APDS-9101
Integrated Reflective Sensor

AVAGO TECHNOLOGIES

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

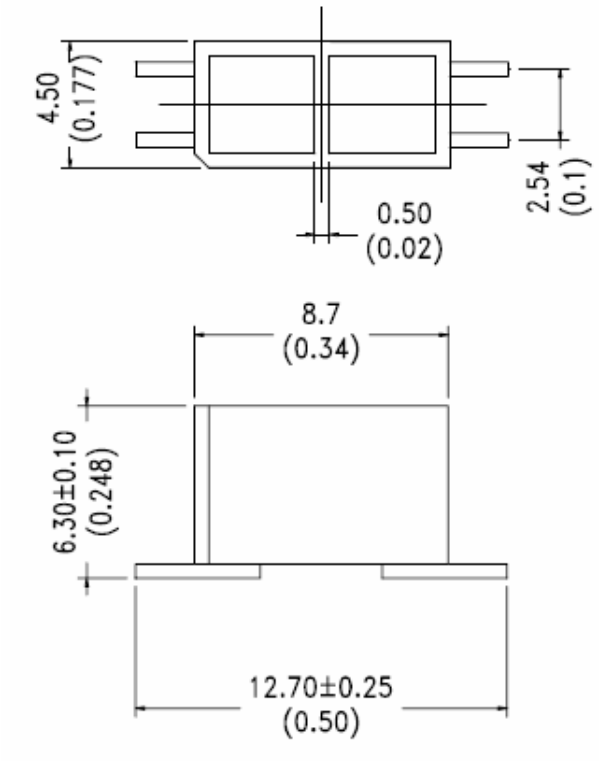
Absolute Maximum Ratings (Ta=25˚C)

Parameter	Symbol	Max Rating	Unit
Input Diode			
Power Dissipation	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_{ECO}	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 Termperature (1.6mm(0.063 ″) Form Case)	T_S		260˚C for 5 seconds

Electrical / Optical Characteristics (Ta=25˚C)

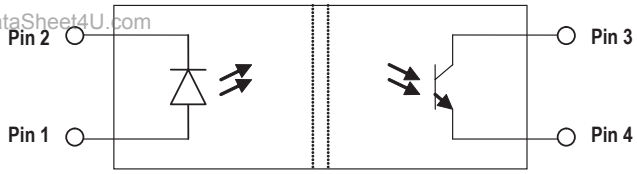
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition	
Input Diode							
Forward Voltage	V_F		1.2	1.6	V	I_F=20mA	
Reverse Current	I_R			100	µA	V_R= 5V	
Output Phototransistor							
Collector-Emitter Dark Current	I_{CEO}			100	nA	V_{CE}= 10V	
Coupler							
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$			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 D = 3.5mm (90% Reflective White Paper)	BIN A
	$I_{C(ON)}$	1090		1430	µA		BIN B
	$I_{C(ON)}$	1370		1770	µA		BIN C
Response Time (Rise Time)	T_R		3	15	µs	V_{CE}= 5V, I_C= 2mA R_L= 100Ω	
Response Time(Fall Time)	T_F		4	20	µs		

APDS-9101 Package Outline



NOTES:
1. All dimensions are in millimeters(inches)
2. Tolerance is ± 0.25mm(0.010") unless otherwise noted

APDS-9101 Block Diagram

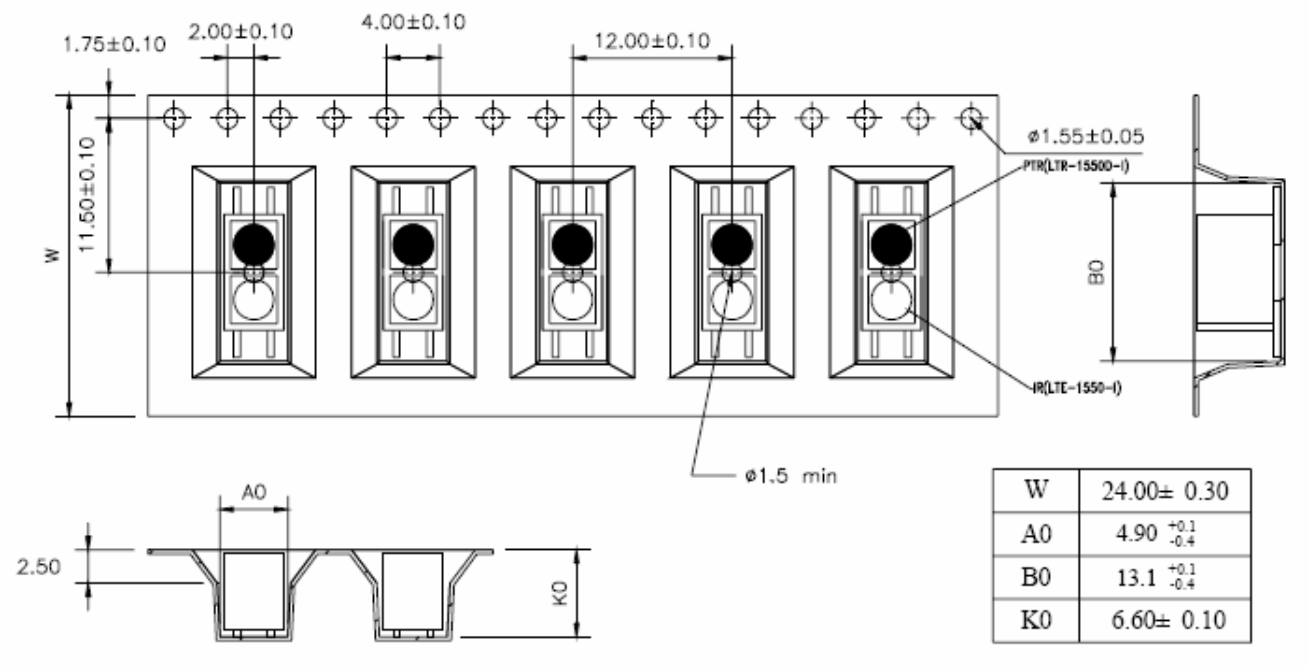


I/O Pins Configuration Table

The electrical pin assignments are depicted in the below table.

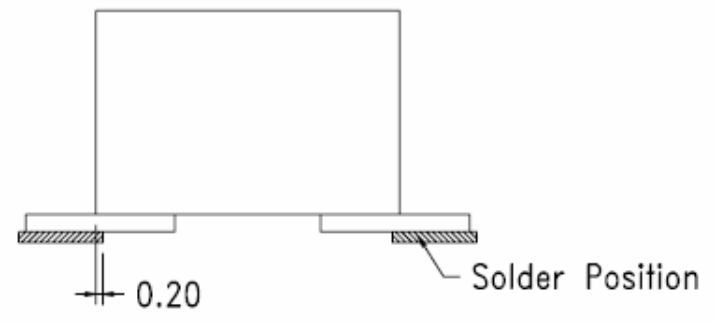
Pin	Function	Description
1	Anode	Led Anode
2	Cathode	Led Cathode
3	Collector	Phototransistor Collector
4	Emitter	Phototransistor Emitter

APDS-9101 Taping Dimensions



W	24.00± 0.30
A0	4.90 $^{+0.1}_{-0.4}$
B0	13.1 $^{+0.1}_{-0.4}$
K0	6.60± 0.10

Soldering Area



APDS-9101 Performance Charts

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

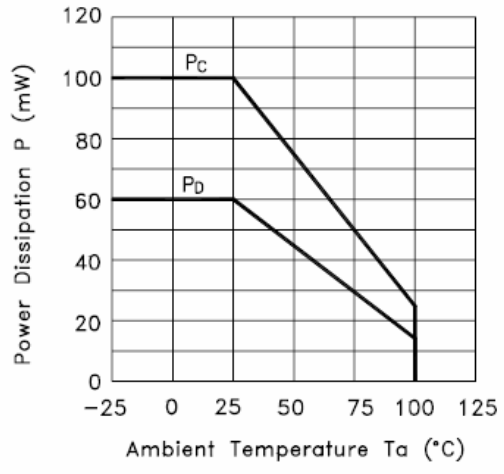


Figure 1. Power Dissipation vs. Ambient Temperature

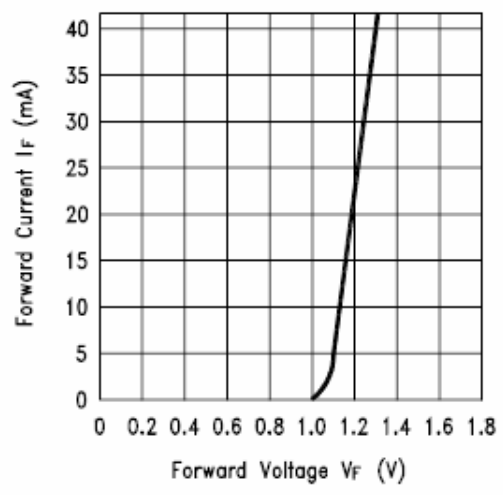


Figure 2. Forward Current vs. Forward Voltage

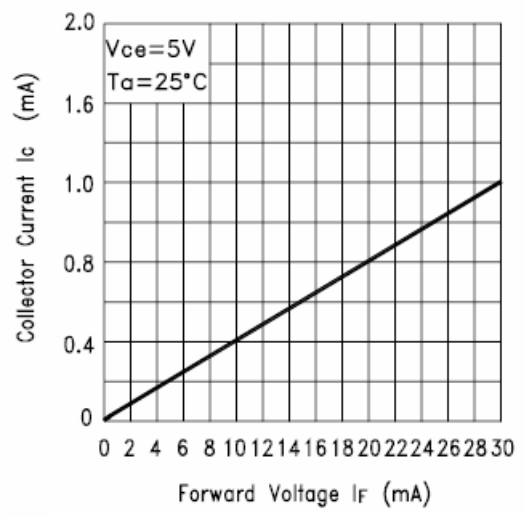


Figure 3. Collector Current vs. Forward Voltage

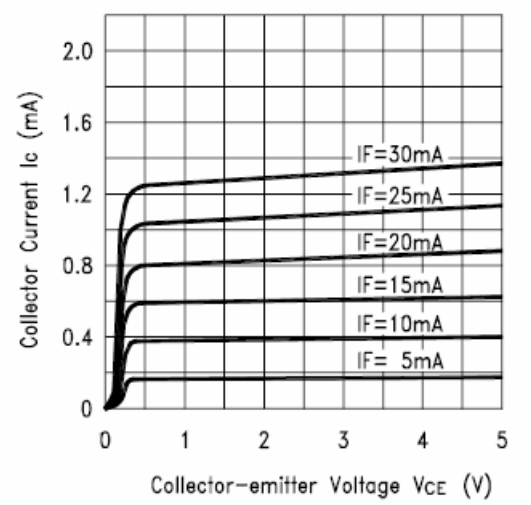


Figure 4. Collector Current vs. Collector-emitter Voltage

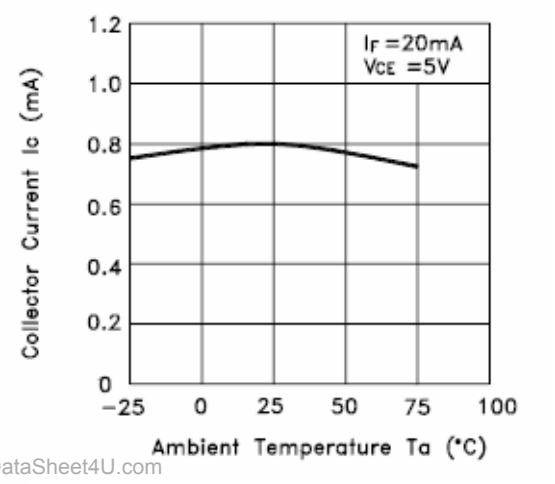


Figure 5. Collector Current vs. Ambient Temperature

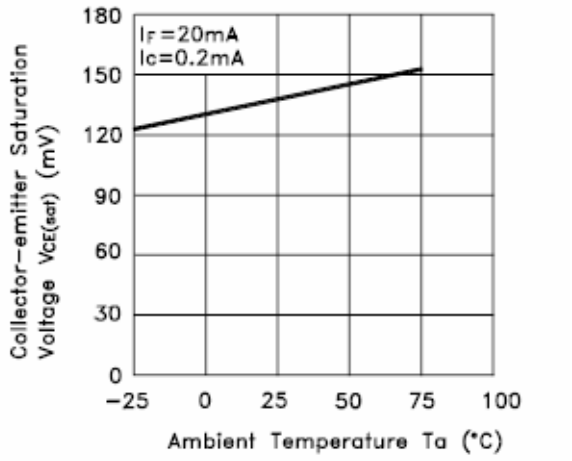


Figure 6. Collector-emitter Saturation Voltage vs. Ambient Temperature

For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**

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