APDS-9104
Integrated Reflective Sensor

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

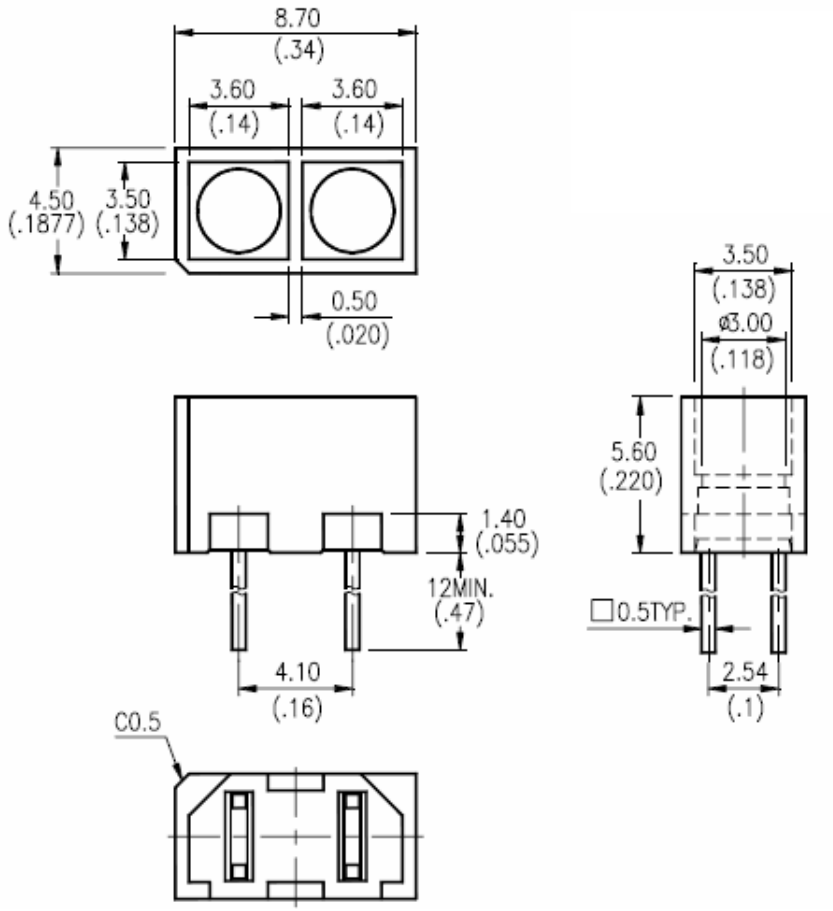
Absolute Maximum Ratings (Ta=25˚C)

Parameter	Symbol	Max Rating	Unit
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)

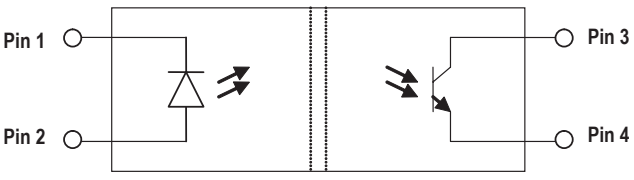
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition	
Input Diode							
Forward Voltage	V_F		1.2	1.6	V	I_F=20mA	
Reverse Current	I_R			100	µA	V_R= 5V	
Output Phototransistor							
Collector-Emitter Dark Current	I_{CEO}			100	nA	V_{CE}= 10V	
Coupler							
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$			0.4	V	I_C= 0.2mA, I_F= 20mA	
On State Collector Current	$I_{C(ON)}$	200		400	µA	V_{CE}= 5V I_F= 20mA D = 3.5m (90% Reflective White Paper)	BIN A
	$I_{C(ON)}$	300		600	µA		BIN B
	$I_{C(ON)}$	500		1000	µA		BIN C
	$I_{C(ON)}$	800		1600	µA		BIN D

APDS-9104 Package Outline



NOTES:
1. All dimensions are in millimeters(inches)
2. Tolerance is ± 0.25mm(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)

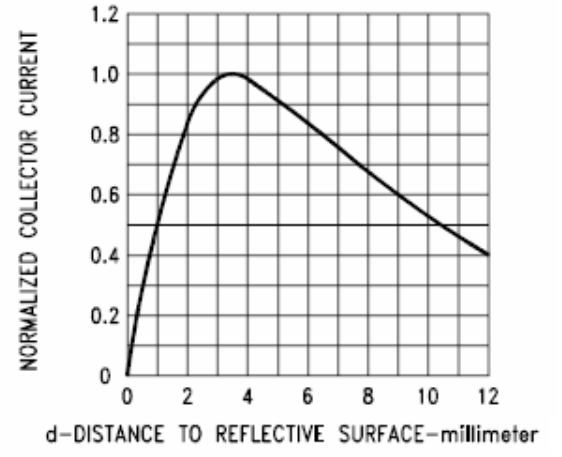


Figure 1. Normalized Collector Current vs. Object Distance

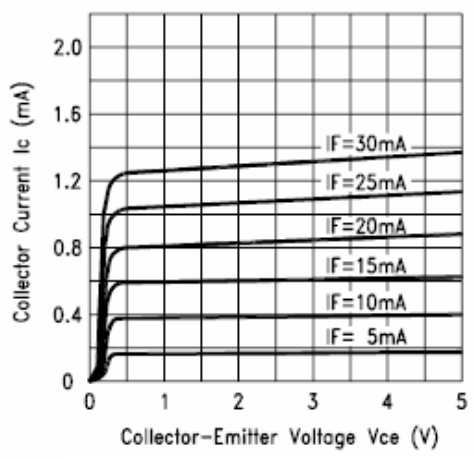


Figure 2. Collector Current vs. Collector Voltage

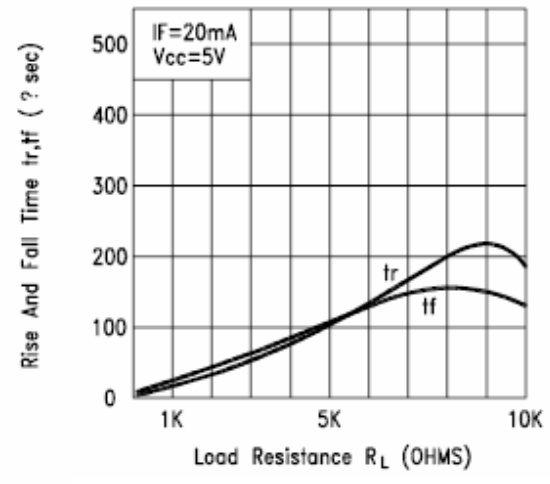


Figure 3. Rise and Fall time vs. Load Resistance

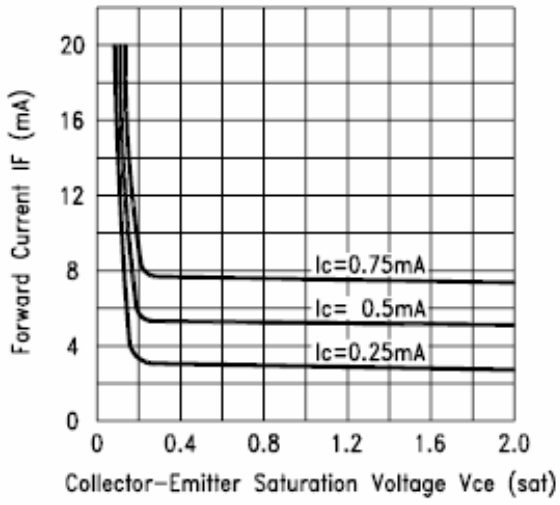


Figure 4. Forward Current vs. Collector-emitter Saturation Voltage

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

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