PRODUCT SPECIFICATION

DATE: 08/14/2008

cosmo ELECTRONICS CORPORATION	Photocoupler : KPC410	NO.61P04029	REV
		SHEET 1 OF 7	2

Super High Speed Response Photocoupler

●Features

1. 5 pin Mini-flat package.
2. Super high speed response (t_{PLH},t_{PHL}:typ.45ns at R_L=350 ohm).
3. Instantaneous common mode rejection voltage(CM_H:typ. 500V/us).
4. High isolation voltage between input and output (Viso:2500Vrms).
5. Low input current drive (I_{FHL}: Max. 5mA).
6. LSTTL and TTL compatible output.

●Applications

1. High speed interfaces for computer peripherals, microcomputer systems.
2. High speed line receivers.
3. Noise reduction.
4. Interfaces for data transmission equipment.
5. Inverter.

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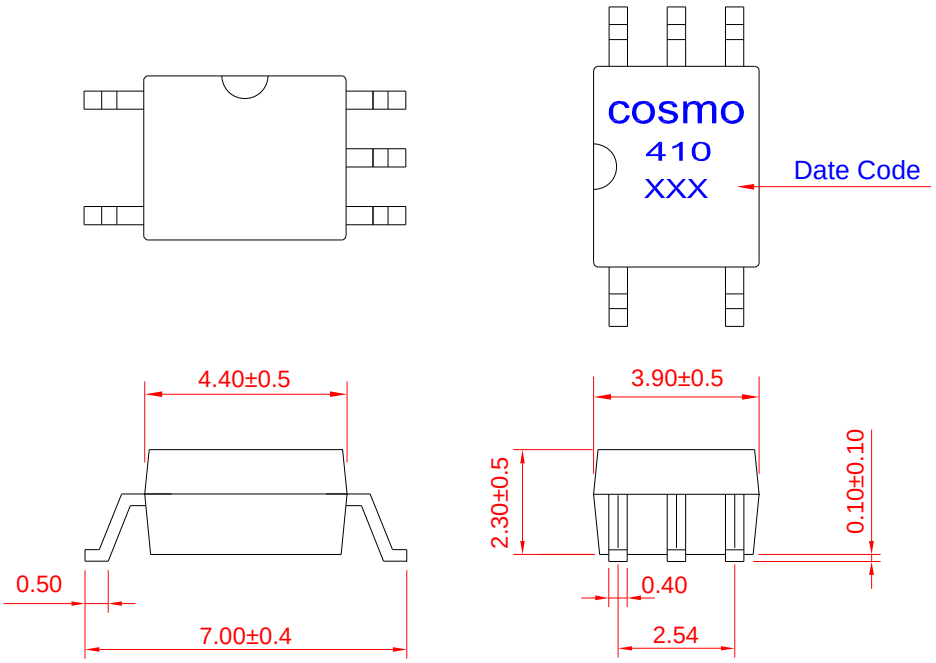
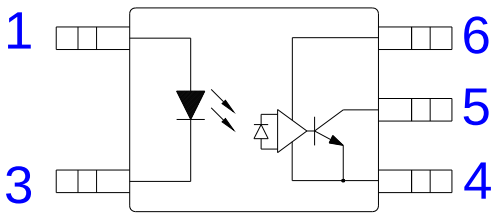
1. OUTSIDE DIMENSION : UNIT (mm)



TOLERANCE : ±0.2mm

2. SCHEMATIC : Top View



1.Anode
3.Cathode
4.GND
5.Vo
6.Vcc

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●Absolute Maximum Ratings

(Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward current (*1)	I_F	25	mA
	Peak forward current (*2)	I_{FM}	40	mA
	Reverse voltage	V_R	5	V
	Power dissipation	P_D	45	mW
Output	Supply voltage	V_{CC}	7	V
	High level output voltage	V_{OIL}	7	V
	Low level output current	I_{OL}	50	mA
	Output collector power dissipation	P_C	85	mW
Isolation voltage 1 minute (*3)		Viso	2500	Vrms
Operating temperature		Topr	-40 to +85	℃
Storage temperature		Tstg	-55 to +125	℃
Soldering temperature 10 second		Tsol	260	℃

●Electro-optical Characteristics

(Ta= 0 to+ 85°C unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input forward voltage (*4)	V_F	I_F=10mA,Ta=25℃	-	1.6	1.75	V
Input reverse voltage	BV_R	I_R=10uA,Ta=25℃	5	-	-	V
Input capacitance	C_{IN}	V_F=0, f=1MHz	-	60	-	pF
Logic (1) output current	I_{OH}	V_{CC}=3.3V,V_O=5.5V,I_F=250uA	-	2	250	uA
Logic (0) output voltage	V_{OL}	V_{CC}=3.3V,I_F=5mA, $I_{OL(Sinking)}$=13mA	-	0.4	0.6	V
Logic (1) supply current	I_{CCH}	V_{CC}=3.3V,IF=0mA	-	7	15	mA
Logic (0) supply current	I_{CCL}	V_{CC}=3.3V,IF=10mA	-	13	18	mA
Leak current (*5)	I_{I-O}	45%RH,Ta=25℃,t=5s,V_{I-O}=3000V_{DC}	-	-	1.0	mA
Isolation resistance (input-output) (*5)	R_{I-O}	V_{I-O}=500V, Ta=25℃	-	10^{12}	-	Ω
Capacitance (input-output) (*5)	C_{I-O}	f=1MHZ, Ta=25℃	-	0.6	-	pF
Propagation delay time Output (0)→(1) (*6)	t_{PLH}	I_F=7.5mA,V_{CC}=3.3V,RL=350Ω, CL=15pF,Ta=25℃	-	45	100	ns
Propagation delay time Output (1)→(0) (*6)	t_{PHL}		-	45	75	ns
Output rise-fall time (10 to 90%)	tr,tf	I_F=7.5mA,V_{CC}=3.3V,RL=350	-	30	-	ns
Instantaneous common mode rejection voltage "output(0)" (*7)	CM_H	I_F=0mA, V_{CM}=10V,$V_{O(Min)}$=2.0V RL=350Ω	-	500	-	V/us
Instantaneous common mode rejection voltage "output(1)" (*7)	CM_L	I_F=5mA, V_{CM}=10V,$V_{O(Max)}$=0.8V RL=350Ω	-	-500	-	V/us

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Note) Typical values are all at Vcc = 3.3V, Ta= 25°C
*1 Ta=0 to 70°C.
*2 Pulse width <= 1ms
*3 40 to 80%RH AC for 1 minute ,f=60HZ.
*4 At Iin =10mA, VF decreases at the rate of 1.6mV/°C if the temperature goes up.
*5 Measured as 2-pin element. Connect pins 2 and 3, connect pins 5, 6, 7 and 8.
*6 Refer to the Fig. 1.
*7 CMH represents a common mode voltage ignorable rise time ratio that can hold logic (1) state in output.
CML represents a common mode voltage ignorable fall time ratio that can hold logic (0) state in output.

●Recommmended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Low level input current	I_{FL}	0	250	uA
High level input current	I_{FH}	7.0	15	mA
Supply voltage	V_{CC}	4.5	5.5	V
Fanout (TTL load)	N	-	8	-
Operating temperature	T_{opr}	-40	85	℃

Circuit Block Diagram

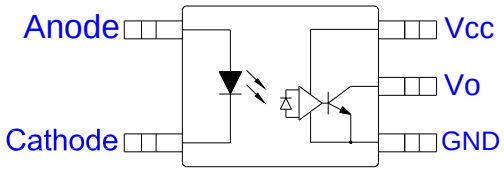

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Fig.1 Test Circuit for Propagation Delay time

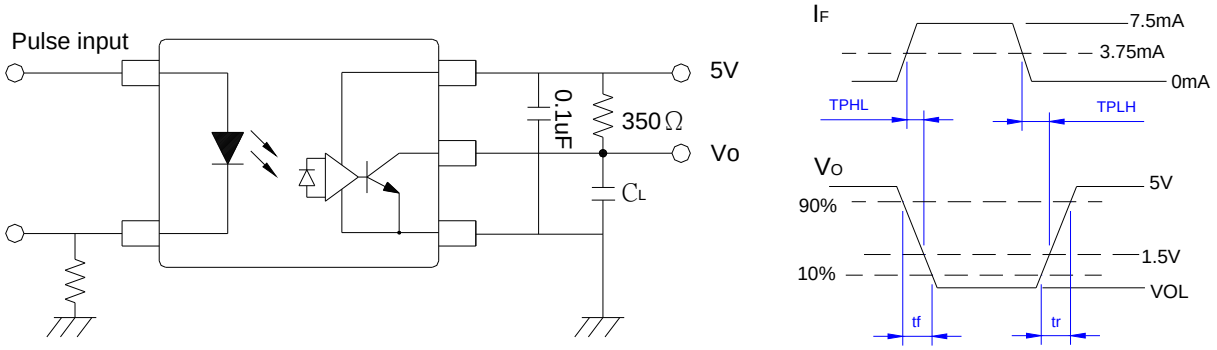

Fig.2 Test Circuit for Instantaneous Common Mode Rejection Voltage

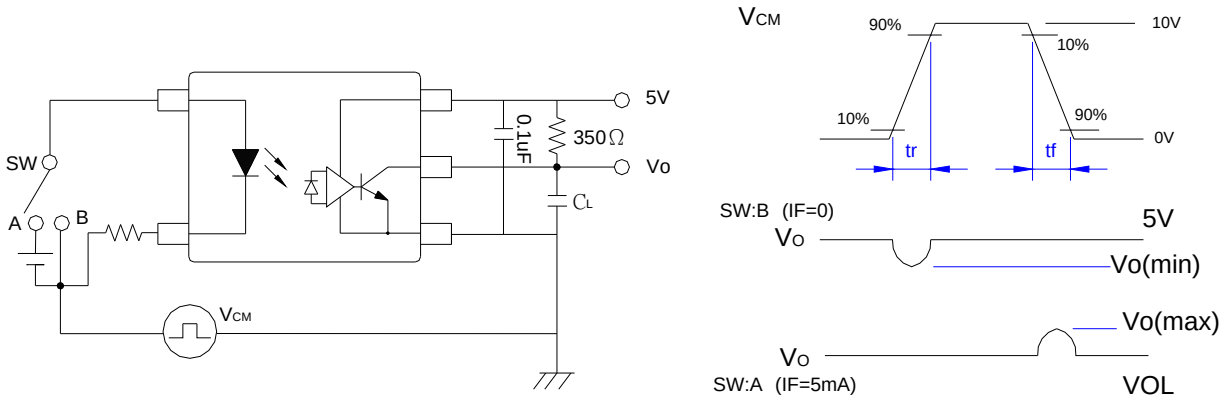

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Fig.1 Low Level Output Voltage vs. Ambient Temperature

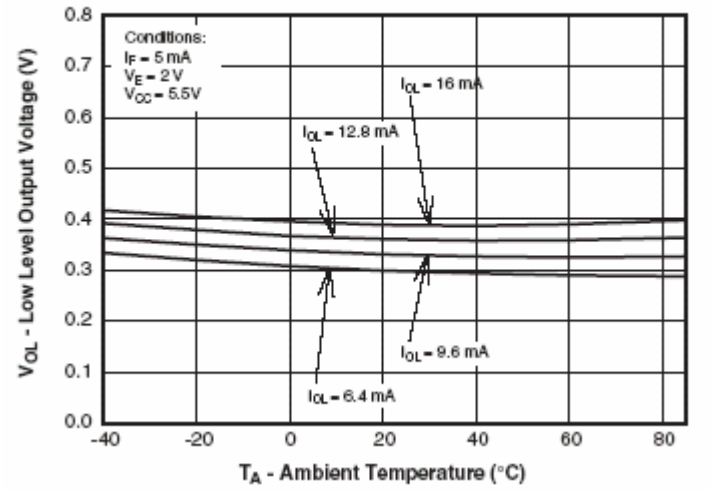

Fig.2 Input Diode Forward Voltage vs. Forward Current

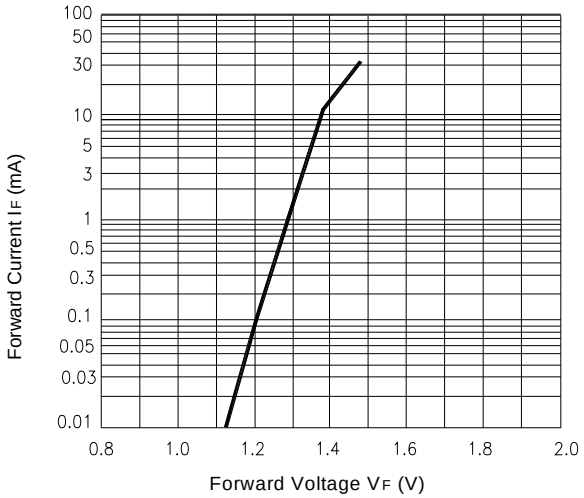

Fig.3 Switching Time vs. Forward Current

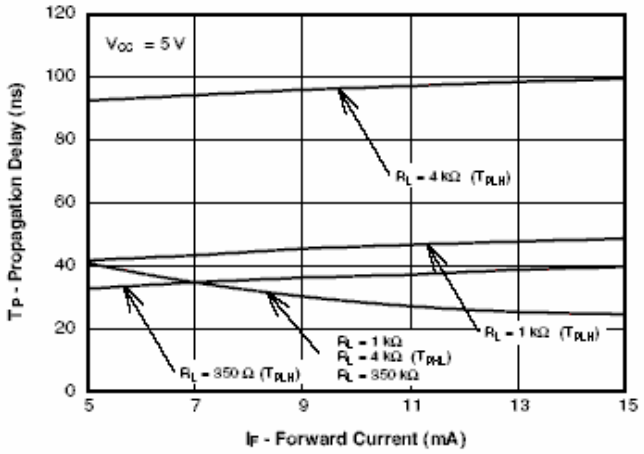

Fig. 4 Low Level Output Current vs. Ambient Temperature

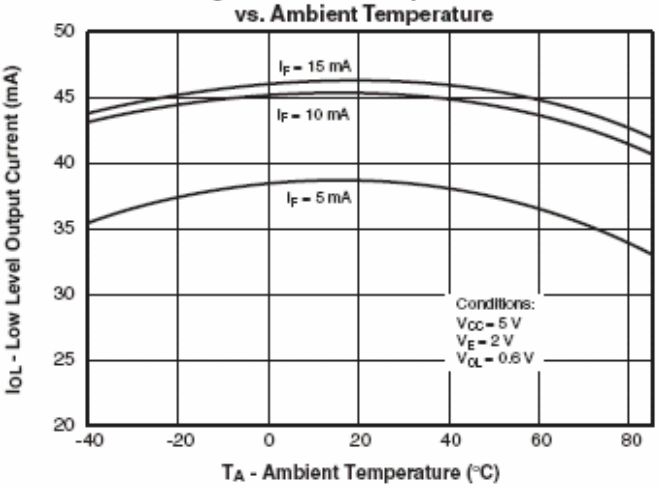

Fig. 5 Input Threshold Current vs. Ambient Temperature

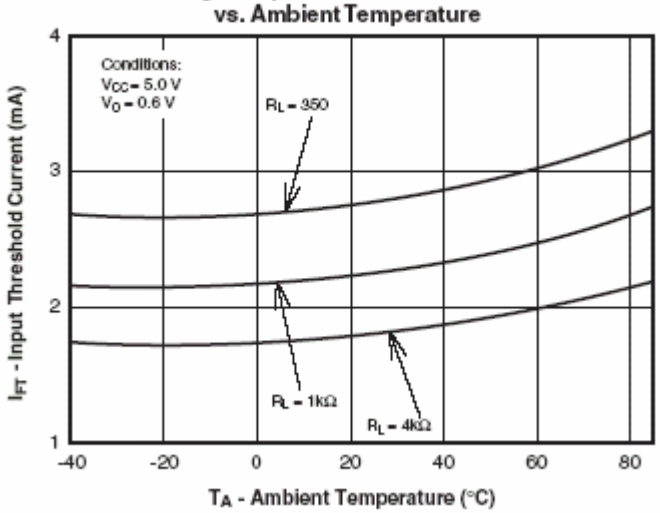

Fig. 6 Output Voltage vs. Input Forward Current

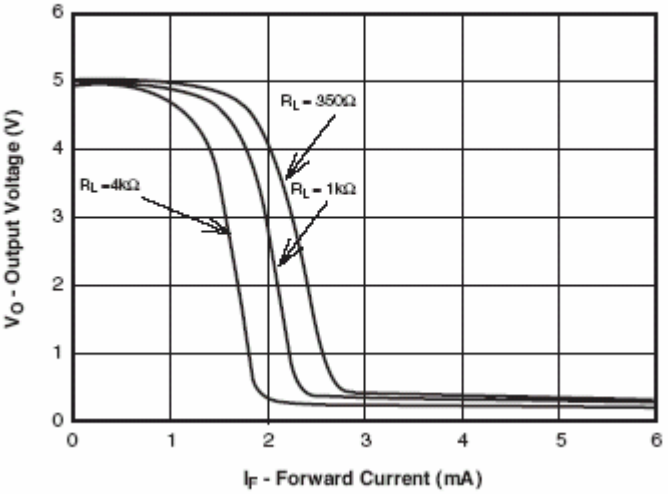

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Fig. 7 Pulse Width Distortion vs. Temperature

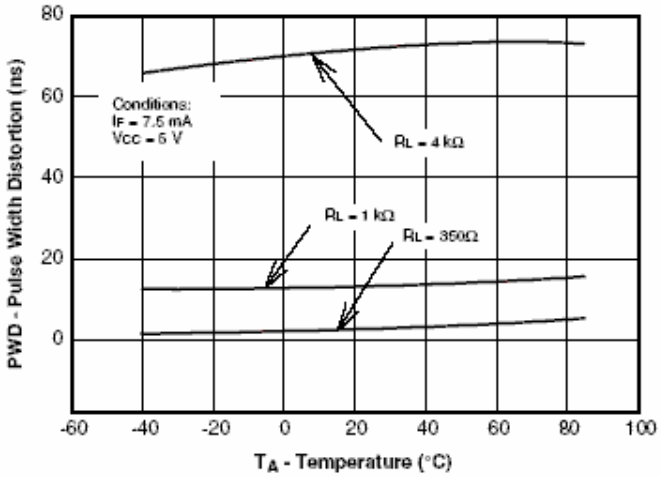

Fig. 8 Rise and Fall Time vs. Temperature

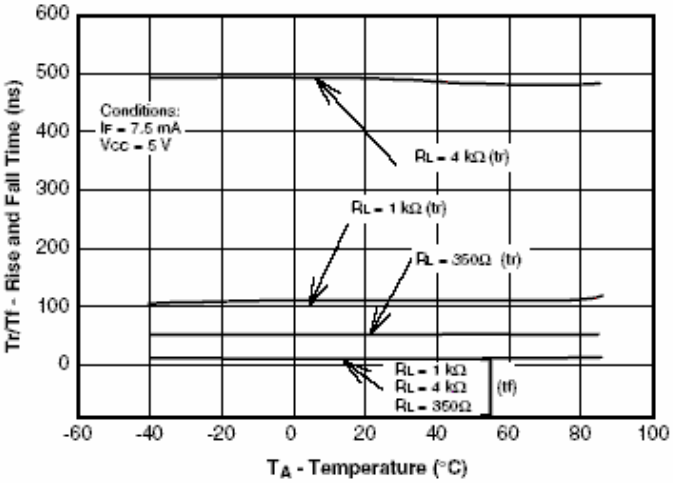

Fig. 10 Switching Time vs. Temperature

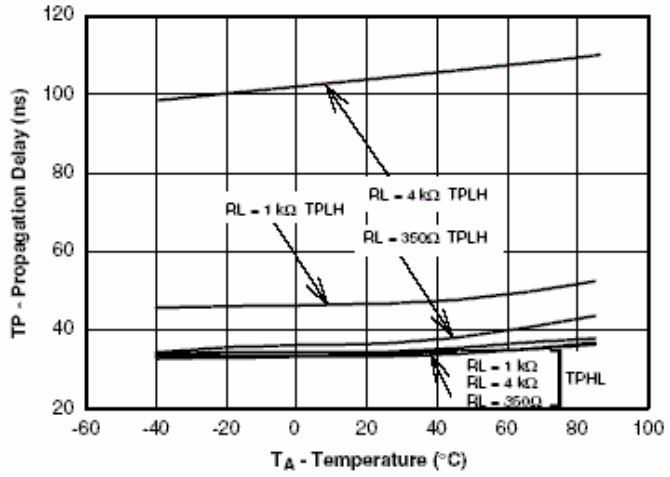

Fig. 11 High Level Output Current vs. Temperature