

Fx-DS26

OPTICAL CATV AND SAT-IF TRANSMITTER

Application

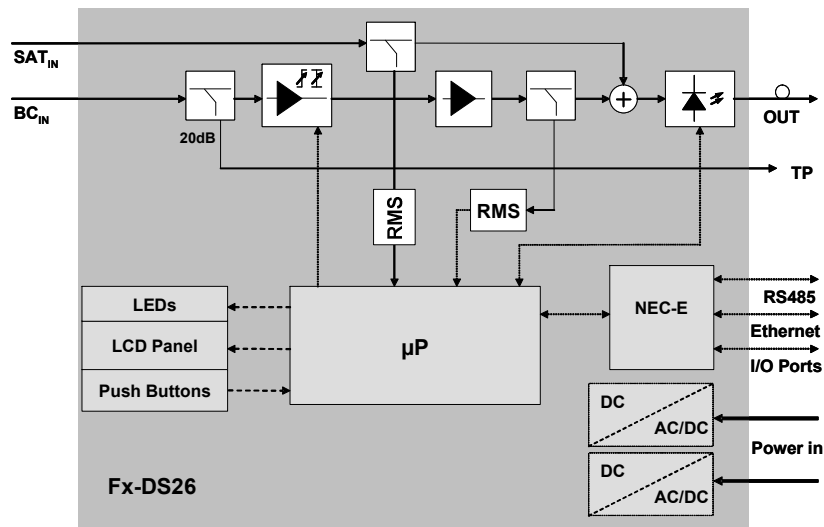


- ▶ Electrical to optical conversion of multichannel CATV signals like AM-VSB, FM and QAM signals
- ▶ Electrical to optical conversion of SAT-IF video signals by separate input
- ▶ The 1550nm versions enable the usage of optical amplifiers (EDFAs) as boosters or repeaters in order to realize FTtx HFC networks

Features

- ▶ SBS suppression with very high SBS threshold and 1550 nm pre-chirping technology
- ▶ Bandwidth of 5...870 MHz for CATV and 950...2610 MHz for SAT-IF input
- ▶ All-electronically adjustments for CATV input: slope, gain, output power, OMI, pre-chirping etc.
- ▶ Automatic load control (ALC) for constant OMI_{norm} of CATV signals
- ▶ Linearity optimized versions either for European Cenelec 42 or for Japanese NTSC74 channel allocation
- ▶ Separate RF input for SAT-IF signals
- ▶ ITU-Grid wavelength, wavelength adjustable ± 100 GHz
- ▶ Front panel RF test point -20 dB
- ▶ Dual, hot-plug-in power supply modules for 100...240 VAC or ± 36 ... ± 72 VDC
- ▶ Web and SNMP Interface
- ▶ LC display and LED status indication
- ▶ General purpose I/O interface for remote functions
- ▶ Very thin, only 1 U design for mounting into 19", ETSI or JIS racks

Block Diagram



General Technical Data

Wavelength	[nm]	Type 1310: 1290 ... 1330 Type 1550 : 1540 ... 1560 Type DWmm : according to ITU grid no. mm
Wavelength adjustment range	[GHz]	Type DWmm: -100 ... +100 in steps of 50
Optical output power	[dBm]	Type 70: +7 ... +10 Type 80: +8 ±0.5 Type 110: +11 ±0.5 Type 130: +13 ±0.5
Side mode suppression	[dB]	> 30
Relative intensity noise (optical return loss > 40 dB)	[dBc/Hz]	< -155
SBS suppression ^{1) 3) 4)} (measured for 25 km fiber length and NTSC74 or Cenelec42 input)	[dBm]	Type 1310: ≥ +16.0 Type 1550: ≥ +18.0 Type DWmm: ≥ +18.0
Opt. connector		Any type of high return loss connectors rear side mounted
Optical fibre		Standard single mode 9/125 µm
RF-connector/ impedance		F-female, 75Ω, rear side mounted
Control interface		Ethernet 10/100 interface
Climatic specification Operation Storage		ETS 300 019, class 3.1 ETS 300 019, class 1.2
EMI		EN50083-2, EN50083-2 /A1
Safety		EN 50083-1 and EN 60950, Laser class 1M according IEC 60825-1 (eyesafe for normal viewing)
Power supply Dual redundant, hot pluggable		100 ... 240 VAC, or 36 ... 72 VDC
Power consumption 110 VAC 48 VDC		< 25/34 VA (1/2 power supplies) < 21/25 W (1/2 power supplies)
Enclosure dimensions		19" / 1 rack unit [U] (optionally compatible to ETSI or JIS standards)
Weight	[kg]	9 (including two power supplies)

CATV Signal Data

CATV input impedance	[Ω]	75			
Frequency range	[MHz]	5 ... 870			
Frequency response at 80 dBμV / 5%					
5 ... 7 MHz	[dB]	±1.5			
7 ... 47 MHz	[dB]	±0.75			
47 ... 606 MHz	[dB]	±0.5			
606 ... 870 MHz	[dB]	±0.75			
Return loss					
5 ... 47 MHz	[dB]	≥ 18			
47 ... 870 MHz	[dB]	≥ 20 (at 47 MHz) – 1.5 dB/oct., min. 15			
Input level (referred to OMI = 5%)	[dBμV]	73 minimum			
Gain adjustment range	[dB]	0 ... 24			
Slope adjustment range (10...870 MHz)	[dB]	-3 (cable equivalent) ... +16 (cable equalization)			
Testpoint attenuation	[dB]	20			
Version		Fx-DS26-	1310 -nnn-C42	1310 -nnn-N74	1550/DWmm -70-C42 1550/DWmm -70-N74
CNR ¹⁾					
0 ... 15 km fibre length	[dB]	51 ³⁾	51 ⁴⁾	50.5 ³⁾	50.5 ⁴⁾
15 ... 25 km fibre length	[dB]	50 ³⁾	50 ⁴⁾	49 ³⁾	49 ⁴⁾
CSO ¹⁾	[dB]	65 ³⁾	65 ⁴⁾	53 ²⁾³⁾ (f<600 MHz: 58)	58 ²⁾⁴⁾
CTB ¹⁾	[dB]	64 ³⁾	64 ⁴⁾	62 ³⁾	62 ⁴⁾

SAT-IF Signal Data

SAT-IF input impedance	[Ω]	75			
Frequency range	[MHz]	950 ... 2610			
Frequency response	[dB]	±2			
Return loss	[dB]	≥ 10			
Version		Fx-DS26-	1310 -nnn-C42	1310 -nnn-N74	1550/DWmm -70-C42 1550/DWmm -70-N74
Nominal input level per SAT-IF carrier	[dBμV]	92 ⁵⁾	90 ⁶⁾	92 ⁵⁾	90 ⁶⁾
CNR ¹⁾ referred to nominal SAT-IF carrier	[dB]	27 ⁵⁾	25 ⁶⁾	27 ⁵⁾	25 ⁶⁾
Spurious signals referred to nominal SAT-IF carrier	[dB]	35 ⁵⁾	40 ⁶⁾	35 ⁵⁾	40 ⁶⁾

Test Conditions

- ¹⁾ $P_{opt,in} = 0$ dBm, appropriate receiver technology with $I_{eq} = 7.0$ pA/√Hz and $\eta = 0.95$ A/W (at 1550 nm) used, CATV and SAT-IF signals transmitted together (see also test conditions 5 and 6 below)
- ²⁾ Internal prechirping parameter flc set according to connected fibre length:
0...10km / flc=5km, 5...15km / flc=10km, 10...20km / flc=15km, 15...25km / flc=20km
- ³⁾ European Cenelec 42 channel allocation with OMI = 4.1% measured with noise bandwidth of 5 MHz
- ⁴⁾ Japanese NTSC74 channel allocation with OMI = 3.3% measured with noise bandwidth of 4 MHz
- ⁵⁾ 10 dB backoff of SAT-IF carriers referred to CATV video carriers, 36 QPSK modulated SAT-IF carriers with 27 MHz IF bandwidth, $OMI_{SAT} = 1.3\%$ for SAT-IF carriers, Cenelec42 carriers with OMI = 4.1%, 27 MHz noise bandwidth
- ⁶⁾ 10 dB backoff of SAT-IF carriers referred to CATV video carriers, 36 QPSK modulated SAT-IF carriers with 27 MHz IF bandwidth, $OMI_{SAT} = 1.0\%$ for SAT-IF carriers, NTSC74 carriers with OMI = 3.3%, 27 MHz noise bandwidth



Ordering Information

For more information on this product please contact BKtel communications. Properties for ordering optical transmitter Fx-DS26:

Optical output power	70	+7.0 dBm
	80	+8.0 dBm
	110	+11.0 dBm
	130	+13.0 dBm
Frequency plan *)	C42	Cenelec 42
	N74	NTSC 74
I/O ports	0	No
	1	Yes
Wavelength	1310	1310 nm
	1550	1550 nm
	DWmm	DDM ITU grid no. mm
Optical connector	1	E2000
	2	SC/APC
	3	FC/APC-NTT
	4	FC/APC-JDS
	5	SC/APC with shutter
RF input / optical output	F	on front side
	R	on rear side
Version	0	BKtel
	OEM	OEM
Power supply	230/230	2 x (100...240 VAC)
	48/48	2 x (36...72 VDC)
	230	1 x (100...240 VDC)
	48	1 x (36...72VDC)
	230/48	mixed 230 VAC / 48 VDC

*) Other frequency plan on request!

Available Types

Fx-DS26-1310-80-C42, Fx-DS26-1310-110-C42 and Fx-DS26-1310-130-C42
 Fx-DS26-1310-80-N74, Fx-DS26-1310-110-N74 and Fx-DS26-1310-130-N74

Fx-DS26-1550-70-C42 and Fx-DS26-1550-70-N74

Fx-DS26-DWmm-70-C42 and Fx-DS26-DWmm-70-N74 with mm=21, 23, ... 45