BA45F6730

CO/GAS　Demo推廣

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BA45F6730資源-1

➢MCU資源介紹

MCU model		BA45F6730
Op. Temperatrue		-40℃~85℃
Op. Voltage		2.2V~5.5V
Memory	ROM	2K x 16
	RAM	128 x 8
	EEPROM	32 x 8
OSC	HIRC	2/4/8MHz
	LIRC	32KHz
I/O		4/10/14
EXT. INT.		1
Timer	Type	10-bit x 1
A/D		12-bit x 8（5External+3Internal）
OPA		x1(CO&GAS AFE)
Stack		6
Interface		UART/SPI/IIC
LVR/LVD		V
Package		10SOP/16NSOP/20SSOP

BA45F6730資源-2

Operating Current Characteristics

Ta=25°C

Symbol	Operating Mode	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
I_{DD}	Operating Current – LIRC	2.2V	f_{SYS}=32kHz	—	8	6	μA
		3V		—	10	20	
		5V		—	30	50	
	Operating Current – HIRC	2.2V	f_{SYS}=2MHz	—	0.1	0.2	mA
		3V		—	0.2	0.3	
		5V		—	0.4	0.6	
		2.2V	f_{SYS}=4MHz	—	0.3	0.5	mA
		3V		—	0.4	0.6	
		5V		—	0.8	1.2	
		2.2V	f_{SYS}=8MHz	—	0.6	1.0	mA
		3V		—	0.8	1.2	
		5V		—	1.6	2.4	

Note: When using the characteristic table data, the following notes should be taken into consideration:

1. Any digital inputs are setup in a non-floating condition.
2. All measurements are taken under conditions of no load and with all peripherals in an off state.
3. There are no DC current paths.
4. All Operating Current values are measured using a continuous NOP instruction program loop.

BA45F6730資源-3

Standby Current Characteristics

Ta=25°C

Symbol	Standby Mode	Test Conditions		Min.	Typ.	Max.	Max.	Unit
		V_{DD}	Conditions				85°C	
I_{STB}	SLEEP Mode	2.2V	WDT off	—	0.2	0.6	0.7	μA
		3V		—	0.2	0.8	1	
		5V		—	0.5	1	1.2	
		2.2V	WDT on	—	1.2	2.4	2.9	μA
		3V		—	1.5	3	3.6	
		5V		—	3	5	6	
	IDLE0 Mode	2.2V	f_{SUB} on	—	2.4	4	4.8	μA
		3V		—	3	5	6	
		5V		—	5	10	12	
	IDLE1 Mode – HIRC	2.2V	f_{SUB} on, f_{SYS}=2MHz	—	0.03	0.06	0.08	mA
		3V		—	0.07	0.14	0.16	
		5V		—	0.13	0.26	0.30	
		2.2V	f_{SUB} on, f_{SYS}=4MHz	—	0.05	0.07	0.09	mA
		3V		—	0.11	0.22	0.25	
		5V		—	0.21	0.42	0.50	
		2.2V	f_{SUB} on, f_{SYS}=8MHz	—	0.15	0.25	0.30	mA
		3		—	0.30	0.36	0.40	
		5V		—	0.55	0.74	0.85	

Note: When using the characteristic table data, the following notes should be taken into consideration:

1. Any digital inputs are setup in a non-floating condition.
2. All measurements are taken under conditions of no load and with all peripherals in an off state.
3. There are no DC current paths.
4. All Standby Current values are taken after a HALT instruction execution thus stopping all instruction execution.

BA45F6730資源-4

High Speed Internal Oscillator – HIRC – Frequency Accuracy

During the program writing operation the writer will trim the HIRC oscillator at a user selected HIRC frequency and user selected voltage of either 3V or 5V.

2/4/8MHz

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Temperature				
f_{HIRC}	2MHz Writer Trimmed HIRC Frequency	3V/5V	25°C	-1%	2	+1%	MHz
			-40°C ~ 85°C	-4%	2	+4%	
		2.2V~5.5V	25°C	-6%	2	+6%	
			-40°C ~ 85°C	-8%	2	+8%	
	4MHz Writer Trimmed HIRC Frequency	3V/5V	25°C	-1%	4	+1%	MHz
			-40°C ~ 85°C	-2%	4	+2%	
		2.2V~5.5V	25°C	-2.5%	4	+2.5%	
			-40°C ~ 85°C	-3%	4	+3%	
	8MHz Writer Trimmed HIRC Frequency	3V/5V	25°C	-1%	8	+1%	MHz
			-40°C ~ 85°C	-2%	8	+2%	
		2.7V~5.5V	25°C	-2.5%	8	+2.5%	
			-40°C ~ 85°C	-3%	8	+3%	

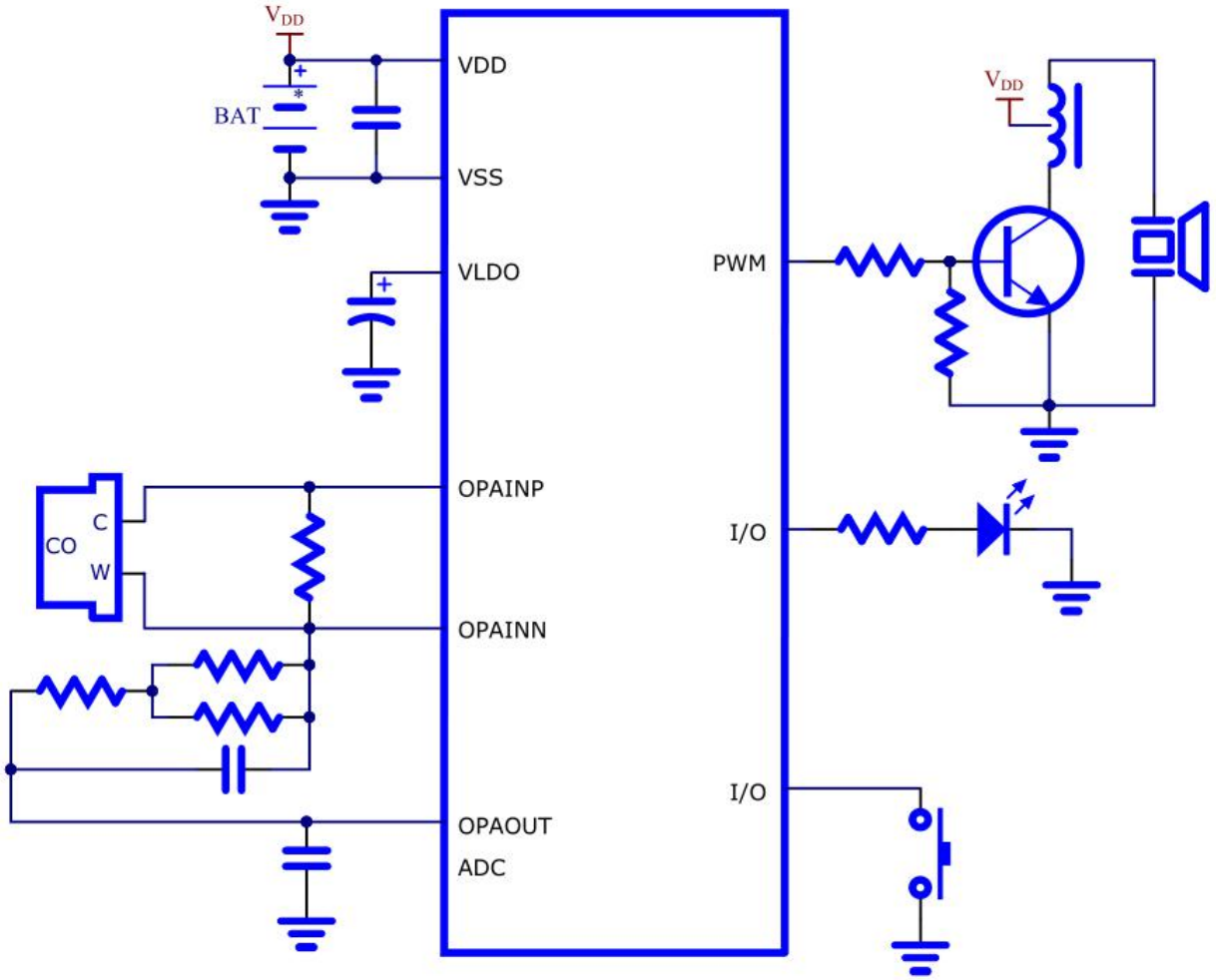
Note: 1. The 3V/5V values for V_{DD} are provided as these are the two selectable fixed voltages at which the HIRC frequency is trimmed by the writer.

2. The row below the 3V/5V trim voltage row is provided to show the values for the full V_{DD} range operating voltage. It is recommended that the trim voltage is fixed at 3V for application voltage ranges from 2.7V to 3.6V and fixed at 5V for application voltage ranges from 3.3V to 5.5V.

3. The minimum and maximum tolerance values provided in the table are only for the frequency at which the writer trims the HIRC oscillator. After trimming at this chosen specific frequency any change in HIRC oscillator frequency using the oscillator register control bits by the application program will give a frequency tolerance to within ±20%.

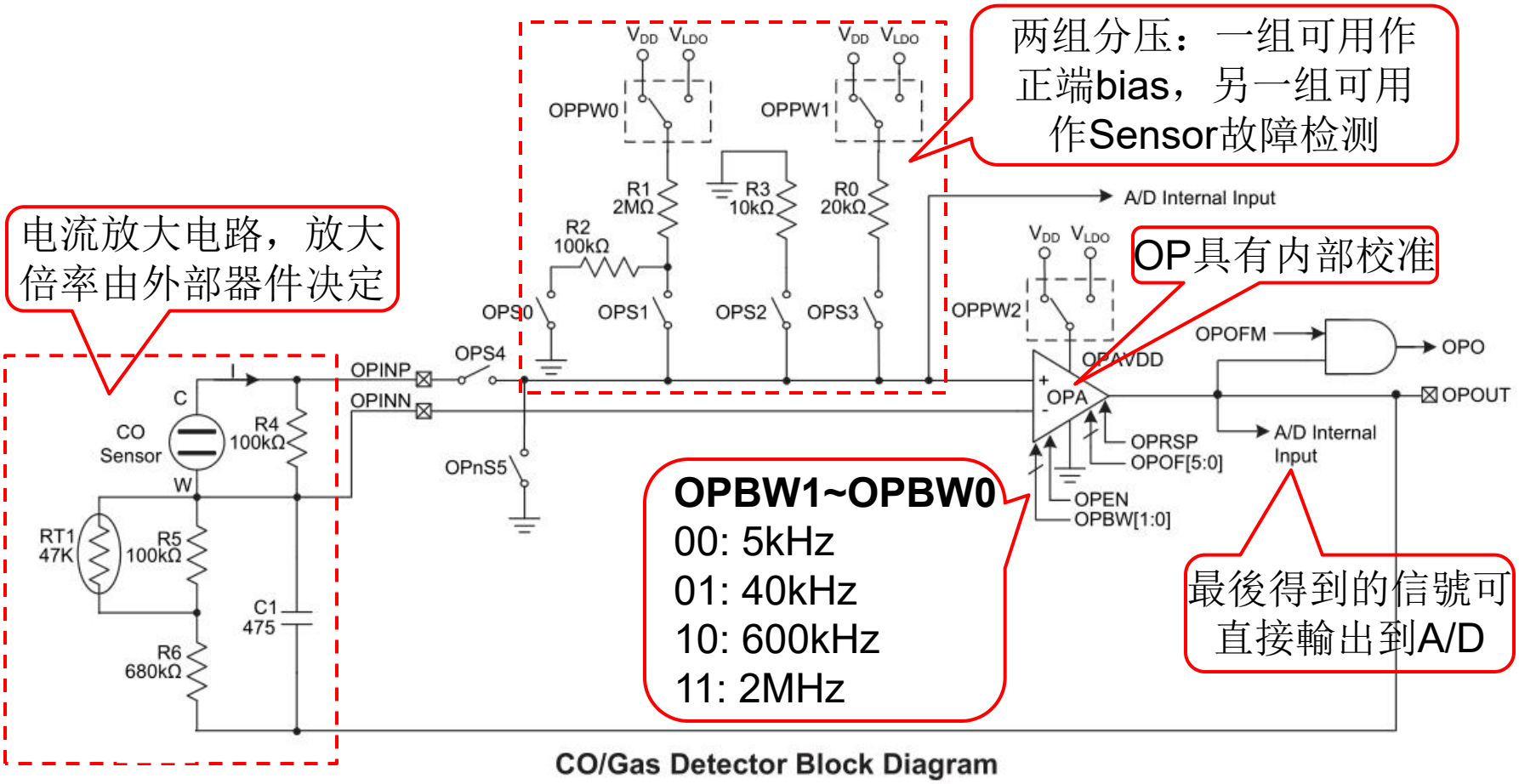
BA45F6730應用-1

Application Circuits



BA45F6730應用-2

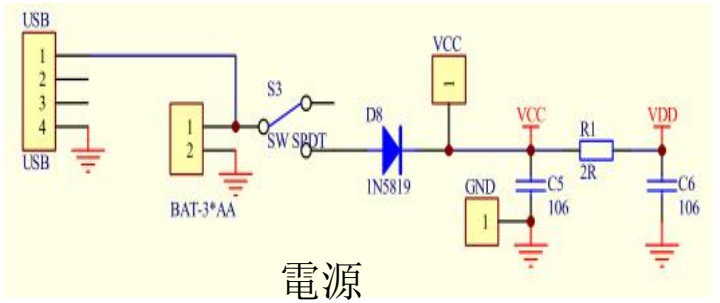
- CO/Gas AFE



CO/Gas Detector Block Diagram

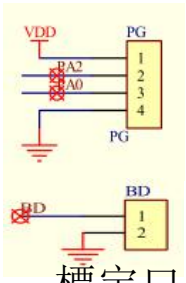
CO Demo原理圖

➢CO Demo原理圖



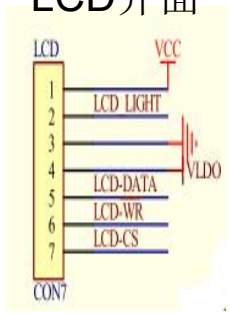
電源

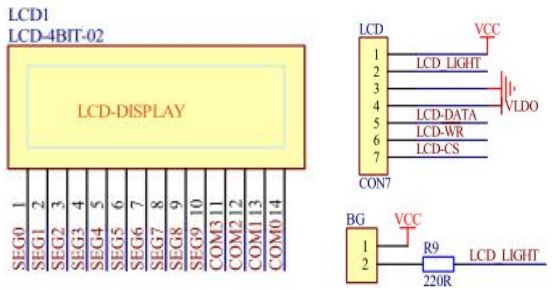
燒錄口

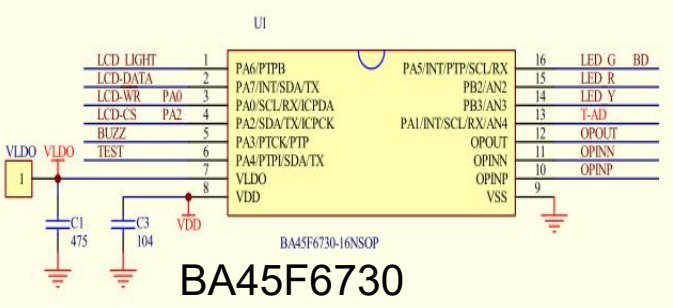


標定口

LCD介面







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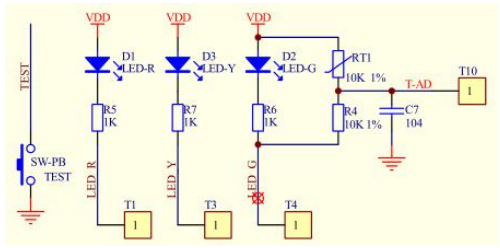
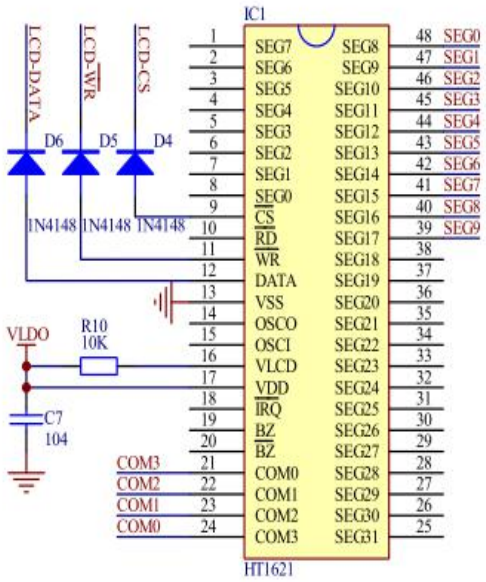
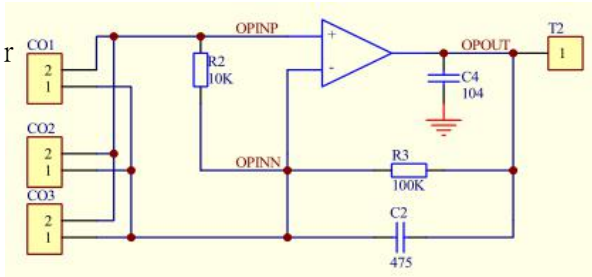


KEY&LED

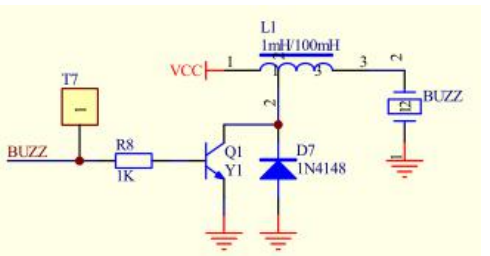


LCD顯示模組

CO Sensor



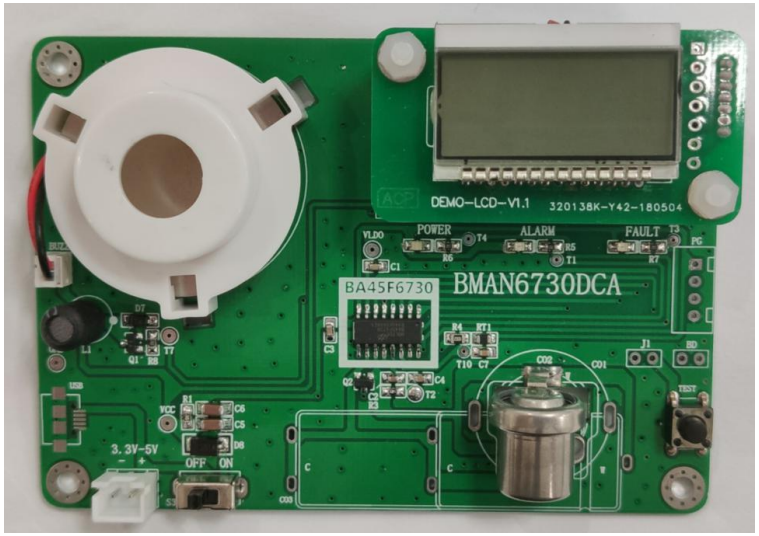
信號放大電路



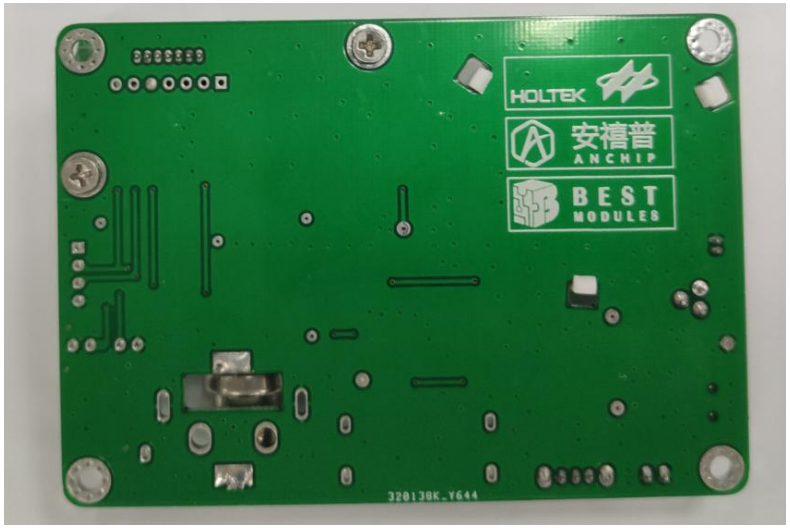
蜂鳴器驅動電路

CO Demo外觀-1

- CO Demo整體效果圖



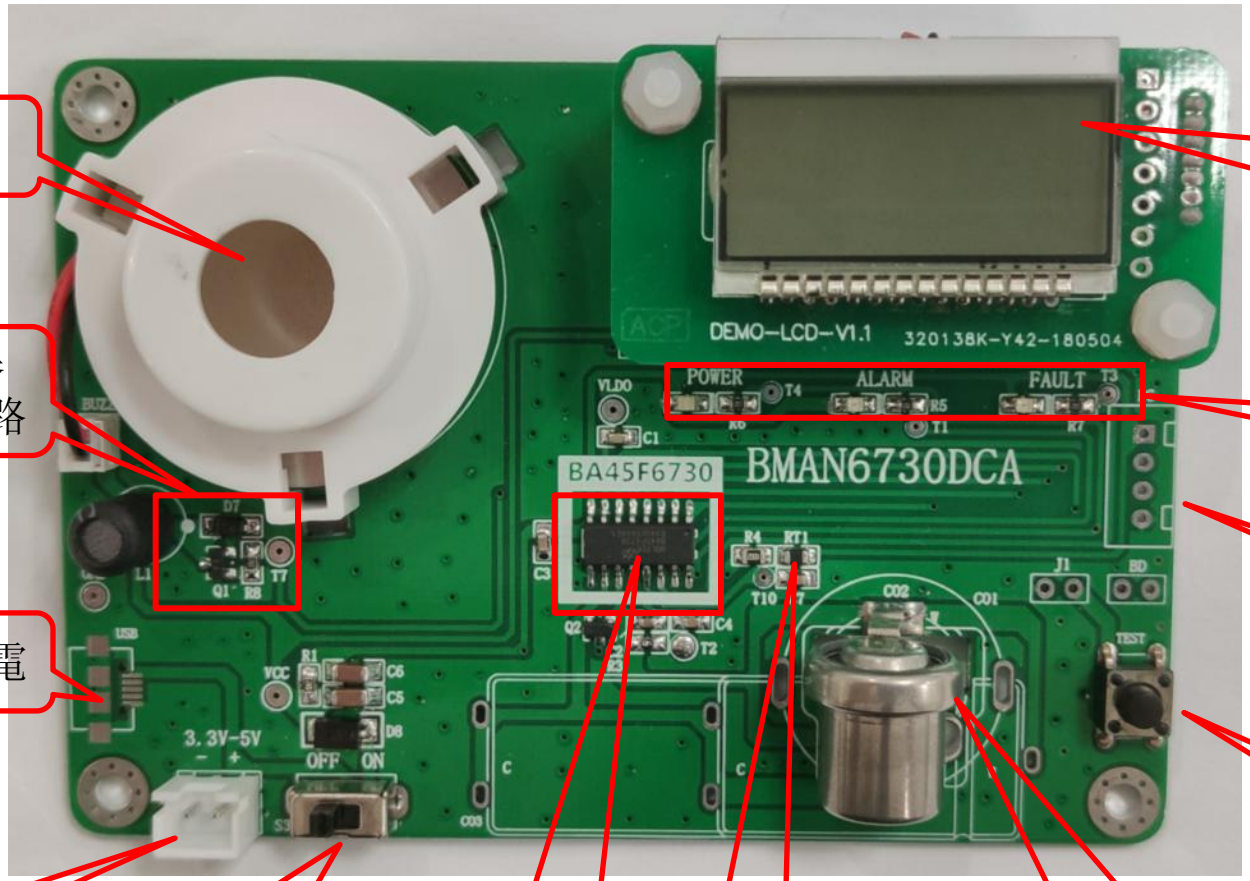
CO Demo正面



CO Demo背面

CO Demo外觀-2

CO Demo器件介紹



CO Demo實現功能

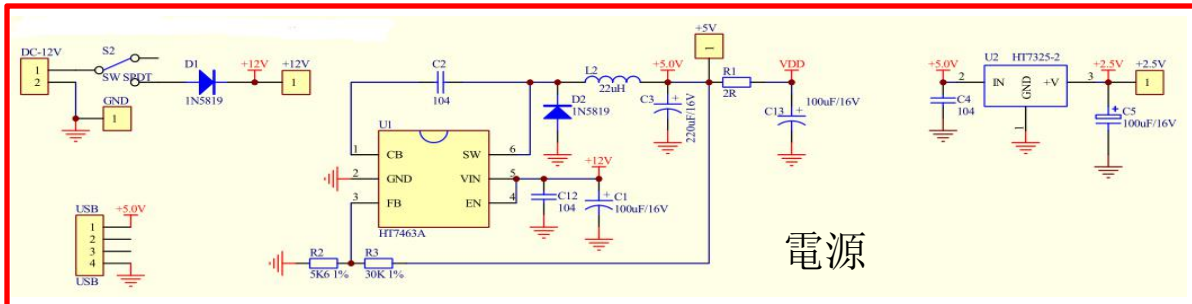
主要功能

- 預熱模式：上電預熱120s，綠燈2s閃一次；
- 常態模式：綠燈40s閃一次；
- 休眠模式：WDT 4s喚醒一次；
- 標定模式：預熱完成之後可進行標定動作，短接標定口，標定時間為120s，過程中綠燈1s閃一次，標定成功後LCD會顯示濃度標定失敗時，LCD會顯示“bdE”，同時所有燈常亮；
- 當濃度超出30ppm時,LCD屏會亮，低於30ppm時LCD屏滅；
- 報警模式：當濃度超過180ppm時，蜂鳴器2s響三次，同時紅燈2s閃爍3次,低於40ppm撤銷；
- 長按按鍵1s模擬報警。

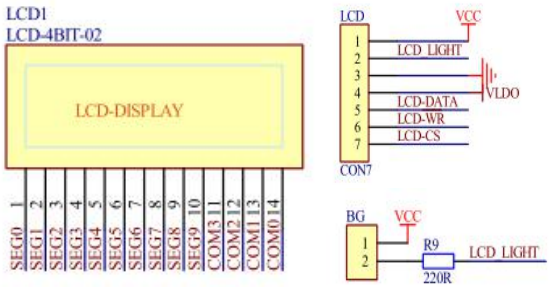
Note：以上功能為code“SOFTWARE-DM20171201-BA45F6730-數顯一氧化碳-V2.0-A1”所實現，後續若有增加功能或代碼完善則響應的code版本號會升級

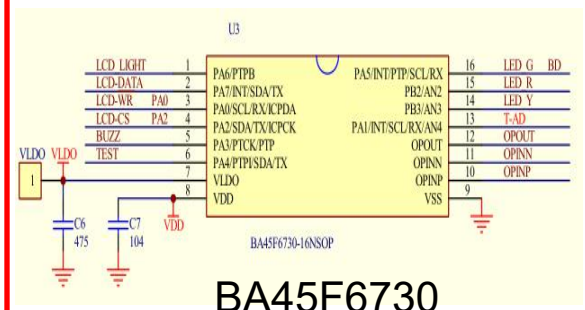
GAS 原理圖

➢GAS Demo原理圖



電源





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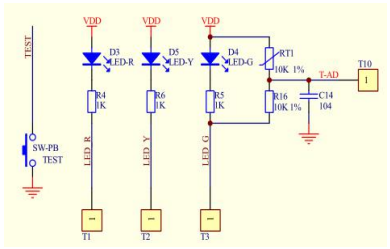
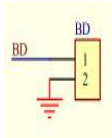
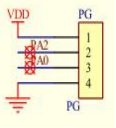


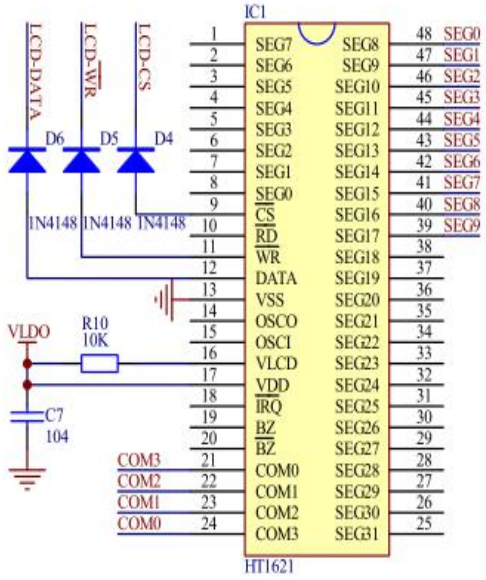
KEY&LED



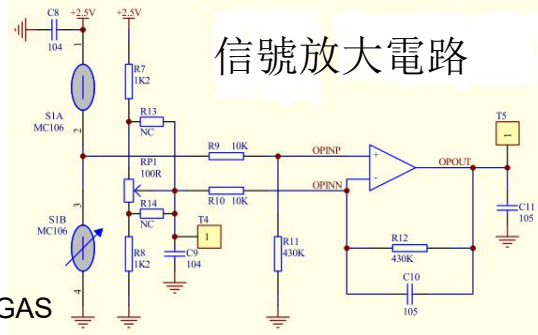
標定口



燒錄口

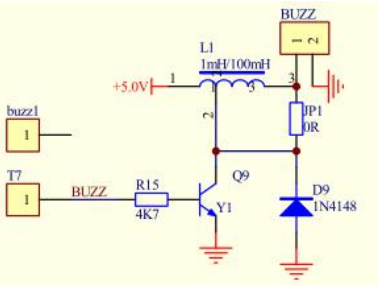


LCD顯示模組

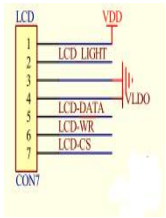


信號放大電路

GAS Sensor



蜂鳴器驅動電路

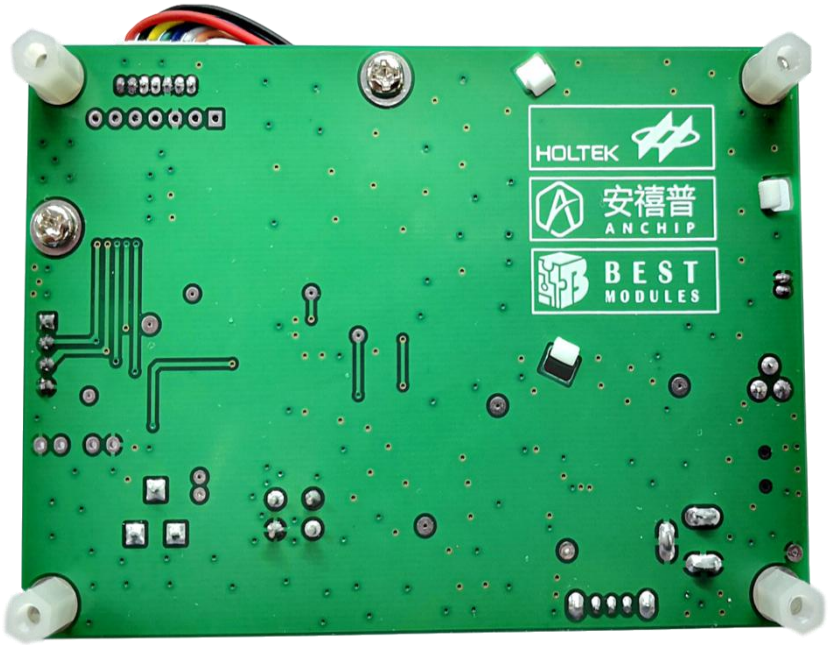


LCD介面

GAS Demo外觀-1

➢GAS Demo整體效果圖

GAS Demo正面

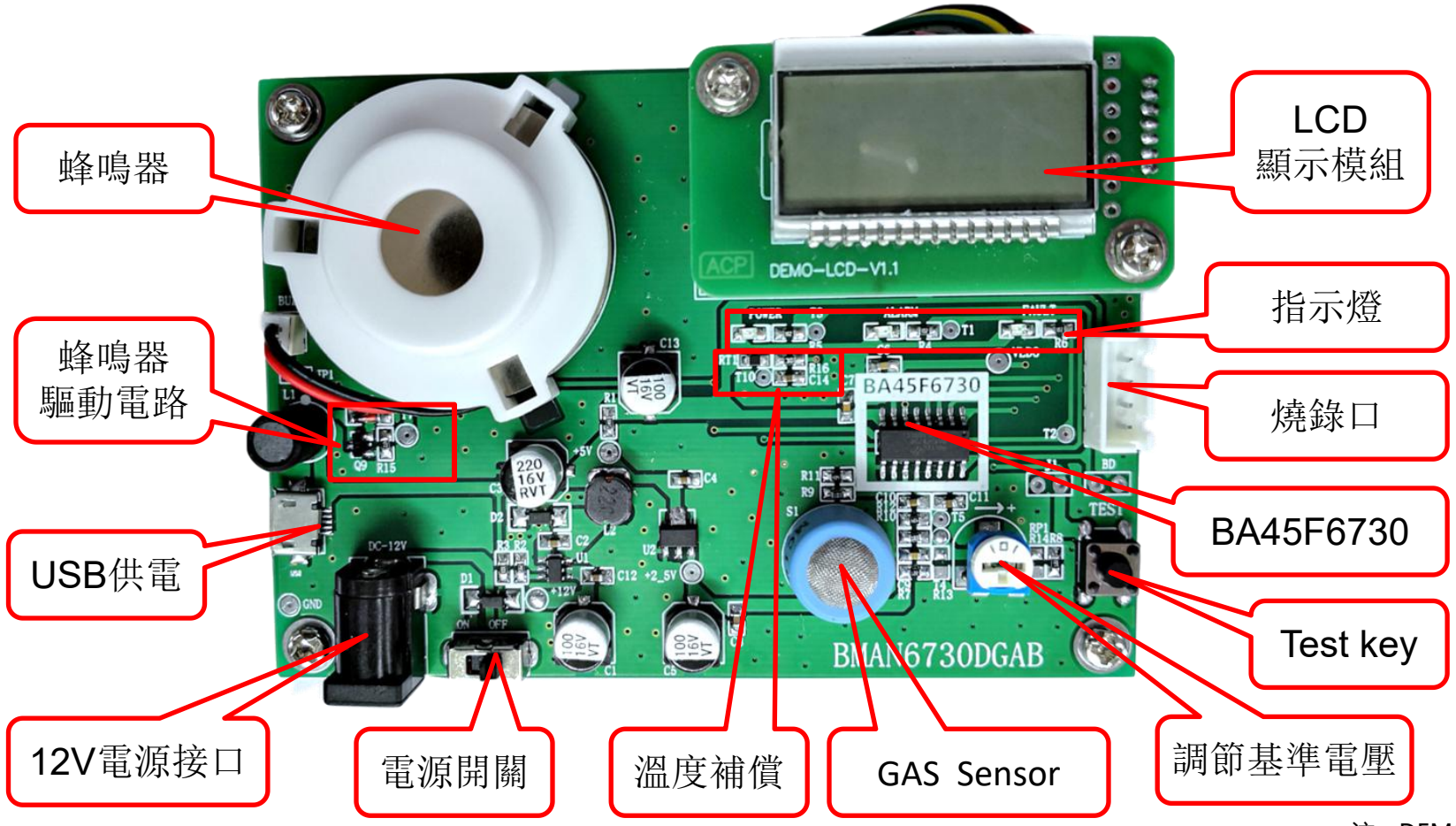


GAS Demo背面

注：DEMO 样板不定时更新，我司不另行通知，购买请以实物为准。

GAS Demo外觀-2

➢GAS Demo器件介紹



注：DEMO 样板不定时更新，我司不另行通知，购买请以实物为准。

GAS Demo實現功能

主要功能

- 預熱模式：上电后自动进入预热模式，传感器将有180s的预热时间来进入正常工作状态，在这过程中将同步显示180s倒计时，并且绿灯每秒闪烁一次；
- 常態模式：LCD将实时显示当前燃气浓度，绿灯40s闪烁一次，表示无任何异常。当检测到燃气浓度大于500ppm时，背光灯将开启；
- 按键自检模式：在正常显示模式下，按下测试按键后可以进入测试模式，该模式可以测试设备的LED、LCD显示、蜂鸣器报警等功能是否正常；
- 带气標定模式：标定功能主要是将设备放至一个标准的报警浓度（如5000ppm）的密封环境来进行标定。当设备预热完毕后短接标定端口将进入带气标定模式，标定时间为30s，LCD将显示“bd2”，并且绿灯每1s闪烁3次；标定成功后设备将进入报警状态；标定失败时，所有LED常亮，并且LCD显示bdE；
- 報警模式：当检测到燃气浓度大于5000ppm时（超过设定阈值），将进入报警模式。在该模式下，红灯闪烁3次，蜂鸣器叫3声，然后停1s，周期循环，LCD显示实时浓度（最大9999ppm）且背光灯开启。

Note：以上功能為code“SOFTWARE-DM20171202-BA45F6730-數顯燃氣-V1.1-A1”所實現，後續若有增加功能或代碼完善則響應的code版本會升級。

優勢

BA45F6730 CO&GAS Detector優勢

- CO&GAS Detecor：集成一個可校準OPA和兩組分壓電路，方便了信號處理和Sensor故障检测；
- OPA bandwidth可調，選擇相應的bandwidth可較低功耗；
- 内建 LDO： 2.2V/3.0V 輸出；
- 外部元器件少，降低成本。

END