

PRODUCT SPECIFICATION

DATE : 06/03/2005

cosmo ELECTRONICS CORPORATION	Photocoupler : KPC6N136	NO.60P51009	REV.
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General Purpose Type Photocoupler

● Features

1. High speed response t_{PHL} , t_{PLH}
(MAX. 0.8us at $RL=1.9K\Omega$)
2. High common mode rejection voltage
(CM_H : TYP. 1KV/us)
3. Standard dual-in-line package

● Application :

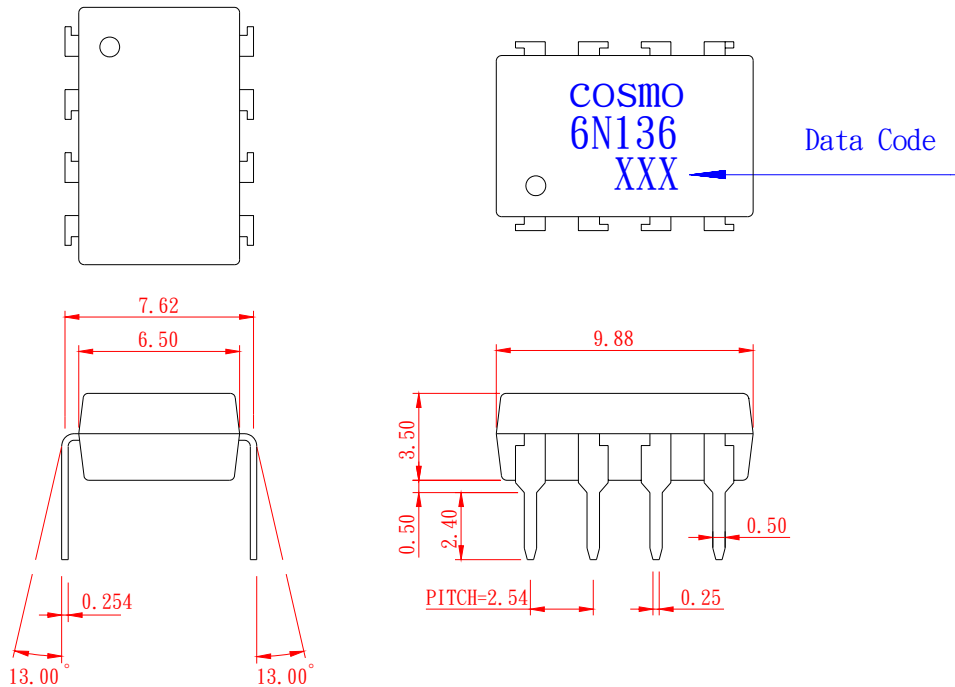
1. Computers, measuring instruments, control equipment.
2. High speed line receivers, high speed logic.
3. Telephone sets.
4. Signal transmission between circuits of different Potentials and impedances.

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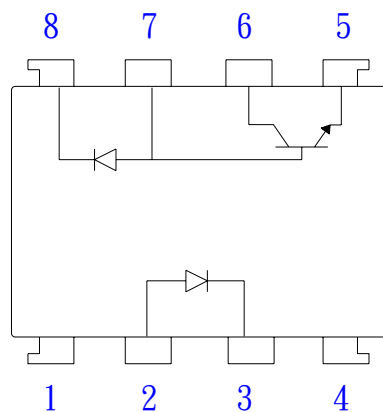
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● Outside Dimension : Unit (mm)



TOLERANCE : $\pm 0.2\text{mm}$

● Schematic : Top View



1. NC
2. Anode
3. Cathode
4. NC
5. GND
6. V_O
7. V_B
8. V_{CC}

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● Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	25	mA
	*1 Peak forward current	I_F	50	mA
	*2 Peak transient forward current	I_{FM}	1	A
	Reverse voltage	V_R	5	V
	Power dissipation	P	45	mW
Output	Supply voltage	V_{CC}	-0.5 to 15	V
	Output voltage	V_O	-0.5 to 15	V
	Emitter-base reverse with stand voltage (Pin5 to 7)	V_{EBO}	5	V
	Average output current	I_O	8	mA
	Peak output current	I_{OP}	16	mA
	Base current (Pin7)	I_B	5	mA
	Power dissipation	P_O	100	mW
*3 Isolation voltage 1 minute		V_{iso}	2500	Vrms
Operating temperature		T_{opr}	-55 to +115	°C
Storage temperature		T_{stg}	-55 to +125	°C
*4 Soldering temperature 10 second		T_{sol}	260	°C

*1 50% duty cycle, Pulse width : 1mS

Decreases at the rate of 1.6mA/°C if the external temperature is 70°C or more.

*2 Pulse width \leq 1uS, 300pulse/sec

*3 40 to 60% RH, AC for 1 minute

*4 For 10 seconds

● Electro-optical Characteristics

(Ta=0 to +70°C unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*5 Current transfer ratio	CTR(1)	Ta=25°C, $I_F=16mA$ $V_O=0.4V, V_{CC}=4.5V$	19	40	-	%
	CTR(2)	$I_F=16mA$ $V_O=0.5V, V_{CC}=4.5V$	15	43	-	%
Logic (0) output voltage	V_{OL}	*6 $V_{CC}=4.5V, I_F=16mA$	-	0.1	0.4	V
Logic (1) output current	$I_{OH}(1)$	Ta=25°C, $I_F=0$ $V_O=V_{CC}=5.5V$	-	3.0	500	nA
	$I_{OH}(2)$	Ta=25°C, $I_F=0$ $V_O=V_{CC}=15V$	-	0.01	1.0	uA
	$I_{OH}(3)$	$V_{CC}=V_O=15V, I_F=0$	-	-	50	uA
Logic (0) supply current	I_{CCL}	$I_F=16mA$ $V_O=open, V_{CC}=15V$	-	200	-	uA
Logic (1) supply current	$I_{CCH}(1)$	Ta=25°C, $I_O=0$ $V_F=open, V_{CC}=15V$	-	0.02	1.0	uA
	$I_{CCH}(2)$	$I_O=0$ $V_O=open, V_{CC}=15V$	-	-	2.0	uA
Input forward voltage	V_F	Ta=25°C, $I_F=16mA$	-	1.7	1.95	V
Input forward voltage temperature coefficient	$\Delta V_F/\Delta Ta$	$I_F=16mA$	-	-1.9	-	mV/°C
Input reverse voltage	BV_R	Ta=25°C, $I_R=10uA$	5.0	-	-	V
Input capacitance	C_{IN}	$V_F=0, f=1MHz$	-	60	-	pF
*7 Leak current (input-output)	I_{I-O}	Ta=25°C, 45%RH $V_{I-O}=3KVDC, t=5s$	-	-	1.0	uA
*7 Isolation resistance (input-output)	R_{I-O}	$V_{I-O}=500VDC$	-	10^{12}	-	Ω
*7 Capacitance (input-output)	C_{I-O}	$f=1MHz$	-	0.6	-	pF
Transistor current amplification factor	h_{FE}	$V_O=5V, I_O=3mA$	-	70	-	

*5 Current transfer ratio is the ratio of input current and output current expressed in %

*6 $I_O=2.4mA$

*7 Measured as 2-pin element (Short 1, 2, 3, 4 and 5, 6, 7, 8)

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● Switching Characteristics

(Ta=25°C, V_{CC}=5V, I_F=16mA)

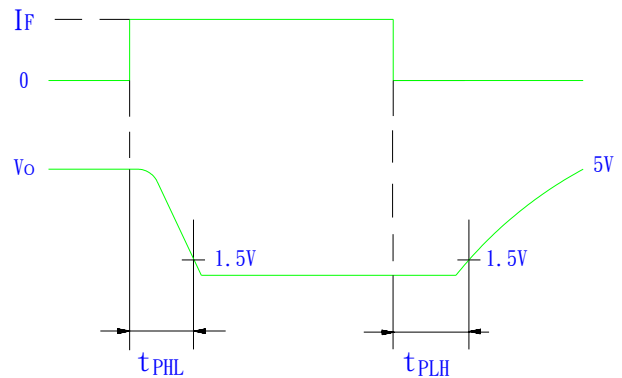
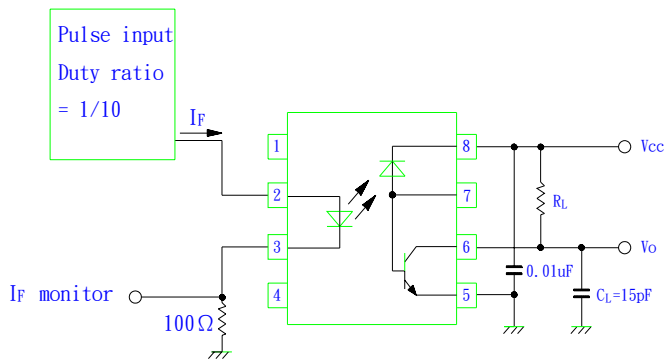
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*8 Propagation delay time *9 Output (1) → (0)	t _{PHL}	R _L =1.9KΩ	-	0.3	0.8	uS
*8 Propagation delay time *9 Output (0) → (1)	t _{PLH}	R _L =1.9KΩ	-	0.3	0.8	uS
*10 Instantaneous common mode rejection voltage *11 " Output (1) "	CM _H	I _F =0, V _{CM} =10V _{P-P}	-	1000	-	V/uS
*10 Instantaneous common mode rejection voltage *11 " Output (0) "	CM _L	I _F =16mA, V _{CM} =10V _{P-P}	-	-1000	-	V/uS
*12 Bandwidth	BW	R _L =100Ω	-	2.0	-	MHz

*8 R_L=1.9KΩ is equivalent to one LSTTL and 5.6KΩ pull-up resistor.

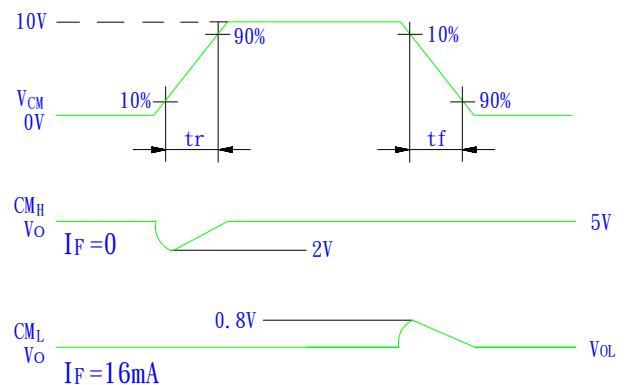
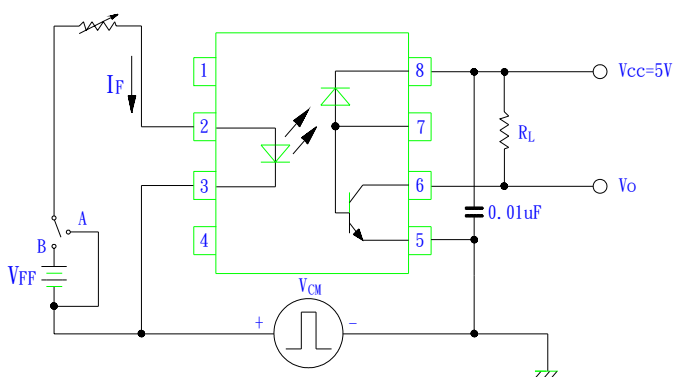
*10 Instantaneous common mode rejection voltage " output (1) " represents a common mode voltage variation that can hold the output above (1) level (V_o > 2.0V)
Instantaneous common mode rejection voltage " output (0) " represents a common mode voltage variation that can hold the output above (0) level (V_o < 0.8V)

*12 Bandwidth represents a point where AC input goes down by 3dB.

*9 Test Circuit Propagation Delay Time



*11 Test Circuit for Instantaneous Common Mode Rejection Voltage



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