

AC Input 4-Pin Mini-Flat Phototransistor Optocoupler

Features

- High isolation 3750 VRMS
- CTR flexibility available see order information
- AC input with transistor output
- Temperature range - 55 °C to 110 °C
- Regulatory Approvals
 - UL - UL1577 (E492440)

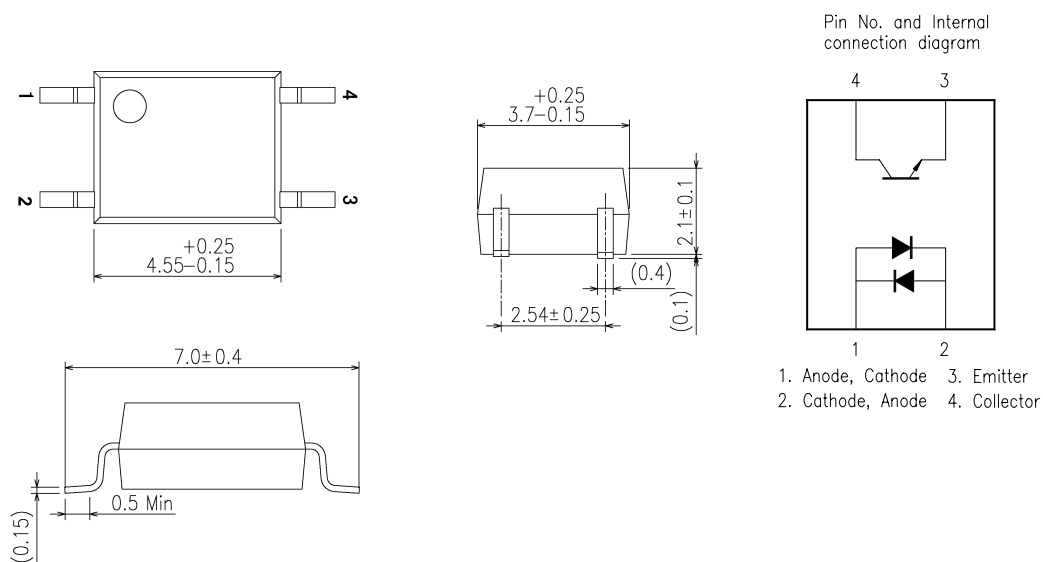
Description

These series of AC input optocoupler consists of a photo transistor optically coupled to two gallium arsenide Infrared-emitting diodes in a 4-lead Mini-Flat package.

Applications

- Switch mode power supplies
- Computer peripheral interface
- Microprocessor system interface

Packaging and Pin Assignment



AC Input 4-Pin Mini-Flat Phototransistor Optocoupler

Absolute Maximum Rating at 25°C

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	3750	V _{RMS}	
T _{OPR}	Operating temperature	-55 ~ +110	°C	
T _{STG}	Storage temperature	-55 ~ +150	°C	
T _{SOL}	Soldering temperature	260	°C	
P _{TOT}	Total power dissipation	200	mW	
Emitter				
I _F	Forward current	±50	mA	
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	1	A	
P _D	Power dissipation	70	mW	
Detector				
P _C	Power dissipation	150	mW	
B _{VCEO}	Collector-Emitter Breakdown Voltage	80	V	
B _{VECO}	Emitter-Collector Breakdown Voltage	7	V	
I _C	Collector Current	50	mA	

AC Input 4-Pin Mini-Flat Phototransistor 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	$I_F = 10\text{mA}$		1.24	1.4	V	
C_{IN}	Input Capacitance	$f = 1\text{kHz}$	-	45	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$B_{V_{CEO}}$	Collector-Emitter Breakdown	$I_C = 100\mu\text{A}$	80	-	-	V	
$B_{V_{ECO}}$	Emitter-Collector Breakdown	$I_E = 100\mu\text{A}$	7	-	-	V	
I_{CEO}	Collector-Emitter Dark Current	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$	-	-	100	nA	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
CTR	Current Transfer Ratio	$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$	20	-	300	%	
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	$I_F = \pm 20\text{mA}, I_C = 1\text{mA}$	-	0.1	0.2	V	
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	5×10^{10}	-	-	Ω	
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.6	1.0	pF	

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
t_r	Rise Time	$I_C = 2\text{mA}, V_{CE} = 2\text{V}, R_L = 100\Omega$	-	6	18	μs	
t_f	Fall Time		-	8	18		

AC Input 4-Pin Mini-Flat Phototransistor Optocoupler

Typical Characteristic Curves

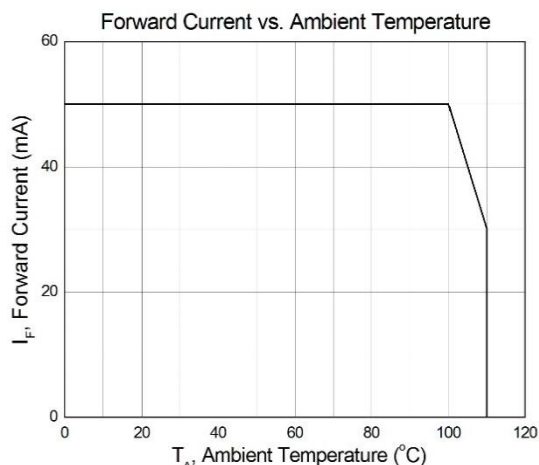


Figure 1

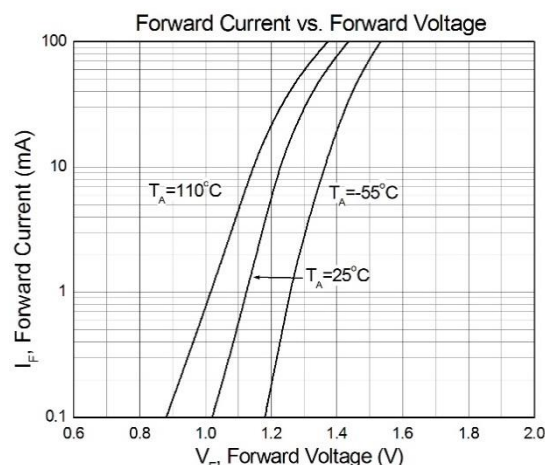


Figure 2

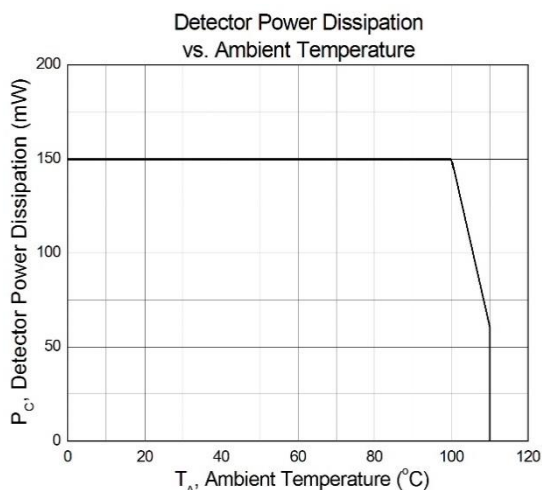


Figure 3

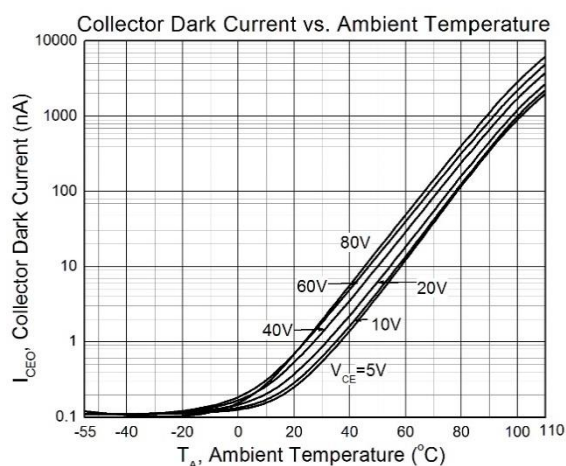


Figure 4

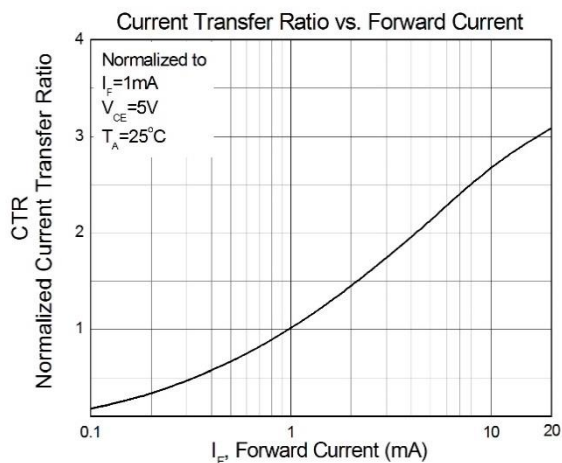


Figure 5

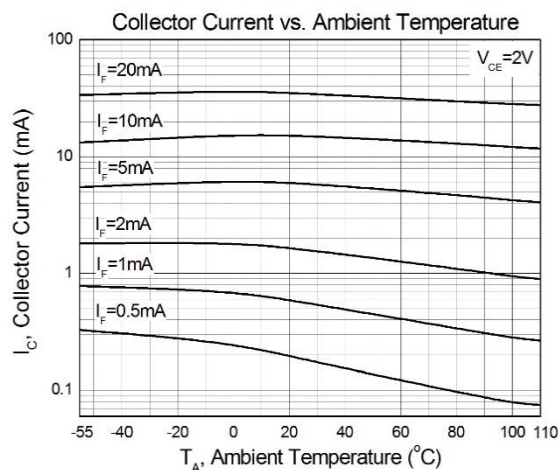


Figure 6

AC Input 4-Pin Mini-Flat Phototransistor Optocoupler

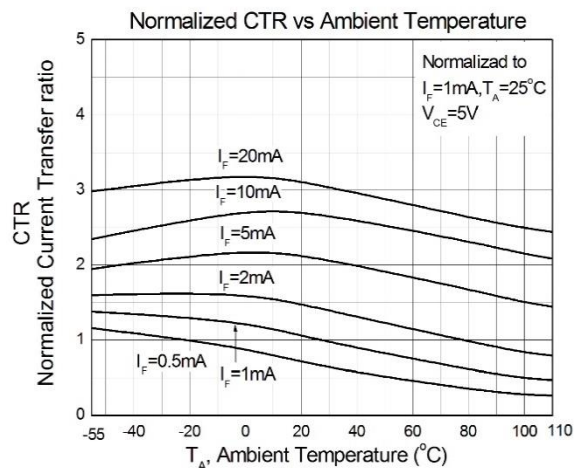


Figure 7

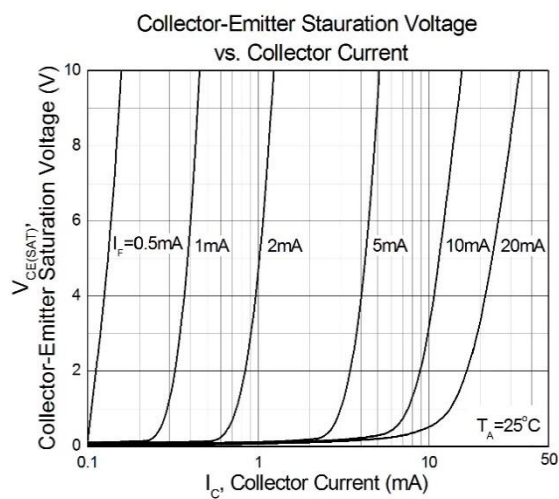


Figure 8

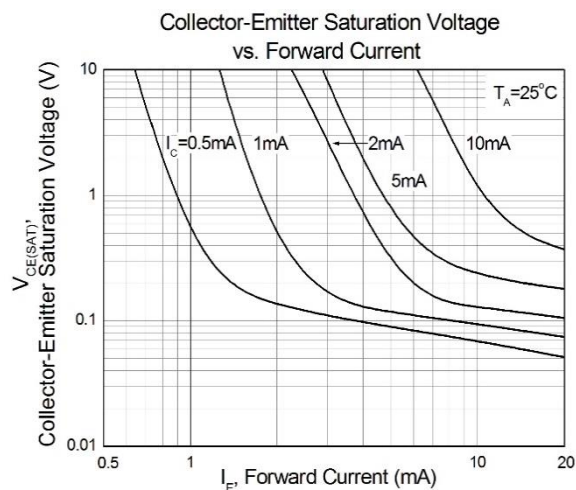


Figure 9

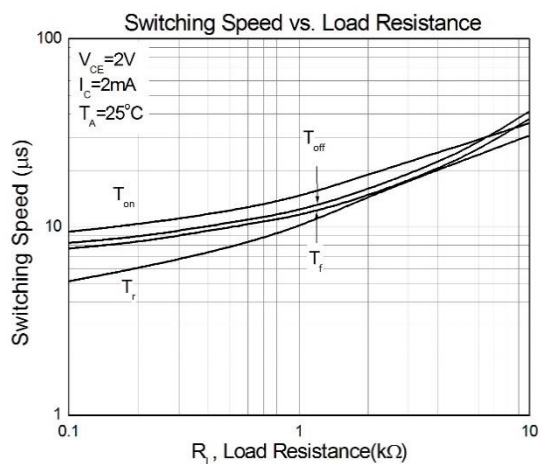


Figure 10

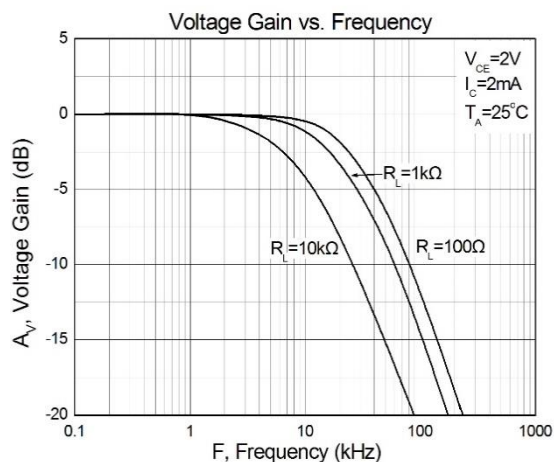


Figure 11

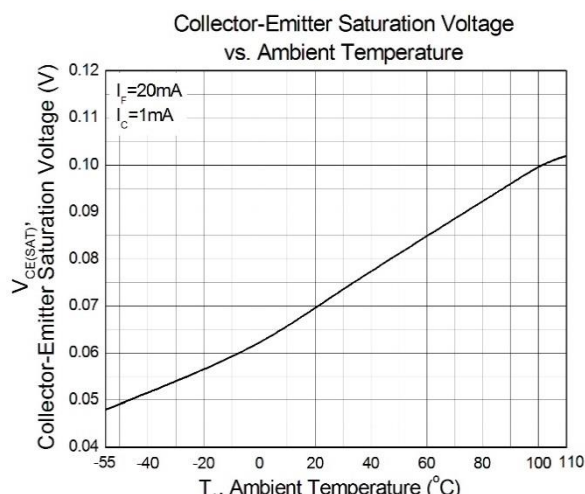
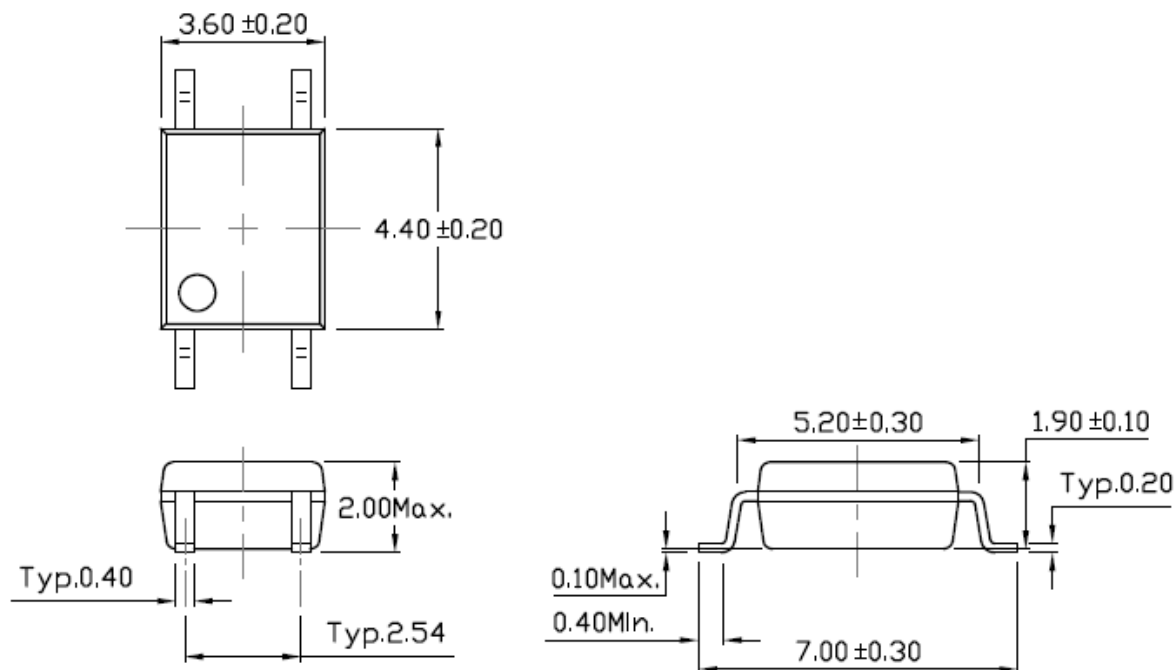


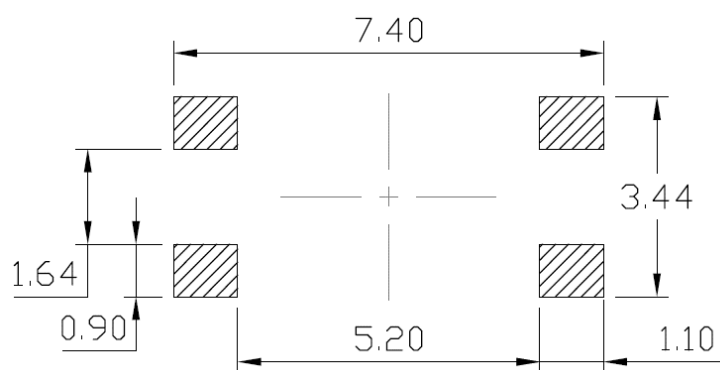
Figure 12

AC Input 4-Pin Mini-Flat Phototransistor Optocoupler

Package Dimension *Dimensions in mm unless otherwise stated*

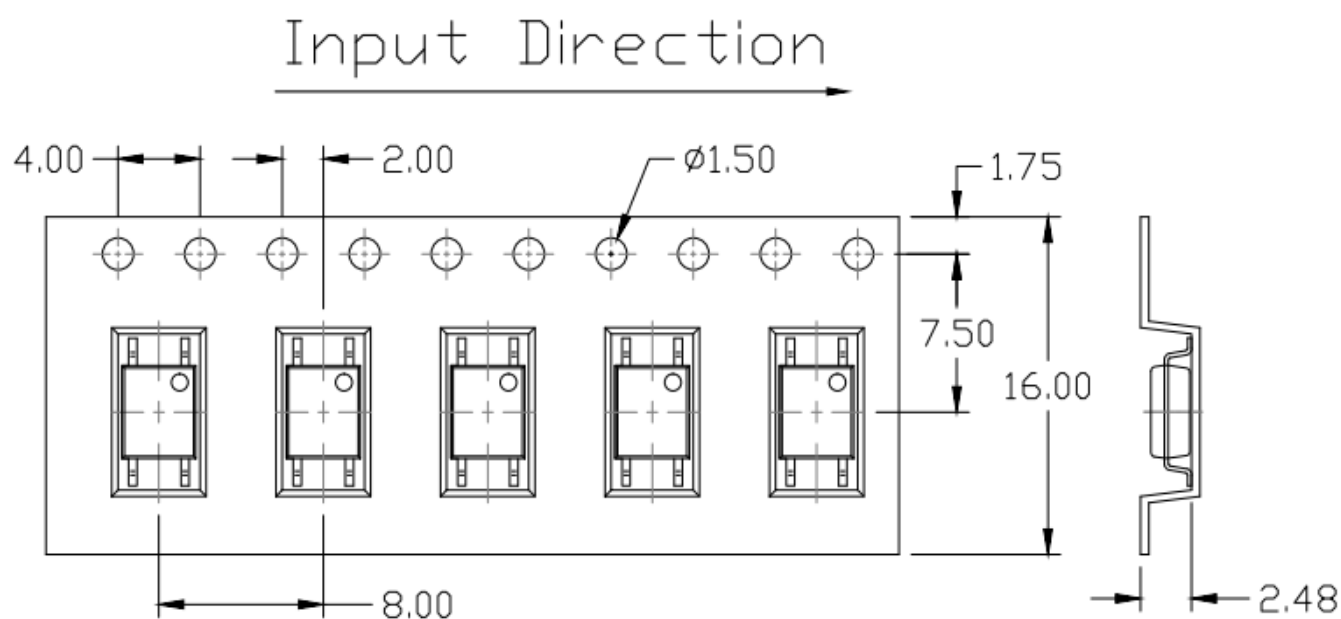


Recommended Solder Mask *Dimensions in mm unless otherwise stated*



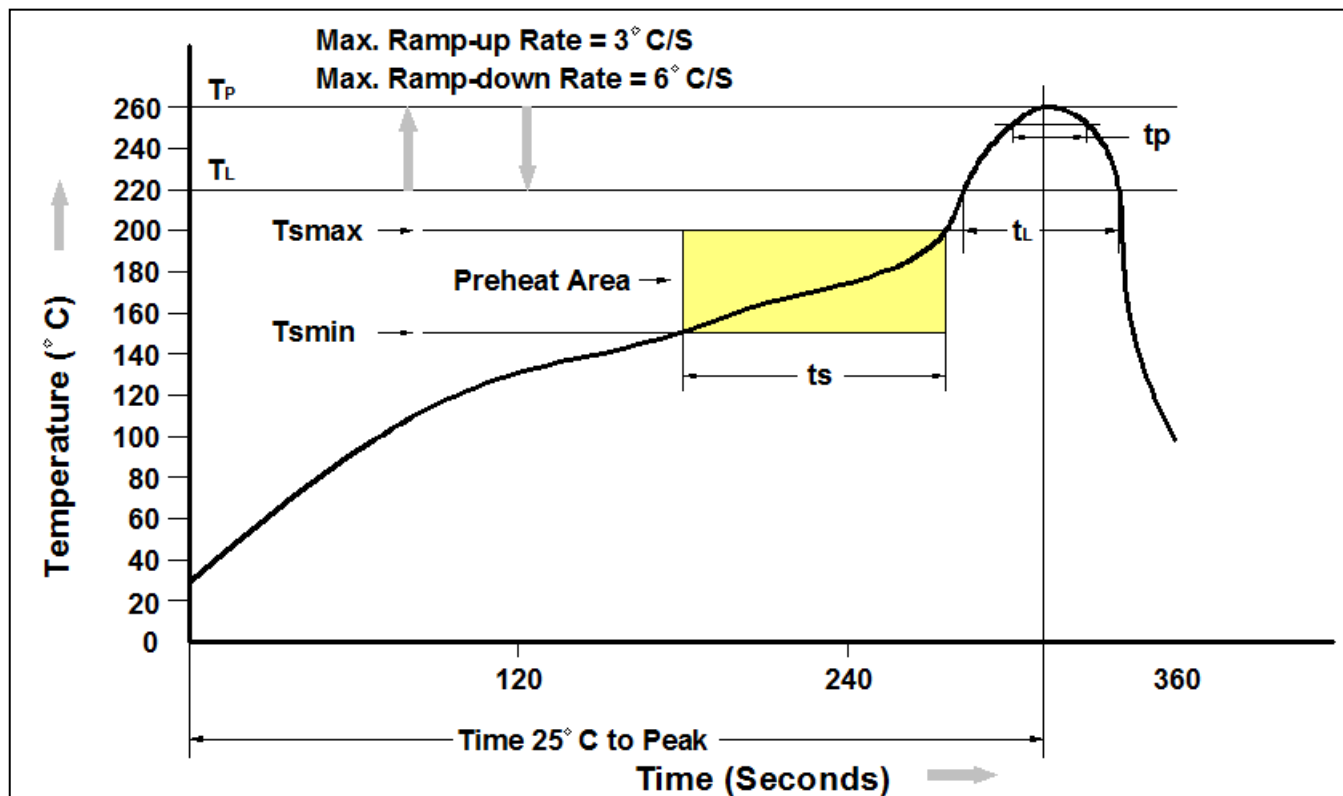
AC Input 4-Pin Mini-Flat Phototransistor Optocoupler

Carrier Tape Specifications *Dimensions in mm unless otherwise stated*



AC Input 4-Pin Mini-Flat Phototransistor Optocoupler

Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	150°C
Temperature Max. (T_{smax})	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Ramp-up Rate (t_L to t_P)	3°C/second max.
Liquidous Temperature (T_L)	217°C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t_P) within 5°C of 260°C	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

ORDERING INFORMATION

Order Code	Package	Baseqty	Deliverymode
UMW LTV-354	SOP-4	3000	Tape and reel