

제스처 모듈

Datasheet & User guide

Information Security

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Revision History

VERSION	DATE	SUMMARY OF CHANGES	AUTHOR
Version 0.1.0	2017.11.30	초안 작성	양학재
Version 0.1.1	2017.12.02	내용 수정	양학재

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1. Description

AVAGO社의 APDS9960 센서를 이용하여 제작한 제스처 센서모듈 입니다. APDS9960 모듈은 다음 세 가지의 측정이 가능합니다.

- Up, Down, Left, Right, Near, Far 6가지의 동작을 측정
- 주변환경의 밝기를 측정
- 주변환경의 색을 측정하여 RGB값으로 추출 - 칼라센서

IR센서에서 반사된 에너지를 4방향의 포토다이오드로 검출하여 동작을 측정합니다.
주변환경의 밝기와 색을 측정하여 RGB값으로 출력할 수 있습니다.

2. Feature

- Ambient Light and RGB Color Sensing, Proximity Sensing, and Gesture Detection in an Optical Module
- Ambient Light and RGB Color Sensing
 - UV and IR blocking fillters
 - Programmable gain and integration time
 - Very high sensitivity-Ideally suited for operation behind dark glass
- Proximity Sensing
 - Trimmed to provide consistent reading
 - Ambient light rejection
 - Offset compensation
 - Programmable driver for IR LED current
 - Saturation indicator bit
- Complex Gesture Sensing
 - Four separate diodes sensitive to different directions
 - Ambient light rejection
 - Offset compensation
 - Programmable driver for IR LED current
 - 32 dataset storage FIFO
 - Interrupt driven I2C communication
- I2C - bus Fast Mode Compatible Interface
 - Data Rates up to 400kHz
 - Dedicated Interrupt Pin

3. Specification

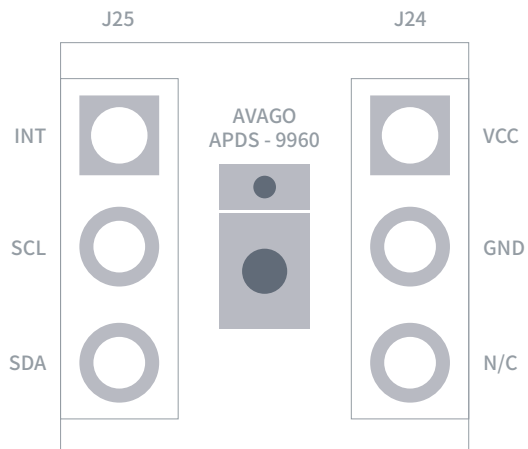
Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	
Operating ambient temperature	T _A	-30		85	°C	
Power supply voltage	V _{DD}	2.4	3.0	3.6	V	
Supply voltage accuracy, V _{DD} total error including transients		-3		±3	%	
LED supply voltage	V _{LEDA}	3.0		4.5	V	

Operating Characteristics V_{DD} = 3 V, T_A = 25°C (unless otherwise noted)

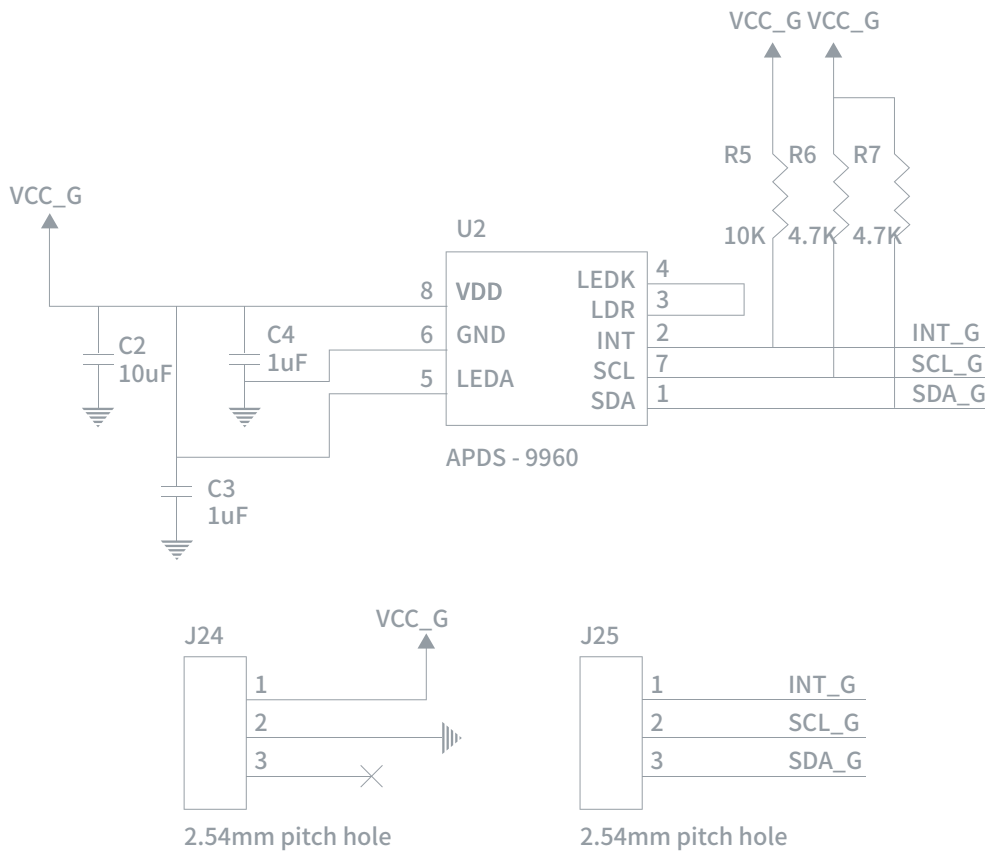
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	
IDD supply current [1]	I _{DD}		200	250	μA	Active ALS state PON = AEN = 1, PEN = 0
			790			Proximity, LDR pulse ON, PPulse = 8 (I _{LDR} not included)
			790			Gesture, LDR pulse ON, GPulse = 8 (I _{LDR} not included)
			38			Wait state PON = 1, AEN = PEN = 0
			1.0	10.0		Sleep state [2]
VoL INT, SDA output low voltage	VoL	0		0.4	V	3mA sink current
I _{LEAK} leakage current, SDA, SCL, INT pins	I _{LEAK}	-5		5	μA	
I _{LEAK} leakage current, LR P\pins	I _{LEAK}	-10		10	μA	
SCL, SDA input high voltage, V _{IH}	V _{IH}	1.26		V _{DD}	V	
SCL, SDA input low voltage, V _{IL}	V _{IL}			0.54	V	
<p>Note</p> <p>1. Values are shown at the VDD pin and do not include current through the IR LED.</p> <p>2. Sleep state occurs when PON = 0 and I2C bus is idle. If Sleep state has been entered as the result of operational flow, SAI = 1, PON will be high</p>						
Prximity ADC count value, 100mm distance object ^[5,6]	96	120	144		counts	Reflecting object = 73mm X 83mm Kodak 90% grey card, 100mm distance, V _{LEA} = 3V, LDRIVE = 100mA, PPULSE = 8, PGAIN = 4x, PPLEN = 8μs, LED_BOOST = 100%, open view (no glass) above the module.

4. Pin Out Description

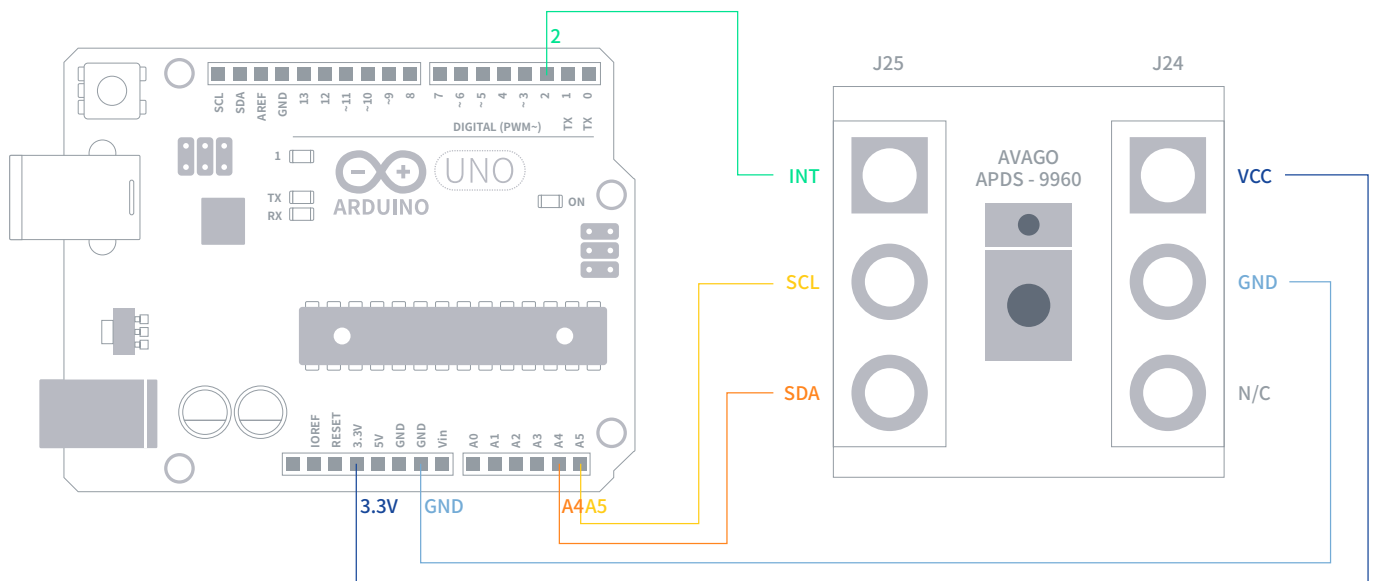


PIN	DESCRIPTION
VCC	Supply voltage. Decouple this pin to ground with 0.1 μ F capacitor.
GND	Ground. This pin must be grounded.
EN	Active high enable pin. (High: Active mode, Low: Standby mode)
OUT	Output (Low in power down or standby mode)

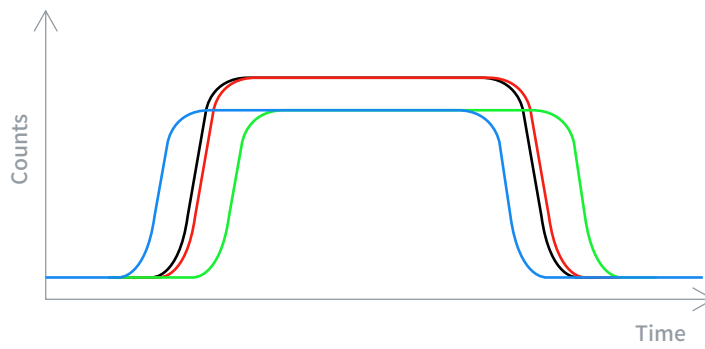
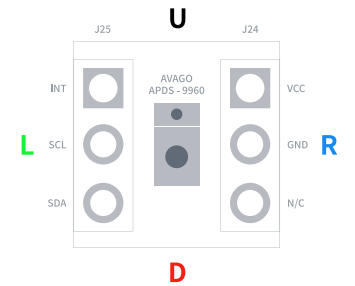
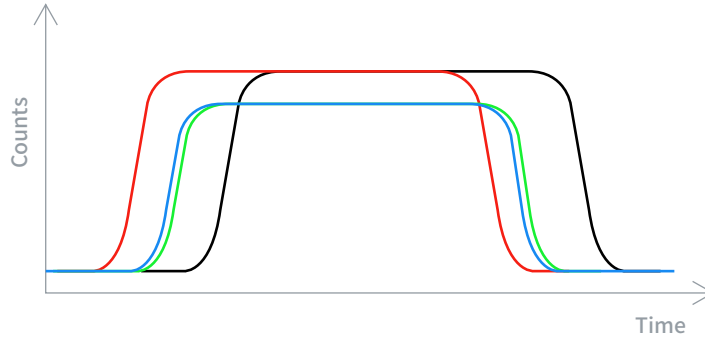
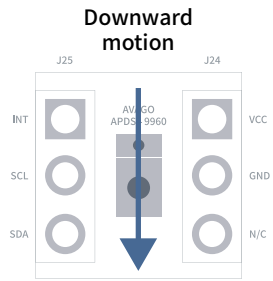
5. Schematic



6. Arduino Connection

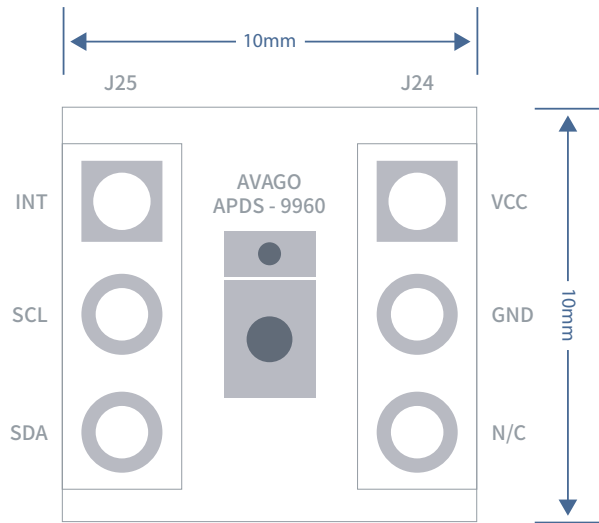


7. Dimensions



— Up OxFC — Down OxFD — Left OxFE — Right OxFF

8. Dimensions



Contact

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