GlobalOptoisolator™

VDE | UL | CSA | SETI | SEMKO | DEMKO | NEMKO | BABT

6-Pin DIP Optoisolators High Voltage Transistor Output (300 Volts)

H11D1*

H11D2

[CTR = 20% Min]

***Motorola Preferred Device**

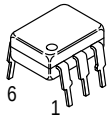
The H11D1 and H11D2 consist of gallium arsenide infrared emitting diodes optically coupled to high voltage, silicon, phototransistor detectors in a standard 6–pin DIP package. They are designed for high voltage applications and are particularly useful in copy machines and solid state relays.

- ***To order devices that are tested and marked per VDE 0884 requirements, the suffix "V" must be included at end of part number. VDE 0884 is a test option.***

Applications

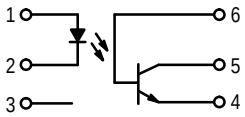
- Copy Machines
- Interfacing and coupling systems of different potentials and impedances
- Monitor and Detection Circuits
- Solid State Relays

STYLE 1 PLASTIC



STANDARD THRU HOLE
CASE 730A–04

SCHEMATIC



PIN 1. ANODE
2. 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			
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	V_{CER}	300	Volts
Emitter–Collector Voltage	V_{ECO}	7	Volts
Collector–Base Voltage	V_{CBO}	300	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(3)	T_J	–55 to +100	°C
Storage Temperature Range(3)	T_{stg}	–55 to +150	°C
Soldering Temperature (10 s)	T_L	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. For this test, Pins 1 and 2 are common, and Pins 4, 5 and 6 are common.
2. H11D1 is rated @ 5656 Volts peak (V_{ISO}). H11D2 is rated @ 3535 Volts peak (V_{ISO}) Otherwise they are identical, both parts built by Motorola are rated @ 7500 Volts peak (V_{ISO})
3. Refer to Quality and Reliability Section in Opto Data Book for information on test conditions.

Preferred devices are Motorola recommended choices for future use and best overall value.

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)(1)

Characteristic		Symbol	Min	Typ(1)	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
(T_A = 100°C)	H11D1,2		—	—	250	μA
Collector–Base Breakdown Voltage (I_C = 100 μA)	H11D1,2	$V_{(BR)CBO}$	—	—	300	Volts
Collector–Emitter Breakdown Voltage (I_C = 1 mA, R_{BE} = 1 MΩ)	H11D1,2	$V_{(BR)CER}$	—	—	300	Volts
Emitter–Base Breakdown Voltage (I_E = 100 μA)		$V_{(BR)EBO}$	7	—	—	Volts
COUPLED (T_A = 25°C unless otherwise noted)						
Output Collector Current (V_{CE} = 10 V, I_F = 10 mA, R_{BE} = 1 MΩ)	H11D1,2	I_C (CTR)(2)	2 (20)	—	—	mA (%)
Surge Isolation Voltage (Input to Output)(3) Peak ac Voltage, 60 Hz, 1 sec		V_{ISO}	7500	—	—	Vac(pk)
Isolation Resistance(3) (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(3) (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	—	

1. Always design to the specified minimum/maximum electrical limits (where applicable).
2. Current Transfer Ratio (CTR) = I_C/I_F x 100%.
3. For this test, Pins 1 and 2 are common, and Pins 4, 5 and 6 are common.

TYPICAL CHARACTERISTICS

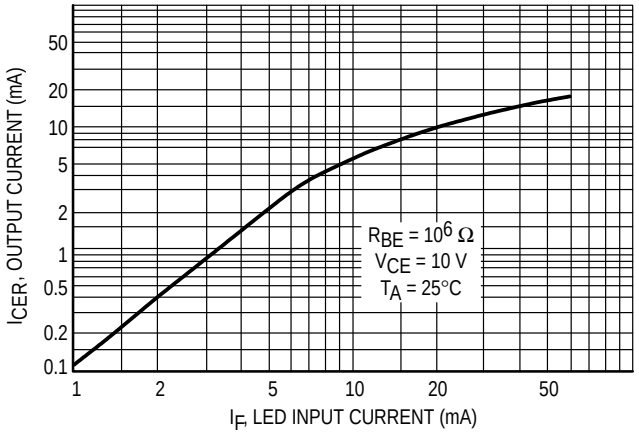


Figure 1. Output Current versus LED Input Current

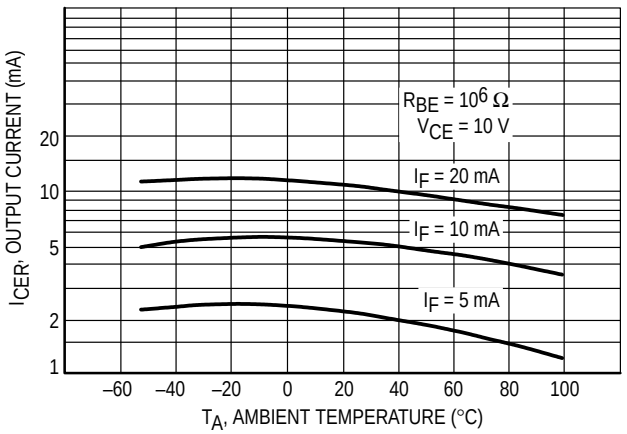


Figure 2. Output Current versus Temperature

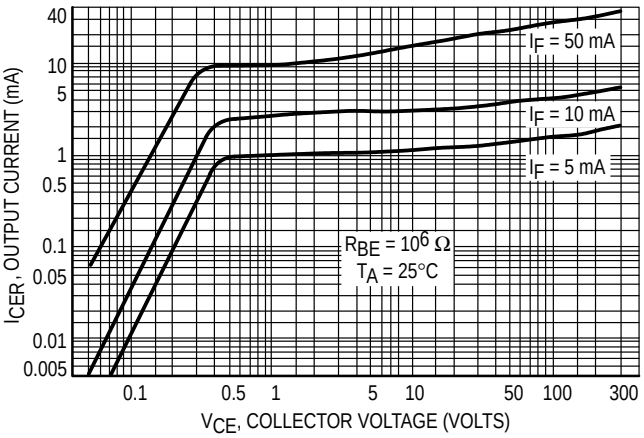


Figure 3. Output Characteristics

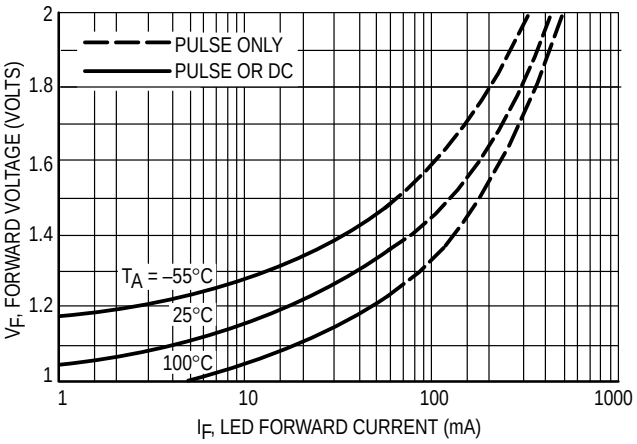


Figure 4. Forward Characteristics

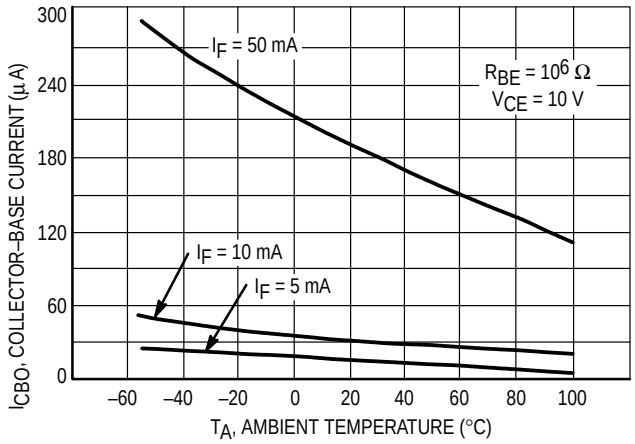


Figure 5. Collector–Base Current versus Temperature

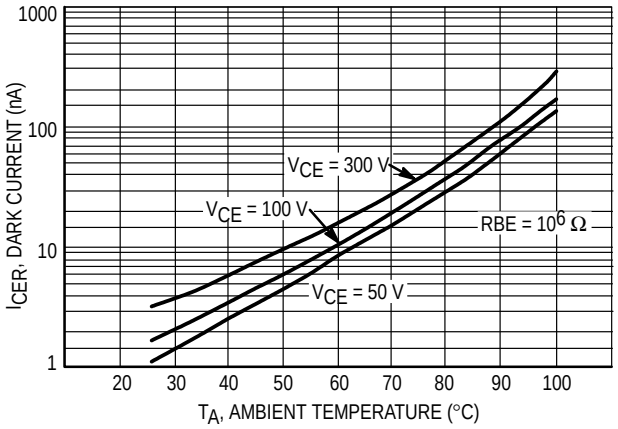


Figure 6. Dark Current versus Temperature

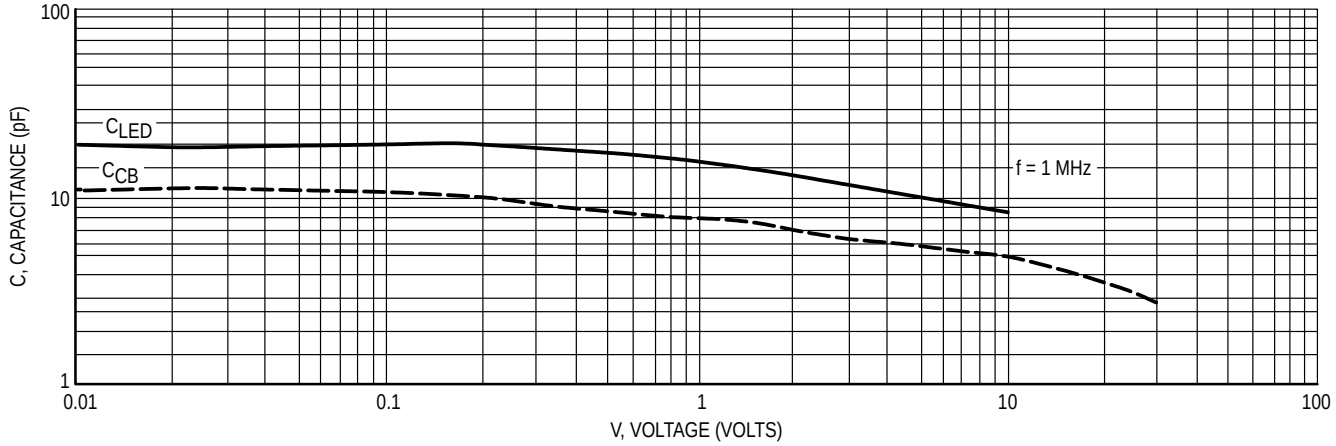
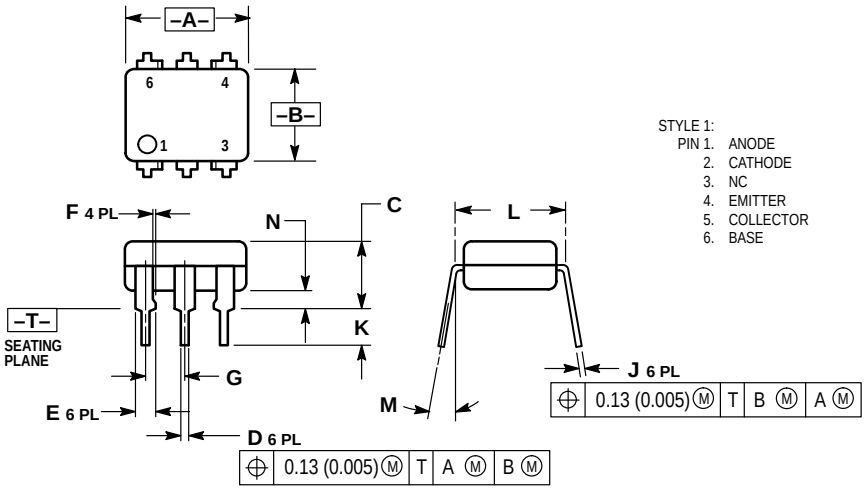


Figure 7. Capacitance versus Voltage

PACKAGE DIMENSIONS

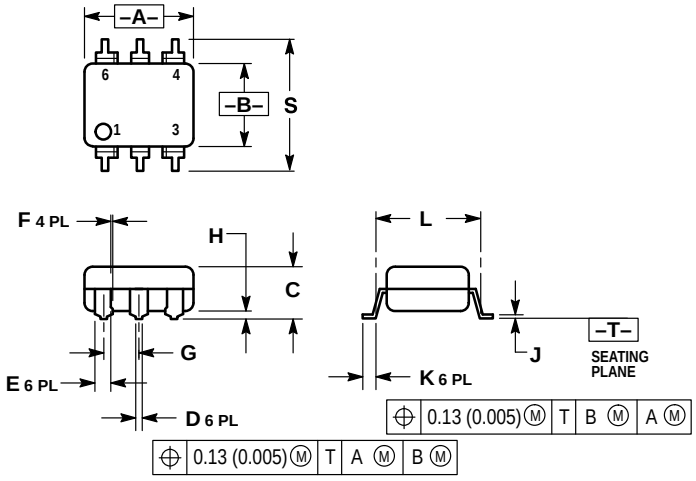


STYLE 1:
PIN 1. ANODE
2. CATHODE
3. NC
4. EMITTER
5. COLLECTOR
6. BASE

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

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.320	0.350	8.13	8.89
B	0.240	0.260	6.10	6.60
C	0.115	0.200	2.93	5.08
D	0.016	0.020	0.41	0.50
E	0.040	0.070	1.02	1.77
F	0.010	0.014	0.25	0.36
G	0.100 BSC		2.54 BSC	
J	0.008	0.012	0.21	0.30
K	0.100	0.150	2.54	3.81
L	0.300 BSC		7.62 BSC	
M	0°	15°	0°	15°
N	0.015	0.100	0.38	2.54

CASE 730A–04
ISSUE G

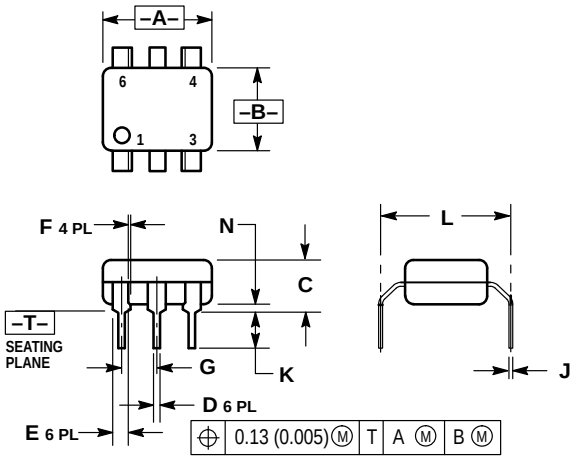


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.320	0.350	8.13	8.89
B	0.240	0.260	6.10	6.60
C	0.115	0.200	2.93	5.08
D	0.016	0.020	0.41	0.50
E	0.040	0.070	1.02	1.77
F	0.010	0.014	0.25	0.36
G	0.100 BSC		2.54 BSC	
H	0.020	0.025	0.51	0.63
J	0.008	0.012	0.20	0.30
K	0.006	0.035	0.16	0.88
L	0.320 BSC		8.13 BSC	
S	0.332	0.390	8.43	9.90

***Consult factory for leadform option availability**

CASE 730C–04
ISSUE D



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

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.320	0.350	8.13	8.89
B	0.240	0.260	6.10	6.60
C	0.115	0.200	2.93	5.08
D	0.016	0.020	0.41	0.50
E	0.040	0.070	1.02	1.77
F	0.010	0.014	0.25	0.36
G	0.100 BSC		2.54 BSC	
J	0.008	0.012	0.21	0.30
K	0.100	0.150	2.54	3.81
L	0.400	0.425	10.16	10.80
N	0.015	0.040	0.38	1.02

***Consult factory for leadform option availability**

CASE 730D–05
ISSUE D

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