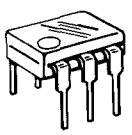
6-Pin DIP Optoisolators
Transistor Output

H11D1
H11D2
H11D3
H11D4

6-PIN DIP OPTOISOLATORS TRANSISTOR OUTPUT 200 AND 300 VOLTS

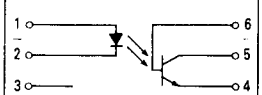
. . . consist of gallium-arsenide infrared emitting diodes optically coupled to high voltage, silicon, phototransistor detectors in a standard 6-pin DIP package. They are designed for applications requiring high voltage output and are particularly useful in copy machines and solid state relays.

- High Voltage — H11D1,2 — 300 V
  — H11D3,4 — 200 V
- High Isolation Voltage — V_{ISO} = 7500 Vac pk Min
- Standard 6-Pin DIP Package
- UL Recognized, File Number E54915
- VDE approved per standard 0883/6.80 (Certificate number 41853), with additional approval to DIN IEC380/VDE0806, IEC435/VDE0805, IEC65/VDE0860, VDE110b, covering all other standards with equal or less stringent requirements, including IEC204/VDE0113, VDE0160, VDE0832, VDE0833, etc. 883
- Special lead form available (add suffix "T" to part number) which satisfies VDE0883/6.80 requirement for 8 mm minimum creepage distance between input and output solder pads.
- Various lead form options available. Consult "Optoisolator Lead Form Options" data sheet for details.



CASE 730A-02
PLASTIC

SCHEMATIC



1. ANODE
2. CATHODE
3. NC
4. EMITTER
5. COLLECTOR
6. BASE

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating		Symbol	Value	Unit
INPUT LED				
Forward Current — Continuous		I_F	60	mA
Forward Current — Peak Pulse Width = 1 μs, 330 pps		I_F	1.2	Amps
LED Power Dissipation @ T_A = 25°C Derate above 25°C		P_D	120 1.41	mW mW/°C
OUTPUT TRANSISTOR				
Collector-Emitter Voltage	H11D1,2 H11D3,4	V_{CER}	300 200	Volts
Emitter-Collector Voltage		V_{ECO}	7	Volts
Collector-Base Voltage	H11D1,2 H11D3,4	V_{CBO}	300 200	Volts
Collector Current — Continuous		I_C	100	mA
Detector Power Dissipation @ T_A = 25°C Derate above 25°C		P_D	150 1.76	mW mW/°C
TOTAL DEVICE				
Total Device Power Dissipation @ T_A = 25°C Derate above 25°C		P_D	250 2.94	mW mW/°C
Operating Temperature Range		T_J	−55 to +100	°C
Storage Temperature Range		T_{stg}	−55 to +150	°C
Soldering Temperature (10 s)		T_{sol}	260	°C
Isolation Surge Voltage Peak ac Voltage, 60 Hz, 1 Second Duration (1)		V_{ISO}	7500	Vac(pk)

(1) Isolation surge voltage is an internal device dielectric breakdown rating.

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ELECTRICAL CHARACTERISTICS

Characteristic		Symbol	Min	Typ	Max	Unit
INPUT LED (T_A = 25°C unless otherwise noted)						
Reverse Leakage Current (V_R = 6 V)		I_R	—	—	10	μA
Forward Voltage (I_F = 10 mA)		V_F	—	1.2	1.5	Volts
Capacitance (V = 0 V, f = 1 MHz)		C	—	18	—	pF
OUTPUT TRANSISTOR (T_A = 25°C and I_F = 0 unless otherwise noted)						
Collector-Emitter Dark Current (R_{BE} = 1 MΩ)		I_{CER}				
(V_{CE} = 200 V, T_A = 25°C)	H11D1,2		—	—	100	nA
(V_{CE} = 100 V, T_A = 25°C)	H11D3,4		—	—	100	nA
(T_A = 100°C)	All Devices		—	—	250	μA
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$				Volts
(I_C = 100 μA)	H11D1,2		—	—	300	
	H11D3,4		—	—	200	
Collector-Emitter Breakdown Voltage		$V_{(BR)CER}$				Volts
(I_C = 1 mA, R_{BE} = 1 MΩ)	H11D1,2		—	—	300	
	H11D3,4		—	—	200	
Emitter-Base Breakdown Voltage (I_E = 100 μA)		$V_{(BR)EBO}$	7	—	—	Volts
COUPLED (T_A = 25°C unless otherwise noted)						
Current Transfer Ratio		CTR				%
(V_{CE} = 10 V, I_F = 10 mA, R_{BE} = 1 MΩ)	H11D1,2,3		20	—	—	
	H11D4		10	—	—	
Surge Isolation Voltage (Input to Output) (1) Peak ac Voltage, 60 Hz, 1 sec		V_{ISO}	7500	—	—	Volts
Isolation Resistance (1) (V = 500 V)		R_{ISO}	—	10^{11}	—	Ohms
Collector-Emitter Saturation Voltage (I_C = 0.5 mA, I_F = 10 mA, R_{BE} = 1 MΩ)		$V_{CE(sat)}$	—	—	0.4	Volts
Isolation Capacitance (1) (V = 0, f = 1 MHz)		C_{ISO}	—	0.2	—	pF
Turn-On Time	V_{CC} = 10 V, I_C = 2 mA, R_L = 100 Ω	t_{on}	—	5	—	μs
Turn-Off Time		t_{off}	—	5	—	

NOTE: 1. For this test LED Pins 1 and 2 are common and phototransistor Pins 4, 5, and 6 are common.

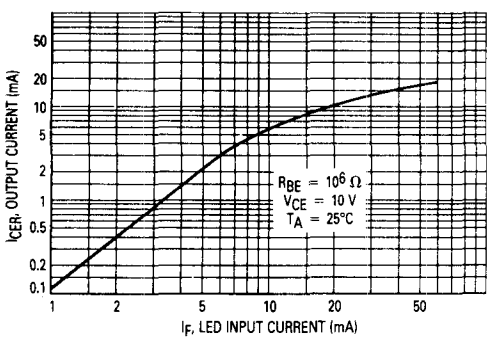

Figure 1. Output Current versus LED Input Current

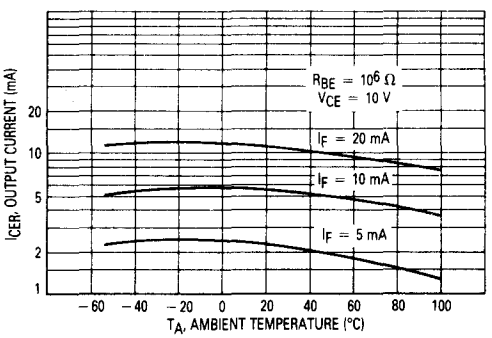

Figure 2. Output Current versus Temperature

TYPICAL ELECTRICAL CHARACTERISTICS

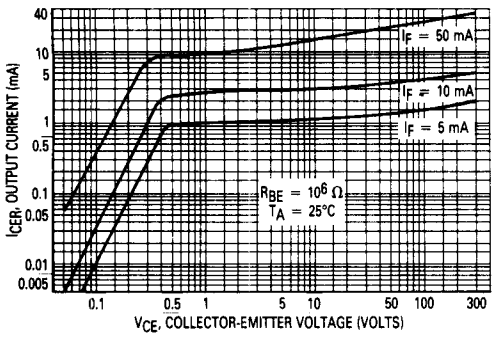

Figure 3. Output Characteristics

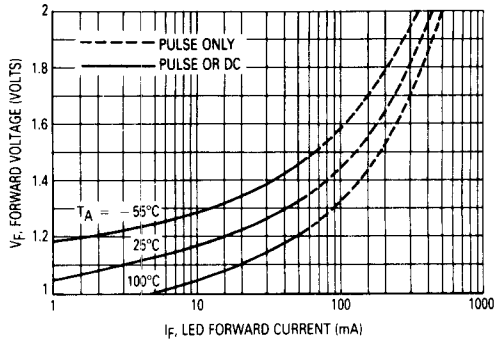

Figure 4. Forward Characteristics

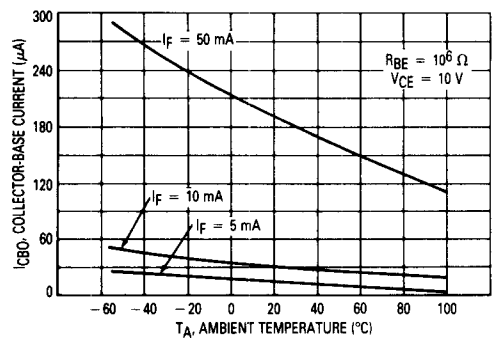

Figure 5. Collector-Base Current versus Temperature

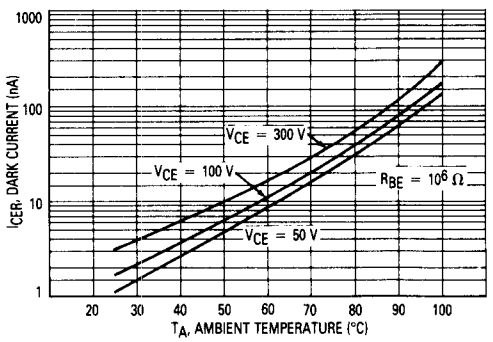

Figure 6. Dark Current versus Temperature

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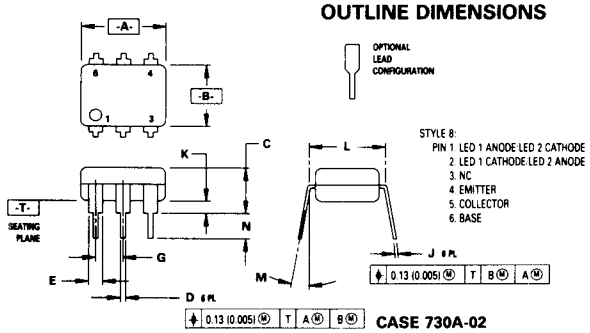
OUTLINE DIMENSIONS



STYLE 8:
PIN 1. LED 1 ANODE LED 2 CATHODE
2. LED 1 CATHODE LED 2 ANODE
3. NC
4. EMITTER
5. COLLECTOR
6. BASE

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIM L TO CENTER OF LEAD WHEN FORMED PARALLEL.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	8.13	8.89	0.320	0.350
B	6.10	6.60	0.240	0.260
C	2.93	5.08	0.115	0.200
D	0.41	0.50	0.016	0.020
E	1.02	1.77	0.040	0.070
G	2.54 BSC		0.100 BSC	
J	0.21	0.30	0.008	0.012
K	0.38	2.54	0.015	0.100
L	7.62 BSC		0.300 BSC	
M	0°	15°	0°	15°
N	2.54	3.81	0.100	0.150

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