

Ambient Light Sensor IC Series

Digital 16bit Serial Output Type Ambient Light Sensor IC



BH1750FVI

No.11046EDT01

●Descriptions

BH1750FVI is an digital Ambient Light Sensor IC for I²C bus interface. This IC is the most suitable to obtain the ambient light data for adjusting LCD and Keypad backlight power of Mobile phone. It is possible to detect wide range at High resolution. (1 - 65535 lx).

●Features

- 1) I²C bus Interface (f / s Mode Support)
- 2) Spectral responsibility is approximately human eye response
- 3) Illuminance to Digital Converter
- 4) Wide range and High resolution. (1 - 65535 lx)
- 5) Low Current by power down function
- 6) 50Hz / 60Hz Light noise reject-function
- 7) 1.8V Logic input interface
- 8) No need any external parts
- 9) Light source dependency is little. (ex. Incandescent Lamp. Fluorescent Lamp. Halogen Lamp. White LED. Sun Light)
- 10) It is possible to select 2 type of I²C slave-address.
- 11) Adjustable measurement result for influence of optical window
(It is possible to detect min. 0.11 lx, max. 100000 lx by using this function.)
- 12) Small measurement variation (+/- 20%)
- 13) The influence of infrared is very small.

●Applications

Mobile phone, LCD TV, NOTE PC, Portable game machine, Digital camera, Digital video camera, PDA, LCD display

●Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units
Supply Voltage	V _{max}	4.5	V
Operating Temperature	T _{opr}	-40~85	°C
Storage Temperature	T _{stg}	-40~100	°C
SDA Sink Current	I _{max}	7	mA
Power Dissipation	P _d	260*	mW

* 70mm × 70mm × 1.6mm glass epoxy board. Derating in done at 3.47mW/°C for operating above Ta=25°C.

●Operating Conditions

Parameter	Symbol	Ratings			Units
		Min.	Typ.	Max.	
V _{cc} Voltage	V _{cc}	2.4	3.0	3.6	V
I ² C Reference Voltage	V _{DVI}	1.65	-	V _{cc}	V

●Electrical Characteristics (Vcc = 3.0V, DVI = 3.0V, Ta = 25°C, unless otherwise noted)

Parameter	Symbol	Limits			Units	Conditions
		Min.	Typ.	Max.		
Supply Current	Icc1	—	120	190	μA	Ev = 100 lx ※ ¹
Powerdown Current	Icc2	—	0.01	1.0	μA	No input Light
Peak Wave Length	λp	—	560	—	nm	
Measurement Accuracy	S/A	0.96	1.2	1.44	times	Sensor out / Actual lx EV = 1000 lx ※ ¹ , ※ ²
Dark (0 lx) Sensor out	S0	0	0	3	count	H-Resolution Mode ※ ³
H-Resolution Mode Resolution	rHR	—	1	—	lx	
L-Resolution Mode Resolution	rLR	—	4	—	lx	
H-Resolution Mode Measurement Time	tHR	—	120	180	ms	
L-Resolution Mode Measurement Time	tLR	—	16	24	ms	
Incandescent / Fluorescent Sensor out ratio	rIF	—	1	—	times	EV = 1000 lx
ADDR Input 'H' Voltage	VAH	0.7 * VCC	—	—	V	
ADDR Input 'L' Voltage	VAL	—	—	0.3 * VCC	V	
DVI Input 'L' Voltage	VDVL	—	—	0.4	V	
SCL, SDA Input 'H' Voltage 1	VIH1	0.7 * DVI	—	—	V	DVI ≥ 1.8V
SCL, SDA Input 'H' Voltage 2	VIH2	1.26	—	—	V	1.65V ≤ DVI < 1.8V
SCL, SDA Input 'L' Voltage 1	VIL1	—	—	0.3 * DVI	V	DVI ≥ 1.8V
SCL, SDA Input 'L' Voltage 2	VIL2	—	—	DVI - 1.26	V	1.65V ≤ DVI < 1.8V
SCL, SDA, ADDR Input 'H' Current	IiH	—	—	10	μA	
SCL, SDA, ADDR Input 'L' Current	IiL	—	—	10	μA	
I ² C SCL Clock Frequency	fSCL	—	—	400	kHz	
I ² C Bus Free Time	tBUF	1.3	—	—	μs	
I ² C Hold Time (repeated) START Condition	tHDSTA	0.6	—	—	μs	
I ² C Set up time for a Repeated START Condition	tsUSTA	0.6	—	—	μs	
I ² C Set up time for a Repeated STOP Condition	tsUSTD	0.6	—	—	μs	
I ² C Data Hold Time	tHDDAT	0	—	0.9	μs	
I ² C Data Setup Time	tsUDAT	100	—	—	ns	
I ² C 'L' Period of the SCL Clock	tLOW	1.3	—	—	μs	
I ² C 'H' Period of the SCL Clock	tHIGH	0.6	—	—	μs	
I ² C SDA Output 'L' Voltage	VOL	0	—	0.4	V	IOL = 3 mA

※¹ White LED is used as optical source.

※² Measurement Accuracy typical value is possible to change '1' by "Measurement result adjustment function".

※³ Use H-resolution mode or H-resolution mode2 if dark data (less than 10 lx) is need.