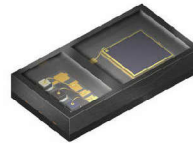**BioMon Sensor**
Datasheet
Version 1.1

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

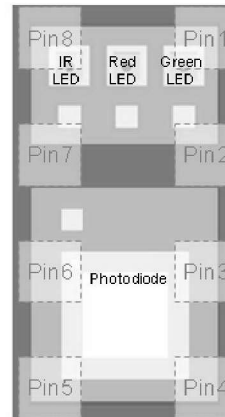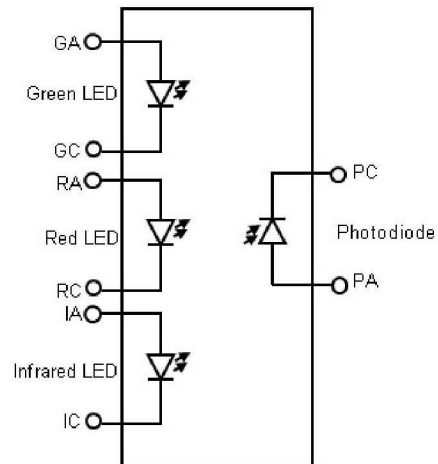| Type:	Ordering Code
SFH7050	Q65111A6271

2016-04-20   1

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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

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Maximum Ratings (T_A = 25 °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 µs, 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 µs, 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 µs, 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.

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Characteristics (T_A = 25 °C)

Parameter		Symbol	Value	Unit
Infrared Emitter				
Wavelength of peak emission (I_F = 20 mA, t_p = 20 ms)	(typ.)	λ_{peak}	950	nm
Centroid Wavelength (I_F = 20 mA, t_p = 20 ms)	(typ. (max.))	$\lambda_{centroid}$	940 (±10)	nm
Spectral bandwidth at 50% of I_{max} (I_F = 20 mA, t_p = 20 ms)	(typ.)	$\Delta\lambda$	42	nm
Half angle	(typ.)	φ	± 60	°
Rise and fall time of I_e (10% and 90% of $I_{e\,max}$) (I_F = 100 mA, t_p = 16 µs, R_L = 50 Ω)	(typ.)	t_r, t_f	16	ns
Forward voltage (I_F = 20 mA, t_p = 20 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 mA, t_p = 20 ms)	(typ.)	I_e	2	mW / sr
Total radiant flux (I_F = 20 mA, t_p = 20 ms)	(typ.)	Φ_e	5.3	mW
Temperature coefficient of I_e or Φ_e (I_F = 20 mA, t_p = 20 ms)	(typ.)	TC_I	-0.3	% / K
Temperature coefficient of V_F (I_F = 20 mA, t_p = 20 ms)	(typ.)	TC_V	-0.8	mV / K
Temperature coefficient of $\lambda_{centroid}$ (I_F = 20 mA, t_p = 20 ms)	(typ.)	$TC_{\lambda centroid}$	0.25	nm / K

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Characteristics (T_A = 25 °C)

Parameter		Symbol	Value	Unit
Red Emitter				
Wavelength of peak emission (I_F = 20 mA)	(typ.)	λ_{peak}	660	nm
Centroid Wavelength (I_F = 20 mA)	(typ. (max.))	$\lambda_{centroid}$	655 (±3)	nm
Spectral bandwidth at 50% of I_{max} (I_F = 20 mA)	(typ.)	$\Delta\lambda$	17	nm
Half angle	(typ.)	φ	± 60	°
Rise and fall time of I_e (10% and 90% of $I_{e\,max}$) (I_F = 100 mA, t_p = 16 µs, R_L = 50 Ω)	(typ.)	t_r, t_f	17	ns
Forward voltage (I_F = 20 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 mA, t_p = 20 ms)	(typ.)	I_e	2.6	mW / sr
Total radiant flux (I_F = 20 mA, t_p = 20 ms)	(typ.)	Φ_e	6.4	mW
Temperature coefficient of $\lambda_{centroid}$ (I_F = 20 mA, -10°C ≤ T ≤ 100°C)	(typ.)	$TC_{\lambda centroid}$	0.13	nm / K

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MASITC_01080544

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