ON Semiconductor®

H11AXM-5164
General Purpose 6-Pin Phototransistor Optocouplers

Features

- UL recognized (File # E90700, Volume 2)

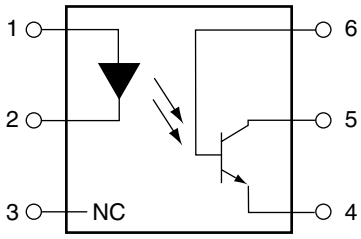
Applications

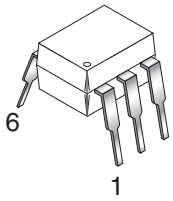
- Power supply regulators
- Digital logic inputs
- Microprocessor inputs

Description

This optocoupler consists of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 6-pin dual in-line package.

Functional Block Diagram





PIN 1. ANODE
2. CATHODE
3. NO CONNECTION
4. EMITTER
5. COLLECTOR
6. BASE

September-2017, Rev. 2

Publication Order Number:
H11AXM-5164/D

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

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Value	Units
TOTAL DEVICE			
T_{STG}	Storage Temperature	-40 to +150	°C
T_{OPR}	Operating Temperature	-40 to +100	°C
T_{SOL}	Wave solder temperature (see page 8 for reflow solder profile)	260 for 10 sec	°C
P_D	Total Device Power Dissipation @ T_A = 25°C	250	mW
	Derate above 25°C	2.94	
EMITTER			
I_F	DC/Average Forward Input Current	60	mA
V_R	Reverse Input Voltage	6	V
I_F(pk)	Forward Current – Peak (300µs, 2% Duty Cycle)	3	A
P_D	LED Power Dissipation @ T_A = 25°C	120	mW
	Derate above 25°C	1.41	mW/°C
DETECTOR			
V_{CEO}	Collector-Emitter Voltage	70	V
V_{CBO}	Collector-Base Voltage	70	V
V_{ECO}	Emitter-Collector Voltage	7	V
P_D	Detector Power Dissipation @ T_A = 25°C	150	mW
	Derate above 25°C	1.76	mW/°C

Electrical Characteristics (T_A = 25°C unless otherwise specified)

Individual Component Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.*	Max.	Unit
EMITTER						
V_F	Input Forward Voltage	I_F = 10mA		1.18	1.50	V
		I_F = 10mA, T_A = -40°C			1.7	
		I_F = 10mA, T_A = 100°C			1.4	
I_R	Reverse Leakage Current	V_R = 6.0V		0.001	10	µA
DETECTOR						
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C = 1.0mA, I_F = 0	70	100		V
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 100µA, I_F = 0	70	120		V
BV_{ECO}	Emitter-Collector Breakdown Voltage	I_E = 100µA, I_F = 0	7	10		V
I_{CEO}	Collector-Emitter Dark Current	V_{CE} = 10V, I_F = 0		1	50	nA
I_{CBO}	Collector-Base Dark Current	V_{CB} = 10V		18		nA
C_{CE}	Capacitance	V_{CE} = 0V, f = 1 MHz		8		pF

Isolation Characteristics

Symbol	Characteristic	Test Conditions	Min.	Typ.*	Max.	Units
V_{ISO}	Input-Output Isolation Voltage	f = 60Hz, t = 1 sec	7500			Vac(pk)
R_{ISO}	Isolation Resistance	V_{I-O} = 500 VDC	10^{11}			Ω
C_{ISO}	Isolation Capacitance	V_{I-O} = &, f = 1MHz		0.2	2	pF

Transfer Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.*	Max.	Unit
DC CHARACTERISTICS						
CTR	Current Transfer Ratio, Collector to Emitter	I_F = 10mA, V_{CE} = 10V	100		300	%
$V_{CE\ (SAT)}$	Collector-Emitter Saturation Voltage	I_C = 2mA, I_F = 20mA			0.4	V
AC CHARACTERISTICS						
T_{ON}	Non-Saturated Turn-on Time	I_C = 2mA, V_{CC} = 10V, R_L = 100Ω (Fig. 11)		2	15	µs
T_{OFF}	Turn-off Time	I_C = 2mA, V_{CC} = 10V, R_L = 100Ω (Fig. 11)		2	15	µs

* Typical values at T_A = 25°C

Typical Performance Curves

Fig. 1 LED Forward Voltage vs. Forward Current

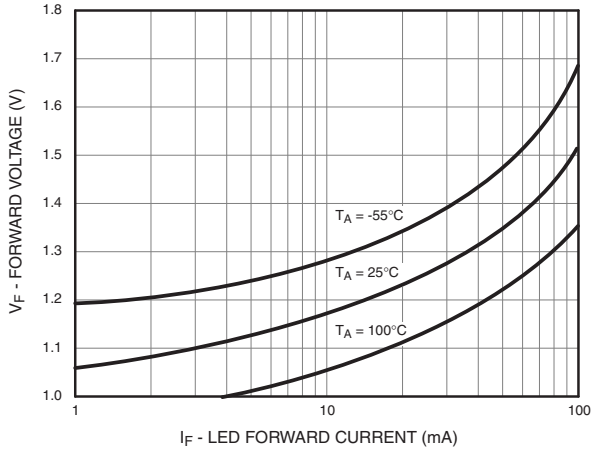


Fig.2 Normalized CTR vs. Forward Current

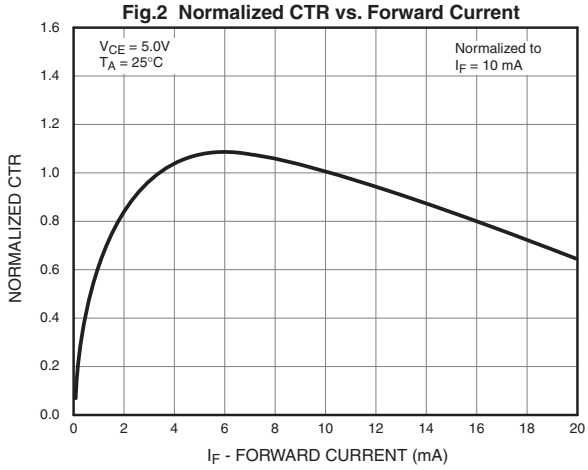


Fig. 3 Normalized CTR vs. Ambient Temperature

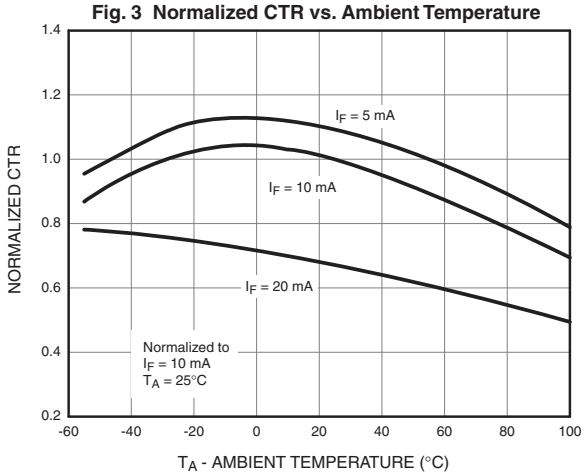


Fig. 4 CTR vs. RBE (Unsaturated)

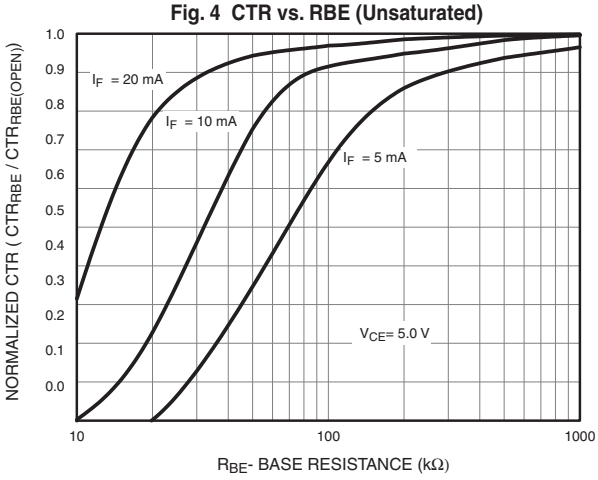


Fig. 5 CTR vs. RBE (Saturated)

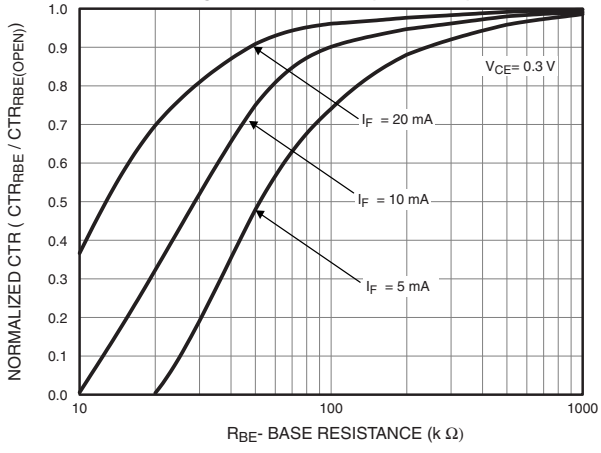


Fig. 6 Collector-Emitter Saturation Voltage vs. Collector Current

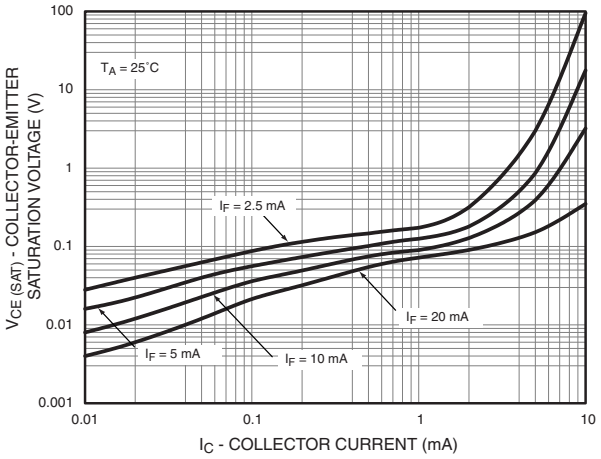


Fig. 7 Switching Speed vs. Load Resistor

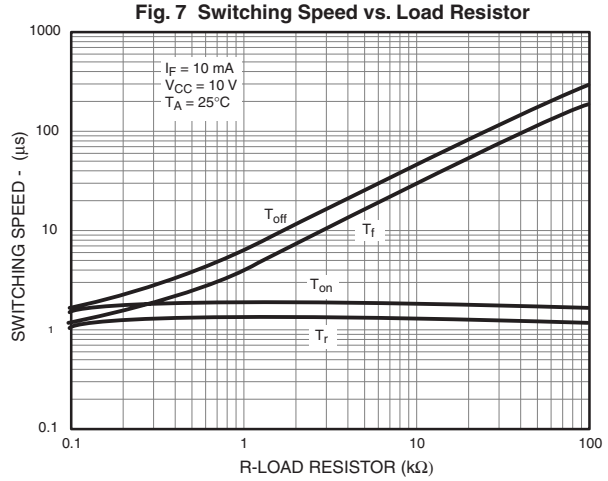


Fig. 8 Normalized t_{on} vs. R_{BE}

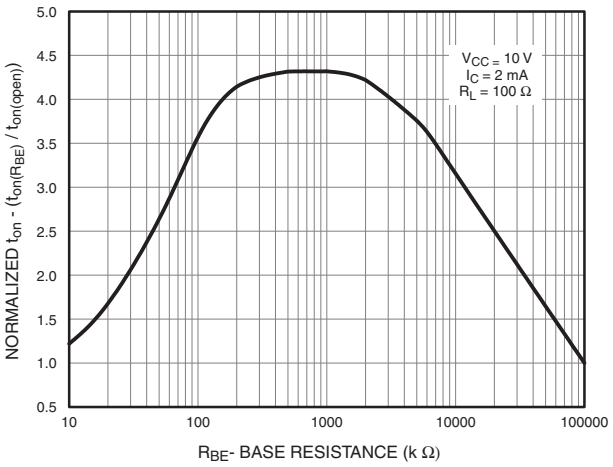


Fig. 9 Normalized t_{off} vs. R_{BE}

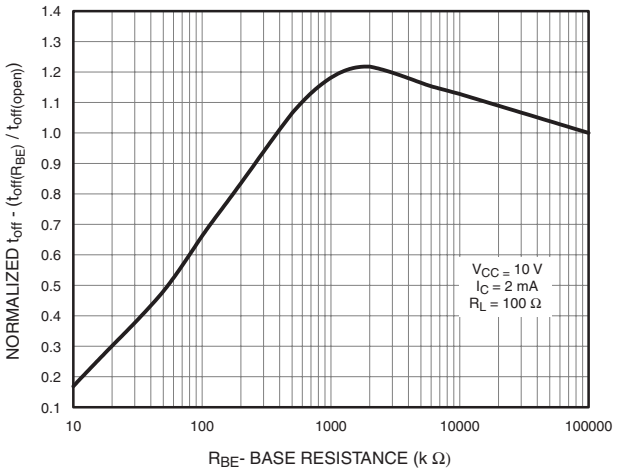
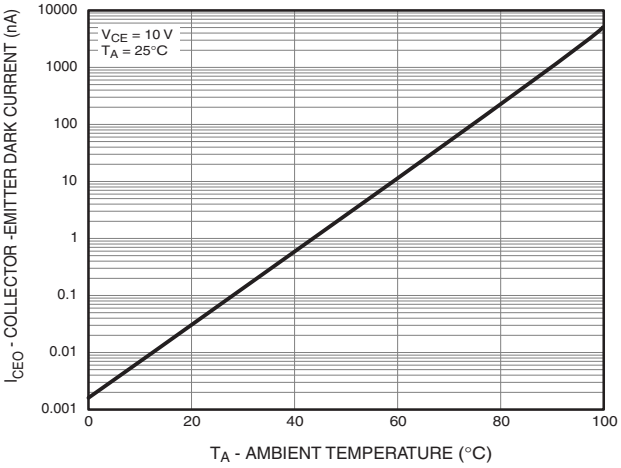
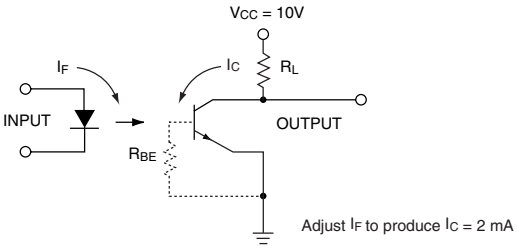


Fig. 10 Dark Current vs. Ambient Temperature



TEST CIRCUIT



WAVE FORMS

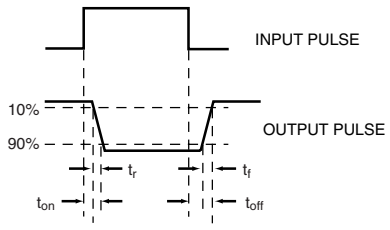
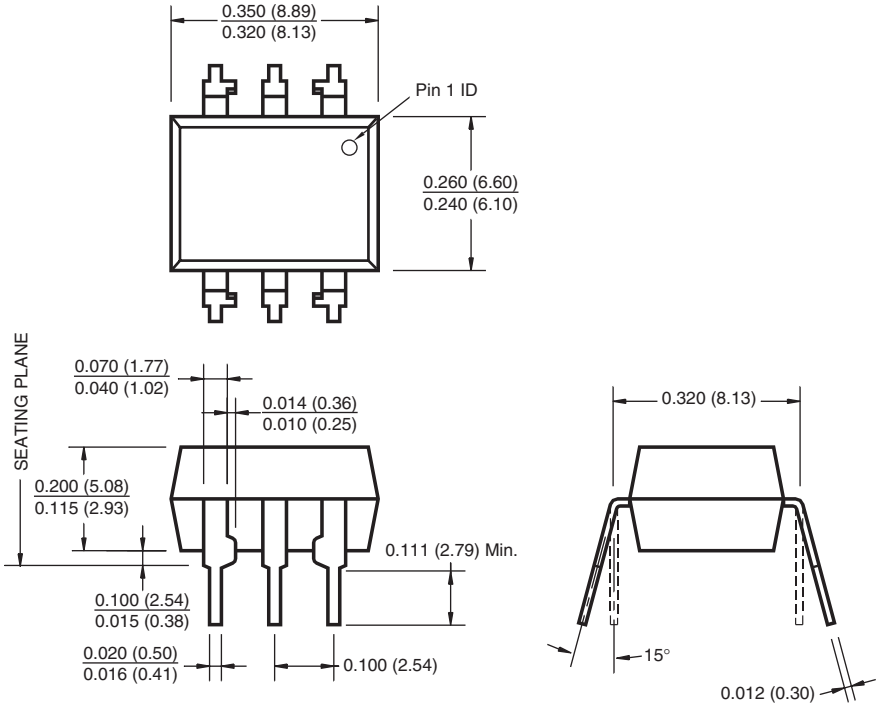


Figure 11. Switching Time Test Circuit and Waveforms

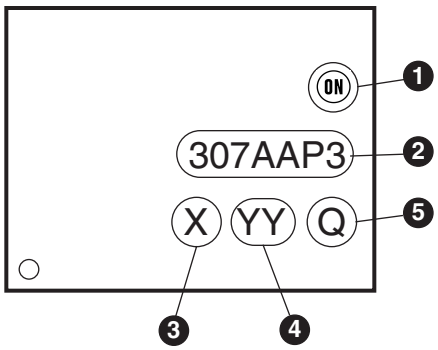
Package Dimensions

Through Hole



Note:
All dimensions are in inches (millimeters)

Marking Information



Definitions	
1	ON Semiconductor logo
2	Device number
3	One digit year code, e.g., ‘7’
4	Two digit work week ranging from ‘01’ to ‘53’
5	Assembly package code

*Note – Packing tubes are labeled with customer part no. (41A296307AAP3)

PUBLICATION ORDERING INFORMATION

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