NEC

IC BUILT-IN PHOTODIODE | PH502HC

FEATURES

- **SCHMIDT TRIGGER CIRCUIT INCORPORATED**
- **LOW THRESHHOLD IRRADIANCE**
  H_{LH} = 50 μW/cm² MAX
- **DIRECT CONNECTION WITH TTL, LSTTL, AND CMOS ALLOWED**
- **WIDE-RANGE OPERATING SOURCE VOLTAGE**
  V_{CC} = 4.5 to 17 V
- **HIGH SPEED RESPONSE**
  t_{PLH}, t_{PHL} = 3.3 μs TYP
  t_f = 50 ns, t_r = 100 ns TYP @ R_L = 280 Ω
- **ACTIVE HIGH TYPE**
- **OPEN COLLECTOR OUTPUT**

DESCRIPTION

The PH502HC is a digital-output light receiving IC, integrating a photodiode and a signal processing circuit in one chip. Direct connection with an IC without using a processing circuit simplifies the circuit configuration. It is most suitable as various sensors in OA and AV equipment. Combination with the small infrared LED SE308 allows the digital-output photointerrupter to be composed. In addition, the PH502HC is ideally suited for the application of the light-receiving module internal elements of a simplified optical transmission link. At the time of receiving-light shielding, the output is set at the low level.

APPLICATIONS

- **SENSORS FOR PPCs, FAXs, PRINTERs, ELECTRONIC TYPEWRITERs, FDDs AND OA EQUIPMENT**
- **SENSORS FOR VTRs, VDs, CDs, AVs**
- **HOOK SENSOR FOR TELEPHONES**

3

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

PART NUMBER			PH502HC		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V_{CC}	Operating Source Voltage	V	4.5		17
V_{OL}	Low Level Output Voltage, I_{OL} = 16 mA, V_{CC} = 5 V	V		0.15	0.4
V_{OH}	High Level Output Voltage, V_{CC} = 5 V, H = 50 μW/cm²	V	4.9		
I_{CCL}	Low Level Supply Current, V_{CC} = 5 V, H = 0	mA		2.5	5
I_{CCH}	High Level Supply Current, V_{CC} = 5 V, H = 50 μW/cm²	mA		1	3
H_{LH}	Threshold Irradiance, V_{CC} = 5 V, λ = 940 nm, R_L = 280 Ω	μW/cm²		24	50
H_{HL}/H_{LH}	Hysteresis, V_{CC} = 5 V, λ = 940 nm, R_L = 280 Ω			0.7	
t_{PLH}	Transmission Delay Time, V_{CC} = 5 V, H = 50 μW/cm², R_L = 280 Ω	μs		3.3	9
t_{PHL}	Transmission Delay Time, V_{CC} = 5 V, H = 50 μW/cm², R_L = 280 Ω	μs		3.3	9
t_r	Rise Time, V_{CC} = 5 V, H = 50 μW/cm², R_L = 280 Ω	ns		100	300
t_f	Fall Time, V_{CC} = 5 V, H = 50 μW/cm², R_L = 280 Ω	ns		50	150

ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CC}	Source Voltage	V	17
I_{OL}	Low Level Output Current	mA	50
P_D	Power Consumption	mW	250
T_{OP}	Operating Temperature	°C	-30 to +85
T_{STG}	Storage Temperature	°C	-40 to +100

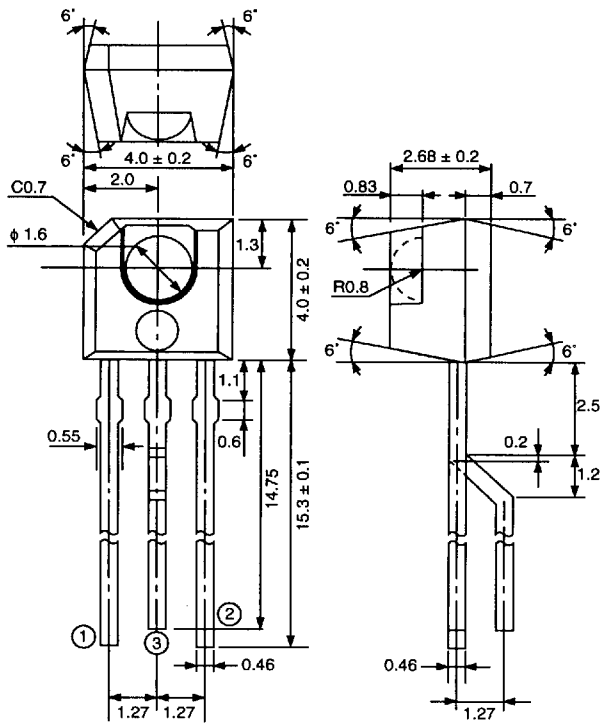
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.

RECOMMENDED OPERATING CONDITIONS

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
T_{OP}	Operating Temperature	°C	-10		+60
V_{CC}	Source Voltage	V	4.5	5	12
H	Irradiance	μW/cm²	50		

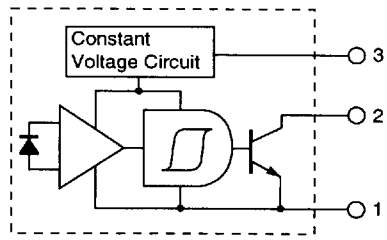
OUTLINE DIMENSIONS (Units in mm)

PH502HC



TERMINAL CONNECTION

PH502HC



1. GND
2. Vo
3. Vcc