

## 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

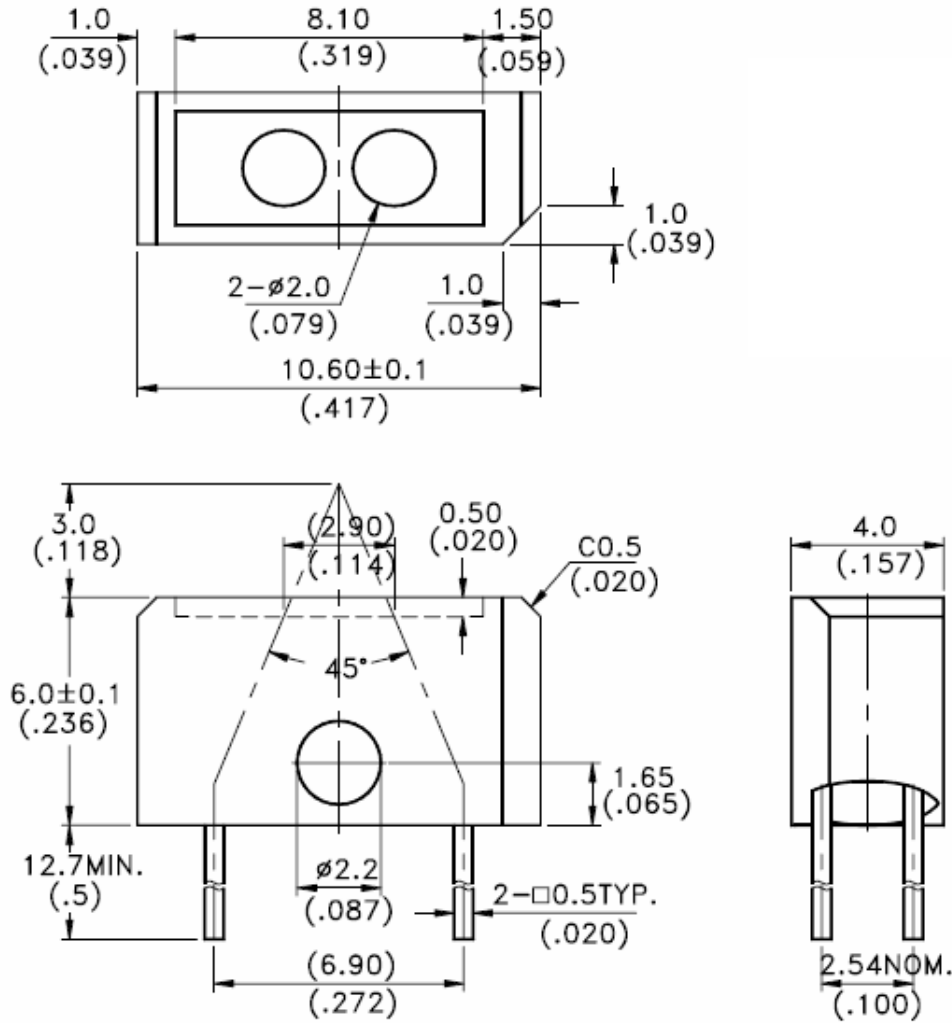
### Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Max Rating	Unit
<b>Input Diode</b>			
Power Dissipation	$P_D$	75	mW
Peak Forward Current (300pps, 10 $\mu$ s pulse)	$I_{CP}$	1	A
Continuous Forward Current	$I_F$	60	mA
Reverse Voltage	$V_R$	5	V
<b>Output Phototransistor</b>			
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
<b>Input Diode</b>						
Forward Voltage	$V_F$		1.2	1.6	V	$I_F=20mA$
Reverse Current	$I_R$			100	$\mu A$	$V_R=5V$
<b>Output Phototransistor</b>						
Collector-Emitter Dark Current	$I_{CEO}$			100	nA	$V_{CE}=10V$
<b>Coupler</b>						
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$			0.4	V	$I_C=0.05mA$ $I_F=20mA$
On State Collector Current	$I_{C(ON)}$	100		300	$\mu A$	$V_{CE}=5V$ BIN A
	$I_{C(ON)}$	260		650	$\mu A$	$I_F=20mA$ BIN B
	$I_{C(ON)}$	400		1200	$\mu A$	$D=3.0mm$ BIN C
Response Time (Rise Time)	$T_R$		3	15	$\mu s$	$V_{CE}=5V$
Response Time(Fall Time)	$T_F$		4	20	$\mu s$	$I_C=2mA$ $R_L=100\Omega$

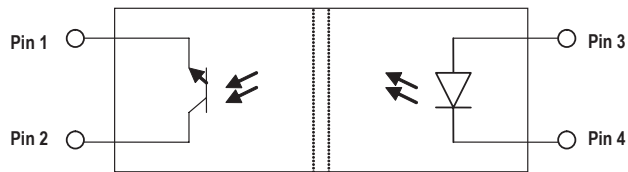
### APDS-9103 Package Outline



**NOTES:**

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

### APDS-9103 Block Diagram

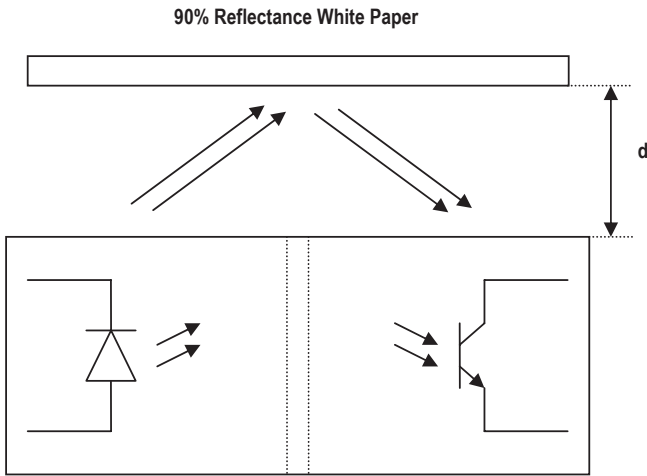
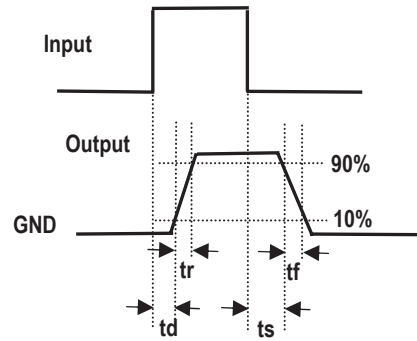
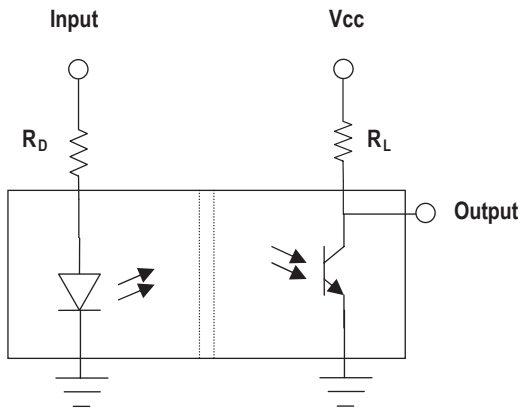


### I/O Pins Configuration Table

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 (Ta=25°C unless otherwise indicated)

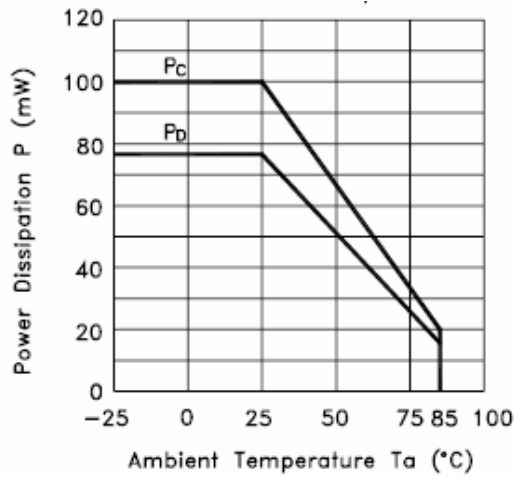


Figure 1. Power Dissipation vs. Ambient Temperature

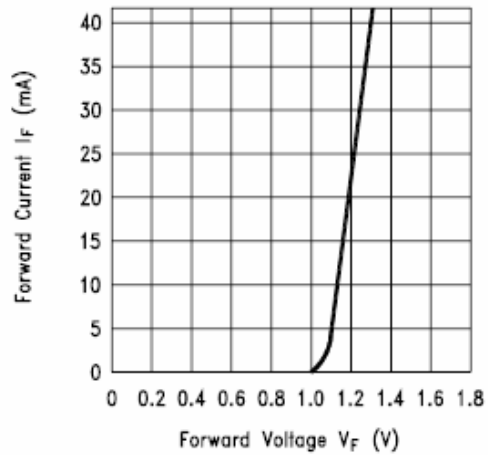


Figure 2. Forward Current vs. Forward Voltage

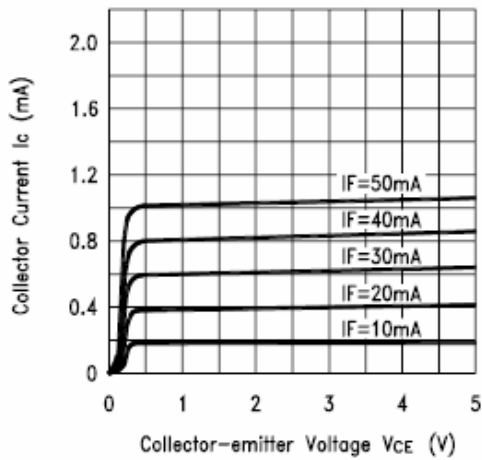


Figure 3. Collector Current vs. Collector-emitter Voltage

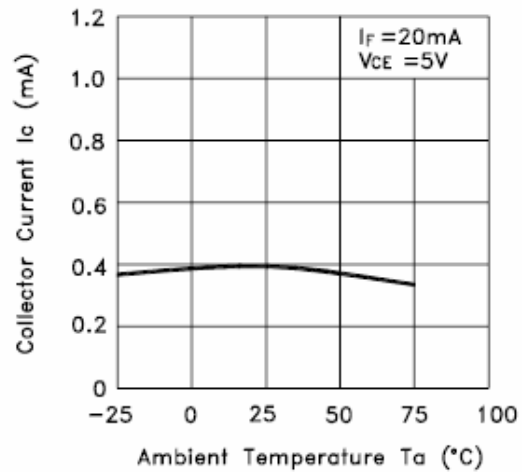


Figure 4. Collector Current vs. Ambient Temperature

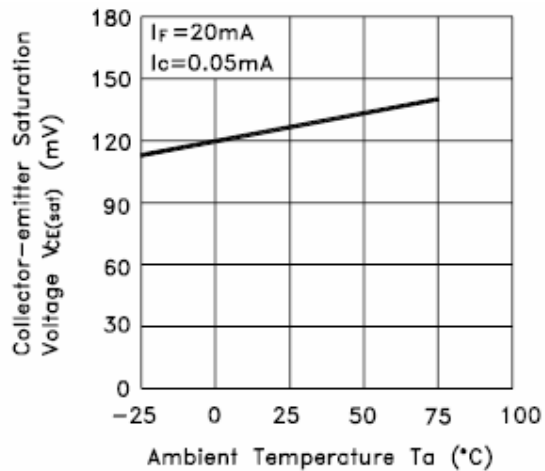


Figure 5. Collector-emitter Saturation Voltage vs. Ambient Temperature

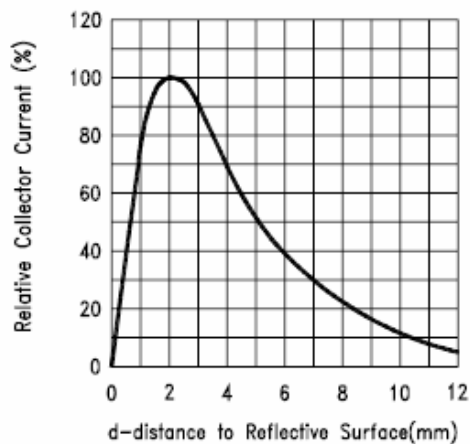


Figure 6. Relative Collector Current vs. Object Distance

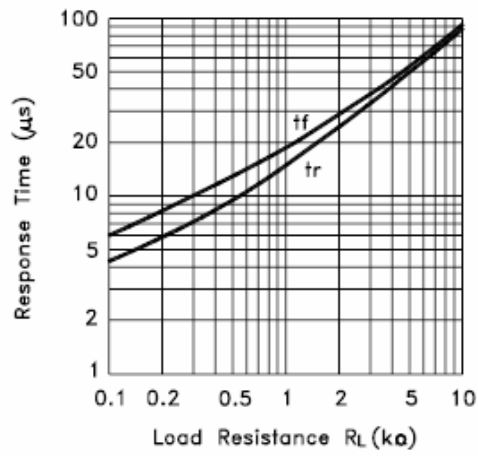


Figure 7. Response Time vs. Load Resistance

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AV02-0007EN - January 22, 2007

