

Small Form-factor Pluggable (SFP) Optical Module Cartridges (12G Video)

For Densité Frames, IQ Modular and KudosPro UHD-1200

The Small Form-factor Pluggable (SFP) optical module cartridges for video are small, hot-pluggable devices used to provide fiber connectivity to 12G/3G/HD/SD SDI products from either a Densité frame (they can be used with any 12G video card that has a rear module with an “F” name suffix (i.e., HDA-3961-3SRP-HF), irrelevant of which Densité frame is hosting the card), IQ Modular 12G SDI card such as the IQSDA4100-1B4, IQSDA4200-1B4 and the KudosPro UHD-1200. By using single mode fiber instead of coaxial cables, these interfaces can be used over much longer distances without degrading signal quality, which is very useful when carrying 12G signals.

All SFP optical module cartridges for video that are available from Grass Valley are RoHS compliant.

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SFP-U-R-LC

12 Gb/s Single Channel Optical Receiver Cartridge with Simplex LC

Small form-factor pluggable (SFP) optical module video cartridge for 12G products from Densité Modular, IQ Modular and KudosPro.

The SFP-U-R-LC is a single channel single mode optical receiver that supports signals up to 12 Gb/s as per SMPTE ST 2082, SMPTE ST 259, SMPTE ST 292 and SMPTE ST 424, including SDI pathological test patterns described in SMPTE engineering guideline SMPTE EG 34 and SMPTE recommended practices SMPTE RP 178 and SMPTE RP 198.

KEY FEATURES

- SMPTE ST 297-1:2015 compatible
- 12G/3G/HD/SD SDI:
 - SMPTE ST 2082, SMPTE ST 424, SMPTE ST 292
 - SMPTE ST 259-ABCD compliant
- Supports video pathological patterns for SD-SDI, HD-SDI, 3G-SDI and 12G-SDI
- Based on Industry Standard SFP+
- Single receiver with simplex LC
- RoHS 6/6 compliant
- Hot pluggable

SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Receiver Optical Specifications (0°C < Tc < 70°C, 3.13V < Vcc < 3.47V)						
Wavelength of Operation	λ_c	1260		1620	nm	
Sensitivity for SMPTE ST 2082 11.88 Gb/s	Sen			-11	dBm	Pathological pattern; BER < 10 ⁻¹²
Receiver Overload	P _{MAX}	-2	—		dBm	
LOS — Asserted	LOS _A	-30	—	—	dBm	Transition: high to low
LOS — De-asserted	LOS _D	—	—	-12	dBm	Transition: low to high
Optical Hysteresis	Hys	0.5	2		dB	
Absolute Maximum Ratings — Exposure to absolute maximum rating conditions for extended periods may affect device reliability						
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	

ORDERING

Part Number	Type	Maximum Bit Rate (Gb/s)	RX1		RX2		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Sen.(dBm)	λ (nm)	Sen.(dBm)			
SFP-U-R-LC	1-RX	12	1260/1620	-2 to -11			LC SFP+ with DMI	0 to 70	Yes

Related Products

Part Number	Type	Maximum Bit Rate (Gb/s)	TX		Rx		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Power (dBm)	λ (nm)	Power (dBm)			
SFP-U-RR-LC	2-RX	12			1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes
SFP-U-T-S13-LC	1-TX	12	1310 DFB	1 to -5			LC SFP+ with DMI	0 to 70	Yes
SFP-U-TT-S13S13-LC	2-TX	12	1310 DFB	1 to -5			LC SFP+ with DMI	0 to 70	Yes
SFP-U-RT-S13-LC	1-TX + 1-RX	12	1310 DFB	1 to -5	1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes

Note: Only connections with patch cords with PC or UPC connectors are supported.

Note: All receiver channels (R) are wideband, responding to wavelengths ranging from 1260 to 1620 nm, compatible with standard 1310 nm and CWDM wavelengths, except for the receiver from the WDM Series.

SFP-U-RR-LC

12 Gb/s Dual Channel Optical Receiver Cartridge with Duplex LC

Small form-factor pluggable (SFP) optical module video cartridge for 12G products from Densité Modular, IQ Modular and KudosPro.

The SFP-U-RR-LC is a dual channel single mode optical receiver that supports signals up to 12 Gb/s as per SMPTE ST 2082, SMPTE ST 259, SMPTE ST 292 and SMPTE ST 424, including SDI pathological test patterns described in SMPTE engineering guideline SMPTE EG 34 and SMPTE recommended practices SMPTE RP 178 and SMPTE RP 198.

KEY FEATURES

- SMPTE ST 297-1:2015 compatible
- 12G/3G/HD/SD SDI:
 - SMPTE ST 2082, SMPTE ST 424, SMPTE ST 292
 - SMPTE ST 259-ABCD compliant
- Supports video pathological patterns for SD-SDI, HD-SDI, 3G-SDI and 12G-SDI
- Based on Industry Standard SFP+
- Dual receiver with duplex LC
- RoHS-6 compliant
- Hot pluggable

SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Receiver Optical Specifications (0°C < Tc < 70°C, 3.13V < Vcc < 3.47V)						
Wavelength of Operation	λ_c	1260		1620	nm	
Sensitivity for SMPTE ST 2082 11.88 Gb/s	Sen			-11	dBm	Pathological pattern; BER < 10 ⁻¹²
Receiver Overload	P _{MAX}	-2	—		dBm	
LOS — Asserted	LOS _A	-30	—	—	dBm	Transition: high to low
LOS — De-asserted	LOS _D	—	—	-12	dBm	Transition: low to high
Optical Hysteresis	Hys	0.5	2		dB	
Absolute Maximum Ratings						
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	

ORDERING

Part Number	Type	Maximum Bit Rate (Gb/s)	RX1		RX2		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Sen.(dBm)	λ (nm)	Sen.(dBm)			
SFP-U-RR-LC	2-RX	12	1260/1620	-2 to -11	1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes

Related Products

Part Number	Type	Maximum Bit Rate (Gb/s)	TX		Rx		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Power (dBm)	λ (nm)	Power (dBm)			
SFP-U-R-LC	1-RX	12			1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes
SFP-U-T-S13-LC	1-TX	12	1310 DFB	1 to -5			LC SFP+ with DMI	0 to 70	Yes
SFP-U-TT-S13S13-LC	2-TX	12	1310 DFB	1 to -5			LC SFP+ with DMI	0 to 70	Yes
SFP-U-RT-S13-LC	1-TX + 1-RX	12	1310 DFB	1 to -5	1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes

Note: Only connections with patch cords with PC or UPC connectors are supported.

Note: All receiver channels (R) are wideband, responding to wavelengths ranging from 1260 to 1620 nm, compatible with standard 1310 nm and CWDM wavelengths, except for the receiver from the WDM Series.

SFP-U-T-S13-LC

12 Gb/s Single Channel 1310 nm Optical Transmitter Cartridge with Simplex LC

Small form-factor pluggable (SFP) optical module video cartridge for 12G products from Densité Modular, IQ Modular and KudosPro.

The SFP-U-T-S13-LC is a single channel single mode optical transmitter that supports signals up to 12 Gb/s as per SMPTE ST 2082, SMPTE ST 259, SMPTE ST 292 and SMPTE ST 424, including SDI pathological test patterns described in SMPTE engineering guideline SMPTE EG 34 and SMPTE recommended practices SMPTE RP 178 and SMPTE RP 198. The unit uses a 1310 nm multiple quantum well DFB laser transmitter.

KEY FEATURES

- SMPTE ST 297-1:2015 compatible
- 12G/3G/HD/SD SDI:
 - SMPTE ST 2082, SMPTE ST 424, SMPTE ST 292
 - SMPTE ST 259-ABCD compliant
- Supports video pathological patterns for SD-SDI, HD-SDI, 3G-SDI and 12G-SDI
- Based on Industry Standard SFP+
- Distance up to 10 km for 12G-SDI
- Single transmitter with simplex LC
- RoHS 6/6 compliant
- Hot pluggable
- Class 1 Laser International Safety Standard IEC-60825 Compliant

SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Transmitter Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)						
Average Launch Power	P _{o, avg}	-5		1	dBm	Output power is power coupled into a 9/125 μm single mode fiber
Output Center Wavelength	λ _c	1260	1310	1360	nm	
Output Spectrum Width	σ _λ			1	nm	-20 dB width
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	-3.5				
Relative Intensity Noise	RIN			-128	dB/Hz	
Average Launch Power of OFF Transmitter				-30	dBm	
Absolute Maximum Ratings — Exposure to absolute maximum rating conditions for extended periods may affect device reliability						
Storage Temperature	T _{stg}	-40		85	°C	
Operating Case Temperature	T _{opr}	0		70	°C	

ORDERING

Part Number	Type	Maximum Bit Rate (Gb/s)	TX1		TX2		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Power (dBm)	λ (nm)	Power (dBm)			
SFP-U-T-S13-LC	1-TX	12	1310 DFB	1 to -5			LC SFP+ with DMI	0 to 70	Yes

Related Products

Part Number	Type	Maximum Bit Rate (Gb/s)	TX		Rx		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Power (dBm)	λ (nm)	Power (dBm)			
SFP-U-R-LC	1-RX	12			1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes
SFP-U-RR-LC	2-RX	12			1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes
SFP-U-TT-S13S13-LC	2-TX	12	1310 DFB	1 to -5			LC SFP+ with DMI	0 to 70	Yes
SFP-U-RT-S13-LC	1-TX + 1-RX	12	1310 DFB	1 to -5	1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes

Note: Only connections with patch cords with PC or UPC connectors are supported.

SFP-U-TT-S13S13-LC

12 Gb/s Dual Channel 1310 nm Optical Transmitter Cartridge with Duplex LC

Small form-factor pluggable (SFP) optical module video cartridge for 12G products from Densité Modular, IQ Modular and KudosPro.

The SFP-U-TT-S13S13-LC is a dual channel single mode optical transmitter that supports signals up to 12 Gb/s as per SMPTE ST 2082, SMPTE ST 259, SMPTE ST 292 and SMPTE ST 424, including SDI pathological test patterns described in SMPTE engineering guideline SMPTE EG 34 and SMPTE recommended practices SMPTE RP 178 and SMPTE RP 198. The unit uses two independent 1310 nm multiple quantum well DFB laser transmitters.

KEY FEATURES

- SMPTE ST 297-1:2015 compatible
- 12G/3G/HD/SD SDI:
 - SMPTE ST 2082, SMPTE ST 424, SMPTE ST 292
 - SMPTE ST 259-ABCD compliant
- Supports video pathological patterns for SD-SDI, HD-SDI, 3G-SDI and 12G-SDI
- Based on Industry Standard SFP+
- Distance up to 10 km for 12G-SDI
- Dual transmitter with duplex LC
- RoHS 6/6 compliant
- Hot pluggable
- Class 1 Laser International Safety Standard IEC-60825 Compliant

SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Transmitter Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)						
Average Launch Power	P _{0, avg}	-5		1	dBm	Output power is power coupled into a 9/125 μm single mode fiber
Output Center Wavelength	λ _c	1260	1310	1360	nm	
Output Spectrum Width	σ _λ			1	nm	-20 dB width
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	-3.5				
Relative Intensity Noise	RIN			-128	dB/Hz	
Average Launch Power of OFF Transmitter				-30	dBm	
Absolute Maximum Ratings — Exposure to absolute maximum rating conditions for extended periods may affect device reliability						
Storage Temperature	T _{stg}	-40		85	°C	
Operating Case Temperature	T _{opr}	0		70	°C	

ORDERING

Part Number	Type	Maximum Bit Rate (Gb/s)	TX1		TX2		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Power (dBm)	λ (nm)	Power (dBm)			
SFP-U-TT-S13S13-LC	2-TX	12	1310 DFB	1 to -5	1310 DFB	1 to -5	LC SFP+ with DMI	0 to 70	Yes

Related Products

Part Number	Type	Maximum Bit Rate (Gb/s)	TX		Rx		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Power (dBm)	λ (nm)	Power (dBm)			
SFP-U-R-LC	1-RX	12			1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes
SFP-U-RR-LC	2-RX	12			1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes
SFP-U-T-S13S13-LC	1-TX	12	1310 DFB	1 to -5			LC SFP+ with DMI	0 to 70	Yes
SFP-U-RT-S13-LC	1-TX + 1-RX	12	1310 DFB	1 to -5	1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes

Note: Only connections with patch cords with PC or UPC connectors are supported.

SFP-U-RT-S13-LC

12 Gb/s 1310 nm Optical Transceiver Cartridge with Duplex LC

Small form-factor pluggable (SFP) optical module video cartridge for 12G products from Densité Modular, IQ Modular and KudosPro.

The SFP-U-RT-S13-LC is a single mode optical transceiver that supports signals up to 12 Gb/s as per SMPTE ST 2082, SMPTE ST 259, SMPTE ST 292 and SMPTE ST 424, including SDI pathological test patterns described in SMPTE engineering guideline SMPTE EG 34 and SMPTE recommended practices SMPTE RP 178 and SMPTE RP 198.

KEY FEATURES

- SMPTE ST 297-1:2015 compatible
- 12G/3G/HD/SD SDI:
 - SMPTE ST 2082, SMPTE ST 424, SMPTE ST 292
 - SMPTE ST 259-ABCD compliant
- Supports video pathological patterns for SD-SDI, HD-SDI, 3G-SDI and 12G-SDI
- Based on Industry Standard SFP+
- Distance up to 10 km for 12G-SDI
- Single transmitter and Single Receiver with duplex LC
- RoHS 6/6 compliant
- Hot pluggable
- Class 1 Laser International Safety Standard IEC-60825 Compliant

SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Transmitter Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)						
Average Launch Power	P _{o, avg}	-5		1	dBm	Output power is power coupled into a 9/125 μm single mode fiber
Output Center Wavelength	λ _c	1260	1310	1360	nm	
Output Spectrum Width	σ _λ			1	nm	-20 dB width
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	-3.5				
Relative Intensity Noise	RIN			-128	dB/Hz	
Average Launch Power of OFF Transmitter				-30	dBm	
Receiver Optical Specifications (0°C < Tc < 70°C, 3.13V < Vcc < 3.47V)						
Wavelength of Operation	λ _c	1260		1620	nm	
Sensitivity for SMPTE ST 2082 11.88 Gb/s	Sen			-11	dBm	Pathological pattern; BER <10 ⁻¹²
Receiver Overload	P _{MAX}	-2	—		dBm	
LOS — Asserted	LOS _A	-30	—	—	dBm	Transition: high to low
LOS — De-asserted	LOS _D	—	—	-12	dBm	Transition: low to high
Optical Hysteresis	Hys	0.5	2		dB	
Absolute Maximum Ratings — Exposure to absolute maximum rating conditions for extended periods may affect device reliability						
Storage Temperature	T _{stg}	-40		85	°C	
Operating Case Temperature	Topr	0		70	°C	

ORDERING

Part Number	Type	Maximum Bit Rate (Gb/s)	TX		RX		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Power (dBm)	λ (nm)	Sen. (dBm)			
SFP-U-RT-S13-LC	1-TX + 1-RX	12	1310 DFB	1 to -5	1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes

Related Products

Part Number	Type	Maximum Bit Rate (Gb/s)	TX		Rx		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Power (dBm)	λ (nm)	Power (dBm)			
SFP-U-R-LC	1-RX	12			1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes
SFP-U-RR-LC	2-RX	12			1260/1620	-2 to -11	LC SFP+ with DMI	0 to 70	Yes
SFP-U-T-S13-LC	1-TX	12	1310 DFB	1 to -5			LC SFP+ with DMI	0 to 70	Yes
SFP-U-TT-S13S13-LC	2-TX	12	1310 DFB	1 to -5			LC SFP+ with DMI	0 to 70	Yes

Note: Only connections with patch cords with PC or UPC connectors are supported.

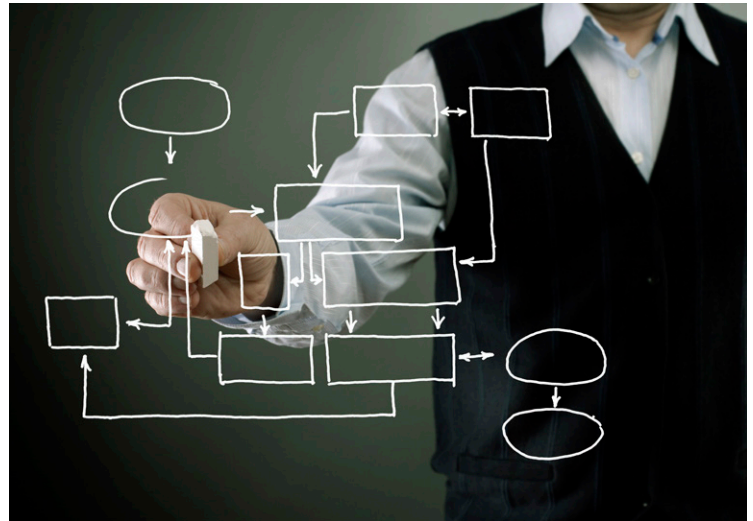
Global Services

In a world of ever-increasing complexity and system distribution, broadcast producers inside a studio or outside in a vehicle need production control equipment suppliers who can provide industry-leading technical support. Personnel is but one part of the support equation. The other is a business infrastructure capable of deploying and cost-effectively supporting reliable solutions. Grass Valley Global Services has the depth of knowledge, industry experience and technical expertise to achieve this objective. The Global Services portfolio provides everything necessary insure maximum uptime and high velocity problem resolution.

Grass Valley Global Services delivers a comprehensive array of tangible value:

- A global network of field engineers with the experience, knowledge and skill to keep production switchers/vision mixers and associated equipment up to date, operational and optimized
- A worldwide parts distribution system that ensures rapid access to replacement parts
- A team of educators skilled in the nuances of production control and switcher operations
- Technical and operational training, provided on-site at Grass Valley facilities worldwide and online, that maximizes productivity through tailored learning paths
- Comprehensive support agreements that ensure every Grass Valley system remains in peak condition — all while supporting the enterprise's need for financial predictability

Grass Valley Global Services offerings deliver tangible value. The Global Services organization does this by providing the resources to ensure that users get the maximum value from an investment in Grass Valley production switchers — from initial startup through the entire in-service lifespan. Global Services empowers users to meet tactical day-to-day objectives while giving staff more time to focus on strategic business initiatives. A global presence, logistics expertise and world-renowned team of media professionals are here to help the achievement of financial performance objectives by reducing risk while boosting operational efficiencies.



GLOBAL SERVICES PROVIDES:

- Unequaled depth of industry knowledge and technical expertise
- Over 50 years of worldwide experience
- Complete set of services:
 - Strategic advice
 - System architecture
 - Workflow analysis and design
 - Project management
 - Integration and implementation
 - Performance optimization
 - Technical and operational training
 - Educational services
- Address today's challenges and prepare for tomorrow's opportunities

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