

TLP560J

Triac Driver
 Programmable Controllers
 AC-Output Module
 Solid State Relay

The TOSHIBA TLP560J consists of a photo-triac optically coupled to an infrared emitting diode in a six lead plastic DIP package.

- Peak off-state voltage: 600 V (min)
- On-state current: 100 mA (max)
- Isolation voltage: 2500 V_{rms} (min)
- UL-recognized: UL 1577, File No.E67349
- cUL-recognized: CSA Component Acceptance Service No.5A
 File No.E67349
- VDE-approved: EN 60747-5-5 (Note 1)

Note 1: When a VDE approved type is needed,
 please designate the **Option(D4)**.

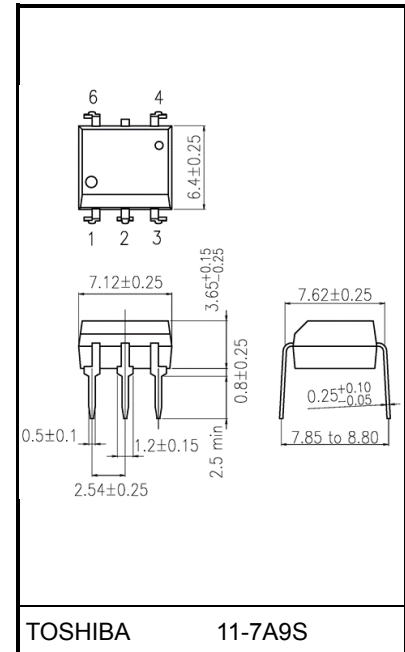
| Classification (Note 2) | Trigger LED Current (mA) | | Marking of Classification |
|----------------------------|--|-----|------------------------------|
| | V _T =6V, T _a =25°C | | |
| | Min | Max | |
| (IFT7) | — | 7 | T7 |
| Standard | — | 10 | T7, blank |

Note 2: Ex. (IFT7); TLP560J(IFT7)

Note: Application type name for certification test, please
 use standard product type name, i.e.
 TLP560J(IFT7): TLP560J

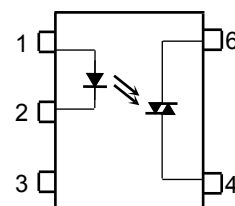
Note: According to VDE0110, table 4.

Unit: mm



Weight: 0.39 g (typ.)

Pin Configuration (top view)



- 1: Anode
- 2: Cathode
- 3: N.C.
- 4: Triac Terminal
- 6: Triac Terminal

Start of commercial production
 1986-05

Absolute Maximum Ratings (Ta = 25°C)

| Characteristic | | Symbol | Rating | Unit |
|---|---|-------------------------------|-----------|---------|
| LED | Forward current | I_F | 50 | mA |
| | Forward current derating (Ta ≥ 53°C) | $\Delta I_F / ^\circ\text{C}$ | -0.7 | mA / °C |
| | Peak forward current (100µs pulse, 100pps) | I_{FP} | 1 | A |
| | Reverse voltage | V_R | 5 | V |
| | Diode power dissipation | P_D | 100 | mW |
| | Diode power dissipation derating (Ta ≥ 53°C) | $\Delta P_D / ^\circ\text{C}$ | -1.4 | mW/°C |
| | Junction temperature | T_j | 125 | °C |
| Detector | Off-state output terminal voltage | V_{DRM} | 600 | V |
| | On-state RMS current | Ta=25°C | 100 | mA |
| | | Ta=70°C | 50 | |
| | On-state current derating (Ta ≥ 25°C) | $\Delta I_T / ^\circ\text{C}$ | -1.1 | mA / °C |
| | Peak on-state current (100µs pulse, 120pps) | I_{TP} | 2 | A |
| | Peak non-repetitive surge current (Pw=10ms) | I_{TSM} | 1.2 | A |
| | Output power dissipation | P_O | 300 | mW |
| | Output power dissipation derating (Ta ≥ 25°C) | $\Delta P_O / ^\circ\text{C}$ | -3.0 | mW / °C |
| | Junction temperature | T_j | 115 | °C |
| Storage temperature range | T_{stg} | -55 to 125 | °C | |
| Operating temperature range | T_{opr} | -40 to 100 | °C | |
| Lead soldering temperature (10 s) | T_{sol} | 260 | °C | |
| Isolation voltage (AC, 60 s, R.H. ≤ 60 %) | BVS | 2500 | V_{rms} | |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Recommended Operating Conditions

| Characteristic | Symbol | Min | Typ. | Max | Unit |
|-----------------------|-----------|-----|------|-----|----------|
| Supply voltage | V_{AC} | — | — | 240 | V_{ac} |
| Forward current | I_F | 15 | 20 | 25 | mA |
| Peak on-state current | I_{TP} | — | — | 1 | A |
| Operating temperature | T_{opr} | -25 | — | 85 | °C |

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

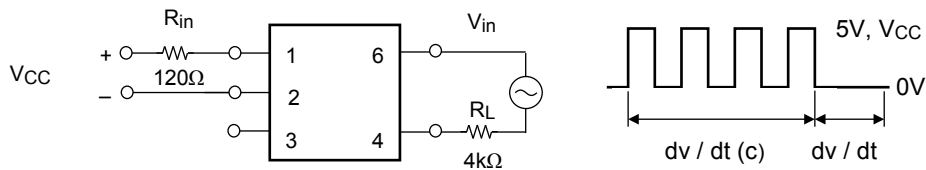
Electrical Characteristics (Ta = 25°C)

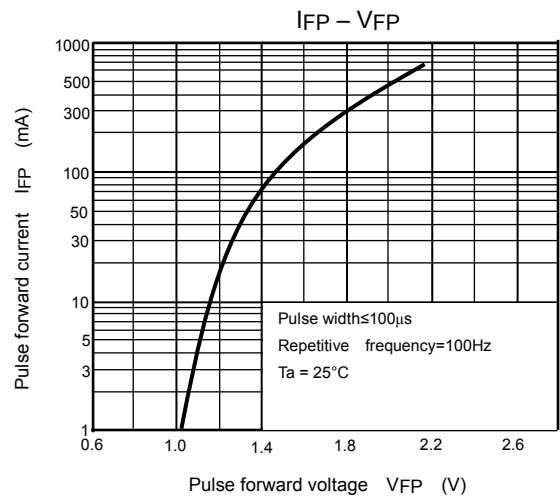
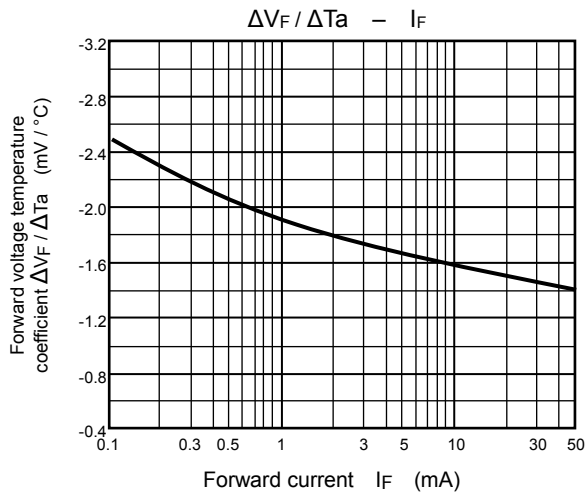
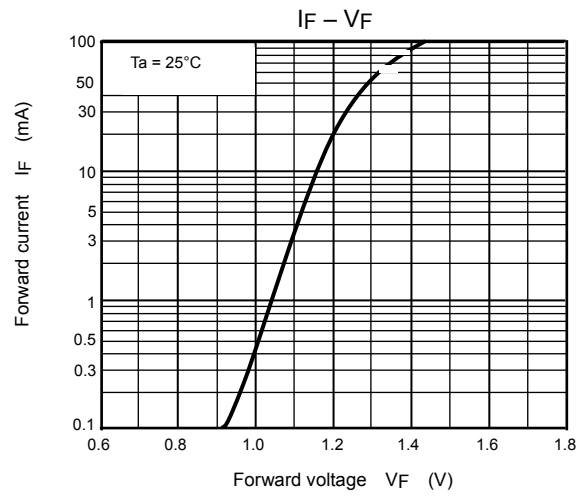
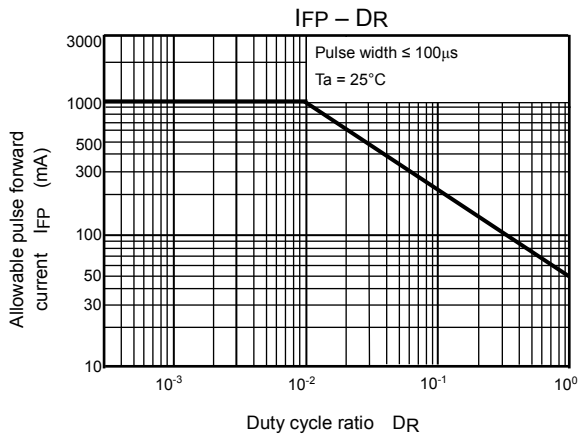
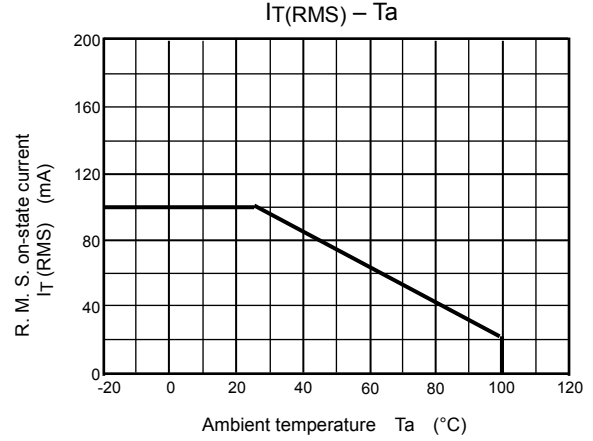
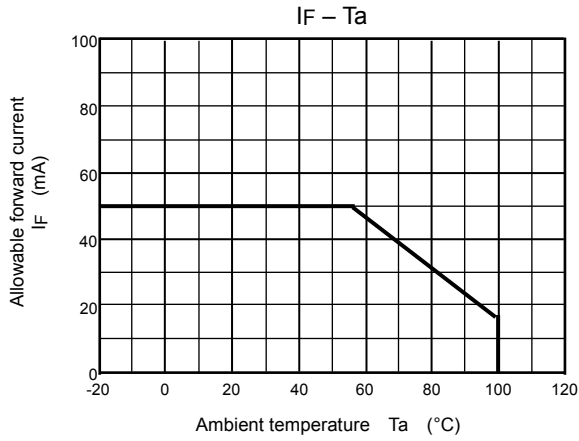
| Characteristic | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|----------------|--|------------|---|-----|------|------|------------------------|
| LED | Forward voltage | V_F | $I_F=10\text{ mA}$ | 1.0 | 1.15 | 1.3 | V |
| | Reverse current | I_R | $V_R=5\text{ V}$ | — | — | 10 | μA |
| | Capacitance | C_T | $V_F=0\text{ V}, f=1\text{ MHz}$ | — | 30 | — | pF |
| Detector | Peak off-state current | I_{DRM} | $V_{DRM}=600\text{ V}$ | — | 10 | 1000 | nA |
| | Peak on-state voltage | V_{TM} | $I_{TM}=100\text{ mA}$ | — | 1.7 | 3.0 | V |
| | Holding current | I_H | — | — | 1.0 | — | mA |
| | Critical rate of rise of off-state voltage | dv/dt | $V_{in}=240\text{ V}_{rms}, T_a=85\text{ }^\circ\text{C}$ (fig.1) | — | 500 | — | $\text{V}/\mu\text{s}$ |
| | Critical rate of rise of commutating voltage | $dv/dt(c)$ | $V_{in}=60\text{ V}_{rms}, I_T=15\text{ mA}$ (fig.1) | — | 0.2 | — | $\text{V}/\mu\text{s}$ |

Coupled Electrical Characteristics (Ta = 25°C)

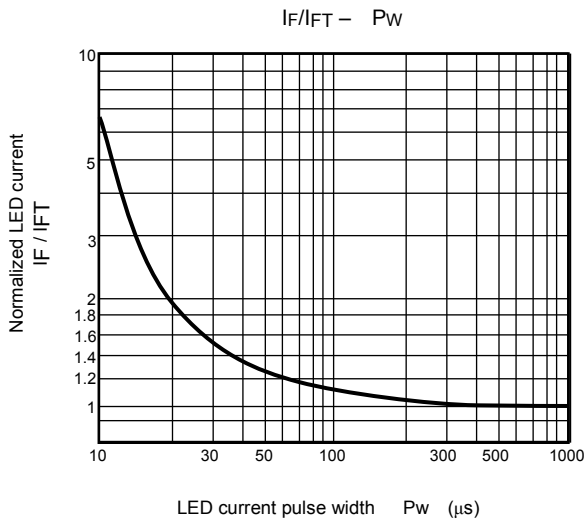
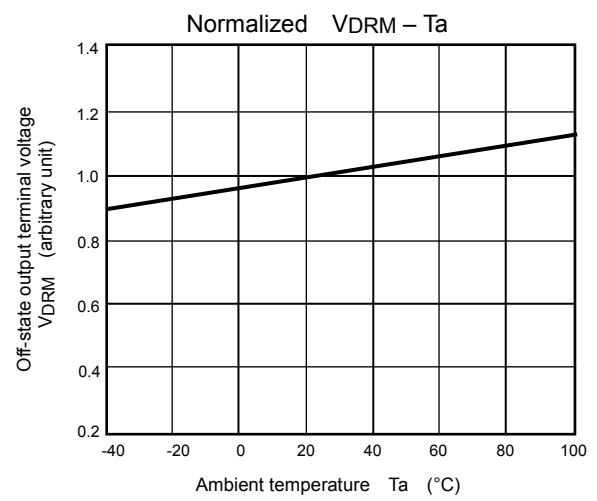
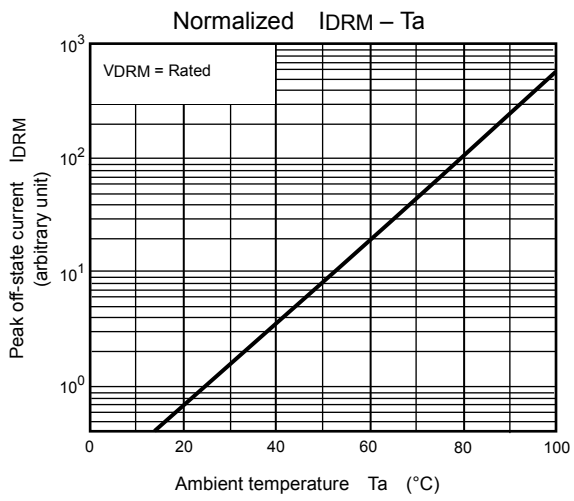
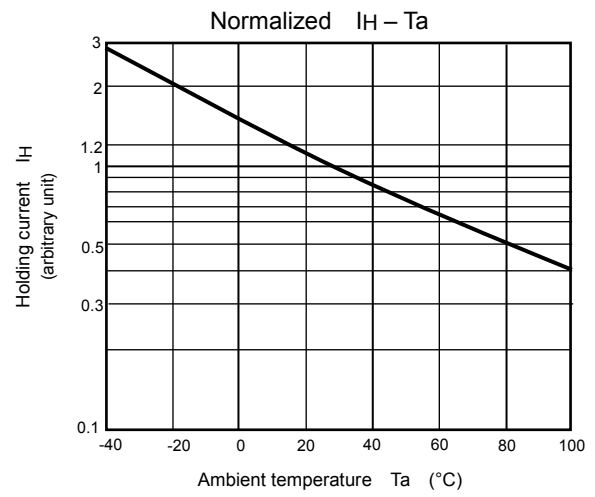
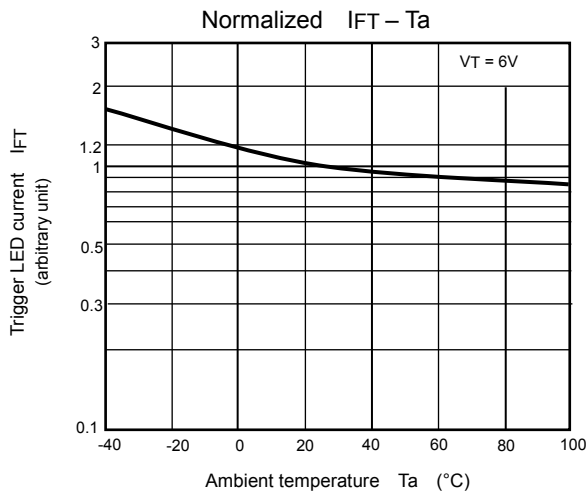
| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------------------|----------|---|--------------------|-----------|-----|------------------|
| Trigger LED current | I_{FT} | $V_T=6\text{ V}, R_L=100\ \Omega$ | — | 5 | 10 | mA |
| Capacitance (input to output) | C_S | $V_S=0\text{ V}, f=1\text{ MHz}$ | — | 0.8 | — | pF |
| Isolation resistance | R_S | $V_S=500\text{ V}, \text{R.H.} \leq 60\%$ | 5×10^{10} | 10^{14} | — | Ω |
| Isolation voltage | BV_S | AC, 60 s | 2500 | — | — | V_{rms} |

Fig. 1: dv/dt test circuit





NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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