

FOR APPROVAL

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COMMODITY : ATSC MODULE

MODEL NUMBER: DTM-805HAM SERIES

ISSUE DATE : 07th, Aug. 2012

T-NIM VERSION: V1.1

APPROVED DATE: _____

APPROVED		SIGNATURES	
APPROVED	REVIEWED BY	CHECKED BY	

1. GENERAL DESCRIPTION

This Specification covers ATSC DTV+ Open Cable module(optional) intended for application of car or portable system in USA/Canada/Mexico/Korea.

The module compliant with ATSC A/153 VSB standard for American DTV.

2. GENERAL SPECIFICATIONS

2 - 1	Receiving frequency range	UHF 470MHz ~ 806MHz VHF 54MHz~88/174-216MHz
2 - 2	RF Input level	-84 ± 3dBm@ 8VSB(ATSC)/ -79 ± 3dBm(64QAM)
2 - 3	RF Input connector	F TERMINAL/Cable/ RF Socket(U.FL-R-SMT)
2 - 4	Nominal input impedance	75/50 ohm
2 - 5	Channel selection system	Electronic tuning , PLL synthesizer
2 - 6	Video output	Composite CVBS
2 - 7	Video output level	1Vpp 75ohm
2 - 8	Video Decoder	MPEG
2 - 9	Video Resolution	720X480 pixels ATSC Air/Cable
2 - 10	Audio output	Analog stereo R/L CH
2 - 11	Audio Decoder	MPEG-1 audio Layer II
2 - 12	Command Interface	I2C/UART(Optional)
2 - 13	RF and Demod. IC	NM130+SAMSUNG Demo
2 - 14	Power Consumption	2.1W Max.(5V 420mA Max.)
2 - 15	Operating voltage	DC 5V
2 - 16	Dimension	80(L)x40(W)x11(T) mm
2 - 17	Temperature	Operation -10 °C ~ 60°C Storage -20 °C ~ 70°C
2 - 18	Humidity	Operating Less than 85% Storage Less than 95%

3. Pin Description:

CN13

Pin NO.	Name	Description
1	AUD_L_OUT	Analog audio Left output
2	AUD_R_OUT	Analog audio Right output
3	GND	Ground
4	CVBS	Composite video output
5	Y_OUTPUT	Y of YC Output 1Vpp 75ohm
6	C_OUTPUT	C of YC Output 0.3Vpp 75ohm
7	GND	Ground
8	RX	UART_RX (Up grade)
9	TX	UART_TX (Up grade)
10	SCL	I2C Clock
11	SDA	I2C Data
12	GND	Ground
13	VCC	Power In +5V

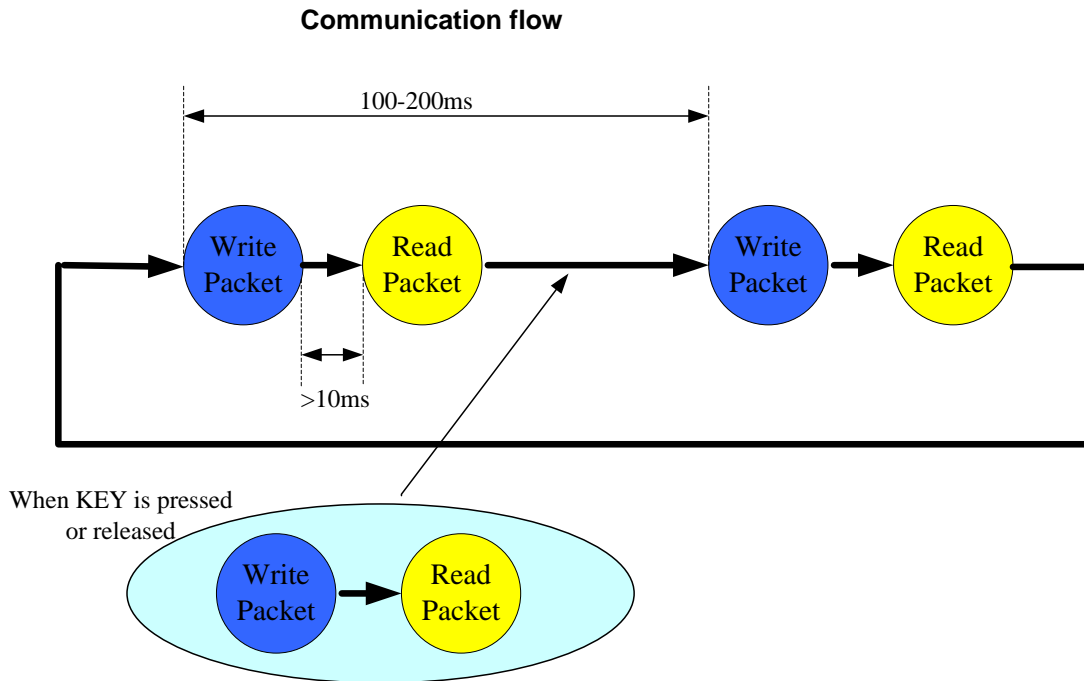
CN101(NC/Optional)

Pin NO.	Name	Description
1	Pr_out	Pr output 0.7vpp 75 ohm(option)
2	Pb_out	Pb output 0.7vpp 75 ohm(option)
3	Y_out	Y output 1vpp 75 ohm(option)
4	GND	Ground
5	SPDIF_OUT	SPDIF output (option)

CN1(NC/Optional)

Pin NO.	Name	Description
1	GND	Ground
2	GND	Ground
3	GND	Ground

4. I2C PROTOCOL:



Suggested I2c bus speed: $\leq 40\text{kHz}$

I2C Address

Read Address :0x63

Write Address :0x62

IIC_KEY_NODEF: 0

A. Functions:

dtvI2C_dummyWrite(): Read One Byte From Module.

dtvI2C_commandWrite(): Write Command To Module,

[write address, operate code, commandcode, checksum]

[checkSum=write address+operateCode+commandCode]

[operation Code=0x12]

SendKeyPacket(): Send command to Module.

[dtvI2C_dummyWrite(), dtvI2C_commandWrite()]

SendNoKey(): Send command end to Module.

ATSC_PowerOn : Open command interface on Module.

[operation Code=0x04, commandCode =0x08]

B: Example :

Startup:

```
ATSC_PowerOn();
```

```
While(haskey){
```

```
    SendKeyPacket(keyValue);
```

```
    [wait about 200ms];
```

```
    SendNoKey();
```

```
}
```

```

static void dtvl2C_dummyWrite(void)
{
    unsigned char i;
    for (i=0;i<3;i++){
        StartCondition();
        if (Send_Byte(READ_ADRESS)) StopCondition();
        else {
            Read_Byte(1);
            StopCondition();
            break;
        }
    }
}

static void dtvl2C_commandWrite(uCHAR operateType,uCHAR KeyValue)
{
    unsigned char i;
    unsigned char index = 1;
    unsigned char number = 3;
    unsigned char checksum = 0;

    SendBuff[0]=WRITE_ADRESS;
    SendBuff[1]=operateType;
    SendBuff[2]=KeyValue;

    for (i=0;i<3;i++)
        checksum = checksum + SendBuff[i];
    SendBuff[3] = checksum;

    for (i=0;i<3;i++){
        StartCondition();

        if (Send_Byte(WRITE_ADRESS)) StopCondition();
        else{
            while (number){
                if (Send_Byte(SendBuff[index])) break;
                number--;
                index++;
            }
            StopCondition();
            if (!number) break;
        }
    }
}

```

```

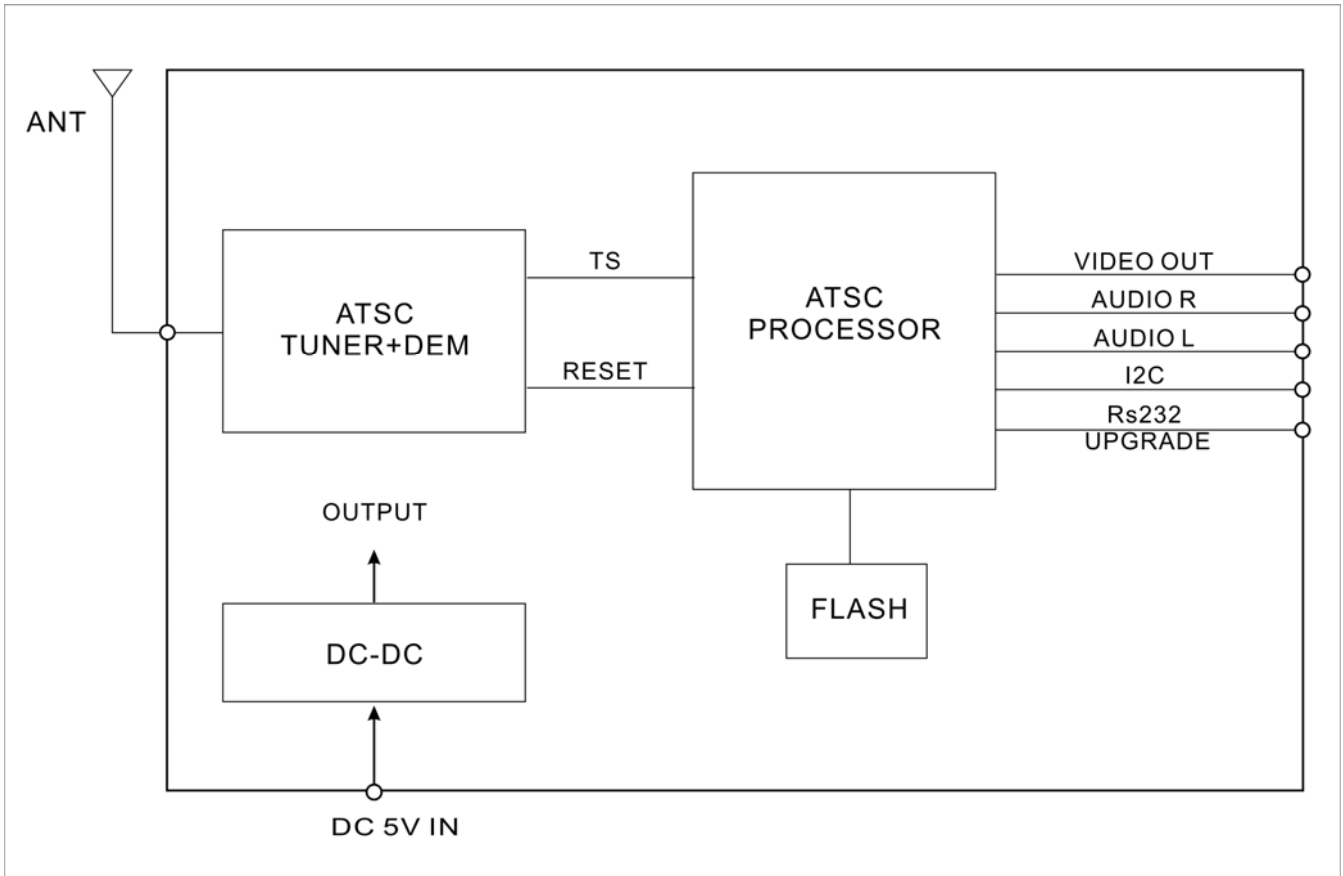
    }
}
static void SendKeyPacket(uCHAR KeyValue)
{
    dtvI2C_dummyWrite();
    dtvI2C_commandWrite(0x12,KeyValue);
}
void SendNoKey(){
    SendKeyPacket(IIC_KEY_NODEF);
}
void ATSC_PowerOn(void)
{
    dtvI2C_dummyWrite();
    dtvI2C_commandWrite(0x04,0x08);
}

```

KEY Value:

0x00	No Key	0x12	power on
0x85	menu	0xf9	exit(woo)
0xa6	cursor up	0xa7	cursor down
0xa9	cursor left	0xa8	cursor right
0xce	1	0xcd	2
0xcc	3	0xcb	4
0xca	5	0xc9	6
0xc8	7	0xc7	8
0xc6	9	0xcf	0
0xd8	enter(Fas) -	0x83	mute
0x87	ok	0x18	Page UP
0xd7	Page DN	0x0b	TV/AV
0x88	favorite	0x81	information
0x80	EPG	0x82	CCD
0x86	recall	0xe0	Audio Mode

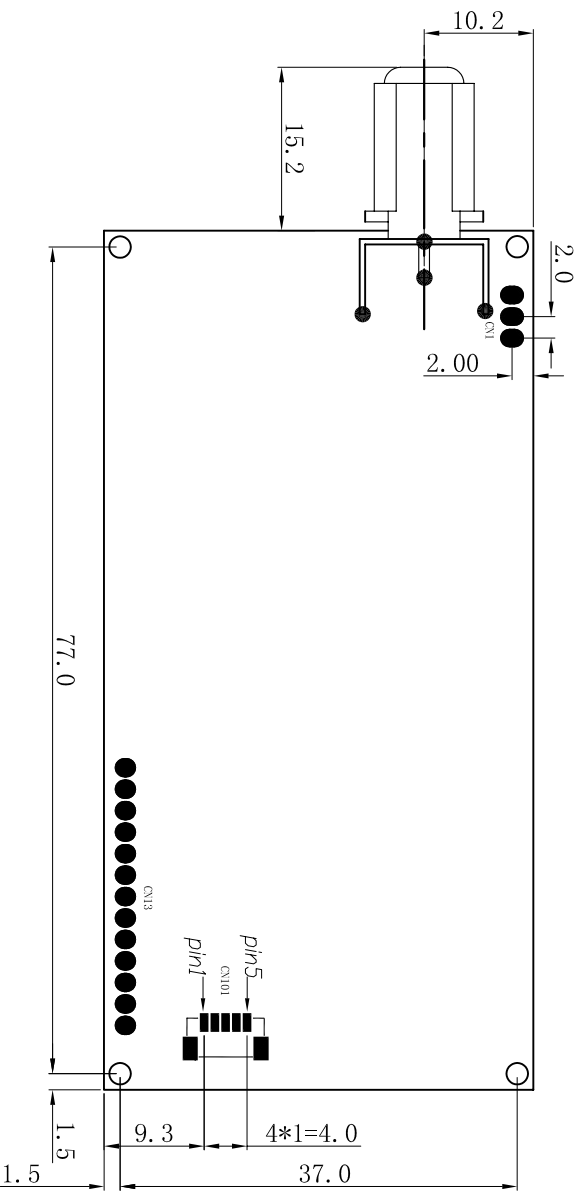
5. BLOCK DIAGRAM



6. SAFETY AND RELIABILITY

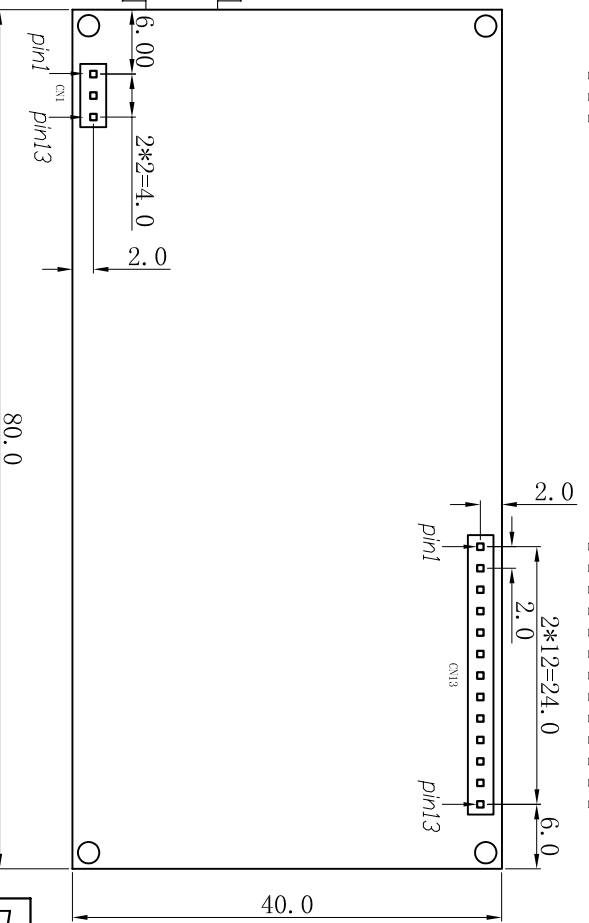
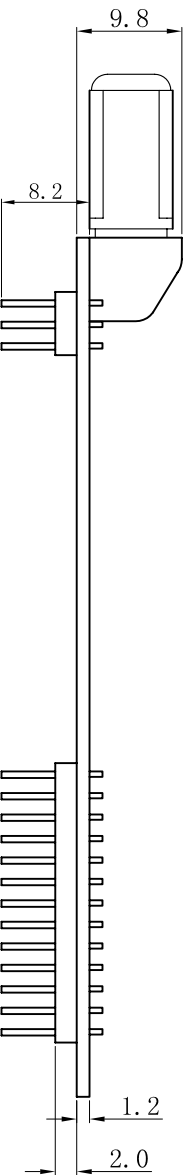
No.	ITEM	TEST CONDITIONS	SPECIFICATIONS
1	COLD TEST	-20°C, 96 HR	Gain Variation: $\pm 3\text{dB}$ Wave Variation : $\pm 30\%$
2	HIGH TEMPERATURE LOAD TEST	+60°C, 96 HR WITH STD POWER SUPPLY	
3	HUMIDITY TEST	+40°C ,95%RH, 96 HR	
4	HUMIDITY & TEMPERATURE LOAD TEST	+40°C ,95%RH, 96 HR , WITH STD POWER SUPPLY	
5	VIBRATION TEST	Frequency ranging from 5 to 55Hz, amplitude 2mm, 40 minutes in each direction of X,Y,Z.	

6	Life Test	<p>1) Take measurements in standard test condition.</p> <p>2) Leave samples for 1000 hours, in nominal ambient with standard power supply.</p> <p>3) Take measurements within 1 hour.</p>	
7	ESD protection	<p>1) The tuner contains components that can be damaged by static discharge.</p> <p>2) Observe these precautions.</p> <p>3) Ground yourself before handling the tuner.</p> <p>4) Do not touch the tuner connector pins without ESD protection</p>	



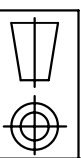
CN1			
No.	NAME	DESCRIPTION	
1	GND	Ground	
2	GND	Ground	
3	GND	Ground	

CN13			
No.	NAME	DESCRIPTION	
1	L_OUT	Audio Output L Channel	
2	R_OUT	Audio Output R Channel	
3	AGND	Ground	
4	CVBS_OUT	Video Output 1V _{pp} 75 Ohm Load	
5	Y_OUT	Y of YC(S-Video) 1V _{pp} 75 Ohm Load	
6	C_OUT	Y of YC(S-Video) 0.3V _{pp} 75 Ohm Load	
7	AGND	Ground	
8	RX	UART(optional)	
9	TX		
10	SCL		I ² C Clock
11	SDA	I ² C Data	
12	GND	Ground	
13	VCC	Power In +5v	



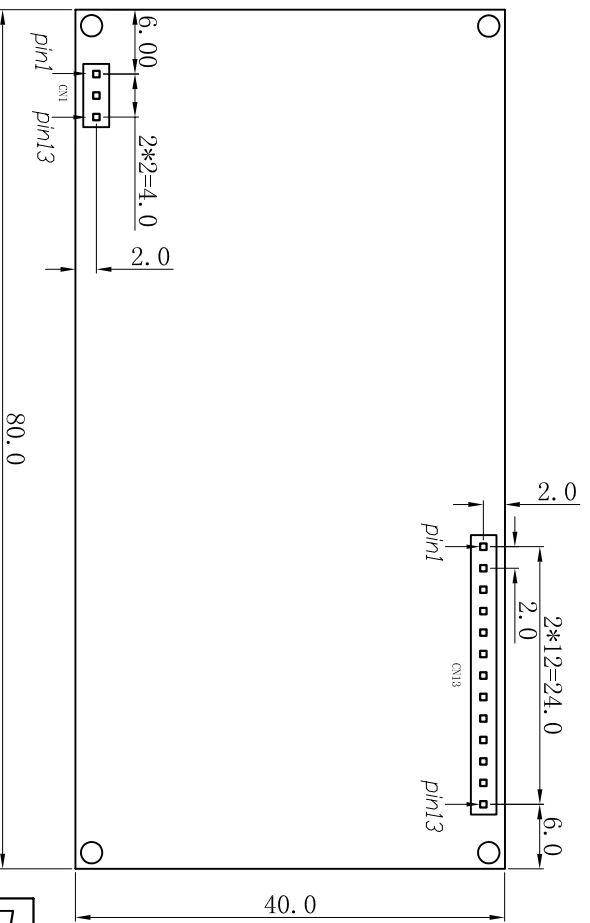
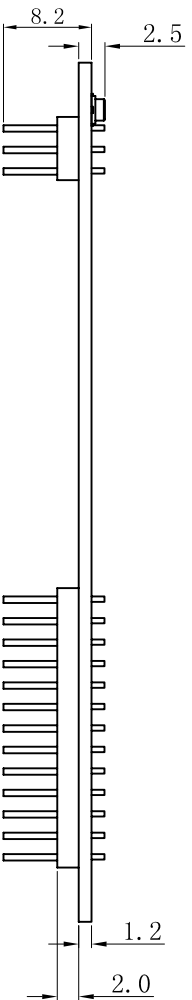
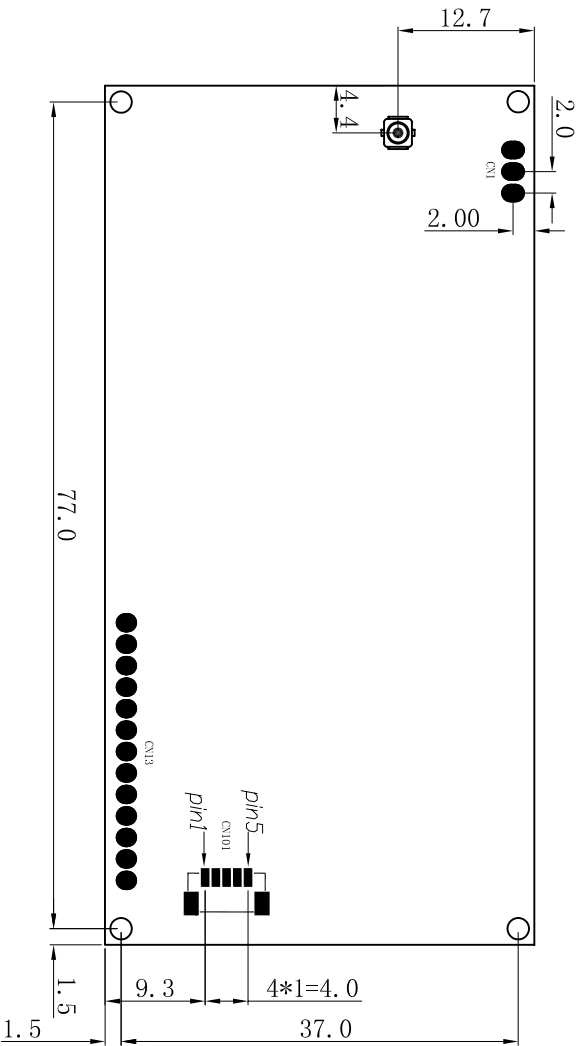
CN101			
No.	NAME	DESCRIPTION	
1	Pr_OUT	Pr Output 0.7V _{pp} 75 Ohm Load	
2	Pb_OUT	Pb Output 0.7V _{pp} 75 Ohm Load	
3	Y_OUT	Y Output 1V _{pp} 75 Ohm Load	
4	GND	Ground	
5	SPDIF_OUT	Spdif Out	

PARTS NO:
DTM-805HAM F TERMINAL & I²C/UART (optional)



TOLERANCE				SUNSHINE (ZH) CO. LTD			
UNIT: MM	F	G	H	NAME: PCB	MODEL NO: DTM-805HAM		
< 8	±0.05	±0.10	±0.10	PART NO:	SCALE: FIT		
< 8-25	±0.08	±0.15	±0.15	COLOR:	FINISH:		
< 25-40	±0.12	±0.20	±0.25	MATERIAL:	DATE: 2012-04-08		
< 50-250	±0.25	±0.30	±0.40	SHEET 1 OF 1	DRAWING NO:	DRAWN: 戴勤	REVISION
< 250-800	±0.50	±0.60	±0.80	APPROVED:	CHECKED:		00

CN1	No.	NAME	DESCRIPTION
	1	GND	Ground
	2	GND	Ground
	3	GND	Ground



CN13	No.	NAME	DESCRIPTION
	1	L_OUT	Audio Output L Channel
	2	R_OUT	Audio Output R Channel
	3	AGND	Ground
	4	CVBS_OUT	Video Output 1V _{pp} 75 Ohm Load
	5	Y_OUT	Y of YC(S-Video) 1V _{pp} 75 Ohm Load
	6	C_OUT	Y of YC(S-Video) 0.3V _{pp} 75 Ohm Load
	7	AGND	Ground
	8	RX	UART(optional)
	9	TX	
	10	SCL	
	11	SDA	I ² C Clock
	12	GND	I ² C Data
	13	VCC	Ground
			Power In +5v

CN101	No.	NAME	DESCRIPTION
	1	Pr_OUT	Pr Output 0.7V _{pp} 75 Ohm Load
	2	Pb_OUT	Pb Output 0.7V _{pp} 75 Ohm Load
	3	Y_OUT	Y Output 1V _{pp} 75 Ohm Load
	4	GND	Ground
	5	SPDIF_OUT	Spdif Out

PARTS NO:

DTM-805HAM-01 RF JACK & I²C/UART(optional)

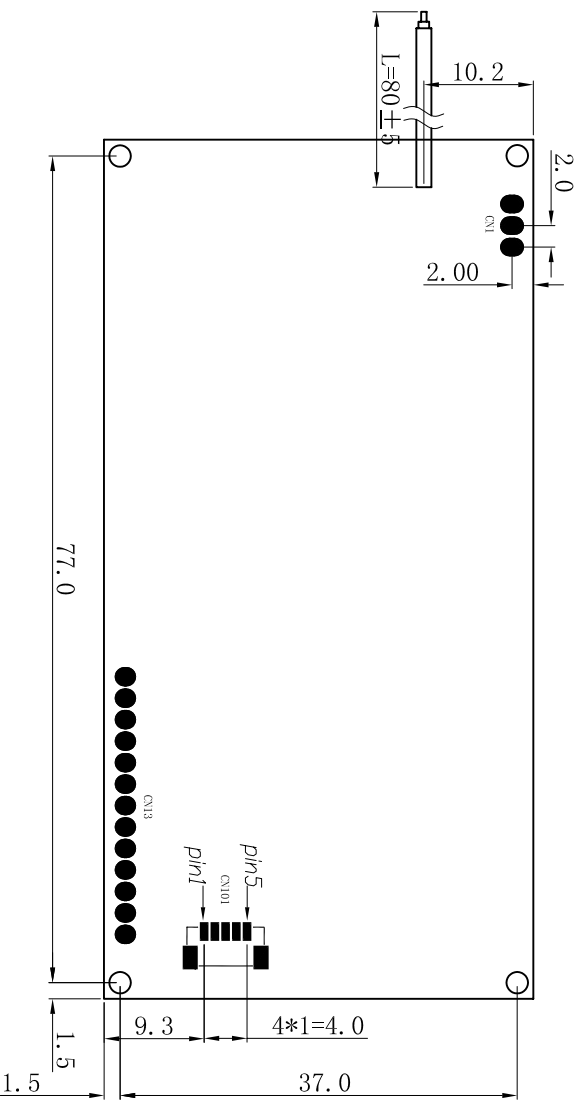
TOLERANCE

UNIT: MM	F	G	H
< 8	±0.05	±0.10	±0.10
< R-2.5	±0.08	±0.15	±0.15
< R-40	±0.12	±0.20	±0.25
< R-250	±0.25	±0.30	±0.40
< R-800	±0.50	±0.60	±0.80

SUNSHINE (ZH) CO. LTD

NAME: PCB	MODEL NO: DTM-805HAM-01
PART NO:	SCALE: FIT
COLOR:	FINISH:
MATERIAL:	DATE: 2012-04-08
SHEET 1 OF 1	DRAWING NO:
APPROVED:	CHECKED:
	DRAWN: 戴勤
	REVISION
	00

CN1	No.	NAME	DESCRIPTION
	1	GND	Ground
	2	GND	Ground
	3	GND	Ground



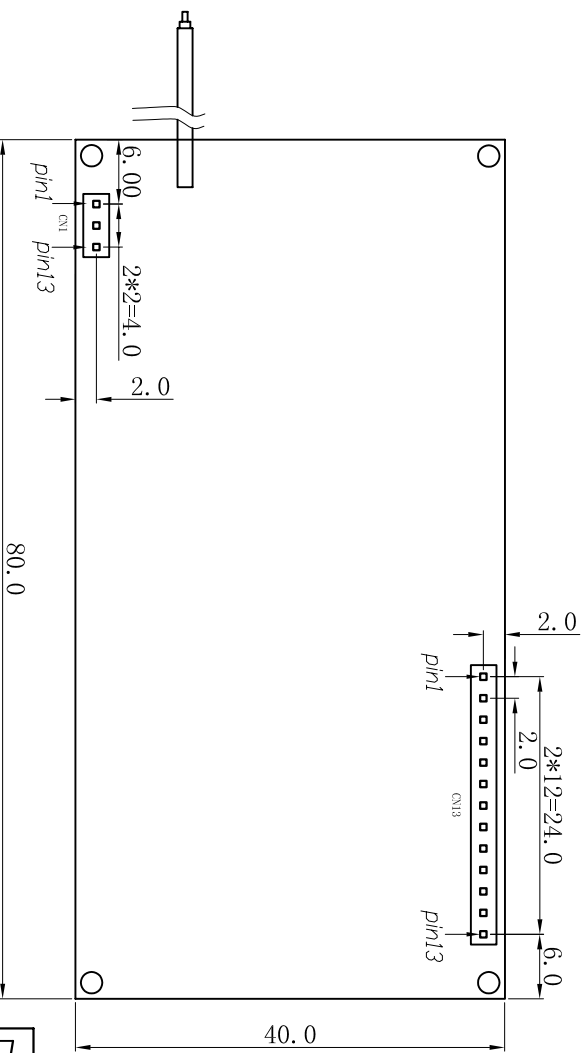
CN13	No.	NAME	DESCRIPTION
	1	L_OUT	Audio Output L Channel
	2	R_OUT	Audio Output R Channel
	3	AGND	Ground
	4	CVBS_OUT	Video Output 1V _{pp} 75 Ohm Load
	5	Y_OUT	Y of YC(S-Video) 1V _{pp} 75 Ohm Load
	6	C_OUT	Y of YC(S-Video) 0.3V _{pp} 75 Ohm Load
	7	AGND	Ground
	8	RX	UART(optional)
	9	TX	
	10	SCL	I ² C Clock
	11	SDA	I ² C Data
	12	GND	Ground
	13	VCC	Power In +5v

CN101

No.	NAME	DESCRIPTION
1	Pr_OUT	Pr Output 0.7V _{pp} 75 Ohm Load
2	Pb_OUT	Pb Output 0.7V _{pp} 75 Ohm Load
3	Y_OUT	Y Output 1V _{pp} 75 Ohm Load
4	GND	Ground
5	SPDIF_OUT	Spdif Out

PARTS NO:

DTM-805HAM--02 RF CABLE & I²C/UART (optional)



TOLERANCE

UNIT: MM	F	G	H
< 8	±0.05	±0.10	±0.10
< R-2.5	±0.08	±0.15	±0.15
< 25-40	±0.12	±0.20	±0.25
< 50-250	±0.25	±0.30	±0.40
< 250-800	±0.50	±0.60	±0.80

SUNSHINE (ZH) CO. LTD

NAME: PCB	MODEL NO: DTM-805HAM-02
PART NO:	SCALE: FIT
COLOR:	FINISH:
MATERIAL:	DATE: 2012-04-08
SHEET 1 OF 1	DRAWING NO:
APPROVED:	CHECKED:
	DRAWN: 戴勤
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