

PRODUCT SPECIFICATION

DATE : 03/26/2012

cosmo ELECTRONICS CORPORATION	Photocoupler : KPC6N136S	NO.61P51001	REV.
		SHEET 1 OF 5	3

General Purpose Type Photocoupler

● Features

1. Pb free and RoHS compliant.
2. High speed response t_{PHL} , t_{PLH}
(MAX. 0.8us at $R_L=1.9K\Omega$)
3. High common mode rejection voltage
(CM_H : TYP. 1KV/us)
4. Compact surface mount type package
5. Agency Approvals
UL approved : UL1577 , No.E169586
CUL approved : C22.2 No.1 & NTC No.5 , No.E169586
VDE approved : EN60747 , No.40006080
FIMKO approved : EN 60065 No. FI 25798
EN 60950 No. FI 25798

● Application :

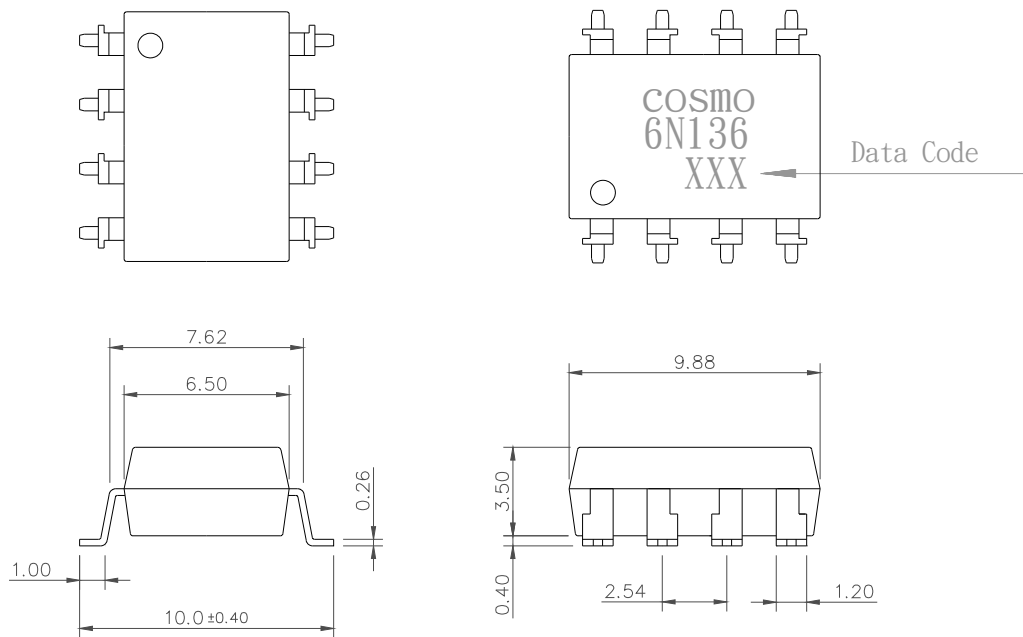
1. Computers, measuring instruments, control equipment.
2. High speed line receivers, high speed logic.
3. Telephone sets.
4. Signal transmission between circuits of different Potentials and impedances.

PRODUCT SPECIFICATION

DATE : 03/26/2012

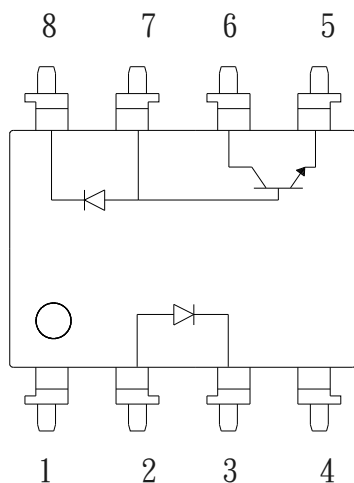
cosmo ELECTRONICS CORPORATION	Photocoupler : KPC6N136S	NO.61P51001	REV. 3
		SHEET 2 OF 5	

● Outside Dimension : Unit (mm)



TOLERANCE : ±0.2mm

● Schematic : Top View



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

PRODUCT SPECIFICATION

DATE : 03/26/2012

cosmo ELECTRONICS CORPORATION	Photocoupler : KPC6N136S	NO.61P51001	REV. 3
		SHEET 3 OF 5	

● 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}	5000	Vrms
Operating temperature		T_{opr}	-55 to +100	°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 ≤ 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)

PRODUCT SPECIFICATION

DATE : 03/26/2012

cosmo ELECTRONICS CORPORATION	Photocoupler : KPC6N136S	NO.61P51001	REV. 3
		SHEET 4 OF 5	

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

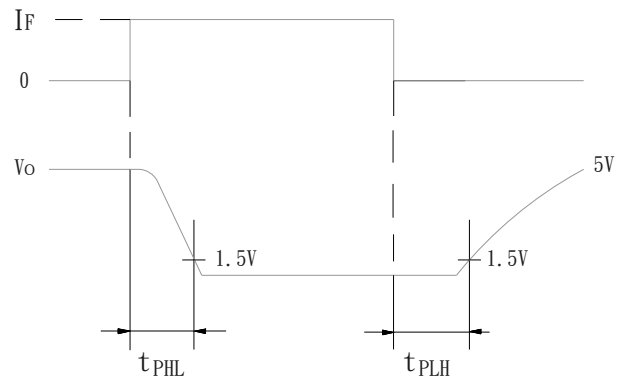
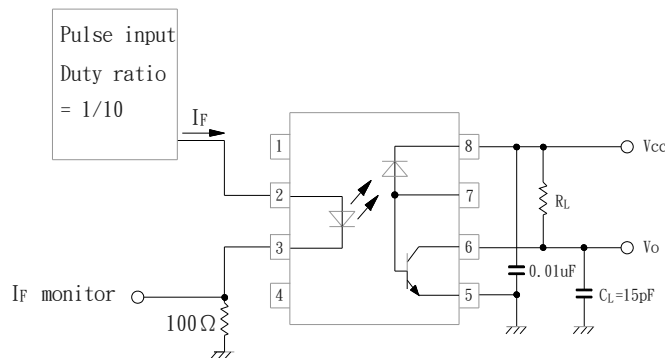
*8 R_L=1.9KΩ is equivalent to one LSTTL and 5.6KΩ pull-up resistor.

*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)

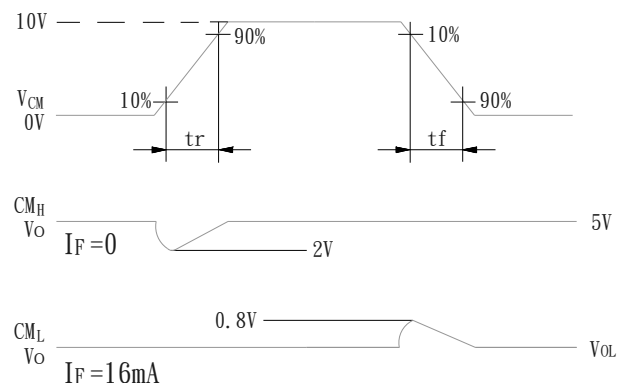
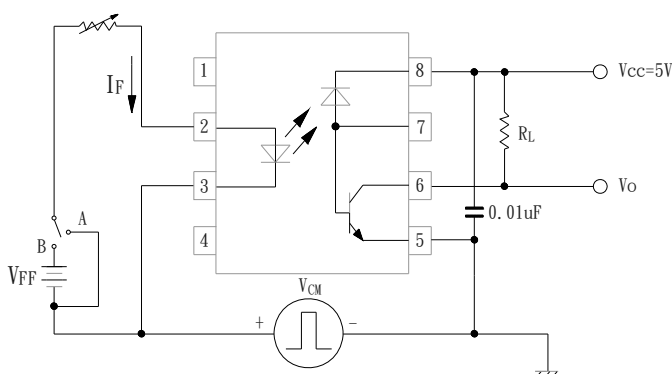
Instantaneous common mode rejection voltage " output (0) " represents a common mode voltage variation that can hold the output above (0) level (V_O < 0.8V)

*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



PRODUCT SPECIFICATION

DATE : 03/26/2012

cosmo ELECTRONICS CORPORATION	Photocoupler : KPC6N136S	NO.61P51001	REV.
		SHEET 5 OF 5	3

● Notice

The information contained in this document is intended to be a general product description and is subject to change without notice. Please contact cosmo in order to obtain the latest device data sheets before using any cosmo device. cosmo does not assume any responsibility for use of any circuitry described. No circuit patent licenses are implied. This publication is the property of cosmo. No part of this publication may be reproduced or copied in any form or by any means, or transferred to any third party without the prior written consent of cosmo Electronics Corporation.

The devices listed in this document are designed for general applications only in electronic equipment. No devices shall be deployed which require higher level of reliability such as :

- Medical and other life support equipments.
- Space application.
- Telecommunication equipment (trunk lines).
- Nuclear power control equipment.

Unless it received prior written approval from cosmo.

cosmo takes no responsibility for damages arise form the improper usage of our device. Please contact cosmo for further information regarding the above notices.