PRODUCT SPECIFICATION

DATE: 03/26/2012

cosmo ELECTRONICS CORPORATION	Photocoupler : KPC6N138S	NO.61P51003	REV. 2
		SHEET 1 OF 7	

General Purpose Type Photocoupler

●Features

1. Pb free and RoHS compliant.
2. High current transfer ratio
   (CTR:MIN.300% at I_F =1.6mA)
3. High speed response
   (t_{PHL}:TYP.2us at R_L =2.2kΩ)
4. Instantaneous common mode rejection voltage
   (CM_H : TYP.500V/us)
5. TTL compatible output
6. Compact surface mount type package.
7. 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

●Applications

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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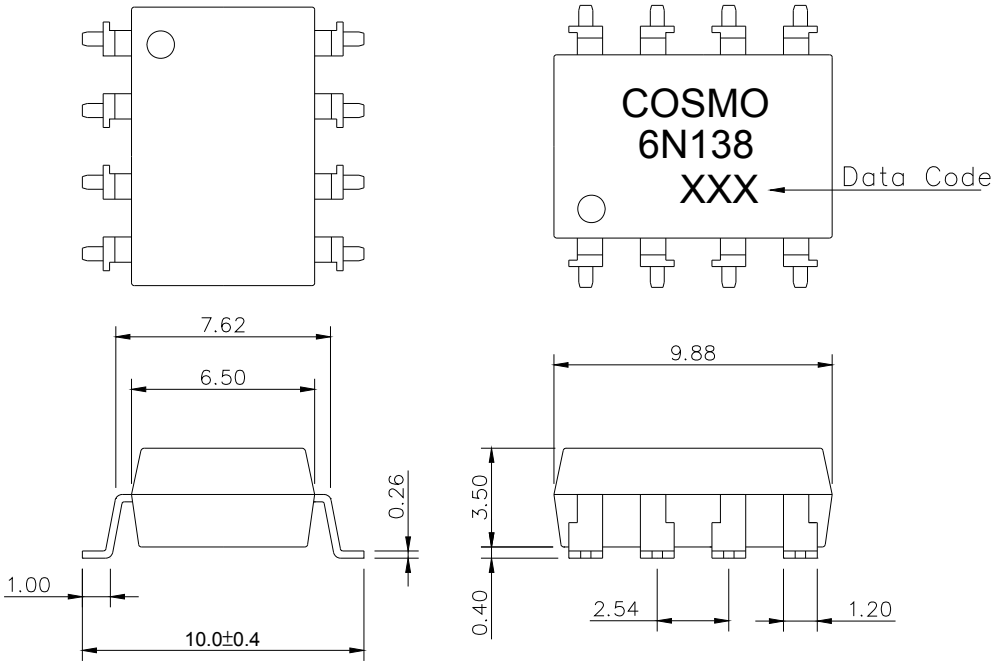
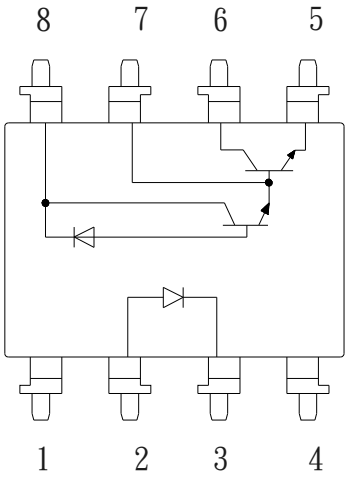
1. OUTSIDE DIMENSION : UNIT (mm)



TOLERANCE : ±0.2mm

2. SCHEMATIC : TOP VIEW



1. NC
2. Anode
3. Cathode
4. NC
5. GND
6. Vo
7. V_B
8. Vcc

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●Absolute Maximum Ratings

(Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	20	mA
	*1Peak forward current	I_F	40	mA
	*2Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	5	V
	Power dissipation	P_D	35	mW
Output	Supply voltage	V_{cc}	-0.5 to 7	V
	Output voltage	Vo	-0.5 to 7	V
	Emitter-base reverse with-stand voltage (Pin 5 to 7)	V_{EBO}	0.5	V
	*3Average output current	Io	60	mA
	Power dissipation	P_o	100	mW
*4Isolation voltage 1 minute		Viso	5000	Vrms
Operating temperature		Topr	-40 to +100	℃
Storage temperature		Tstg	-55 to +125	℃
*5Soldering temperature		Tsol	260	℃

*1 50% duty cycle, pulse width : 1mS
*2 Pulse width<=1uS,300 pulse/sec
*3 Decreases at the rate of 0.7mA/℃ if the external temperature is 25℃ or more
*4 40% to 60% RH,AC for 1 minute
*5 For 10 seconds

●Electro-optical Characteristics

(Ta=0 to +70℃ unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*6 Current transfer ratio	CTR	I_F=1.6mA Vo=0.4V,Vcc=4.5V	300	1600	-	%
Logic (0) output volage	V_{OL}	I_F=1.6mA Io=4.8mA,Vcc=4.5V	-	0.1	0.4	V
Logic (1) output current	I_{OH}	I_F=0,Vo=Vcc=7V	-	0.1	250	uA
Logic (0) supply current	I_{CCL}	I_F=1.6mA,Vo=open,Vcc=5V	-	0.5	-	mA
Logic (1) supply current	I_{CCH}	I_F=0,V_O=open,Vcc=5V	-	10	-	nA
Input forward voltage	V_F	Ta=25℃,I_F=1.6mA	-	1.5	1.7	V
Input forward voltage temperature coefficient	△V_F/△Ta	IF=1.6mA	-	-1.9	-	mV/℃
Input reverse voltage	BV_R	Ta=25℃,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℃,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 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

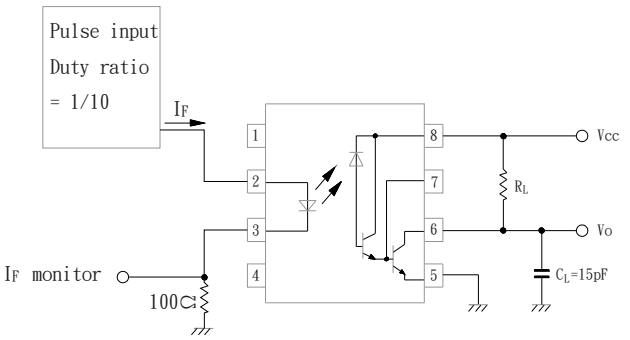
(Ta=25℃ ,Vcc=5V)

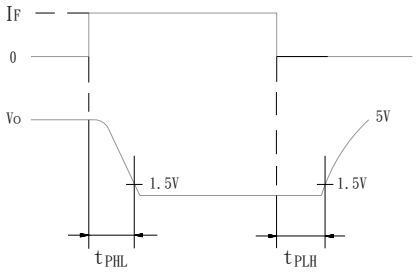
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*8 Propagation delay time Output (1)-->(0)	t_{PHL}	R_L=2.2kΩ,I_F=1.6mA	-	2	10	uS
*8 Propagation delay time Output (0)-->(1)	t_{PLH}	R_L=2.2kΩ,I_F=1.6mA	-	7	35	uS
*9 Instantaneous common *10 mode rejection voltage "Output (1)"	CM_H	I_F=0,V_{CM}=10Vp-p,R_L=2.2kΩ	-	500	-	V/uS
*9 Instantaneous common *10 mode rejection voltage "Output (0)"	CM_L	I_F=1.6mA,V_{CM}=10Vp-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 (Vo > 2.0V)

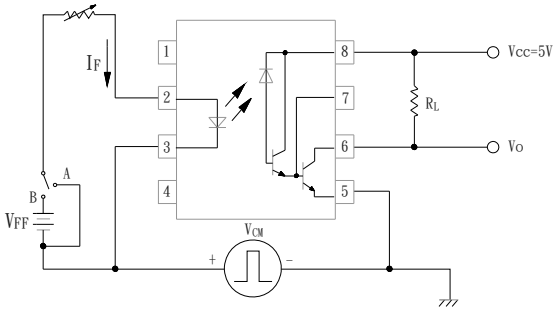
*10 Instantaneous common mode rejection voltage "output(0)" represents.
a common mode voltage variation that can hold the output above (0) level (Vo < 0.8V)

*8 Tset Circuit Propagation Delay Time





*10 Tset Circuit for Instantaneous Common Mode Rejection Voltage



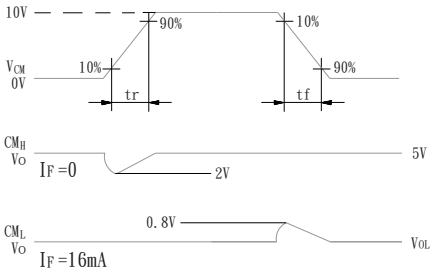


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Fig.1 **LED Forward Current vs. Forward Voltage**

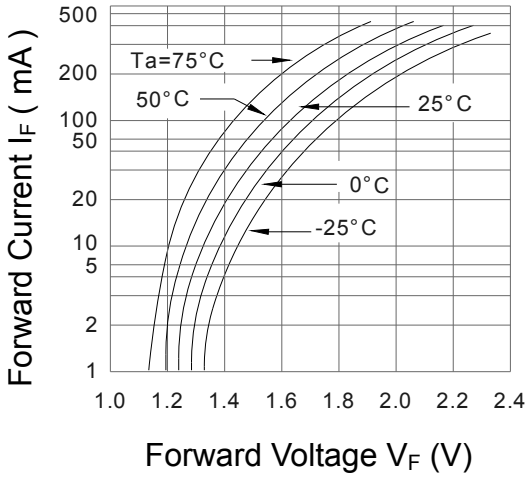

Fig.2 **LED Forward Current vs. Ambient Temperature**

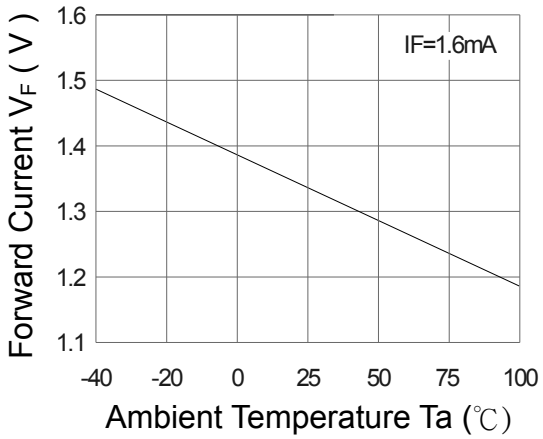

Fig.3 **Response and Fall Time vs. Load Resistance**

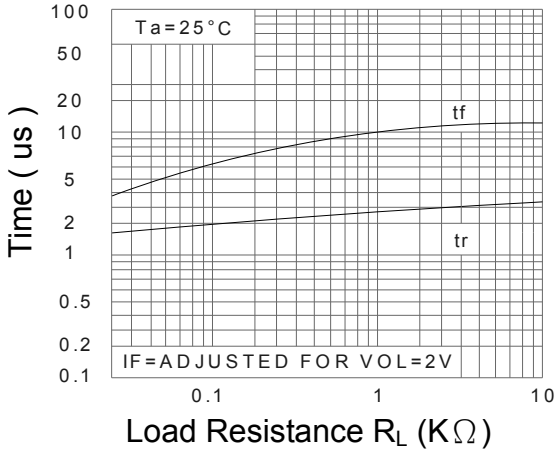

Fig.4 **Current Transfer Ratio vs. Forward Current**

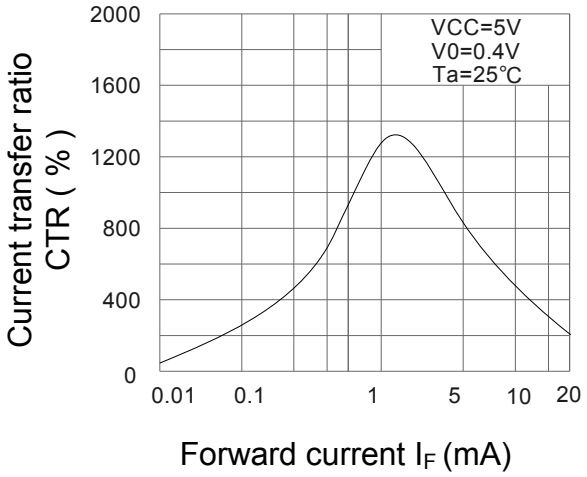

Fig.5 **Current Transter Ratio vs. Base-Emitter Resistance**

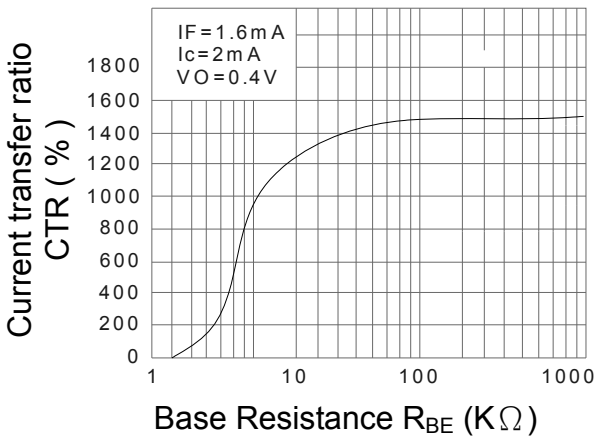

Fig.6 **Output Current vs. Output Voltage**

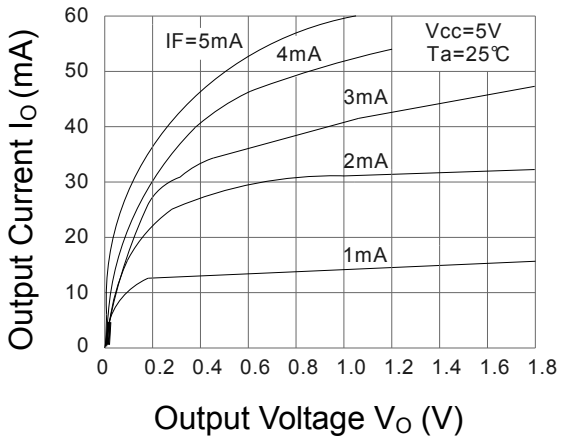

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Fig.7 **Output Current vs. Input Diode Forward Current**

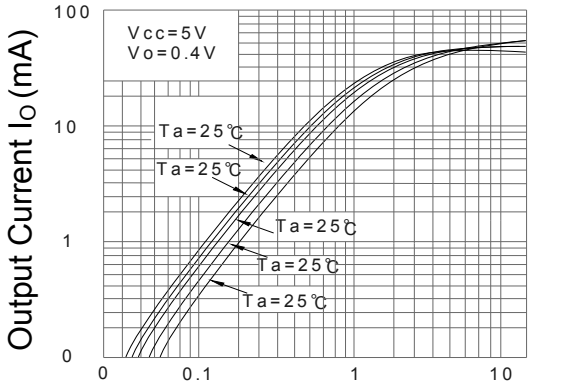


Fig.8 **Logic Low Supply Current vs. Input Diode Forward Current**

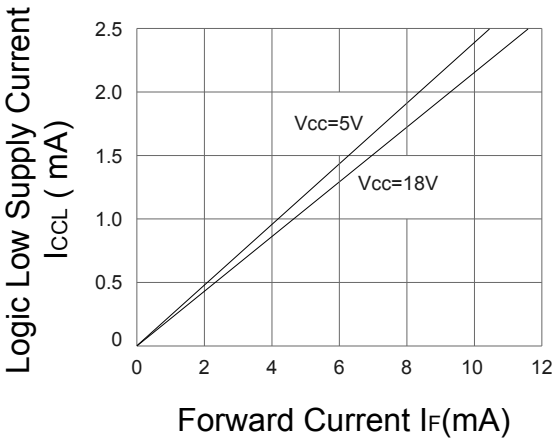


Fig.9 **Propagation Delay vs. Input Diode Forward Current**

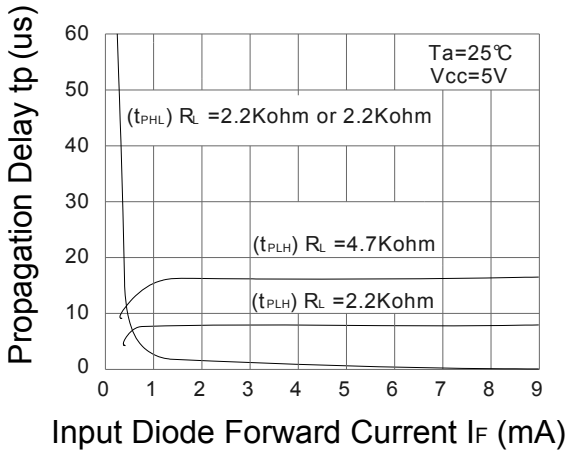
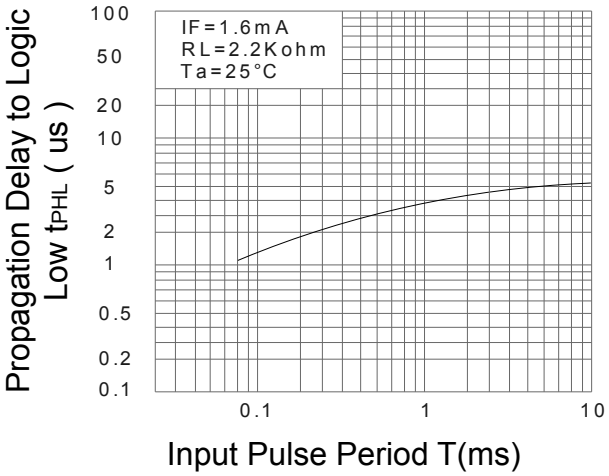


Fig.10 **Propagation Delay to Logic Low vs. Pulse Period**



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