

HSDL - 9100

Surface-Mount Proximity Sensor



Data Sheet



Description

The HSDL-9100 is an analog-output reflective sensor with an integrated high efficiency infrared emitter and photodiode housed in a small form factor SMD package. The optical proximity sensor is housed in a specially designed metal-shield to ensure excellent optical isolation resulting in low optical cross-talk.

HSDL-9100 has an option for 2.7 or 2.4mm height parts with its small form SMD package and at a detection range from near zero to 60mm. It is specifically optimized for size, performance and ease of design in mobile constrained applications such as mobile phones and notebooks.

HSDL-9100 has extremely low dark current and high signal to noise ratio (SNR) where high SNR is achieved with a pair of highly efficient infrared emitter and highly sensitive detector.

Application Support Information

The Application Engineering Group is available to assist you with the application design associated with HSDL-9100 Proximity Sensor. You can contact them through your local sales representatives for additional details.

Features

- Excellent optical isolation resulting in near zero optical cross-talk
- High efficiency emitter and high sensitivity photodiode for high signal-to-noise ratio
- Low cost & lead-free miniature surface-mount package
 - Height – 2.40 or 2.70 mm
 - Width – 2.75 mm
 - Length – 7.10 mm
- Can be paired up with signal conditioning IC (APDS-9700)
- Detect objects from near zero to 60mm
- Low dark current
- Guaranteed Temperature Performance -40°C to 85°C
- Lead-free and RoHS Compliant

Applications

- Mobile phones
- Notebooks
- Industrial Control
- Printers, Photocopiers and Facsimile machines
- Home Appliances
- Vending Machines

Order Information

Part Number	Description	Packaging Type	Package	Quantity
HSDL-9100-021	2.7mm Height	Tape & Reel	SMD	2500
HSDL-9100-024	2.4mm Height	Tape & Reel	SMD	2500

Block Layout

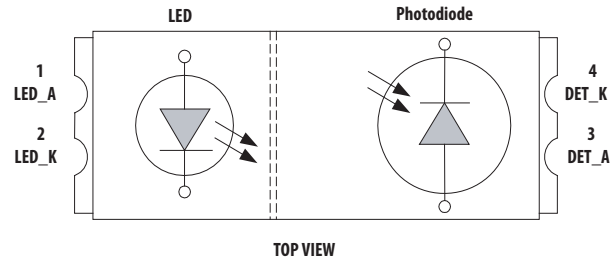


Figure 1. Block Layout of HSDL-9100

Pins Configuration Table

Pin	Symbol	Description	Notes
1	LED_A	LED Anode	1
2	LED_K	LED Cathode	-
3	DET_A	Photodiode Anode	-
4	DET_K	Photodiode Cathode	-

Notes:

Voltage to supply across the LED; VLED

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Ratings		Units
		Min.	Max	
Emitter Continuous Forward Current	I _{DC}	-	100	mA
Coupled Total Power Dissipation (refer to Figure 1)	P _{TOT}	-	165	mW
Operating Temperature	T _{OP}	-40	+85	°C
Storage Temperature	T _{STG}	-40	+100	°C
Reflow Soldering Temperature	T _{SOL}	-	260	°C

Electrical-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Test Condition	Ratings			Units
			Min	Typ	Max	
Emitter						
Forward Voltage	V _F	I _F = 100mA	-	1.50	1.65	V
Reverse Voltage	V _R	I _R = 10μA	5	-	-	V
Peak Wavelength	I _p	I _F = 20mA	-	940	-	nm
Spectrum Width of Half Value	D _p	I _F = 20mA	-	50	-	nm
Detector						
Dark Current	I _{Dark}	V _R = 10V, L** = 0	-	2	10	nA
Forward Voltage	V _F	I _F = 10mA , L=0	0.5	-	1.3	V
Reverse Breakdown Voltage	V _{BR}	I _R = 100uA, L = 0	-	-	35	V
Coupled						
Output Current	I _O	Refer to Fig 2	-	10	-	μA
Peak Output Distance	D _O	Refer Note 1	-	5	-	mm
Operating Cross Talk Current	I _{FD}	Refer to Fig 3	-	-	200	nA
Rise Time (LED)	T _{RL}	R _L = 50Ω	-	50	-	ns
Fall Time (LED)	T _{FL}	R _L = 50Ω	-	50	-	ns
Rise Time (Photodiode)	T _{RD}	R _L = 5.1KΩ	-	6	-	μs
Fall Time (Photodiode)	T _{FD}	R _L = 5.1KΩ	-	6	-	μs

** L = 0 (zero light condition)

Note:

1. I_{Led} = 300mA Pulse, 5% Duty Cycle (Kodak 18% Reflectance Gray Card)