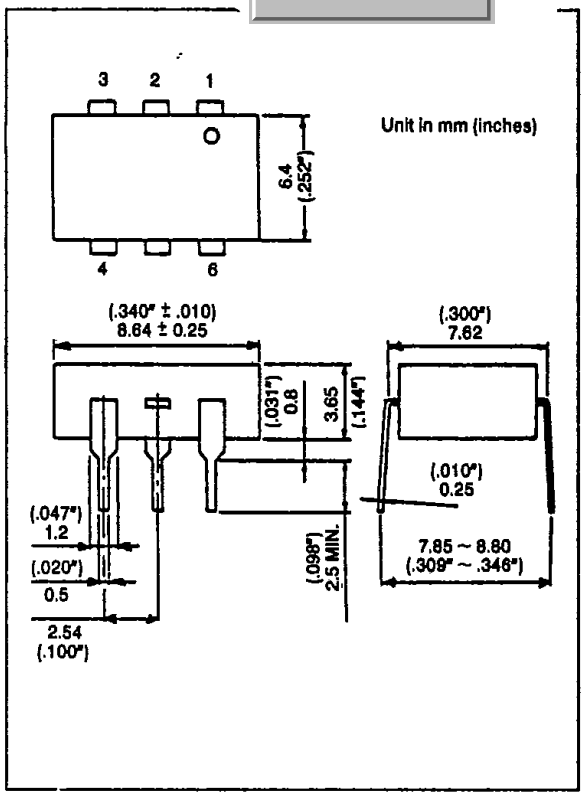
PHOTO TRIAC COUPLER

MT30310, MT30320, MT30330



APPLICATIONS

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

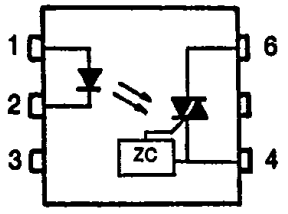
The MARKTECH MT30310, MT30320 and MT30330 consist of a zero voltage crossing turn on photo-triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

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_{rms} 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_{ac} or 600V_{dc} 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_F	50	mA
	Forward Current Derating (Ta ≧ 53°C)		ΔI_F/°C	-0.7	mA/°C
	Peak Forward Current (100μs pulse, 100pps)		I_{FP}	1	A
	Power Dissipation		P_D	100	mW
	Power Dissipation Derating (Ta ≧ 25°C)		ΔP_D/°C	-1.0	mW/°C
	Reverse Voltage		V_R	5	V
	Junction Temperature		Tj	125	°C
DETECTOR	Off-State Output Terminal Voltage		V_{DRM}	250	V
	On-State RMS Current	Ta=25°C	I_T(RMS)	100	mA
		Ta=70°C		50	
	On-State Current Derating (Ta ≧ 25°C)		ΔI_T/°C	-1.1	mA/°C
	Peak On-State Current (100μs pulse, 120pps)		I_{TP}	2	A
	Peak Nonrepetitive Surge Current (P_W=10ms, DC=10%)		I_{TSM}	1.2	A
	Power Dissipation		P_D	300	mW
	Power Dissipation Derating (Ta ≧ 25°C)		ΔP_D/°C	-4.0	mW/°C
	Junction Temperature		Tj	100	°C
Storage Temperature Range			T_{stg}	-55 ~ 150	°C
Operating Temperature Range			T_{opr}	-40 ~ 100	°C
Lead Soldering Temperature (10 sec.)			T_{sold}	260	°C
Total Package Power Dissipation			P_T	330	mW
Total Package Power Dissipation Derating (Ta ≧ 25°C)			ΔP_T/°C	-4.4	mW/°C
Isolation Voltage (AC, 1 min., RH ≦ 60%)			BV_S	5000	V_{rms}

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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	μA
	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°C (Fig. 1)	200	500	—	V/μs
	Critical Rate of Rise of Commutating Voltage	$dv/dt_{(c)}$	V_{in}=30V_{rms}, I_T=15mA (Fig. 1)	—	0.2	—	V/μs

COUPLED ELECTRICAL CHARACTERISTICS (Ta=25°C)

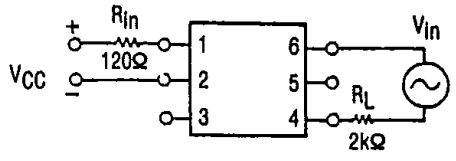
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	MT30310	I_{FT}	V_T=3V	—	—	15	mA
	MT30320			—	5	10	
	MT30330			—	—	5	
Inhibit Voltage		V_{IH}	I_F=Rated I_{FT}	—	—	40	V
Leakage in Inhibited State		I_{IH}	IF=Rated I_{FT}, V_T=Rated V_{DRM}	—	100	300	μA
Capacitance Input to Output		C_S	V_S=0, f=1MHz	—	0.8	—	pF
Isolation Resistance		R_S	V_S=500V	$5x10^{10}$	10^{14}	—	Ω
Isolation Voltage		BV_S	AC, 1 minute	5000	—	—	V_{rms}
			AC, 1 second	—	10000	—	
			DC, 1 minute	—	10000	—	V_{dc}

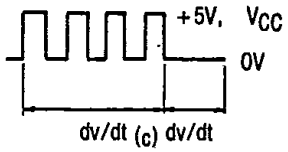
RECOMMENDED OPERATING CONDITIONS

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	°C

*In the case of MT30320

Fig. 1 dv/dt TEST CIRCUIT





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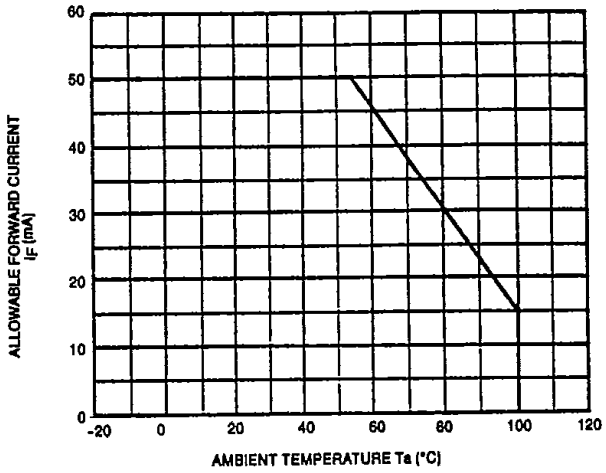
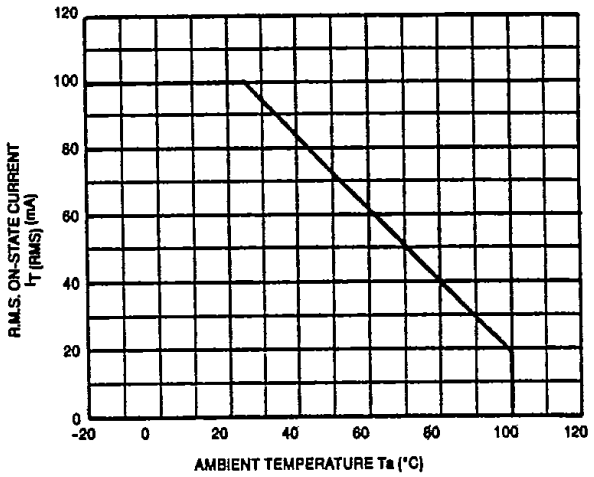
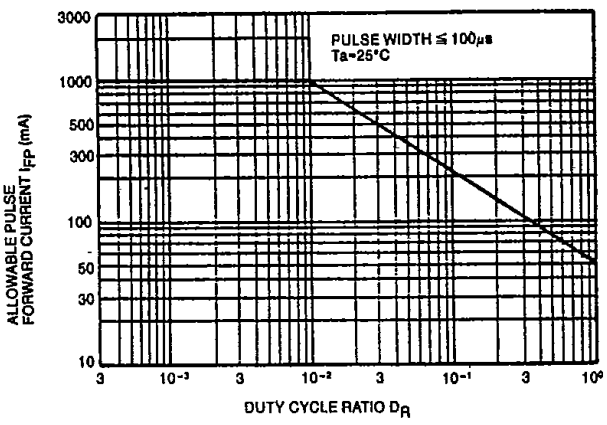
I_F — Ta



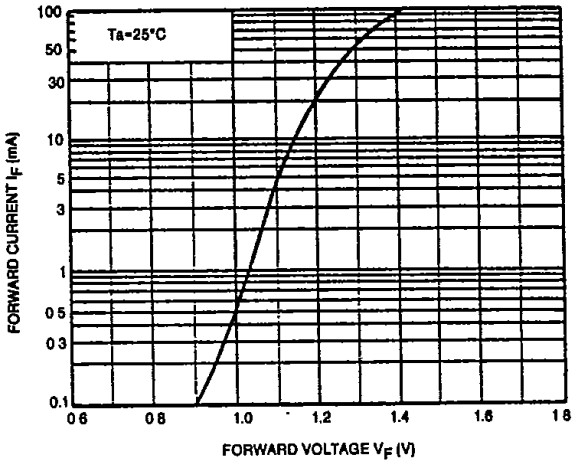
$I_{T\ (RMS)}$ — Ta



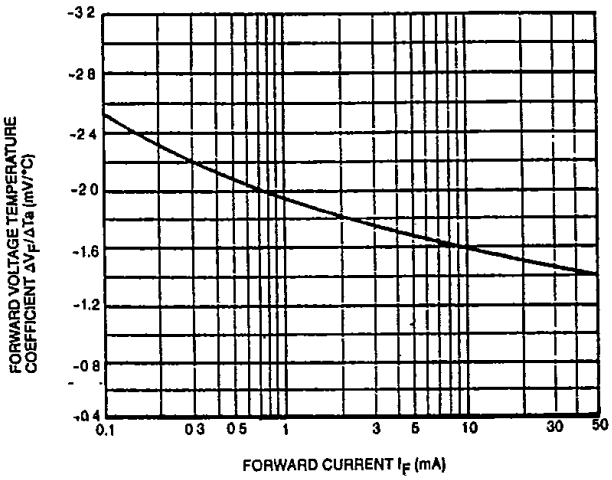
I_{FP} — D_R



I_F — V_F



$\Delta V_F/\Delta Ta$ — I_F



I_{FP} — V_{FP}