NEC Electronics Inc.

6N136
HIGH SPEED PHOTO COUPLER
NEPOC SERIES

Description

The 6N136 is a high speed photo coupler containing GaAsP light emitting diode and a PN photo diode connected to a high speed transistor. The CTR is 15% min.

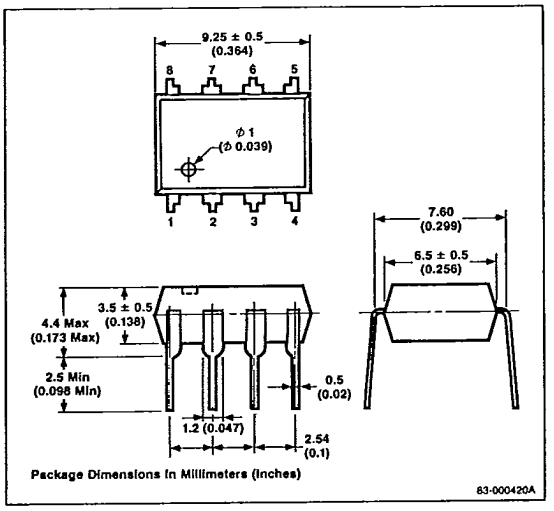
Features

- ☐ High isolation voltage: 3000V_{DC} min
- ☐ High speed response: t_{PHL}, t_{PLH} = 300ns typ
- ☐ Compact, dual in-line plastic package

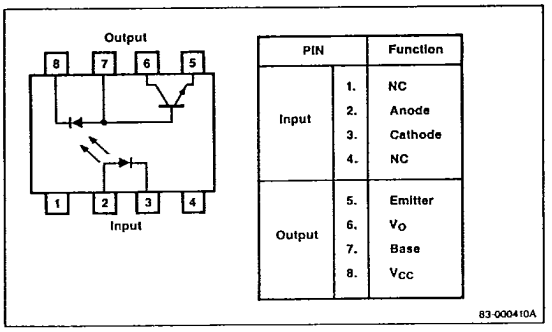
Applications

- ☐ Interface circuit for various instruments and control equipment
- ☐ Floating power supply feedback networks
- ☐ Computer and peripheral manufacture
- ☐ Pulse transformers
- ☐ High speed digital and analog line receivers

Package Dimensions



Pin Connection



PIN		Function
Input	1.	NC
	2.	Anode
	3.	Cathode
	4.	NC
Output	5.	Emitter
	6.	V_O
	7.	Base
	8.	V_{CC}

Absolute Maximum Ratings
T_A = +25°C

Diode	
Reverse Voltage, V_R	5V
Forward Current, I_F	25mA
Power Dissipation, P_D	45mW
Detector	
Supply Voltage, V_{CC}	−0.5V to +15V
Output Voltage, V_O	−0.5V to +15V
Output Current, I_O	8mA
Emitter to Base Voltage, V_{EBO}	5V
Power Dissipation, P_D	100mW
Isolation Voltage[1], BV	3000V_{DC}
Storage Temperature, T_{STG}	−55°C to +125°C
Operating Temperature, T_{OPT}	−55°C to +100°C

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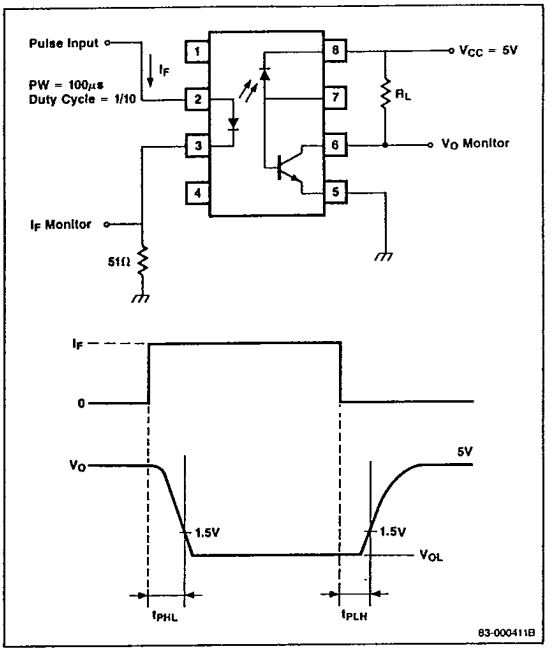
Electrical Characteristics
T_A = +25°C

Parameter	Symbol	Limits Min	Typ	Max	Unit	Test Conditions
Diode						
Forward Voltage	V_F		1.43	1.7	V	I_F = 16mA
Reverse Current	I_R		0.01	10	μA	V_R = 5V
Forward Voltage Temperature Coefficient	$\Delta V_F/\Delta T$		−1.51		mV/°C	I_F = 16mA
Capacitance	C_T		60		pF	V = 0, f = 1MHz
Detector						
High Level Output Current	I_{OH}[1]		3	500	nA	I_F = 0mA, V_{CC} = 5.5V V_O = 5.5V
High Level Output Current	I_{OH}[2]			100	μA	I_F = 0ma, V_{CC} = 15V V_O = 15V
DC Current Gain	h_{FE}		120			V_O = 5V, I_O = 3mA
Coupled						
Current Transfer Ratio	CTR	15	22		%	I_F = 16mA, V_{CC} = 4.5V V_O = 0.4V
Low Level Output Voltage	V_{OL}		0.1	0.4	V	I_F = 16mA, V_{CC} = 4.5V I_O = 2.4mA
Low Level Supply Current	I_{CCL}		50		μA	I_F = 16mA, V_O = Open, V_{CC} = 15V
High Level Supply Current	I_{CCH}		0.01	1	μA	I_F = 0mA, V_O = Open, V_{CC} = 15V
Isolation Resistance	R_{1-2}		10^{12}		Ω	V_{IN-OUT} = 1kV
Isolation Capacitance	C_{1-2}		0.7		pF	V = 0, f = 1MHz
Propagation Delay Time to Low Output Level	t_{PHL}[2]		0.3/ .05	0.8/ 1.5	μs	I_F = 16mA, V_{CC} = 5V R_L = 1.9kΩ/ 4.1kΩ
Propagation Delay Time to High Output Level	t_{PLH}[2]		0.3/ .05	0.8/ 1.5	μs	I_F = 16mA, V_{CC} = 5V R_L = 1.9kΩ/ 4.1kΩ

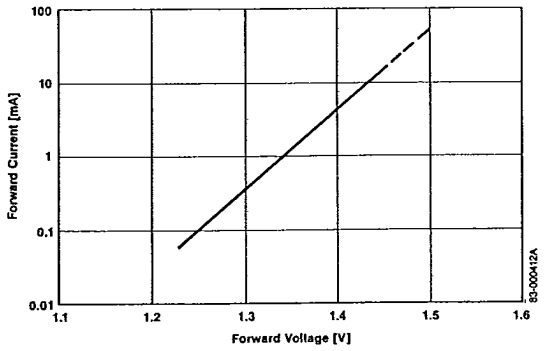
Notes: 1. Measuring Conditions: DC voltage for 1 min at T_A = +25°C, RH = 60% between input (pins 1, 2, 3, and 4 common) and output (pins 5, 6, 7, and 8 common).
2. Measuring circuit.

Measuring circuit

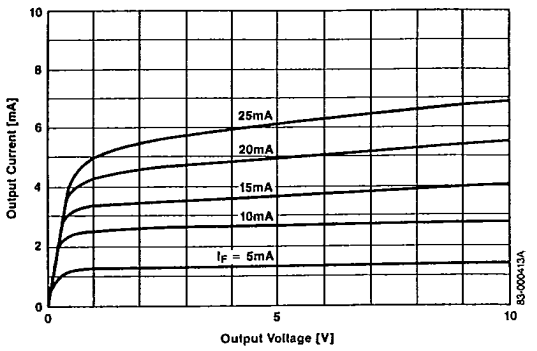


Typical Characteristics
T_A = +25°C

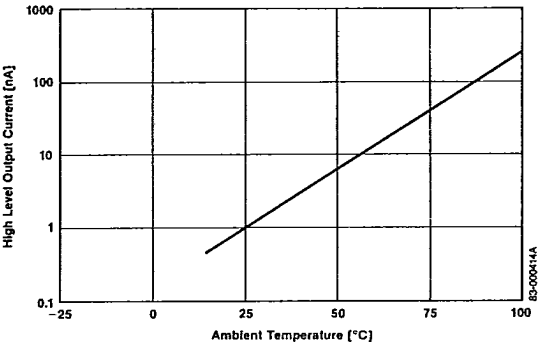
Forward Current vs Forward Voltage



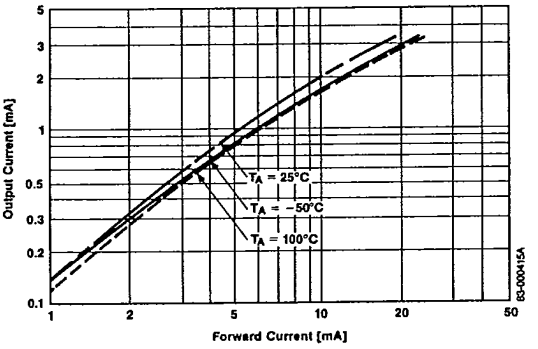
Output Current vs Output Voltage



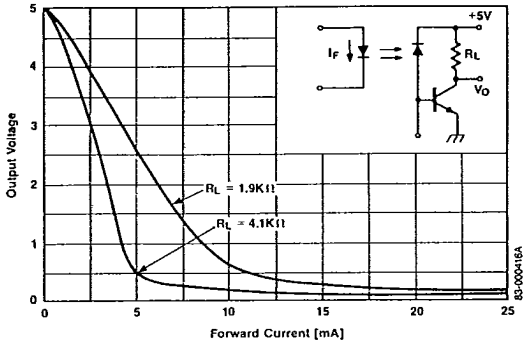
High Level Output Current vs Ambient Temperature



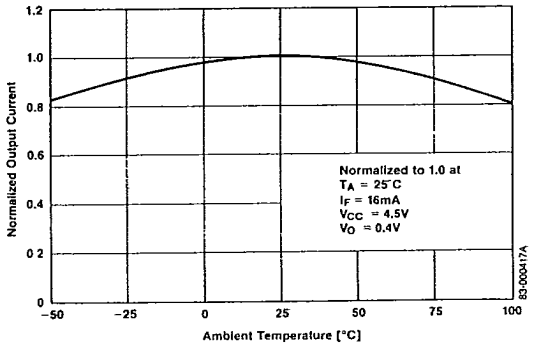
Output Current vs Forward Current



Output Voltage vs Forward Current



Normalized Output Current vs Ambient Temperature



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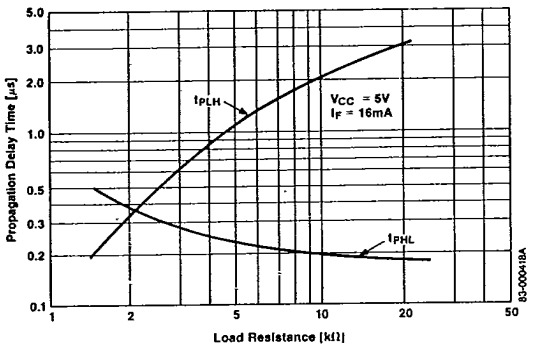
Typical Characteristics (cont)

$T_A = +25°C$

Propagation Delay Time vs Load Resistance



Propagation Delay Time vs Ambient Temperature