

Ambient Light Sensor IC Series

Digital 16bit Serial Output Type

Ambient Light Sensor IC

BH1715FVC



● Descriptions

BH1715FVC is a 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. 0.33 lx, max. 100000 lx by using this function.)
- 12) Small measurement variation (+/- 15%)

● Applications

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

● Absolute Maximum Ratings

Parameter	Symbol	Limits	Units
Supply Voltage	Vmax	4.5	V
Operating Temperature	Topr	-40~85	°C
Storage Temperature	Tstg	-40~100	°C
SDA Sink Current	I _{max}	7	mA
Power Dissipation	P _d	260 _※	mW

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

● Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units
VCC Voltage	V _{cc}	2.4	3.0	3.6	V
I ² C Reference Voltage	VDVI	1.65	—	VCC	V

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

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Supply Current	Icc1	—	120	190	uA	Ev = 100 lx ※1
Powerdown Current	Icc2	—	0.01	1.0	uA	No input Light
Peak Wave Length	λ p	—	560	—	nm	
Measurement Accuracy	S/A	1.02	1.2	1.38	times	Sensor out / Actual lx EV = 1000 lx ※1, ※2
Dark (0 lx) Sensor out	S0	0	0	2	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	uA	
SCL, SDA, ADDR Input 'L' Current	IiL	—	—	10	uA	
I ² C SCL Clock Frequency	fSCL	—	—	400	kHz	
I ² C Bus Free Time	tBUF	1.3	—	—	us	
I ² C Hold Time (repeated) START Condition	tHDSTA	0.6	—	—	us	
I ² C Set up time for a Repeated START Condition	tSUSTA	0.6	—	—	us	
I ² C Set up time for a Repeated STOP Condition	tSUSTD	0.6	—	—	us	
I ² C Data Hold Time	tHDDAT	0	—	0.9	us	
I ² C Data Setup Time	tSUDAT	100	—	—	ns	
I ² C 'L' Period of the SCL Clock	tLOW	1.3	—	—	us	
I ² C 'H' Period of the SCL Clock	tHIGH	0.6	—	—	us	
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 if dark data (less than 10 lx) is need.