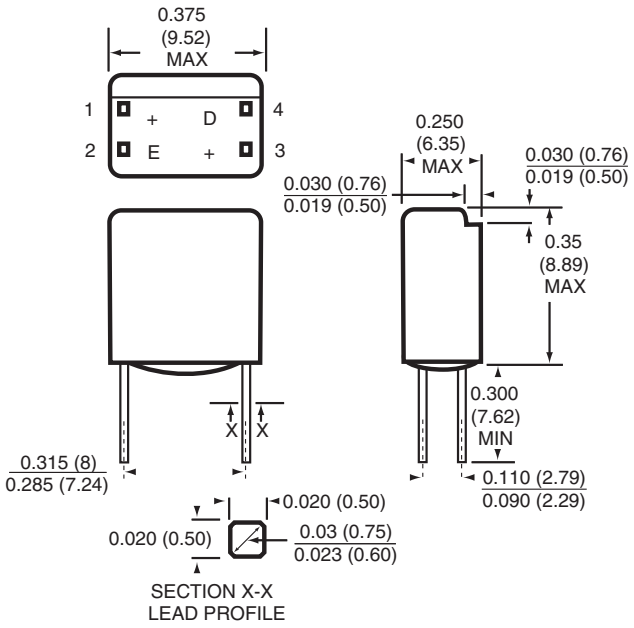
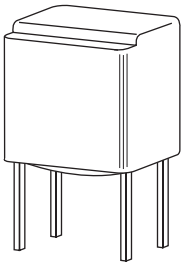
PHOTODARLINGTON OPTOCOUPLER

H24B1 H24B2

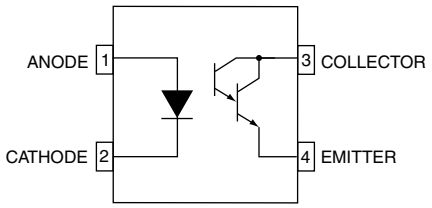
PACKAGE DIMENSIONS



NOTES:
1. Dimensions for all drawings are in inches (mm).
2. Tolerance of ± .010 (.25) on all non-nominal dimensions unless otherwise specified.



SCHEMATIC



DESCRIPTION

The H24B series consists of a gallium arsenide infrared emitting diode coupled with a silicon photodarlington. The devices are housed in a low cost plastic package with lead spacing compatible with a dual in line package.

FEATURES

- 4-pin configuration
- Small package size and low cost
- UL recognized - file E50151
- High current transfer ratio.

© 2002 Fairchild Semiconductor Corporation

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Rating	Unit
Operating Temperature	T_{OPR}	-55 to +85	°C
Storage Temperature	T_{STG}	-55 to +85	°C
Soldering Temperature (Flow)	T_{SOL-F}	260 for 5 sec	°C
EMITTER			
Power Dissipation at 25°C Ambient(1)	P_D	100	mW
Continuous Forward Current	I_F	60	mA
Reverse Voltage	V_R	4	V
DETECTOR			
Power Dissipation 25°C Ambient(2)	P_D	150	mW
Collector to Emitter Voltage	V_{CEO}	30	V
Emitter to Collector Voltage	V_{ECO}	7	V
Continuous Forward Current	I_C	100	mA

ELECTRICAL / OPTICAL CHARACTERISTICS (T_A =25°C)

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameters	Test Conditions	Symbol	Min	Typ	Max	Units
EMITTER						
Forward Voltage	I_F = 60 mA	V_F		–	1.7	V
Reverse Current	V_R = 3.0 V	I_R		–	1	µA
Reverse Breakdown Voltage	I_R = 10 µA	$V_{(BR)R}$	4			V
Capacitance	V = 0 V, f = 1 MHz	C		30		pF
DETECTOR						
Breakdown Voltage Collector to Emitter	I_C = 1.0 mA, I_F = 0	BV_{CEO}	30			V
Emitter to Collector	I_E = 100 µA, I_F = 0	BV_{ECO}	7			V
Leakage Current Collector to Emitter	V_{CE} = 10 V, I_F = 0	I_{CEO}		5	100	nA
Capacitance Collector to Emitter	V_{CE} = 5V, f = 1 MHz	C_{CE}		5		pF

NOTE:
1. Derate power linearly 1.67 mW/°C above 25°C
2. Derate power linearly 2.5 mW/°C above 25°C

© 2002 Fairchild Semiconductor Corporation

TRANSFER CHARACTERISTICS (T_A = 25°C Unless otherwise specified.)

DC Characteristics	Test Conditions		Symbol	Min	Typ	Max	Units
COUPLED DC current Transfer Ratio (note 1)	V_{CE} = 1.5 V, I_F = 5 mA	H24B1	CTR	1000			%
		H24B2		400			
Saturation Voltage	I_C = 2 mA, I_F = 5 mA		$V_{CE(SAT)}$		0.8	1.0	V
AC Characteristics	**Test Conditions**		**Symbol**	**Min**	**Typ**	**Max**	**Units**
Turn-on Time	I_C = 10mA, V_{CE} = 10V, R_L = 100Ω		ton		105		µs
Turn-off Time			toff		60		µs
Turn-on Time	I_F = 10mA, V_{CC} = 5V, R_L = 1.0kΩ		ton		10		µs
Turn-off Time			toff		700		µs

ISOLATION CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Min	Typ	Max	Units
Surge Isolation Voltage	1 Minute	V_{ISO}	6000			V_{peak}
Steady-State Isolation Voltage	1 Minute	V_{ISO}	5300			V_{RMS}
Isolation Resistance	V_{I-0} = 500VDC	R_{ISO}	10^{11}			Ohm
Isolation Capacitance	V_{I-0} = 0, f = 1 MHz	C_{ISO}		0.5		pF

NOTE:
1. The current transfer ratio (I_C/I_F) is the ratio of the detector collector current to the LED input current with V_{CE} at 1.5 volts.

© 2002 Fairchild Semiconductor Corporation

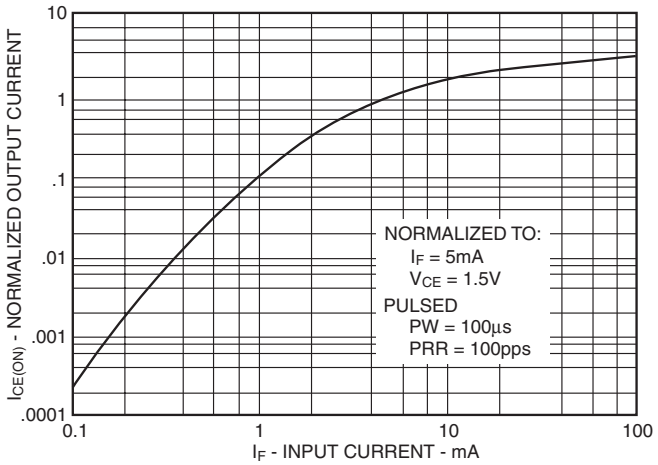


Fig. 1. Output Current vs. Input Current

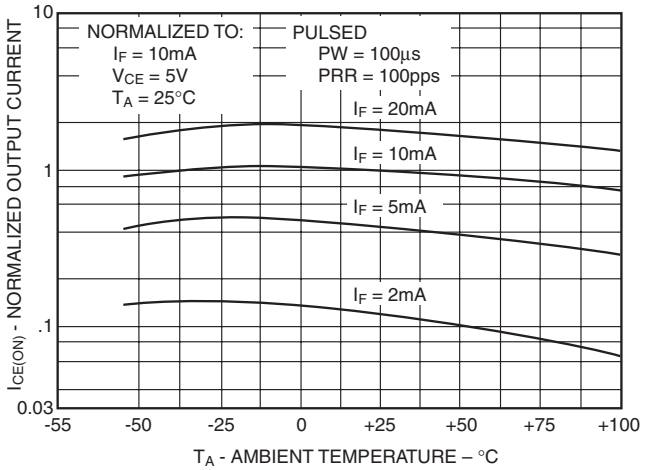


Fig. 2. Output Current vs. Temperature

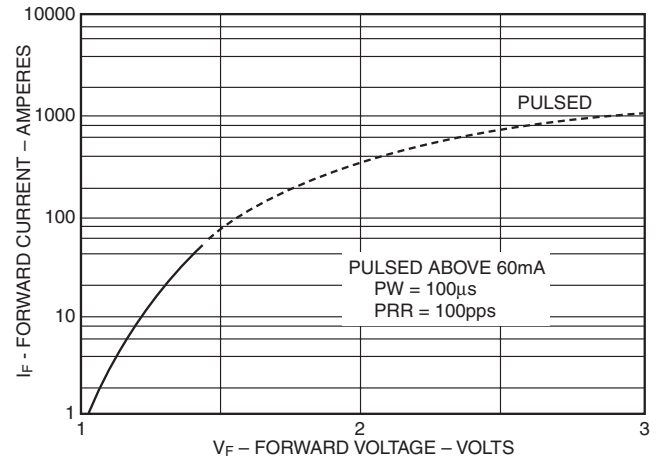


Fig. 3. Input Characteristics

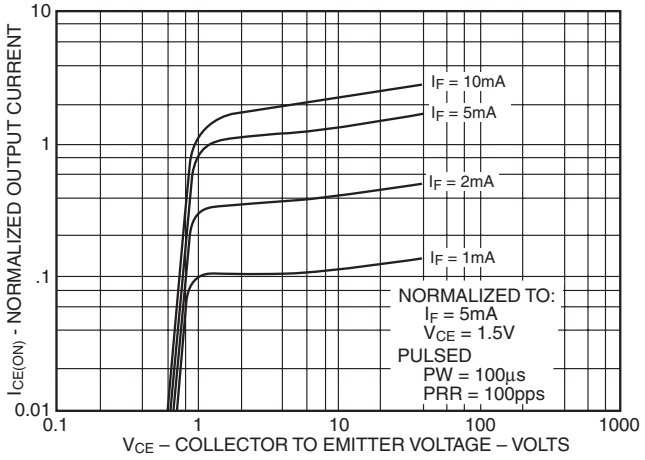


Fig. 4. Output Characteristics

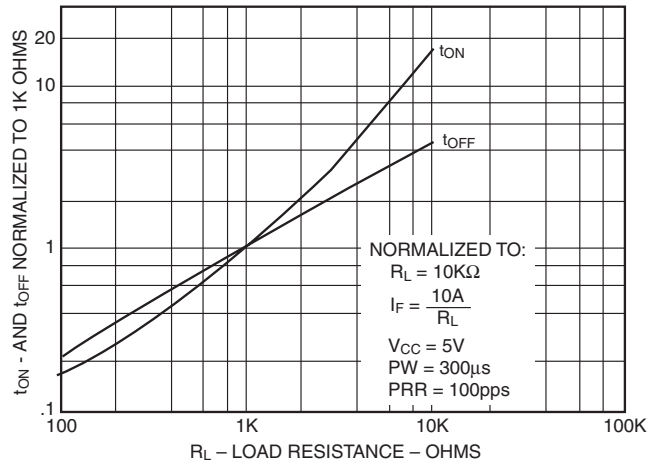


Fig. 5. Switching Speed vs R_L

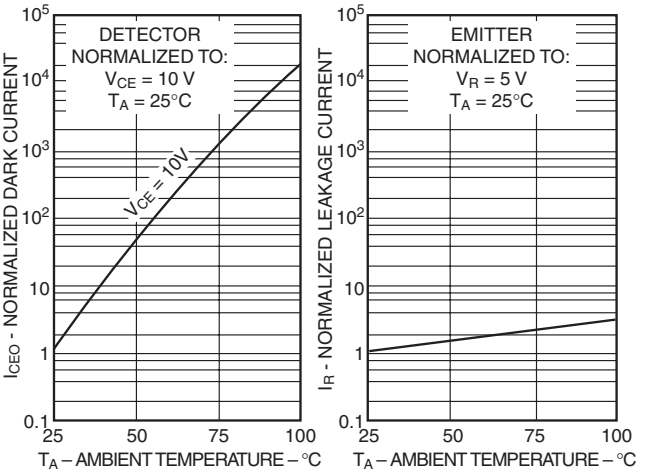


Fig. 6. Leakage Current vs. Temperature

© 2002 Fairchild Semiconductor Corporation

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

© 2002 Fairchild Semiconductor Corporation