BA45F5542

Smoke IC推廣

日期：2021年08月26日

目录 CONTENTS

BA45F5542資源-1

➢MCU資源介紹

MCU model		BA45F5542
Op. Temperatrue		-40℃~85℃
Op. Voltage		2.2V~5.5V
Memory	ROM	4K x 16
	RAM	256 x 8
	EEPROM	64 x 8
OSC	HIRC	2/4/8MHz
	LIRC	32KHz
I/O		6/9
EXT. INT.		2
Timer	Type	10-bit x 2
A/D		12-bit x 8 （4External+4Internal）
OPA		x2(Smoke AFE)
ISINK		x2(Smoke AFE)
PLT		V
Stack		8
Interface		UART/SPI/IIC
LVR/LVD		V
Package		16NSOP/20SSOP

BA45F5542資源-2

Operating Current Characteristics

Ta=25°C

Symbol	Normal Operation	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
I_{DD}	SLOW Mode (LIRC)	2.2V	f_{SYS}=32kHz	—	8	16	μA
		3V		—	10	20	
		5V		—	30	50	
	FAST Mode (HIRC)	2.2V	f_{SYS}=2MHz	—	0.15	0.20	mA
		3V		—	0.20	0.30	
		5V		—	0.40	0.60	
		2.2V	f_{SYS}=4MHz	—	0.3	0.5	mA
		3V		—	0.4	0.6	
		5V		—	0.8	1.2	
		2.7V	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.

BA45F5542資源-3

Standby Current Characteristics

Ta=25°C, unless otherwise specify

Symbol	Standby Mode	Test Conditions		Min.	Typ.	Max.	Max.	Unit
		V_{DD}	Conditions				85°C	
I_{STB}	SLEEP Mode	2.2V	WDT on	—	1.2	2.4	2.9	μA
		3V		—	1.5	3	3.6	
		5V		—	3	5	6	
	IDLE0 Mode (LIRC)	2.2V	f_{SUB} on	—	2.4	4.0	4.8	μA
		3V		—	3	5	6	
		5V		—	5	10	12	
	IDLE1 Mode (HIRC)	2.2V	f_{SUB} on, f_{SYS}=2MHz	—	60	120	140	μA
		3V		—	70	140	160	
		5V		—	130	260	280	
		2.2V	f_{SUB} on, f_{SYS}=4MHz	—	90	200	220	μA
		3V		—	110	220	240	
		5V		—	210	420	460	
		2.7V	f_{SUB} on, f_{SYS}=8MHz	—	150	300	340	μA
		3V		—	180	360	400	
		5V		—	370	740	800	

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.

BA45F5542資源-4

High Speed Internal Oscillator 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.

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Temp.				
f_{HIRC}	2MHz Writer Trimmed HIRC Frequency	3V/5V	25°C	-1%	2	+1%	MHz
			-20°C~60°C	-2%	2	+2%	
			-40°C~85°C	-3%	2	+3%	
		2.2V~5.5V	25°C	-9%	2	+9%	
			-40°C~85°C	-10%	2	+10%	
	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	-10%	8	+2%	
		2.2V~5.5V	25°C	-10%	8	+3%	
			-40°C~85°C	-15%	8	+5%	

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 2.2V 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%.

BA45F5542資源-5

Sink Current Generator Electrical Characteristics

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
I_{SINK0}	Sink Current for ISINK0 Pin	5V	Ta=25°C, V_{ISINK0}=3.0V, ISGDATA0[4:0]=00000B	-5%	50	+5%	mA
		—	Ta=-40°C~85°C, V_{ISINK0}=1.0V~4.5V, ISGDATA0[4:0]=00000B	-18%	50	+18%	
		5V	Ta=25°C, V_{ISINK0}=3.0V, ISGDATA0[4:0]=11111B	-8%	360	+8%	
		—	Ta=-40°C~85°C, V_{ISINK0}=1.0V~4.5V, ISGDATA0[4:0]=11111B	-18%	360	+18%	

BA45F5542資源-6

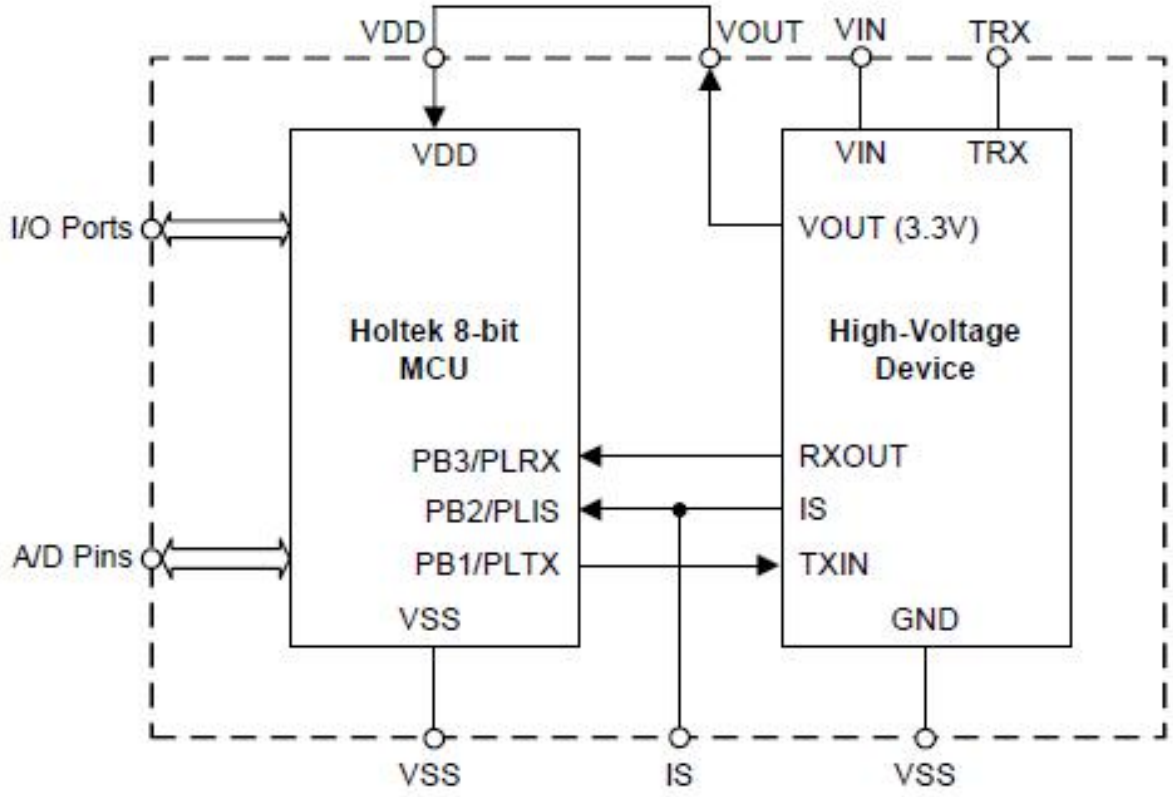
Sink Current Generator Electrical Characteristics

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
I_{SINK1}	Sink Current for ISINK1 Pin	5V	Ta=25°C, V_{ISINK1}=3.0V, ISGDATA1[4:0]=00000B	-10%	50	+10%	mA
		—	Ta=-40°C~85°C, V_{ISINK1}=1.0V~4.5V ISGDATA1[4:0]=00000B	-18%	50	+18%	
		5V	Ta=25°C, V_{ISINK1}=3.0V, ISGDATA1[4:0]=11111B	-13%	205	+13%	
		—	Ta=-40°C~85°C, V_{ISINK1}=1.0V~4.5V ISGDATA1[4:0]=11111B	-18%	205	+18%	

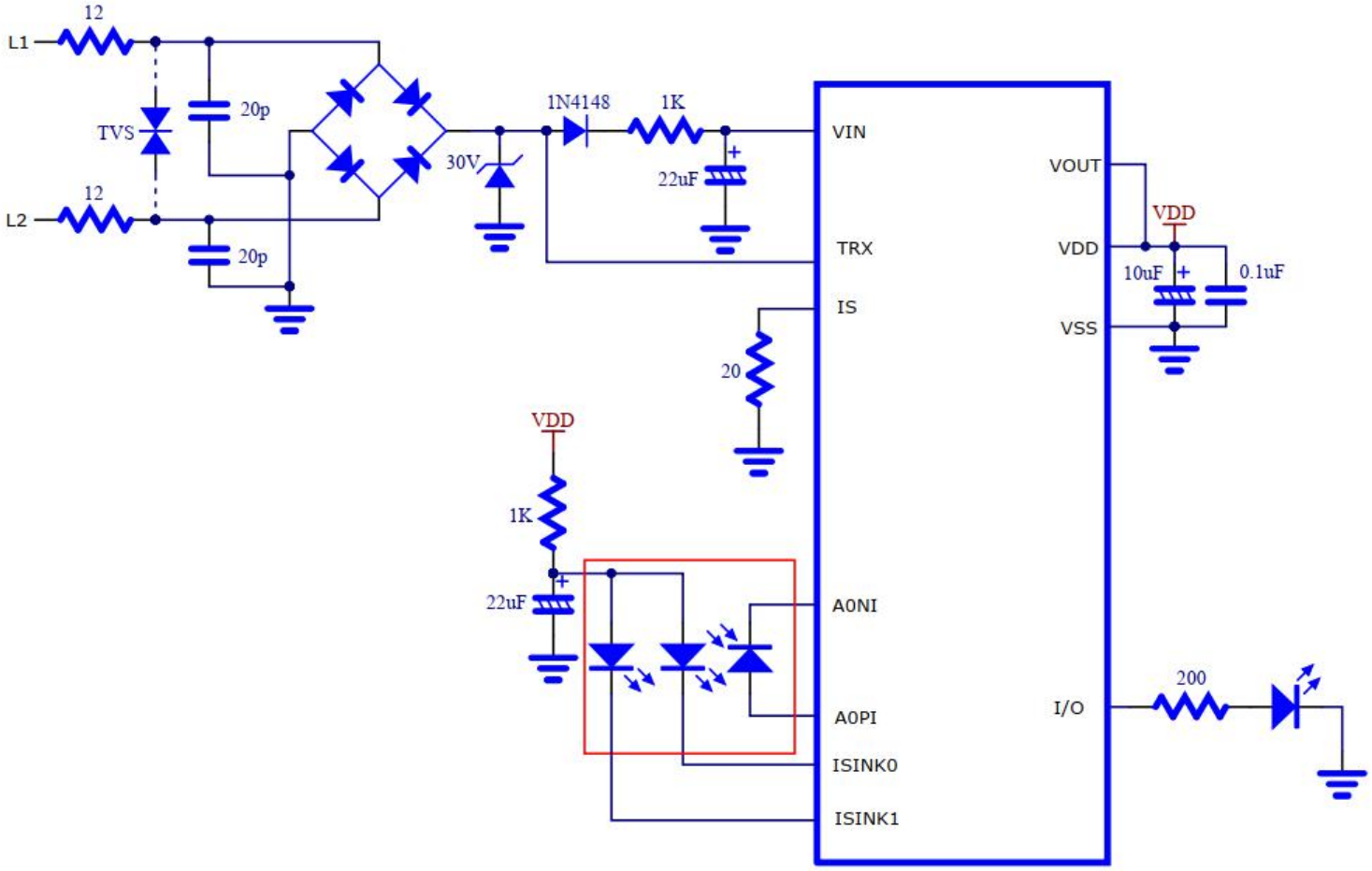
BA45F5542應用-1

總體框架



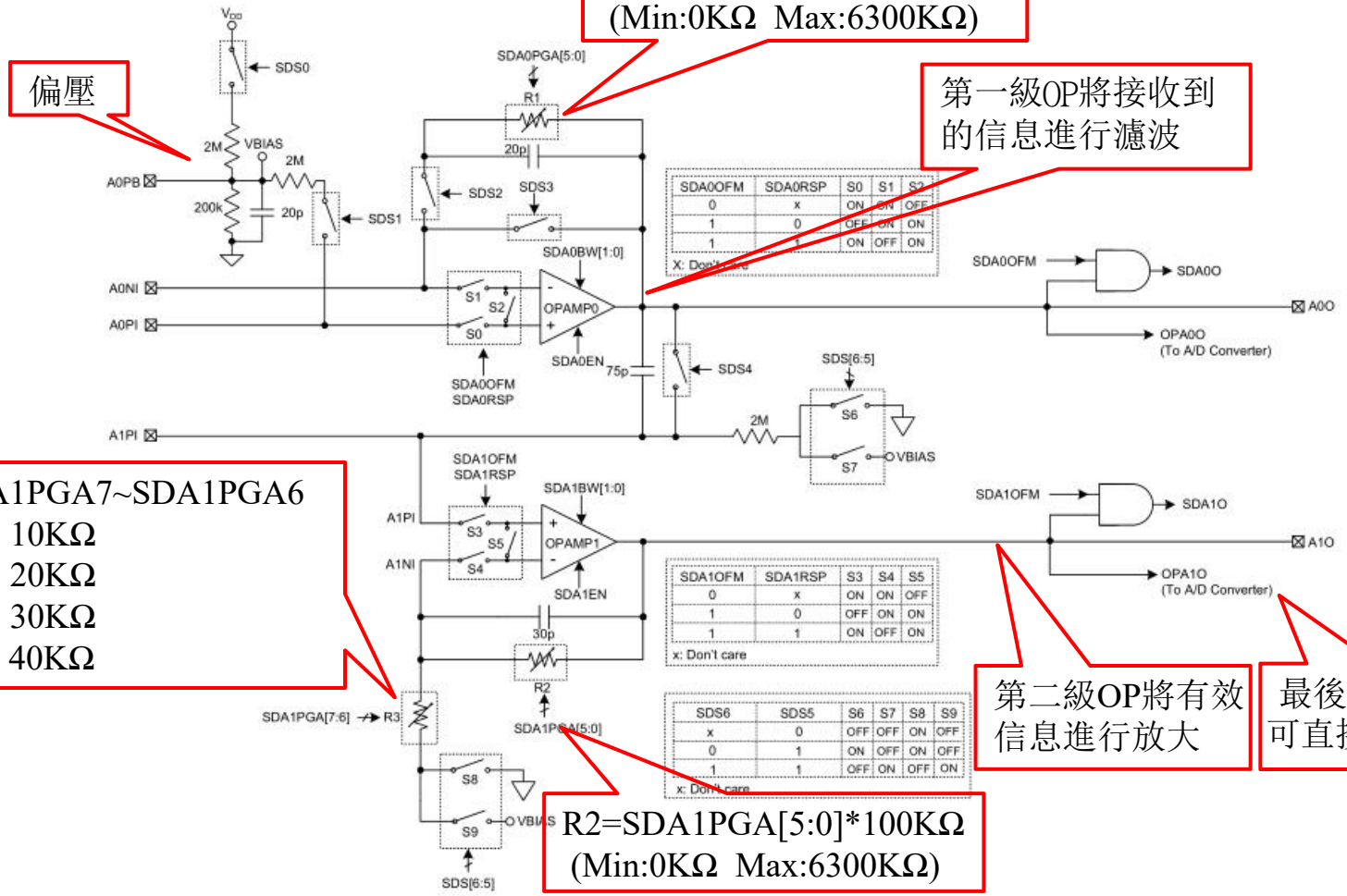
BA45F5542應用-2

應用電路



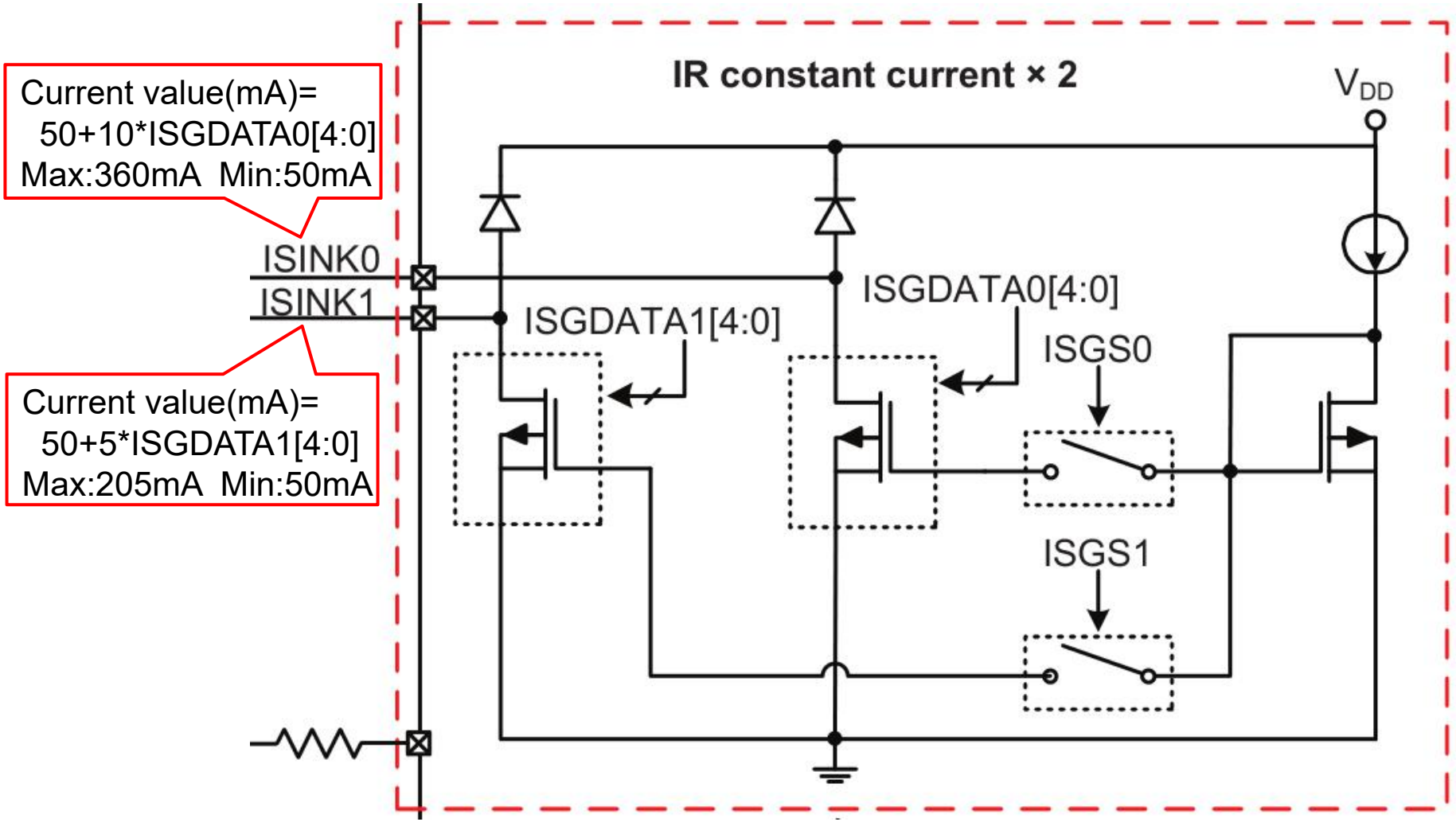
BA45F5542應用-3

Smoke AFE



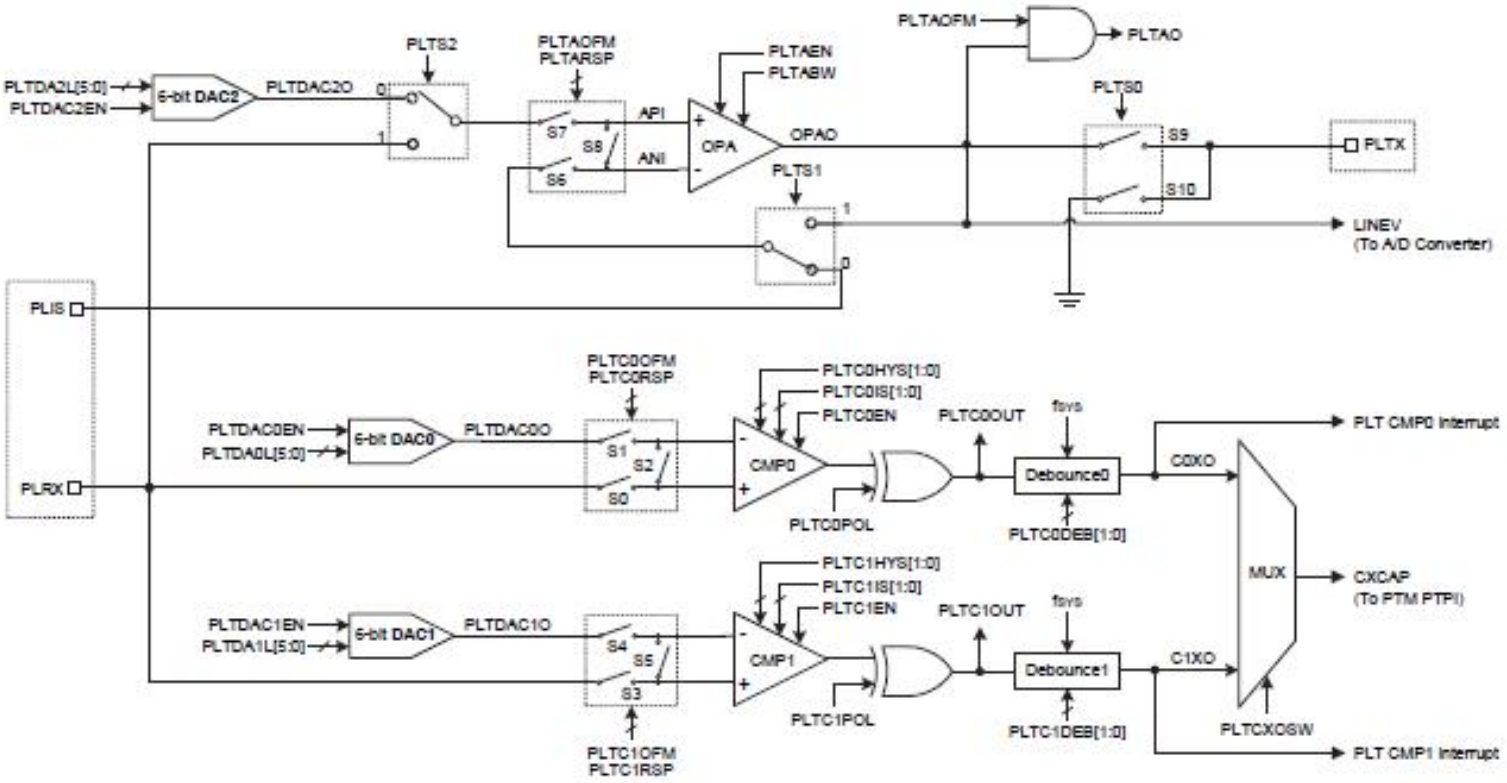
BA45F5542應用-4

Sink Current Generator



BA45F5542應用-5

- PTL(Power Line Transceiver)

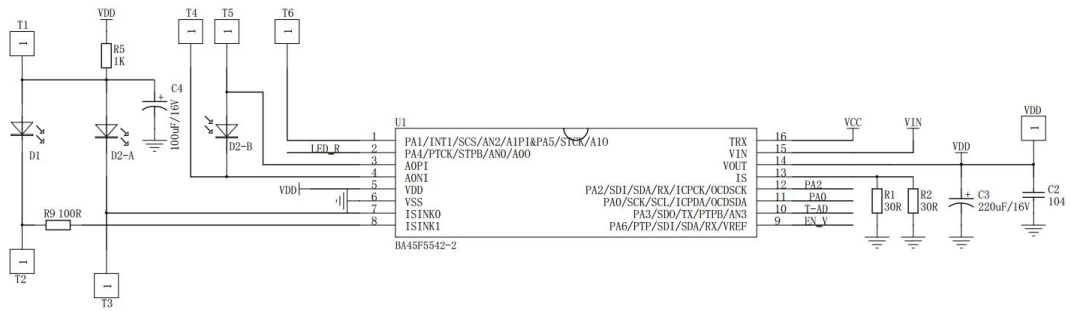


Power Line Data Transceiver Block Diagram

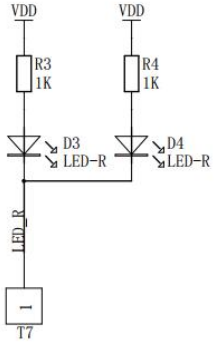
Note：請配合datasheet上的應用電路理解。

原理圖

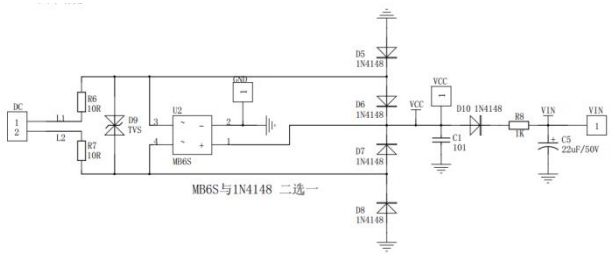
➢Demo原理圖



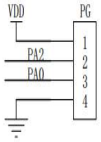
BA45F5542&IR發射接收



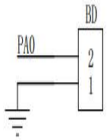
LED



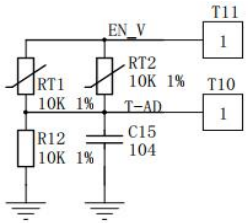
橋堆



燒錄口



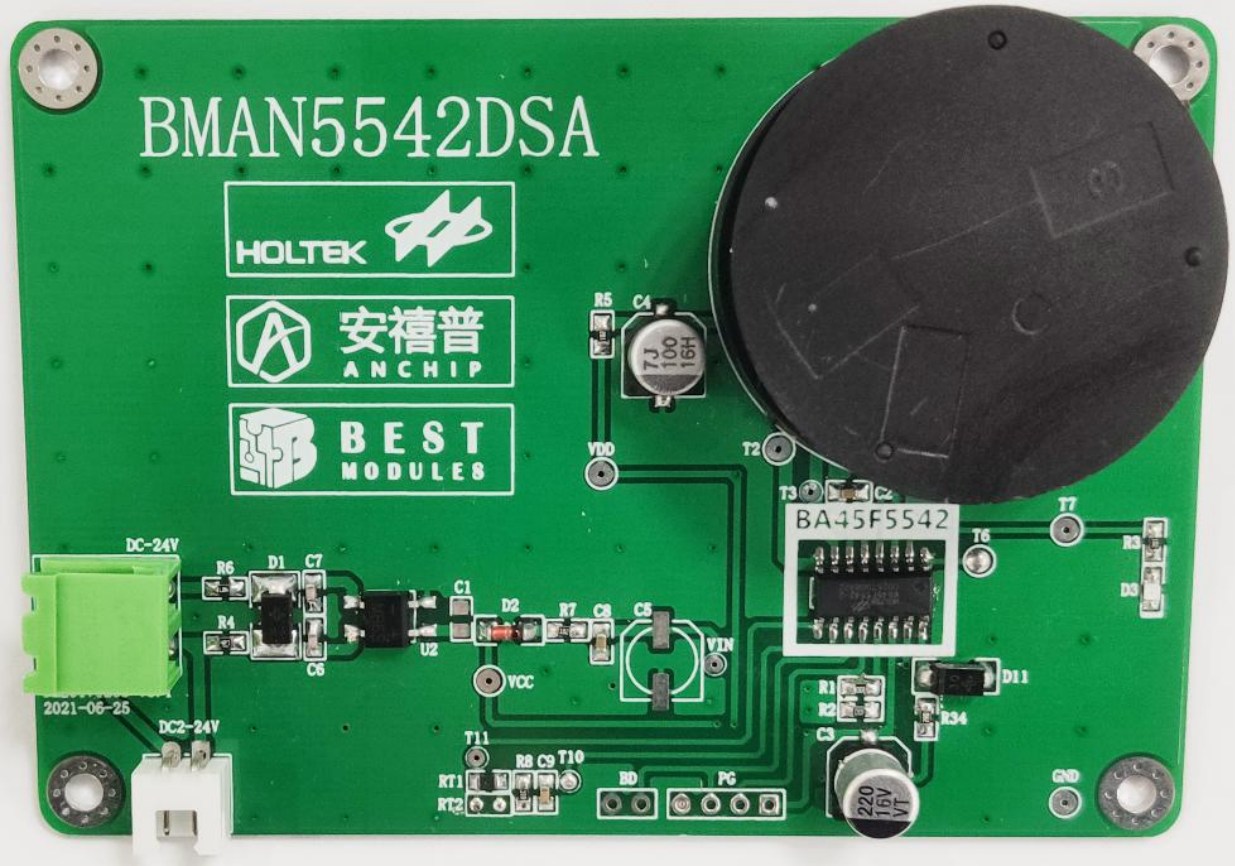
標定口



溫度補償

DEMO-外觀-1

- Demo整體效果圖



注：DEMO 样板不定时更新，我司不另行通知，购买请以实物为准。

DEMO-外觀-2

- 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。

DEMO實現功能

➢主要功能

◆若沒有標定，則上電後紅燈常亮。標定方式：上電前短接PA0和GND。若標定過，上電後紅燈閃一次。

◆標定模式：紅燈1s閃爍一次，共4s。標定成功進入常態，不成功紅燈常亮。

◆常態模式：紅燈40s閃爍一次。

◆報警模式：間接響3聲後停1s，之後迴圈。

◆故障檢測：LED閃2次，40s迴圈一次。

◆具有溫度補償功能

Note：以上功能為code“SOFTWARE-DM20171205-BA45F5542-聯網煙感-V2.3-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

優勢

➢BA45F5542 Smoke Detector 優勢

- Smoke Detector AFE集成2個OP，極大的方便了信號的處理。
- 信號的放大倍率可由軟件調節。
- 內部集成兩路2路IR constant current,電流可以通過軟件調節；

  ININK0的範圍為（Min:50mA,Max:360mA）；

  ININK1的範圍為（Min:50mA,Max:205mA）。
- 外圍元器件極少，可降低成本。
- 集成了一個兩線式電源線數據收發器。通過電源電壓線發送數據，互連電纜可以簡化為兩條，大大減少電纜和安裝成本。
- 內部 LDO 能確保提供恒定的電源電壓給互連子系統。

END