

# Silicon Photodetectors

## Series 5T

### Blue Sensitive, Biased or Photovoltaic Operation

The Series 5T are a range of low cost detectors offering high blue sensitivity coupled with high shunt resistance and low dark leakage current.

They are particularly suited to low light level applications throughout the spectral range 430 to 900 nm and for applications where the highest signal to noise ratio is important.

The detectors may be operated in the photovoltaic mode or with reverse bias to achieve a lower capacitance. They provide the most economic solution for all applications where high speed of responses above 800 nm is not critical.

### ABSOLUTE MAXIMUM RATINGS

|                                               | Max. Rating | Unit     |
|-----------------------------------------------|-------------|----------|
| DC Reverse Voltage                            | 15          | V        |
| Peak Pulse Current (1 $\mu$ S, 1% duty cycle) | 200         | mA       |
| Peak DC Current                               | 10          | mA       |
| Storage Temperature Range                     | -45 to +100 | degree C |
| Operating Temperature Range                   | -25 to +75  | degree C |
| Soldering Temperature for 5 seconds max.      | 200         | degree C |

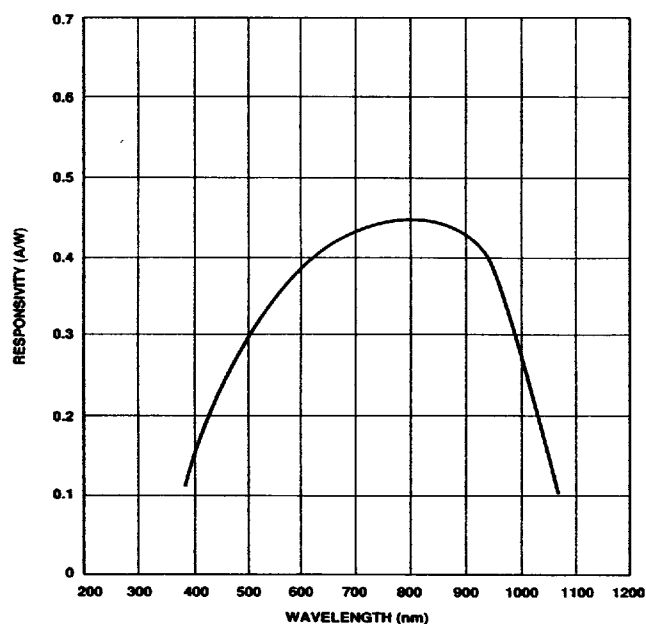


Fig.26 SERIES 5T - TYPICAL SPECTRAL RESPONSE

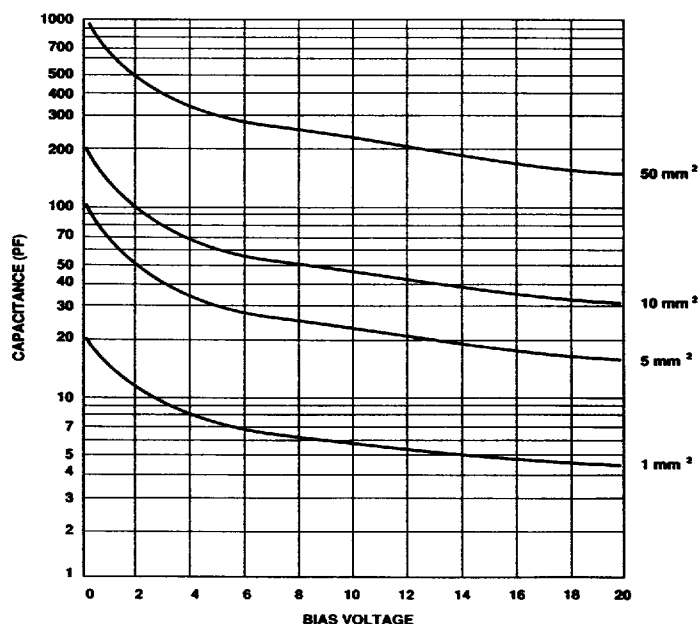


Fig.27 SERIES 5T - TYPICAL CAPACITANCE VERSUS BIAS VOLTAGE FOR A GIVEN DETECTOR AREA

# Series 5T

## Electrical / Optical Specifications

Characteristics measured at 22° C (±2) ambient, and a reverse bias of 12 volts, unless otherwise stated.  
Shunt Resistance measured at +/- 10mV.

## Single Elements

| Type No.  | Active Area     |             | Responsivity A/W<br>L = 436 nm |      | Dark Current<br>nA |      | NEP WHz <sup>-1/2</sup><br>L = 436 nm | Capacitance pF              |                              | Shunt Resistance<br>Megohms |      | Package |
|-----------|-----------------|-------------|--------------------------------|------|--------------------|------|---------------------------------------|-----------------------------|------------------------------|-----------------------------|------|---------|
|           | mm <sup>2</sup> | mm          | Min.                           | Typ. | Max.               | Typ. |                                       | V <sub>r</sub> = 0V<br>Max. | V <sub>r</sub> = 12V<br>Max. | Min.                        | Typ. |         |
| OSD1-5T   | 1               | 1.13 dia    | 0.15                           | 0.21 | 5                  | 0.5  | 1.2 x 10 <sup>-13</sup>               | 30                          | 6                            | 100                         | 1000 | 1       |
| OSD3-5T   | 3               | 2.16 x 1.4  | 0.15                           | 0.21 | 20                 | 1    | 1.7 x 10 <sup>-13</sup>               | 80                          | 20                           | 60                          | 700  | 1       |
| OSD5-5T   | 5               | 2.52 dia    | 0.15                           | 0.21 | 25                 | 2    | 2.4 x 10 <sup>-13</sup>               | 130                         | 35                           | 40                          | 600  | 3       |
| OSD7.5-5T | 7.5             | 2.75 x 2.75 | 0.15                           | 0.21 | 25                 | 2    | 2.4 x 10 <sup>-13</sup>               | 150                         | 40                           | 30                          | 300  | 3       |
| OSD15-5T  | 15              | 3.8 x 3.8   | 0.15                           | 0.21 | 50                 | 3    | 3.0 x 10 <sup>-13</sup>               | 390                         | 80                           | 5                           | 80   | 3       |
| OSD35-5T  | 35              | 5.9 x 5.9   | 0.15                           | 0.21 | 50                 | 3    | 3.0 x 10 <sup>-13</sup>               | 950                         | 200                          | 10                          | 100  | 8       |
| OSD50-5T  | 50              | 7.98 dia    | 0.15                           | 0.21 | 100                | 5    | 3.8 x 10 <sup>-13</sup>               | 1300                        | 270                          | 1.5                         | 25   | 9       |
| OSD60-5T  | 62              | 7.9 x 7.9   | 0.15                           | 0.21 | 100                | 9    | 5.1 x 10 <sup>-13</sup>               | 1800                        | 310                          | 1                           | 12   | 9       |
| OSD100-5T | 100             | 11.3 dia    | 0.15                           | 0.21 | 200                | 20   | 7.6 x 10 <sup>-13</sup>               | 2500                        | 520                          | 1                           | 15   | 13      |
| OSD200-5T | 200             | 15.96 dia   | 0.15                           | 0.21 | 500                | 100  | 1.7 x 10 <sup>-12</sup>               | 5000                        | 1000                         | 0.5                         | 7    | 13      |
| OSD300-5T | 300             | 19.54 dia   | 0.15                           | 0.21 | 1000               | 250  | 2.7 x 10 <sup>-12</sup>               | 7500                        | 1500                         | 0.5                         | 5    | 15      |

## Quadrants

(Values given are per element unless otherwise stated)

| Type No. | Active Area<br>(Total) |          |            | Responsivity A/W<br>L = 436 nm |      | Dark Current<br>nA |      | NEP WHz <sup>-1/2</sup><br>L = 436 nm | Capacitance pF              |                              | Shunt Resistance<br>Megohms |      | Crosstalk %<br>L = 900 nm |      | Package |
|----------|------------------------|----------|------------|--------------------------------|------|--------------------|------|---------------------------------------|-----------------------------|------------------------------|-----------------------------|------|---------------------------|------|---------|
|          | mm <sup>2</sup>        | mm       | Sep.<br>mm | Min.                           | Typ. | Max.               | Typ. |                                       | V <sub>r</sub> = 0V<br>Max. | V <sub>r</sub> = 12V<br>Max. | Min.                        | Typ. | Max.                      | Typ. |         |
| QD7-5T   | 7                      | 2.99 dia | 0.2        | 0.15                           | 0.21 | 100                | 6    | 4.2 x 10 <sup>-13</sup>               | 50                          | 15                           | 80                          | 1200 | 5                         | 1    | 7       |
| QD50-5T  | 50                     | 7.98 dia | 0.2        | 0.15                           | 0.21 | 150                | 10   | 5.3 x 10 <sup>-13</sup>               | 330                         | 80                           | 5                           | 300  | 5                         | 1    | 10      |
| QD100-5T | 100                    | 11.3 dia | 0.2        | 0.15                           | 0.21 | 200                | 15   | 5.6 x 10 <sup>-13</sup>               | 650                         | 130                          | 2                           | 100  | 5                         | 1    | 11      |

## Linear Arrays

(Values given are per element unless otherwise stated)

| Type No. | No. of Elements | Array Dimensions        |             |             |            | Responsivity A/W<br>L = 436 nm |      | Dark Current<br>nA |      | NEP WHz <sup>-1/2</sup><br>L = 436 nm | Capacitance pF              |                              | Shunt Resistance<br>Megohms |      | Package |
|----------|-----------------|-------------------------|-------------|-------------|------------|--------------------------------|------|--------------------|------|---------------------------------------|-----------------------------|------------------------------|-----------------------------|------|---------|
|          |                 | Area<br>mm <sup>2</sup> | Width<br>mm | Lgth.<br>mm | Sep.<br>mm | Min.                           | Typ. | Max.               | Typ. |                                       | V <sub>r</sub> = 0V<br>Max. | V <sub>r</sub> = 12V<br>Max. | Max.                        | Typ. |         |
| LD2-5T   | 2               | 1.00                    | 2.00        | 0.5         | 0.05       | 0.15                           | 0.21 | 2                  | 0.7  | 1.4 x 10 <sup>-13</sup>               | 30                          | 6                            | 100                         | 1000 | 4       |

## Matrix Arrays

(Values given are per element unless otherwise stated)

| Type No. | No. of Elements | Array Dimensions        |             |             |            | Responsivity A/W<br>L = 436 nm |      | Dark Current<br>nA |      | NEP WHz <sup>-1/2</sup><br>L = 436 nm | Capacitance pF              |                              | Shunt Resistance<br>Megohms |      | Package |
|----------|-----------------|-------------------------|-------------|-------------|------------|--------------------------------|------|--------------------|------|---------------------------------------|-----------------------------|------------------------------|-----------------------------|------|---------|
|          |                 | Area<br>mm <sup>2</sup> | Width<br>mm | Lgth.<br>mm | Sep.<br>mm | Min.                           | Typ. | Max.               | Typ. |                                       | V <sub>r</sub> = 0V<br>Max. | V <sub>r</sub> = 12V<br>Max. | Max.                        | Typ. |         |
| MD25-5T  | 5 x 5           | 7.29                    | 2.7         | 2.7         | 0.1        | 0.15                           | 0.21 | 50                 | 5    | 3.8 x 10 <sup>-13</sup>               | 240                         | 47                           | 5                           | 200  | 18      |
| MD100-5T | 10 x 10         | 1.96                    | 1.4         | 1.4         | 0.1        | 0.15                           | 0.21 | 200                | 1    | 1.7 x 10 <sup>-13</sup>               | 55                          | 12                           | 1                           | 400  | 19      |
| MD144-5T | 12 x 12         | 1.96                    | 1.4         | 1.4         | 0.1        | 0.15                           | 0.21 | 200                | 1    | 1.7 x 10 <sup>-13</sup>               | 55                          | 12                           | 1                           | 400  | 19      |

Note: Recommended operating voltage range 0 to 12 volts, for all Series 5T Detectors.