

FOR APPROVAL

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COMMODITY : HD DIVERSITY DVB-T MODULE FOR MOBILE APPLICATION

MODEL NUMBER: DTM-717HTW/HEU--01 SERIES (U+VH BAND)

ISSUE DATE : 28th,Nov 2011

T-NIM VERSION: V1.5

APPROVED DATE: _____

APPROVED SIGNATURES		
APPROVED	REVIEWED BY	CHECKED BY

1. GENERAL DESCRIPTION

This Spec covers diversity dual tuner DVB-T module intended for application of mobile system.

The module supports H.264 HD and MPEG2 HD DVB-T standard.

Lowest power consumption and smallest size with only 40(L)*80(W)*13(H) mm.

Features:

DC 5V power input

Fully comply with HD DVB-T MPEG2/MPEG4 AVC/H.264 Standard

Recording and playback TV programs with USB Disk.

Use DiBcom Dib9090M high performance NIM chip with diversity structure

Speed over 180km/h(HD)/230km/h(SD) min (at 8k, 64QAM,CR2/3.GI1/8,474MHz)

High Doppler effect correction

Provide antenna power supply function for pair use with mobile active antenna

Stores Over 500 TV & radio programs

+5V ANT. Power supply for active ANT.

Support PAL/NTSC/SECAM Video output

Favorite channel list editing

Support USB SW update /Media player

PIG (Picture in Graphic) support

On screen channel information

OSD Teletext (DVB ETS 300 706) and subtitle function support (EU model)

VBI Teletext support (EU model)

Fast scan for high speed driving and cross difference area

UART / IR Communication with host

USB playback supports as below video and audio format:

Video: RMVB, RM, Sorenson H.263, H.264, MPEG-1, 2, 4, VC1, Divx, Xvid, AVS, JPEG.

Audio: MP2, MP3, AC3, LPCM, ADPCM, AAC, HEAAC, WMA.

Remark: Some format need License, such as Divx, RMVB, AC3...

2. GENERAL SPECIFICATIONS

2 - 1	Receiving frequency range	UHF 470MHz ~ 862MHz VHF 174MHz ~ 230MHz
2 - 2	RF Input level	- 81dBm ~ -20dBm
2 - 3	RF Input connector	F terminal x2
2 - 4	Nominal input impedance	75 ohm
2 - 5	Channel selection system	Electronic tuning, PLL synthesizer
2 - 6	IF frequency	Zero IF (IQ)
2 - 7	Band width	6/7/8MHz (software selectable)
2 - 8	COFDM-Demod. IC	DiB9090M x2
2 - 9	Audio Output	1Vpp 47Kohm Adjustable With E Volume
2 - 10	Video Output	1Vpp +/- 0.3Vpp
2 - 11	Video Resolution	720*576@25fps/720*480@30fps
2 - 12	Operating voltage and current	
	Supply voltage & current	DC 5V: 610mA (5V) Max.
	Total watt	Running : 3.1W(5v) Max, Standby : 1.1W Max

2--13	Temperature	Operation	-10 °C ~ 50°C
		Storage	-20 °C ~ 70°C
2--14	Humidity	Operating	Less than 85%
		Storage	Less than 95%
2--15 TESTING CONDITION			
	Supply voltage		5V
	Ambient temperature		25 °C ± 5 °C
	Ambient humidity		65% ± 10%
2--16	Dimension		80(L)*40(W)*13(H) mm.
2-17	Weight		N.W. 43.5g±10%

3.ELECTRICAL CHARACTERISTICS

NO	Item	Specification				Condition
		Min	TYP	MAX	Unit	
3-1	ANT Input Return Loss	5	6		dB	170 ~ 230, 470 ~ 862MHz
3-2	ANT leakage at input terminal			46	dBuV	150 ~ 950MHz
				54	dBuV	950 ~ 1750MHz
3-3	RF Sensitivity (Min. Input level)			-81	dBm	8k, 64QAM, 2/3 Code Rate 1/32 Guard Interval C/N OFF
	Max. Input Level			-20		
3-4	Active White Gaussian Noise condition			18.7	dB	BER 2×10^{-4} , -50dBm Input 8k, 64QAM, 2/3 Code Rate 1/32 Guard Interval
3-5	DVB-T TO DVB-T Image Rejection	28	35		dB	Input : -50dBm
3-6	Adjacent PAL Interference Protection Ratio(N+1)	-33			dB	8k mode, Input : -50dBm,
	Adjacent PAL Interference Protection Ratio(N-1)	-33			dB	8k mode, Input : -50dBm,
	Adjacent DVB-T Interference Protection Ratio(N+1)	-28			dB	8k mode, Input : -50dBm,
	Adjacent DVB-T Interference Protection Ratio(N+1)	-28			dB	8k mode, Input : -50dBm,
3-7	Co-Channel PAL-I Interference Ratio C/I			+3	dB	8k mode,

4. UART COMMUNICATION SPEC

UART Configure	
Baud rate	115.2Kbps/others
Data Bit	8bits
Stop Bit	1bit
Parity Bit	none

V1.0

Cmd type = 0xA5: write 3 bytes command, only for key value send

Cmd type (0xA5)	Key	End (0x2A)
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start code_1byte

key data (hex_1byte)

end_1byte

ex) Menu Key select->hex data: A5852A

S=0xA5, K=0x85, E=0x2A

V2.0

First: Write Command

1: Write key

Cmd type = 0xA5:

Cmd type(0xA5)	Key	0x2A	Check sum
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Check sum = byte0(Cmd type) + byte1(such as key)+byte2(such as 0x2A)

Ex: power key code = 0x8A

0xA5	0x8A	0x2A	0x59(check sum)
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2: Write program number

Cmd type = 0xA6:

Cmd type(0xA6)	Data 0	Data1	Check sum
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Data0 = Program number High Byte

Data1 = Program number Low Byte

Check sum = byte0(Cmd type) + Data0+Data1

Ex: Write program number: 518 = 0x206

0xA6	0x02	0x06	0xAE(check sum)
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Second: Read Command

Send to dvb module:

Cmd type = 0xB3: Read

Cmd type(0xB3)	Data type	0	Check sum
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Data type: A certain kind of datas, see below

Echo bytes from dvb module:

Cmd type(0xB3)	Data type	Data(0..5)	Check sum
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Check sum = 0xb3+Data type + Data0+Data1+Data2+Data3+Data4+Data5

Ex: To read program number, for example: current dvb program number is 342 (=0x0156), strength=0x4d,

Quality = 0x2b, send the command as below:

B3	0	0	B3
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DVB module should return the data as below:

0xB3	0	0	0x01	0x56	0	0x4d	0x2b	0x82
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(Attention: you will receive many bytes, including the bytes you need, so, you should drop the junk bytes. How to get useful data?

The correct data start at b3 00, and the checksum is important, too.)

Data type 0:

Data0:

Standby or not	:1bit	bit0	//0:run, 1:standby
Antenna Power on or off	:1bit	bit1	//0:power on, 1:off
Current Service type	:1bit	bit2	//0:tv, 1:radio
Service Info: fav	:1bit	bit 3	//0:not fav, 1:fav
Service Info: lock,	:1bit	bit 4	//0:unlock,1:lock
Service Info:,skip	:1bit	bit 5	
Reserved	:2bit	bit6-7	

Data1:

CMMB status	/0:cmmmb, 1:mp4, 2: mp3, 3:pic, 4: game,bigger than 5:other
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Data2-Data3:

Current Service index	2bytes : Data0 = Index MSB, Data1= Index LSB
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Data4-Data5:

Current Frequency:	2bytes : Data0 = Freq MSB, Data1= Freq LSB
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Data type 1:

Data0:

Signal strength value	1bytes
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Data1:

Signal quality value	1bytes
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Data2-Data5:Reserved

Data type 2: Reserved for future

Data type 3: Reserved for future

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Basic R/C Key Data:

IR_HEADER_CODE0	0x80	// Custom 0
IR_HEADER_CODE1	0x7F	// Custom 1
IRKEY_AUDIO	= 0x9E,	
IRKEY_UP	= 0x80,	
IRKEY_POWER	= 0x8A,	
IRKEY_EXIT	= 0x87,	
IRKEY_MENU	= 0x85,	
IRKEY_DOWN	= 0x81,	
IRKEY_LEFT	= 0x83,	
IRKEY_SELECT	= 0x9F,	
IRKEY_RIGHT	= 0x82,	
IRKEY_NUM_0	= 0x90,	
IRKEY_NUM_1	= 0x91,	
IRKEY_NUM_2	= 0x92,	
IRKEY_NUM_3	= 0x93,	
IRKEY_NUM_4	= 0x94,	
IRKEY_NUM_5	= 0x95,	
IRKEY_NUM_6	= 0x96,	
IRKEY_NUM_7	= 0x97,	
IRKEY_NUM_8	= 0x98,	
IRKEY_NUM_9	= 0x99,	
IRKEY_MUTE	= 0x8C,	
IRKEY_PAGE_UP	= 0x9C,	
IRKEY_PAGE_DOWN	= 0x9D,	
IRKEY_INFO	= 0x89,	
IRKEY_RED	= 0x84,	
IRKEY_GREEN	= 0x8b,	
IRKEY_YELLOW	= 0x88,	
IRKEY_BLUE	= 0x86,	
IRKEY_TTX	= 0x8E,	
IRKEY_EPG	= 0x9B,	
IRKEY_RECORD	= 0x8F,	
IRKEY_SUBCODE	= 0xc4,	
IRKEY_AVTV	= 0xC0,	
IRKEY_SCAN	= 0x9a,	

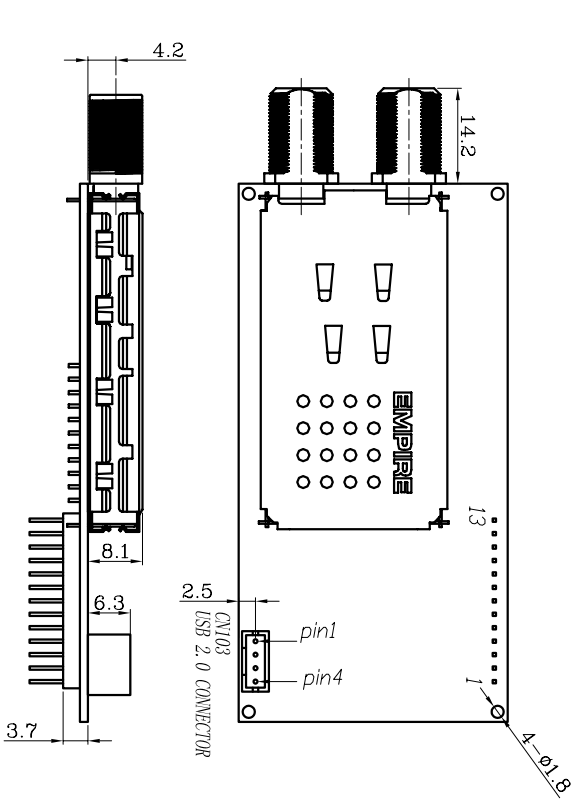
5. PIN DISCRPTION

CN102 (GENENAL I/O)

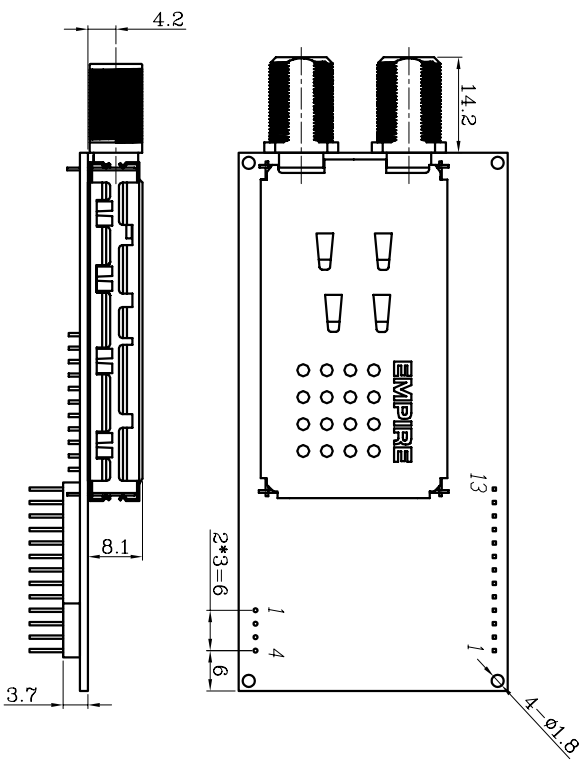
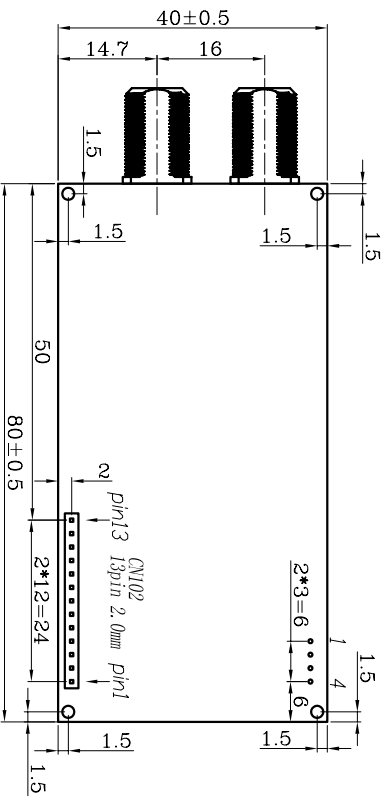
NO	I/O	NAME	DESCRIPTION
1	I	+5V IN	DC +5V Input
2	-	GND	Ground
3	-	NC	
4	O	NC	
5	O	CVBS	Video Output 1Vpp 75 ohm load
6	-	GND	Ground
7	O	L out	Audio Output L Channel
8	O	R out	Audio Output R Channel
9	-	GND	Ground
10	-	GND	Ground
11		IR(IN)	Remote Command Input
12	I/O	RX	UART input
13	I/O	TX	

CN103 (USB I/O)

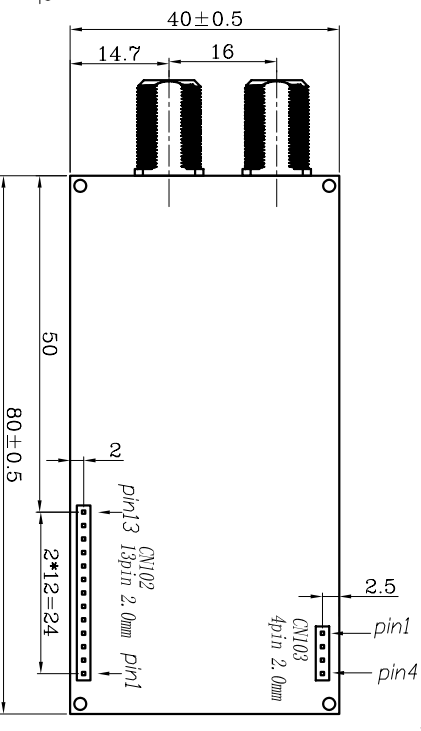
NO	I/O	NAME	DESCRIPTION
1	I	+5V IN	DC +5 Input
2	i/o	D -	USB D-
3	i/o	D+	USB D+
4	-	GND	GND



CN103 SOCKET Type



CN103 PIN Type



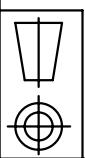
No.	NAME	DESCRIPTION
1	+5V	DC +5V IN
2	GND	Ground
3	NC	NC
4	NC	NC
5	CVBS	Video Output 1V _{pp} 75 ohm Load
6	GND	Ground
7	L OUT	Audio Output L Channel
8	R OUT	Audio Output R Channel
9	GND	Ground
10	GND	Ground
11	IR IN	Remote Command Input
12	RX	UART Input
13	TX	

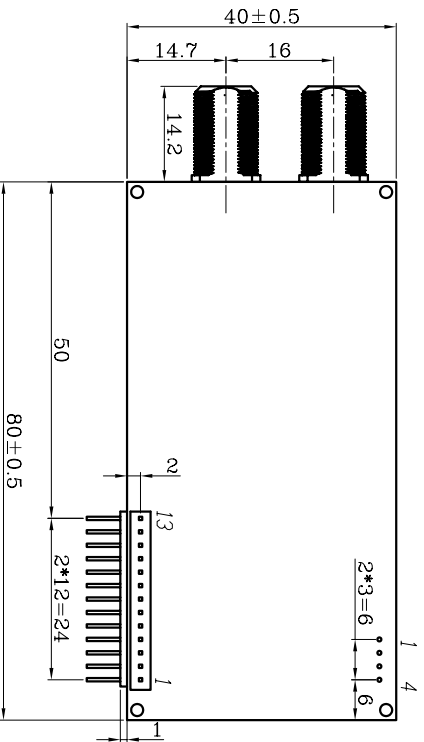
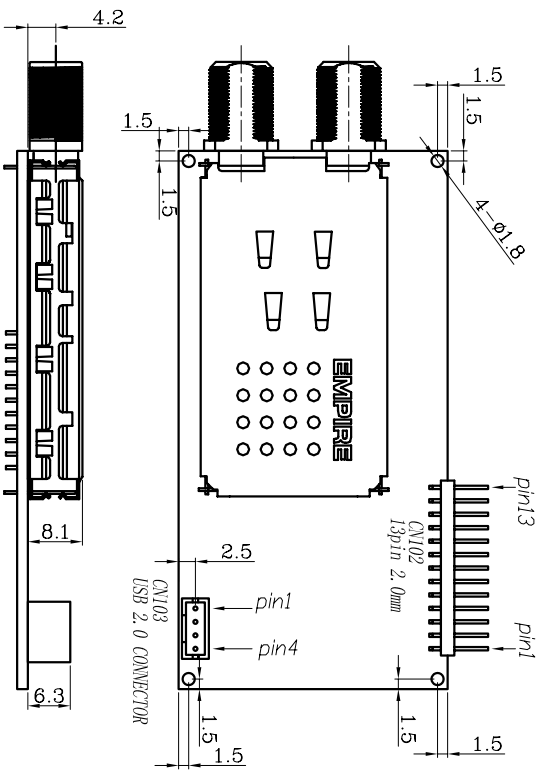
TOLERANCE

SUNSHINE (ZH) CO. LTD

UNIT:MM	F	G	H
< 8	±0.05	±0.10	±0.10
< 8-25	±0.08	±0.15	±0.15
< 25-80	±0.12	±0.20	±0.25
< 80-250	±0.25	±0.30	±0.40
< 250-800	±0.50	±0.60	±0.80

NAME: PCB	MODEL NO: DTM-717HTW
PART NO:	SCALE: FIT
COLOR:	FINISH:
MATERIAL:	DATE: 2011/11/29
SHEET 1 OF 1	DRAWING NO:
APPROVED:	CHECKED:
APPV'D: Qln	BRVW'D: Qln
REVISION	00





No.	NAME	DESCRIPTION
1	+5V	DC +5V IN
2	GND	Ground
3	NC	NC
4	NC	NC
5	CVBS	Video Output 1V _{pp} 75 ohm Load
6	GND	Ground
7	L OUT	Audio Output L Channel
8	R OUT	Audio Output R Channel
9	GND	Ground
10	GND	Ground
11	IR IN	Remote Command Input
12	RX	UART Input
13	TX	

No.	NAME
1	+5V
2	DM
3	DP
4	GND

TOLERANCE				SUNSHINE (ZH) CO. LTD			
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UNIT: MM	F	G	H	NAME: PCB	MODEL NO: DTM-717-TW
< 8	±0.05	±0.10	±0.10	PART NO:	SCALE: FIT
< 8-25	±0.08	±0.15	±0.15	COLOR:	FINISH:
< 25-80	±0.12	±0.20	±0.25	MATERIAL:	DATE: 2011/11/29
< 80-250	±0.25	±0.30	±0.40	SHEET 1 OF 1	DRAWING NO:
< 250-800	±0.50	±0.60	±0.80	APPROVED:	CHECKED:
					DRAWN: Dal Qin
					REVISION
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