

# PHOTO TRIAC COUPLER

**MT30200, MT30210,  
MT30220, MT30230**

T-4(-87

## APPLICATIONS

- OFFICE MACHINERY
- HOUSEHOLD APPLIANCES
- TRIAC DRIVER
- SOLID STATE RELAY
- TELECOMMUNICATIONS
- FACSIMILE
- LAMP & RELAY DRIVE CIRCUIT

The MARKTECH TRIAC SERIES consists of a photo-triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

## FEATURES

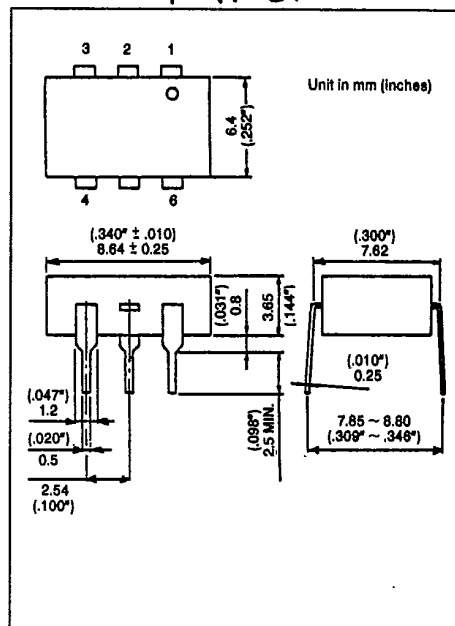
- Peak Off-State Voltage : 400V Min.
- Trigger LED Current : 30mA Max. (MT30200)  
15mA Max. (MT30210)  
10mA Max. (MT30220)  
5mA Max. (MT30230)
- On-State Current : 100mA Max.
- Isolation Voltage : 5000V<sub>rms</sub> Min.
- Climatic Test Class : 55/150/21
- Isolation Creepage Path : 8.0mm Min.
- Isolation Clearance : 7.3mm Min.
- Isolation Operating Voltage : 500V<sub>ac</sub> or 600V<sub>dc</sub> for Isolation Group C. \*1
- Creeping Current Resistance : Group I \*2

\*1 : According to VDE0110, table 4

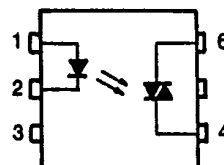
\*2 : According to VDE0110, table 3

THE MT30220 CONTAINS ALL MECHANICAL & OPTO ELECTRICAL PARAMETERS AS THE MTPC5600G, WITH A HIGHER ISOLATION.

THE MT30230 CONTAINS ALL MECHANICAL & OPTO ELECTRICAL PARAMETERS AS THE MTPC6600G, WITH A HIGHER ISOLATION AND A LOWER TRIGGER CURRENT ( $I_{FT}$ ).



## PIN CONFIGURATIONS (TOP VIEW)



- 1: ANODE
- 2: CATHODE
- 3: NC
- 4: TERMINAL 1
- 5: TERMINAL 2

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## MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC                                       |                                                                 | SYMBOL               | RATING    | UNIT             |
|------------------------------------------------------|-----------------------------------------------------------------|----------------------|-----------|------------------|
| LED                                                  | Forward Current                                                 | I <sub>F</sub>       | 50        | mA               |
|                                                      | Forward Current Derating (Ta ≥ 53°C)                            | ΔI <sub>F</sub> /°C  | -0.7      | mA/°C            |
|                                                      | Peak Forward Current (100μs pulse, 100pps)                      | I <sub>FP</sub>      | 1         | A                |
|                                                      | Power Dissipation                                               | P <sub>D</sub>       | 100       | mW               |
|                                                      | Power Dissipation Derating (Ta ≥ 25°C)                          | ΔP <sub>D</sub> /°C  | -1.0      | mW/°C            |
|                                                      | Reverse Voltage                                                 | V <sub>R</sub>       | 5         | V                |
|                                                      | Junction Temperature                                            | T <sub>J</sub>       | 125       | °C               |
| DETECTOR                                             | Off-State Output Terminal Voltage                               | V <sub>DRM</sub>     | 400       | V                |
|                                                      | On-State RMS Current                                            | I <sub>T</sub> (RMS) | 100       | mA               |
|                                                      |                                                                 |                      | 50        |                  |
|                                                      | On-State Current Derating (Ta ≥ 25°C)                           | ΔI <sub>T</sub> /°C  | -1.1      | mA/°C            |
|                                                      | Peak On-State Current (100μs pulse, 120pps)                     | I <sub>TP</sub>      | 2         | A                |
|                                                      | Peak Nonrepetitive Surge Current (P <sub>w</sub> =10ms, DC=10%) | I <sub>TSM</sub>     | 1.2       | A                |
|                                                      | Total Power Dissipation                                         | P <sub>D</sub>       | 300       | mW               |
|                                                      | Total Power Dissipation Derating (Ta ≥ 25°C)                    | ΔP <sub>D</sub> /°C  | -4.0      | mW/°C            |
|                                                      | Junction Temperature                                            | T <sub>J</sub>       | 100       | °C               |
|                                                      | Storage Temperature Range                                       | T <sub>stg</sub>     | -55 ~ 150 | °C               |
| Operating Temperature Range                          |                                                                 | T <sub>opr</sub>     | -40 ~ 100 | °C               |
| Lead Soldering Temperature (10 sec.)                 |                                                                 | T <sub>sold</sub>    | 260       | °C               |
| Total Package Power Dissipation                      |                                                                 | P <sub>T</sub>       | 330       | mW               |
| Total Package Power Dissipation Derating (Ta ≥ 25°C) |                                                                 | ΔP <sub>T</sub> /°C  | -4.4      | mW/°C            |
| Isolation Voltage (AC, 1 min., RH ≤ 60%)             |                                                                 | BV <sub>S</sub>      | 5000      | V <sub>rms</sub> |

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## INDIVIDUAL 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   | $\mu\text{A}$          |
|                | Capacitance                                  | $C_T$         | $V=0, f=1\text{MHz}$                               | —    | 10   | —    | pF                     |
| DETECTOR       | Peak Off-State Current                       | $I_{DRM}$     | $V_{DRM}=400\text{V}$                              | —    | 10   | 100  | nA                     |
|                | Peak On-State Voltage                        | $V_{TM}$      | $I_{TM}=100\text{mA}$                              | —    | 1.7  | 3.0  | V                      |
|                | Holding Current                              | $I_H$         | —                                                  | —    | 0.2  | —    | mA                     |
|                | Critical Rate of Rise of Off-State Voltage   | $dv/dt$       | $V_{in}=120V_{rms}, T_a=85^\circ\text{C}$ (Fig. 1) | 200  | 500  | —    | $\text{V}/\mu\text{s}$ |
|                | Critical Rate of Rise of Commutating Voltage | $dv/dt_{(c)}$ | $I_T=15\text{mA}, V_{in}=30V_{rms}$ (Fig. 1)       | —    | 0.2  | —    | $\text{V}/\mu\text{s}$ |

## COUPLED ELECTRICAL CHARACTERISTICS (Ta=25°C)

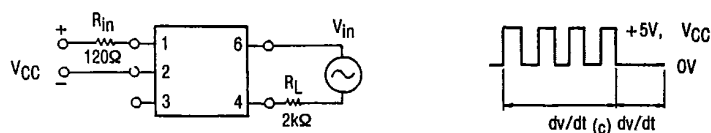
| CHARACTERISTIC              |         | SYMBOL   | TEST CONDITION         | MIN.               | TYP.      | MAX. | UNIT      |
|-----------------------------|---------|----------|------------------------|--------------------|-----------|------|-----------|
| Trigger LED Current         | MT30200 | $I_{FT}$ | $V_T=3\text{V}$        | —                  | —         | 30   | mA        |
|                             | MT30210 |          |                        | —                  | —         | 15   |           |
|                             | MT30220 |          |                        | —                  | 5         | 10   |           |
|                             | MT30230 |          |                        | —                  | —         | 5    |           |
| Capacitance Input to Output |         | $C_S$    | $V_S=0, f=1\text{MHz}$ | —                  | 0.8       | —    | pF        |
| Isolation Resistance        |         | $R_S$    | $V_S=500\text{V}$      | $5 \times 10^{10}$ | $10^{14}$ | —    | $\Omega$  |
| Isolation Voltage           |         | $BV_S$   | AC, 1 minute           | 5000               | —         | —    | $V_{rms}$ |
|                             |         |          | AC, 1 second           | —                  | 10000     | —    |           |
|                             |         |          | DC, 1 minute           | —                  | 10000     | —    | $V_{dc}$  |

## RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTIC        | SYMBOL    | MIN. | TYP. | MAX. | UNIT             |
|-----------------------|-----------|------|------|------|------------------|
| Supply Voltage        | $V_{AC}$  | —    | —    | 120  | $V_{ac}$         |
| Forward Current       | $I_F^*$   | 15   | 20   | 25   | mA               |
| Peak On-State Current | $I_{TP}$  | —    | —    | 1    | A                |
| Operating Temperature | $T_{opr}$ | -25  | —    | 85   | $^\circ\text{C}$ |

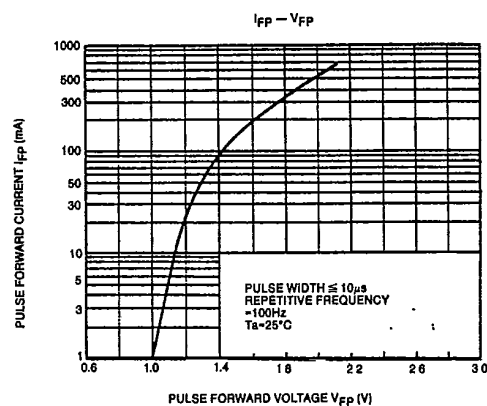
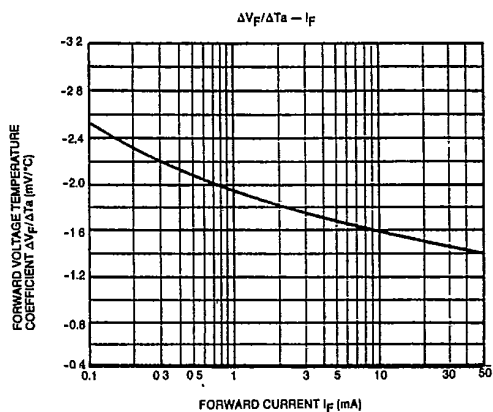
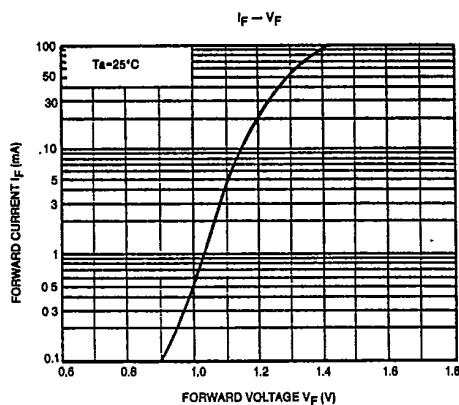
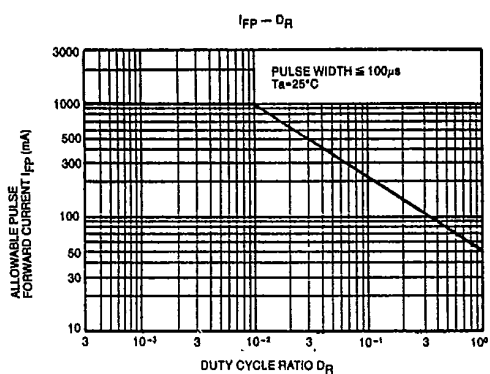
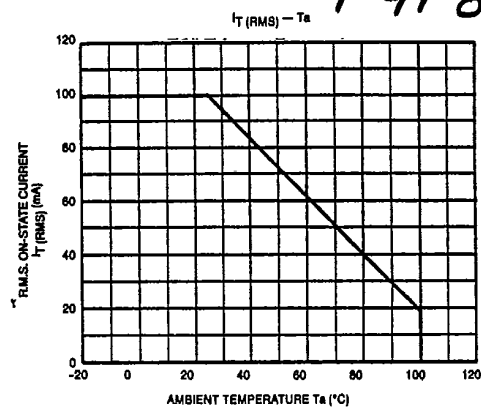
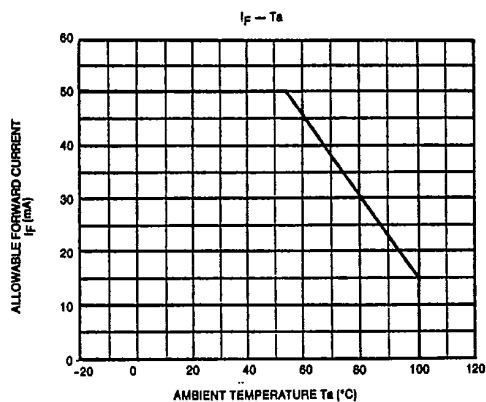
\*In the case of MT30220

Fig. 1 dv/dt TEST CIRCUIT



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