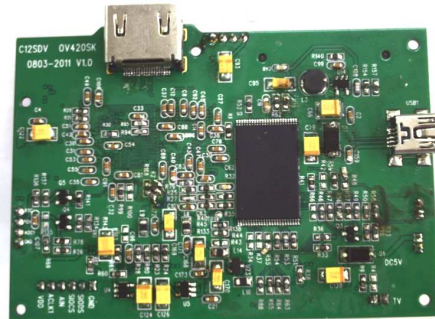## Introduction

This module has been designed to interface the micro camera muC301. It can be connected to HDMI TV monitor and display real time video at 720p. It performs still image capture and video recording, store files to SD card. It is good for desktop application.
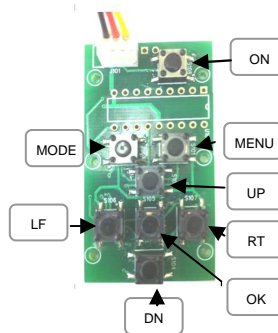

Key Features

- ✓ Interface to muC301
- ✓ Real time Video output, Support 720p
- ✓ Video display in center of screen / full screen
- ✓ One key for white balance tuning
- ✓ Manual capture JPG

- ✓ Image resolution 384*384
- ✓ Image quality fine tune possible
- ✓ AWB under different color temp
- ✓ Store to SD card, up to 16G
- ✓ Mass storage
- ✓ 5V or 3.7V Li-ion battery operated

Keyboard Design

8- Key design: power/mode/menu/UP/DN/LF/RT/OK

1. Power: power on the module
2. Mode: toggle playback or preview
3. Menu: for setup or quit the setup
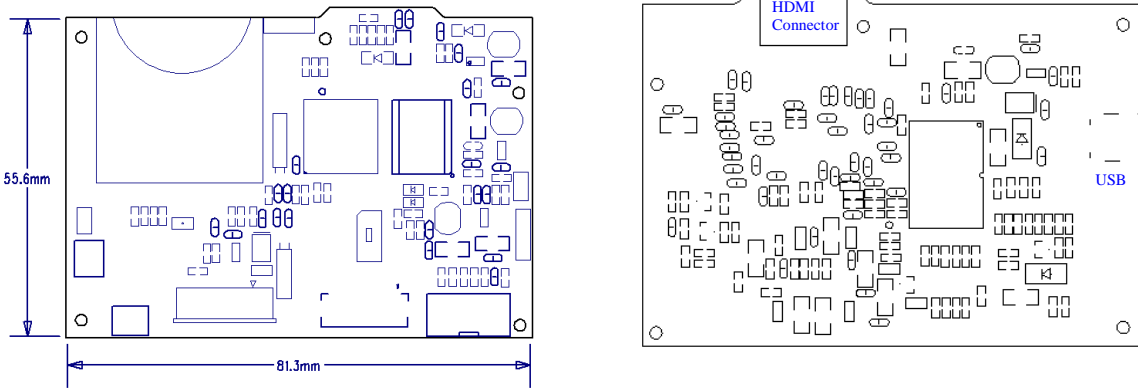4. LF/RT/UP/DN for item select
5. OK to confirm

Module Specifications

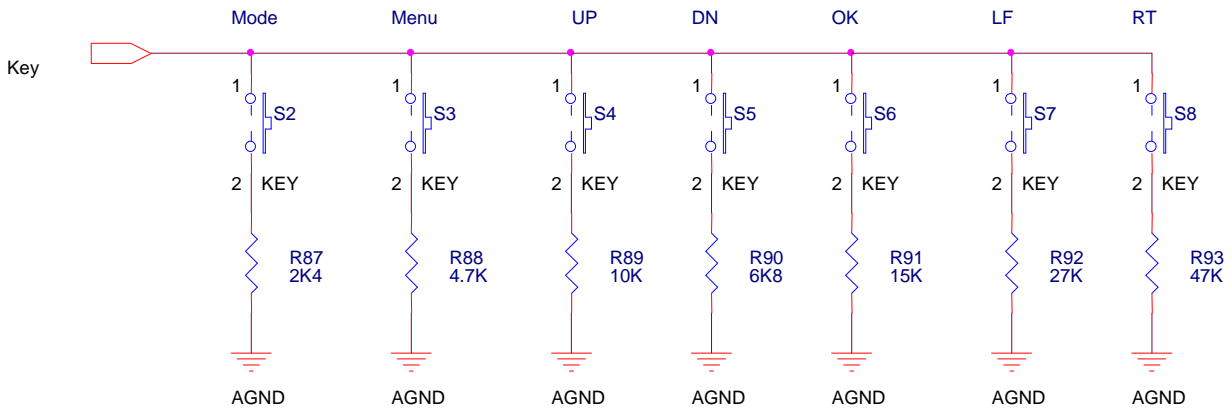| Board Dimension	81.3x55.6mm
Storage	External SDHC card up to 16GB
Video Capture	384*384 (30 fps) Unlimited capturing time depends on available memory space
Photo Resolution	384*384 JPEG format
USB Interface	Mass storage mode USB 2.0
Power	DC 5V/AAx4/Li-ion 3.7V battery

Electrical Characteristics

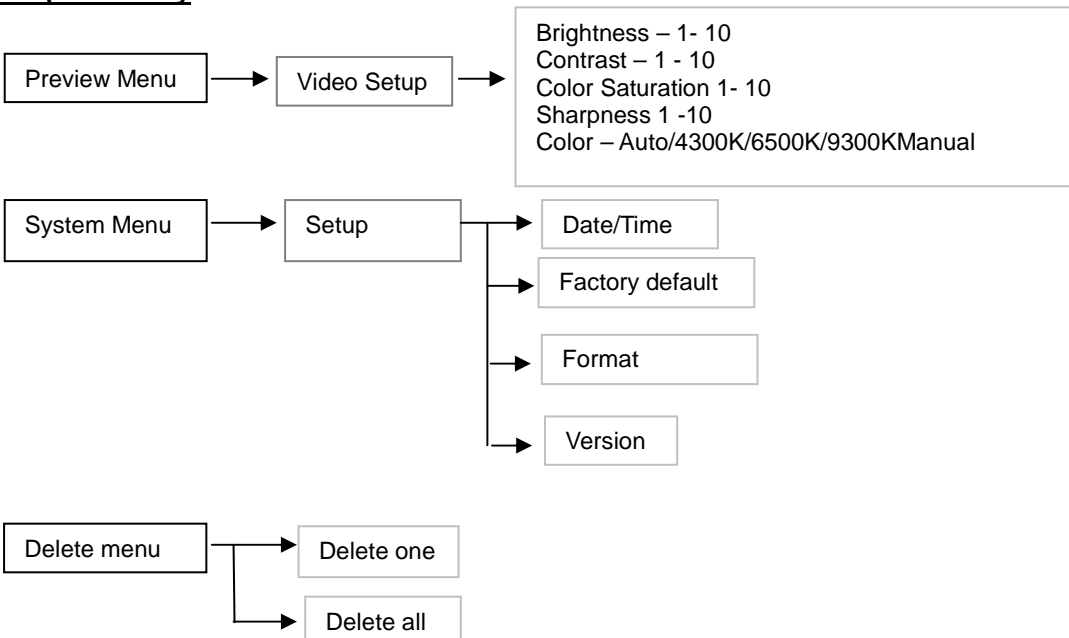| Parameter	Condition	Min.	Typ.	Max	Unit
Operation Voltage		3.7	5	6	V
Operation current	Preview				mA
	Capture JPG (Peak @ capturing)				mA
	Capture AVI (Peak @ recording)				mA
	Playback				mA

Mechanical Dimension

Keyboard Circuit

	Mode	Menu	UP	DN	OK	LF	RT
Key							
1	S2	S3	S4	S5	S6	S7	S8
2	KEY	KEY	KEY	KEY	KEY	KEY	KEY
	R87 2K4	R88 4.7K	R89 10K	R90 6K8	R91 15K	R92 27K	R93 47K
	AGND	AGND	AGND	AGND	AGND	AGND	AGND

Setup Summary

Preview Menu → Video Setup →

> Brightness – 1- 10
> Contrast – 1 - 10
> Color Saturation 1- 10
> Sharpness 1 -10
> Color – Auto/4300K/6500K/9300KManual

System Menu → Setup →
- Date/Time
- Factory default
- Format
- Version

Delete menu →
- Delete one
- Delete all

Operation:

On-off the module
Press once PWR key, the module will power on. By default it enters preview mode. Note the module needs to have the SD card for image recording. It will display a "?" logo if the card is not presented. It supports hot plug.

Preview mode
1. Press MODE to toggle between preview mode and playback mode.
2. Press LF to take a JPG picture.
3. Press RT to start recording AVI, press it again to stop recording. When memory is full, it will show "Memory Full".
4. Press UP to turn OSD on and off.
5. Press DN to do AWB according to the user's working condition. Before doing white balance, point the camera to the white paper and hold, press DN button once, it will do AWB. When the wordings "Auto White Balance" disappeared in the screen, means AWB has been done.
6. Press OK to switch display format full screen or 1:1

Menu
Press Menu key to enter parameter setup. Use UP/DN to select item, LF/RT to toggle value. Text in red means the current setting. Press Menu again to exit

```
INPUT SETTING -VIDEO

BRIGHTNESS        5
CONTRAST          5
SATURATION        5
SHARPNESS         5
COLOR          AUTO
EXIT
```

1. Brightness – 10 By default it is set to 3
2. Contrast: 1 - 10. By default it is set to 1
3. Color Saturation:1-10. By default it is set to 4
4. Sharpness: 1 - 10: By default it is set to 1
5. Color Mode: AUTO/4300K/6500K/9500K/Manual By default it is set at AUTO. User can change to other manual settings.
6. Exit: press ok, save the setting and quit this menu. When next time power on the device, it will load the previous settings as default. If it is not exit properly, the setting will not be stored.

Playback Operation
1. Press mode to toggle between preview mode and playback mode.
2. If no SD card is presented, it will show no files and enter preview mode
3. Files are displayed in thumbnail of 6 photos. Press LF/RT to move to previous or next file, press OK to display current file in full screen.
4. When file is selected, press UP to turn OSD on and off. Press OK to start playing AVI.
5. At playing AVI, LF for backward, OK to stop. Use DN to pause / resume.
6. When backward playing, press RT to forward playing.
7. Delete file: press Menu to select delete one or delete all, confirmation is required.

```
[thumbnail grid]
10/21/2010    10/21/2010    10/21/2010
09.00 0001    10.00 0002    11.00 0003

10/21/2010    10/21/2010    10/21/2010
12.00 0004    13.00 0005    16.00 0006
           PICT0006.AVI
```

Menu
1. Use UP/DN key to select, use OK to confirm select
2. Sub-menu will prompt for confirmation when deleting. Always set default value to Cancel, use UP/DN to move cursor, OK to confirm and quit.

```
Playback                Delete One

Delete One
Delete All                 Cancel
                           Confirm

Exit
```

Note: all files are saved under the folder called DCIM. The files will be saved under the sub-folder with the name start from 100IMAGE, each folder contents 1000 files.
File names will be PICT0001.JPG, PICT0002.AVI … PICT1000.JPG

PC Connection
The module can be connected to PC thru USB port and perform as mass storage device. When connected, the display will show "PC Connected"

System Setup

1. Press and hold the MENU key for 5sec until enter system setup menu. Use UP/DN key to select, use LF/RT key to toggle the selection, use OK to confirm.
2. Setup
   2.1 Date Time: the system has built-in the real time clock, and time stamping to the image, enter the correct date time is essential for the system. Press OK to enter date time setting. Use UP/DN to increase/decrease digit, LF/RT to shift next field, OK to confirm.
   2.2 Factory default: restore factory default settings.
   2.3 Format: to format the SD card, need confirmation
   2.4 Version: check current F/W version.

```
SETUP - SYSTEM

DATE/TIME
FACTORY DEFAULT
FORMAT
VERSION

EXIT
```

```
DATE TIME

        YY MM DD
        2007 01 01
        HH MM SS
        12 : 00 : 00

EXIT
```

Keys Operation matrix

	Preview	Playback (Thumbnail)	Playback single file
Mode	Change to playback	Change to preview	Playback (thumbnail)
Menu	Enter setup Menu	Select file	Delete menu
UP	Turn on/off OSD	Previous 3 file	Turn on/off OSD
DN	AWB	Next 3 file	-
LF	Capture JPG	Previous file	Previous file
RT	Start/stop AVI	Next file	Next file
OK	Full/1:1	Select current file	Start playing AVI

	Playing AVI	Set up Menu	Date time setting
Mode	Enter playback mode	Enter playback mode	Enter playback mode
Menu	-	Quit menu mode	Quit menu mode
UP	Turn on/off OSD	Select item	Increase digit
DN	Pause/resume	Select item	Decrease digit
LF	Backward	Select setting	shift to previous
RT	Forward	Select setting	shift to next
OK	Stop	Confirm and quit	Confirm and quit