

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

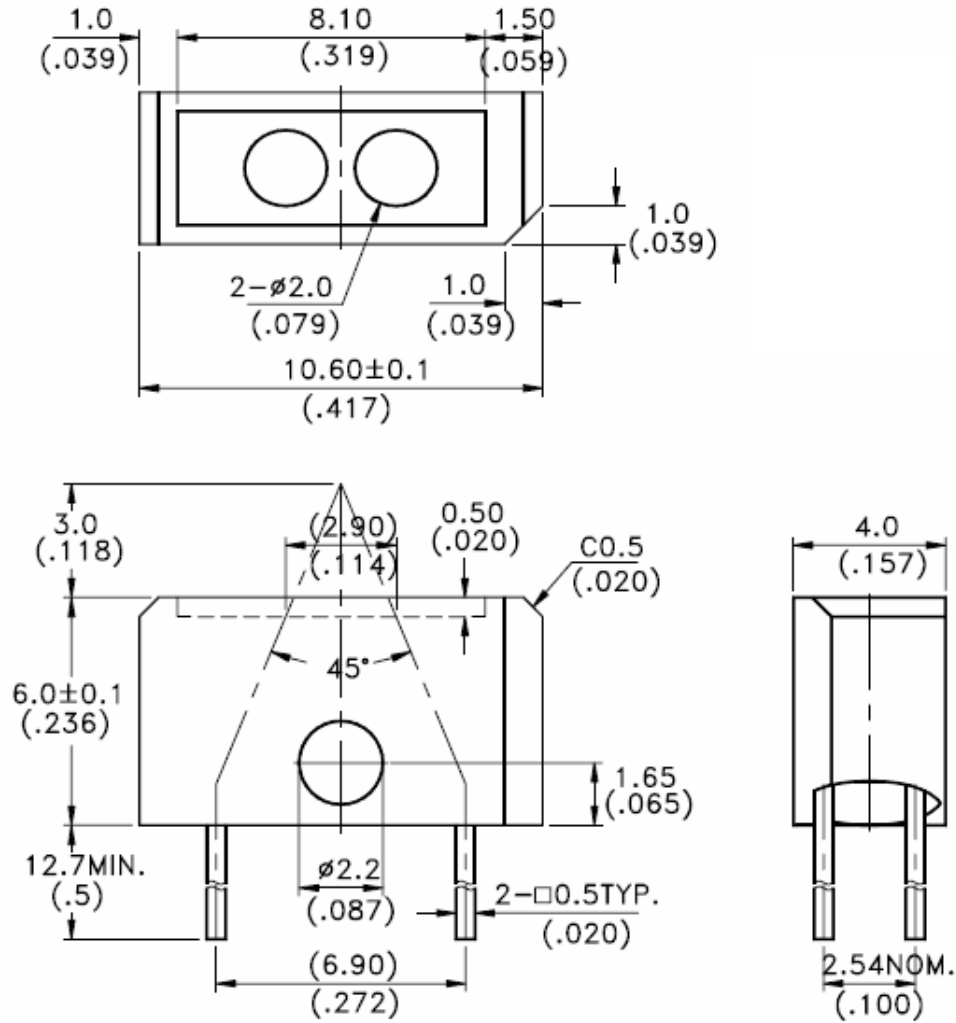
Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Max Rating	Unit
Input Diode			
Power Dissipation	P_D	75	mW
Peak Forward Current (300pps, 10 μ s 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_{CE0}	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	$I_F=20\text{mA}$
Reverse Current	I_R			100	μA	$V_R=5\text{V}$
Output Phototransistor						
Collector-Emitter Dark Current	I_{CE0}			100	nA	$V_{CE}=10\text{V}$
Coupler						
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$			0.4	V	$I_C=0.05\text{mA}$ $I_F=20\text{mA}$
On State Collector Current	$I_{C(ON)}$	100		300	μA	$V_{CE}=5\text{V}$ BIN A
	$I_{C(ON)}$	260		650	μA	$I_F=20\text{mA}$ BIN B
	$I_{C(ON)}$	400		1200	μA	$D=3.0\text{mm}$ BIN C
Response Time (Rise Time)	T_R		3	15	μs	$V_{CE}=5\text{V}$
Response Time(Fall Time)	T_F		4	20	μs	$I_C=2\text{mA}$ $R_L=100\Omega$

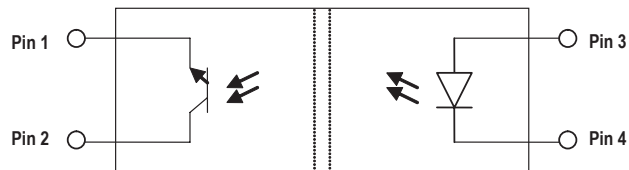
APDS-9103 Package Outline



NOTES:

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

APDS-9103 Block Diagram

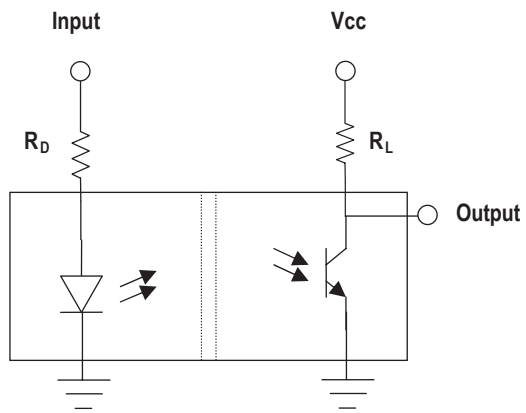
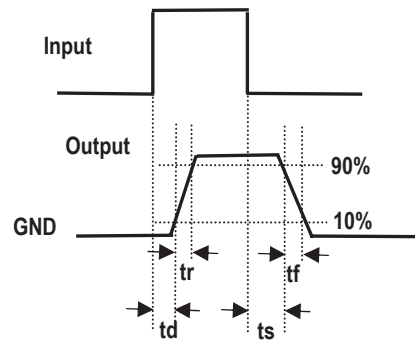
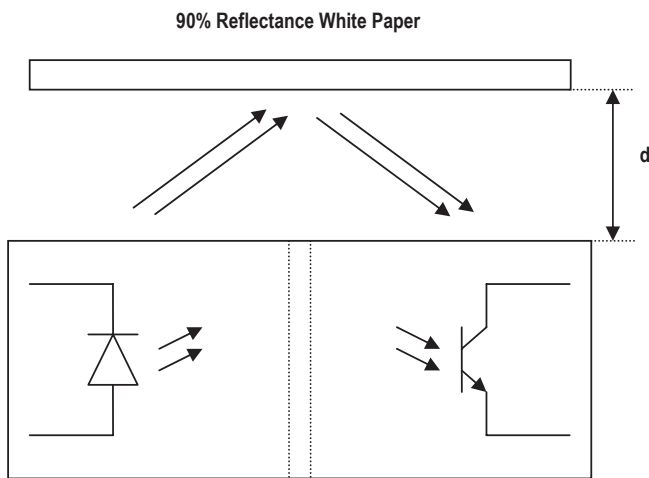


I/O Pins Configuration Table

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



APDS-9103 Performance Charts

Typical Electrical/Optical Characteristics Curves ($T_a=25^\circ\text{C}$ unless otherwise indicated)

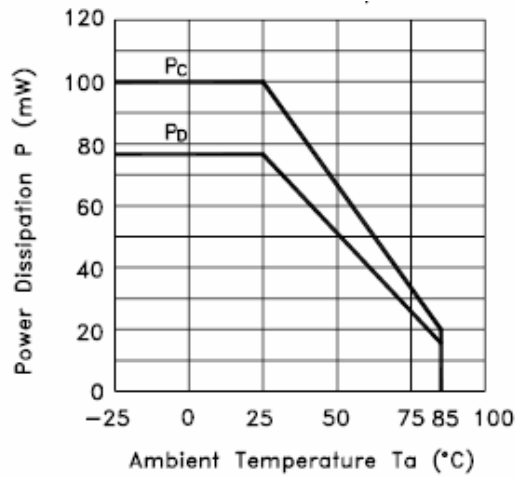


Figure 1. Power Dissipation vs. Ambient Temperature

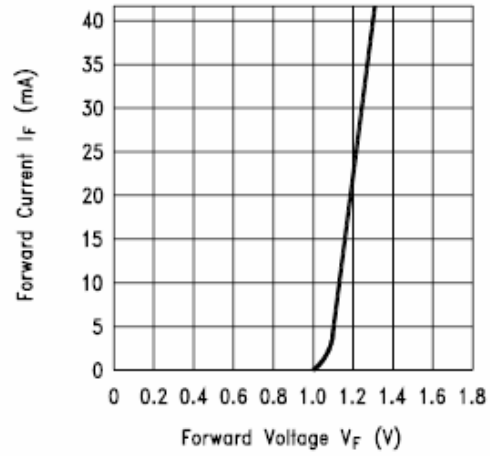


Figure 2. Forward Current vs. Forward Voltage

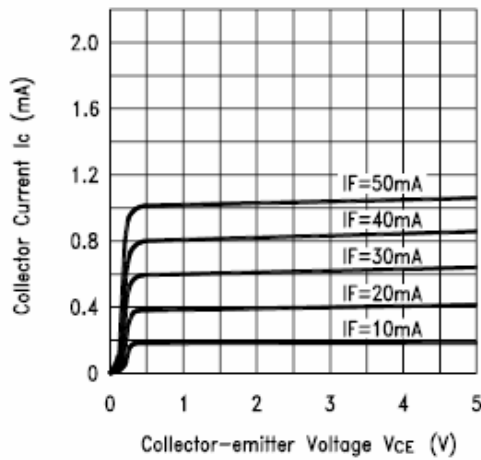


Figure 3. Collector Current vs. Collector-emitter Voltage

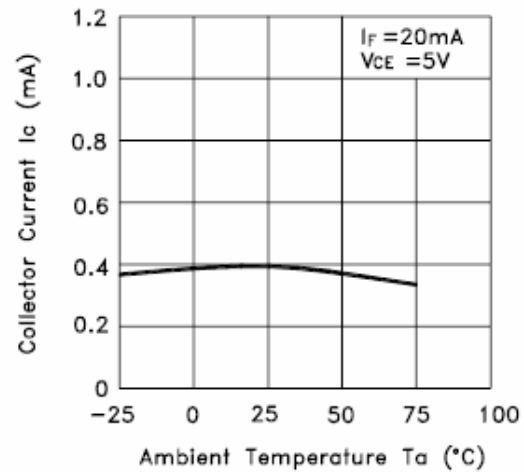


Figure 4. Collector Current vs. Ambient Temperature

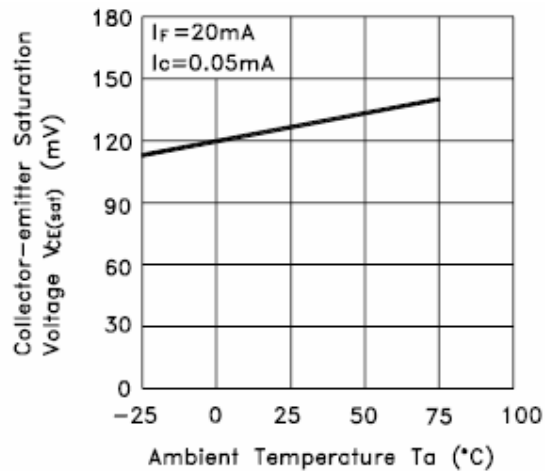


Figure 5. Collector-emitter Saturation Voltage vs. Ambient Temperature

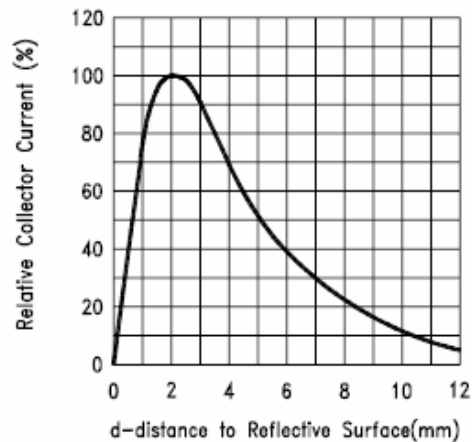


Figure 6. Relative Collector Current vs. Object Distance

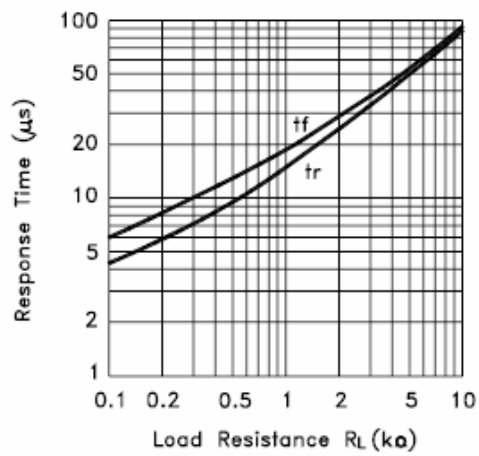


Figure 7. Response Time vs. Load Resistance

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