



**TYNTEK CORPORATION**  
**鼎元光電科技股份有限公司**

*Lighting*  
**the new world**



**ACE Royal Tech Inc.**  
**(주) 에이스 로알테크**

## About Us

TYNTEK CORPORATION was established in 1987, 30 years to focus on LED visible, LED infrared products, SILICON photo diode, photo transistor, ZENER ESD protection diode, Optical communication receiver and transmitter chips. We dedicate to design, manufacture and provide customers overall service project. Our customers around the world, including mainland China, Japan, Korea, Europe, North America and other countries.

## Product & Service : LED Chips

### 1. Visible LED Chip

|              |                                    |
|--------------|------------------------------------|
| GaP /GaP     | Red, Green                         |
| GaAsP/GaP    | Yellow , Orange Red                |
| AlGaAs/GaAs  | SH, DH, DDH high brightness Red    |
| AlGaInP/GaAs | As Type Yellow, Green, Orange, Red |
| AlGaInP/Si   | Wafer Bond Red, Yellow             |

### 2. Infrared LED Chip

|               |                                    |
|---------------|------------------------------------|
| GaAs/GaAs     | 940nm Infrared LED                 |
| AlGaAs/GaAs   | 940nm Infrared LED                 |
| AlGaAs/AlGaAs | 700~900nm Infrared LED             |
| AlGaAs/Si     | Wafer Bond 730 ~940nm Infrared LED |

### 3. OEM and ODM service in compound semiconductor products.

## Product & Service : Silicon chips

### 1. Photo-Transistor Chip

Photo-coupler  
Photo-interrupter  
Photo-Switch  
Ambient Sensor

### 2. Photo-Diode Chip

Standard Type for Remote controller  
Data Communication  
Smoke Sensor  
Optical Encoder  
Ambient Sensor

### 3. Zener-Diode /TVS Chip

ESD Protection  
Surge Protection  
Voltage Regulation

### 4. OEM and ODM service in Bi-polar silicon devices.



**ACE Royal Tech Inc.**

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## **Product & Service: Optical Fiber Chips**

### **1. InGaAs/InP**

Monitor PD (Aperture :200um,250um, 300um, 1mm,2mm,3mm)

Edge Monitor PD

2.5G 1300nm PIN PD

10G 1300nm PIN PD

25G 1300nm PIN PD

### **2. AlGaAs/GaAs**

5G PIN PD

10G PIN PD

25G PIN PD

40G PD ARRAY (HDMI)

100G PD ARRAY

### **3. AlGaAs/GaAs 850nm VCSEL**

10G VCSEL

40G VCSEL ARRAY(HDMI)

### **4. InGaAs APD**

2.5G APD

## **Strength Of Tyntek**

### **Wide Range Opto-Electronic Products**

LED & Silicon Devices

Total product solutions

### **High Volume Production Capability**

Total 4,000 million pcs chips/month

Flexibility in manufacturing

### **Good Quality & Responsibility**

ISO9001 , ISO14001 , QS9000 and TS-16949 Approved system

Products with comfortable quality

Customized Products

Cooperate with R&D institutes and universities

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## Product & Service : LED Chips

### Infrared LED Chip

|               |                                     |
|---------------|-------------------------------------|
| GaAs/GaAs     | 940nm Infrared LED                  |
| AlGaAs/GaAs   | 940nm Infrared LED                  |
| AlGaAs/AlGaAs | 700 ~ 900nm Infrared LED            |
| AlGaAs/Si     | Wafer Bond 730 ~ 940nm Infrared LED |

#### LPE TYPE

| Wp(nm)     | Part no.  | Material      | Top Polarity | Size (um) | Thickness (um) | Po(mW)  | Wp(nm) | VF(V) |
|------------|-----------|---------------|--------------|-----------|----------------|---------|--------|-------|
|            |           |               |              |           |                | Typ     | Typ.   | Typ.  |
| IRB(700nm) | TK0114IRB | AlGaAs/AlGaAs | P            | 350       | 160            | 4.0     | 700    | 1.90  |
| IRD(730nm) | TK0114IRD | AlGaAs/AlGaAs | P            | 350       | 160            | 4.0     | 730    | 1.90  |
|            | TK0N14IRD | AlGaAs/AlGaAs | N            | 350       | 150            | 4.8     | 724    | 2.00  |
| IRE(770nm) | TK0114IRE | AlGaAs/AlGaAs | P            | 350       | 160            | 4.0     | 770    | 1.90  |
|            | TK0N14IRE | AlGaAs/AlGaAs | N            | 350       | 155            | 4.8     | 770    | 1.90  |
| IRV(810nm) | TK0114IRV | AlGaAs/AlGaAs | P            | 350       | 180            | 4.5     | 810    | 1.65  |
|            | TK0N14IRV | AlGaAs/AlGaAs | N            | 350       | 170            | 4.6     | 810    | 1.80  |
| IRK(830nm) | TK0114IRK | AlGaAs/AlGaAs | P            | 350       | 175            | 4.5     | 830    | 1.60  |
| IRP(850nm) | TK0110IRP | AlGaAs/AlGaAs | P            | 250       | 175            | 3.6~5.0 | 850    | 1.70  |
|            | TK0114IRP | AlGaAs/AlGaAs | P            | 350       | 175            | 4.2~6.3 | 850    | 1.60  |

#### LPE TYPE

| Wp(nm)     | Part no.  | Material      | Top Polarity | Size (um) | Thickness (um) | Po(mW)  | Wp(nm) | VF(V) |
|------------|-----------|---------------|--------------|-----------|----------------|---------|--------|-------|
|            |           |               |              |           |                | Typ     | Typ.   | Max.  |
| IRP(850nm) | TK0N14IRP | AlGaAs/AlGaAs | N            | 350       | 175            | 3.8~5.2 | 850    | 1.60  |
| IRS(870nm) | TK0114IRS | AlGaAs/AlGaAs | P            | 350       | 175            | 3.6~4.8 | 865    | 1.60  |
|            | TK0N14IRS | AlGaAs/AlGaAs | N            | 350       | 175            | 3.8~5.0 | 865    | 1.55  |
| IRQ(890nm) | TK0114IRQ | AlGaAs/AlGaAs | P            | 350       | 170            | 2.8~3.8 | 890    | 1.45  |
| IRP(890nm) | TK0214IRP | AlGaAs/AlGaAs | N            | 350       | 200            | 1.5~2.1 | 890    | 1.50  |
| IRN(900nm) | TK0114IRN | AlGaAs/AlGaAs | P            | 350       | 160            | 3.6~4.6 | 900    | 1.45  |
| IRN(900nm) | TK0N14IRN | AlGaAs/AlGaAs | N            | 350       | 170            | 2.4~3.5 | 900    | 1.55  |
| IRF(910nm) | TK0N14IRF | AlGaAs/AlGaAs | N            | 350       | 170            | 2.8~3.8 | 910    | 1.60  |
| IRA(940nm) | TK0114IRA | AlGaAs/GaAs   | P            | 350       | 250            | 1.9~2.4 | 940    | 1.65  |
|            | TK0H40IRA | AlGaAs/GaAs   | P            | 1015      | 250            | 2.2~2.8 | 940    | 1.60  |
| IRG(940nm) | TK0109IRG | GaAs/GaAs     | P            | 225       | 225            | 0.8~1.4 | 940    | 1.30  |
|            | TK0A09IRG | GaAs/GaAs     | P            | 225       | 225            | 1.0~1.4 | 940    | 1.30  |





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## Infrared LED Chips

### Wafer Bond TYPE

| Wp(nm) | Part no.  | Material  | Top Polarity | Size (um) | Thickness (um) | Po(mW) | Wp(nm) | VF(V) |
|--------|-----------|-----------|--------------|-----------|----------------|--------|--------|-------|
|        |           |           |              |           |                | Min    | Typ.   | Max.  |
| 730 nm | TK0514IRD | AlGaAs/Si | N            | 350       | 170            | 26     | 735    | 2.0   |
| 750 nm | TK0514IRC | AlGaAs/Si | N            | 350       | 170            | 36     | 755    | 2.0   |
| 810 nm | TK0514IRV | AlGaAs/Si | N            | 350       | 170            | 36     | 820    | 1.9   |
| 830 nm | TK0514IRK | AlGaAs/Si | N            | 350       | 170            | 36     | 830    | 1.8   |
| 850 nm | TK0514IRP | AlGaAs/Si | N            | 350       | 170            | 40     | 850    | 1.8   |
| 880 nm | TK0514IRS | AlGaAs/Si | N            | 350       | 170            | 36     | 885    | 1.8   |
| 910 nm | TK0514IRF | AlGaAs/Si | N            | 350       | 170            | 40     | 910    | 1.8   |
| 940 nm | TK0514IRA | AlGaAs/Si | N            | 350       | 170            | 40     | 945    | 1.7   |

### VCSEL

| Wp(nm) | Part no.  | Material    | Top Polarity | Size (um) | Thickness (um) | Po(mW) | Wp(nm) | VF(V) |
|--------|-----------|-------------|--------------|-----------|----------------|--------|--------|-------|
|        |           |             |              |           |                | Min    | Typ.   | Max.  |
| 850nm  | TK0909VPN | AlGaAs/GaAs | P            | 200       | 150            | 3.0    | 850    | 2.50  |
| 940nm  | TK0909VAN | AlGaAs/GaAs | P            | 200       | 150            | 3.0    | 940    | 2.50  |
| 850nm  | TK1413VPN | AlGaAs/GaAs | P            | 350X325   | 150            | 80     | 850    | 2.80  |
| 940nm  | TK1413VAN | AlGaAs/GaAs | P            | 350X325   | 150            | 80     | 940    | 2.50  |
| 850nm  | TK2424VPN | AlGaAs/GaAs | P            | 585       | 150            | 160    | 850    | 2.80  |
| 940nm  | TK2424VAN | AlGaAs/GaAs | P            | 585       | 150            | 160    | 940    | 2.50  |
| 850nm  | TK4141VPN | AlGaAs/GaAs | P            | 1050      | 150            | 360    | 850    | 2.80  |





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Standard Type for Remote controller  
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Smoke Sensor  
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### 2.Photo-Transistor Chip

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### 3.Zener-Diode /TVS Chip

ESD Protection  
Surge Protection  
Voltage Regulation

#### Photo-Diode

| Photo Diode      | Part no.  | Structure | Top Polarity | Size     | Thickness | VF(V) | BVR(V) | Id(nA) | Cp(pF) |
|------------------|-----------|-----------|--------------|----------|-----------|-------|--------|--------|--------|
|                  |           |           |              | (um)     | (um)      | Max.  | Min.   | Max.   | Typ.   |
| PIN Photo -Diode | TK0020PDN | Vertical  | Anode        | 325*520  | 150       | 1.3   | 35     | 10     | 2      |
|                  | TK0021PDN | Vertical  | Anode        | 525      | 150       | 1.3   | 35     | 10     | 2      |
|                  | TK0025PDN | Vertical  | Anode        | 875*625  | 250       | 1.3   | 35     | 10     | 2      |
|                  | TK0026RPD | Vertical  | Anode        | 670      | 300       | 1.3   | 60     | 8      | 2      |
|                  | TK040APDN | Vertical  | Anode        | 1000     | 280       | 1.02  | 70     | 4      | 5      |
|                  | TK0043PDN | Vertical  | Anode        | 1075     | 300       | 1.3   | 35     | 10     | 5      |
|                  | TK0060PDN | Vertical  | Anode        | 1500     | 300       | 1.3   | 35     | 10     | 15     |
|                  | TK0090PDN | Vertical  | Anode        | 2250     | 300       | 1.3   | 35     | 20     | 18     |
|                  | TK0120PDN | Vertical  | Anode        | 3000     | 300       | 1.3   | 35     | 10     | 22     |
|                  | TK0P62PDN | Lateral   | A-C          | 1545     | 300       | 1.3   | 35     | 20     | 16     |
|                  | TK0P70PDN | Lateral   | A-C          | 1750     | 300       | 1.3   | 35     | 20     | 16     |
|                  | TK4017PDA | Vertical  | Anode        | 1000*430 | 250       | 1.3   | 35     | 10     | 2      |
|                  | TK4P17PDA | Lateral   | A-C          | 1000*430 | 250       | 1.3   | 35     | 10     | 2      |

#### Photo-Diode

| Photo Diode      | Part no.  | Structure | Top Polarity | Size      | Thickness | VF(V) | BVR(V) | Id(nA) | Cp(pF) |
|------------------|-----------|-----------|--------------|-----------|-----------|-------|--------|--------|--------|
|                  |           |           |              | (um)      | (um)      | Max.  | Min.   | Max.   | Typ.   |
| NIP Photo -Diode | TK0N40PDN | Vertical  | Cathode      | 1000      | 300       | 1.3   | 35     | 10     | 5      |
|                  | TK0N43PDN | Vertical  | Cathode      | 1075      | 300       | 1.3   | 35     | 10     | 5      |
|                  | TK0N51PDN | Vertical  | Cathode      | 1250      | 300       | 1.3   | 35     | 10     | 10     |
|                  | TK0N60PDN | Vertical  | Cathode      | 1500      | 300       | 1.3   | 35     | 10     | 15     |
|                  | TK0N70PDN | Vertical  | Cathode      | 1750      | 300       | 1.3   | 35     | 10     | 15     |
|                  | TK0N77PDN | Vertical  | Cathode      | 1925x1325 | 368       | 1.3   | 35     | 10     | 10     |
|                  | TK5N60PDN | Vertical  | Cathode      | 1500x1250 | 300       | 1.3   | 35     | 10     | 15     |
|                  | TKNP75PDN | Lateral   | A-C          | 1870x885  | 150       | 1.3   | 35     | 10     | 15     |
| Ambient          | TKA060PDN | Vertical  | Anode        | 1500      | 300       | 1.3   | 35     | 10     | 15     |
| Green pass       | TKG060PDN | Vertical  | Anode        | 1500      | 300       | 1.3   | 35     | 10     | 15     |
| Blue pass        | TKB060PDN | Vertical  | Anode        | 1500      | 300       | 1.3   | 35     | 10     | 15     |
| Ambient          | TKA120PDN | Vertical  | Anode        | 3000      | 300       | 1.3   | 35     | 10     | 22     |
| Green pass       | TKG120PDN | Vertical  | Anode        | 3000      | 300       | 1.3   | 35     | 10     | 22     |
| Blue pass        | TKB120PDN | Vertical  | Anode        | 3000      | 300       | 1.3   | 35     | 10     | 22     |
| R-G-B 3 in 1     | TK0123PDN | Vertical  | Anode        | 2300      | 300       | 1.3   | 35     | 10     | 22     |





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## Silicon Chips

### Photo-Transistor

| Photo Diode             | Part no.  | Structure | Size (um) | Thickness (um) | Vce(sat) (V) | BVceo (V) | BVceo (V) | Iceo (nA) | Tf (ns) | Tf (ns) |
|-------------------------|-----------|-----------|-----------|----------------|--------------|-----------|-----------|-----------|---------|---------|
|                         |           |           |           |                | Max.         | Min.      | Min.      | Max.      | Typ.    | Typ.    |
| Normal Photo-Transistor | TK0021PTN | NPN       | 500       | 150            | 0.25         | 60        | 4.5       | 30        | 35      | 35      |
|                         | TK0123PTN | NPN       | 575       | 300            | 0.3          | 40        | 5         | 40        | 40      | 40      |
|                         | TK0124PTA | NPN       | 600       | 150            | 0.2          | 60        | 3.5       | 100       | 30      | 32      |
|                         | TK0124PTN | NPN       | 600       | 300            | 0.2          | 60        | 4.5       | 100       | 50      | 50      |
|                         | TKCS16PTS | NPN       | 382       | 190            | 0.3          | 85        | 8.2       | 30        | 15      | 16      |
|                         | TKCS18PTN | NPN       | 452       | 190            | 0.3          | 85        | 8.2       | 50        | 15      | 16      |
| Rbe Photo-Transistor    | TK022BPTN | NPN       | 550       | 240            | 0.27         | 80        | 0.45      | 40        | 15      | 15      |
|                         | TK030BPTN | NPN       | 750       | 250            | 0.27         | 50        | 0.6       | 40        | 20      | 20      |
| Ambient                 | TKA124PTN | NPN       | 600       | 200            | 0.4          | 35        | 35        | 35        | 50      | 50      |

### Zener Diode

| Zener Diode             | Part no.  | Structure | Top Polarity | Size (um) | Thickness (um) | VF(V)     | IF(uA) | VZ(V)                 | IR(uA) |
|-------------------------|-----------|-----------|--------------|-----------|----------------|-----------|--------|-----------------------|--------|
|                         |           |           |              |           |                | Min.-Max. | Max.   | Min.-Max.             | Max.   |
| 1 Direction Zener Diode | TK0006ZDN | P/N       | Anode        | 165       | 110/150        | 0.7-1.2   | -      | 7-9<br>13-16          | 0.5    |
|                         | TK0009ZDN | P/N       | Anode        | 200       | 110/150        | 0.7-1.2   | -      | 7-9<br>13-16<br>20-24 | 0.5    |
| 1 Direction Zener Diode | TK0N06ZDN | N/P       | Cathode      | 165       | 110/150        | 0.7-1.2   | -      | 7-9<br>10-14<br>13-16 | 0.5    |
|                         | TK0D11ZDN | P/N       | Anode        | 250       | 110/150        | 0.7-1.2   | -      | 7-9<br>13-16<br>20-24 | 0.5    |

### Zener Diode

| Zener Diode                | Part no.   | Structure | Top Polarity | Size (um) | Thickness (um) | VF(V)                 | IF(uA) | VZ(V)                 | IR(uA) |
|----------------------------|------------|-----------|--------------|-----------|----------------|-----------------------|--------|-----------------------|--------|
|                            |            |           |              |           |                | Min.-Max.             | Max.   | Min.-Max.             | Max.   |
| 2 Direction Vertical Zener | TK0S06ZDN  | NPN       | Anode        | 165       | 110/150        | 5-7<br>6-8            | 0.5    | 8-13<br>8-13          | 0.5    |
|                            | TK0S09ZDN  | NPN       | Anode        | 200       | 110/150        | 5-7<br>6-8            | 0.5    | 8-13<br>8-13          | 0.5    |
|                            | TKAS09ZDN  | NPN       | Anode        | 200       | 110/150        | 5.5-7.8               | 0.5    | 5.5-7.8               | 0.5    |
| 2 Direction Lateral Zener  | TK0H09ZDN  | PNP       | A-C          | 200x850   | 110/150        | 7-9<br>13-16<br>20-24 | 0.5    | 7-9<br>13-16<br>20-24 | 0.5    |
|                            | TK2210FZDN | NPN       | A-C          | 540x240   | 110/150        | 7-9<br>13-16          | 0.5    | 7-9<br>13-16          | 0.5    |





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**Product & Service :  
Optical Fiber Chips**

**1. InGaAs/InP**

Monitor PD

(Aperture : 200um, 250um, 300um,  
1mm, 2mm, 3mm)

Edge Monitor PD

2.5G 1300nm PIN PD

10G 1300nm PIN PD

25G 1300nm PIN PD

**2. AlGaAs/GaAs**

5G PIN PD

10G PIN PD

25G PIN PD

40G PD ARRAY (HDMI)

100G PD ARRAY

**3. AlGaAs/GaAs 850nm VCSEL**

10G VCSEL

40G VCSEL ARRAY (HDMI)

**4. InGaAs APD**

2.5G APD

**InGaAs PD**

| Photo Diode  | Part no.  | Material   | Structure | Active Area (um) | Size(um) | Thickness (um) | VF (V) | BVR (V) | Id (nA) | Cp (pF) |
|--------------|-----------|------------|-----------|------------------|----------|----------------|--------|---------|---------|---------|
|              |           |            |           |                  |          |                | Max.   | Min.    | Max.    | Max.    |
| 1.25G PIN PD | TK0910P3F | InGaAs/InP | Vertical  | 70               | 270      | 150            | 0.8    | 20      | 1       | 0.6     |
| 2.5G PIN PD  | TK0910A3G | InGaAs/InP | Vertical  | 60               | 270      | 150            | 0.8    | 20      | 1       | 0.6     |
| 10G PIN PD   | TK0912S3A | InGaAs/InP | Lateral   | 40               | 280      | 150            | 1.3    | 20      | 1       | 0.20    |
| 10G PIN PD   | TK0912S3B | InGaAs/InP | Lateral   | 45               | 280      | 150            | 1.3    | 20      | 1       | 0.22    |
| Monitor PD   | TK0913M3A | InGaAs/InP | Vertical  | 200              | 330      | 150            | 0.8    | 20      | 1       | 4       |
|              | TK0915M3A | InGaAs/InP | Vertical  | 250              | 380      | 150            | 0.8    | 20      | 1       | 5       |
|              | TK0918M3A | InGaAs/InP | Vertical  | 300              | 460      | 150            | 0.8    | 20      | 1       | 6       |
|              | TK0952M3A | InGaAs/InP | Vertical  | 1000             | 1360     | 300            | 0.8    | 20      | 1       | 100     |
|              | TK0992M3A | InGaAs/InP | Vertical  | 2000             | 2360     | 300            | 0.8    | 15      | 15      | 300     |
|              | TK9137M3A | InGaAs/InP | Vertical  | 3000             | 3440     | 300            | 0.8    | 15      | 15      | 800     |
| Edge MPD     | TK0910G3S | InGaAs/InP | Vertical  | -                | 250      | 110            | 0.8    | 20      | 1       | 2       |

**GaAs PD**

| Photo Diode        | Part no.  | Material    | Structure | Active Area (um) | Size(um) | Thickness (um) | VF (V) | BVR (V) | Id (nA) | Cp (pF) |
|--------------------|-----------|-------------|-----------|------------------|----------|----------------|--------|---------|---------|---------|
|                    |           |             |           |                  |          |                | Max.   | Min.    | Max.    | Max.    |
| 5G GaAs PD         | TK0912S8C | AlGaAs/GaAs | Lateral   | 80               | 300      | 150            | 1.5    | 20      | 1       | 0.4     |
| 10G GaAs PD        | TK0910S8C | AlGaAs/GaAs | Lateral   | 55               | 250      | 150            | 1.5    | 20      | 1       | 0.2     |
| 40G GaAs array PD  | TK0910M8C | AlGaAs/GaAs | Lateral   | 55               | 250*1000 | 150            | 1.5    | 20      | 1       | 0.2     |
| 25G GaAs PD        | TK091228T | AlGaAs/GaAs | Lateral   | 30               | 300*250  | 150            | 1.5    | 20      | 1       | 0.13    |
| 100G GaAs array PD | TK0912283 | AlGaAs/GaAs | Lateral   | 30               | 300*1000 | 150            | 1.5    | 20      | 1       | 0.13    |





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## Optical Fiber Chips

### LED / AlGaAs / GaAs 850nm VCSEL

| Wp(nm)            | Part no.  | Material    | Structure | Emitting Area (um) | Size(um) | Thickness (um) | Po (mW) | Wp (nm) | VF (V) | BW (GHz) |
|-------------------|-----------|-------------|-----------|--------------------|----------|----------------|---------|---------|--------|----------|
|                   |           |             |           |                    |          |                | Typ.    | Typ.    | Max.   | Min.     |
| 1.3um LED         | TK0912E3A | InGaAsP/InP | Vertical  | 180                | 340      | 120            | 0.17    | 1310    | 1.4    | 0.155    |
| 850nm VCSEL       | TK0909V8S | AlGaAs/GaAs | Lateral   | 10                 | 230      | 150            | 2       | 850     | 2.2    | 10       |
| 850nm VCSEL Array | TK0909V8F | AlGaAs/GaAs | Lateral   | 10                 | 230*985  | 150            | 2       | 850     | 2.2    | 40       |

### InGaAs APD

| Photo Diode | Part no.  | Material   | Structure | Active Area (um) | Size(um) | Thickness (um) | VF (V) | BVR (V) | Id (nA) | Cp (pF) |
|-------------|-----------|------------|-----------|------------------|----------|----------------|--------|---------|---------|---------|
|             |           |            |           |                  |          |                | Max.   | Min.    | Max.    | Max.    |
| 2.5G APD    | TK1212APD | InGaAs/InP | Vertical  | 50               | 300      | 150            | 1.3    | 35      | 20      | 0.5     |



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