

HIGH SPEED COUPLER

6N137

INFRARED LED+ PHOTO IC

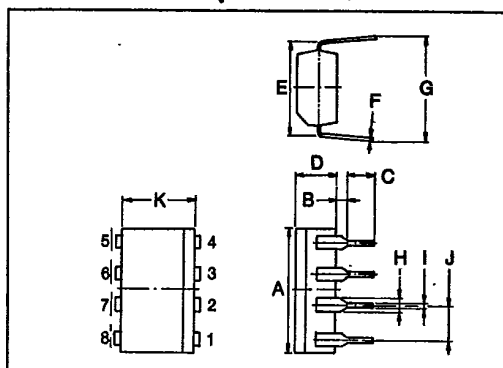
The 6N137 consists of a high emitting diode and a one chip photo IC. This unit is an 8-lead DIP package.

APPLICATIONS

- DIGITAL LOGIC ISOLATION
- TELE-COMMUNICATIONS
- ANALOG DATA EQUIPMENT CONTROL

FEATURES

- LSTTL/TTL compatible: 5V Supply.
- Ultra high speed: 75nS.
- Guaranteed performance over temperature.
- High isolation voltage: 2500Vrms.
- UL recognized.



1. NO CONNECTION
2. LED ANODE
3. LED CATHODE
4. NO CONNECTION
5. GND
6. OUTPUT
(OPEN COLLECTOR)
7. ENABLE
8. VCC

SYMBOL	INCHES	MM
A	0.380 ± 0.010	9.66 ± 0.25
B	0.031	0.8
C	0.098 MIN	2.5 MIN
D	0.144	3.65
E	0.300	7.62 ± 0.25
F	0.098 ± 0.004	0.25 ± 0.1
G	0.309 ~ 0.346	7.85 ~ 8.80
H	0.047	1.2
I	0.020	0.5
J	0.100	2.54
K	0.252	6.4

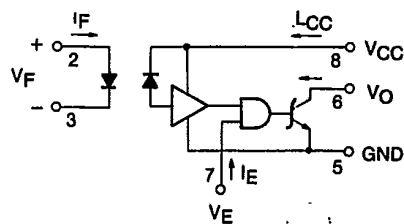
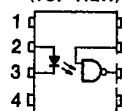
MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Forward Current	I _F	20	mA
A Pulse Forward Current (Note)	I _{FP}	40	mA
Reverse Voltage	V _R	5	V
Output Current	I _O	50	mA
Output Voltage	V _O	7	V
B Supply Voltage (1 Minute Maximum)	V _{CC}	7	V
Enable Input Voltage (Not to exceed V _{CC} by more than 500mV)	V _{EH}	5.5	V
Output Collector Power Dissipation	P _O	85	mW
Operating Temperature Range	T _{opr}	- 0 ~ 70	°C
Storage Temperature Range	T _{stg}	- 55 ~ 125	°C

Note: 50% duty cycle, 1ms pulse width.

A - LED B - DETECTOR

PIN CONFIGURATIONS (TOP VIEW)



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OPTO-ELECTRICAL CHARACTERISTICS OVER RECOMMENDED TEMPERATURE ($T_a = 0^\circ\text{C} \sim 70^\circ\text{C}$ Unless otherwise noted)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.*	MAX.	UNIT
High Level Output Current	I_{OH}	$V_{CC}=5.5V, V_O=5.5V$ $I_F=250\mu A, V_E=2.0V$	—	1	250	μA
Low Level Output Voltage	V_{OL}	$V_{CC}=5.5V, I_F=5mA$ $V_{EH}=2.0V, I_{OL}(\text{Sinking})=13mA$	—	0.4	0.8	V
High Level Enable Current	I_{EH}	$V_{CC}=5.5V, V_E=2.0V$	—	-1.0	—	mA
Low Level Enable Current	I_{EL}	$V_{CC}=5.5V, V_E=0.5V$	—	-1.6	-2.0	mA
High Level Supply Current	I_{CCH}	$V_{CC}=5.5V, I_F=0, V_E=0.5V$	—	7	15	mA
Low Level Supply Current	I_{CCL}	$V_{CC}=5.5V, I_F=10mA, V_E=0.5V$	—	12	18	mA
Input-Output Insulation Leakage Current (Note)	I_{I-O}	45% Relative Humidity $T_a=25^\circ\text{C}, t=5s$ $V_{I-O}=3000V_{dc}$	—	—	1.0	μA
Resistance (Input-Output) (Note)	R_{I-O}	$V_{I-O}=500V, T_a=25^\circ\text{C}$	—	10^{12}	—	Ω
Capacitance (Input-Output) (Note)	C_{I-O}	$f=1MHz, T_a=25^\circ\text{C}$	—	0.6	—	pF
Input Forward Voltage	V_F	$I_F=10mA, T_a=25^\circ\text{C}$	—	1.65	1.75	V
Input Reverse Breakdown Voltage	BV_R	$I_R=10\mu A, T_a=25^\circ\text{C}$	5	—	—	V
Input Capacitance	C_{IN}	$V_F=0, f=1MHz$	—	45	—	pF
Current Transfer Ratio	CTR	$I_F=5.0mA, R_L=100\Omega$	—	1000	—	%

*All typical values are at $V_{CC}=5V, T_a=25^\circ\text{C}$.

Note: Pins 1, 2, 3 and 4 shorted together and Pins 5, 6, 7 and 8 shorted together.

SWITCHING CHARACTERISTICS ($T_a = 25^\circ\text{C}, V_{CC}=5V$)

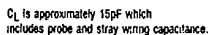
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Propagation Delay Time to High Output Level	t_{pLH}	1	$R_L=350\Omega, C_L=15pF$ $I_F=7.5mA$	—	60	75	ns
Propagation Delay Time to Low Output Level	t_{pHL}			—	60	75	ns
Output Rise-Fall Time (10-90%)	t_r, t_f	—	—	—	30	—	ns
Propagation Delay Time of Enable from V_{EH} to V_{EL}	t_{ELH}	2	$R_L=350\Omega, C_L=15pF$ $I_F=7.5mA, V_{EH}=3.0V$ $V_{EL}=0.5V$	—	25	—	ns
Propagation Delay Time of Enable from V_{EL} to V_{EH}	t_{EHL}			—	25	—	ns
Common Mode Transient Immunity at Logic High Output Level	CMH	3	$V_{CM}=10V, R_L=350\Omega$ $V_O(\text{min.})=2V,$ $I_F=0mA$	—	200	—	V/ μs
Common Mode Transient Immunity at Logic Low Output Level	CM _L		$V_{CM}=10V, R_L=350\Omega$ $V_O(\text{max.})=0.8V,$ $I_F=5mA$	—	-500	—	V/ μs

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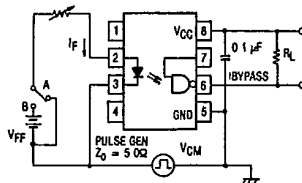
TRUTH TABLE

INPUT	ENABLE	OUTPUT
H	H	L
L	H	H
H	L	H
L	L	H

PHL PH

t_{ELH} and t_{GH}L

Transient Immunity and Typical Waveforms



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