

51C7 CPU

User's Manual

Ver 021111

Shi Nichi Electronic Device(H.K.) LTD.
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Main Functions

- Receive signal range from 48.25MHz up to 863MHz
- RF support PAL/SECAM DK/I/BG
- Video input support PAL4.43/NTSC3.58/NTSC4.43/SECAM and Vertical scan 50Hz/60Hz
- Two AV input one S-VIDEO input one AVoutput
- AV or S-VIDEO optimal mono/stereo balance control
- White balance, black balance and horizontal /vertical scanning adjusted in digitalized way
- NTSC auto flash
- With many improving picture quality functions: Coring, Black level extension, gamma correction, etc.
- Compensate vertical size due to the variation of contrast
- No frash on screen at shut off
- Optional 7 languages on screen display (OSD) including English, Arabic, French, Italian, German, Russian and Spanish.
- With beautiful icon in the top level of menu system
- Auto adjust OSD position under PAL or NTSC, Auto adjust OSD in variable languages.
- Changeable Logo (character, size, color, OSD position changeable), max 2 line with each line max 10 character.
- Full function remote control
- Max stored channel 100 or 200 optional
- Channel scanning/ channel RECALL return to the last chancel , Plug and search with one key and power on auto search
- Full functions of turn on/off timers and auto change channel
- Picture setting preset mode Vivid, Standard, Soft, Save, User
- Teletext Support (Optional with many languages)
- Support SECAM system Optional

Key Devices

1	LC863332 Sanyo MCU for CTV(32K ROM)	42 pins	1 pcs
2	LA76810A One-chip decoder	54 pins	1 pcs
3	LC7461M Sanyo 32key RC	24 pins	1 pcs
4	SPS-443-1-E Ir module	3 pins	1 pcs
5	LA7840 or LA78040 vertical drive	7 pins	1 pcs
6	LA4277 volume/tone control 5W audio amplifier (stereo)	10 pins	1 pcs
	LA4267 3W audio amplifier(mono)(pin compatible with LA4277)	10 pins	1 pcs
7	2SC3468 or 2SC4217 hor. driveer transistor		1 pcs
8	2SD2624 or 2SD2578 hor. Output transistor		1 pcs
9	2SC2789 or 2SC4075 R/G/B amplifier		3 pcs
10	24C08 EEPROM	8 pins	1 pcs
11	4053 analog Switch	16 pins	2 pcs
12	STV5348 ST Teletext decode 8 页 optional		1 pcs
13	LA7642N SANYO SECAM IC optional		1 pcs

Pin Assign

1	<input type="checkbox"/>	50/60	Band1	<input type="checkbox"/>	42
2	<input type="checkbox"/>	WOOF	Band2	<input type="checkbox"/>	41
3	<input type="checkbox"/>	S-VHS	TV/AV	<input type="checkbox"/>	40
4	<input type="checkbox"/>	VOLUME-R	AV1	<input type="checkbox"/>	39
5	<input type="checkbox"/>	VOLUME-L	AV2	<input type="checkbox"/>	38
6	<input type="checkbox"/>	SCART	BAND3	<input type="checkbox"/>	37
7	<input type="checkbox"/>	POWER	MUTE	<input type="checkbox"/>	36
8	<input type="checkbox"/>	VT	NC	<input type="checkbox"/>	35
9	<input type="checkbox"/>	GND	IR	<input type="checkbox"/>	34
10	<input type="checkbox"/>	Xtal 1	SD	<input type="checkbox"/>	33
11	<input type="checkbox"/>	Xtal 2	LNA SW	<input type="checkbox"/>	32
12	<input type="checkbox"/>	VDD	ENABLE	<input type="checkbox"/>	31
13	<input type="checkbox"/>	KEY IN	I2C CLK	<input type="checkbox"/>	30
14	<input type="checkbox"/>	AFT IN	I2C DATA	<input type="checkbox"/>	29
15	<input type="checkbox"/>	SECAM	EEPROM CLK	<input type="checkbox"/>	28
16	<input type="checkbox"/>	NC	EEPROM DATA	<input type="checkbox"/>	27
17	<input type="checkbox"/>	Reset	NC	<input type="checkbox"/>	26
18	<input type="checkbox"/>	Filt	OSD BLANK	<input type="checkbox"/>	25
19	<input type="checkbox"/>	NC	OSD B	<input type="checkbox"/>	24
20	<input type="checkbox"/>	V-Sync	OSD G	<input type="checkbox"/>	23
21	<input type="checkbox"/>	H-Sync	OSD R	<input type="checkbox"/>	22

Pin Assign:

Pin	port	assign	function
1	P10/SO0	50/60	Vert. 50/60 output
2	P11/SI0	Woof ON/OFF	Woofer switch
3	P12/SCK0	S-VHS	S-Video input signal
4	P13/PWM1	VOLUME-R	Volume PWM out (right)
5	P14/PWM2	VOLUME-L	Volume PWM out (left)
6	P15/PWM3	SCART	SCART input signal
7	P16	POWER	POWER control out
8	P17/PWM	VT	Tuning14Bit PWM out
9	VSS	GND	Ground
10	XT1	XTAL 1	CPU xtal1
11	XT2	XTAL 2	CPU xtal2
12	VDD	VDD	VDD +5V
13	P84/AN4	KEY IN	Key input signal
14	P85/AN5	AFT IN	AFT signal in
15	P86/AN6	SECAM	SECAM detect
16	P87/AN7	NC	Reserved
17	RESET	RESET	CPU reset
18	FILT	FILT	OSD filter
19	P83/AN3	NC	Reserved
20	VS	V-SYNC	V sync. input
21	HS	H-SYNC	H sync. Input
22	R	R OUT	OSD Red signal
23	G	G OUT	OSD Green signal
24	B	B OUT	OSD Blue signal
25	BL	BLANK	OSD Blanking signal
26	I	NC	Reserved
27	P60/SDA0	SDA0	IIC data for EEPROM
28	P61/SCLK0	SCL0	IIC clock for EEPROM
29	P62/SDA1	SDA1	IIC data for other IC
30	P63/SCLK1	SCL1	IIC clock for other IC
31	P70/INT0	ENABLE	Power safety
32	P71/INT1	LNA SW	LNA SW Control
33	P72/INT2	SD	SD signal input
34	P73/INT3	IR	IR signal input
35	P00	NC	Reserved
36	P01	MUTE	Extend mute (sound)
37	P02	BAND3	Band switch 3
38	P03	AV2	AV selector 2
39	P04	AV1	AV selector 1
40	P05	TV/AV	TV/AV selector
41	P06	BAND2	Band switch 2
42	P07	BAND1	Band switch 1

Port Control

1 PIN7 POWER Power switch

Port	POWER ON	POWER OFF
PIN7 POWER	0	1

2 Band control:

Port	BANK OPT= 0			BANK OPT= 1 LA7910			BANK OPT= 2		
	V-L	V-H	UHF	V-L	V-H	UHF	V-L	V-H	UHF
PIN42 BAND1	0	1	1	0	1	1	1	0	0
PIN41 BAND2	1	0	1	0	0	1	0	1	0
PIN40 BAND3	X	X	X	X	X	X	0	0	1

注 X 为不用

Port	BANK OPT= 3		
	V-L	V-H	UHF
PIN42 BAND1	0	1	1
PIN41 BAND2	1	0	1
PIN40 BAND3	1	1	0

3 AV control

Shi Nichi main board AV system :2 pin control

a) One AV:

Port	TV	AV
PIN39 AV1	0	1
PIN38 AV2	0	1

b) Two AV:

Port	TV	AV1	AV2
PIN39 AV1	0	0	1
PIN38 AV2	0	1	1

c) Three AV:

Port	TV	AV1	AV2	AV3
PIN39 AV1	0	1	0	1
PIN38 AV2	0	0	1	1

Shencai Main board 5Y29 AV system: 3 pins control

d) One AV:

Port	TV	AV
PIN40 TV/AV	0	1
PIN39 AV1	0	1
PIN38 AV2	0	1

e) Two AV:

Port	TV	AV1	AV2
PIN40 TV/AV	0	1	1
PIN39 AV1	0	0	1
PIN38 AV2	0	1	1

f) Three AV:

Port	TV	AV1	AV2	AV3
PIN40 TV/AV	0	1	1	1
PIN39 AV1	0	1	0	1
PIN38 AV2	0	0	1	1

4 Vert. Scan 50/60 output:

Port	50Hz	60Hz
PIN2 50/60	0	1

5 Volume control system:

a Mono system:

When change volume , PIN5 VOLUME-L / PIN6 VOLUME-R PWM output in same.

b AV Stereo system

There are volume level control and balance between left channel and right channel, left/right channel will output separately:

Port	Function
PIN5 VOLUME-L	Volume PWM Output (left)
PIN6 VOLUME-R	Volume PWM Output (right)

6 Woofer Switch:

Port	Woofer off	Woofer on
PIN36 WOOFER	0	1

7 RF LNA Switch:

Port	LNA off	LNA on
PIN1 LNA SW	0	1

8 Power safety Safety

CPU detect the input port, when it lower than 5V, it will enter the “Standby” mode to protect the power supplier.

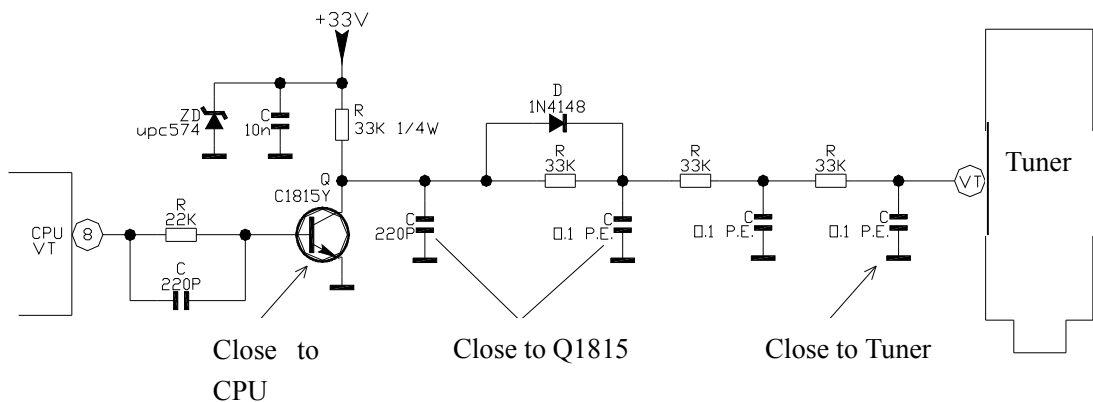
9 Panel Key Define Analog input

Port	Voltage	Key	Function
PIN13 AN4 KEY IN	0V~3/32 VDD	OFF	No key press
	4/32 VDD~7/32 VDD	AUTO	Auto search
	8/32 VDD~11/32 VDD	TV/AV	TV/AV
	12/32 VDD~15/32 VDD	MENU	Menu
	16/32 VDD~19/32 VDD	VOL+	Volume increase
	20/32 VDD~23/32 VDD	VOL-	Volume decrease
	24/32 VDD~27/32 VDD	CH+	Program NO. increase
	28/32 VDD~VDD	CH-	Program NO. decrease

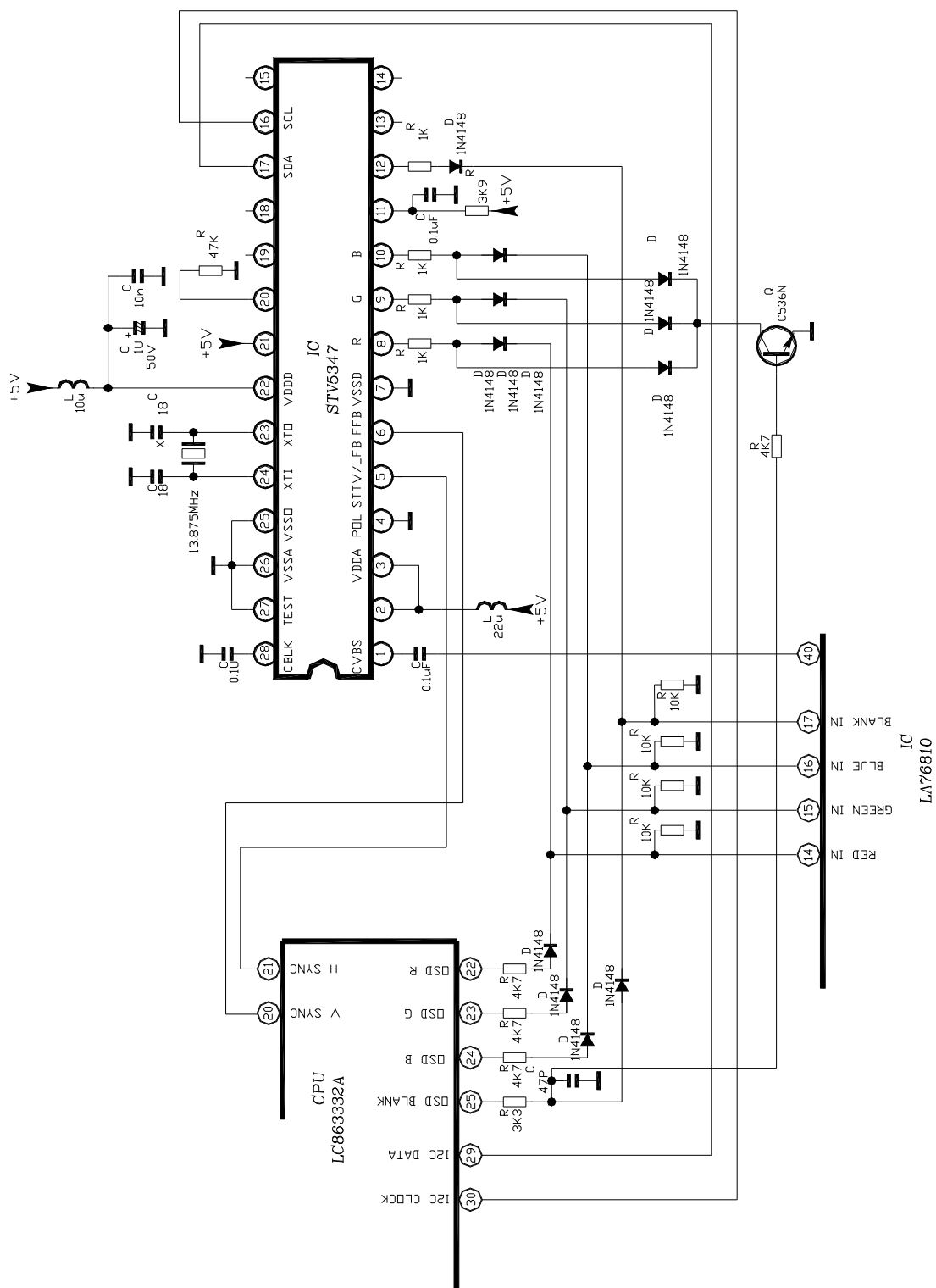
10 SD reference design:



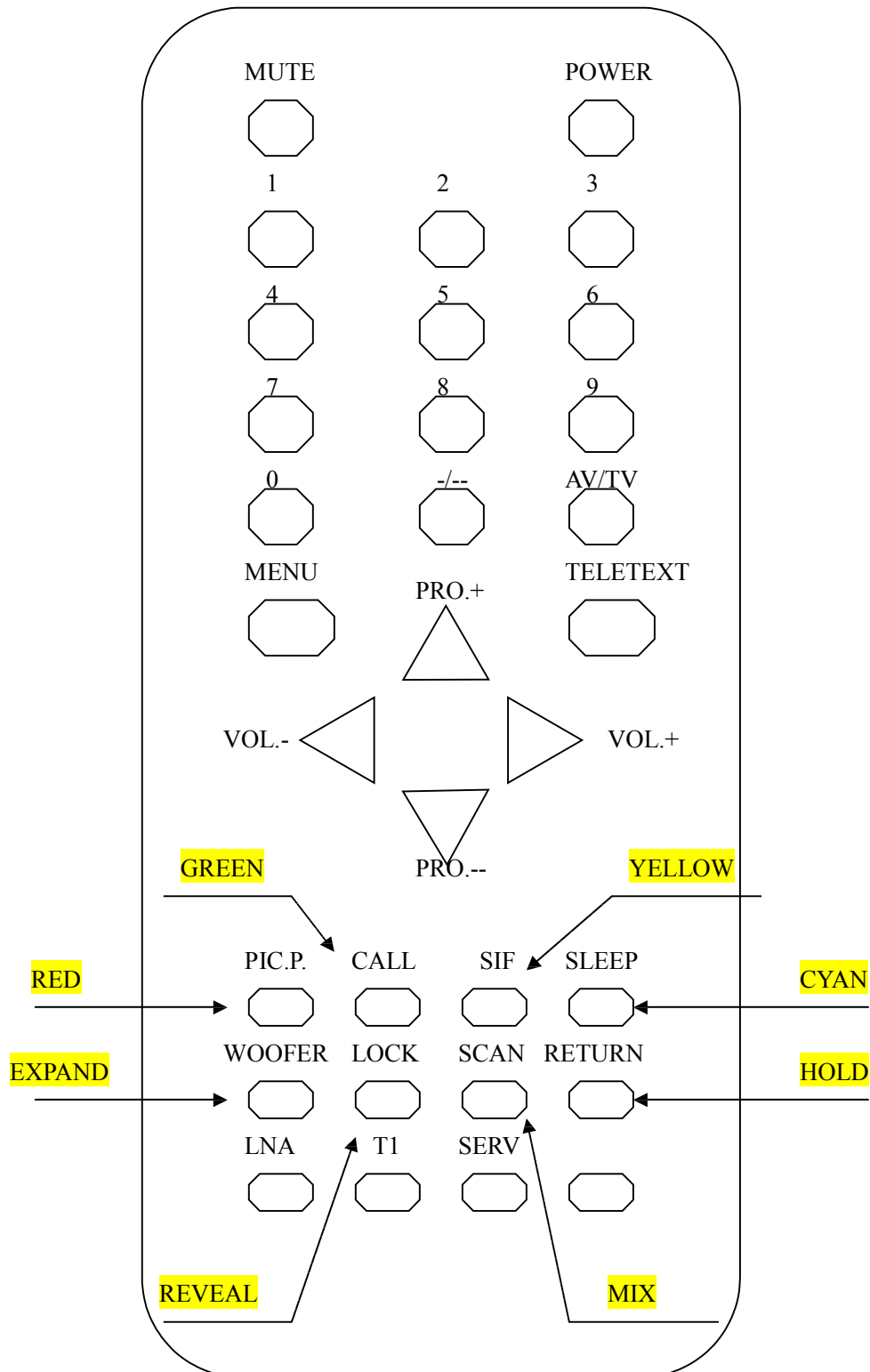
11 VT reference design:



Teletext reference design



RC Panel reference

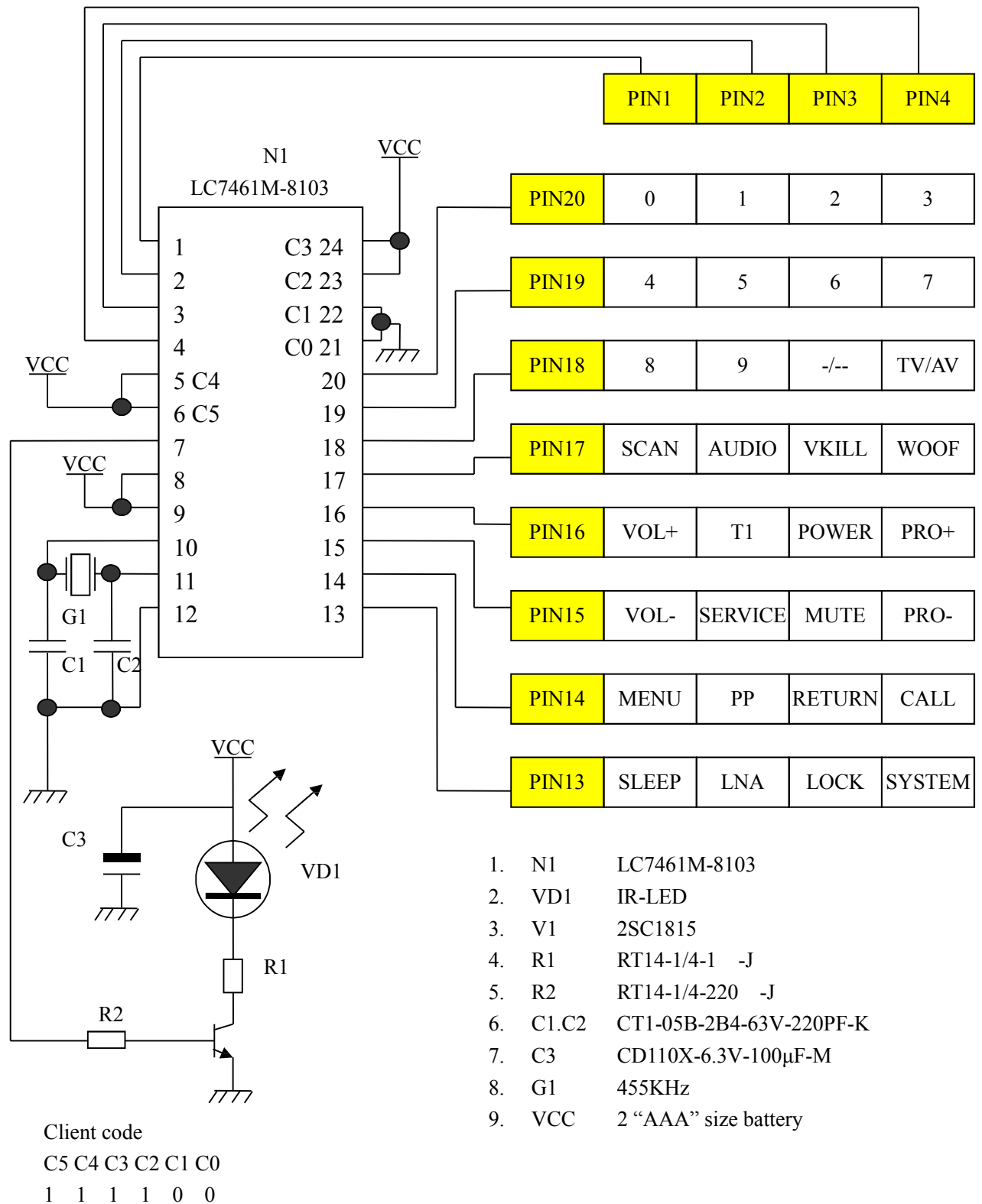


Note Function descriptions with yellow background are keys' functions in Teletext mode

RC key Code

code HEX	TV Function	description	Teletext Function	description
00	0	Digit 0	0	digit 0
01	1	Digit 1	1	digit 1
02	2	Digit 2	2	digit 2
03	3	Digit 3	3	digit 3
04	4	Digit 4	4	digit 4
05	5	Digit 5	5	digit 5
06	6	Digit 6	6	digit 6
07	7	Digit 7	7	digit 7
08	8	Digit 8	8	digit 8
09	9	Digit 9	9	digit 9
0A	-/--	Tens digit	SUBPAGE	Sub Page
0B	AV/TV	AV/TV switch		
0C	PRO. SCAN	Program scan	MIX	TV and text Mix
0D	TELETEXT	Teletext switch		
0F	WOOFER	woofer	EXPAND	expand
10	VOL +	Volume increase		
11	FACTORY	Switch factory modes		
12	POWER	Power switch		
13	PRO +	Program NO. +1	PAGE +	Page +1
14	VOL -	Volume decrease		
15	SERVICE	Setup menu		
16	MUTE	Mute		
17	PRO -	Program NO. -1	PAGE -	Page -1
18	MENU	menu	INDEX	Index
19	PICTURE PRESET	Picture preset mode	RED	Red Key
1A	RETURN	Return to last channel	HOLD	Hold
1B	CALL	Display	GREEN	Green Key
1C	SLEEP	Sleep	CYAN	Cyan Key
1D	SUPER RECEIVE	RF LNA		
1E	LOCK	Lock channel	REVEAL	Reveal
1F	SOUND SYSTEM	Sound system	YELLOW	Yellow Key

RC diagram



Special Functions

LOGO Editing

To edit the LOGO, first, enter option menu page 05, set option “LOGO-EDIT” to “1” then exit option menu, then switch to AV (no signal input), it will display log, then you can edit it. You may use the function keys below

Press digit “8” key will switch the current edit line; Press “menu” key will exit the edit mode; Press -/-- key will switch the current edit function menu :

- CHAR change character, VOL +/- move the edit cursor, POS +/- change
- COLOR change color VOL +/- change color POS +/- switch line
- SIZE change size VOL +/- change size POS +/- switch line
- POSITION change position VOL +/- move in horizontal direction
“POS +/- move in vertical direction.

White balance adjust

- enter Option Menu mode press MUTE key to enter the white balance adjust mode, there is only one bright line displayed on the screen, then
 - press digit key 0 enter sub brightness adjust mode press VOL+/- to adjust
 - press digit key 1 enter red bias adjust mode press VOL+/- to adjust
 - press digit key 2 enter green bias adjust mode press VOL+/- to adjust
 - press digit key 3 enter blue bias adjust mode press VOL+/- to adjust
 - press digit key 4 enter red drive adjust mode press VOL+/- to adjust
 - press digit key 5 enter green drive adjust mode press VOL+/- to adjust
 - press digit key 6 enter blue drive adjust mode press VOL+/- to adjust

Password enter Option Menu

- press Menu key as the icons display, type “8633” quickly, will enter Option menu

Lock channel

- Enable channel lock press LOCK key you will find a “lock” figer appear beside the icon TUNING . It means that channel lock function is enabled. At this time
 - 1 Can’t enter the “Tuning” function menu, and only press PRO+/- to change channel
 - 2 When press digit key to select the locked channel, the screen is covered with blue.
- Select lock program set SKIP/LOCK to “ON” in the normal TUNING function menu and the color of the channel NO. is changed to Red. And when press PRO+/- to change TV channel, the locked channel will be skipped. If you want to change to the locked channel, you have to use digit key.

Option Menu

LA76810 OPTION MENU 00	Value	Range	Description	M
H-PAHSE/50H (60H)	13	0 ... 31	Horizontal center	✕
V-POS /50H (60H)	40	0 ... 127	Vertical center	✕
V-SIZE /50H (60H)	40	0 ... 127	Vertical size	✕
V-LINE /50H (60H)	14	0 ... 31	Vertical linearity	✕
V-SC	16	0 ... 31	Vertical S- Correction	✕
CHANGE PRO		0 ... 99	Channel NO.	✕
				⊙
				⊙
LA76810 OPTION MENU 01	Value	Range	Description	M
RB	46	0 ... 255	Red bias	✕
GB	63	0 ... 255	Green bias	✕
BB	47	0 ... 255	Blue bias	✕
RD	127	0 ... 127	Red drive	✕
GD	15	0 ... 15	Green drive	✕
BD	127	0 ... 127	Blue drive	✕
LA76810 OPTION MENU 02	Value	Range	Description	M
SUB-BRIGHT	63	0 ... 127	Sub brightness (hardware)	✕
SUB-SHARP	0	0 ... 63	Sub sharpness (software)	✕
SUB-CONT	106	0 ... 127	Sub contrast (software)	✕
SUB-COLOR	40	0 ... 63	Sub color (software)	✕
SUB-TINT	63	0 ... 127	Sub Tint (software)	✕
OSD-H-POS	16	0 ... 63	Osd Horizontal position adjust	✕
OSD-V-POS	14	0 ... 63	Osd Vertical position adjust	✕
LA76810 OPTION MENU 03	Value	Range	Description	M
AGC-DELAY	6	0 63	RF AGC delay	✕
B-Y DC	0	0 ... 15	SECAM B-Y DC level	👁
R-Y DC	0	0 ... 15	SECAM R-Y DC level	👁
ENG OPTION	0	0 , 1	Enable engineer options (menu04 ... 16)	⌂

Note switch “0” means “off” while “1” means “on”

M Samples:

✕ : adjust when producing

⊙ : No use

⌂ : expand setup menu

LA76810 OPTION MENU 04	Value	Range	Description	M
AV-AGC	0	0 , 1	AV mode: TV output switch	i
NO-V-MUTE	0	x	Mute picture when change channel	i
CURTAIN	0	0~3	Power on/off effect 0- none 1-power on effect ,power off no 2- power on no effect, but power off do 3- both on/off have the effect	i
CURT-DELAY	0	0~7	Power on mute delay (seconds)	i
LAST-POWER	0	0~2	Power on standby/memory/on	i
LAST-TV/AV	1	0 , 1	Power on enter TV / last TV,AV	i
TUNER-TYPE	0	0~3	Tuner type select see Port control	i
P-OFF-MUTE	1	0 1	Mute screen when power off	i
LA76810 OPTION MENU 05	Value	Range	Description	M
AV-SYSTEM	2	0 ... 2	AV numbers none / 1 AV/2 AV	i
OPT-LOGO	1	0 , 1	Logo switch	i
LOGO-EDIT	0	0 , 1	Edit logo	i
SW-BALANCE	0	0 1	AV stereo PWM output balance option	i
SW-WOOFER	0	0 1	Woofer switch	i
BLUE-BACK	1	0 1	Background color black/blue	i
SW-100/200	0	0 1	Max channel number 100/200	i
OPT-RF-LNA	2	0 ... 2	RF LNA off/ level 1/ level 2	i
LA76810 OPTION MENU 06	Value	Range	Description	M
SW FIX VOL	1	0 1	Fix 76810 internal volume switch	i
FIX VOL	63	0~127	Fixed volume	i
OSD-CONT	59	0 ... 127	OSD contrast	👁
VIF-SYS	0	0 ... 3	Video IF select 38 / 38.9 / 45.75 / 39.5	👁
CROSS-B/W	0	0 ... 3	Internal test signal off/black/white/cross	⌘
GRAY-MODE	0	0 , 1	Internal test white signal /gray (60%)	⌘
LA76810 OPTION MENU 07	Value	Range	Description	M
C D MODE	0	0 ... 7	Vertical scan mode: 50Hz / 60Hz etc.	⌘
VS-SEP-UP	0	0 , 1	Sensitivity of Vertical separation switch	👁
V-SIZE-CMP	7	0 ... 7	Compensate vertical size	👁
BR-ABL-DEF	0	0 , 1	Brightness ABL defeat 0: enable/ 1: disable	👁
MD-STP-DEF	1	0 , 1	Bright mid stop defeat 0:enable/1:disable	👁
EM-ABL-DEF	0	0 1	Emergency ABL defeat 0:en /1:dis	👁
BRT-ABL-TH	3	0 ... 7	Bright ABL threshold	👁
SYNC-KILL	0	0 , 1	Force H.OSC. free run mode	⌘
LA76810 OPTION MENU 08	Value	Range	Description	M
AFC-GAIN	1	0 , 1	AFC gain & gate 0:auto/1:high gain	👁
FBP-BK-SW	1	0 , 1	FBP blanking “OR” switch 0:internal /1: internal “OR” FBP	👁
H-FREQ	34	0 ... 63	Hor. Frequency (only for ES Sample)	🕒
H-BLK-L	7	0 ... 7	Left blinking adjust	👁

H-BLK-R	3	0 ... 7	Right blinking adjust	👁
FILT-SYS	1	0 ... 15	Y/C filter select	🔧
C-KILL-ON	0	0, 1	Color Kill mode 0:auto/1:force ON	🔧
C-KILL-OFF	0	0, 1	Disable killer circuit 0:mormal/1:test	🔧
LA76810 OPTION MENU 09	Value	Range	Description	M
AUTO-FRESH	1	0, 1	NTSC auto flesh switch 0:off/1:on	👁
BLANK-DEF	0	0, 1	Disable RGB output blanking 0:on/1:off	🔧
BLK-STR-DF	0	0, 1	Black stretch defeat 0:on/1:off	👁
CORING EN	1	0, 1	Coring switch 0: enable /1:disable	👁
R/B G BAL	7	0 ... 15	R-Y / B-Y gain balance	👁
R/B ANGLE	7	0 ... 15	R-Y / B-Y angle	👁
VIDEO-MUTE	0	0, 1	RGB output switch 0:mormal/1:mute	🔧
VIDEO-LVL	3	0 ... 7	Align IF video level	👁
LA76810 OPTION MENU 10	Value	Range	Description	M
C-EXT	0	0, 1	Select C in switch 0:internal/1:extenal	🔧
C-BYPASS	0	0, 1	Select chroma BPF bypass 0:BPF/1:bypass	🔧
DIG -OSD	0	0, 1	analog / digital OSD	👁
FM-GAIN	0	0, 1	FM gain@1000Vrms0: 50KHz /1: 25KHz	👁
DE-EMP -TC	0	0, 1	FM de-emphasis TC 0:50us/1:75us	👁
FM-LEVEL	31	0 ... 31	FM level adjust (1000mv 20mv)	👁
B-GAMMA	3	0 ... 3	B correction	👁
RG-GAMMA	1	0, 1	R G correction switch 0:off/1:on	👁
LA76810 OPTION MENU 11	Value	Range	Description	M
ENGLISH	1	0, 1	OSD English option 0:off/1:on	👤
ARABIC	1	0 1	OSD Arabic option 0:off/1:on	👤
ITALIAN	1	0 1	OSD Italian option 0:off/1:on	👤
FRANCH	1	0 1	OSD Franch option 0:off/1:on	👤
GERMAN	1	0 1	OSD German option 0:off/1:on	👤
RUSSIAN	1	0 1	OSD Russian option 0:off/1:on	👤
SPANISH	1	0 1	OSD Spanish option 0:off/1:on	👤
LA76810 OPTION MENU 12	Value	Range	Description	M
COL-PAL	1	0, 1	Color system PAL 0:off/1:on	👤
COL-NT3.58	1	0, 1	Color system NTSC3.58 0:off/1:on	👤
COL-SECAM	1	0, 1	Color system SECAM 0:off/1:on	👤
COL-NT4.43	1	0, 1	Color system NTSC4.43 0:off/1:on	👤
SND-D/K	1	0, 1	Sound system D/K 0:off/1:on	👤
SND-B/G	1	0, 1	Sound system B/G 0:off/1:on	👤
SND-I	1	0, 1	Sound system I 0:off/1:on	👤
SND-M/N	1	0, 1	Sound system M/N 0:off/1:on	👤

M Figure Sample:

🔧 : no use

👤 : software option usaly setup for the certain hardware

🔧 : LA76810 testing options it is controled by software automatically when normal functioning

👁 : LA76810 options for designer agjust



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