



CTM3010, CTM3011, CTM3012 CTM3020, CTM3021, CTM3022, CTM3023 250V/400V Random Phase MFP-4L Phototriac Optocoupler

Features

- High isolation 3750 VRMS
- Peak Breakdown Voltage
 - 250V – CTM3010,3011,3012
 - 400V – CTM3020,3021,3022,3023
- Temperature range - 55 °C to 100 °C
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950
- Green package

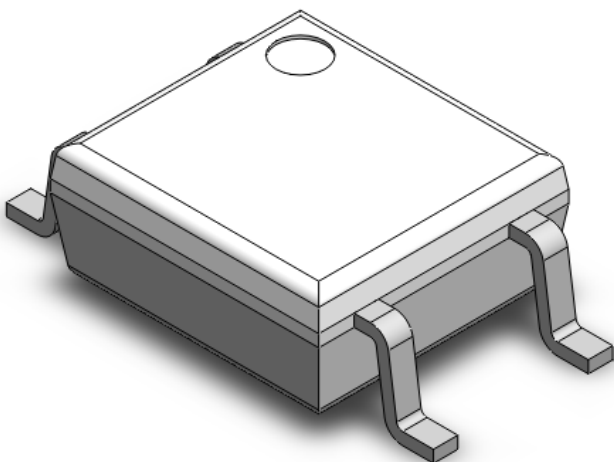
Description

The CTM3010, CTM3011, CTM3012, CTM3020, CTM3021, CTM3022 and CTM3023 consists of a Random Phase Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a 4 pin mini-flat package.

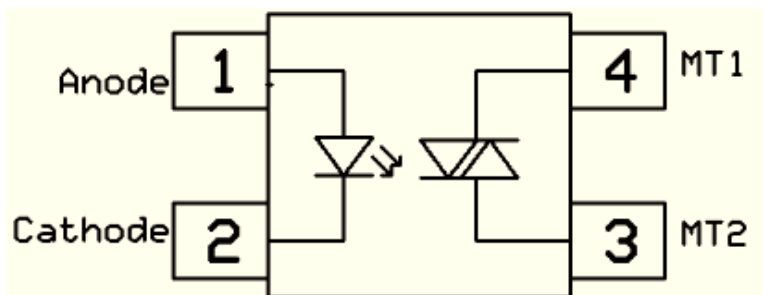
Applications

- Motor Controls
- Lamp ballasts
- Static AC Power Switch
- Solenoid/ Valve Control
-

Package Outline



Schematic



Note: Different lead forming options available. See package dimension.



CTM3010, CTM3011, CTM3012
CTM3020, CTM3021, CTM3022, CTM3023
250V/400V Random Phase MFP-4L Phototriac Optocoupler

Absolute Maximum Rating at 25°C

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	3750	V _{RMS}	
T _{OPR}	Operating temperature	-55 ~ +100	°C	
T _{STG}	Storage temperature	-55 ~ +150	°C	
T _{SOL}	Soldering temperature	260	°C	
Emitter				
I _F	Forward current	60	mA	
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	1	A	
V _R	Reverse voltage	6	V	
P _D	Power dissipation	100	mW	
Detector				
P _D	Power dissipation	300	mW	
V _{DRM}	Off-State Output Terminal Voltage	CTM3010,3011,3012	250	V
		CTM3020,3021,3022,3023	400	V
I _{TSM}	Peak Repetitive Surge Current	1	A	



CTM3010, CTM3011, CTM3012 CTM3020, CTM3021, CTM3022, CTM3023 250V/400V Random Phase MFP-4L Phototriac Optocoupler

Electrical Characteristics $T_A = 25^\circ\text{C}$ (unless otherwise specified)

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	$I_F = 10\text{mA}$	-	-	1.5	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	45	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{DRM}	Peak Blocking Current	$I_F = 0\text{mA}$, $V_{DRM} = \text{Rated } V_{DRM}$	-	-	100	nA	
V_{TM}	Peak On-State Voltage	$I_F = \text{Rated } I_{FT}$, $I_{TM} = 100\text{mA}$	-	-	2.5	V	
dv/dt	Critical Rate of Rise off-State Voltage	$V_{PEAK} = \text{Rated } V_{DRM}$	-	100	-	$\text{V}/\mu\text{s}$	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes	
I_{FT}	Input Trigger Current	CTM3020	Terminal Voltage = 3V $I_{TM} = 100\text{mA}$	-	-	30	mA	
		CTM3010, CTM3021		-	-	15		
		CTM3011, CTM3022		-	-	10		
		CTM3012, CTM3023		-	-	5		
I_H	Holding Current		-	250	-	μA		
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	1×10^{11}	-	-			
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	-	pF		



CTM3010, CTM3011, CTM3012 CTM3020, CTM3021, CTM3022, CTM3023 250V/400V Random Phase MFP-4L Phototriac Optocoupler

Typical Characteristic Curve

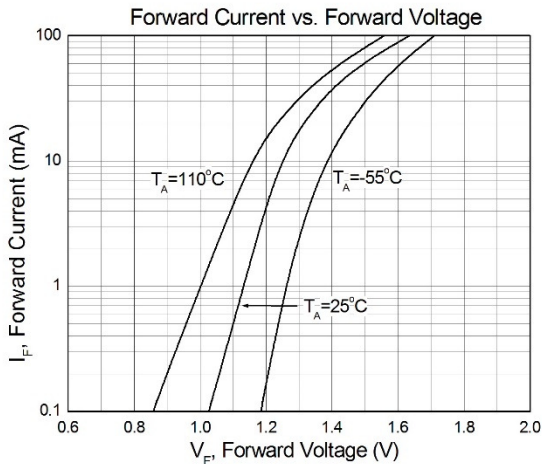


Figure 1

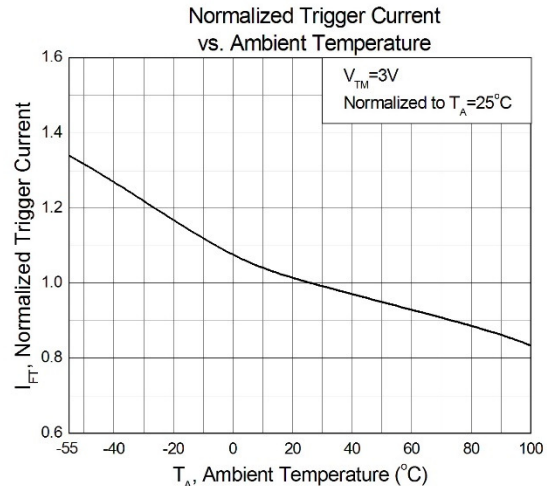


Figure 2

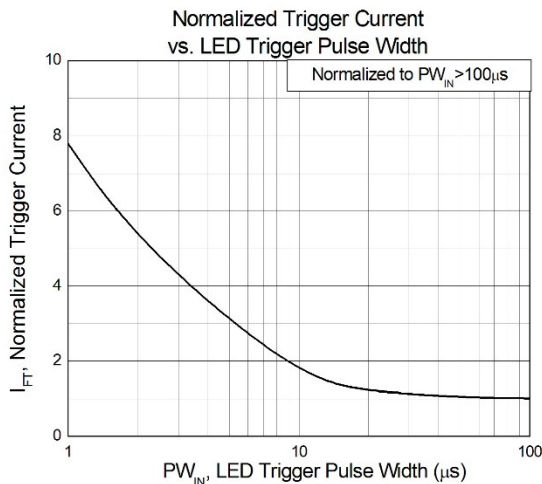


Figure 3

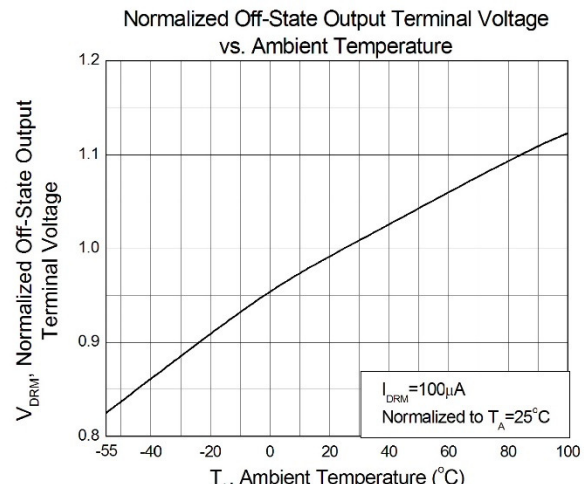


Figure 4

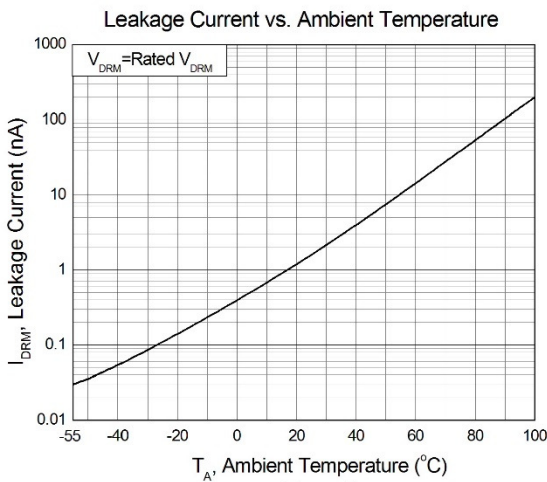


Figure 5

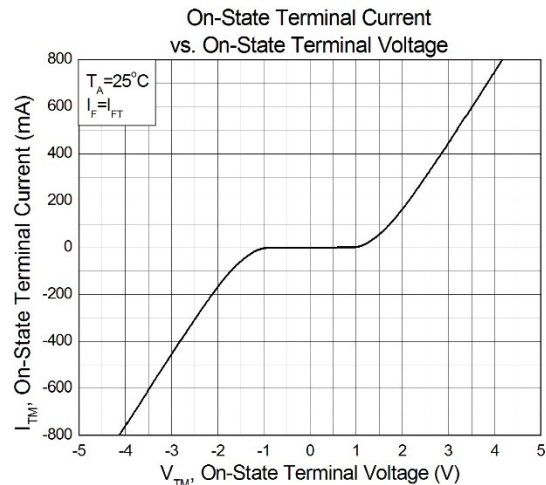
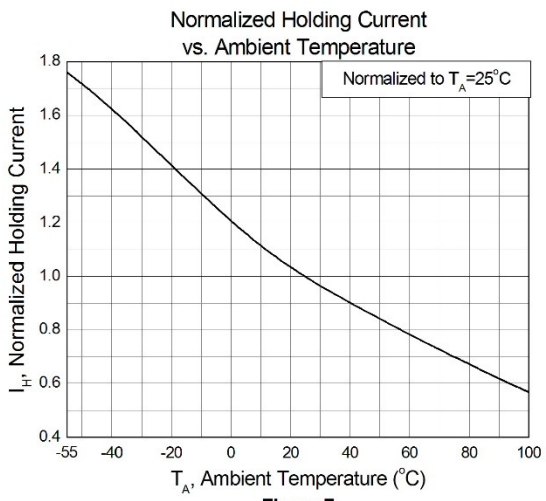


Figure 6



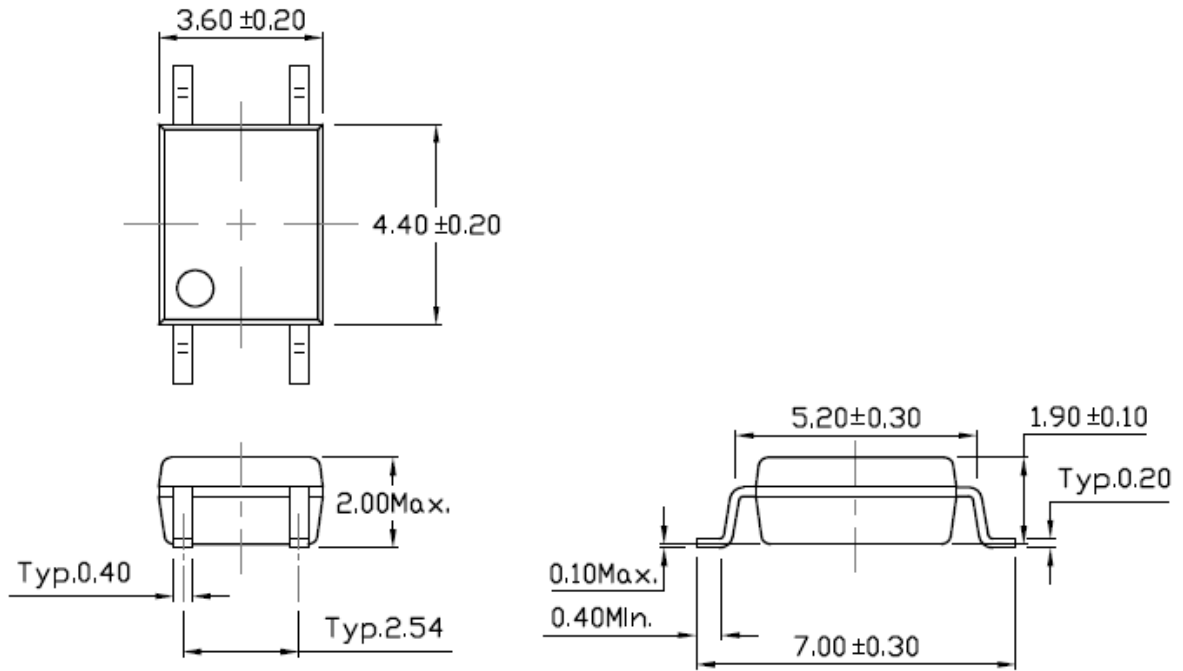
CTM3010, CTM3011, CTM3012
CTM3020, CTM3021, CTM3022, CTM3023
250V/400V Random Phase MFP-4L Phototriac Optocoupler



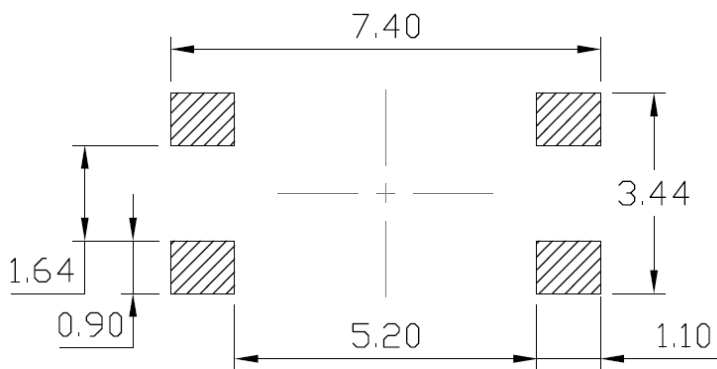


CTM3010, CTM3011, CTM3012 CTM3020, CTM3021, CTM3022, CTM3023 250V/400V Random Phase MFP-4L Phototriac Optocoupler

Package Dimension *Dimensions in mm unless otherwise stated*



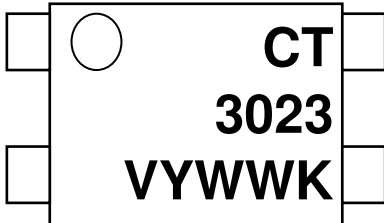
Recommended Solder Mask *Dimensions in mm unless otherwise stated*





CTM3010, CTM3011, CTM3012
CTM3020, CTM3021, CTM3022, CTM3023
250V/400V Random Phase MFP-4L Phototriac Optocoupler

Marking Information



Note:

- CT : Denotes "CT Micro"
- 3023 : Product Number
- V : VDE Option
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code

Ordering Information

CTM30XX(V)(Z)

XX = Part No. (XX=10, 11, 12, 20, 21, 22 or 23)

V = VDE Option (V or None)

Z = Tape and reel option (T1 or T2)

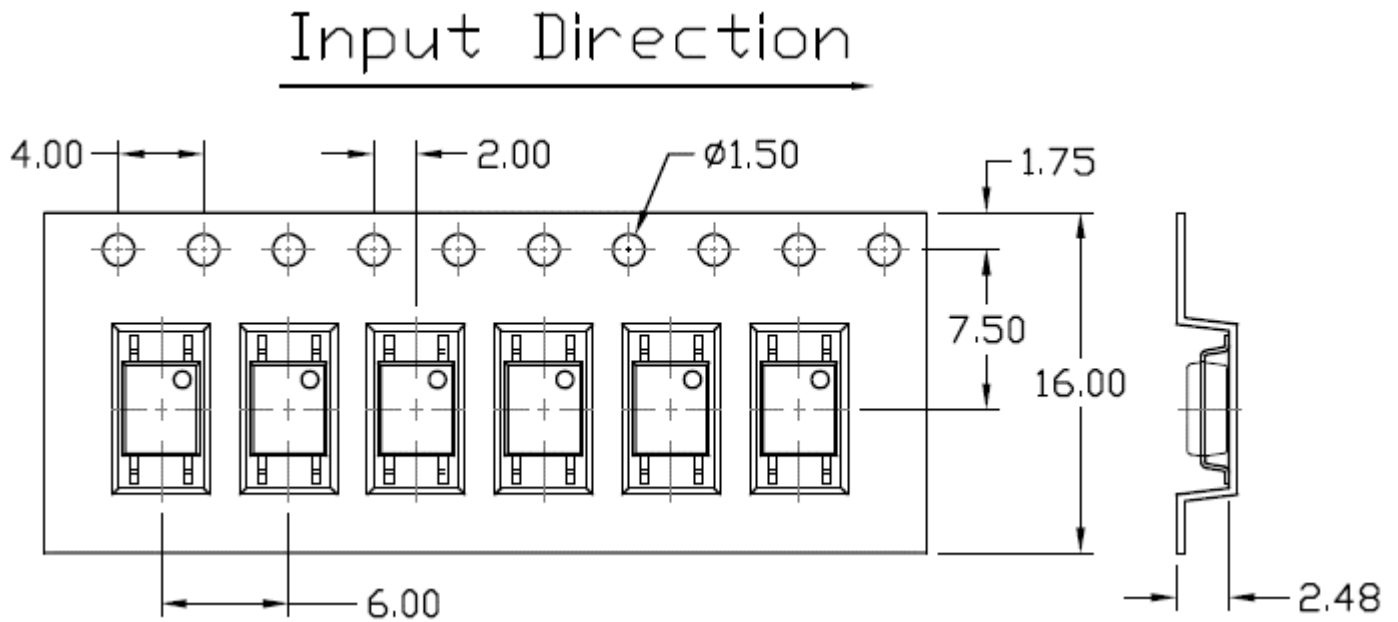
Option	Description	Quantity
T1	Surface Mount Lead Forming – With Option 1 Taping	3000 Units/Reel
T2	Surface Mount Lead Forming – With Option 2 Taping	3000 Units/Reel



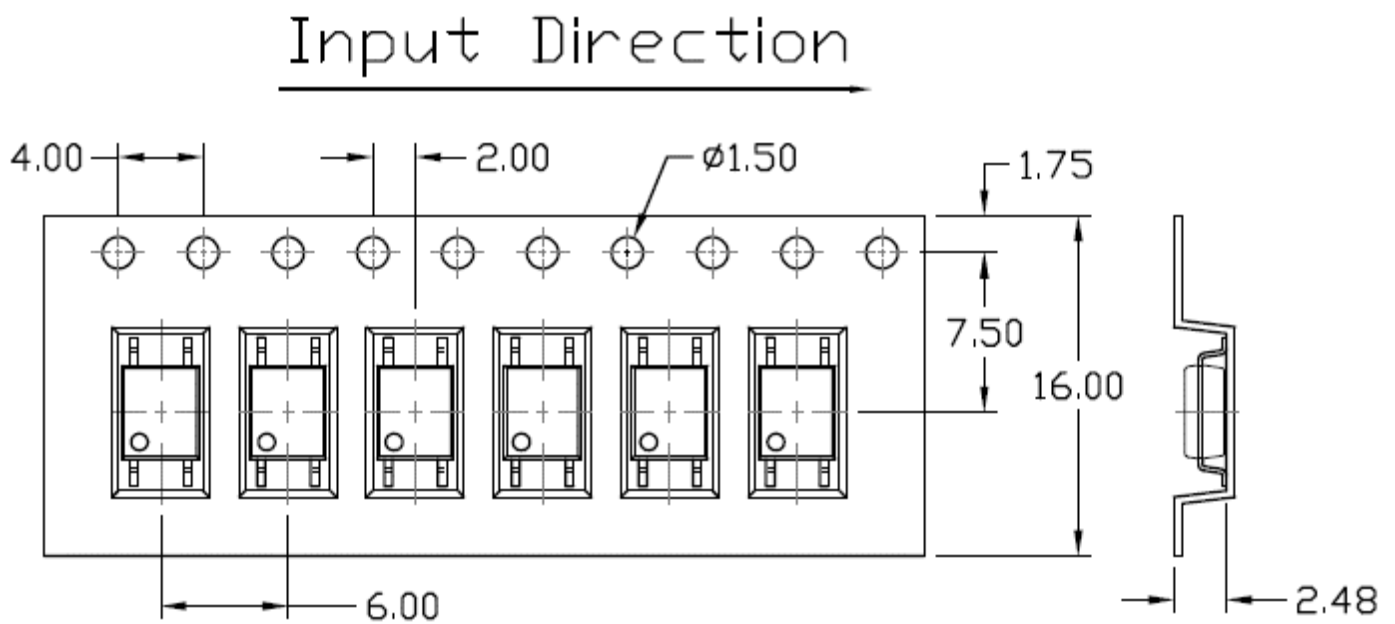
CTM3010, CTM3011, CTM3012
CTM3020, CTM3021, CTM3022, CTM3023
250V/400V Random Phase MFP-4L Phototriac Optocoupler

Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1



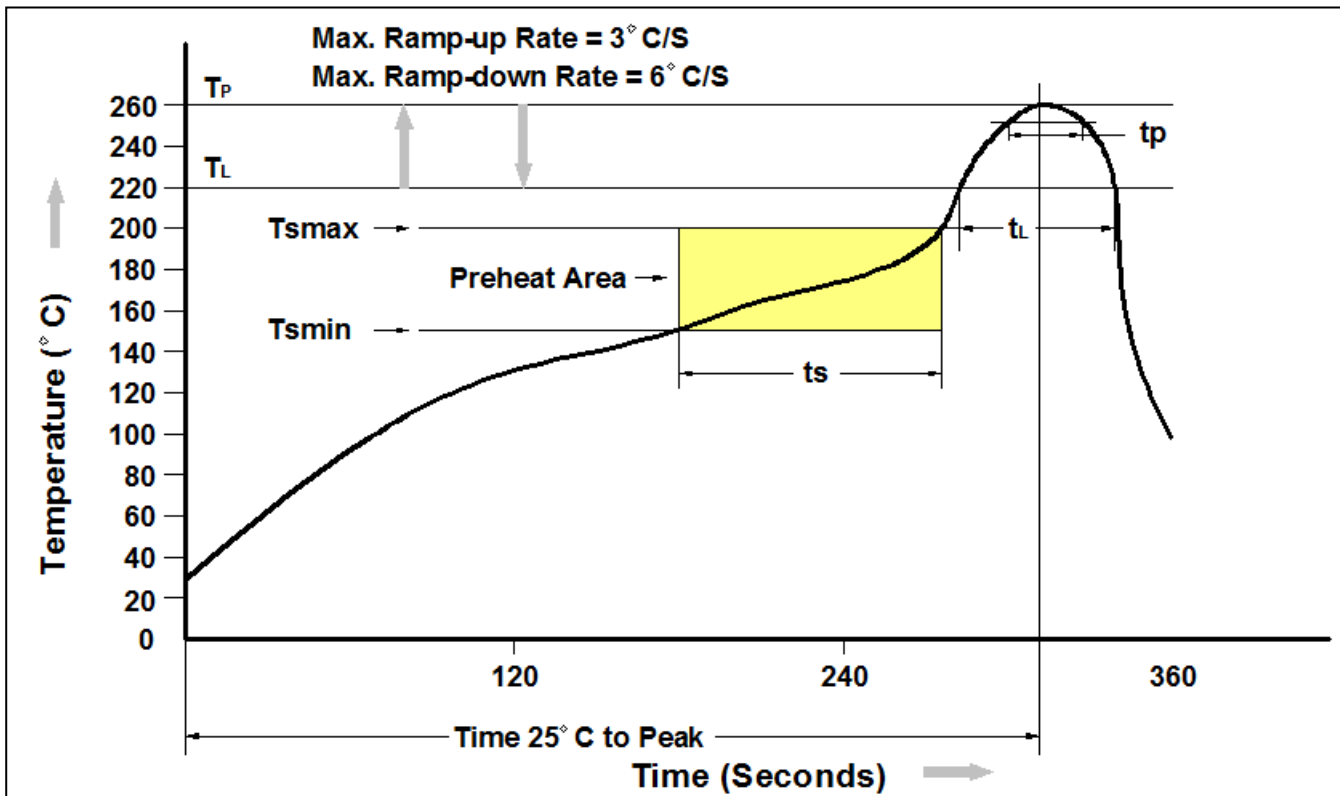
Option T2





CTM3010, CTM3011, CTM3012
CTM3020, CTM3021, CTM3022, CTM3023
250V/400V Random Phase MFP-4L Phototriac Optocoupler

Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmmin)	150 °C
Temperature Max. (Tsmmax)	200 °C
Time (ts) from (Tsmmin to Tsmmax)	60-120 seconds
Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217 °C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Body Package Temperature	260 °C +0 °C / -5 °C
Time (tP) within 5 °C of 260 °C	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25 °C to Peak Temperature	8 minutes max.



**CTM3010, CTM3011, CTM3012
CTM3020, CTM3021, CTM3022, CTM3023
250V/400V Random Phase MFP-4L Phototriac Optocoupler**

DISCLAIMER

CT MICRO RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. CT MICRO DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

DISCOLORATION MIGHT OCCUR ON THE PACKAGE SURFACE AFTER SOLDERING, REFLOW OR LONG TERM USE. THIS DOES NOT IMPACT THE PRODUCT PERFORMANCE NOR THE PRODUCT RELIABILITY.

CT MICRO ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT EXPRESS WRITTEN APPROVAL OF CT MICRO INTERNATIONAL CORPORATION.

- 1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instruction for use provided in the labelling, can be reasonably expected to result in significant injury to the user.*
- 2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.*