

3. TECHNICAL BRIEF

3.2.6 Display & LCD FPC Interface

LCD module include device in table 3-2

Device	Type
Main LCD	176 x RGB x 220 65K Color TFT LCD
Sub LCD	96 x 64 Mono FSTN LCD
Main LCD Backlight	White LED
Sub LCD Backlight	7 color LED

Table, Devices in LCD Module

LCD module is connected to key board with 40-pin BtoB connector (CONN_40_AXK840145J) and Speaker, Receiver, Vibrator, Camera Flash is connected by soldering the leads to 9 pads in LCD module.

The Main LCD is controlled by 8-bit PDI(Parallel Data Interface) in Marita and Sub LCD is controlled by 8-bit PDI in Marita.

PIN	SYMBOL	FUNCTION	I/O	REMARKS
SPK TERMINAL				
1	EARP	Ear Piece Plus	O	
2	EARM	Ear Piece Minus	O	
3	SPKP	Loud Speaker Plus	O	
4	SPKM	Loud Speaker Minus	O	
MOTOR TERMINAL				
1	MOTOR_BATT	MOTOR Power	O	
2	MOTOR_GND	MOTOR Ground	O	
CAMERA FLASH TERMINAL				
1	VOUT_F1	FLASH Power	O	
2	VSIG_F2	FLASH Signal	O	
3	F3	Dummy Ground	O	

Table, Interface between LCD module and Speaker, Receiver, Vibrator, Flash

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PIN	SYMBOL	FUNCTION	I/O	REMARKS
1	GND	Ground		
2	CAM_FLASH_SHOT	Turn ON the Camera Flash Shot		
3	MOTOR_BATT	MOTOR Power		
4	SPKP	Loud Speaker Plus		
5	SPKM	Loud Speaker Minus		
6	EN_LED_G	Enable Signal for Sub LCD Backlight LED(Green)		
7	7C_LED_VDD	Power Supply for Sub LCD Backlight		
8	BL_EN	Enable Signal for Main LCD Backlight		
9	PDID0	Parallel Data 0 bit for Main/Sub LCD		
10	PDID2	Parallel Data 2 bit for Main/Sub LCD		
11	PDID4	Parallel Data 4 bit for Main/Sub LCD		
12	PDID6	Parallel Data 6 bit for Main/Sub LCD		
13	LCDRDX	Read Signal for Main/Sub LCD status		
14	LCDRS	Register Select Pin		
15	LCDCSX_SUB	Chip Select Signal for Sub LCD		
16	LCDVSYNCl	Main LCD Vertical Synch, Signal		
17	GND	Ground		
18	GND	Ground		
19	GND	Ground		
20	GND	Ground		
21	GND	Ground		
22	GND	Ground		
23	VDIG_2.8V	Power Supply for system and I/O Logic(2.8V)		
24				
25	LCDERESX	Reset Signal for Main/Sub LCD		
26	LCDCSX_MAIN	Chip Select Signal for Main LCD		
27	LCDWRX	Write Signal for Main/Sub LCD		
28	PDID7	Parallel Data 7 bit for Main/Sub LCD		
29	PDID5	Parallel Data 5 bit for Main/Sub LCD		

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PIN	SYMBOL	FUNCTION	I/O	REMARKS
30	PDID3	Parallel Data 3 bit for Main/Sub LCD		
31	PDID1	Parallel Data 1 bit for Main/Sub LCD		
32	BL_PWL	Main LCD PWL signal		
33	VBATL_4.2V	Battery Power(4.2V)		
34	EN_LED_B	Enable Signal for Sub LCD Backlight LED(Blue)		
35	EN_LED_R	Enable Signal for Sub LCD Backlight LED(Red)		
36	EARP	Ear Piece Plus		
37	ERAM	Ear Piece Minus		
38	GND	Ground		
39	CAM_FLASH_ON	Turn ON the Camera Flash Continuous ON		
40	GND	Ground		

Table. Interface between LCD module and main board(in LCD Module)

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3.2.7 Main LCD Backlight Illumination

There are 4 white LEDs in Main LCD Backlight circuit which are driven by 4.5V Regulated Output Charge Pump(SC604). GPIO_01(BL_PWL) is used for Backlightbrightness control.

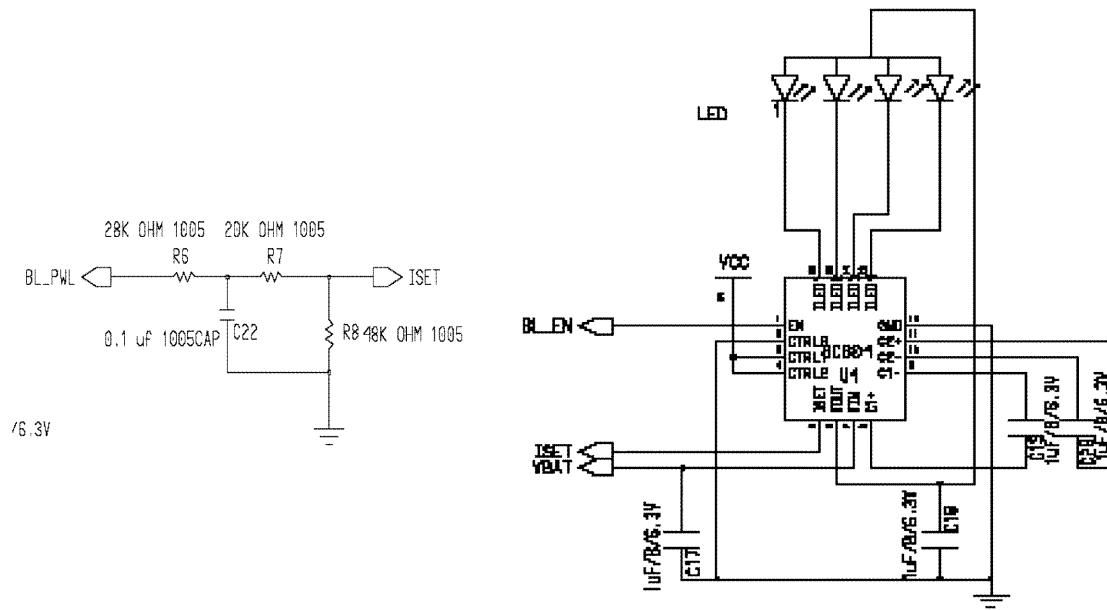
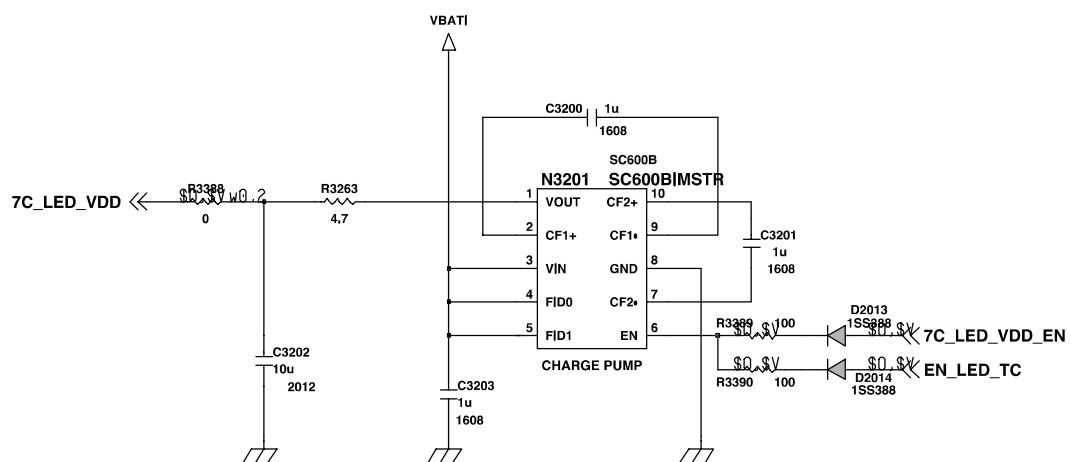


Figure. Charge Pump Circuit for Main LCD Backlight

* LED : SSC-HWTS902(Seoul Semiconductor)

3.2.8 Sub LCD Backlight Illumination

GPIO_02(7C_LED_VDD_EN) in Marita enables 7 color LED. 7 color LED consists of Red LED, Green LED and Blue LED. GPIO_44(EN_LED_R), GPIO_45(EN_LED_G) and GPIO_46(EN_LED_B) in Marita does ON or OFF its own LEDs.



Figure, Sub LCD Backlight 4.5V

In case of power off mode, if TA is inserted, Red LED is turned-on.

3.2.9 Keypad Illumination

There are 19 blue LEDs in key board backlight circuit, which are driven by GPIO_32 (KEY_LED_ONOFF) line from Marita.

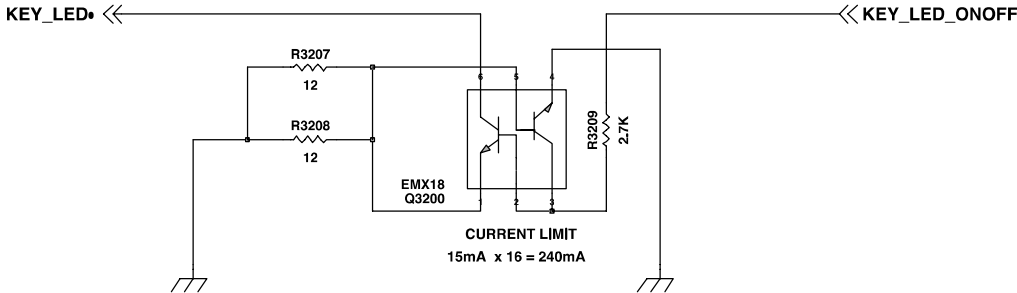
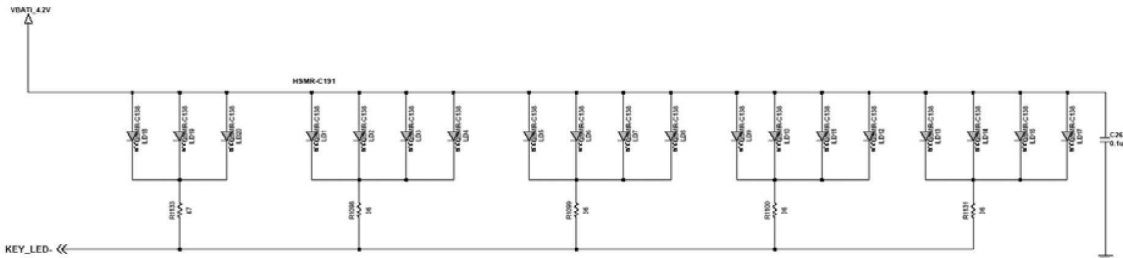


Figure. Keypad Backlight Blue LED Interface

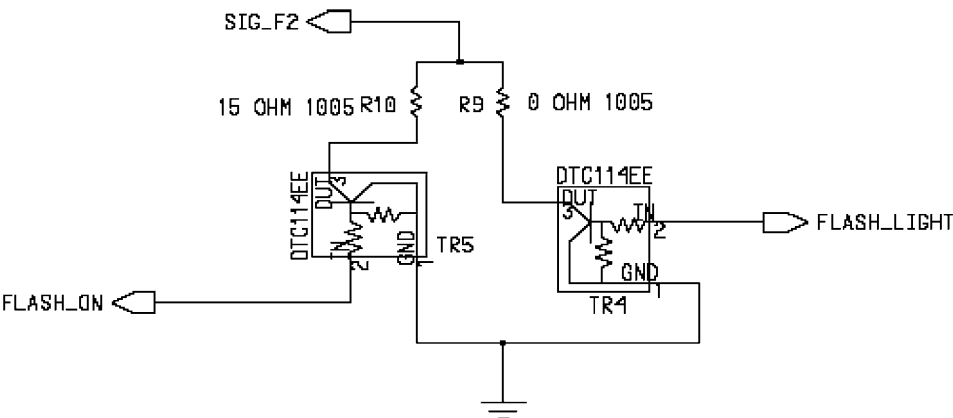


Figure, Keypad Backlight Circuit

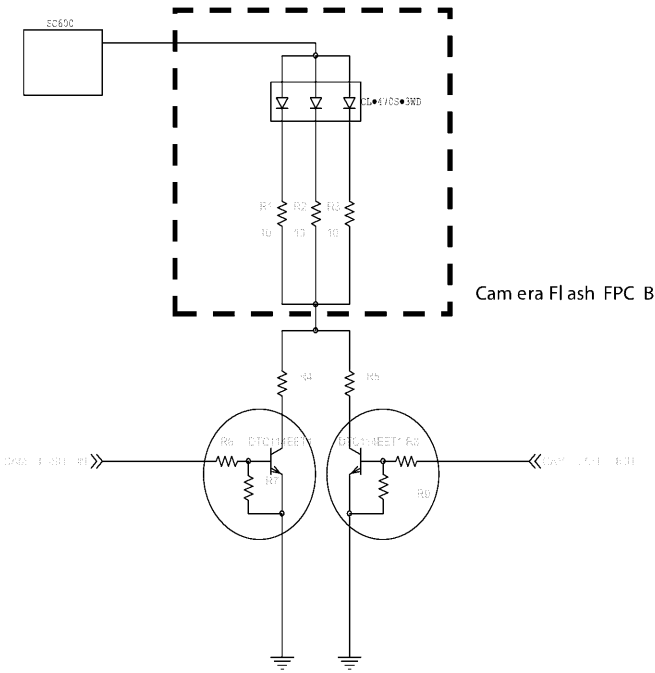
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3.2.10 Camera Flash Illumination

Camera Flash illumination circuit make 3 modes using white LED. Mode 1. Is Continuous ON mode using GPIO_21(CAM_FLASH_ON), Mode 2. Is Flash Shot using GPIO_23(CAM_FLASH_SHOT) and Mode 3. combines Mode 1. and Mode 2.



Figure, Camera Flash Circuit



Figure, Camera Flash FPCB & Circuit

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3.3 LCD Module

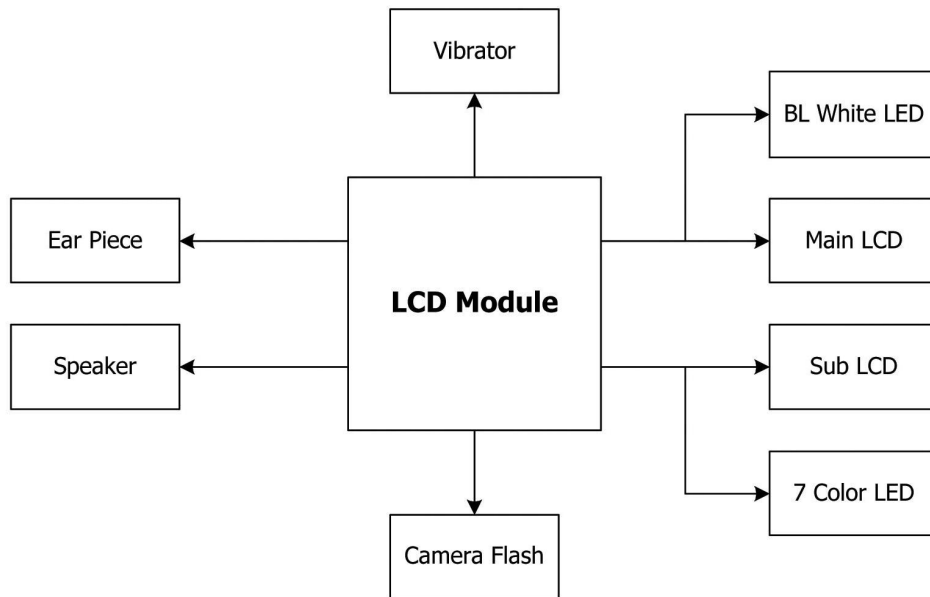


Figure. LCD Module Block Diagram

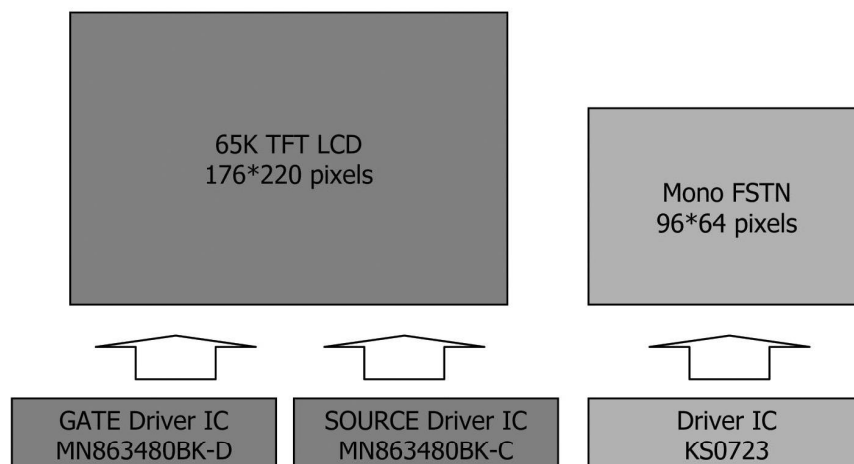


Figure. LCD Module(Main & Sub LCD)