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## Data Sheet

### Description

The APDS-9104 is a low cost, fully integrated module targeting at object sensing or non-contact switching applications. The module consists of an infrared LED and a phototransistor in a single integrated package. It is capable of supporting detection distance from near 0 to 12mm.

### Application Support Information

The Application Engineering Group is available to assist you with the application design associated with APDS-9104. You can contact them through your local sales representatives for additional details

### Ordering Information

Part Number	Package	Quantity
APDS-9104-L22	4-leads	2500

### Features

- For Direct PC Board or dual-in-line socket mounting
- Fast switching speed
- Detection range of near 0 to 12mm
- Package size
  - Height – 5.6 mm
  - Width – 4.5 mm
  - Depth – 8.7 mm
- Operating temperature : -25°C to 85°C
- Lead-free and RoHS Compliant

### Applications

APDS-9104 is widely suitable to provide a reflective high speed object detection or non-contact switching suitable for various applications in industrial, office automation, consumer and other applications.

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

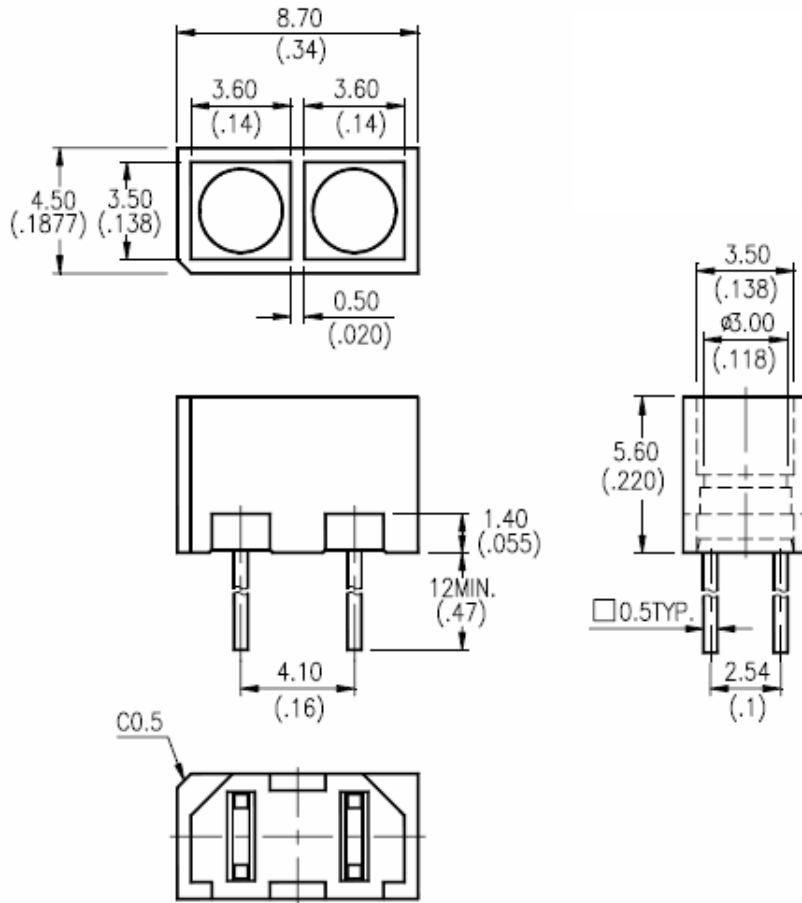
## Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Max Rating	Unit
<b>Input Diode</b>			
Power Dissipation	P <sub>D</sub>	90	mW
Peak Forward Current (300pps, 10 μs pulse)	I <sub>CP</sub>	1	A
Continuous Forward Current	I <sub>F</sub>	60	mA
Reverse Voltage	V <sub>R</sub>	5	V
<b>Output Phototransistor</b>			
Power Dissipation	P <sub>C</sub>	100	mW
Collector-Emitter Voltage	V <sub>CEO</sub>	30	V
Emitter-Collector Voltage	V <sub>ECO</sub>	5	V
Collector Current	I <sub>C</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 Temperature (1.6mm(0.063") Form Case)	T <sub>S</sub>	260°C for 5 seconds	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition	
<b>Input Diode</b>							
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 <sub>R</sub> = 5V	
<b>Output Phototransistor</b>							
Collector-Emitter Dark Current	I <sub>CEO</sub>			100	nA	V <sub>CE</sub> = 10V	
<b>Coupler</b>							
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>			0.4	V	I <sub>C</sub> = 0.2mA, I <sub>F</sub> = 20mA	
On State Collector Current	I <sub>C(ON)</sub>	200		400	μA	V <sub>CE</sub> = 5V	BIN A
	I <sub>C(ON)</sub>	300		600	μA	I <sub>F</sub> = 20mA	BIN B
	I <sub>C(ON)</sub>	500		1000	μA	D = 3.5m	BIN C
	I <sub>C(ON)</sub>	800		1600	μA	(90% Reflective White Paper)	BIN D

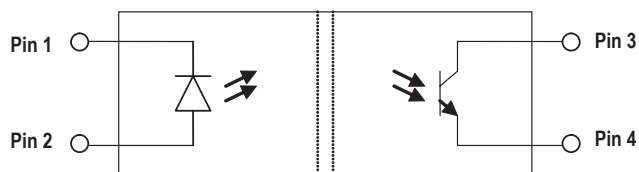
## APDS-9104 Package Outline



### NOTES:

1. All dimensions are in millimeters(inches)
2. Tolerance is  $\pm 0.25\text{mm}(0.010")$  unless otherwise noted
3. Lead spacing is measured where the leads emerge from the package

## APDS-9104 Block Diagram



## I/O Pins Configuration Table

The electrical pin assignments are depicted in the below table.

Pin	function	Description
1	Cathode	LED Cathode
2	Anode	LED Anode
3	Collector	Phototransistor Collector
4	Emitter	Phototransistor Emitter

APDS-9104 Performance Charts

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

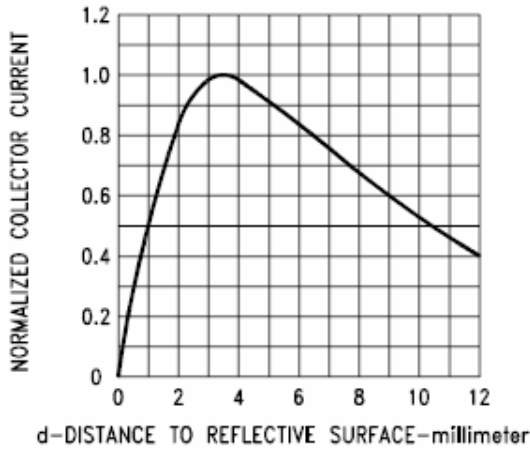


Figure 1. Normalized Collector Current vs. Object Distance

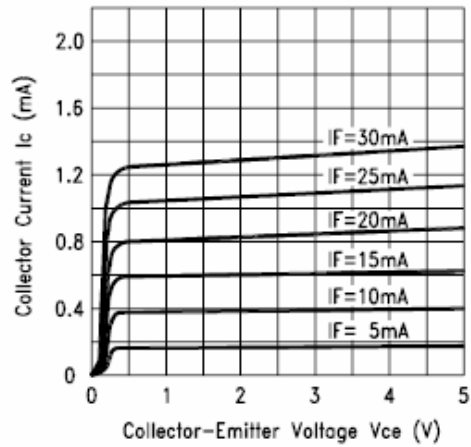


Figure 2. Collector Current vs. Collector Voltage

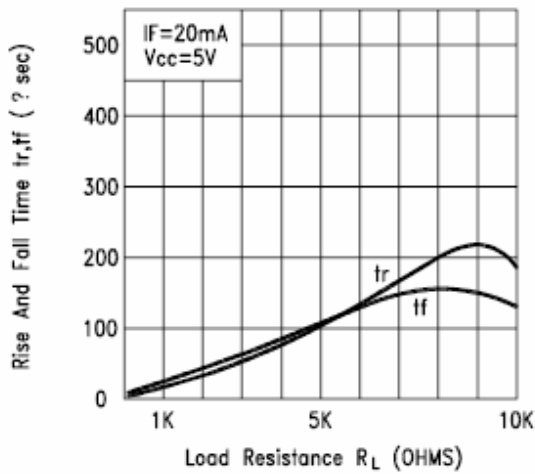


Figure 3. Rise and Fall time vs. Load Resistance

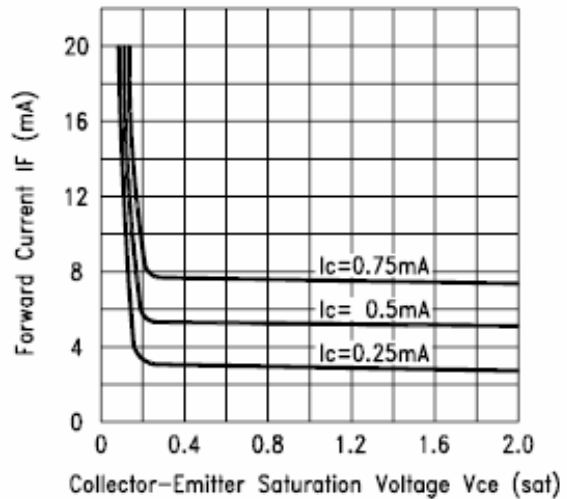


Figure 4. Forward Current vs. Collector-emitter Saturation Voltage

For product information and a complete list of distributors, please go to our web site: [www.avagotech.com](http://www.avagotech.com)

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