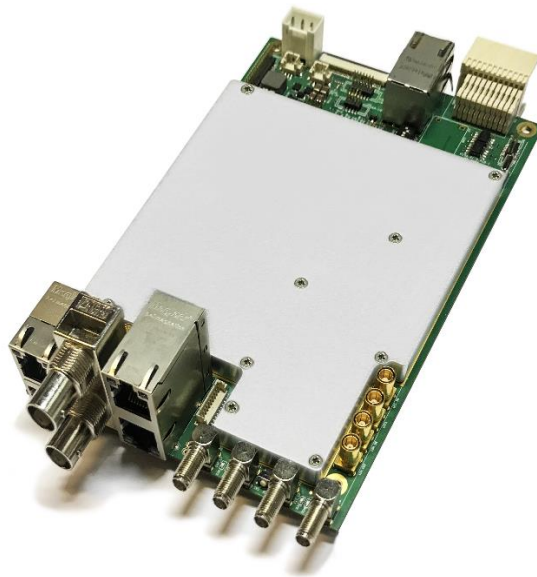




OEM Modulator Series (DVB-T/T2/T2x2/Tx4)

FNJ-OEM6K-01



Version 1
2020



Description

FNJ-OEM6K is an OEM modulator for terrestrial broadcasting fully compliant with DVB-T/T2 standards. The system has great level of reliability and excellent processing performance for broadcast applications. The product can be used as the exciter of television transmitters with the output power up to tens of kilowatts.

Thanks to novel hardware architecture FNJ-OEM6K is a dual core modulator which makes it possible to transmit four DVB-T on four distinct channels or two DVB-T2 transport streams on two distinct channels with just one transmitter.

FNJ-OEM6K is equipped with double output internal Re-multiplexing core which enables the broadcasters to select and combine services from all modulator input signals. It also supports BISS decoding and service component select, combine and remove option.

Taking advantage of newest analog techniques and wide simulations in designing the RF front-end of this product has caused the output signal spectrum (UHF/VHF) to be free of any unwanted components and at the same time having a very low noise floor. This fact has dramatically reduced the modulation errors in all operating modes and is another factor in achieving high signal quality at the output of the transmitter.

The system Adaptive pre-corrector is the most remarkable mechanism of this modulator which eliminates distortions and restores signal quality while it is amplified with high efficiency power amplifiers.

Simple integration, high flexibility, advanced correction algorithms, graphical LCD driver option of the modulator along with compact size and economic price has made it a comprehensive solution for TV transmitter manufacturers.

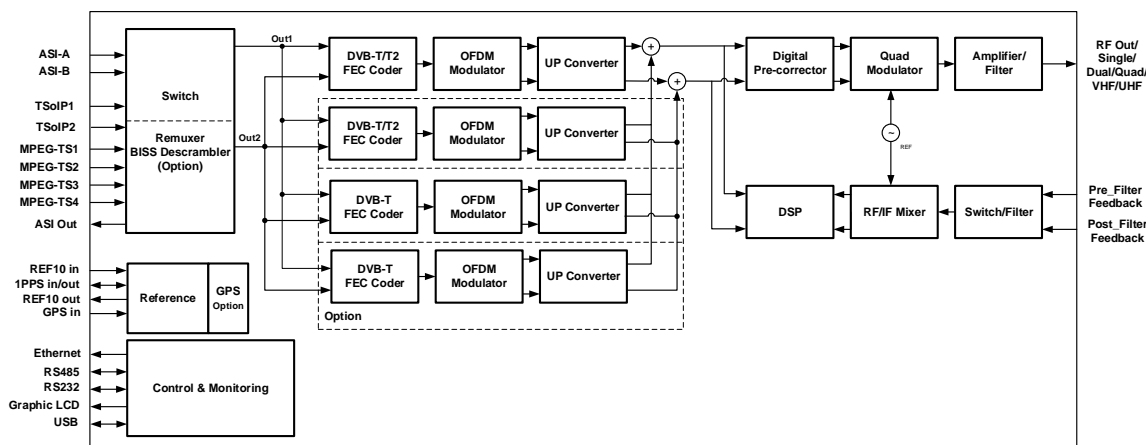


Features



- Two independent DVB-T2 or four independent DVB-T output
- UHF/VHF band selection via software
- In full compliance with (EN302755 DVB-T) and (EN300744 DVB-T)
- Re-multiplexing core capable of all Re-multiplexing all inputs
- Pre-corrector option in order to increase system efficiency
- Supporting T2MI Over IP, TS Over IP
- Displaying transmitter output signal analysis (MER, Shoulder distance, Group delay) as data or on LCD via RS 485
- SFN mode (Capable of receiving time and frequency reference from NTP server)
- OCXO reference frequency
- UP to +10 dBm RF output

Block diagram



Technical Specification

• Input

ASI Inputs
TSOIP Input
10 MHz Reference Input
1 PPS Reference Input
GPS Antenna input
Pre-Filter Feedback Input
Post-Filter Feedback Input

2xBNC, 75 Ω , DVB-ASI, 188/204 Bytes
2xRJ45 Gigabit TS Over IP Inputs Based on SMPTE-2022
1xSMB, 50 Ω , 500mVpp~5Vpp
1xSMB, 500mVpp~5Vpp
1xSMB, 50 Ω (Option)
1xSMA, 50 Ω , -10~-10dBm
1xSMA, 50 Ω , -10~-10dBm

• Output

RF Output

RF Monitoring Connector
10MHz Reference Output
1 PPS Reference Output
ASI Output
TSOIP Output

1xSMA, 50 Ω
Frequency Range: (Resolution: 1 Hz)
470-862 MHz UHF band
174-230 MHz VHF band
Level: -15 to 0dBm (Resolution: 0.1 dB)
(-15 to +10dBm Available as an Option)
1xSMA, 50 Ω , Coupling Factor: 30dB
1xSMB, 50 Ω , 3.3V CMOS
1xSMB, LVTTTL (shared with 1PPS input)
1xSMB, 75 Ω , DVB-ASI, 188/204 Bytes
2xRJ45 Gigabit TS over IP outputs Based on SMPTE-2022 (option)

• Remux Core Parameters(Option)

Re-multiplexing capabilities

Remux at Service components level, ADD/Del components
PID re-mapping, PCR re-stamping, BISS descrambling,
Complete TS analyzing

Supported Tables & Descriptors
Decryption

NIT, SDT, TDT, TOT, EIT, LCN
BISS Modes 1 and E

• Qualitative Signal Characteristics

MER	>40dB (Typical: 42dB)
Shoulder Distance	>50dB (Typical: 58dB)
Output PAPR	PAPR Adjustable in 7 to 12dB range
Amplitude Variations in One Channel	<0.3dB
Group Delay after output filter	<10 ns
Out of Band Spurious Emissions	<60dBc
LO Phase Noise	10 Hz <-55dBc/Hz 100 Hz <-85dBc/Hz 1 kHz <-90dBc/Hz 10 kHz <-95dBc/Hz 100 kHz <-112dBc/Hz

• Modulation (DVB-T)

Number of Modulation Cores	Up to 4 DVB-T Cores (EN 300 744 Compliant)
Output Channel Spacing	All Channels within 40MHz Bandwidth (Quad DVB-T Mode)
Transmission Modes	MFN, SFN
IFFT	2K, 4K, 8K
Constellation	QPSK, 16QAM, 64QAM
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC	1/2, 2/3, 3/4, 5/6, 7/8 (For Both LP & HP Streams)
Interleaving	Native, In Depth
Hierarchical Mode	Supported, Mapping $\alpha=1, 2, 4$
Maximum Throughput	31.67 Mbps at Each Modulator
Bandwidth	8 MHz, 7 MHz

• Modulation (DVB-T2)

Number of Modulation Cores	Up to 2 DVB-T2 Cores (EN302755 v1.4.1 Compliant)
Output Channel Spacing	All Channels within 40MHz Bandwidth (Dual DVB-T2 Mode)
Transmission Modes	MFN, SFN-SISO, SFN-MISO
Modulation Modes	Single PLP, Multi-PLP up to 255 PLPs
IFFT	1k, 2k, 4 k, 8k, 8k Extended, 16k, 16k Extended, 32k, 32k Extended
Constellation	QPSK, 16QAM, 64 QAM, 256 QAM (Normal and Rotated)
Guard Interval	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4
FEC	1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Interleaving	Time, Frequency, Cell
Maximum Throughput	50.34 Mbps at Each Modulator Core
Bandwidth	8 MHz, 7 MHz

• Digital Adaptive Pre-Correction

Pre-correction Modes	Single Output: Adaptive LC, Adaptive NLC
Multi Core DVB-T/T2	Fixed NLC
Correction Criterion	MER, Right/Left Shoulder, Group Delay, In-Band Flatness
Crest Factor Reduction (CFR)	Soft and Hard Clipping

NLC Performance
LC Performance

Typically 10dB MER Improvement (Dependent on PA model)
Up to ± 5 dB Amplitude and ± 500 ns Group Delay Correction

• Control & Monitoring

Monitoring & Control Connection Port
Remote User Interface
Firmware Upgrade Interface

1x RJ45 (10/100 Base-T), 1xRS232, 1xRS485, 1x Graphic LCD
WEB, SNMP v1/v2/v3
WEB, USB

• Physical

▪ Power Requirement

Operating Voltage 8~55 VDC
Power Consumption 25W max

▪ Dimension & Weight

Weight 400 g
Dimensions (W x H x D) 18 cm x 3.5 cm x 11 cm

▪ Environmental

Operating Temperature 0 ~ +50 °C
Storage Temperature -25 ~ +60 °C
Relative Humidity 95% (Non-condensing)

▪ Compliance

DVB ETSI 300744 – ETSI 302755
ASI DIN EN 500083-9
SFN ETSI TS 101 191

• Ordering

Model	Type
FNJ-DT2-Base	(Base System)
FNJ-DT2-IRD/RMX	(Remux and BISS Descrambler)
FNJ-DT2-TX CTRL	(Simple Transmitter Control)
FNJ-DT2-EXT PWR	(Extended output Power up to +10dBm)
FNJ-DT2-GPS	(GPS Receiver)
FNJ-DT2-T2x2	Dual DVB-T2 Mode
FNJ-DT2-Tx4	Quad DVB-T Mode



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