

## Preamplifier Circuit for IR Remote Control



22906

### DESIGN SUPPORT TOOLS

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### MECHANICAL DATA

#### Pinning:

1, 4, 5 = N.C., 2 =  $V_S$ , 3 = OUT, 6, 8 = GND, 7 = IN

### FEATURES

- Carrier-out-function: carrier frequency and burst length accurately correspond to the input signal
- AC coupled response from 20 kHz to 60 kHz; all data formats
- Small QFN package with 2 mm width
- Can be used with either a photodiode or an IR emitter in forward or reverse polarity
- AC coupled input is insensitive to DC photocurrents
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### ESD

- To maximize the sensitivity, the TIA input pin has minimal ESD protection. Care should be taken never to touch or otherwise expose this pin to an adverse ESD source. The ESD protection conforms to Class 1B

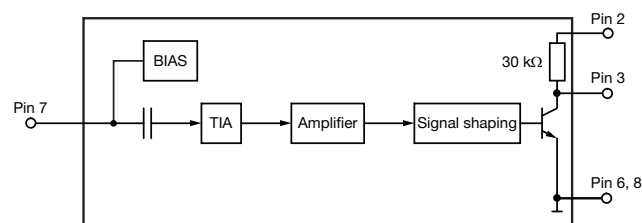
### DESCRIPTION

The VSOP98260 is designed for use in an IR learning application together with a photo PIN diode or IR LED as optical detector. It is compatible with all data formats for IR remote control. On the other hand it is immune to current caused by light sources such as tungsten bulbs or fluorescent lamps.

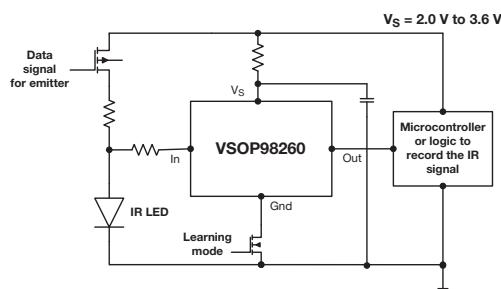
### PARTS TABLE

|                   |        |   |
|-------------------|--------|---|
| Carrier frequency | 38 kHz | VSOP98260   |
| Package           |        | VSOP  |
| Pinning           |        | 1, 4, 5 = N.C., 2 = $V_S$ , 3 = OUT, 6, 8 = GND, 7 = IN |
| Dimensions (mm)   |        | 2.0 W x 2.0 H x 0.76 D                                  |
| Mounting          |        | SMD   |
| Application       |        | Code learning   |

### BLOCK DIAGRAM (simplified)



### APPLICATION CIRCUIT



Recommended to minimize the connection distance between the IR LED and the input of the VSOP98260, and if possible to shield this connection to Gnd.

#### Note

- (1) For further information, see application note, "IC for Code Learning Applications"

| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |           |                         |                    |
|--|---|-----------|-------------------------|--------------------|
| PARAMETER  | TEST CONDITION                            | SYMBOL    | VALUE                   | UNIT               |
| Supply voltage   | Pin 2                                     | $V_S$     | -0.3 to +6              | V                  |
| Supply current   | Pin 2                                     | $I_S$     | 5                       | mA                 |
| Output voltage   | Pin 3                                     | $V_O$     | -0.3 to ( $V_S + 0.3$ ) | V                  |
| Output current   | Pin 3                                     | $I_O$     | 5                       | mA                 |
| Input voltage  | Pin 7                                     | $V_I$     | -0.3 to 3.3             | V                  |
| Input current  | Pin 7                                     | $I_I$     | 7                       | mA                 |
| Power dissipation  | $T_{amb} \leq 85\text{ }^{\circ}\text{C}$ | $P_{tot}$ | 10                      | mW                 |
| Operating temperature range  |   | $T_{amb}$ | -25 to +85              | $^{\circ}\text{C}$ |
| Storage temperature range  |   | $T_{stg}$ | -25 to +85              | $^{\circ}\text{C}$ |
| ESD stress, HBM  | Pin 2, pin 3, MIL-STD-883C                | $V_{ESD}$ | 2000                    | V                  |
|  | Pin 7, MIL-STD-883C                       | $V_{ESD}$ | 500                     | V                  |
| ESD stress, MM   | Pin 2, pin 3, MIL-STD-883C                | $V_{ESD}$ | 200                     | V                  |
|  | Pin 7, MIL-STD-883C                       | $V_{ESD}$ | 100                     | V                  |

**Note**

- Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect the device reliability.

| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 5\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |                  |                             |                    |                             |               |
|--|---|------------------|-----------------------------|--------------------|-----------------------------|---------------|
| PARAMETER  | TEST CONDITION  | SYMBOL           | MIN.                        | TYP.               | MAX.                        | UNIT          |
| Supply voltage   |   | $V_S$            | 2.0                         | -                  | 3.6                         | V             |
| Supply current (pin 2)   | $I_{IN} = 0$ , $V_S = 5\text{ V}$   | $I_S$            | 0.55                        | 0.7                | 0.9                         | mA            |
| Output voltage low (pin 3)   | $I_{OL} = 2\text{ mA}$  | $V_{OL}$         | -                           | -                  | 100                         | mV            |
| Output voltage high (pin 3)  | $I_{OL} = 0$  | $V_{OH}$         | $V_S - 0.25$                | -                  | -                           | V             |
| Internal pull up resistor (pin 2, pin 3)   |   | $R_{PU}$         | -                           | 33                 | -                           | k $\Omega$    |
| Max. input DC current  | $V_{IN} > 0$  | $I_{IN-DCmax.}$  | 400                         | -                  | -                           | $\mu\text{A}$ |
| Min. signal detection current  | $I_{IN-DC} = 0$ , $f_C = f_{BPF}$   | $I_{IN-min.}$    | -                           | 40                 | 80                          | nA            |
|  | $I_{IN-DC} = 100\text{ }\mu\text{A}$ , $f_C = f_{BPF}$  | $I_{IN-min.}$    | -                           | 50                 | -                           | nA            |
| Output accuracy  | $f_C = 20\text{ kHz}$ to $60\text{ kHz}$ ,<br>$I_{IN} = 80\text{ nA}$ to $50\text{ }\mu\text{A}$ ,<br>testsignal see fig. 1, $BER \leq 2\%$ | N carrier pulses | input burst length -1 cycle | input burst length | input burst length +1 cycle | counts        |

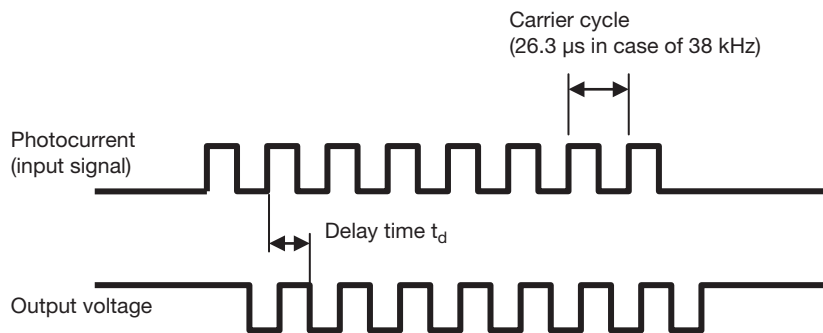
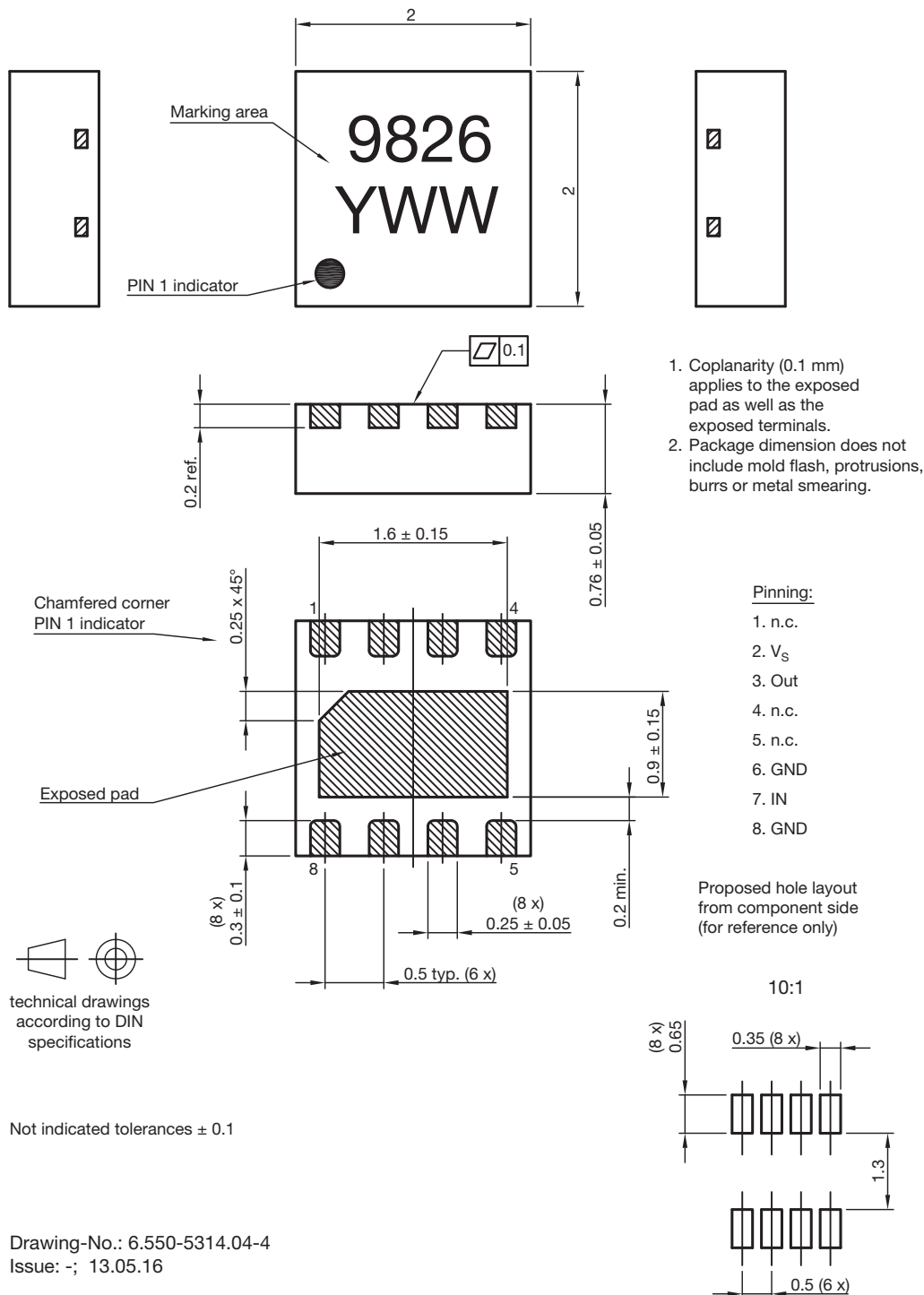


Fig. 1 - Testsignal

### PACKAGE DIMENSIONS in millimeters





## ASSEMBLY INSTRUCTIONS

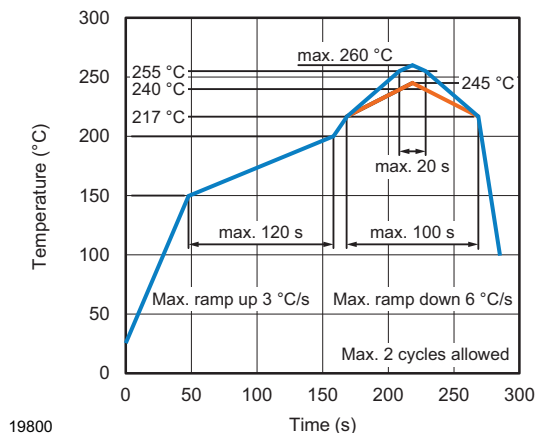
### Reflow Soldering

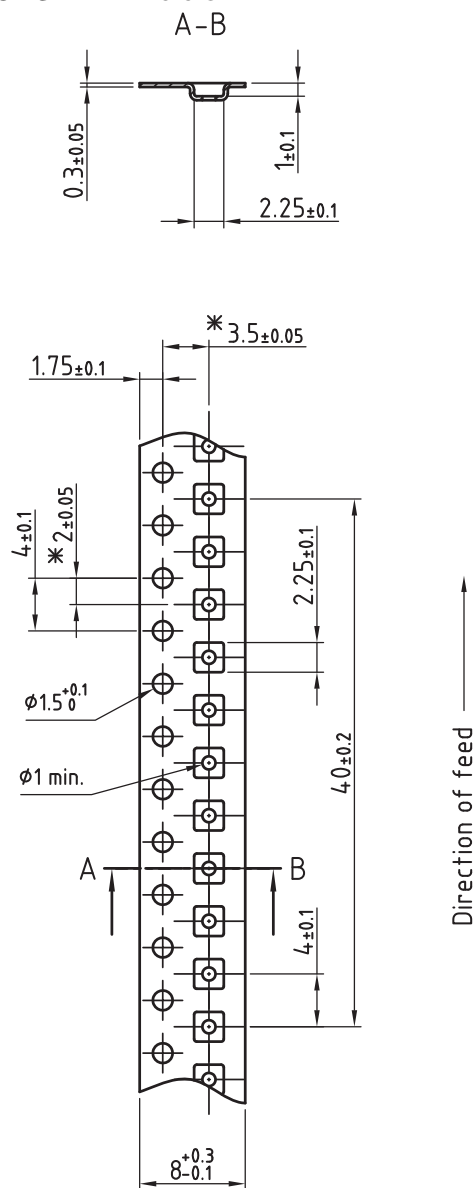
- Set the furnace temperatures for pre-heating and heating in accordance with the reflow temperature profile as shown in the diagram. Exercise extreme care to keep the maximum temperature below 260 °C. The temperature shown in the profile means the temperature at the device surface. Since there is a temperature difference between the component and the circuit board, it should be verified that the temperature of the device is accurately being measured
- Handling after reflow should be done only after the work surface has been cooled off

### Manual Soldering

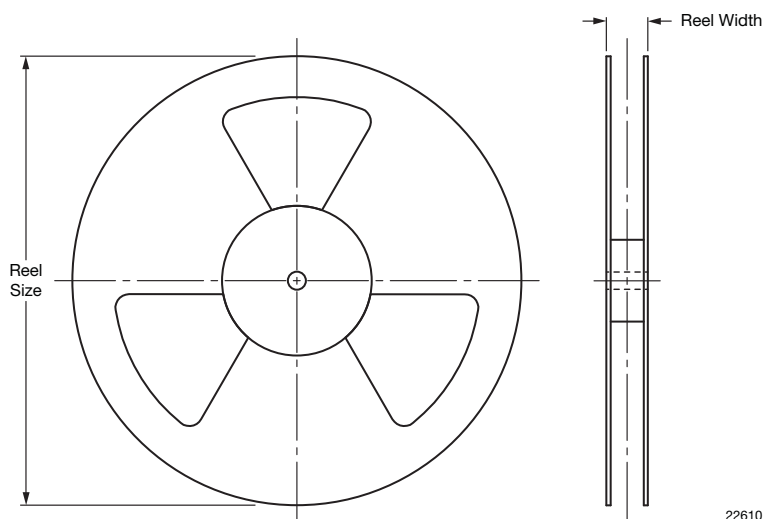
- Use a soldering iron of 25 W or less. Adjust the temperature of the soldering iron below 300 °C
- Finish soldering within 3 s
- Handle products only after the temperature has cooled off.

## VISHAY LEAD (PB)-FREE REFLOW SOLDER PROFILE



**TAPING VERSION VSOP DIMENSIONS** in millimeters


\* Measured from centerline of sprocket hole to centerline of pocket

**REEL DIMENSIONS** in millimeters


| REEL             |                 |                     |                    |                  |
|------------------|-----------------|---------------------|--------------------|------------------|
| REEL SIZE (inch) | REEL WIDTH (mm) | TRAILER LENGTH (mm) | LEADER LENGTH (mm) | QANTITY PER REEL |
| 7                | 8.4             | 160                 | 400                | 3000             |

**LABEL**
**Standard bar code labels for finished goods**

The standard bar code labels are product labels and used for identification of goods. The finished goods are packed in final packing area. The standard packing units are labeled

with standard bar code labels before transported as finished goods to warehouses. The labels are on each packing unit and contain Vishay Semiconductor GmbH specific data.

| VISHAY SEMICONDUCTOR GMBH STANDARD BAR CODE PRODUCT LABEL (finished goods) |              |              |
|--|--------------|--------------|
| PLAIN WRITTING   | ABBREVIATION | LENGTH       |
| Item-description   | -            | 18           |
| Item-number  | INO          | 8            |
| Selection-code   | SEL          | 3            |
| LOT-/serial-number   | BATCH        | 10           |
| Data-code  | COD          | 3 (YWW)      |
| Plant-code   | PTC          | 2            |
| Quantity   | QTY          | 8            |
| Accepted by  | ACC          | -            |
| Packed by  | PCK          | -            |
| Mixed code indicator   | MIXED CODE   | -            |
| Origin   | xxxxxxx+     | Company logo |
| LONG BAR CODE TOP  | TYPE         | LENGTH       |
| Item-number  | N            | 8            |
| Plant-code   | N            | 2            |
| Sequence-number  | X            | 3            |
| Quantity   | N            | 8            |
| Total length   | -            | 21           |
| SHORT BAR CODE BOTTOM  | TYPE         | LENGTH       |
| Selection-code   | X            | 3            |
| Data-code  | N            | 3            |
| Batch-number   | X            | 10           |
| Filter   | -            | 1            |
| Total length   | -            | 17           |



### ESD PRECAUTION

Proper storage and handling procedures should be followed to prevent ESD damage to the devices especially when they are removed from the antistatic shielding bag. Electrostatic sensitive devices warning labels are on the packaging.

### VISHAY SEMICONDUCTORS STANDARD BAR CODE LABELS

The Vishay Semiconductors standard bar code labels are printed at final packing areas. The labels are on each packing unit and contain Vishay Semiconductors specific data.



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