.2	80	No	No	35 mm 1156-pin FCBGA
M21167	160 x 160	6.5	1.2	160	No	No	35 mm 1936-pin FCBGA
MAXP-23002	2 x 2	14	1.8	2	Yes	No	5 mm 32-pin LFGA
MAXP-23004	4 x 4	14	1.8	4	Yes	No	7 mm 48-pin LFGA
MAXP-23008	8 x 8	12.5	1.2	8	No	No	15 mm 192-pin BGA
MAXP-23012	12 x 12	12.5	1.2	12	No	No	15 mm 192-pin BGA
MAXP-23016	16 x 16	12.5	1.2	16	No	No	15 mm 192-pin BGA
M21024	24 x 24	12.5	1.2	24	No	No	21 mm 396-pin BGA
M21036	36 x 36	12.5	1.2	36	No	No	23 mm 480-pin BGA
M21048	48 x 48	12.5	1.2	48	No	No	27 mm 672-pin BGA
M21080	80 x 80	12.5	1.8	80	No	No	45 mm 1924-pin FCBGA
M21601	120 x 120	12.5	1.8	120	No	No	45 mm 1924-pin FCBGA
M21605	160 x 160	12.5	1.8	160	No	No	45 mm 1924-pin FCBGA
MAXP-23170	288 x 288	12.5	0.8	288	Yes	No	60 mm FCBGA



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