

CR-BH17 USER MANUAL

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Crazy Embedded Laboratory

Document History

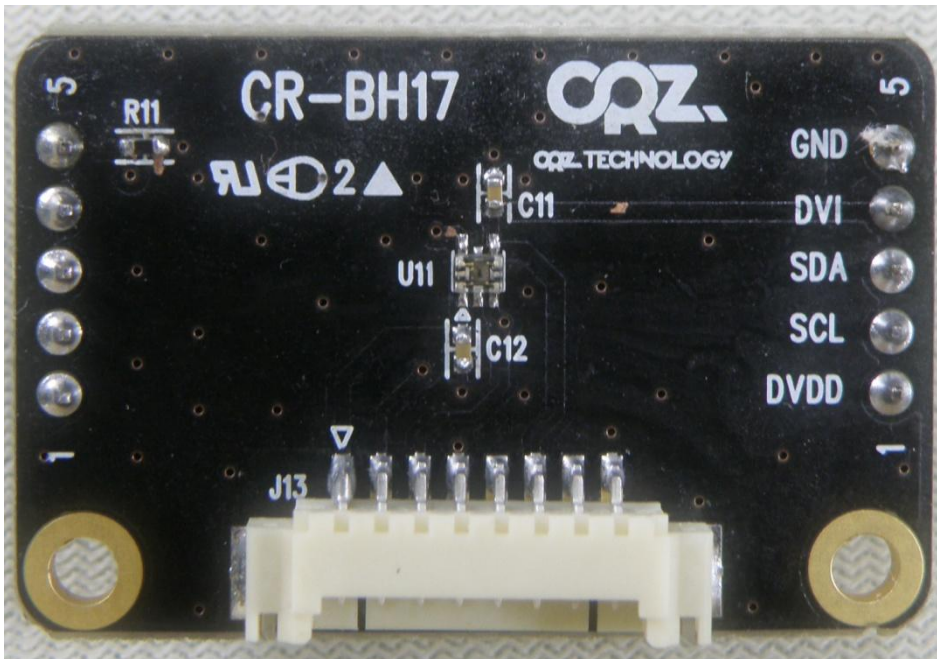
Revision	Date	Change note

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1.CR-IOT 보드 소개

CR-IOT은 사물인터넷 (Internet of Things)이라는 개념을 기반으로 센서를 통한 다양한 정보를 유무선 통신을 이용하여 수집된 정보를 이용하여 특정 기능을 수행할 수 있도록 개발된 보드입니다. CR-IOT 보드 중에서 CR-BH17 보드는 조도 센서를 장착 한 보드로 주변 조도값을 얻어 다양하게 활용이 가능하도록 제작되었습니다.

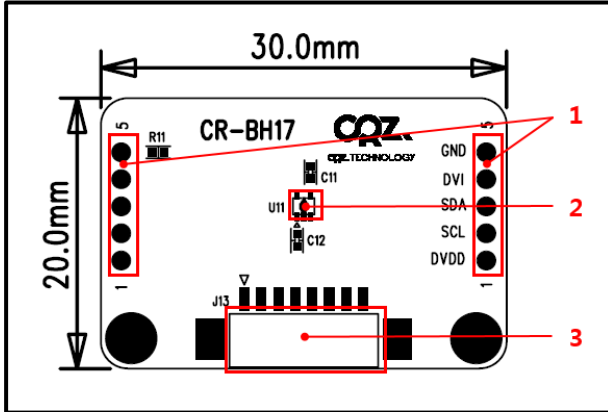
1.1.CR-BH17 Summary



- Ambient Light Sensor IC
- BH1721FVC
- I2C interface
- Wide range and High resolution.
- Input Voltage 2.4~3.6V

2. PCB 설명

2.1CR-BH17 PCB 설명



1	센서 장착 커넥터
2	조도 센서
3	8PIN 커넥터

2.1.1 Part # 1 – 센서 장착 커넥터

센서 장착 커넥터를 이용하여 CR-IOT-AT100 보드 또는 CR-IOT-AIB100 보드에 장착하여 센서를 동작 시켜 데이터를 수집, 활용 할 수 있습니다.

J1

1	Not Connect
2	Not Connect
3	Not Connect
4	Not Connect
5	BD_DETECT

J2

1	DVDD
2	I2C_SCL
3	I2C_SDA
4	DVI
5	GND

2.1.2 Part # 2 – 조도 센서

조도 센서 ROHM 사의 BH1721FVC 을 장착했습니다.
BH1721FVC의 특징 및 센서 성능은 다음과 같습니다.



- Relative Ambient Light Digital Output, I²C interface
- Spectral responsibility is approximately human eye response
- Wide range and High resolution. (1 – 65528 lx)
- 50Hz / 60Hz Light noise reject-function
- Light source dependency is little
- Small measurement variation (+/- 15%)

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

Parameter	Symbol	Ratings			Units	Conditions
		Min.	Typ.	Max.		
VCC Voltage	Vcc	2.4	3.0	3.6	V	
i ² C Reference Voltage	Vbvi	1.65	-	Vcc	V	
Supply Current	Icc1	—	140	199	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	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	—	8	—	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
DVI Input 'L' Voltage	VDVL	—	—	0.4	V	

※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 20 lx) is need.

● **Reference Data**

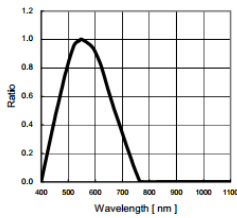


Fig.1 Spectral Response

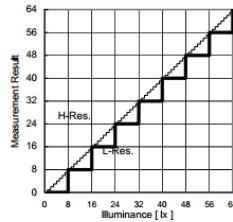


Fig.2 Illuminance - Measurement Result 1

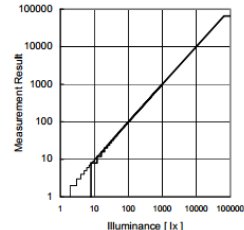


Fig.3 Illuminance - Measurement Result 2

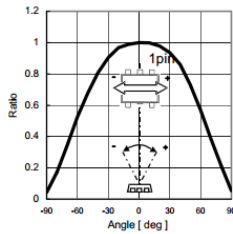


Fig.4 Directional Characteristics 1

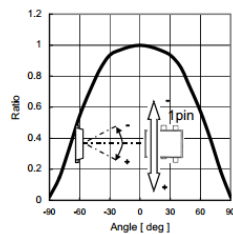


Fig.5 Directional Characteristics 2

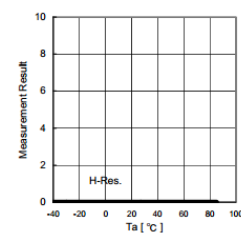


Fig.6 Dark Response

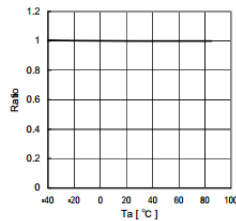


Fig.7 Measurement Result Temperature Dependency

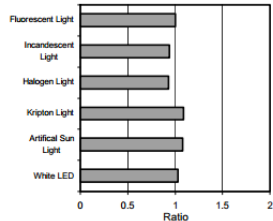


Fig.8 Light Source Dependency (Fluorescent Light is set to '1')

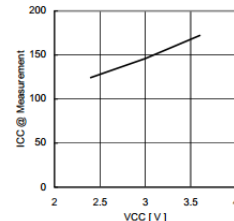


Fig.9 VCC - ICC (During measurement)

2.1.3 Part # 3 – 8PIN 커넥터

8PIN 확장 커넥터를 통해서 CR-IOT-AT100 이외에 사용자가 사용하고자 하는 보드에 센서를 연결시켜 활용이 가능합니다.

1	DVDD	5	Not Connect
2	I2C_SCL	6	DVI
3	I2C_SDA	7	Not Connect
4	BD_DETECT	8	GND