

# PHOTO TRIAC COUPLER

## MT30310, MT30320, MT30330

### APPLICATIONS

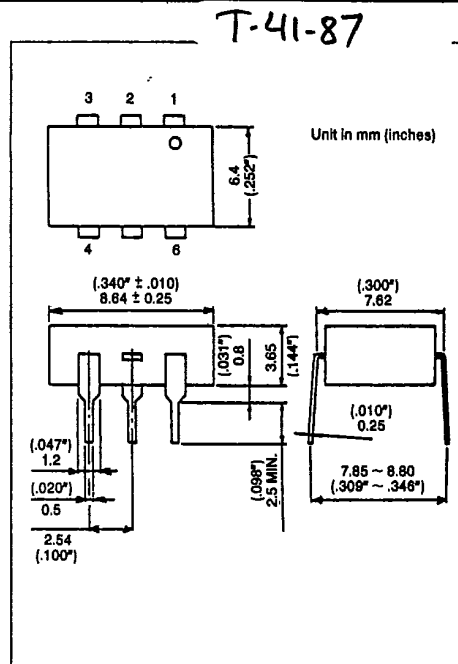
- OFFICE MACHINERY
- HOUSEHOLD APPLIANCES
- TRIAC DRIVER
- SOLID STATE RELAY
- TELECOMMUNICATIONS
- FACSIMILE
- LAMP & RELAY DRIVE CIRCUIT

The MARKTECH MT30310, MT30320 and MT30330 consist of a zero voltage crossing turn on photo-triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

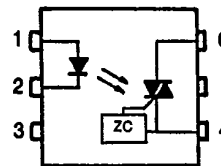
### FEATURES

- Peak Off-State Voltage : 250V Min.
- Trigger LED Current : 15mA Max. (MT30310)  
10mA Max. (MT30320)  
5mA Max. (MT30330)
- On-State Current : 100mA Max.
- Isolation Voltage : 5000V<sub>rms</sub> Min.
- Guaranteed Requirements of IEC380/VDE0806.
- 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



### PIN CONFIGURATIONS (TOP VIEW)



- 1: ANODE
- 2: CATHODE
- 3: NC
- 4: TERMINAL 1
- 6: 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>	250	V
	On-State RMS Current	Ta=25°C	100	mA
		Ta=70°C	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
	Power Dissipation	P <sub>D</sub>	300	mW
	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	$V_F$	$I_F=10mA$	1.0	1.15	1.3	V
	Reverse Current	$I_R$	$V_R=5V$	—	—	10	$\mu A$
	Capacitance	$C_T$	$V=0, f=1MHz$	—	10	—	pF
DETECTOR	Peak Off-State Current	$I_{DRM}$	$V_{DRM}=250V$	—	10	100	nA
	Peak On-State Voltage	$V_{TM}$	$I_{TM}=100mA$	—	1.7	3.0	V
	Holding Current	$I_H$	—	—	0.2	—	mA
	Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{in}=120V_{rms}, Ta=85^\circ C$ (Fig. 1)	200	500	—	V/ $\mu s$
	Critical Rate of Rise of Commutating Voltage	$dv/dt(c)$	$V_{in}=30V_{rms}, I_T=15mA$ (Fig. 1)	—	0.2	—	V/ $\mu s$

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

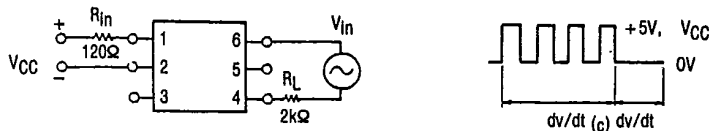
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	MT30310	$I_{FT}$	$V_T=3V$	—	—	15	mA
	MT30320			—	5	10	
	MT30330			—	—	5	
Inhibit Voltage	$V_{IH}$	$I_F=Rated I_{FT}$	—	—	40	V	
Leakage in Inhibited State	$I_{IH}$	$I_F=Rated I_{FT}, V_T=Rated V_{DRM}$	—	100	300	$\mu A$	
Capacitance Input to Output	$C_S$	$V_S=0, f=1MHz$	—	0.8	—	pF	
Isolation Resistance	$R_S$	$V_S=500V$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$	
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	$^\circ C$

\*In the case of MT30320

Fig. 1 dv/dt TEST CIRCUIT



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