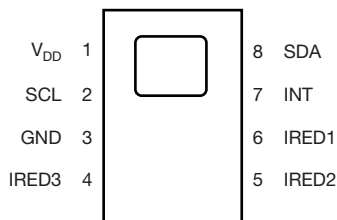


High Resolution Digital Proximity Sensor With I²C Interface



LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

[Design Tools](#)

[Technical Notes](#)

DESCRIPTION

VCNL3036X01 integrates a proximity sensor (PS), a mux, and a driver for up to 3 external IREDs into one small package. It incorporates photodiodes, amplifiers, and analog to digital converting circuits into a single chip by CMOS process. PS programmable interrupt features of individual high and low thresholds offers the best utilization of resource and power saving on the microcontroller.

FEATURES

- Package type: surface-mount
- Dimensions (L x W x H in mm): 4.0 x 2.36 x 0.75
- AEC-Q101 qualified
- Integrated modules: proximity sensor (PS) and signal conditioning IC
- Temperature compensation: -40 °C to +105 °C
- Low power consumption I²C (SMBus compatible) interface
- Output type: I²C bus
- Operation voltage: 2.5 V to 3.6 V
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



PROXIMITY FUNCTION

- Programmable IRED sink current
- Intelligent cancellation to reduce cross talk phenomenon
- Smart persistence scheme to reduce PS response time
- Selectable for 12-bit / 16-bit PS output data

INTERRUPT

- Programmable interrupt function for PS with upper and lower thresholds
- Adjustable persistence to prevent false triggers for PS

APPLICATIONS

- Force feedback applications
- Proximity / optical switch for consumer, computing, automotive, and industrial devices

PRODUCT SUMMARY

PART NUMBER	OPERATING RANGE ⁽¹⁾ (mm)	OPERATING VOLTAGE RANGE (V)	I ² C BUS VOLTAGE RANGE (V)	IRED PULSE CURRENT ⁽²⁾ (mA)	SPECTRAL BANDWIDTH RANGE $\lambda_{0.5}$ (nm)	OUTPUT CODE	ADC RESOLUTION PROXIMITY / AMBIENT LIGHT
VCNL3036X01	0 to 500	2.5 to 3.6	1.8 to 5.5	200	500 to 910	16 bit, I ² C	16 bit / -

Notes

- ⁽¹⁾ Part should be operated in dark condition (not in direct sunlight)
⁽²⁾ Adjustable through I²C interface

ORDERING INFORMATION

ORDERING CODE	PACKAGING	VOLUME ⁽¹⁾	REMARKS
VCNL3036X01-GS08	Tape and reel	MOQ: 3300 pcs	4.0 mm x 2.36 mm x 0.75 mm
VCNL3036X01-GS18		MOQ: 13 000 pcs	

Note

- ⁽¹⁾ MOQ: minimum order quantity

**ABSOLUTE MAXIMUM RATINGS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	MIN.	MAX.	UNIT
Supply voltage		V_{DD}	2.5	3.6	V
Operation temperature range		T_{amb}	-40	+105	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-40	+110	$^{\circ}\text{C}$

RECOMMENDED OPERATING CONDITIONS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	MIN.	MAX.	UNIT
Supply voltage		V_{DD}	2.5	3.6	V
Operation temperature range		T_{amb}	-40	+105	$^{\circ}\text{C}$
I ² C bus operating frequency		$f_{(I2CCLK)}$	10	400	kHz

PIN DESCRIPTIONS

PIN ASSIGNMENT	SYMBOL	TYPE	FUNCTION
1	V_{DD}	-	Power supply input
2	SCL	I	I ² C digital bus clock input
3	GND	-	Ground
4	IREDD3	I	Cathode (IREDD3) connection
5	IREDD2	I	Cathode (IREDD2) connection
6	IREDD1	I	Cathode (IREDD1) connection
7	INT	O	Interrupt pin
8	SDA	I / O (open drain)	I ² C data bus data input / output

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage		V_{DD}	2.5	-	3.6	V
Supply current	Excluded LED driving	I_{DD}	-	300	-	μA
	Light condition = dark, $V_{DD} = 3.3\text{ V}$	$I_{DD}(\text{SD})$	-	0.2	-	μA
I ² C supply voltage		V_{PULLUP}	1.8	-	5.5	V
PS enable		I_{PSSD}	-	200	-	μA
I ² C signal input	Logic high	$V_{DD} = 3.3\text{ V}$	V_{IH}	1.55	-	V
	Logic low		V_{IL}	-	0.4	
	Logic high	$V_{DD} = 2.6\text{ V}$	V_{IH}	1.4	-	V
	Logic low		V_{IL}	-	0.4	
Full PS counts	12-bit / 16-bit resolution		-	-	4096 / 65 535	steps
PS detection range	Kodak gray card ⁽¹⁾⁽²⁾		0	-	500	mm
Operating temperature range		T_{amb}	-40	-	+105	$^{\circ}\text{C}$
LED anode voltage			-	-	5.5	V
IREDD driving current			-	-	200	mA

Notes

- (1) Depending on external IRED
 (2) Part should be operated in dark condition (not in direct sunlight)