# **Data Sheet**



### Description

APDS-9101 is a low cost, integrated reflective sensor that is designed to provide high switching speed for object detection or proximity sensing applications. It is an integrated module that specially incorporates an infrared LED and a phototransistor in a single integrated module.

### **Application Support Information**

The Application Engineering Group is available to assist you with the application design associated with APDS-9101. You can contact them through your local sales representatives for additional details

#### **Ordering Information**

Part Number	Packaging Type	Package	Quantity	
APDS-9101-L21	Tape and Reel	4-pins SMD package	8000	

### Features

- Fast Switching Speed
- Detection distance from near zero to 12mm
- Low cost and 4 pin SMD package Height – 6.3 mm Width – 4.5 mm Depth - 8.7 mm
- Operating temperature : -25°C to 85°C
- Lead-free and RoHS Compliant

### **Applications**

APDS-9101 is widely suitable to provide reflective object/ postion detection or high speed non-contact switching applications in industrial, consumer and other markets.

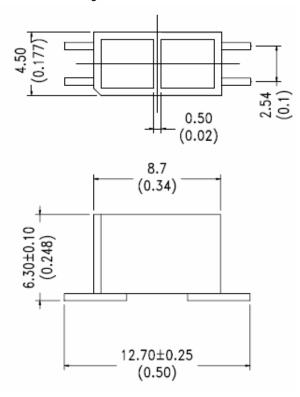
- Industrial Automatic vending machines, amusement/ gaming machines, coin/bill validators etc
- Office automation Printers, Copiers etc
- Consumer Coffee machines, beverage dispensing machines etc

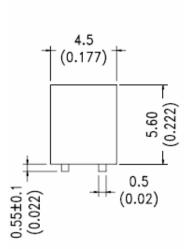
# Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Max Rating	Unit
Input Diode			
Power Dissipation	PD	90	mW
Peak Forward Current (300pps, 10 µs pulse)	I <sub>CP</sub>	1	А
Continuous Forward Current	IF	60	mA
Reverse Voltage	V <sub>R</sub>	5	V
Output Phototransistor Power Dissipation	Pc	100	mW
Collector-Emitter Voltage	V <sub>CEO</sub>	30	V
Emitter-Collector Voltage	V <sub>ECO</sub>	5	V
Collector Current	۱ <sub>۲</sub>	20	mA
Operating Temperature Range	T <sub>OP</sub>		-25°C to +85°C
Storage Temperature Range	T <sub>STG</sub>		-40°C to 100°C
Lead Soldering Termperature (1.6mm(0.063 ") Form Case)	Ts		260°C for 5 seconds

# Electrical / Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Test Condition	
Input Diode							
Forward Voltage	V <sub>F</sub>		1.2	1.6	V	I <sub>F</sub> =20mA	
Reverse Current	I <sub>R</sub>			100	μA	$V_R = 5V$	
Output Phototransistor							
Collector-Emitter Dark Current	I <sub>CEO</sub>			100	nA	V <sub>CE</sub> = 10V	
Coupler							
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>			0.4	V	$I_C = 0.5 \text{mA}$ $I_F = 20 \text{mA}$	
On State Collector Current	I <sub>C(ON)</sub>	750		1150	μA	$V_{CE}$ = 5V, $I_F$ = 20mA	BIN A
	I <sub>C(ON)</sub>	1090		1430	μA	D = 3.5mm	BIN B
	I <sub>C(ON)</sub>	1370		1770	μΑ	(90% Reflective White Paper)	BIN C
Response Time (Rise Time)	T <sub>R</sub>		3	15	μs	$V_{CE}$ = 5V, I <sub>C</sub> = 2mA	
Response Time(Fall Time)	T <sub>F</sub>		4	20	μs	$R_L = 100\Omega$	



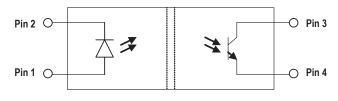


#### NOTES:

1. All dimensions are in millimeters(inches)

2. Tolerance is  $\pm$  0.25mm(0.010") unless otherwise noted

# APDS-9101 Block Diagram

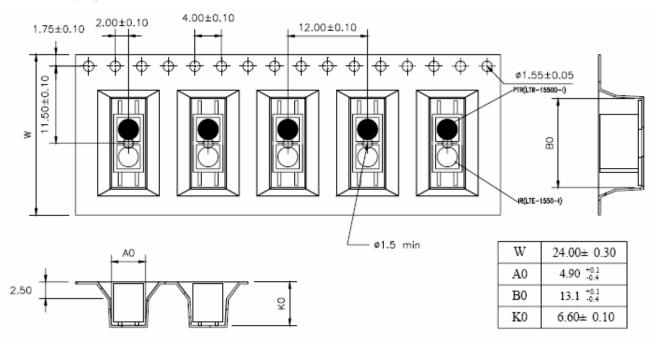


## I/O Pins Configuration Table

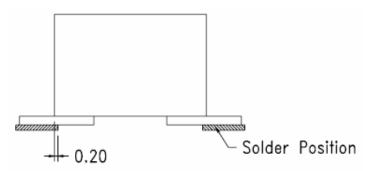
The electrical pin assignments are depicted in the below table.

Pin	Function	Description
1	Anode	Led Anode
2	Cathode	Led Cathode
3	Collector	Phototransistor Collector
4	Emitter	Phototransistor Emitter

### **APDS-9101 Taping Dimensions**



**Soldering Area** 



**APDS-9101 Performance Charts** 

### Typical Electrical/Optical Characteristics Curves (Ta=25°C unless otherwise indicated)

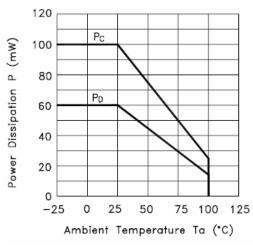
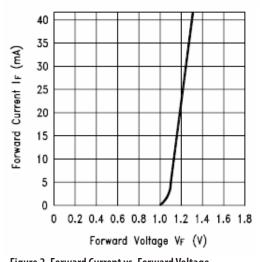
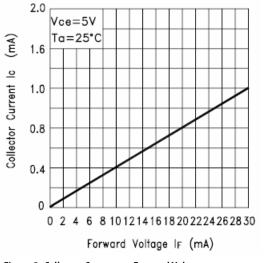


Figure 1. Power Dissipation vs. Ambient Temperature









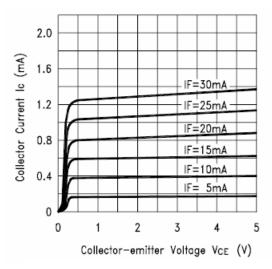


Figure 4. Collector Current vs. Collector-emitter Voltage

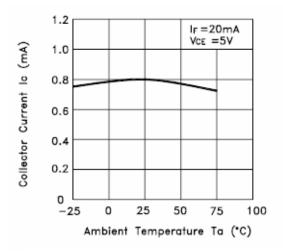


Figure 5. Collector Current vs. Ambient Temperature

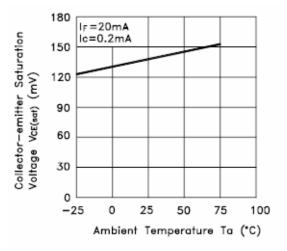


Figure 6. Collector-emitter Saturation Voltage vs. Ambient Temperature

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