

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,  883 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.

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
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INPUT LED

Reverse Voltage	V_R	6	Volts
Forward Current — Continuous	I_F	60	mA
LED Power Dissipation @ $T_A = 25^\circ\text{C}$ with Negligible Power in Output Detector	P_D	120	mW
Derate above 25°C		1.41	mW/ $^\circ\text{C}$

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 @ $T_A = 25^\circ\text{C}$ with Negligible Power in Input LED	P_D	150	mW
Derate above 25°C		1.76	mW/ $^\circ\text{C}$

TOTAL DEVICE

Isolation Surge Voltage (1) (Peak ac Voltage, 60 Hz, 1 sec Duration)	V_{ISO}	7500	Vac
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	250 2.94	mW mW/ $^\circ\text{C}$
Ambient Operating Temperature Range	T_A	-55 to +100	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$
Soldering Temperature (10 sec, 1/16" from case)	T_{sol}	260	$^\circ\text{C}$

(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.

H11AV1,A
H11AV2,A
H11AV3,A

**6-PIN DIP
OPTOISOLATORS
TRANSISTOR OUTPUT**

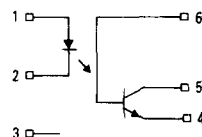


**CASE 730A-02
PLASTIC**



**CASE 730D-02
PLASTIC**

SCHEMATIC



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

H11AV1, H11AV1A, H11AV2, H11AV2A, H11AV3, H11AV3A

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
INPUT LED					
Forward Voltage ($I_F = 10\text{ mA}$) $T_A = 25^\circ\text{C}$ $T_A = -55^\circ\text{C}$ $T_A = 100^\circ\text{C}$	V_F	0.8 0.9 0.7	1.15 1.3 1.05	1.5 1.7 1.4	Volts
Reverse Leakage Current ($V_R = 6\text{ V}$)	I_R	—	—	10	μA
Capacitance ($V = 0\text{ V}$, $f = 1\text{ MHz}$)	C_J	—	18	—	pF

OUTPUT TRANSISTOR

Collector-Emitter Dark Current ($V_{CE} = 10\text{ V}$)	I_{CEO}	—	5	50	nA
Collector-Base Dark Current ($V_{CB} = 10\text{ V}$)	I_{CBO}	—	0.5	—	nA
Collector-Emitter Breakdown Voltage ($I_C = 1\text{ mA}$)	$V_{(BR)CEO}$	70	100	—	Volts
Collector-Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{A}$)	$V_{(BR)CBO}$	70	100	—	Volts
Emitter-Collector Breakdown Voltage ($I_E = 100\text{ }\mu\text{A}$)	$V_{(BR)ECO}$	7	8	—	Volts
DC Current Gain ($I_C = 2\text{ mA}$, $V_{CE} = 10\text{ V}$)	h_{FE}	—	500	—	—
Collector-Emitter Capacitance ($f = 1\text{ MHz}$, $V_{CE} = 10\text{ V}$)	C_{CE}	—	4.5	—	pF

COUPLED

Output Collector Current ($I_F = 10\text{ mA}$, $V_{CE} = 10\text{ V}$) H11AV1, H11AV1A H11AV2, H11AV2A H11AV3, H11AV3A	I_C	10 5 2	15 10 7	30 — —	mA
Collector-Emitter Saturation Voltage ($I_C = 2\text{ mA}$, $I_F = 20\text{ mA}$)	$V_{CE(sat)}$	—	0.15	0.4	Volts
Turn-On Time ($I_C = 2\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\text{ }\Omega$, Figure 11)	t_{on}	—	5	15	μs
Turn-Off Time ($I_C = 2\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\text{ }\Omega$, Figure 11)	t_{off}	—	4	15	μs
Isolation Voltage ($f = 60\text{ Hz}$, $t = 1\text{ sec}$)	V_{ISO}	7500	—	—	Vac(pk)
Isolation Resistance ($V = 500\text{ V}$)	R_{ISO}	10^{11}	—	—	Ω
Isolation Capacitance ($V = 0\text{ V}$, $f = 1\text{ MHz}$)	C_{ISO}	—	0.2	0.5	pF

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TYPICAL CHARACTERISTICS

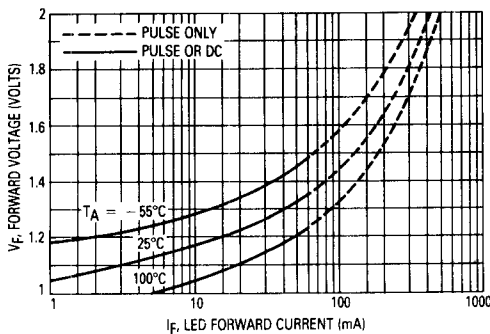


Figure 1. LED Forward Voltage versus Forward Current

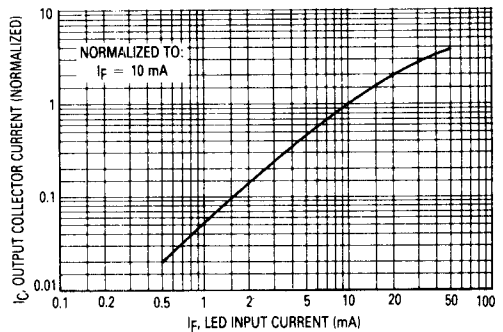


Figure 2. Output Current versus Input Current

H11AV1, H11AV1A, H11AV2, H11AV2A, H11AV3, H11AV3A

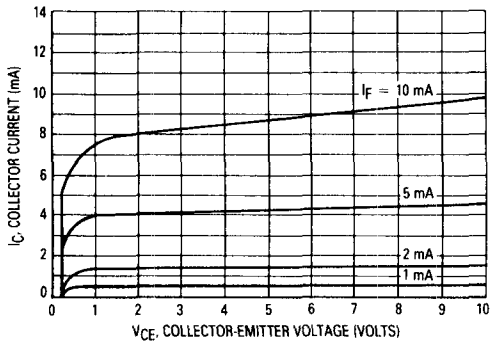


Figure 3. Collector Current versus Collector-Emitter Voltage

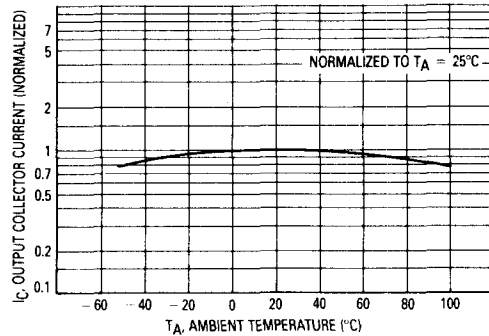


Figure 4. Output Current versus Ambient Temperature

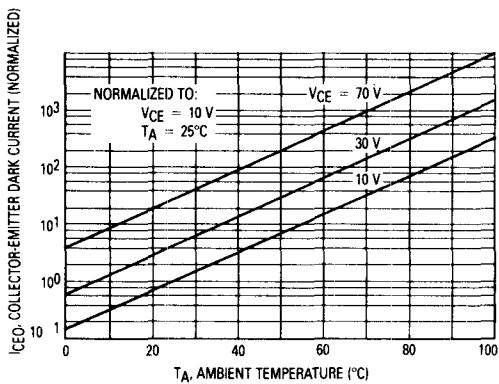


Figure 5. Dark Current versus Ambient Temperature

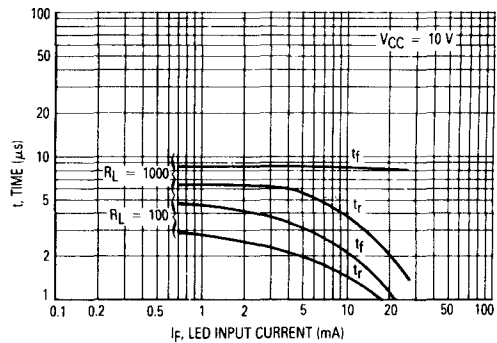


Figure 6. Rise and Fall Times

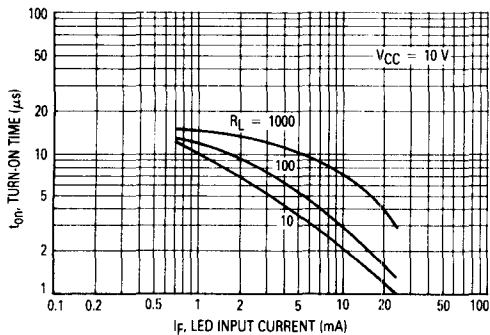


Figure 7. Turn-On Switching Times

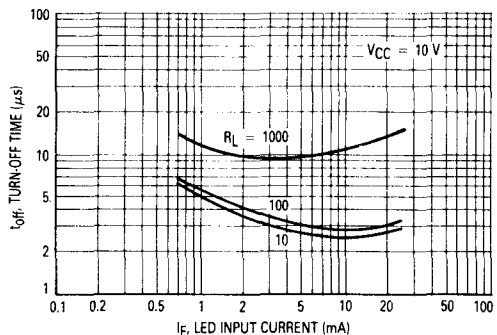


Figure 8. Turn-Off Switching Times

H11AV1, H11AV1A, H11AV2, H11AV2A, H11AV3, H11AV3A

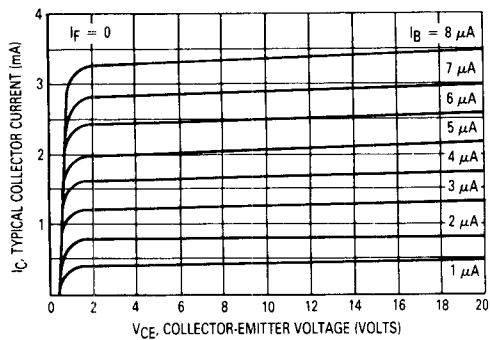


Figure 9. DC Current Gain (Detector Only)

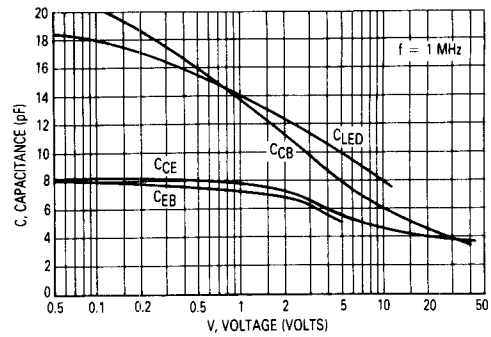


Figure 10. Capacitances versus Voltage

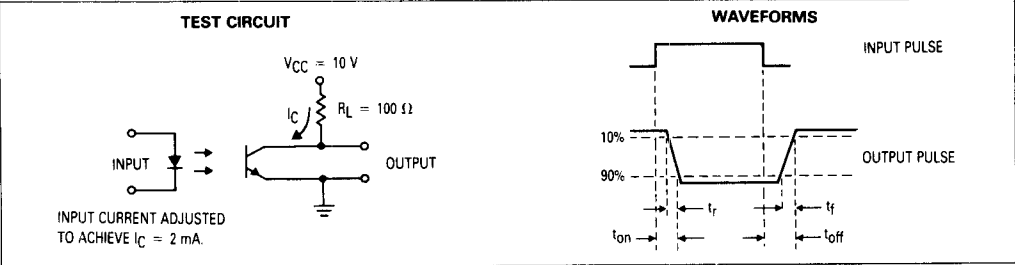


Figure 11. Switching Times

OUTLINE DIMENSIONS

