

Ambient Light Sensor ICs

Analog Current Output Type Ambient Light Sensor IC



BH1680FVC

No.12046EBT14

●Descriptions

BH1680FVC is an analog current output ambient light sensor. This IC can detect the illuminance from 0lx to 50000lx. It is the most suitable to obtain the ambient light data for adjusting LCD and Keypad backlight of Mobile phone for power saving and better visibility. It is suitable also for the use of optical window that the visible light transmission is low because of the high sensitivity type.

●Features

- 1) Compact surface mount package 1.6 x 1.6 mm
- 2) Output current in proportion to brightness
- 3) Suitable for optical window that the visible light transmission is low (High sensitivity type)
- 4) The influence of infrared is very small by an infrared cut filter
- 5) Supply voltage operates from 2.4V to 5.5V
- 6) Built-in shutdown function
- 7) 3 steps controllable output current gain
- 8) 1.8V logic input interface
- 9) Low sensitivity variation (+/-15%)

●Applications

Mobile phone, LCD TV, PDP TV, Laptop PC, Portable game console, Digital camera, Digital video camera, LCD display

●Absolute Maximum Ratings

Parameter	Symbol	Limits	Units
Supply Voltage	Vmax	7	V
Operating Temperature	Topr	-40~85	°C
Storage Temperature	Tstg	-40~100	°C
Iout Current	Ioutmax	7.5	mA
Power Dissipation	Pd	165*	mW

* 70mm x 70mm x 1.6mm glass epoxy board. Derating at 2.2 mW/°C for operating above Ta=25°C.

●Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units
Vcc Voltage	Vcc	2.4	3.0	5.5	V

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

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Supply Current1 (Operate)	Icc1	51.9	75	105	μA	Ev=10 lx (H-Gain Mode)*
Supply Current2 (0 lx)	Icc2	4.5	9	13.5	μA	Ev=0 lx (H-Gain Mode)
Supply Current3 (Shutdown)	Icc3sd	-	0.2	0.4	μA	V _{GC1} =V _{GC2} =0 No Input Light
IOUT Output Current1(Dark Current)	Iout1	-	-	0.2	μA	Ev=0 lx
IOUT Output Current2	Iout2	51.9	61	70.1	μA	Ev=10 lx (H-Gain Mode)*
Peak Wave Length	λp	-	530	-	nm	
Saturated Output Voltage	V _{OMAX}	2.6	2.9	3.0	V	Ev=10 lx, RL=220kΩ (H-Gain Mode)*
GC1,GC2 Input 'L' Voltage	V _{IL}	0	-	0.4	V	
GC1,GC2 Input 'H' Voltage1	V _{IH1}	1.4	-	Vcc	V	2.4V ≤ VCC ≤ 3.6V
GC1,GC2 Input 'H' Voltage2	V _{IH2}	2.0	-	Vcc	V	3.6V < VCC ≤ 5.5V
Wake-up Time	twu	-	13	52	μs	Shutdown → H-Gain Mode Ev=100lx*
Gain Ratio H-Gain Mode/M-Gain Mode	rHM	8	10	12	times	Ev=10lx*
Gain Ratio M-Gain Mode/L-Gain Mode	rML	8	10	12	times	Ev=10lx*

* White LED is used as optical source

●Reference Data

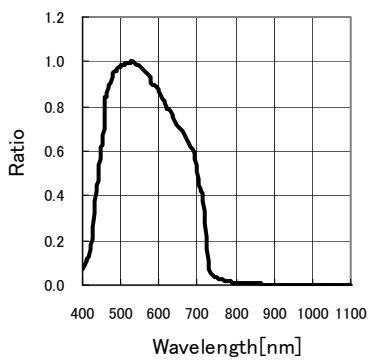


Fig.1 Spectral Response

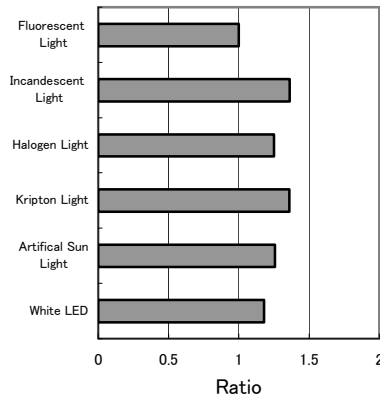
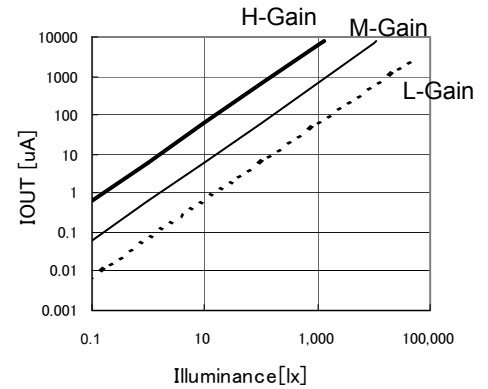
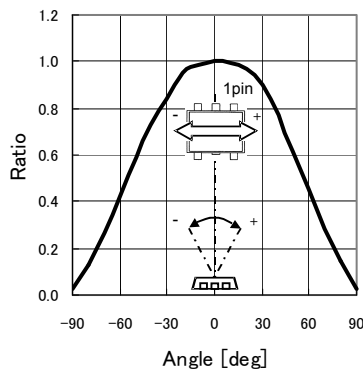
Fig.2 Light Source Dependency
(Fluorescent Light is set to '1')Fig.3 Illuminance – IOUT
Characteristics

Fig.4 Directional Characteristics 1

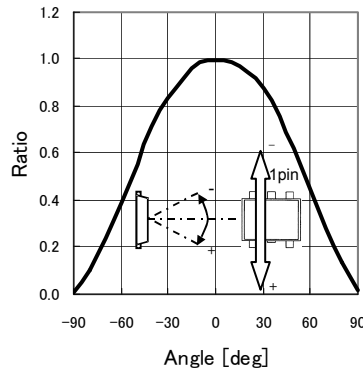


Fig.5 Directional Characteristics 2

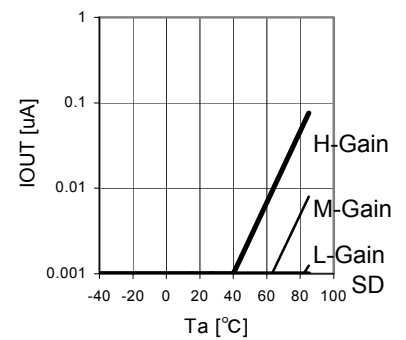


Fig.6 Ta – IOUT (0 lx)

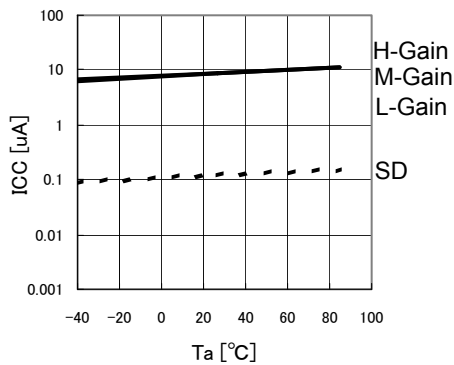


Fig.7 Ta – ICC (0 lx)

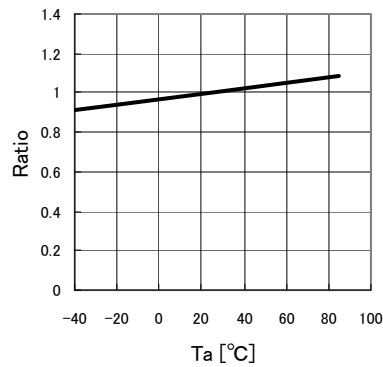
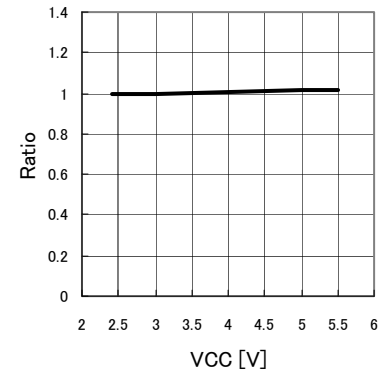
Fig.8 IOUT Temperature dependency
(10 lx)

Fig.9 IOUT VCC dependency

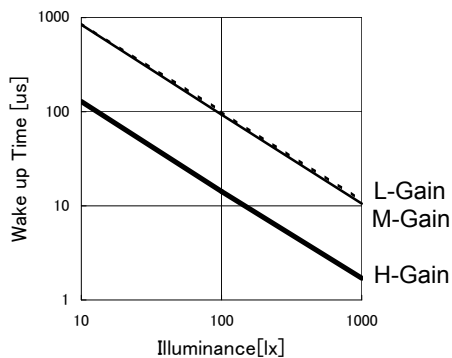


Fig.10 Illuminance – Wake up Time