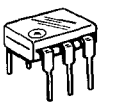
6-Pin DIP Optoisolators
Transistor Output

H11AV1,A
H11AV2,A
H11AV3,A

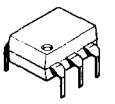
6-PIN DIP OPTOISOLATORS TRANSISTOR OUTPUT

Each device consists of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon phototransistor detector.

- High Efficiency, Low Degradation Liquid-Phase Epitaxial Emitter
- High Input-Output Isolation Guaranteed — 7500 Volts Peak
- 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, VDE0110b, covering all other standards with equal or less stringent requirements, including IEC204/VDE0113, VDE0160, VDE0832, VDE0833, etc.
- Part numbers with suffix 'A' permit circuit board mounting on 0.400" centers, which satisfies VDE requirement for 8 mm minimum creepage distance between input and output solder pads.
- Internal Conductive Part Separation 0.5 mm Minimum which now satisfies all above mentioned VDE and DIN IEC standards. For details consult "Application of the Motorola VDE Approved Optocouplers," AN978.
- Other lead form options are available. Consult "Optoisolator Lead Form Options" data sheet for details.

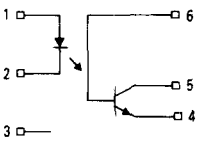


CASE 730A-02
PLASTIC



CASE 730D-02
PLASTIC

SCHEMATIC



1. LED ANODE
2. LED CATHODE
3. N.C.
4. EMITTER
5. COLLECTOR
6. BASE

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

Rating	Symbol	Value	Unit
INPUT LED			
Reverse Voltage	V_R	6	Volts
Forward Current — Continuous	I_F	60	mA
LED Power Dissipation @ T_A = 25°C with Negligible Power in Output Detector	P_D	120	mW
Derate above 25°C		1.41	mW/°C
OUTPUT TRANSISTOR			
Collector-Emitter Voltage	V_{CEO}	70	Volts
Emitter-Base Voltage	V_{EBO}	7	Volts
Collector-Base Voltage	V_{CBO}	70	Volts
Collector Current — Continuous	I_C	150	mA
Detector Power Dissipation @ T_A = 25°C with Negligible Power in Input LED	P_D	150	mW
Derate above 25°C		1.76	mW/°C
TOTAL DEVICE			
Isolation Surge Voltage (1) (Peak ac Voltage, 60 Hz, 1 sec Duration)	V_{ISO}	7500	Vac
Total Device Power Dissipation @ T_A = 25°C	P_D	250	mW
Derate above 25°C		2.94	mW/°C
Ambient Operating Temperature Range	T_A	−55 to +100	°C
Storage Temperature Range	T_{stg}	−55 to +150	°C
Soldering Temperature (10 sec, 1/16" from case)	T_{sol}	260	°C

(1) Isolation surge voltage is an internal device dielectric breakdown rating. For this test, Pins 1 and 2 are common, and Pins 4, 5 and 6 are common.

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
INPUT LED					
Forward Voltage (I_F = 10 mA) T_A = 25°C T_A = −55°C T_A = 100°C	V_F	0.8 0.9 0.7	1.15 1.3 1.05	1.5 1.7 1.4	Volts
Reverse Leakage Current (V_R = 6 V)	I_R	—	—	10	μA
Capacitance (V = 0 V, f = 1 MHz)	C_J	—	18	—	pF
OUTPUT TRANSISTOR					
Collector-Emitter Dark Current (V_{CE} = 10 V)	I_{CEO}	—	5	50	nA
Collector-Base Dark Current (V_{CB} = 10 V)	I_{CBO}	—	0.5	—	nA
Collector-Emitter Breakdown Voltage (I_C = 1 mA)	$V_{(BR)CEO}$	70	100	—	Volts
Collector-Base Breakdown Voltage (I_C = 100 μA)	$V_{(BR)CBO}$	70	100	—	Volts
Emitter-Collector Breakdown Voltage (I_E = 100 μA)	$V_{(BR)ECO}$	7	8	—	Volts
DC Current Gain (I_C = 2 mA, V_{CE} = 10 V)	h_{FE}	—	500	—	—
Collector-Emitter Capacitance (f = 1 MHz, V_{CE} = 10 V)	C_{CE}	—	4.5	—	pF
COUPLED					
Output Collector Current (I_F = 10 mA, V_{CE} = 10 V) H11AV1, H11AV1A H11AV2, H11AV2A H11AV3, H11AV3A	I_C	 10 5 2	 15 10 7	 30 — —	mA
Collector-Emitter Saturation Voltage (I_C = 2 mA, I_F = 20 mA)	$V_{CE(sat)}$	—	0.15	0.4	Volts
Turn-On Time (I_C = 2 mA, V_{CC} = 10 V, R_L = 100 Ω, Figure 11)	t_{on}	—	5	15	μs
Turn-Off Time (I_C = 2 mA, V_{CC} = 10 V, R_L = 100 Ω, Figure 11)	t_{off}	—	4	15	μs
Isolation Voltage (f = 60 Hz, t = 1 sec)	V_{ISO}	7500	—	—	Vac(pk)
Isolation Resistance (V = 500 V)	R_{ISO}	10^{11}	—	—	Ω
Isolation Capacitance (V = 0 V, f = 1 MHz)	C_{ISO}	—	0.2	0.5	pF

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TYPICAL CHARACTERISTICS

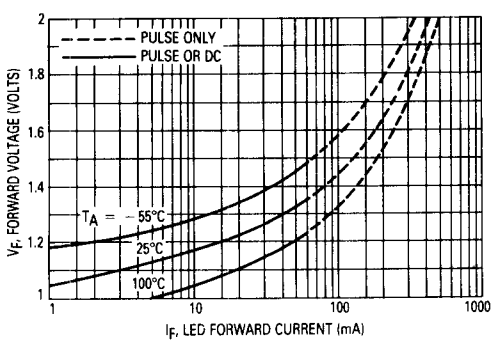

Figure 1. LED Forward Voltage versus Forward Current

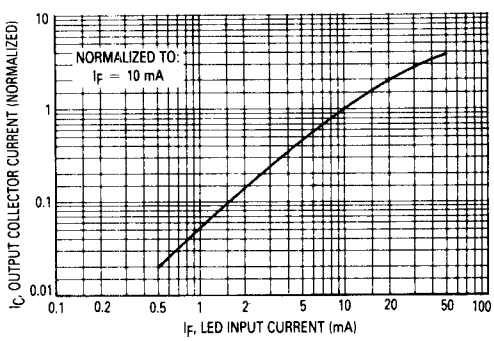

Figure 2. Output Current versus Input Current

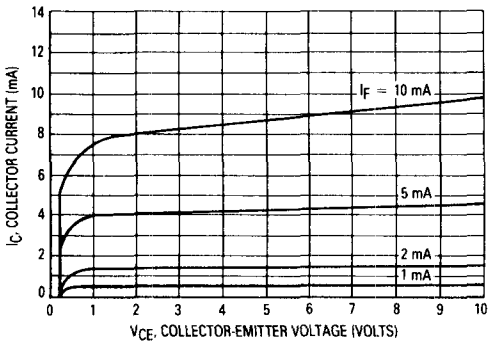

Figure 3. Collector Current versus Collector-Emitter Voltage

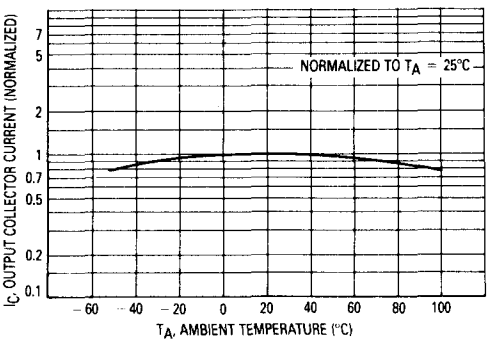

Figure 4. Output Current versus Ambient Temperature

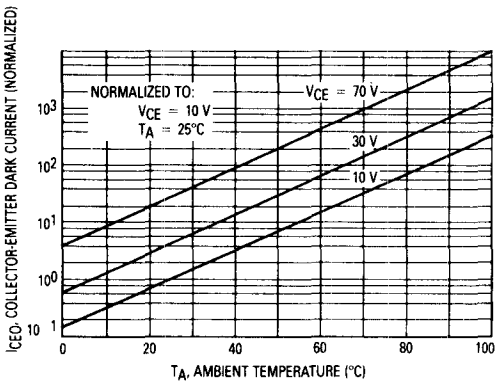

Figure 5. Dark Current versus Ambient Temperature

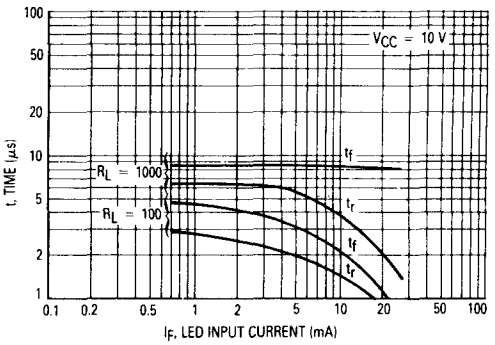

Figure 6. Rise and Fall Times

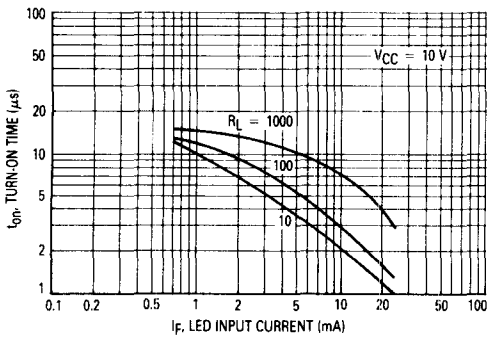

Figure 7. Turn-On Switching Times

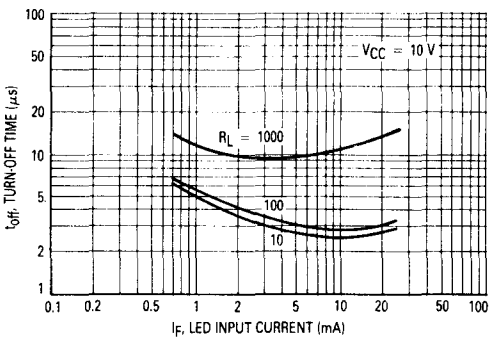

Figure 8. Turn-Off Switching Times

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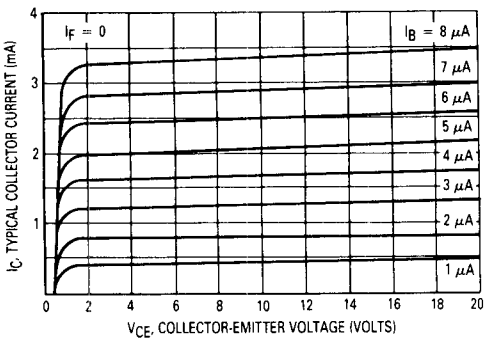


Figure 9. DC Current Gain (Detector Only)

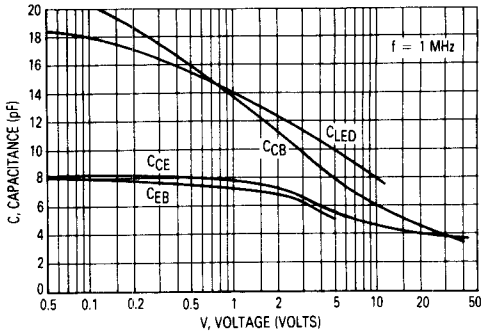


Figure 10. Capacitances versus Voltage

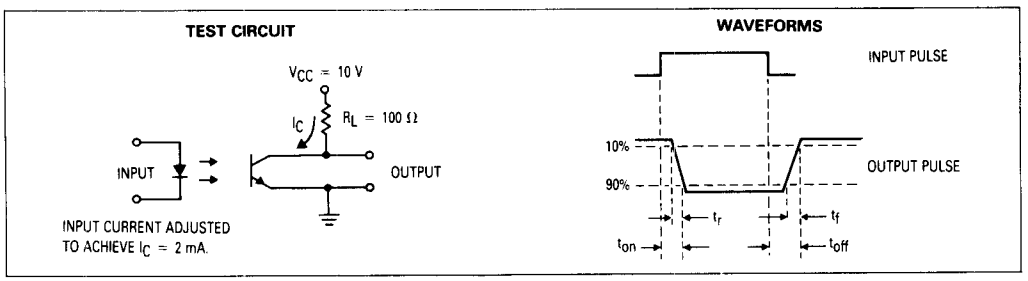
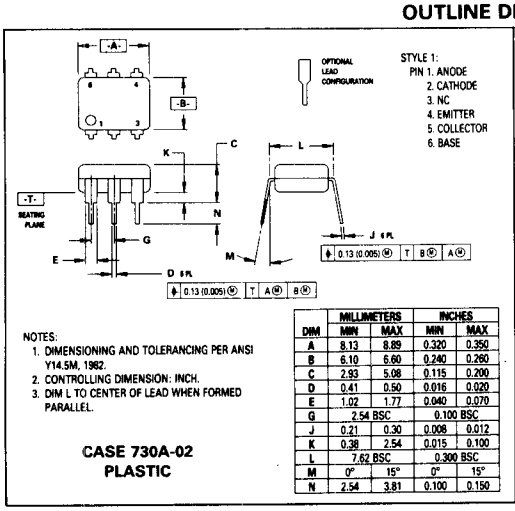


Figure 11. Switching Times

OUTLINE DIMENSIONS



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

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES 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

CASE 730A-02
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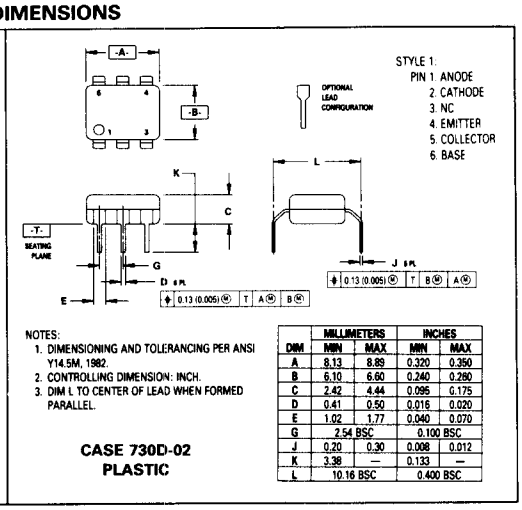

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DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	8.13	8.89	0.320	0.350
B	6.10	6.60	0.240	0.260
C	2.42	4.44	0.095	0.175
D	0.41	0.50	0.016	0.020
E	1.02	1.77	0.040	0.070
G	2.54 BSC		0.100 BSC	
J	0.20	0.30	0.008	0.012
K	3.38	—	0.133	—
L	10.16 BSC		0.400 BSC	

CASE 730D-02
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