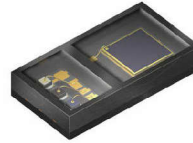


BioMon Sensor
Datasheet
Version 1.1

SFH7050



Features:

- Multi chip package featuring 3 emitters and one detector
- Small package:
(WxDxH) 4.7 mm x 2.5 mm x 0.9 mm
- Light Barrier to block optical crosstalk

Applications

- Heart rate monitoring
- Pulse oximetry

for:

- Wearable devices (e.g. smart watches, fitness trackers, ...)
- Mobile devices

Ordering Information SFH7050 BioMon

Type:	Ordering Code
SFH7050	Q65111A6271

2016-04-20

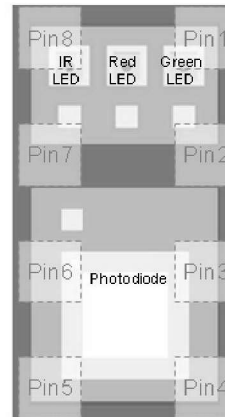
1

OSRAM
Opto Semiconductors
MASITC_01080540

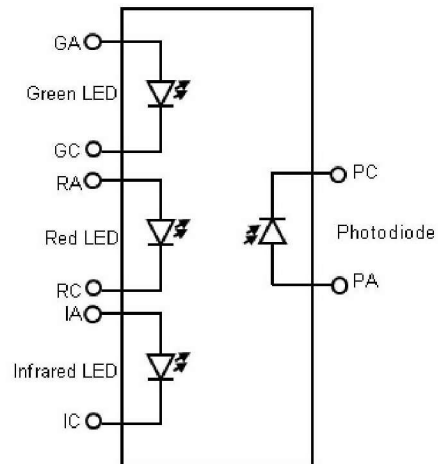
Pin configuration

Pin	Name	Function
1	GC	Green LED Cathode
2	GA	Green LED Anode
3	RA	Red LED Anode
4	PA	Photodiode Anode
5	PC	Photodiode Cathode
6	RC	Red LED Cathode
7	IA	Infrared LED Anode
8	IC	Infrared LED Cathode

Top view



Block diagram



Maximum Ratings ($T_A = 25\text{ °C}$)

Parameter	Symbol	Values	Unit
General			
Operating temperature range	T_{op}	-40 ... 85	°C
Storage temperature range	T_{stg}	-40 ... 85	°C
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	V_{ESD}	2	kV
Infrared Emitter			
Reverse Voltage	V_R	5	V
Forward current	$I_{F(DC)}$	60	mA
Surge current ($t_p = 100\ \mu s$, $D = 0$)	I_{FSM}	1	A
Red Emitter			
Reverse voltage	V_R	12	V
Forward current	$I_{F(DC)}$	40	mA
Surge current ($t_p = 100\ \mu s$, $D = 0$)	I_{FSM}	600	mA
Green Emitter			
Reverse voltage	V_R	not designed for reverse operation	V
Forward current	$I_{F(DC)}$	25	mA
Surge current ($t_p = 100\ \mu s$, $D = 0$)	I_{FSM}	300	mA
Detector			
Reverse voltage	V_R	16	V

Note: The stated maximum ratings refer to single emitter chip operation, unless otherwise specified.

Characteristics ($T_A = 25\text{ }^\circ\text{C}$)

Parameter		Symbol	Value	Unit
Infrared Emitter				
Wavelength of peak emission ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ.)	λ_{peak}	950	nm
Centroid Wavelength ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ. (max.))	$\lambda_{\text{centroid}}$	940 (± 10)	nm
Spectral bandwidth at 50% of I_{max} ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ.)	$\Delta\lambda$	42	nm
Half angle	(typ.)	φ	± 60	$^\circ$
Rise and fall time of I_e (10% and 90% of $I_{e,\text{max}}$) ($I_F = 100\text{ mA}$, $t_p = 16\text{ }\mu\text{s}$, $R_L = 50\text{ }\Omega$)	(typ.)	t_r, t_f	16	ns
Forward voltage ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ. (max.))	V_F	1.3 (≤ 1.8)	V
Reverse current		I_R	not designed for reverse operation	μA
Radiant intensity ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ.)	I_e	2	mW / sr
Total radiant flux ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ.)	Φ_e	5.3	mW
Temperature coefficient of I_e or Φ_e ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ.)	TC_I	-0.3	% / K
Temperature coefficient of V_F ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ.)	TC_V	-0.8	mV / K
Temperature coefficient of $\lambda_{\text{centroid}}$ ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ.)	$TC_{\lambda_{\text{centroid}}}$	0.25	nm / K

Characteristics ($T_A = 25\text{ °C}$)

Parameter		Symbol	Value	Unit
Red Emitter				
Wavelength of peak emission ($I_F = 20\text{ mA}$)	(typ.)	λ_{peak}	660	nm
Centroid Wavelength ($I_F = 20\text{ mA}$)	(typ. (max.))	$\lambda_{\text{centroid}}$	655 (± 3)	nm
Spectral bandwidth at 50% of I_{max} ($I_F = 20\text{ mA}$)	(typ.)	$\Delta\lambda$	17	nm
Half angle	(typ.)	φ	± 60	°
Rise and fall time of I_e (10% and 90% of $I_{e\text{max}}$) ($I_F = 100\text{ mA}$, $t_p = 16\text{ }\mu\text{s}$, $R_L = 50\text{ }\Omega$)	(typ.)	t_r, t_f	17	ns
Forward voltage ($I_F = 20\text{ mA}$)	(typ. (max.))	V_F	2.1 (≤ 2.8)	V
Reverse current	(typ. (max.))	I_R	not designed for reverse operation	μA
Radiant intensity ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ.)	I_e	2.6	mW / sr
Total radiant flux ($I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$)	(typ.)	Φ_e	6.4	mW
Temperature coefficient of $\lambda_{\text{centroid}}$ ($I_F = 20\text{ mA}$, $-10\text{ °C} \leq T \leq 100\text{ °C}$)	(typ.)	$TC_{\lambda_{\text{centroid}}}$	0.13	nm / K

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