

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 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 = 0.2mA, I _F = 20mA	
On State Collector Current	I _{C(ON)}	200		400	μA	V _{CE} = 5V	BIN A
	I _{C(ON)}	300		600	μA	I _F = 20mA	BIN B
	I _{C(ON)}	500		1000	μA	D = 3.5m	BIN C
	I _{C(ON)}	800		1600	μA	(90% Reflective White Paper)	BIN D

Technical drawing of a 2-pin connector showing three views: top, side, and end views. Dimensions are provided in millimeters (mm) and inches (in).

Top View:

- Overall width: 8.70 mm (.34 in)
- Pin spacing: 3.60 mm (.14 in)
- Pin diameter: $\phi 3.00$ mm (.118 in)
- Pin height: 4.50 mm (.1877 in)
- Pin width: 3.50 mm (.138 in)
- Pin thickness: 0.50 mm (.020 in)

Side View:

- Pin height: 1.40 mm (.055 in)
- Pin length: 12 MIN. (.47 in)
- Pin width: 4.10 mm (.16 in)

End View:

- Pin width: 3.50 mm (.138 in)
- Pin length: 5.60 mm (.220 in)
- Pin thickness: 2.54 mm (.1 in)
- Pin width: 2.54 mm (.1 in)
- Pin thickness: 0.5 TYP.

Notes:

- C0.5

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

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 ($T_a=25^\circ\text{C}$ unless otherwise indicated)

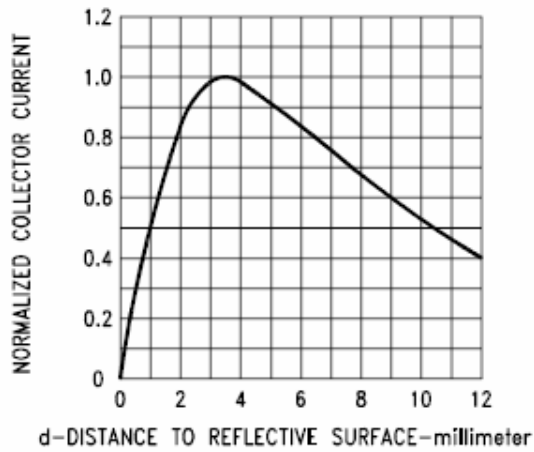


Figure 1. Normalized Collector Current vs. Object Distance

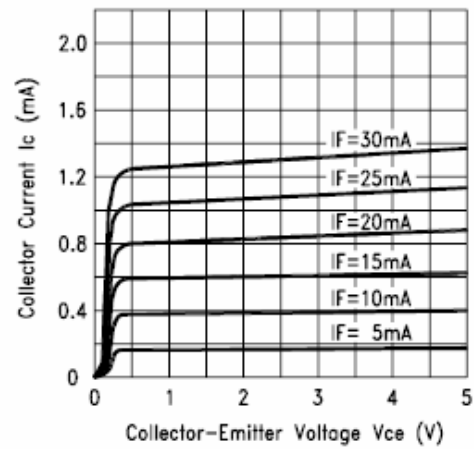


Figure 2. Collector Current vs. Collector Voltage

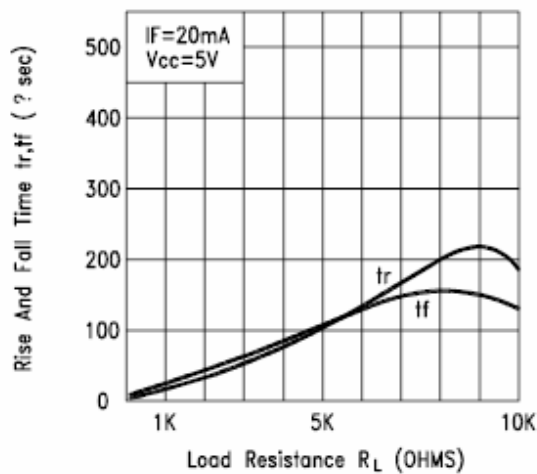


Figure 3. Rise and Fall time vs. Load Resistance

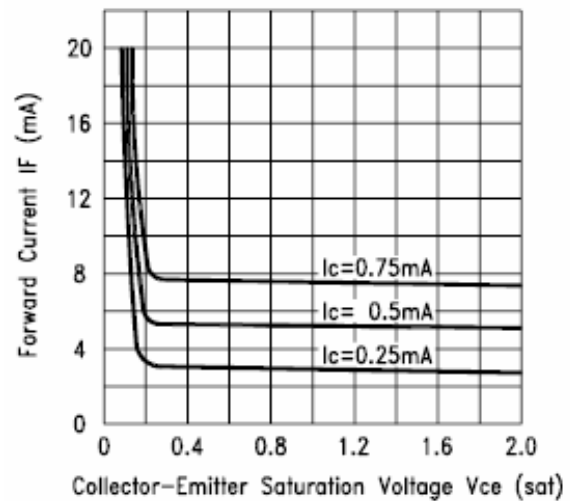


Figure 4. Forward Current vs. Collector-emitter Saturation Voltage

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