BA45F5440

Smoke IC Promotion

Date: December 15, 2021

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BA45F5440

➢MCU Resource Introduction

MCU model		BA45F5440
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		9
EXT. INT.		2
Timer	Type	10-bit x 2
A/D		12-bit x 7 （4External+3Internal）
OPA		x2(Smoke AFE)
ISINK		x2(Smoke AFE)
PLT		--
Stack		8
Interface		UART/SPI/IIC
LVR/LVD		V
Package		20SOP/20SSOP

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Operating Current Characteristics

Ta=25°C

Symbol	Normal Operation	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
I_{DD}	SLOW Mode (LIRC)	3.3V	f_{SYS}=32kHz	—	10	20	μA
	FAST Mode (HIRC)	3.3V	f_{SYS}=2MHz	—	0.2	0.3	mA
		3.3V	f_{SYS}=4MHz	—	0.4	0.6	mA
		3.3V	f_{SYS}=8MHz	—	0.8	1.2	mA

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.

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Standby Current Characteristics

Ta=25°C, unless otherwise specified

Symbol	Standby Mode	Test Conditions		Min.	Typ.	Max.	Max. @85°C	Unit
		V_{DD}	Conditions					
I_{STB}	SLEEP Mode	3.3V	WDT on	—	1.5	3.0	3.6	μA
	IDLE0 Mode (LIRC)	3.3V	f_{SUB} on	—	3	5	6	μA
	IDLE1 Mode (HIRC)	3.3V	f_{SUB} on, f_{SYS}=2MHz	—	70	140	160	μA
		3.3V	f_{SUB} on, f_{SYS}=4MHz	—	110	220	240	μA
		3.3V	f_{SUB} on, f_{SYS}=8MHz	—	180	360	400	μA

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.

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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 3.3V.

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Temp.				
f_{HIRC}	2MHz Writer Trimmed HIRC Frequency	3.3V	25°C	-1%	2	+1%	MHz
			-20°C~60°C	-2%	2	+2%	
			-40°C~85°C	-3%	2	+3%	
	4MHz Writer Trimmed HIRC Frequency	3.3V	25°C	-1%	4	+1%	MHz
			-40°C~85°C	-2%	4	+2%	
	8MHz Writer Trimmed HIRC Frequency	3.3V	25°C	-1%	8	+1%	MHz
			-40°C~85°C	-10%	8	+2%	

Note: 1. The 3.3V values for V_{DD} are provided as this is the fixed voltage at which the HIRC frequency is trimmed by the writer.

2. 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%.

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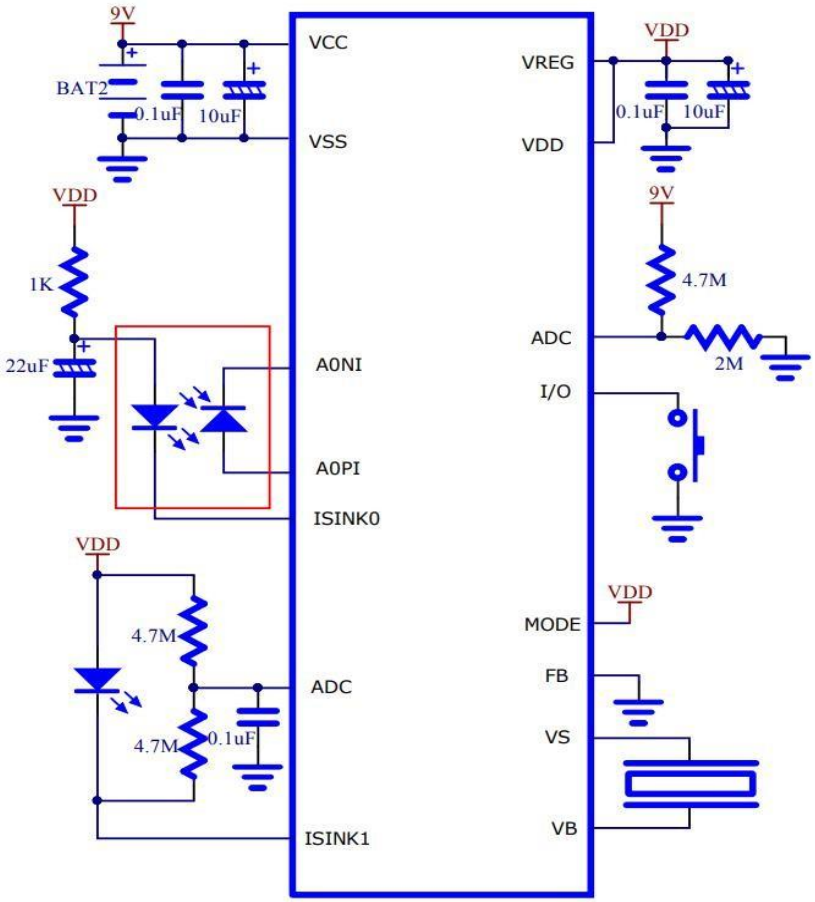
Sink Current Generator Electrical Characteristics

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
I_{SINK0}	Sink Current for ISINK0 Pin	—	Ta=-40°C~85°C, V_{SINK0}=1.0V~3.3V, ISGDATA0[4:0]=00000B	41	50	59	mA
		—	Ta=-40°C~85°C, V_{SINK0}=1.0V~3.3V, ISGDATA0[4:0]=11111B	295	360	425	
I_{SINK1}	Sink Current for ISINK1 Pin	—	Ta=-40°C~85°C, V_{SINK1}=1.0V~3.3V, ISGDATA1[4:0]=00000B	41	50	59	mA
		—	Ta=-40°C~85°C, V_{SINK1}=1.0V~3.3V, ISGDATA1[4:0]=11111B	168	205	242	

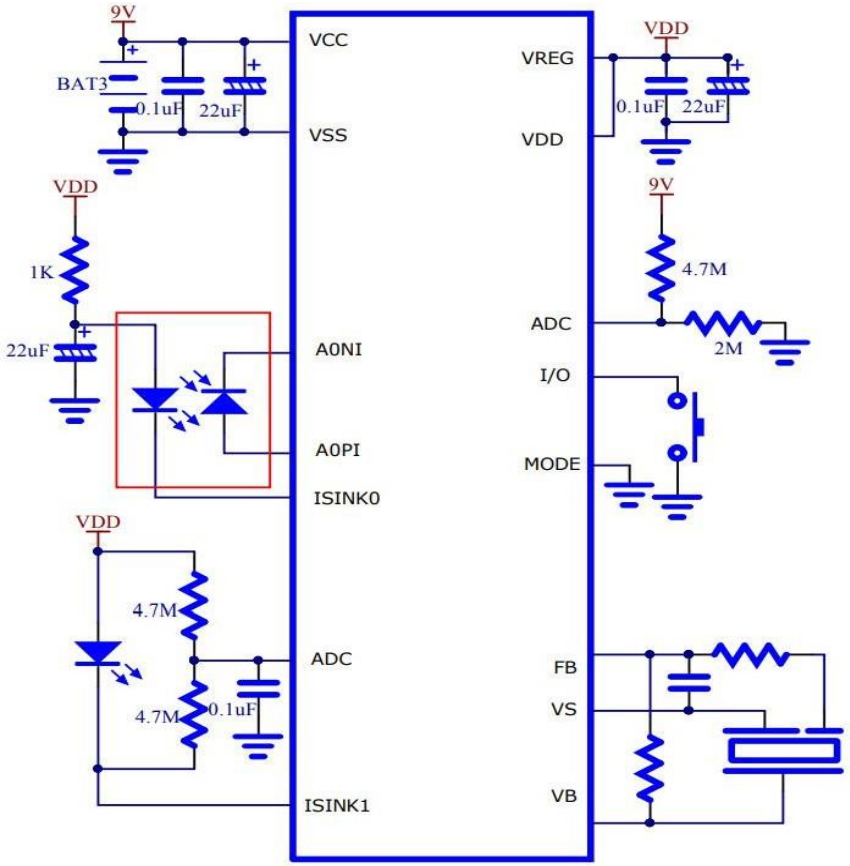
BA45F5440 Resources-1

Application Circuit – Separately Excited Buzzer



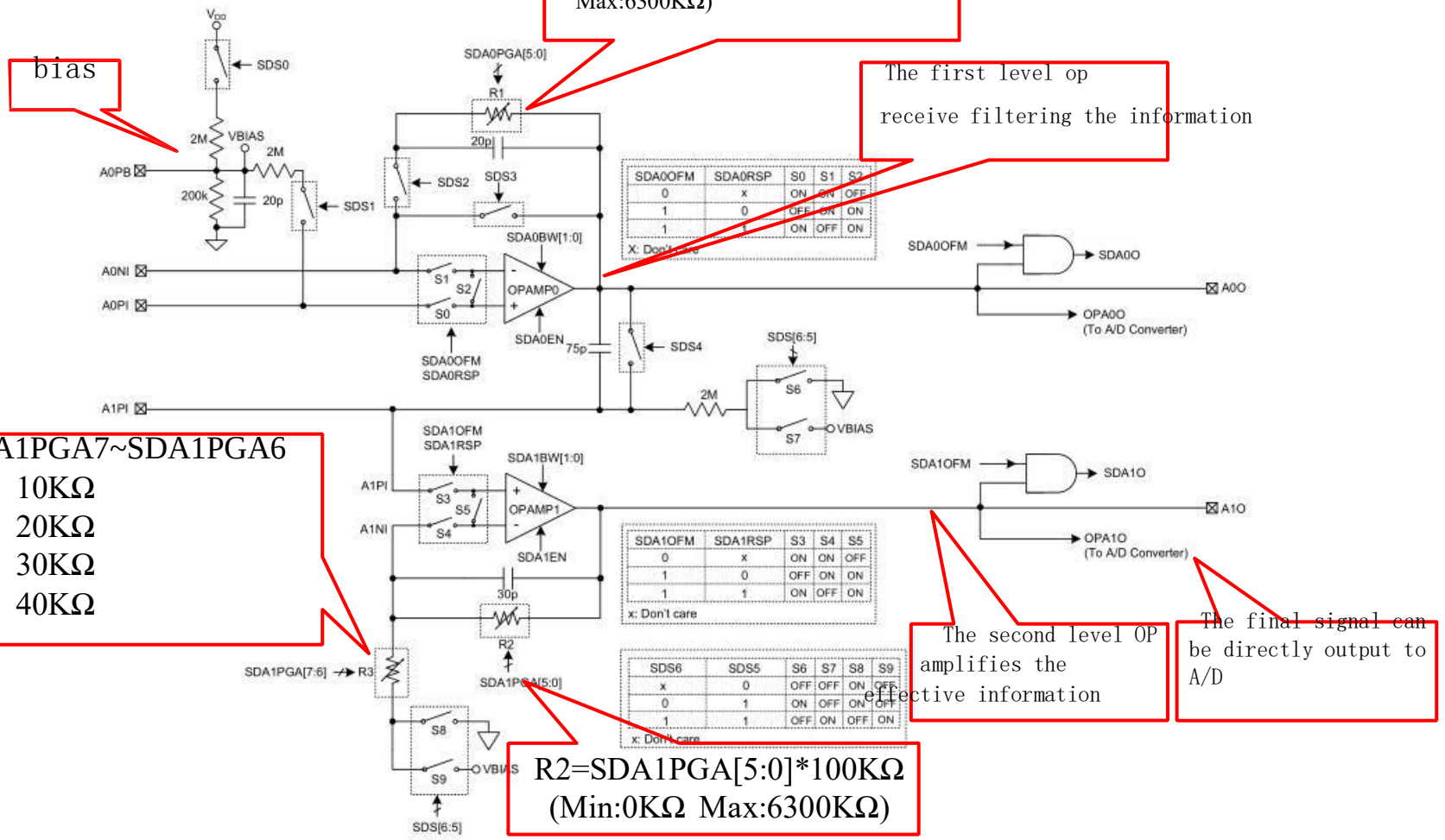
BA45F5440 Resources-2

Application Circuit-Self-excited Buzzer



BA45F5440 Resources-3

Smoke AFE



SDA0OFM	SDA0RSP	S0	S1	S2
0	x	ON	ON	OFF
1	0	OFF	ON	ON
1	1	ON	OFF	ON

X: Don't care

SDA1OFM	SDA1RSP	S3	S4	S5
0	x	ON	ON	OFF
1	0	OFF	ON	ON
1	1	ON	OFF	ON

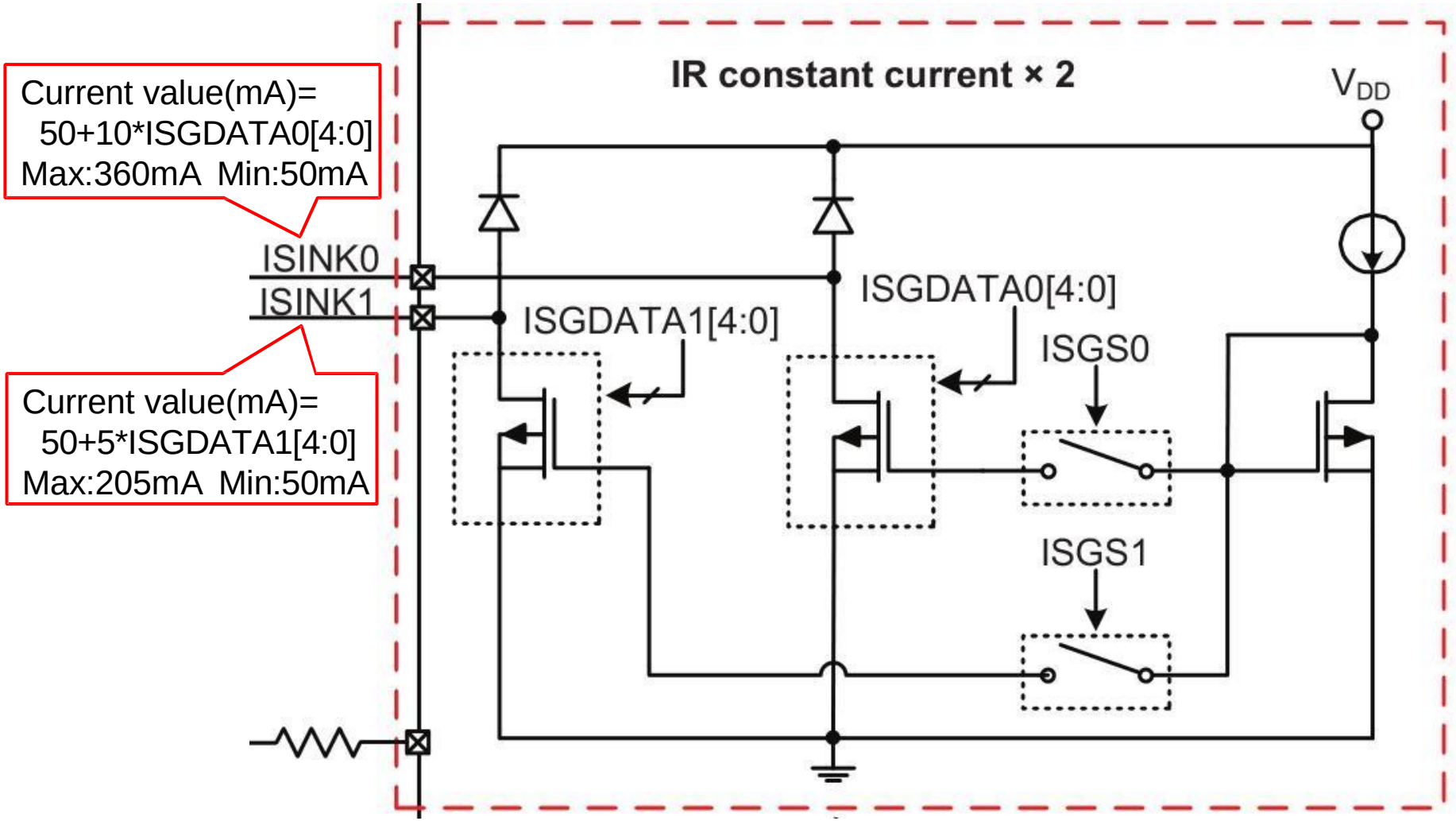
x: Don't care

SDS6	SDS5	S6	S7	S8	S9
x	0	OFF	OFF	ON	OFF
0	1	ON	OFF	ON	OFF
1	1	OFF	ON	OFF	ON

x: Don't care

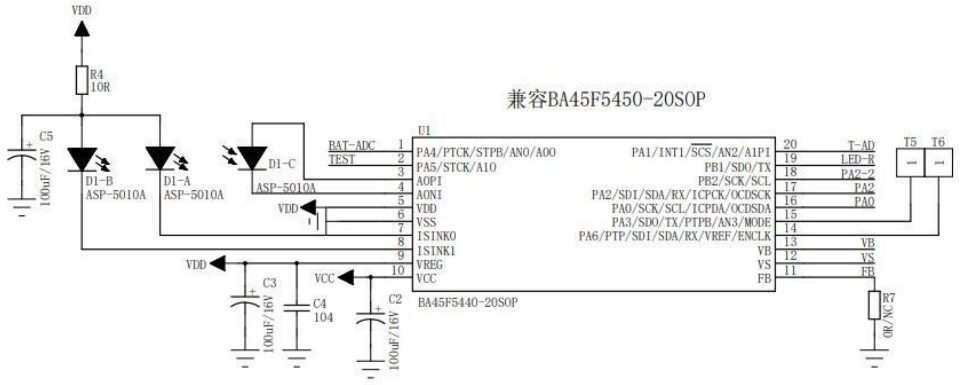
BA45F5440 Resources-4

Sink Current Generator

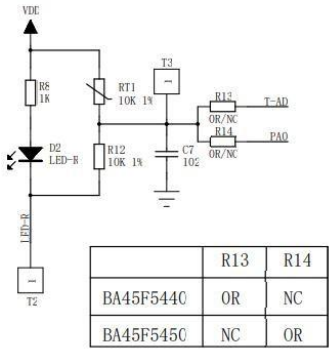


Schematic

Demo Schematic

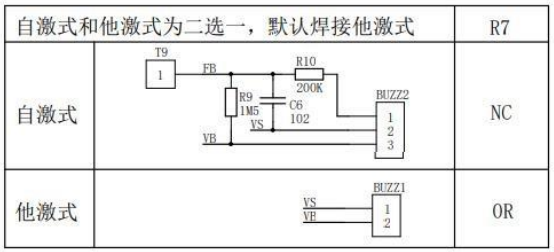


BA45F5440&IR Transmit and receive

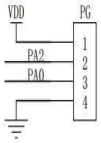


	R13	R14
BA45F5440	OR	NC
BA45F5450	NC	OR

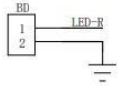
LEDand temperature



Buzzer Circuit



Burning port



Calibration port

button

DEMO-Appearance-1

- Demo overall effect diagram

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-Appearance -2

Demo Device Introduction

Externally excited buzzer terminal

Self-excited buzzer terminal

Power terminals

Power switch

Anti reverse connection circuit

Burning port

BA45F5440

Test button

calibration port

temperature dete

LEDinstruct

Labyrinth cavity (infrared pair tube)

注：DEMO 样板不定时更新，我司不另行通知，购买请以实物为准

Main functions

- If it is not calibrated, the red light will be on after power-on. Calibration method: Short-circuit the BD port and GND before powering on. If it has been calibrated, the red light will flash once after power-on.
- Calibration mode: The red light flashes once every 1s; if the calibration is successful, it will enter the normal state; if it is unsuccessful, the red light will be on steadily.
- Normal mode: The red light flashes once every 40 seconds.
- Alarm mode: Instant beep 3 times, stop for 1s, then loop.
- Fault detection: LED flashes twice, once every 40 seconds.
- With temperature compensation function

Note: The above functions are code "SOFTWARE-DM20210801-BA45F5440-
Independent smoke alarm-C-V1.0-A1". If there are additional functions or code improvements in the future, the corresponding code version number will be upgraded.

BA45F5440 Smoke Detector Advantages

- Smoke Detector AFE integrates 2 OPs, which greatly facilitates signal processing.
- The signal amplification can be adjusted by software.
- Two 2-way IR constant current are integrated internally, and the current can be adjusted by software; the range of ININK0 is (Min: 50mA, Max: 360mA);

The range of ININK1 is (Min:50mA, Max:205mA).

- Very few peripheral components can reduce costs.
- Internal LDO ensures constant supply voltage to interconnect subsystems.
- Internally integrated buzzer driving circuit, can directly drive the buzzer.

END