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[Avago Technologies US, Inc.](#)
[APDS-9101-L21](#)

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APDS-9101 Integrated Reflective Sensor



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/ position 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

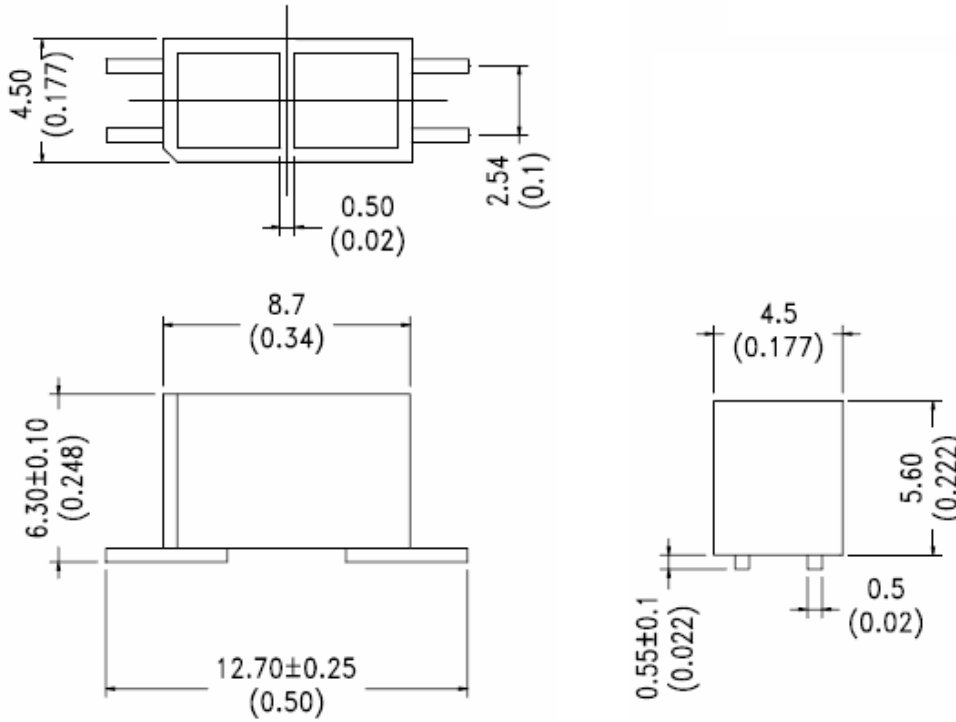
Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Max Rating	Unit
Input Diode			
Power Dissipation	P _D	90	mW
Peak Forward Current (300pps, 10 μs pulse)	I _{CP}	1	A
Continuous Forward Current	I _F	60	mA
Reverse Voltage	V _R	5	V
Output Phototransistor			
Power Dissipation	P _C	100	mW
Collector-Emitter Voltage	V _{CEO}	30	V
Emitter-Collector Voltage	V _{ECCO}	5	V
Collector Current	I _C	20	mA
Operating Temperature Range	T _{OP}		-25°C to +85°C
Storage Temperature Range	T _{STG}		-40°C to 100°C
Lead Soldering Temperature (1.6mm(0.063") Form Case)	T _S		260°C for 5 seconds

Electrical / Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition	
Input Diode							
Forward Voltage	V _F		1.2	1.6	V	I _F =20mA	
Reverse Current	I _R			100	μA	V _R = 5V	
Output Phototransistor							
Collector-Emitter Dark Current	I _{CEO}			100	nA	V _{CE} = 10V	
Coupler							
Collector-Emitter Saturation Voltage	V _{CE(SAT)}			0.4	V	I _C = 0.5mA I _F = 20mA	
On State Collector Current	I _{C(ON)}	750		1150	μA	V _{CE} = 5V, I _F = 20mA	BIN A
	I _{C(ON)}	1090		1430	μA	D = 3.5mm	BIN B
	I _{C(ON)}	1370		1770	μA	(90% Reflective White Paper)	BIN C
Response Time (Rise Time)	T _R		3	15	μs	V _{CE} = 5V, I _C = 2mA	
Response Time(Fall Time)	T _F		4	20	μs	R _L = 100Ω	

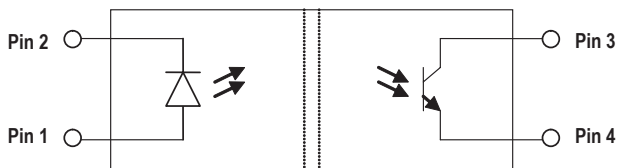
APDS-9101 Package Outline



NOTES:

1. All dimensions are in millimeters(inches)
2. Tolerance is $\pm 0.25\text{mm}(0.010\text{'})$ unless otherwise noted

APDS-9101 Block Diagram

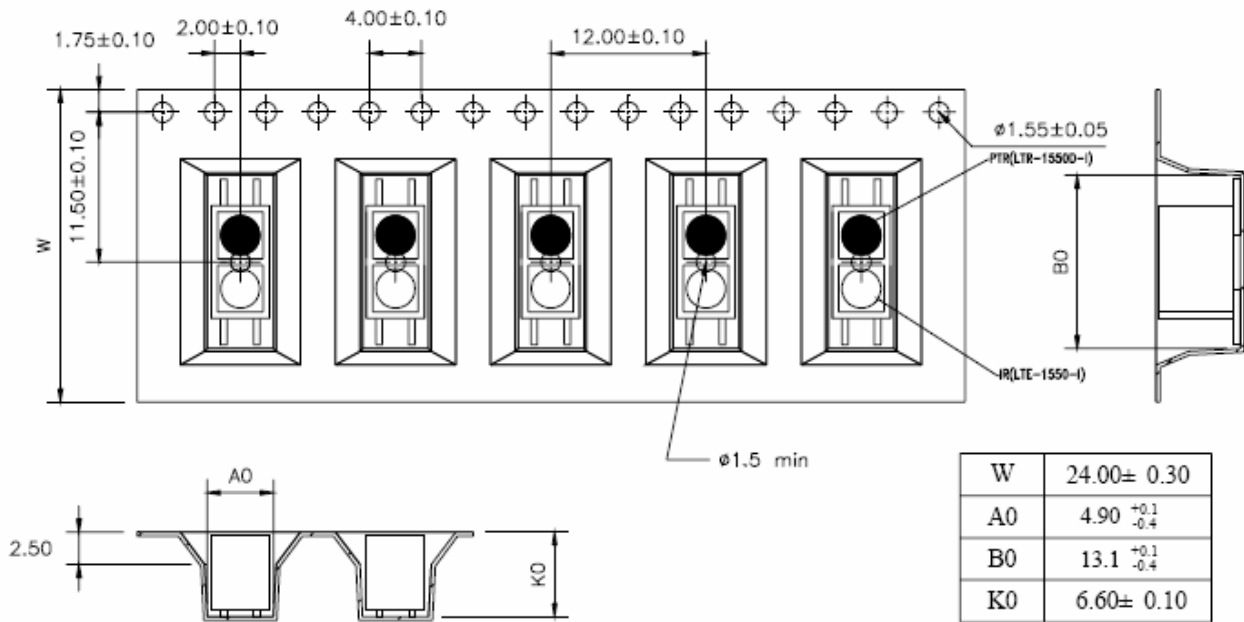


I/O Pins Configuration Table

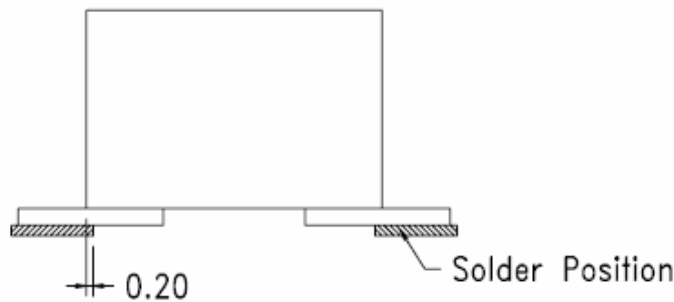
The electrical pin assignments are depicted in the below table.

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)

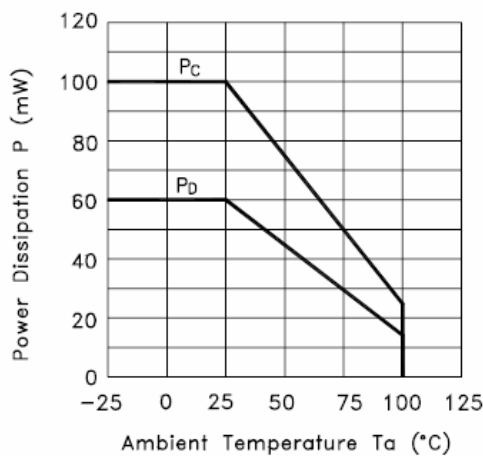


Figure 1. Power Dissipation vs. Ambient Temperature

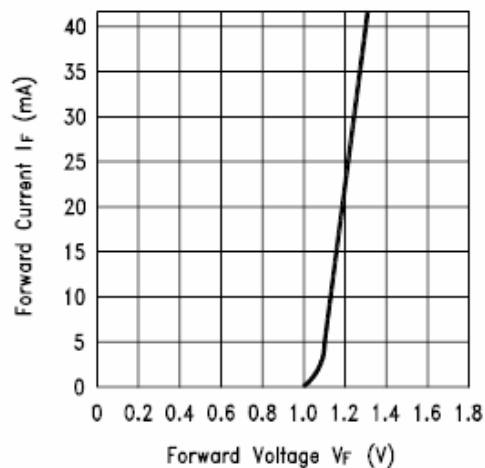


Figure 2. Forward Current vs. Forward Voltage

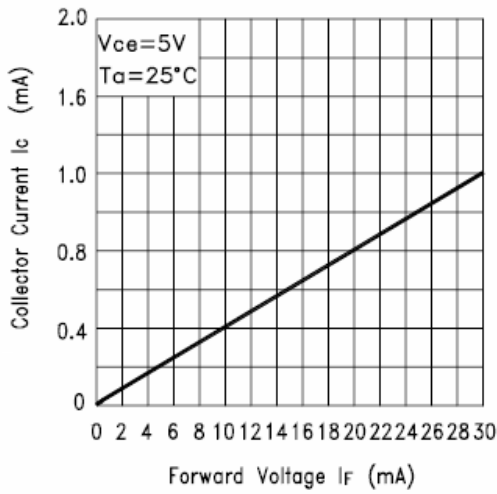


Figure 3. Collector Current vs. Forward Voltage

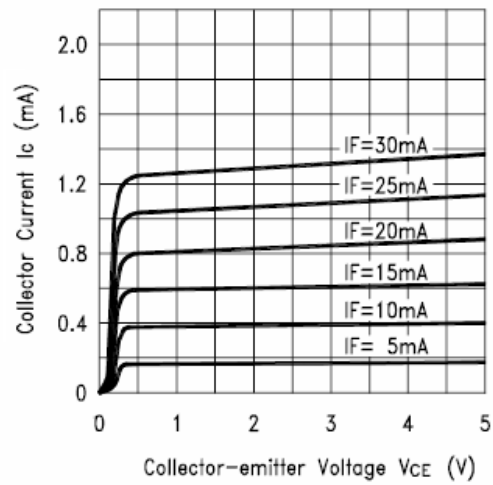


Figure 4. Collector Current vs. Collector-emitter Voltage

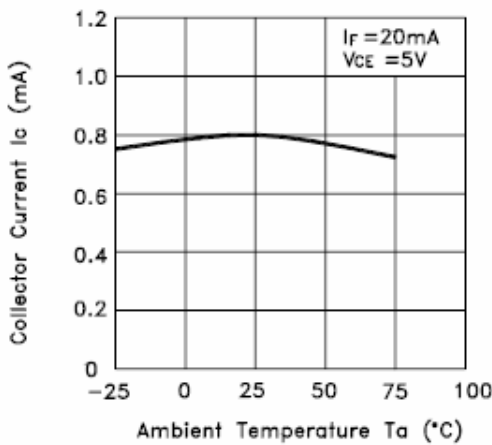


Figure 5. Collector Current vs. Ambient Temperature

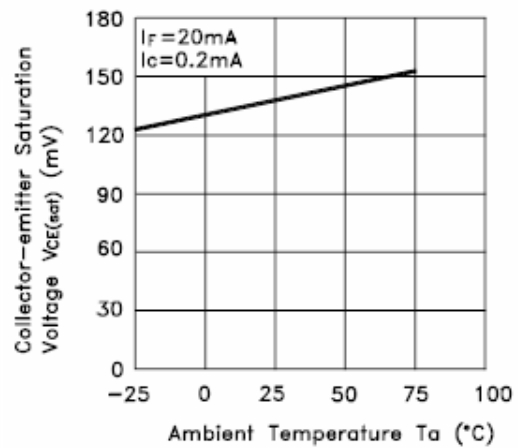


Figure 6. Collector-emitter Saturation Voltage vs. Ambient Temperature

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