APDS-9102
Integrated Reflective Sensor

Data Sheet

Description

APDS-9102 is a low cost, fast switching speed reflective proximity sensor that incorporates an infrared LED and a phototransistor in a single integrated package. APDS-9102 supports the detection distance of near 0 to approx 8mm, enabling to support a wide range of applications.

Application Support Information

The Application Engineering Group is available to assist you with the application design associated with APDS-9102. You can contact them through your local sales representatives for additional details

Ordering Information

Part Number	Package	Quantity
APDS-9102-L22	4 pin leads	1600

Features

- Detection distance of near 0mm to 8mm
- Fast Switching Speed
- Package size
  Height – 15.2 mm
  Width – 5 mm
  Depth – 17.8 mm
- Operating temperature : -35˚C to 65˚C
- Lead-free and RoHS Compliant

Applications

APDS-9102 is widely suitable to provide reflective object or proximity sensing suitable for various applications 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
Infrared Diode			
Power Dissipation [1]	P_D	75	mW
Peak Forward Current (300pps, 10 µs pulse)	I_{CP}	3	A
Continuous Forward Current	I_F	50	mA
Reverse Voltage	V_R	5	V
Phototransistor			
Power Dissipation [1]	Pc	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}		-35˚C to +65˚C
Storage Temperature Range	T_{STG}		-40˚C to +100˚C
Lead Soldering Termperature (1.6mm(0.063 ″) From Case)	T_S		260˚C for 5 seconds

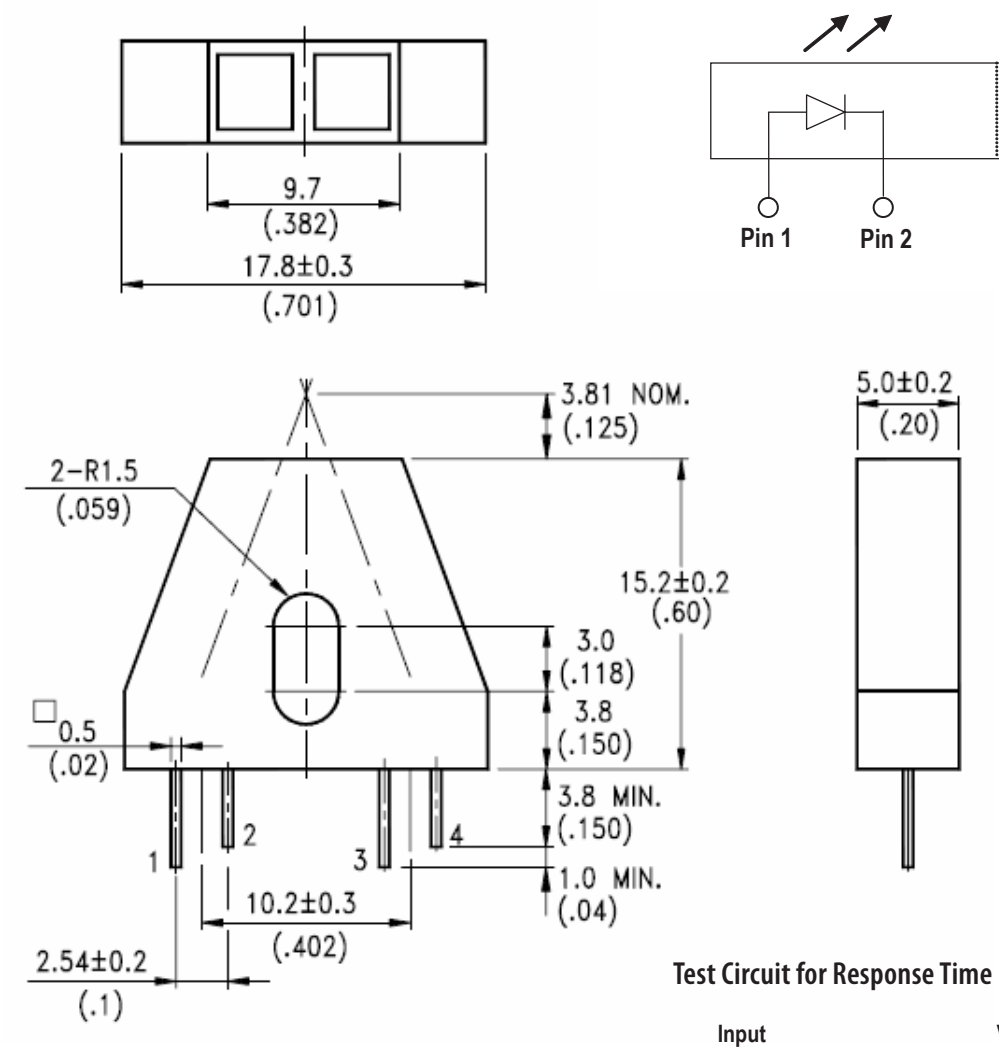
Note:
1. Derate Linearly 1.33mW/ ˚C from 25˚C

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 Breakdown Voltage	$V_{(BR)CEO}$	30			V	I_C= 1mA
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5			V	I_E= 0.1mA
Collector-Emitter Dark Current	I_{CEO}			100	nA	V_{CE}= 10V
Coupler						
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$			0.4	V	I_C= 0.08mA, I_F= 20mA
On State Collector Current [2]	$I_{C(ON)}$	0.16			mA	V_{CE}= 5V, I_F= 20mA

Note:
2. Reflective surface is Eastman Kodak(or equivalent) neutral white paper with 90% diffused reflectance placed at 3.81mm(0.15″) from read head.

APDS-9102 Package Outline



NOTES:
1. All dimensions are in millimeters(inches)
2. Tolerance is ± 0.25mm(0.010") unless otherwise noted
3. Specifications are subjected to change specifications without prior notice.

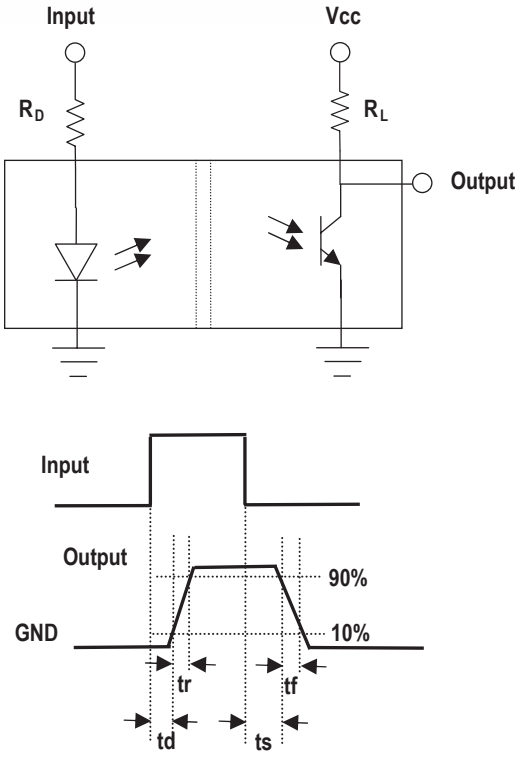
APDS-9102 Block Diagram

I/O Pins Configuration Table

The electrical pin assignments are depicted in the below table.

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

Test Circuit for Response Time



APDS-9102 Performance Charts

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

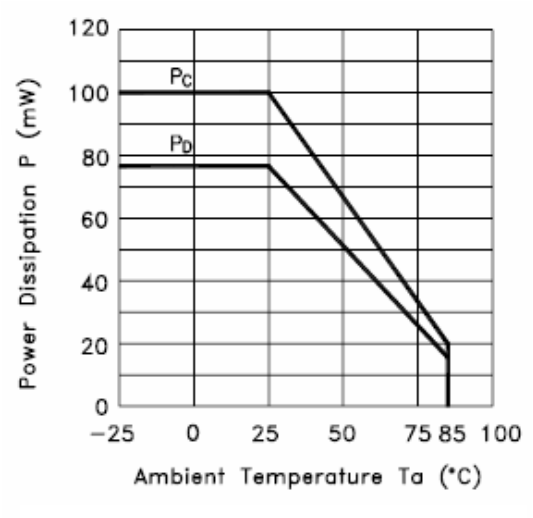


Figure 1. Power Dissipation vs. Ambient Temperature

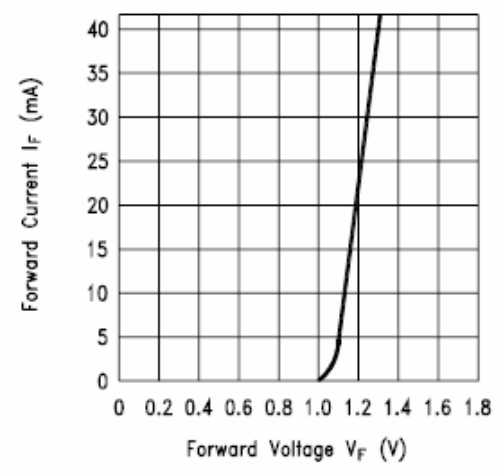


Figure 2. Forward Current vs. Forward Voltage

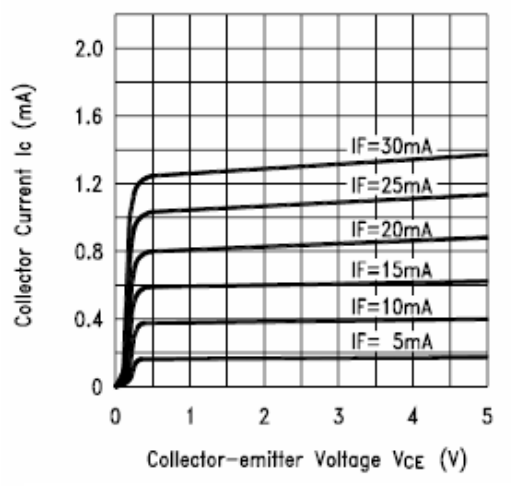


Figure 3. Collector Current vs. Collector-emitter Voltage

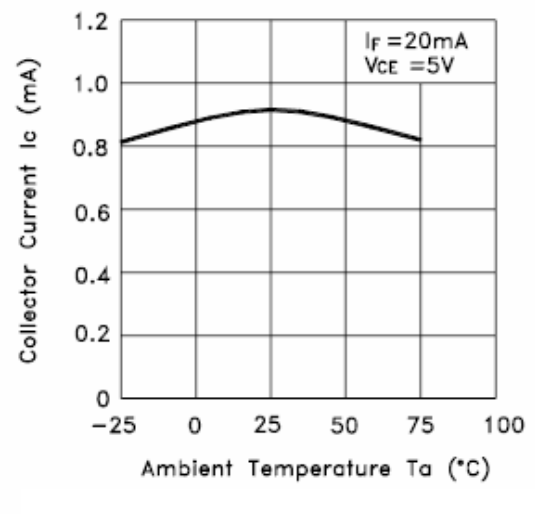


Figure 4. Collector Current vs. Ambient Temperature

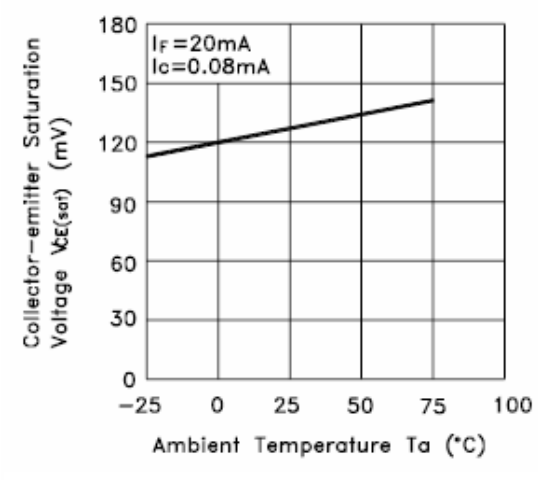


Figure 5. Collector-emitter Saturation Voltage vs. Ambient Temperature

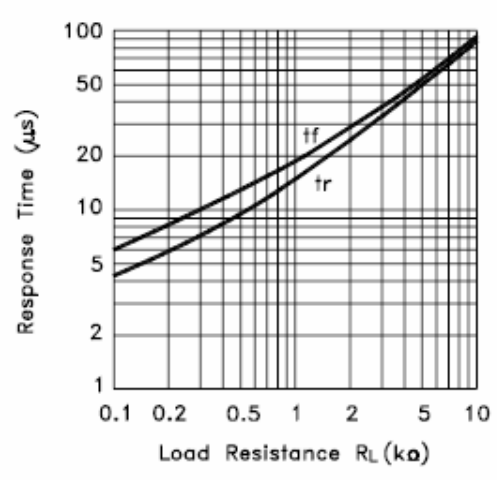


Figure 6. Response Time vs. Load Resistance

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

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