

3517A

ISDB-T OFDM MODULATOR



Type List

Type	Conforming Specifications	Dimensions (mm)
3517A-001	EIA	482.5(W)×44(H)×450(D)
3517A-002	JIS	480(W)×49(H)×450(D)

But, excluding projections.

General

This unit makes re-multiplex process and modulation process of ISDB-T system for input MPEG 2 TS, and output of OFDM wave of 13 segments as RF signal by built-in up-converter.

Also, multiplex process of PSI/SI is made at the time of re-multiplex process. And, corresponding to broadcasting TS input is made, so that input is made, so that input of broadcasting TS signal from external re-multiplexing device (RE-MUX device) is possible.

Features

- Equipping re-multiplexing function.
Re-multiplexing function is equipped, so that MPEG 2 TS not formed broadcasting TS can be input directly.
By input of only MPEG 2 TS to this unit, generation of signal to be able to receive by receiver is possible.
Transmission parameter, when re-multiplexing function (At the time of MPEG 2 TS input) is used, is possible to switch either "13 segments single layer" or "12+ 1 segments for partial reception".
- Equipping PSI/SI multiplexing function.
When re-multiplexing function of this unit (At the time of MPEG 2 TS input) is used, forming of PID block, TOT to input MPEG 2 TS and sending of PSI/SI are made.
- For PSI/SI setting, it is made by pre-downloaded one (Max. 8 kinds) through remote control with ETHERNET by switching in this unit.
- Automatic setting of each parameter by broadcasting TS.
In case of broadcasting TS input, each transmission parameter, such as MODE, guard interval rate, carrier modulation system of each layer, convolution coding rate and etc. is set automatically by IIP information in broadcasting TS.
- Corresponding to 1 segment (Partial reception).
Generation of signal corresponded to partial reception (12 + 1 segments) is possible.
- Built-in up-converter.
Up-converter is built-in, so that output of OFDM modulated wave to VHF/UHF (1 ~ 62 channel) and to MID/SHB of CATV (C13 ~ C63 channel) is possible. (Output level is 0 dBm / 75Ω fixed).
- Possible to synchronize with 10MHz from external.
To synchronize digital process part of this unit with 10 MHz from external is possible.
Up-converter part is impossible to synchronize with 10 MHz from external (Self-run by internal X' tal).
- Possible to output TS clock.
TS clock output to TS data generator is possible.
Output clock is byte clock (256/63MHz ÷ 4.063MHz).
- Equipping remote control function.
Ethernet (10 Base-T/100Base-TX) function is equipped, so that remote control of this unit and detailed setting of PSI/SI when re-multiplexing function is used (At the time of MPEG 2 TS input), can be made.
- Equipping contact output of alarm.
Contact output terminals for various alarm, such as monitoring result of each power source used in this unit and FAN alarm are equipped.

Composition

Main Unit 1
Weight	Approx. 5 kg
Accessories	
Power Cable (Including 3pin→2pin converter) 1
Instruction Manual and Test Result Sheet 1 set
Remote Control Software(Windows 2000, Windows XP exclusive) CD1
Power Source	
Input Voltage Allowable Range	: AC90V ~ AC250V (50Hz/60Hz)
Input Voltage Range	: AC100V ~ AC240V
Connector	: Rectangular 3P (with ground)
Power Consumption	: Approx. less than 50VA
Operating Environment	
Temperature	: 0°C ~ + 45°C
Humidity	: Less than 90%RH (No dew generation)

Rating

• TS Input [TS Input]

This is TS input terminal. Input of MPEG 2 TS or broadcasting TS is possible.

Connector	: BNC-R
Interface	: Conforming to DVB-ASI
Impedance	: 75Ω

• MPEG 2 TS Input

Automatic judgment for 188/204 bytes. It is needed that input MPEG 2 TS rate is less than 40 Mbps and actual rate of TS excluding NULL packet is less than transmission rate of transmission layer set by transmission parameter when re-multiplexing function is used.

Following list is actual rate of TS to be able to input to this unit at the time of default setting (Factory shipping setting).

Transmission Parameter	TS Actual Rate
13 segments single layer	Less than 18.255 Mbps
12+1 segments of partial reception	Less than 312.06Kbps

※At the time of MPEG 2 TS input (Re-multiplexing function is used), to take synchronization this unit with TS data generator is not needed.

• Broadcasting TS Input

Corresponded to broadcasting TS in Chapter 5 of "Annex Operating Guide of Terrestrial Digital Television Broadcasting" of ARIB STD-B31.

Automatic setting and renewal of each TMCC parameter setting of this unit is possible by added information (Dummy byte part of each transport stream and IIP : ISDB-T Information Packet) in broadcasting TS.

• Caution Item

- ① This unit is modulator of 13 segments format of ISDB-T. (This unit is not corresponded to ISDB-TSB 1 segment or broadcasting TS of 3 segments format).
- ② Correspondence to AC data in added information is not made. (AC data in output OFDM modulated wave are to be ALL 1)
- ③ Network information (network _ synchronization _ information) in IIP is data to be used for SFN broadcasting, so that this unit is not corresponded.
- ④ Parity (197th byte to 204th byte) of dummy byte part of each transport stream is not processed.
- ⑤ In case that added information is multiplexed to both dummy byte and IIP, added information of IIP is used.
- ⑥ In case that clock synchronization of broadcasting TS generator side is not taken by output TS clock from this unit, input of 10MHz synchronized with broadcasting TS generator side (synchronized with broadcasting TS) to this unit, is needed.

• 10 MHz Input [10 MHz INPUT]

This is frequency reference input of digital processing part of this unit. It has switching function of frequency reference internal (INT)/external (EXT).

In case of external (EXT) setting, synchronization of broadcasting TS is taken by 10 MHz input from this terminal.

In case of internal (INT) setting, TS clock output terminal of item 4,3 is connected to clock input terminal of TS data generator, and synchronization of broadcasting TS data is taken. In this case, TS data generator becomes slave operation.

※When re-multiplexing function is used (At the time of MPEG 2 input), taking synchronization this unit with TS data generator is not needed.

Connector	: BNC-R
Input Level	: Within 0dBm ± 3dB
Input frequency	: 10MHz
Input frequency Accuracy	: Within ± 1 ppm
	(Needed to synchronize with broadcasting TS)
Impedance	: 50Ω

• TS Clock Output [TS CLK OUTPUT]

This is TS clock (Byte clock) output. By connecting this output to clock input terminal of TS data generator, synchronization of broadcasting TS data is taken. In this case, TS data generator becomes slave operation. But, output is made only in case of "Internal (INT)" of clock setting of this unit.

※ When re-multiplexing function is used (At the time of MPEG 2 input), taking synchronization this unit with TS data generator is not needed).

Connector	: BNC-R
Output Level	: TTL
Output frequency	: 256/63MHz \div 4.0634MHz
Output frequency Accuracy	: Within \pm 50 ppm
Impedance	: 50 Ω

• RF Output [RF OUTPUT]

This is RF modulated wave output.

Setting possible Channel	: 1~62 channel and C13~C63 channel (Available 1/7 MHz off set)
Output Level	: 0dBm
Connector	: F-R
Impedance	: 75 Ω

Performance

Output Level Accuracy	: Within \pm 3dB
Output Return Loss	: More than 13dB (At 6MHz band of selected output channel)
Output Frequency Accuracy	: Within \pm 1ppm (In case that digital processing part is synchronized with external 10MHz)
IH	: Less than -45dB (At output center frequency \pm 3.3MHz offset)
Spurious	: Less than -60dBc (Referenced to total power appeared in 47~870KHz)

• RF Monitor Output [RF MONITOR]

This is monitor output of RF modulated wave output.

Output Level	: -20dBm
Connector	: F-R
Impedance	: 75 Ω

Transmission Parameter

• Parameter when re-multiplexing function is used (At the time of MPEG 2 TS input).

When re-multiplexing function is used (At the time of MPEG 2 TS input), transmission parameter of default setting (Factory shipping setting) is shown in below.

◆ 13 Segments Single Layer (Default setting) ◆

MODE	MODE 3
Guard Interval Rate	1/8
Layer Configuration	13 segments single layer
Carrier Modulation System	64 QAM
Convolution Coding Rate	3/4
Time Interleave Length	2

◆ 12+1 Segments for Partial Reception(Default setting) ◆

MODE	MODE 3
Guard Interval Rate	1/8
A Layer	1 segment (Partial reception)
Carrier Modulation System	QPSK
Convolution Coding Rate	1/2
Time Interleave Length	2
B Layer	12 segments
Carrier Modulation System	64QAM
Convolution Coding Rate	3/4
Time Interleave Length	2

※ MPEG 2 TS input to this unit is multiplexed to A layer. Also, data of B layer are NULL packet.

Change from default setting is made by remote control using attached remote control software.

Also, segment configuration is selected from 2 kinds, "13 segments single layer" and "12+ 1 segments for partial reception". For others, such as, carrier modulation system, convolution coding rate and etc. are selected from following list.

Layer Configuration		Carrier Modulation System	Convolution Coding Rate	Time Interleave Length	
				MODE 2	MODE 2
13 Segments Single layer	A Layer (13 segments)	16QAM	1/2, 2/3	2, 4, 8	1, 2, 4
		64QAM	1/2, 2/3, 3/4, 5/6, 7/8		
12 + 1 Segments for Partial Reception	A Layer (1 segments)	QPSK	1/2, 2/3		
		16QAM	1/2		
	A Layer (12 segments)	16QAM	1/2, 2/3		
		64QAM	1/2, 2/3, 3/4, 5/6, 7/8		

• Parameter at the time of Broadcasting TS Input

Transmission parameter corresponded by this unit at the time of broadcasting TS input is shown in below.

Segment Configuration	Free
MODE	MODE 2, MODE 3
Guard Interval Rate	1/4, 1/8, 1/16
Carrier Modulation System	QPSK, 16QAM, 64QAM ※ Not corresponded to DQPSK
Convolution Coding Rate	1/2, 2/3, 3/4, 5/6, 7/8
Time Interleave Length	0, 2, 4, 8 (MODE 2) 0, 1, 2, 4 (MODE 3)

• Alarm Output [ALARM]

This is contact output of alarm. Make at alarm.

Connector	Dsub 9 pin S (Fixing base 4- # 40 Inch screw)
Pin Assignment	Following list

Pin No.	Signal Name	Pin No.	Signal Name
1	Power Source Alarm +	6	Power Source Alarm -
2	Fan Alarm +	7	Fan Alarm -
3	TS Alarm +	8	TS Alarm -
4	Modulator Alarm +	9	Modulator Alarm -
5	GND		

• Ethernet [ETHERNET]

This is connecting terminal of Ethernet (10 Base-T/100 Base-TX with Auto_negotiation function)

Connector	RJ-45
Input/Output	Conforming to IETE 802.3
Protocol	TCP/IP