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OPIA800—OPIA803, OPID804
DIP Package

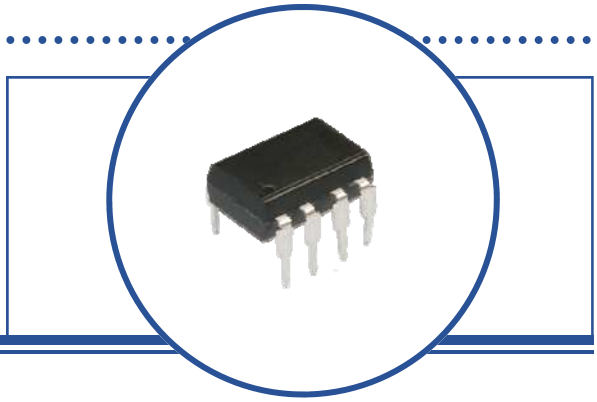
TT electronics
OPTEK Technology

Features:

- 2,500 or 5,000 Vrms electrical isolation
- Choice of a Single and Dual LED
- Choice of Phototransistor or Photologic® Sensor
- Low-cost plastic Dual-In-Line (DIP) package

Agency Approvals:

- UL Certification No: E58730
- VDE NO: 40026713, 40026624



Description:

The OPIA800 through OPID804 optocouplers are designed for applications that utilize a digital output (Phototlogic®) in a dual-in-line package. Isolation voltage from 2,500 to 5,000 Volts RMS product are designed for some of the most stringent power system isolation requirements.

Theory of operation: The LED transmitter is used to illuminate the Photosensor providing electrical isolation between two power systems while maintaining the ability to transmit information from one power system to the other. In many applications, analog or digital signals may be required to be transmitted between two power systems while maintaining isolation between the power systems up to 5,000 volts RMS. A variety of LED and photosensor configurations are available depending on the system requirements

The ratio Current Transfer Ratio (CTR) is determined using the output current and input current for analog photosensors. CTR ratios can range from as low as 5 to over 9,000 depending on the device.

$$CTR = \frac{Photosensor - Current}{LED - Current} = \frac{20mA}{10mA} * 100 = 200$$

All DIP product is shipped in a shipping tube with “TU” identified on the end of the part number.
Example: OPIA800DTU is a 8-Pin DIP shipped in a tube (TU).

Applications:

- High voltage isolation
- PCBoard power system isolation
- Industrial equipment power isolation
- Medical equipment power isolation
- Office equipment

RoHS Moisture[1]

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Analog Output Devices Ordering Information

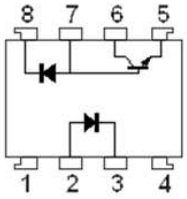
Part Number	Isolation Voltage Max. (Vrms)	CTR Min/Typ/Max	Typ. Tplh / Tphl (ns) [R_L = ohms]	Package	Configuration
OPIA800	2,500	300 / 1,600 / -	7 / 2 [2.2 K]	8 Pin DIP	A K—K A B C E (Dar)
OPIA801	2,500	500 / 1,600 / -	10 / 5 [4.7 K]	8 Pin DIP	A K—K A B C E (Dar)
OPIA802	2,500	15 / 43 / -	0.3 / 0.3 [1.9 K]	8 Pin DIP	A K—K A C E
OPIA803	2,500	5 / 43 / -	0.4 / 0.3 [4.1 K]	8 Pin DIP	A K—K A C E

Digital Output Devices Ordering Information

Part Number	Isolation Voltage Max. (Vrms)	Typ. Tr / Tf (ns) [R_L = 350 ohms]	Typ. Tplh / Tphl (ns) [R_L = ohms]	Package	Configuration
OPID804	5,000	30 / 30	45 / 45 [350]	8 Pin DIP	A K—NAND
Configuration: Definition of Terms LED Identification—Sensor Identification					
LED	A = Anode	K = Cathode			
Sensor	10K Logic	10K Inverted Logic	NAND Gate	NAND Gate	
	K = Cathode	A = Anode	B = Base	C = Collector	E = Emitter
Packaging	Part Number Suffix: **D** = DIP, **TU** = Ship in Tubes, **TR** = Ship on Tape and Reel Example: OPID606DTR				

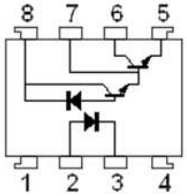
Part Number	Pin #							
	1	2	3	4	5	6	7	8
OPIA800		A	K		E	C	C-B	K-C
OPIA801		A	K		E	C	C-B	K-C
OPIA802		A	K		E	C	A-B	K
OPIA803		A	K		E	C	A-B	K
OPID804		A	K		GND	Output	Enable	Vcc

Package Outline Dimensions and Schematics: Top-View

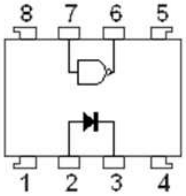


OPIA802
OPIA803

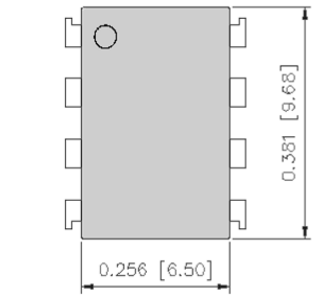
Symbol	Definition
A	Anode
B	Base
C	Collector
E	Emitter
K	Cathode



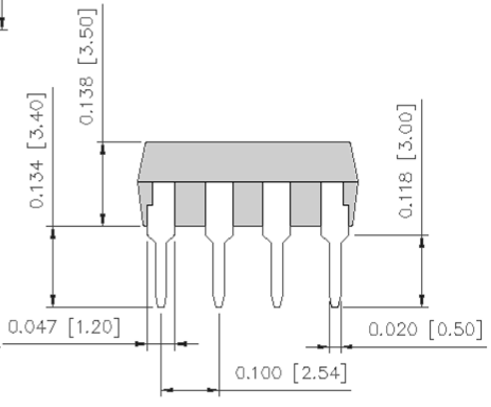
OPIA800
OPIA801



OPID804



DIMENSIONS ARE IN: INCHES [MILLIMETERS]
TOLERANCE: ± 0.008 INCHES
[± 0.2 MILLIMETERS]



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Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Storage Temperature	-55° C to +125° C
Operating Temperature OPIA800 OPIA801 OPIA802 OPIA803 OPID804	 -40° C to +115° C 0° C to +125 ° C -55° C to +115° C -55° C to +100° C 0° C to +85° C
Isolation voltage (1 minute) OPID804 OPIA800, OPIA801, OPIA802, OPIA803	 5,000 Vrms 2,500 Vrms
Lead Soldering Temperature (1/16" (1.6 mm) from case for 5 seconds with soldering iron)	260° C

Input Diode

Continuous Forward Current OPIA802, OPIA803, OPID804 OPIA800 OPIA801	 25 mA 20 mA
Peak Forward current (1 µs pulse width, 300 pps) OPIA800, OPIA801, OPIA802, OPIA803 OPID804	 1 A 40 mA
Reverse Voltage OPIA800, OPIA801, OPIA802, OPIA803, OPID804	 5 V
Power Dissipation OPIA802, OPIA803, OPID804 OPIA800, OPIA801	 45 mW 35 mW

Absolute Maximum Ratings (T_A = 0° C to 70° C unless otherwise specified)

Output IC

Vcc—Collector-Emitter Voltage OPIA800 OPIA801 OPIA802, OPIA803	 -0.5 V to +7 V -0.5 V to +18 V -0.5 V to +15 V
Collector Current OPIA802, OPIA803 OPIA800, OPIA801	 8 mA 60 mA
Power Dissipation OPIA800, OPIA801, OPIA802, OPIA803	 100 mW

Output NAND Gate—OPID804

Vcc—Supply voltage	7 V
Enable voltage	5.5 V
High Level Output voltage	7 V
Low Level Output current	50 mA
Output Collector Power Dissipation	85 mW

Electrical Characteristics: OPIA800

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*6 Current transfer ratio	CTR	IF=1.6mA Vo=0.4V,Vcc=4.5V	300	1600	-	%
Logic (0) output volage	VOL	IF=1.6mA Io=4.8mA,Vcc=4.5V	-	0.1	0.4	V
Logic (1) output current	IOH	IF=0,Vo=Vcc=7V	-	0.1	250	uA
Logic (0) supply current	ICCL	IF=1.6mA,Vo=open,Vcc=5V	-	0.5	-	mA
Logic (1) supply current	ICCH	IF=0,VO=open,Vcc=5V	-	10	-	nA
Input forward voltage	VF	Ta=25℃,IF=1.6mA	-	1.5	1.7	V
Input forward voltage temperature coefficient	△VF/△Ta	IF=1.6mA	-	-1.9	-	mV/℃
Input reverse voltage	BVR	Ta=25℃,IR=10uA	5.0	-	-	V
Input capacitance	CIN	VF=0,f=1MHz	-	60	-	pF
*7 Leak current(input-output)	II-O	Ta=25℃,45% RH VI-O=3kVDC,t=5s	-	-	1.0	uA
*7 Isolation resistance(input-output)	RI-O	VI-O=500VDC	-	10^{12}	-	Ω
*7 Capacitance(input-output)	CI-O	f=1MHz	-	0.6	-	pF

*6 Current transfer ratio is a 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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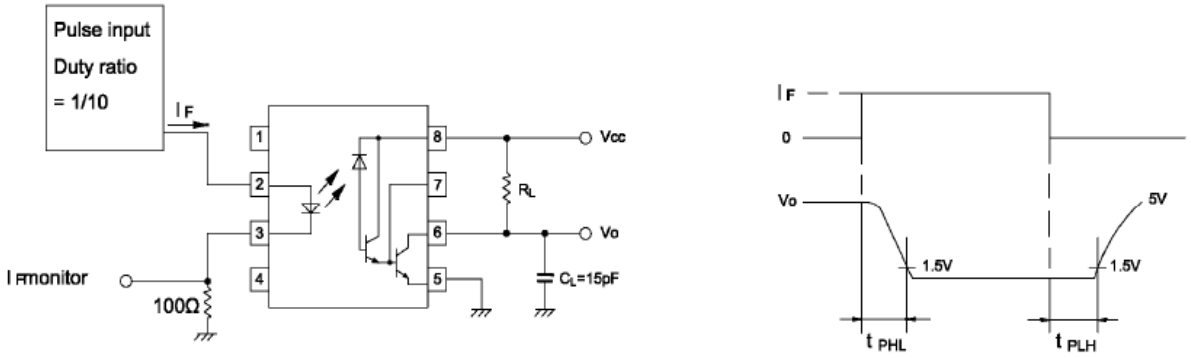
Switching Characteristics: OPIA800

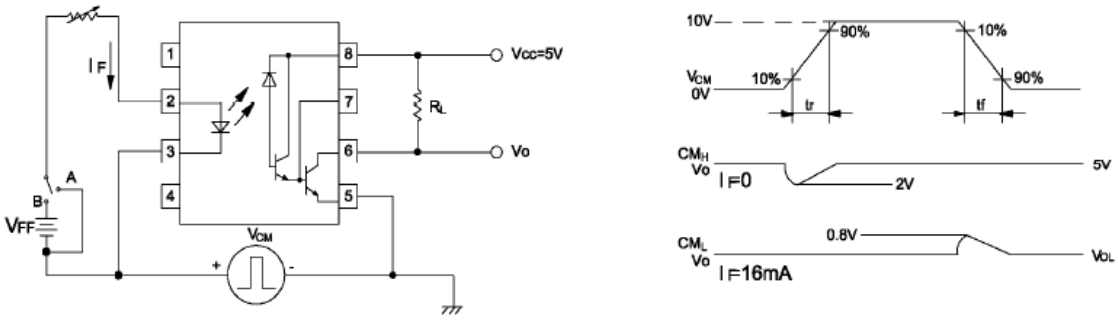
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*8 Propagation delay time Output (1)-->(0)	t_{PHL}	R_L=2.2kΩ,I_F=1.6mA	-	2	10	uS
*8 Propagation delay time Output (0)-->(1)	t_{PLH}	R_L=2.2kΩ,I_F=1.6mA	-	7	35	uS
*9 Instantaneous common *10 mode rejection voltage "Output (1)"	CM_H	I_F=0,V_{CM}=10Vp-p,R_L=2.2kΩ	-	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 voltage variation that can hold the output above (1) level (Vo>2.0V).
*10 Instantaneous common mode rejection voltage “output(1)” represents a common voltage variation that can hold the output above (0) level (Vo>0.8V).

*8 Test Circuit Propagation Delay Time



*10 Test Circuit for Instantaneous Common Mode Rejection Voltage



OPIA800

Characteristic Curves

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

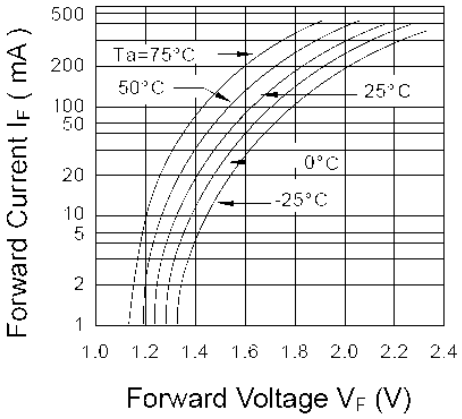


Fig.2 **LED Forward Current vs. Ambient Temperature**

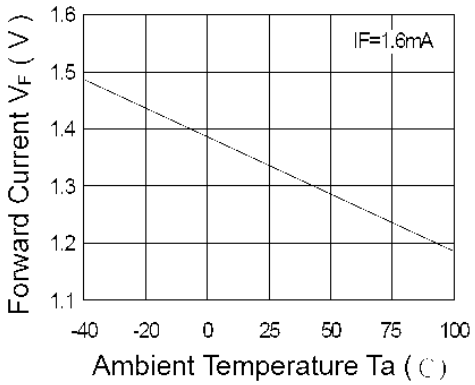


Fig.3 **Response and Fall Time vs. Load Resistance**

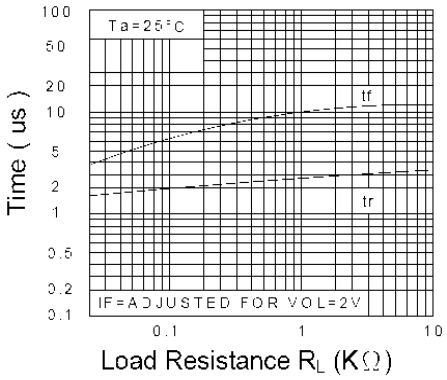


Fig.4 **Current Transfer Ratio vs. Forward Current**

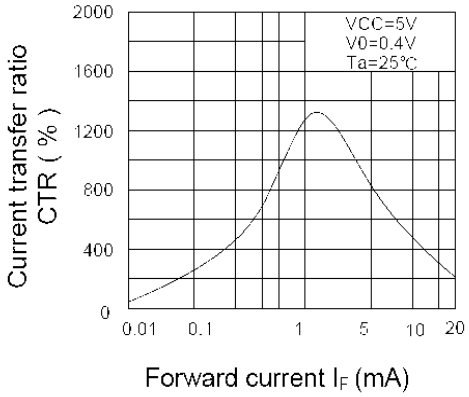


Fig.5 **Current Transter Ratio vs. Base-Emitter Resistance**

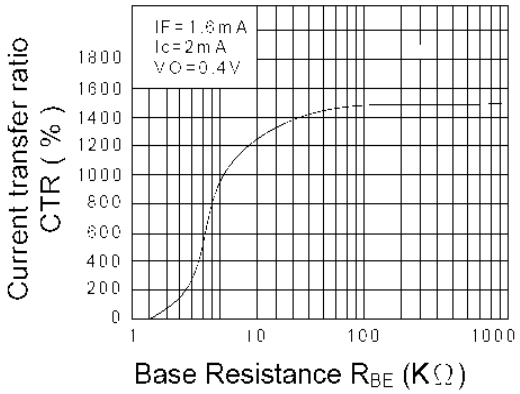
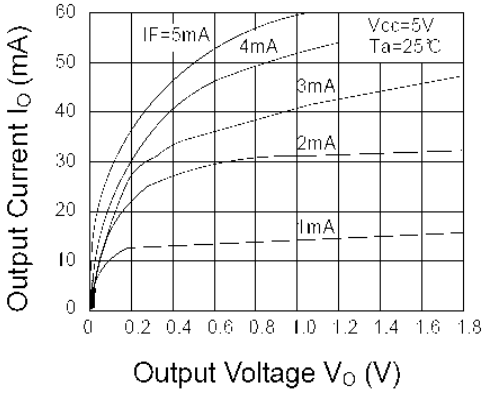


Fig.6 **Output Current vs. Output Voltage**



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OPIA800

Characteristic Curves

Fig.7 Output Current vs. Input Diode Forward Current

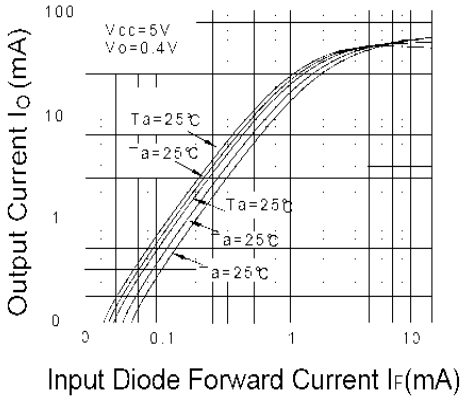


Fig.8 Logic Low Supply Current vs. Input Diode Forward Current

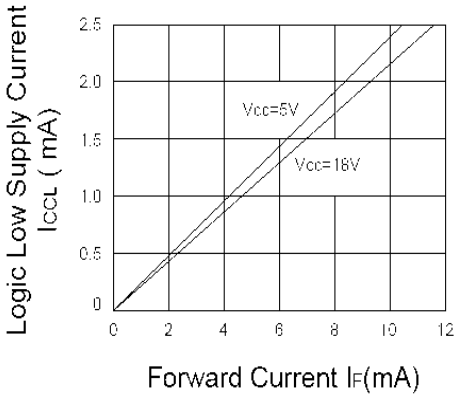


Fig.9 Propagation Delay vs. Input Diode Forward Current

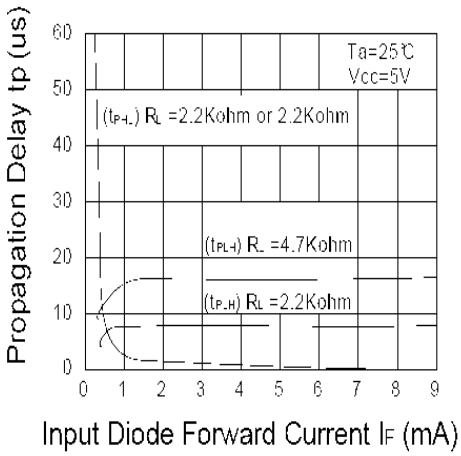
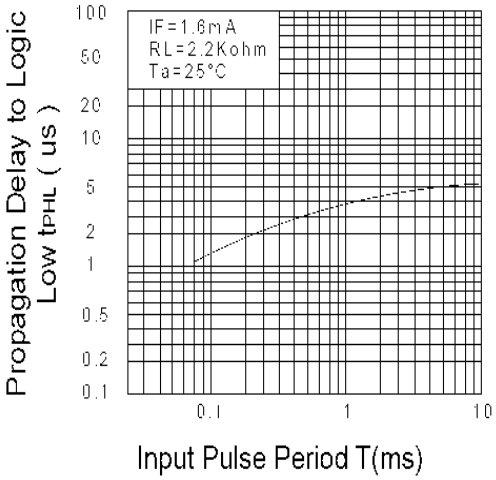


Fig.10 Propagation Delay to Logic Low vs. Pulse Period



Electrical Characteristics: OPIA801

(T_A = 25°C)

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℃, I_F=1.6mA	-	1.5	1.7	V
Input forward voltage temperature coefficient	$\triangle V_F/\triangle Ta$	I_F=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 a 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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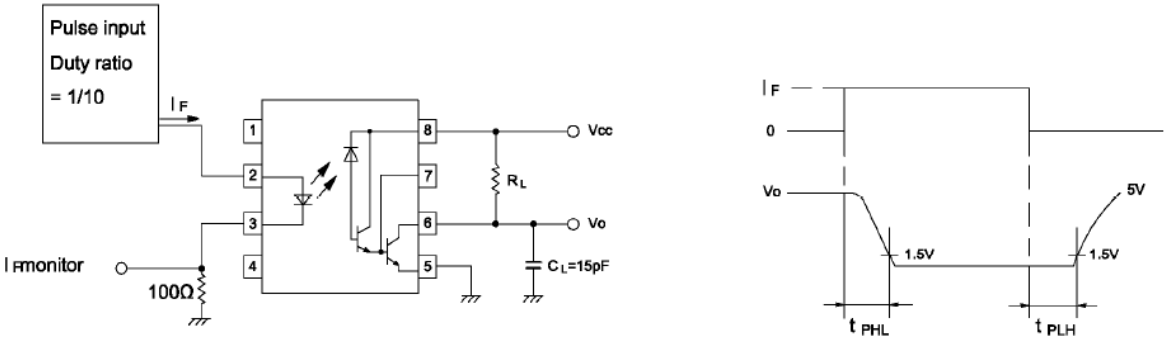
Switching Characteristics: OPIA801

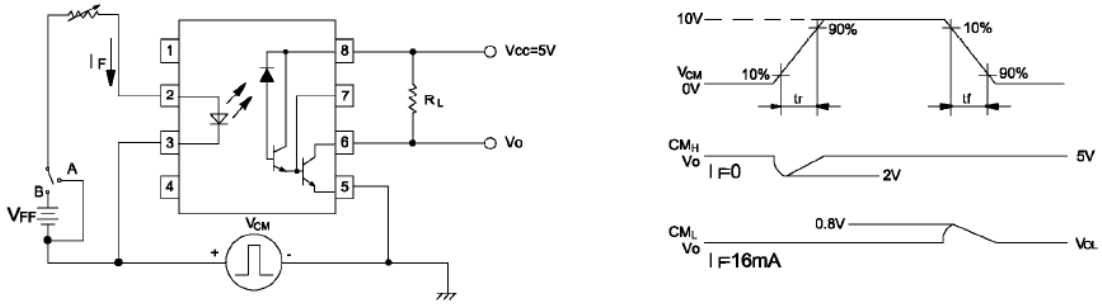
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*8 Propagation delay time Output (1) → (0)	t_{PHL}	R_L=4.7KΩ, I_F=0.5mA	-	5	25	uS
		R_L=270Ω, I_F=12mA	-	0.3	1	uS
*8 Propagation delay time Output (0) → (1)	t_{PLH}	R_L=4.7KΩ, I_F=0.5mA	-	10	60	uS
		R_L=270Ω, I_F=12mA	-	1.5	7	uS
*9 *10 Instantaneous common mode rejection voltage " Output (1) "	CM_H	I_F=0, V_{CM}=10V_{P-P}, R_L=2.2KΩ	-	500	-	V/uS
*9 *10 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 voltage variation that can hold the output above (1) level (Vo>2.0V).
*10 Instantaneous common mode rejection voltage "output(1)" represents a common voltage variation that can hold the output above (0) level (Vo>0.8V).

*8 Test Circuit Propagation Delay Time



*10 Test Circuit for Instantaneous Common Mode Rejection Voltage



Electrical Characteristics: OPIA802

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

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*5 Current transfer ratio	CTR(1)	Ta=25℃, 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℃, I_F=0 V_O=V_{CC}=5.5V	-	3.0	500	nA
	I_{OH}(2)	Ta=25℃, 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℃, 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℃, I_F=16mA	-	1.7	1.95	V
Input forward voltage temperature coefficient	$\triangle V_F/\triangle Ta$	I_F=16mA	-	-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
Transistor current amplification factor	h_{FE}	V_O=5V, I_O=3mA	-	70	-	

*5 Current transfer ratio is a ratio of input current and output current expressed in %.
*6 Io = 2.4mA
*7 Measured as 2-pin element (Short 1,2,3,4 and 5,6,7,8)

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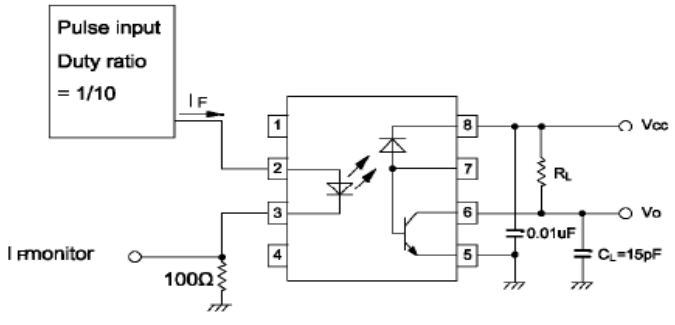
Switching Characteristics: OPIA802

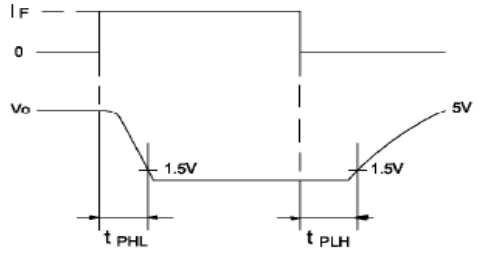
(T_A = 25°C, V_{CC}=5V, I_F=16mA)

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	uS
*8 Propagation delay time *9 Output (0) → (1)	t_{PLH}	R_L=1.9KΩ	-	0.3	0.8	uS
*10 *11 Instantaneous common mode rejection voltage " Output (1) "	CM_H	I_F=0, V_{CM}=10V_{P-P}	-	1000	-	V/uS
*10 *11 Instantaneous common mode rejection voltage " Output (0) "	CM_L	I_F=16mA, V_{CM}=10V_{P-P}	-	-1000	-	V/uS
*12 Bandwidth	BW	R_L=100Ω	-	2.0	-	MHz

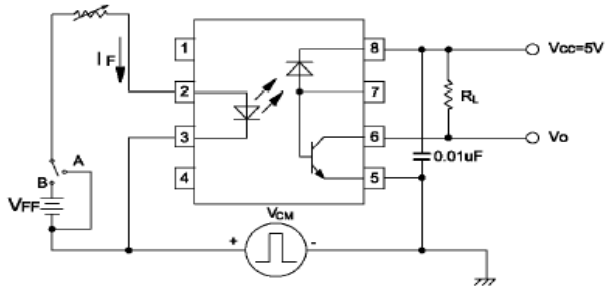
*8 R_L = 1.9k ohms is equivalent to on LSTTL and 5.6k ohm pull-up resistor.
*9 Instantaneous common mode rejection voltage "output(1)" represents a common voltage variation that can hold the output above (1) level (Vo>2.0V).
*10 Instantaneous common mode rejection voltage "output(1)" represents a common voltage variation that can hold the output above (0) level (Vo>0.8V).
*11 Bandwidth represents a point where AC input goes down by 3dB.

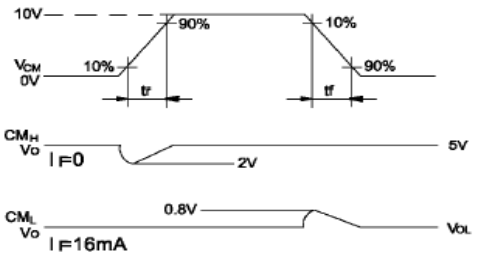
*9 Test Circuit Propagation Delay Time





*11 Test Circuit for Instantaneous Common Mode Rejection Voltage





Electrical Characteristics: OPIA803

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

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*5 Current transfer ratio	CTR(1)	Ta=25℃, I_F=16mA V_O=0.4V, V_{CC}=4.5V	7	40	-	%
	CTR(2)	I_F=16mA V_O=0.5V, V_{CC}=4.5V	5	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℃, I_F=0 V_O=V_{CC}=5.5V	-	3.0	500	nA
	I_{OH}(2)	Ta=25℃, 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℃, 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℃, I_F=16mA	-	1.7	1.95	V
Input forward voltage temperature coefficient	$\triangle V_F/\triangle Ta$	I_F=16mA	-	-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
Transistor current amplification factor	h_{FE}	V_O=5V, I_O=3mA	-	70	-	

*5 Current transfer ratio is a ratio of input current and output current expressed in %.
*6 Io = 1.1mA
*7 Measured as 2-pin element (Short 1,2,3,4 and 5,6,7,8)

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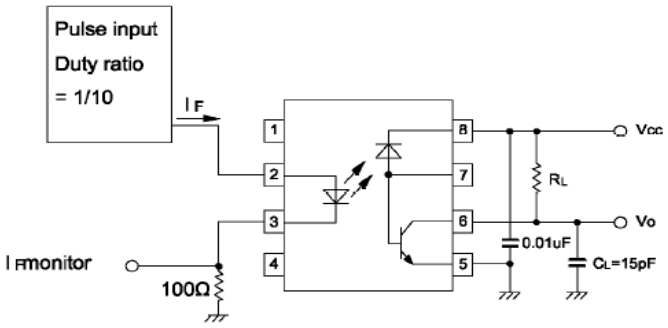
Switching Characteristics: OPIA803

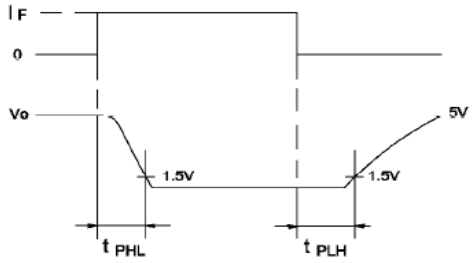
(T_A = 25°C, V_{CC}=5V, I_F=16mA)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*8 Propagation delay time *9 Output (1) → (0)	t_{PHL}	R_L=4.1KΩ	-	0.3	1.5	uS
*8 Propagation delay time *9 Output (0) → (1)	t_{PLH}	R_L=4.1KΩ	-	0.4	1.5	uS
*10 *11 Instantaneous common mode rejection voltage " Output (1) "	CM_H	I_F=0, V_{CM}=10V_{P-P}	-	1000	-	V/uS
*10 *11 Instantaneous common mode rejection voltage " Output (0) "	CM_L	I_F=16mA, V_{CM}=10V_{P-P}	-	-1000	-	V/uS
*12 Bandwidth	BW	R_L=100Ω	-	2.0	-	MHz

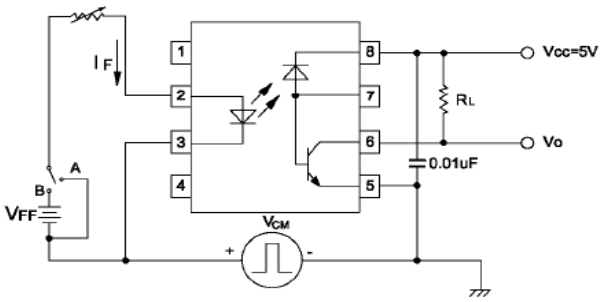
*8 R_L = 4.1k ohms is equivalent to on LSTTL and 6.1k ohm pull-up resistor.
*9 Instantaneous common mode rejection voltage "output(1)" represents a common voltage variation that can hold the output above (1) level (Vo>2.0V).
*10 Instantaneous common mode rejection voltage "output(1)" represents a common voltage variation that can hold the output above (0) level (Vo>0.8V).
*11 Bandwidth represents a point where AC input goes down by 3dB.

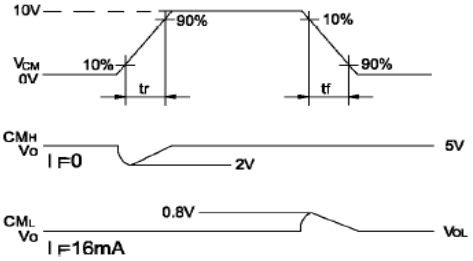
*9 Test Circuit Propagation Delay Time





*11 Test Circuit for Instantaneous Common Mode Rejection Voltage





Electrical Characteristics: OPID804

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage (*4)	-	1.6	1.8	V	I_F = 10 mA, T_A = 25° C
BV_R	Reverse Breakdown Voltage	5	-	-	V	I_R = 10 µA, T_A = 25° C
C_{IN}	Input Capacitance	-	60	-	pf	V_F = 0.0 V, f = 1M Hz
Output Photologic						
V_{OL}	Low Level Output Voltage	-	0.4	0.6	V	I_{OL} = 13 mA, V_{CC} = 5.5 V, I_F = 5 mA, V_{EH}=2V
I_{OH}	High Level Output Current	-	2	250	µA	V_{CC}=5.5 V, V_O=5.5 V, V_E=2.0 V, I_F=250 µA
I_{EH}	High Level Enable Current	-	-0.8	-	mA	V_{CC} = 5.5 V, V_E = 2.0 V
I_{EL}	Low Level Enable Current	-2.0	-1.2	-	mA	V_{CC} = 5.5 V, V_E = 2.0 V
I_{CCL}	Low Level Output Current	-	13	18	mA	V_{CC} = 5.5 V, V_E = 0.5 V, I_F = 10 mA
I_{CCH}	High Level Output Current	-	7	15	mA	V_{CC} = 5.5 V, V_E = 0.5 V, I_F = 0 mA
I_{I-O}	Leakage Current	-	-	1.0	mA	V_{I-O} = 3,000 V, T_A = 25° C, t = 5 s, RH = 45%
t_{EHL}	Enable Propagation delay “High to Low” (*8)	-	15	-	ns	V_{EH} = 3.0 V, V_{EL} = 0.5 V, R_L = 350 Ω , I_F = 7.5 mA, C_{LOAD} = 15 pf
t_{ELH}	Enable Propagation delay “Low to High” (*8)	-	40	-		
I_{FHL} / I_{FLH}	Hysteresis	-	0.8	-	Ratio	V_{CC} = 5 V, R_L = 280 Ω
R_{I-O}	Input-Output Isolation resistance (*5)	-	10^{12}	-	ohm	V_{I-O} = 500 V, T_A = 25° C
C_{I-O}	Input-Output Capacitance (*5)	-	0.6	-	pf	f = 1M Hz, T_A = 25° C
t_{PHL} & t_{PLH}	Propagation delay “High to Low” and “Low to High” (*7)	-	45	75	ns	V_{CC} = 5 V, R_L = 350 Ω , I_F = 7.5 mA, C_{LOAD} = 15 pf, T_A = 25°C
t_R & t_F	Rise and Fall Time	-	30	-		
CM_H	Instantaneous common mode rejection voltage “High Output” (*9)	-	500	-	V/us	V_{CM} = 10 V, R_L = 350 Ω , I_F = 0 mA, V_O = 2.0 V
CM_L	Instantaneous common mode rejection voltage “Low Output” (*9)	-	-500	-		V_{CM} = 10 V, R_L = 350 Ω , I_F = 5 mA, V_O = 0.8 V

Notes: (Typical values are all at VCC = 5V, Ta = 25°C.

*5 Measured as 2-Pin element. Connect pins 2 and 3, connect pins 5,6,7 and 8.
*6 DC current transfer ratio is defined as the ratio of output collector current to forward bias input current.
*7 Refer to Figure 1.
*8 Refer to Figure 2.
*9 CM_H represents a common mode voltage ignorable rise time ratio that can hold logic (1) state in output.
CM_L represents a common mode voltage ignorable fall time ratio that can hold logic (0) state in output.

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Recommended Operating Conditions: OPIA804

Parameter	Symbol	Min	Max	Unit
Low level input current	I_{FL}	0	250	uA
High level input current	I_{FH}	7.0	15	mA
High level enable voltage	V_{EH}	2.0	Vcc	V
Low level enable voltage	V_{EL}	0	0.8	V
Supply voltage	V_{CC}	4.5	5.5	V
Fanout (TTL load)	N	-	8	-
Operating temperature	T_{opr}	0	70	℃

Truth Table

Input	Enable	Ouput
H	H	L
L	H	H
H	L	H
L	L	H

Circuit Block Diagram

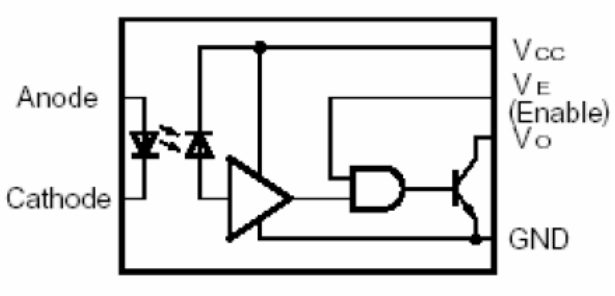
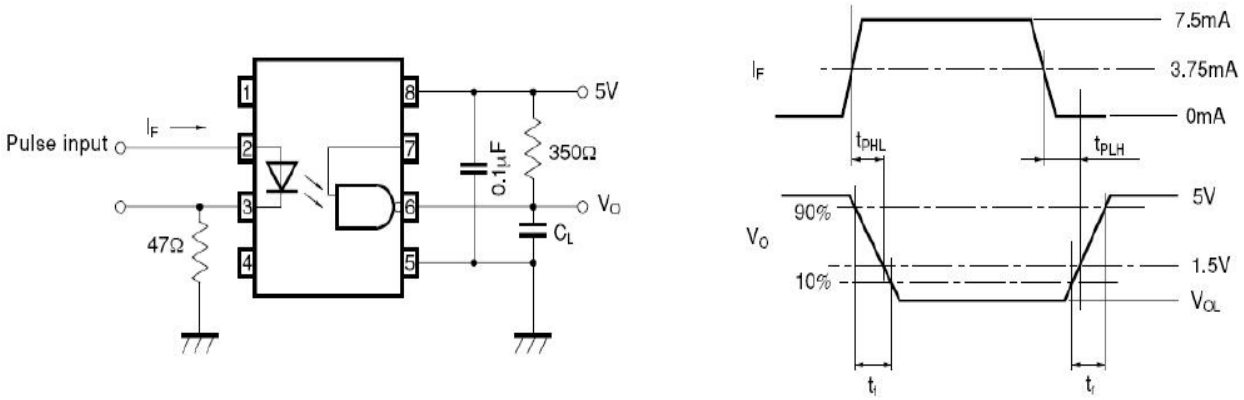


Figure 1. Test Circuit Propagation Delay Time



Recommended Operating Conditions (cont.): OPIA804

Test Circuit for Enable Propagation Delay Time

Figure 2.

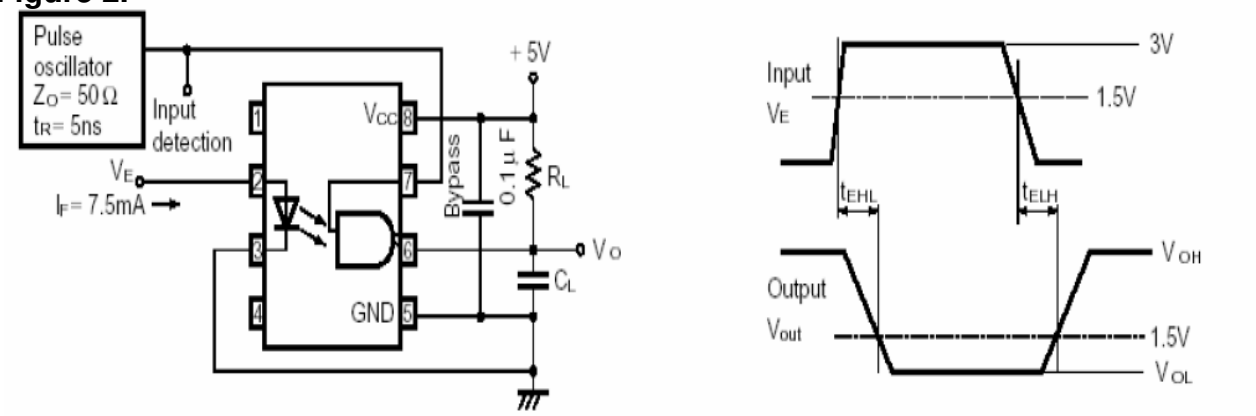
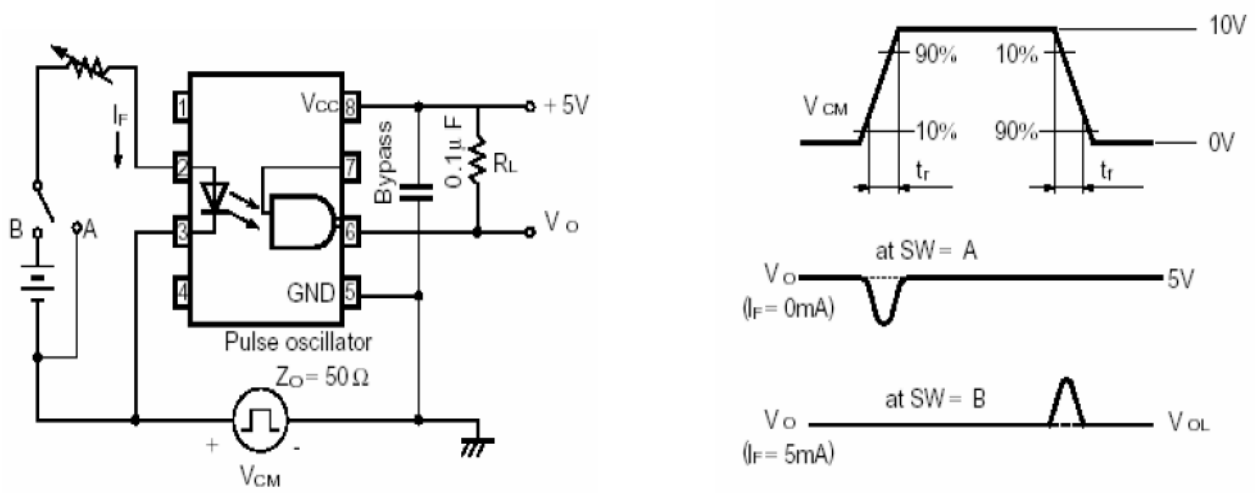


Figure 3.

Test Circuit for Instantaneous Common Mode Rejection Voltage



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OPID804

Characteristic Curves

Fig.1 Low Level Output Voltage vs. Ambient Temperature

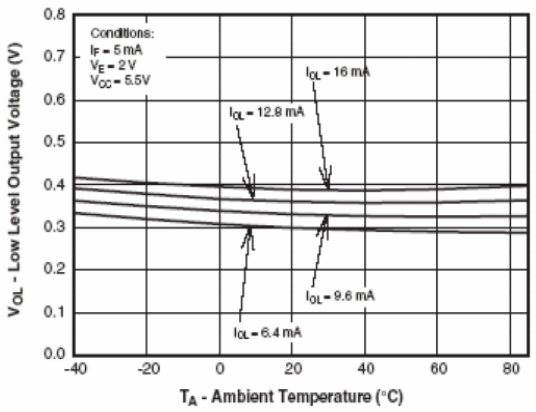


Fig.2 Input Diode Forward Voltage vs. Forward Current

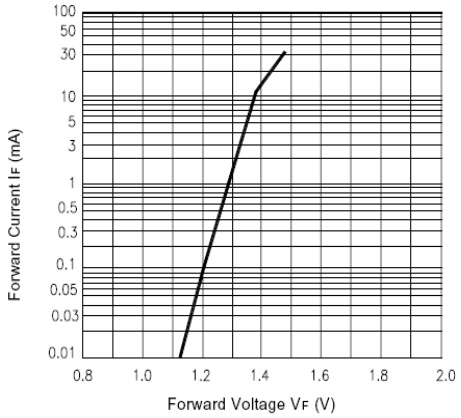


Fig.3 Switching Time vs. Forward Current

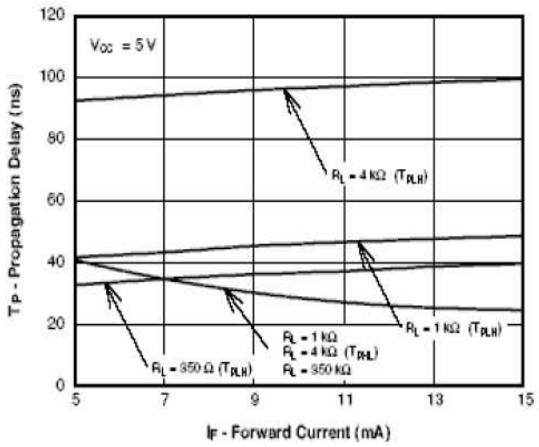


Fig. 4 Low Level Output Current vs. Ambient Temperature

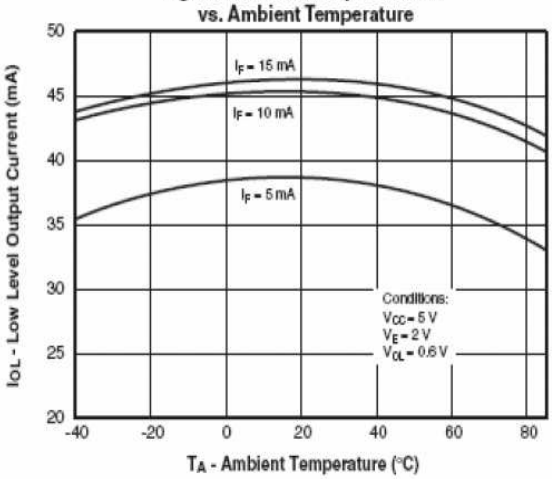


Fig. 5 Input Threshold Current vs. Ambient Temperature

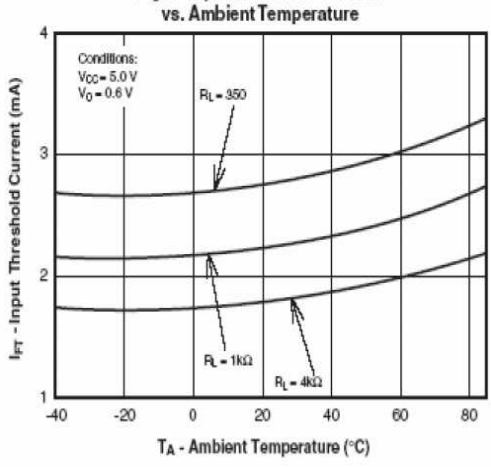
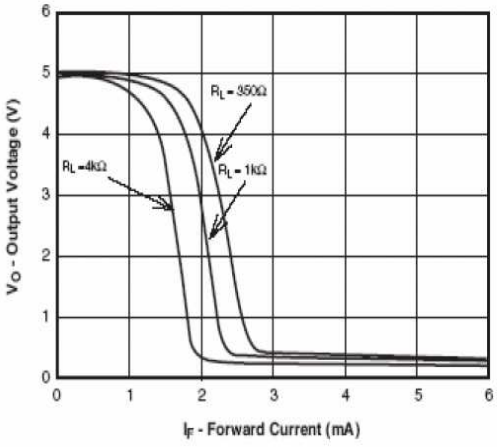


Fig. 6 Output Voltage vs. Input Forward Current



OPID804

Characteristic Curves

Fig. 11 High Level Output Current vs. Temperature

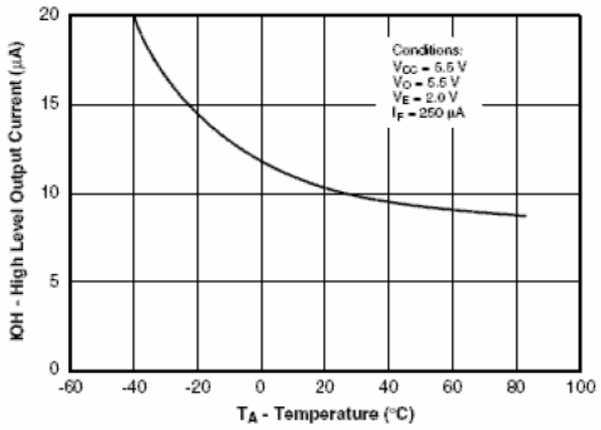


Fig. 9 Enable Propagation Delay vs. Temperature

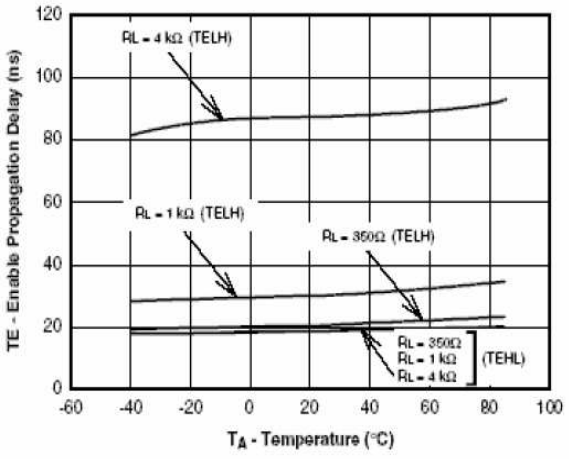


Fig. 10 Switching Time vs. Temperature

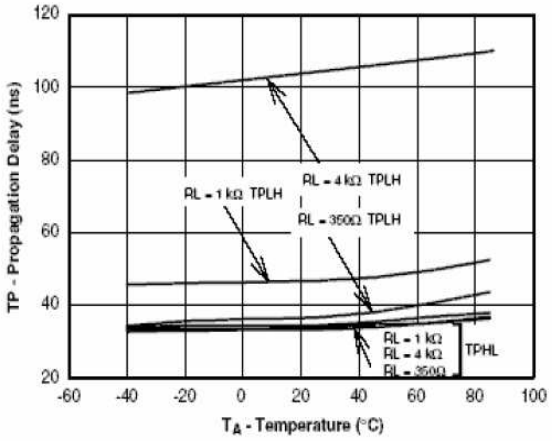


Fig. 7 Pulse Width Distortion vs. Temperature

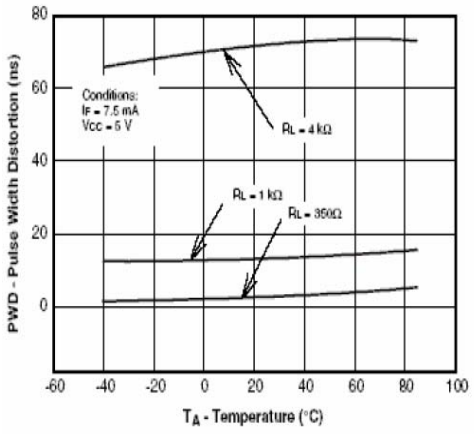
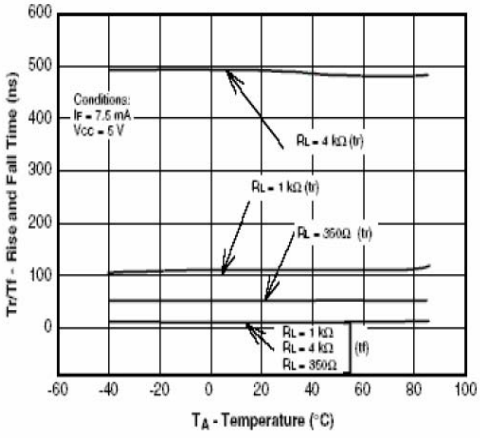


Fig. 8 Rise and Fall Time vs. Temperature



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Quality / Reliability Requirements

Parameter	Failure Criteria	Conditions
HTRB D $I_{C(OFF)}$	± 10%	11 samples after 500Hrs
	0 Fail	@ VCE = 5.0VDC, Ta = 70°C
HTFB D $I_{C(ON)}$	± 10%	50 samples after 96Hrs
	0 Fail	@ Max P_D, Ta = 25°C
MTTF @ 90% confidence	150,000 Min.	@ 25°C, 25mADC
Moisture Sensitivity Level	MSL 1	per JDEC stnd J-STD-020B
Lead Solderability	0 Fail	per Method 208 of MIL-STD-202.
Glass Transition of body	125°C Min.	DSC test method
Temperature Humidity-Bias	± 20%	85°C, 85%RH, 500Hrs, 80% min Iceo
Temperature Cycle	± 20%	per Method 1010.7 of MIL-STD-883E
High Temperature Storage	± 20%	85°C, 500Hrs
Autoclave	0 Fail	T_A = 121°C, Pressure = 15psi, Humidity = 100%, Time = 96Hrs

Note: This is to be performed when a change occurs to form, fit or function.

Government and Industry Standard Compliance Requirements

European Union's Reduction of Hazardous Substances (RoHS) Directive 2002/95/EC

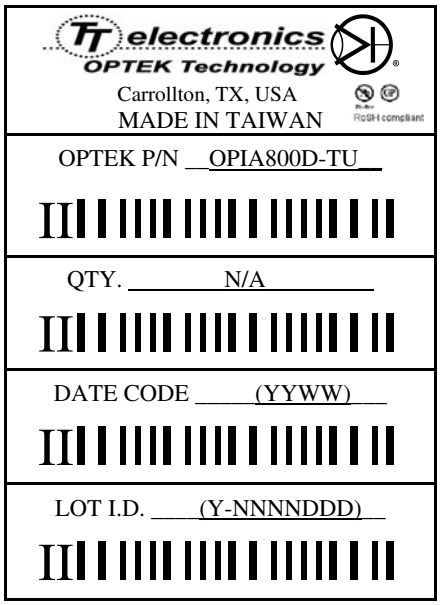
Label Identification

DESCRIPTION:

Size: 3" (7.4 cm) X 2.2" (5.5 cm)
Lettering shall be black on white background.
Format shall be as:

Notes:

1. The DATE CODE is a 4-digit code for date of manufacture where YY is the last two digits of the year, and WW is week number of manufacture.
2. The LOT I.D. is the manufacturing location lot identification where Y is the year of manufacture, NNNN is a sequential lot identifier, and DDD is the day of the year of manufacture. – or use equivalent label format.



OPIA800—OPIA803, OPID804
DIP Package

Packaging Information:

Optek's Optocoupler Part Numbers		Packaging Quantities	Tube		Inner		Small Carton			Medium Carton			Large Carton		
			Qty	Weight	52 x 7 x 7.5 cm		53.5 x 16 x 17.5 cm			53.5 x 30.7 x 17.5 cm			53.5 x 30.7 x 25 cm		
					Qty	Weight	Qty	Weight	Gross Weight	Qty	Weight	Gross Weight	Qty	Weight	Gross Weight
P/H and SMD	**4-PIN** OPIA400D/A, OPIA410D/A - OPIA413D/A		100	44	3,000	1.40	12,000	6.0	6.5	24,000	12.0	12.5	36,000	18.0	18.5
	6-PIN OPIA6XXD/A Series		65	44	1,950	1.50	7,800	6.5	7.0	15,600	12.0	12.5	23,400	18.5	19.0
	8-PIN OPIA8XXD Series and OPID804D		48	44	1,440	1.44	5,760	6.0	6.5	11,520	12.0	12.5	17,290	18.0	18.5
M/F SOP	**4-PIN and 5-PIN** OPIA401B - OPIA404B, OPIA414B, OPIA500B		100	24	6,000	1.60	24,000	6.5	7.0	48,000	13.0	13.5	72,000	19.5	20.0
SSOP	**4-PIN** OPIA405C - OPIA409C		170	--	10,200	--									

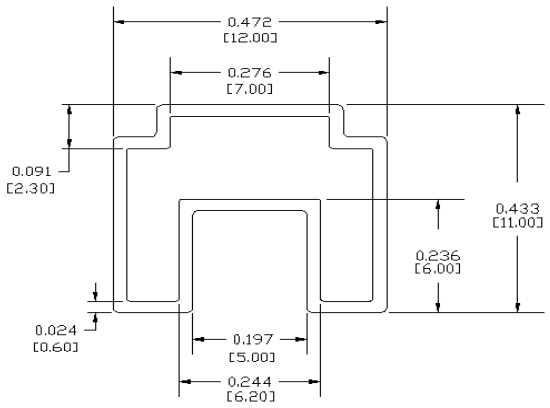
P/H = Pin-Hole Packages (Referred as D = Dual-In-Line Package)

SMD = Standard Surface Mount Packages (Referred as A = 6.5mil SMD)

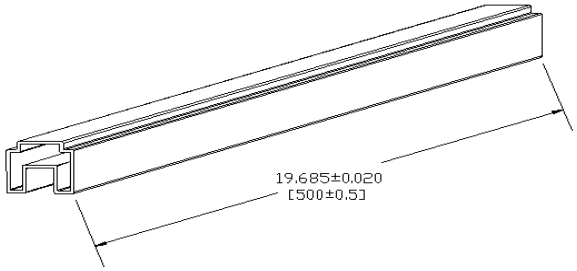
M/F or SOP = Mini-Flat Packages or Small Outside Packages (Referred as B = 4.40mil SMD w/ 2.54mil Lead-Spacing)

SSOP = Shrink SOP Packages (Referred as C = 3.60mil SMD with 1.27mil Lead-Spacing)

Tube Packaging Specifications (TU):



DIMENSIONS ARE IN: INCHES [MILLIMETERS]
TOLERANCE: ± 0.008 INCHES
[± 0.2 MILLIMETERS]



Quantity: 8-pin: 48pcs/tube

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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