

TOSHIBA Photo Transistor Silicon NPN Epitaxial Planar

## TPS601A(F)

Lead Free Product  
 Photoelectric Counter  
 Position Detection  
 Various Kinds Of Readers

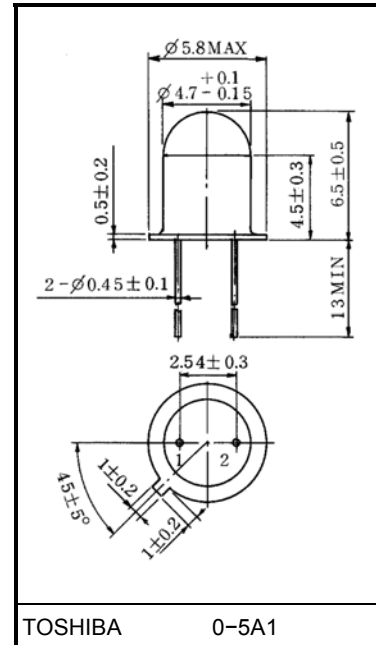
- TO-18 metal CAN package
- High sensitivity.
- Sharp directivity. Incident light can be effectively used.  
 :  $\theta_{1/2} = \pm 10^\circ$  (typ.)
- The same size TPS604(F) with the base pin is available.

### Maximum Ratings (Ta = 25°C)

| Characteristic                                   | Symbol                  | Rating  | Unit    |
|--|-------------------------|---------|---------|
| Collector-emitter voltage                        | $V_{CEO}$               | 40      | V       |
| Emitter-collector voltage                        | $V_{ECO}$               | 5       | V       |
| Collector current                                | $I_C$                   | 50      | mA      |
| Collector power dissipation                      | $P_C$                   | 150     | mW      |
| Collector power dissipation derating (Ta > 25°C) | $\Delta P_C / ^\circ C$ | -1.2    | mW / °C |
| Operating temperature range                      | $T_{opr}$               | -40~125 | °C      |
| Storage temperature range                        | $T_{stg}$               | -55~150 | °C      |

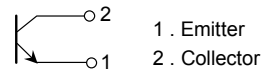
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<http://www.100y.com.tw>

Unit in mm



Weight: 0.39 g (typ.)

### Pin Connection



## Opto-Electrical Characteristics (Ta = 25°C)

| Characteristic                       |           | Symbol               | Test Condition                                 | Min           | Typ.     | Max | Unit    |      |
|--------------------------------------|-----------|----------------------|--|---------------|----------|-----|---------|------|
| Dark current                         |           | $I_D (I_{CEO})$      | $V_{CE} = 30V, E = 0$                          | —             | 0.01     | 0.2 | $\mu A$ |      |
| Light current                        |           | $I_L$                | $V_{CE} = 3V$<br>$E = 0.1mW / cm^2$<br>(Note)  | TPS601A (F)   | 100      | —   | $\mu A$ |      |
|                                      |           |                      |  | TPS601A (A,F) | 100      | —   |         | 300  |
|                                      |           |                      |  | TPS601A (B,F) | 200      | —   |         | 600  |
|                                      |           |                      |  | TPS601A (C,F) | 400      | —   |         | 1200 |
| Collector-emitter saturation voltage |           | $V_{CE (sat)}$       | $I_C = 30 \mu A, E = 0.1mW / cm^2$<br>(Note)   | —             | 0.25     | 0.4 | V       |      |
| Switching time                       | rise time | $t_r$                | $V_{CC} = 5V, I_C = 10mA$<br>$R_L = 100\Omega$ | —             | 2        | —   | $\mu s$ |      |
|                                      | fall time | $t_f$                |  | —             | 2        | —   |         |      |
| Peak sensitivity wavelength          |           | $\lambda_P$          |  | —             | 800      | —   | nm      |      |
| Half value angle                     |           | $\theta \frac{1}{2}$ |  | —             | $\pm 10$ | —   | °       |      |

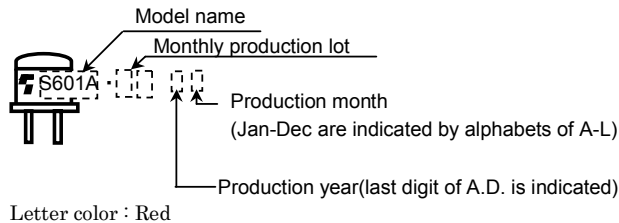
Note: Color temperature = 2870K, standard tungsten lamp.

## Precaution

Please be careful of the followings.

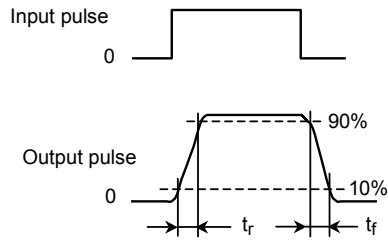
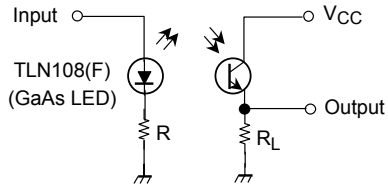
- Soldering temperature: 260°C max.  
Soldering time: 5s max.  
(Soldering portion of lead: Above 1.5mm from the body of the device.)
- If the lead is formed, the lead should be formed at a distance of 2mm from the body of the device.  
Soldering shall be performed after lead forming.

## Product Indication

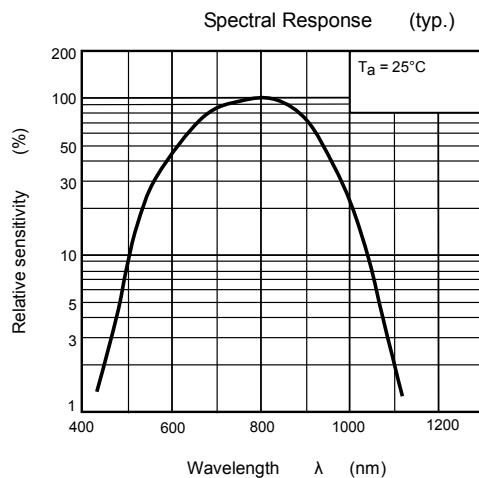
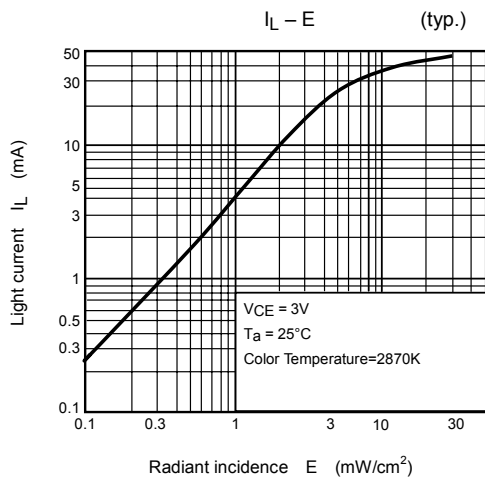
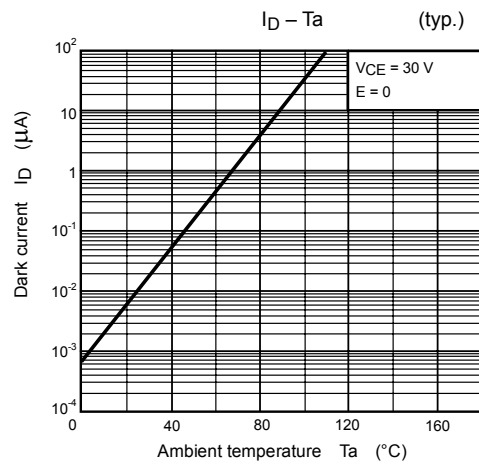
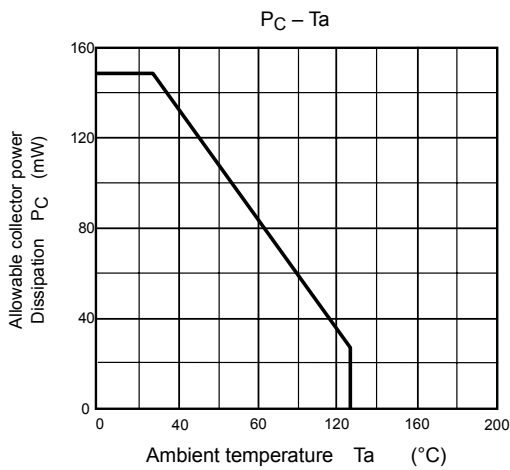


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Fig.1 Switching time test circuit

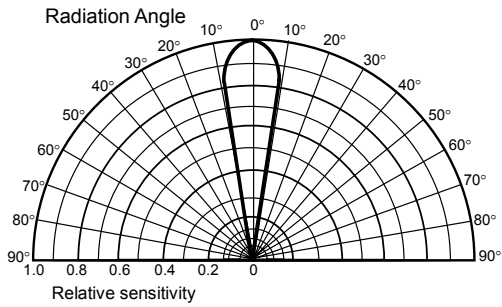


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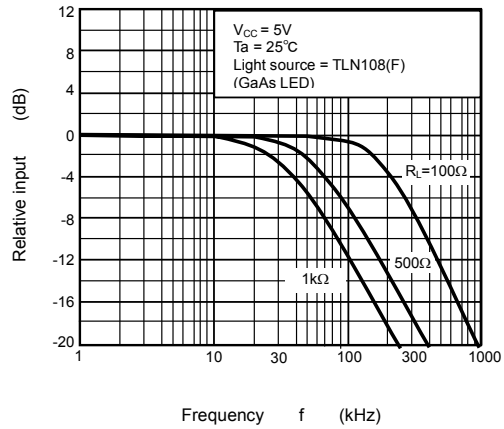


Directional Sensitivity Characteristic (typ.)

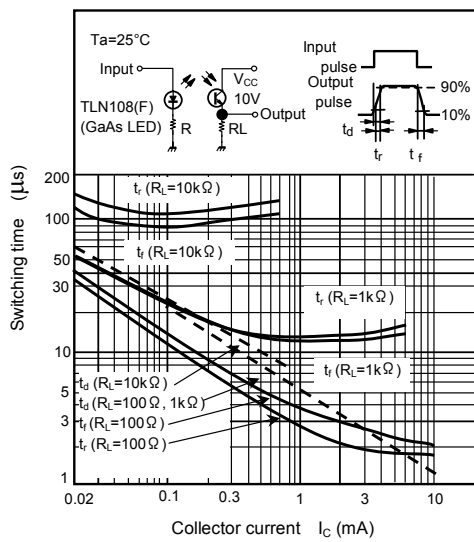
(Ta = 25°C)

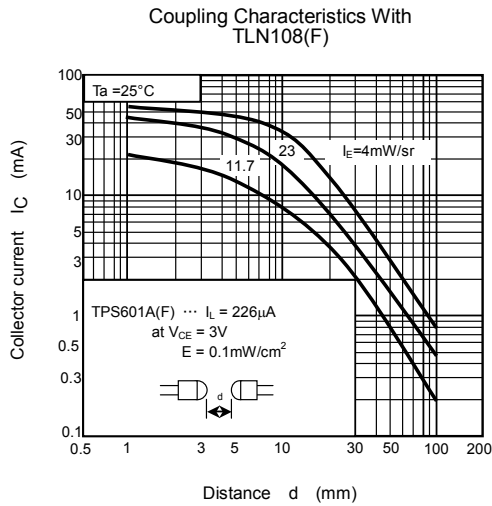
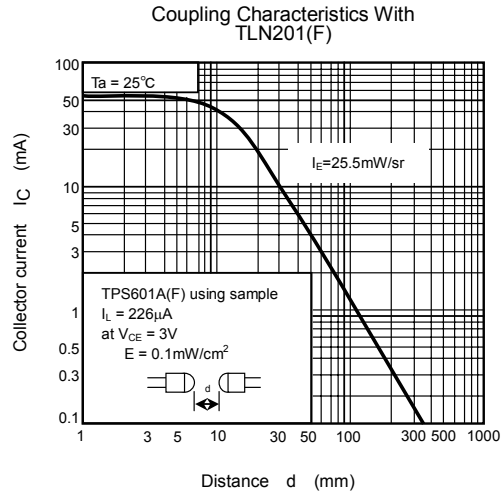
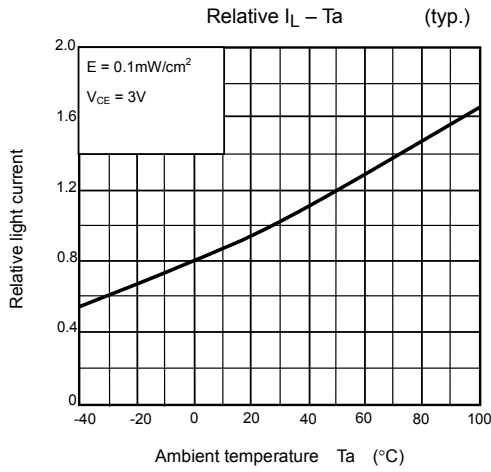


Frequency Characteristics (typ.)



Switching Characteristics (typ.)





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