



10MBit/s High Speed Logic Gate Optocoupler

Features

- High speed 10MBit/s
- High isolation voltage between input and output (Viso=5000 Vrms)
- Guaranteed performance from -40°C to 85°C
- Wide operating temperature range of -55°C to 100°C
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950

Applications

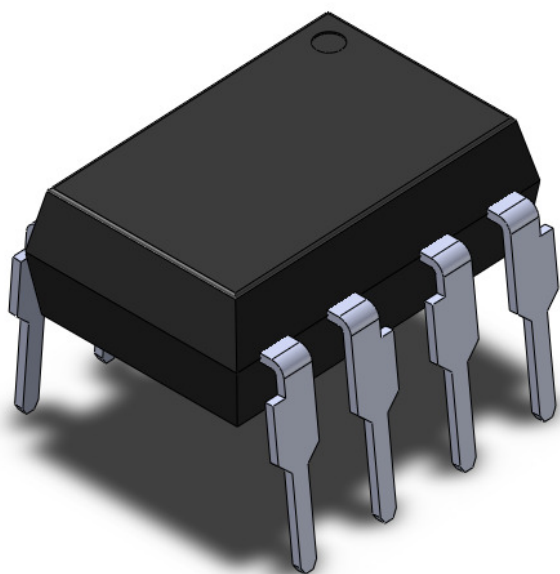
- Line receivers
- Telecommunication equipment

- Feedback loop in switch-mode power supplies
- Home appliances
- High speed logic ground isolation

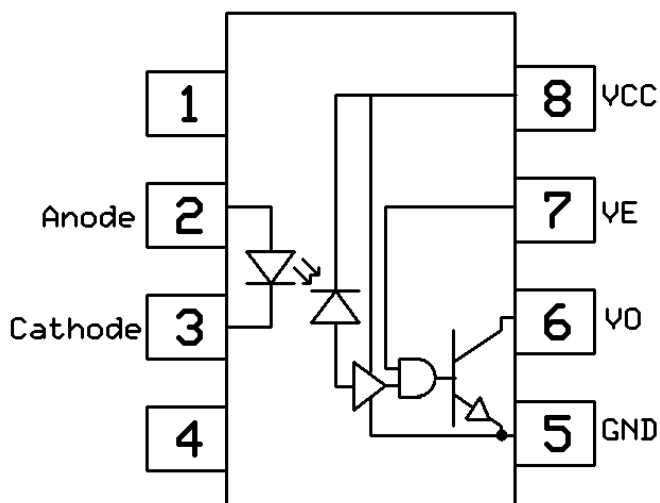
Description

The CT2601 optocouplers consist of a 850 nm AlGaAS LED, optically coupled to a very high speed integrated photo-detector logic gate with a strobable output. This output features an open collector, there by permitting wired OR outputs. The switching parameters are guaranteed over the temperature range of -40°C to +85°C. A maximum input signal of 5mA will provide a minimum output sink current of 13mA (fan out of 8).

Package Outline



Schematic



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



10MBit/s High Speed Logic Gate Optocoupler

Absolute Maximum Rating at 25°C

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage *1	5000	V _{RMS}	
T _{OPR}	Operating temperature	-55 ~ +85	°C	
T _{STG}	Storage temperature	-55 ~ +125	°C	
T _{SOL}	Soldering temperature *2	260	°C	
Emitter				
I _F	Forward current	50	mA	
V _R	Reverse voltage	5	V	
P _I	Power dissipation	100	mW	
Detector				
P _O	Power dissipation	85	mW	
I _O	Average Output current	50	mA	
V _O	Output voltage	7.0	V	1min(Max.)
V _{CC}	Supply voltage	7.0	V	
V _E	Enable Input Voltage Not to Exceed VCC by more than 500mV	5.5	V	



10MBit/s High Speed Logic Gate Optocoupler

Electrical Characteristics

$T_A = -40 - 85^\circ\text{C}$ (unless otherwise specified). Typical values are measured at $T_A = 25^\circ\text{C}$ and $V_{CC}=5\text{V}$

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	$I_F = 10\text{mA}$	-	1.4	1.6	V	
V_R	Reverse Voltage	$I_R = 10\mu\text{A}$	5.0	-	-	V	
$\Delta V_F/\Delta T_A$	Temperature coefficient of forward voltage	$I_F = 10\text{mA}$	-	-1.8	-	mV/ $^\circ\text{C}$	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{CCH}	Logic High Supply Current	$I_F=0\text{mA}$, $V_E=0.5\text{V}$, $V_{CC}=5.5\text{V}$	-	6.5	10	mA	
I_{CCL}	Logic Low Supply Current	$I_F=10\text{mA}$, $V_E=0.5\text{V}$, $V_{CC}=5.5\text{V}$	-	8.8	13	mA	
V_{EH}	High Level Enable Voltage	$I_F=10\text{mA}$, $V_{CC}=5.5\text{V}$	2.0	-	-	V	
V_{EL}	Low Level Enable Voltage	$I_F=10\text{mA}$, $V_{CC}=5.5\text{V}$	-	-	0.8	V	
I_{EH}	High Level Enable Current	$V_E=0.5\text{V}$, $V_{CC}=5.5\text{V}$	-	-0.53	-1.6	mA	
I_{EL}	Low Level Enable Current	$V_E=2.0\text{V}$, $V_{CC}=5.5\text{V}$	-	-0.75	-1.6	mA	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{FT}	Input Threshold Current	$V_{CC}=5.5\text{V}$, $V_O=0.6\text{V}$, $V_E=2.0\text{V}$, $I_O=13\text{mA}$	-	2.5	5	mA	
I_{OH}	Logic High Output Current	$I_F=250\mu\text{A}$, $V_O=V_{CC}=5.5\text{V}$, $V_E=2.0\text{V}$	-	2.0	100	μA	
V_{OL}	Low Level Output Voltage	$I_F=5\text{mA}$, $V_{CC}=5.5\text{V}$, $V_E=2.0\text{V}$, $I_O=13\text{mA}$	-	0.35	0.6	V	



10MBit/s High Speed Logic Gate Optocoupler

Electrical Characteristics

$T_A = -40 - 85^\circ\text{C}$ (unless otherwise specified). Typical values are measured at $T_A = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$ and $I_F = 7.5\text{mA}$

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
T_{PHL}	Output Propagation Delay High To Low	$C_L = 15\text{pF}$, $R_L = 350\Omega$	-	34	75	ns	
T_{PLH}	Output Propagation Delay Low to High		-	39	75	ns	
P_{WD}	Pulse Width Distortion		-	5	34	ns	
T_r	Output Rise Time		-	37	-	ns	
T_f	Output Fall Time		-	10	-	ns	
T_{ELH}	Enable Propagation Delay Low To High	$V_{EH} = 3.5\text{V}$, $C_L = 15\text{pF}$, $R_L = 350\Omega$	-	15	-	ns	
T_{EHL}	Enable Propagation Delay High To Low		-	15	-	ns	
CM_H	Common Mode Transient Immunity at Logic High	$I_F = 0\text{mA}$, $V_{CM} = 50\text{Vp-p}$, $V_{OH} = 2.0\text{V}$, $R_L = 350\Omega$	5000	-	-	V/ μs	
CM_L	Common Mode Transient Immunity at Logic Low	$I_F = 7.5\text{mA}$, $V_{CM} = 50\text{Vp-p}$, $V_{OH} = 0.8\text{V}$, $R_L = 350\Omega$	5000	-	-	V/ μs	



Typical Characteristic Curves

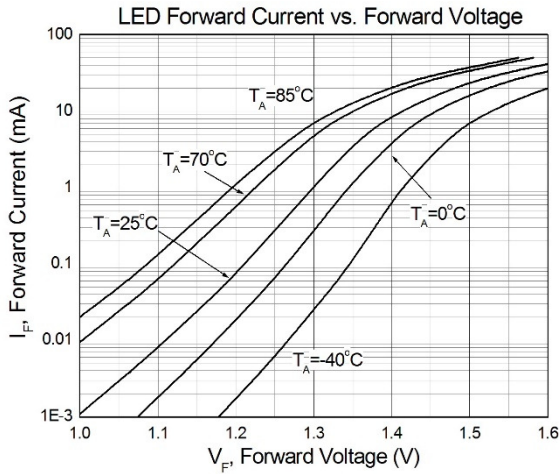


Figure 1

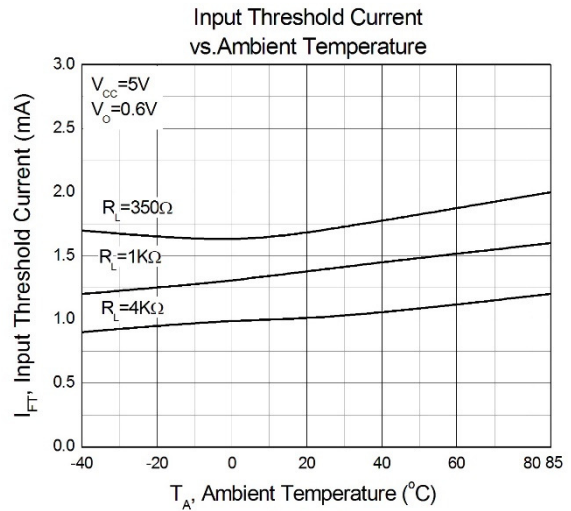


Figure 2

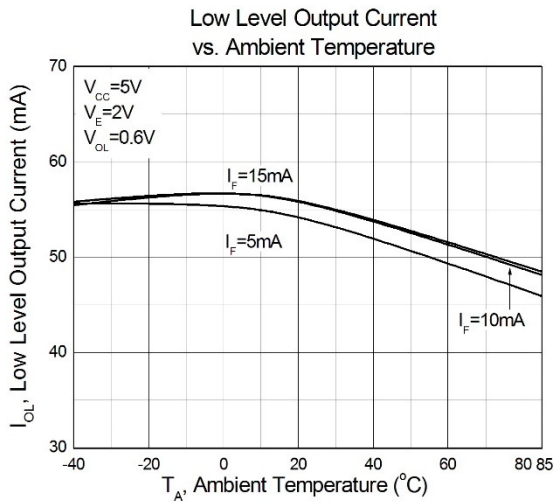


Figure 3

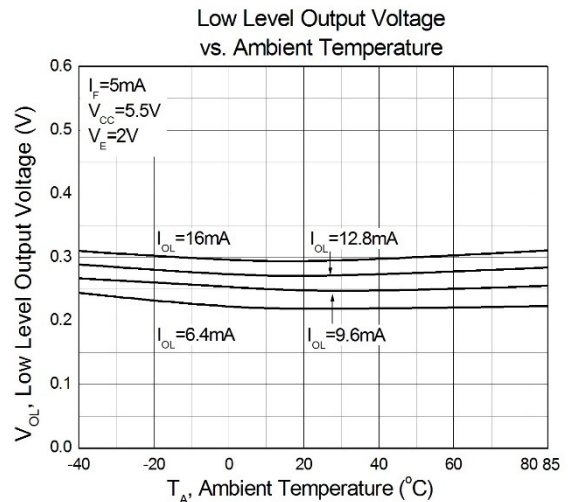


Figure 4



10MBit/s High Speed Logic Gate Optocoupler

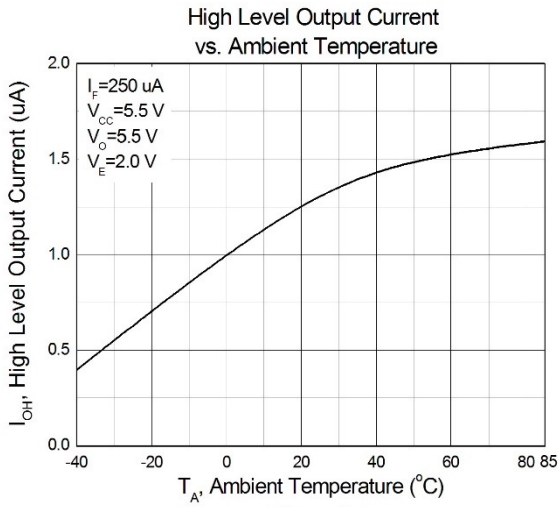


Figure 5

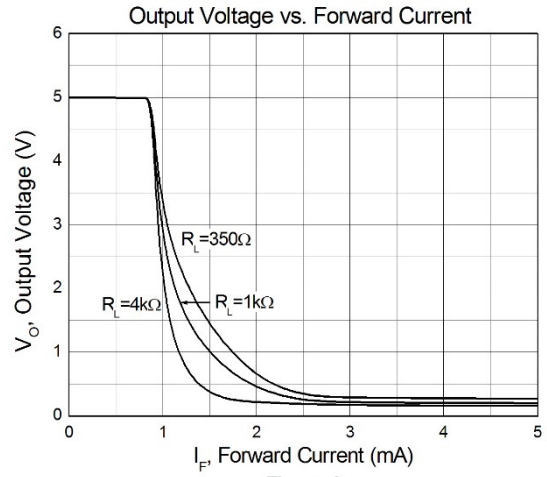


Figure 6

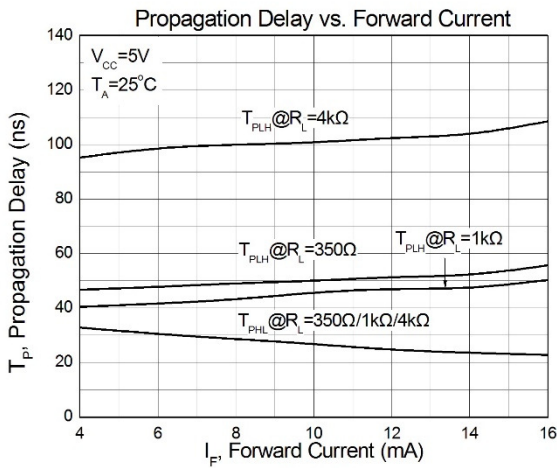


Figure 7

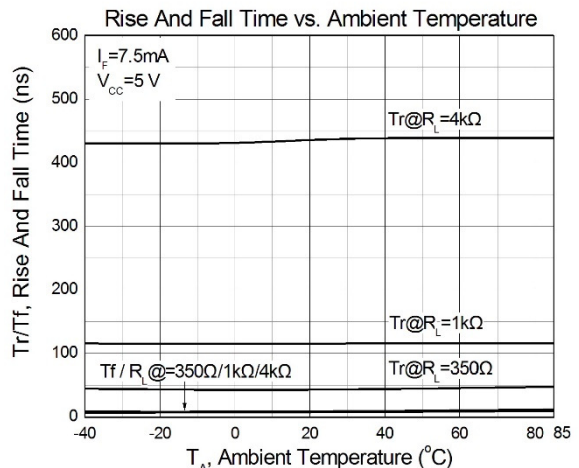


Figure 8

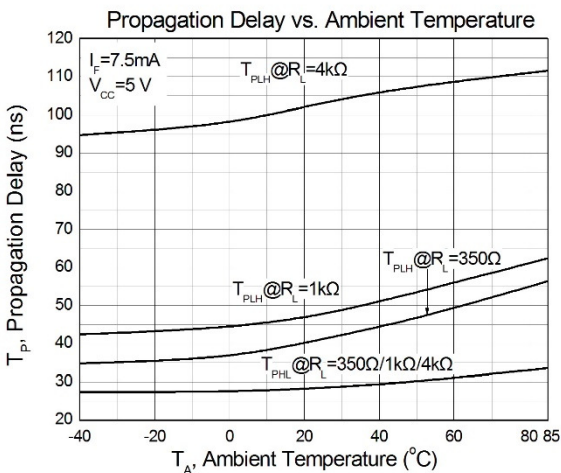


Figure 9

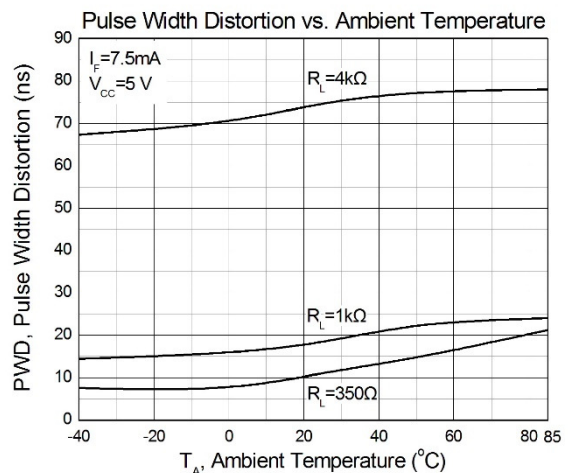


Figure 10



10MBit/s High Speed Logic Gate Optocoupler

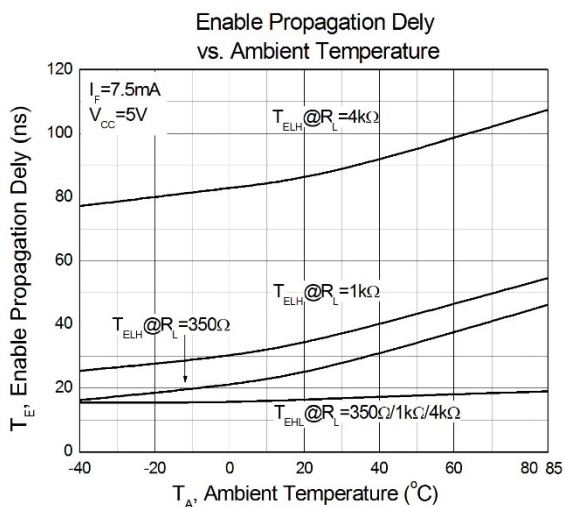
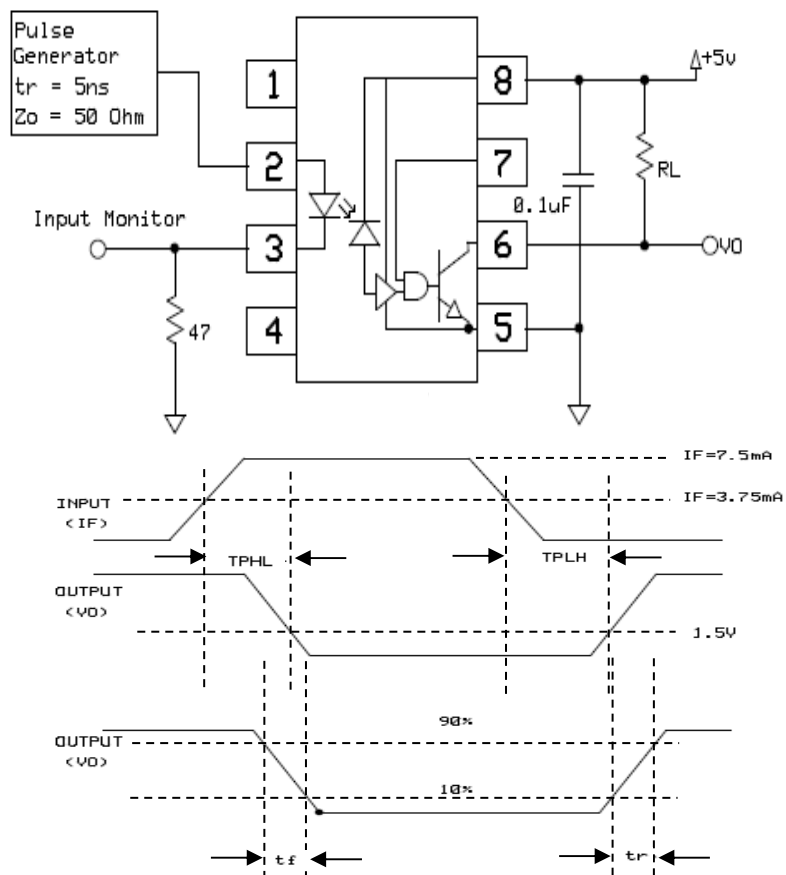


Figure 11

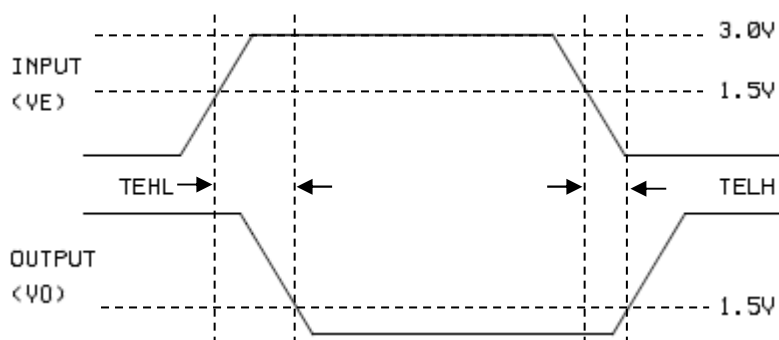
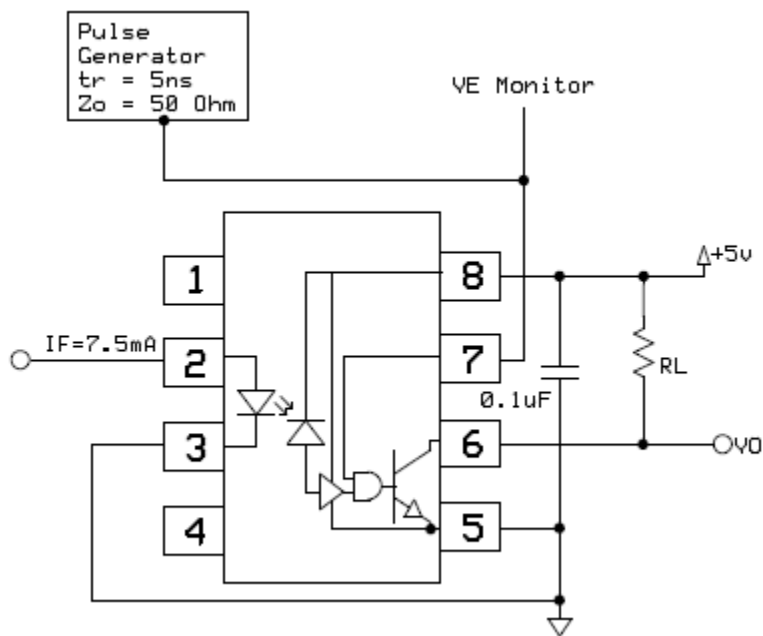
Test Circuits



Switching Time Test Circuit



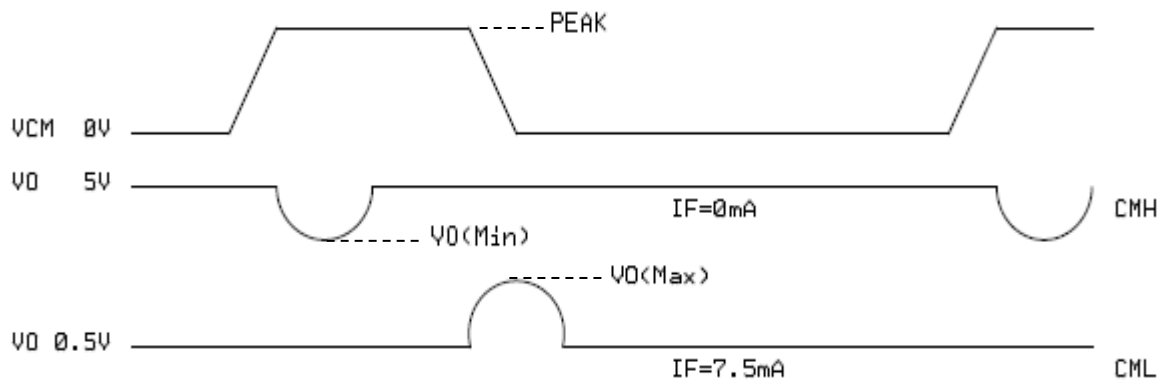
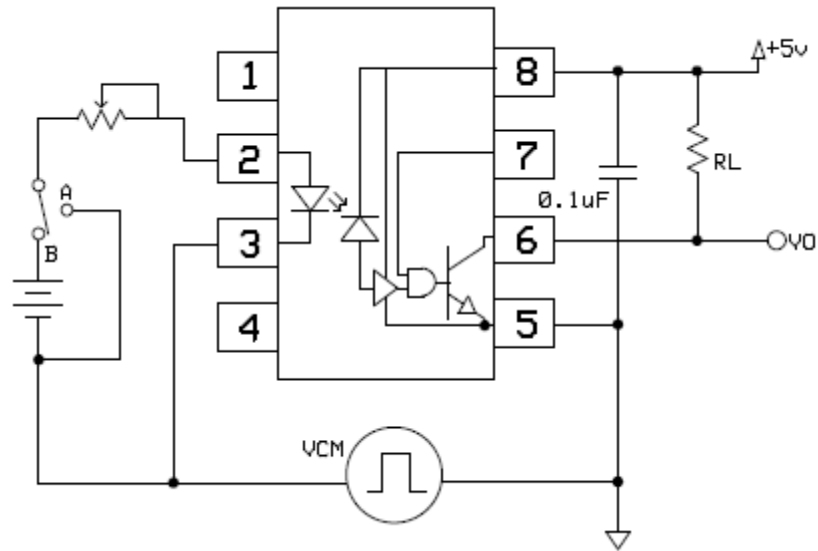
10MBit/s High Speed Logic Gate Optocoupler



Enable Switching Time Test Circuit



10MBit/s High Speed Logic Gate Optocoupler

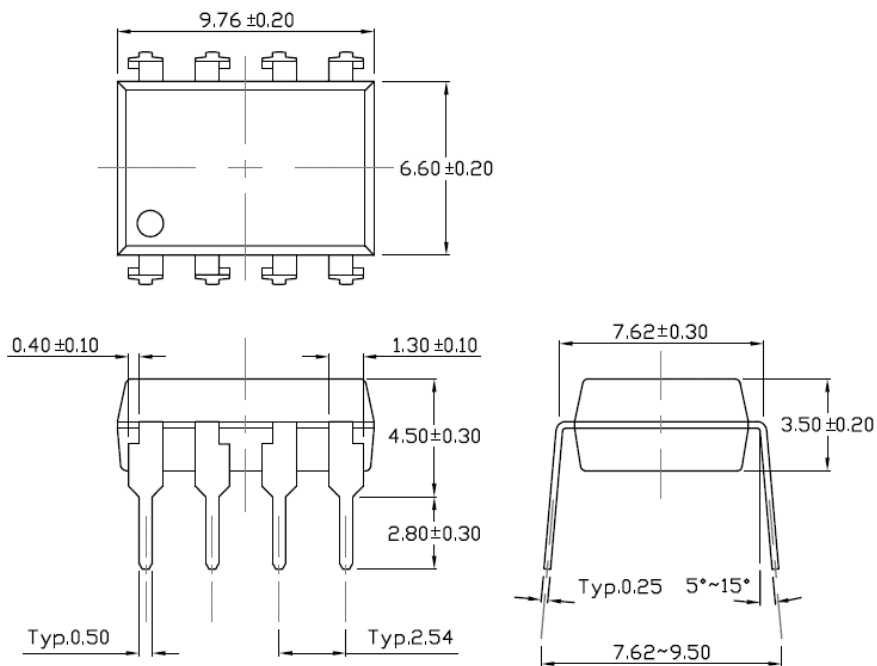


CMR Test Circuit

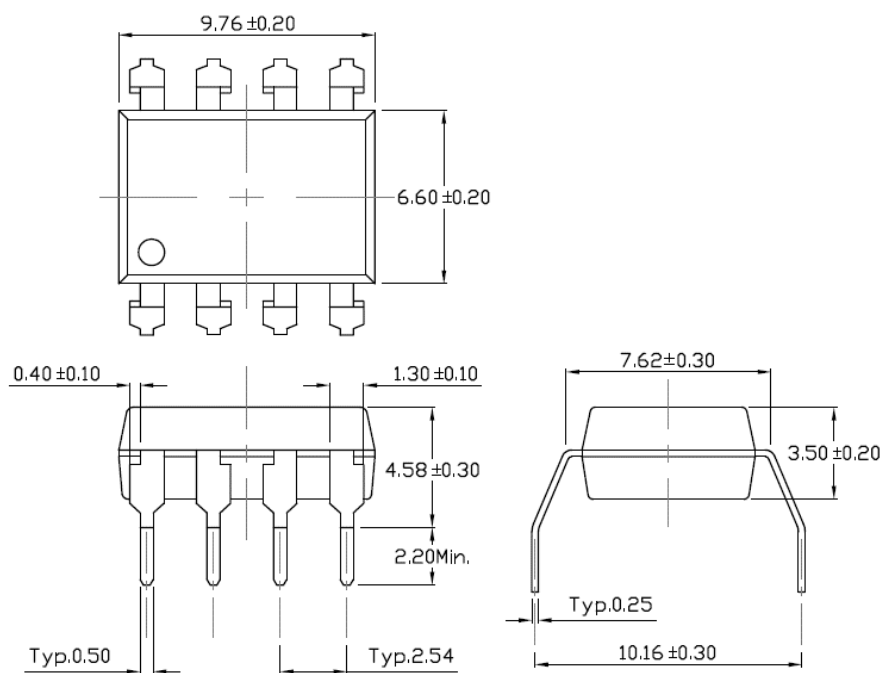


Package Dimension *Dimensions in mm unless otherwise stated*

Standard DIP – Through Hole



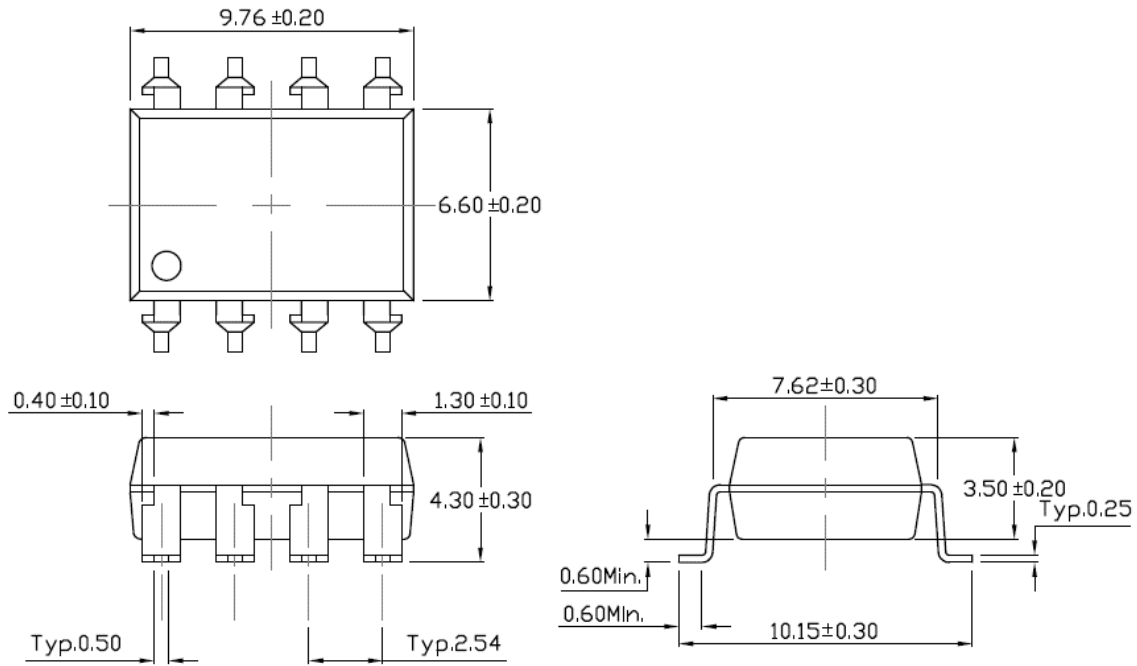
Gullwing (400mil) Lead Forming – Through Hole (M Type)



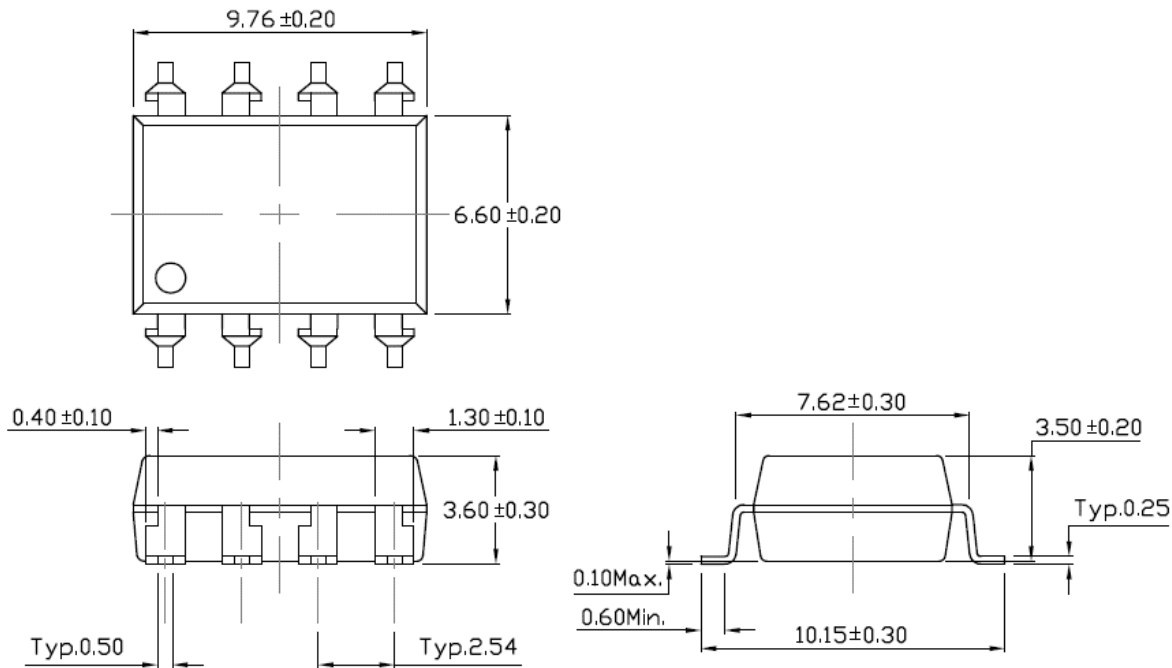


10MBit/s High Speed Logic Gate Optocoupler

Surface Mount Lead Forming (S Type)

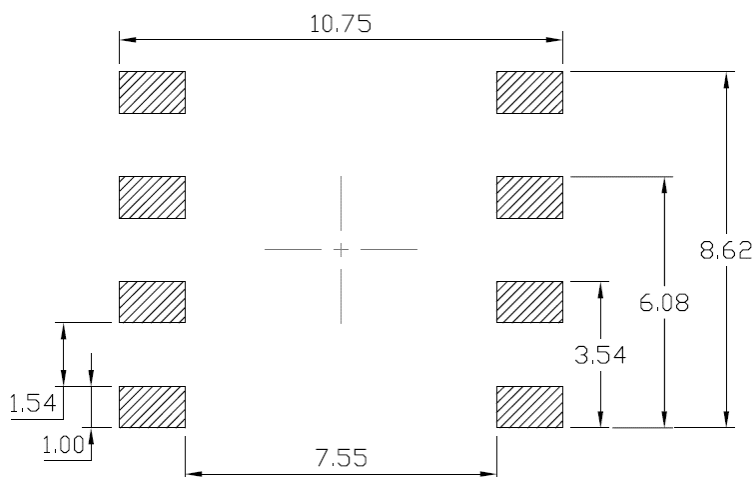


Surface Mount (Low Profile) Lead Forming (SL Type)

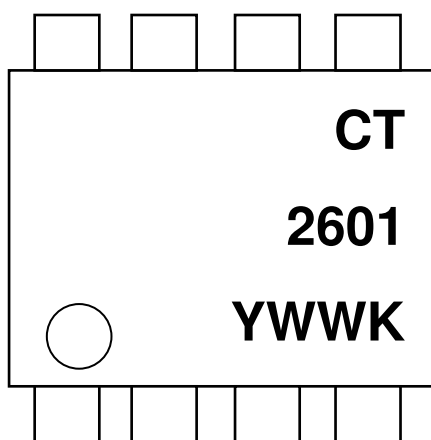




Recommended Solder Mask *Dimensions in mm unless otherwise stated*



Device Marking



Note:

- CT : Denotes "CT Micro"
- 2601 : Product Number
- Y : Fiscal Year
- WW : Work Week
- K : Production Code

**Ordering Information****CT2601Y(Z)**

Y = Lead form option (S, SL, M or none)

Z = Tape and reel option (T1, T2 or none)

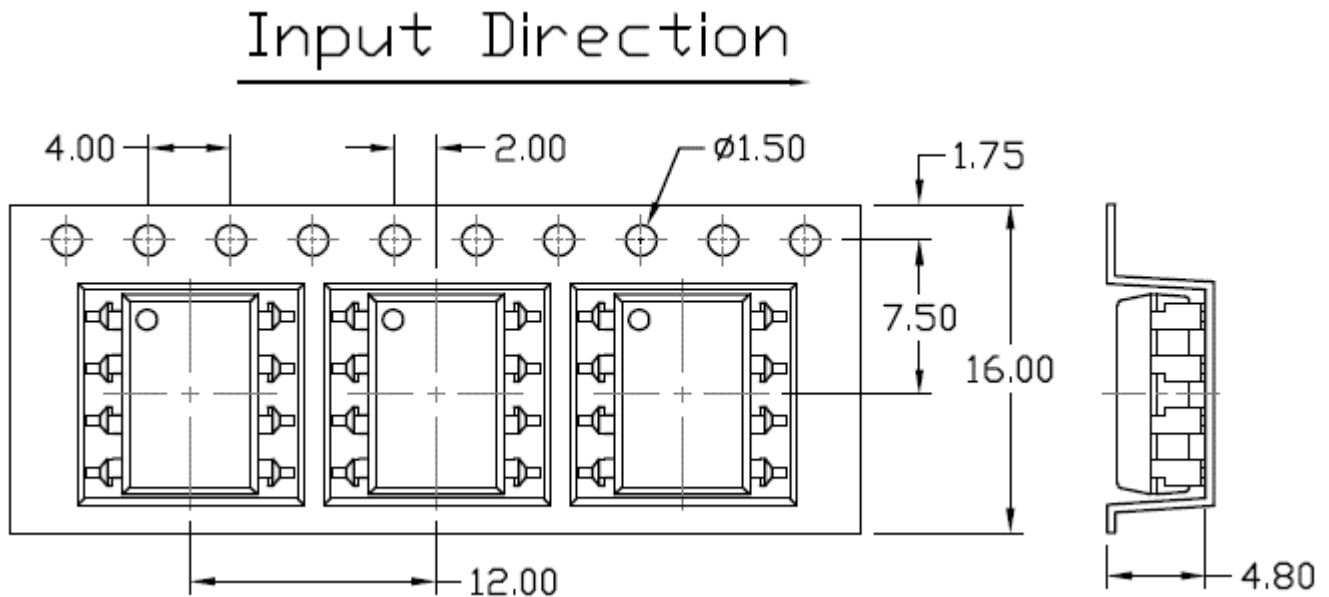
Option	Description	Quantity
None	Standard 8 Pin Dip	45 Units/Tube
M	Gullwing (400mil) Lead Forming	45 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming– With Option 2 Taping	1000 Units/Reel



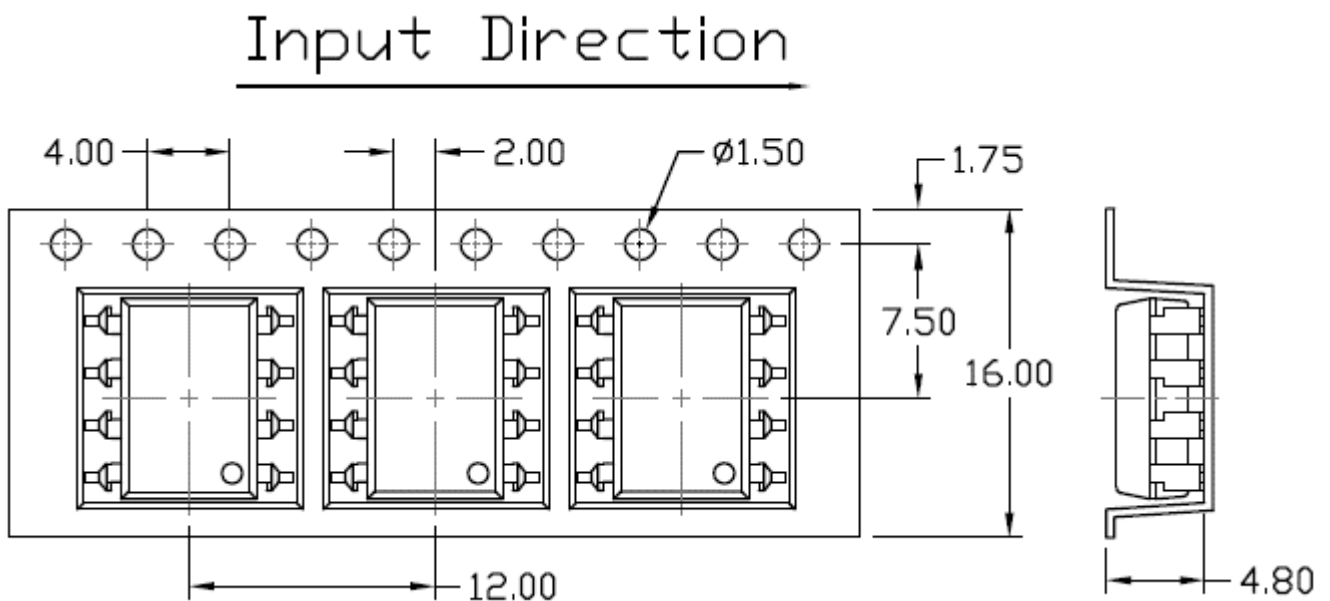
10MBit/s High Speed Logic Gate Optocoupler

Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option S(T1) & SL(T1)

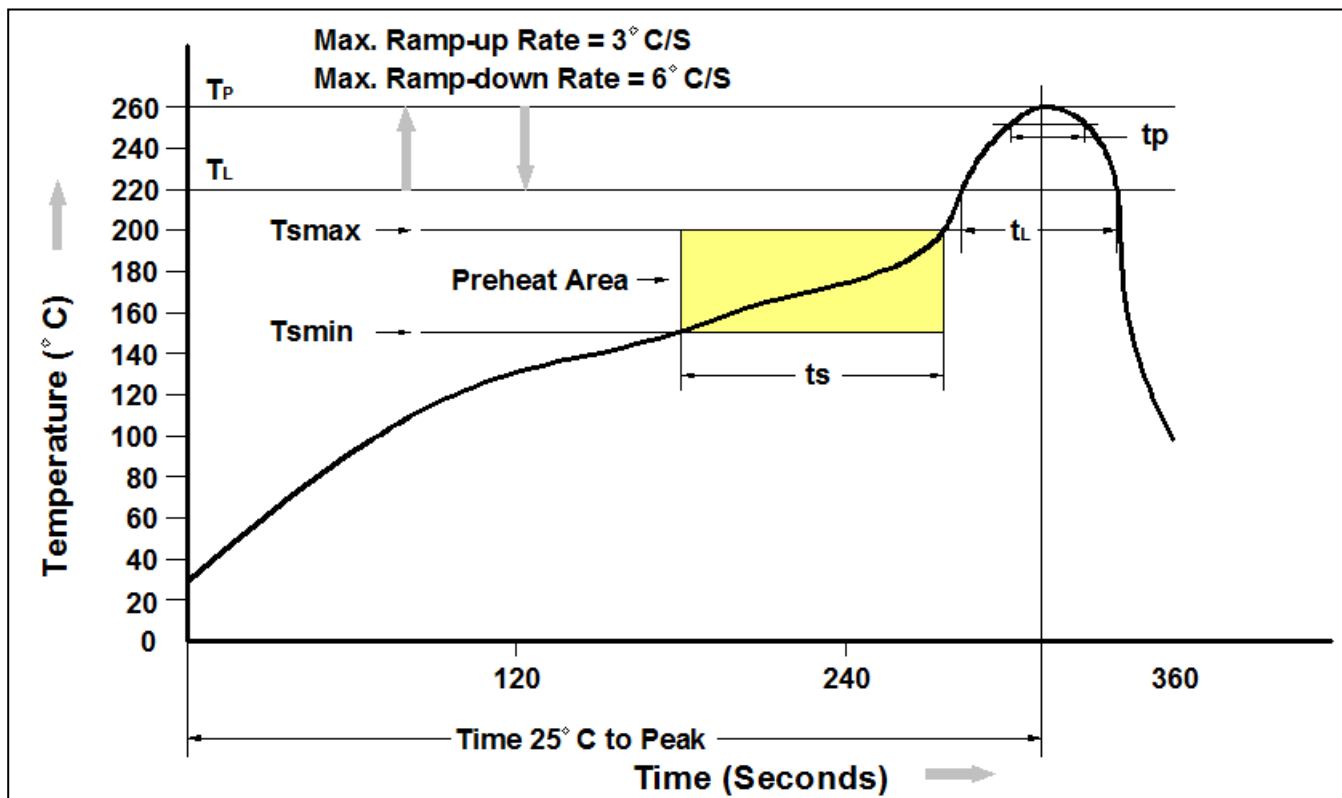


Option S(T2) & SL(T2)





Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150 °C
Temperature Max. (Tsmax)	200 °C
Time (ts) from (Tsmin to Tsmax)	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.



10MBit/s High Speed Logic Gate 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.

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.*