APDS-9103

Integrated Reflective Sensor



Data Sheet

Description

The APDS-9103 is a low cost, integrated module consisting of an infrared LED and a phototransistor in a single integrated package. It is capable of supporting detection distance from near 0 to 10mm. APDS-9103 is specially targeted at office automation products such as printers and fax and optoelectronic switches as well.

Application Support Information

The Application Engineering Group is available to assist you with the application design associated with APDS-9103. You can contact them through your local sales representatives for additional details

Ordering Information

Part Number	Package	Quantity
APDS-9103-L22	4 pin leads	2500

Features

• Package size

Height - 6 mm

Width - 4 mm

Depth – 10.6 mm

- Detection range of near 0mm to 10mm
- Operating temperature : -25°C to 85°C
- Lead-free and RoHS Compliant

Applications

APDS-9103 is widely suitable to provide reflective object or proximity sensing in industrial, office automation and consumer markets

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

1

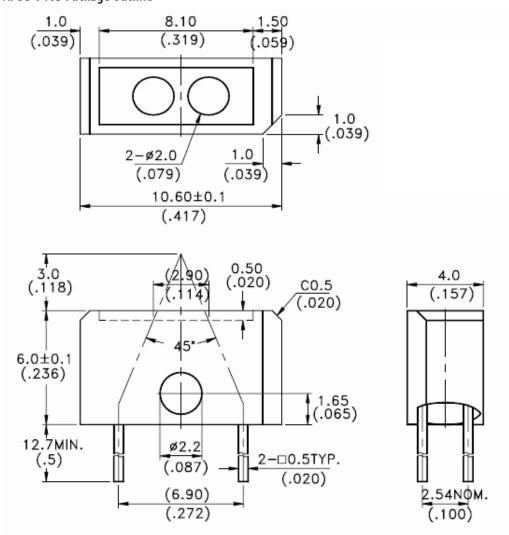
Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Max Rating	Unit
Input Diode			
Power Dissipation	P _D	75	mW
Peak Forward Current (300pps, 10 μs pulse)	Іср	1	A
Continuous Forward Current	IF	60	mA
Reverse Voltage	V _R	5	V
Output Phototransistor Power Dissipation	Pr	100	mW
Collector-Emitter Voltage	V _{CEO}	30	V
Emitter-Collector Voltage	V _{ECO}	5	V
Collector Current	lc	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)	Ts		260°C for 5 seconds

Electrical / Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Test Condition	
Input Diode							
Forward Voltage	V _F		1.2	1.6	٧	I _F =20mA	
Reverse Current	I _R			100	μА	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	IC= 0.05mA IF= 20mA	
On State Collector Current	I _{C(ON)}	100		300	μA	V _{CE} = 5V	BIN A
	I _{C(ON)}	260		650	μΑ	I _F = 20mA	BIN B
	I _{C(ON)}	400		1200	μΑ	D = 3.0mm	BIN C
Response Time (Rise Time)	T _R		3	15	μs	V _{CE} = 5V	
Response Time(Fall Time)	T _F		4	20	μs	$I_C = 2mA$ $R_L = 100\Omega$	

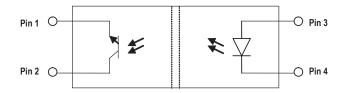
APDS-9103 Package Outline



NOTES:

- 1. All dimensions are in millimeters(inches)
- 2. Tolerance is \pm 0.25mm(0.010") unless otherwise noted

APDS-9103 Block Diagram

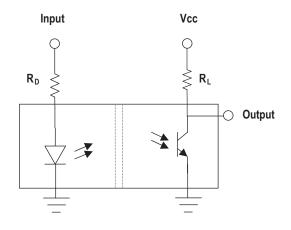


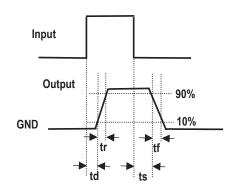
I/O Pins Configuration Table

The electrical pin assignments are depicted in the below table.

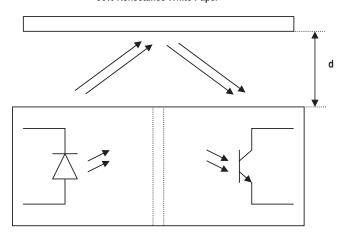
Pin	Function	Description
1	Emitter	Phototransistor Emitter
2	Collector	Phototransistor Collector
3	Anode	LED Anode
4	Cathode	LED Cathode

Test Circuit and Waveforms





90% Reflectance White Paper



APDS-9103 Performance Charts

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

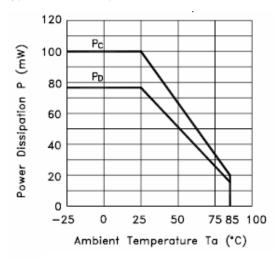


Figure 1. Power Dissipation vs. Ambient Temperature

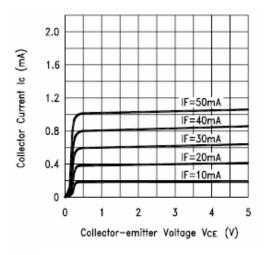


Figure 3. Collector Current vs. Collector-emitter Voltage

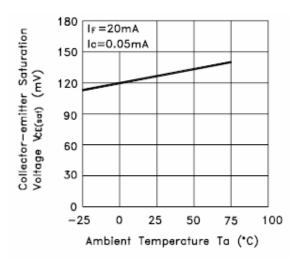


Figure 5. Collector-emitter Saturation Voltage vs. Ambient Temperature

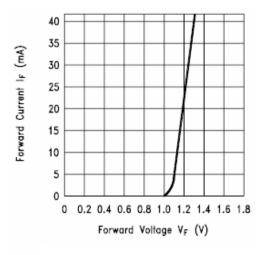


Figure 2. Forward Current vs. Forward Voltage

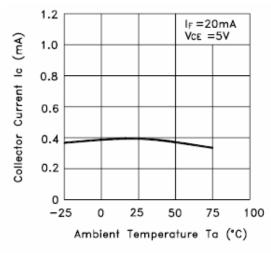


Figure 4. Collector Current vs. Ambient Temperature

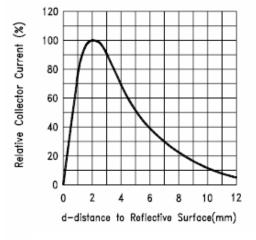


Figure 6. Relative Collector Current vs. Object Distance

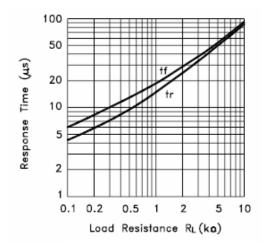


Figure 7. Response Time vs. Load Resistance