

PRODUCT SPECIFICATION

DATE : 03/26/2012

cosmo ELECTRONICS CORPORATION	Photocoupler : KPC6N139	NO.60P51004	REV.
		SHEET 1 OF 5	2

General Purpose Type Photocoupler

● Features

1. Pb free and RoHS compliant.
2. High current transfer ratio
(CTR : MIN. 500% at $I_F=1.6\text{mA}$)
3. High speed response
(t_{PHL} : TYP. 0.2us at $R_L=270\Omega$)
4. High common mode rejection voltage
(CM_H : TYP. 500V/us)
5. TTL compatible output
6. 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 :

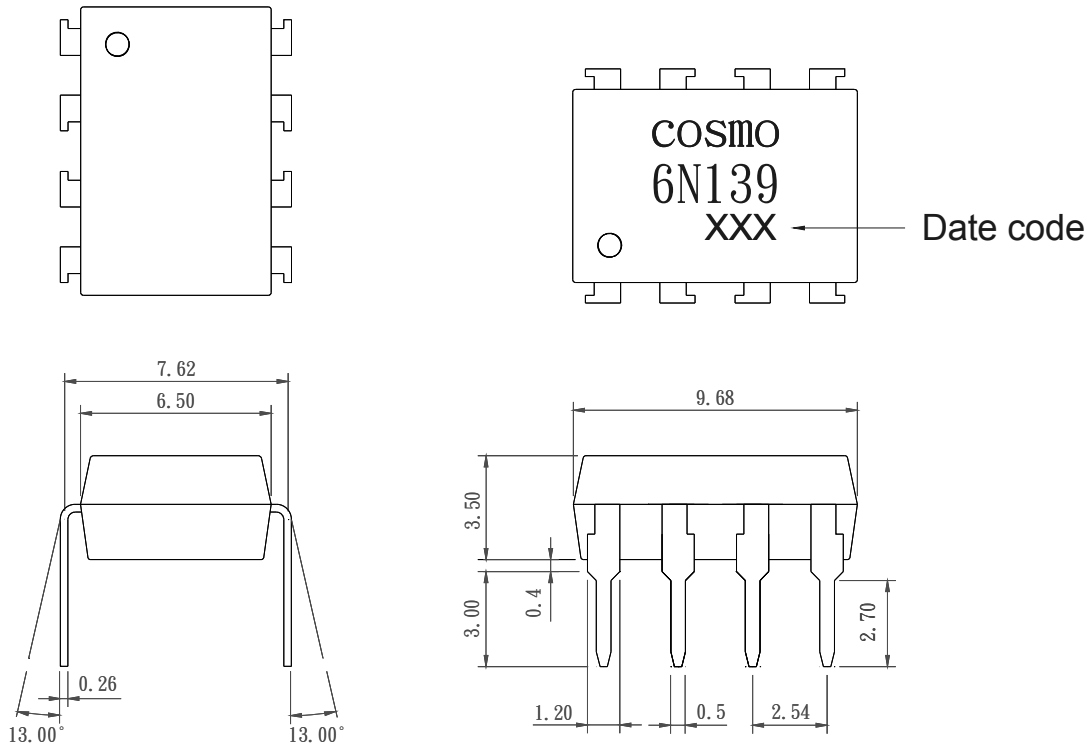
1. Interfaces for computer peripherals.
2. Electronic calculators, measuring instruments, control equipment.
3. Telephone sets.
4. Signal transmission between circuits of different Potentials and impedances.

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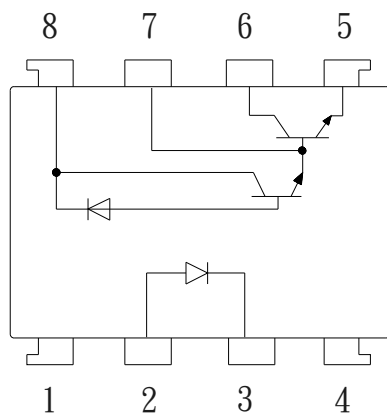
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● Outside Dimension : Unit (mm)



TOLERANCE : ±0.2mm

● 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	20	mA
	*1 Peak forward current	I_F	40	mA
	*2 Peak transient forward current	I_{FM}	1	A
	Reverse voltage	V_R	5	V
	Power dissipation	P	35	mW
Output	Supply voltage	V_{CC}	-0.5 to 18	V
	Output voltage	V_O	-0.5 to 18	V
	Emitter-base reverse with stand voltage (Pin5 to 7)	V_{EBO}	0.5	V
	*3 Average output current	I_O	60	mA
	Power dissipation	P_O	100	mW
*4 Isolation voltage 1 minute		V_{iso}	5000	Vrms
Operating temperature		T_{opr}	0 to +100	°C
Storage temperature		T_{stg}	-55 to +125	°C
*5 Soldering temperature 10 second		T_{sol}	260	°C

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

*2 Pulse width \leq 1us, 300pps

*3 Decreases at the rate of 0.7mA/°C if the external temperature is more than 25°C.

*4 40 to 60% RH, AC for 1 minute

*5 For 10 seconds

● Electro-optical Characteristics

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

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*6 Current transfer ratio	CTR(1)	$I_F=0.5mA, V_O=0.4V, V_{CC}=4.5V$	400	1800	-	%
	CTR(2)	$I_F=1.6mA, V_O=0.4V, V_{CC}=4.5V$	500	1600	-	%
Logic (0) output voltage	$V_{OL}(1)$	$I_F=6.4mA, I_O=1.6mA, V_{CC}=4.5V$	-	0.1	0.4	V
	$V_{OL}(2)$	$I_F=5mA, I_O=15mA, V_{CC}=4.5V$	-	0.1	0.4	V
	$V_{OL}(3)$	$I_F=12mA, I_O=24mA, V_{CC}=4.5V$	-	0.1	0.4	V
Logic (1) output current	I_{OH}	$I_F=0, V_O=V_{CC}=18V$	-	0.05	100	uA
Logic (0) supply current	I_{CCL}	$I_F=1.6mA, V_O=open, V_{CC}=5V$	-	0.5	-	mA
Logic (1) supply current	I_{CCH}	$I_F=0, V_F=open, V_{CC}=5V$	-	10	-	nA
Input forward voltage	V_F	Ta=25°C, $I_F=1.6mA$	-	1.5	1.7	V
Input forward voltage temperature coefficient	$\Delta V_F/\Delta Ta$	$I_F=1.6mA$	-	-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

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

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

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● Switching Characteristics

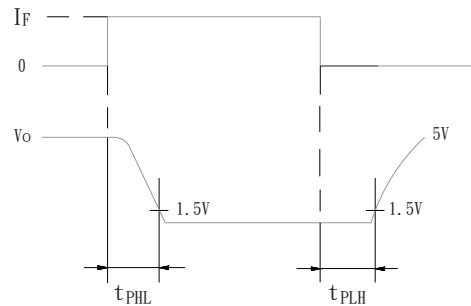
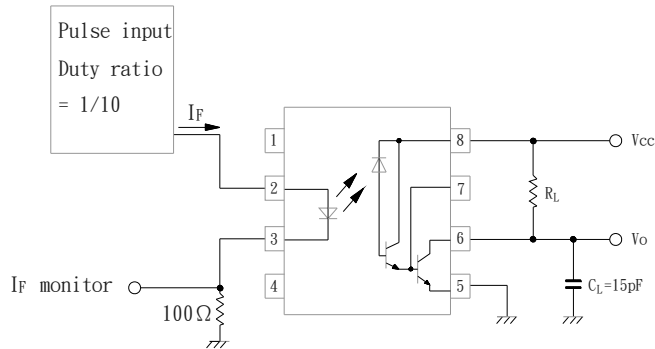
(Ta=25°C, V_{CC}=5V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*8 Propagation delay time Output (1) → (0)	t _{PHL}	R _L =4.7KΩ, I _F =0.5mA	-	5	25	uS
		R _L =270Ω, I _F =12mA	-	0.3	1	uS
*8 Propagation delay time Output (0) → (1)	t _{PLH}	R _L =4.7KΩ, I _F =0.5mA	-	10	60	uS
		R _L =270Ω, I _F =12mA	-	1.5	7	uS
*9 Instantaneous common mode rejection voltage “ Output (1) “	CM _H	I _F =0, V _{CM} =10V _{P-P} , R _L =2.2KΩ	-	500	-	V/uS
*9 Instantaneous common mode rejection voltage “ Output (0) “	CM _L	I _F =1.6mA, V _{CM} =10V _{P-P} , R _L =2.2KΩ	-	-500	-	V/uS

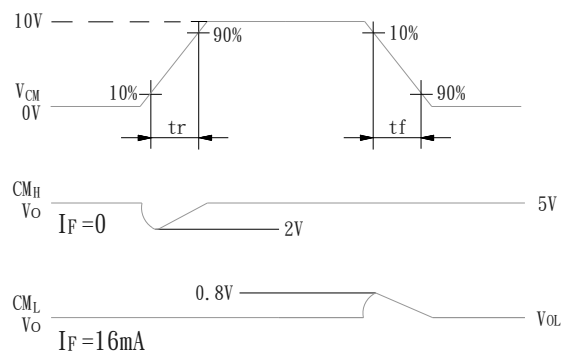
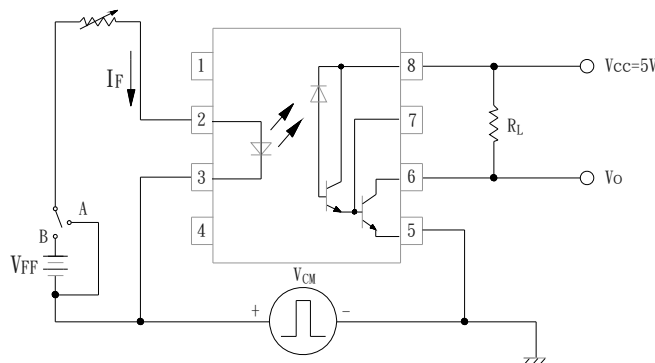
*9 Instantaneous common mode rejection voltage “ output (1) “ represents a common mode voltage variation that can hold the output above (1) level (V_o > 2.0V)

*10 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)

*8 Test Circuit Propagation Delay Time



*10 Test Circuit for Instantaneous Common Mode Rejection Voltage



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