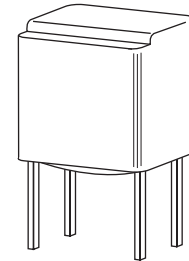
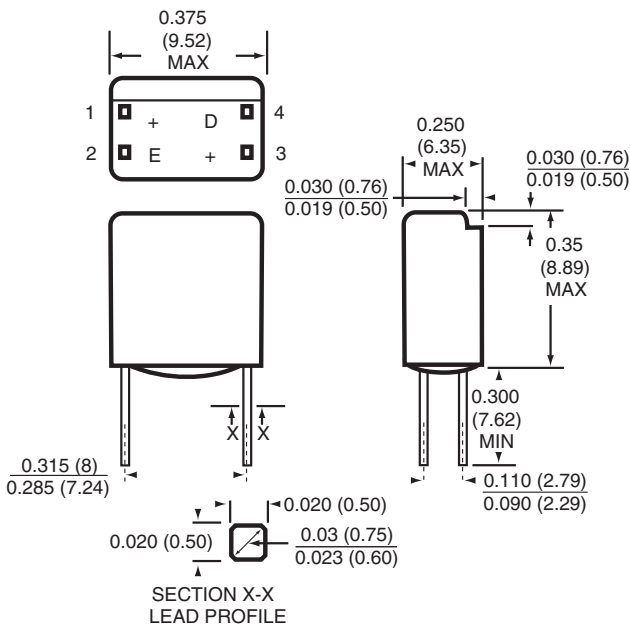
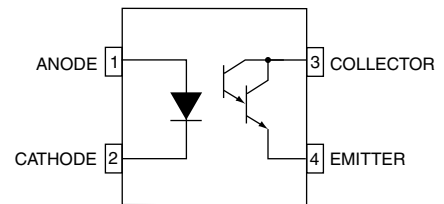


**PACKAGE DIMENSIONS**



**SCHEMATIC**



**NOTES:**

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

**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.

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

Parameter	Symbol	Rating	Unit
Operating Temperature	$T_{OPR}$	-55 to +85	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to +85	$^\circ\text{C}$
Soldering Temperature (Flow)	$T_{SOL-F}$	260 for 5 sec	$^\circ\text{C}$
<b>EMITTER</b>			
Power Dissipation at $25^\circ\text{C}$ Ambient <sup>(1)</sup>	$P_D$	100	mW
Continuous Forward Current	$I_F$	60	mA
Reverse Voltage	$V_R$	4	V
<b>DETECTOR</b>			
Power Dissipation $25^\circ\text{C}$ Ambient <sup>(2)</sup>	$P_D$	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** ( $T_A = 25^\circ\text{C}$ )

**INDIVIDUAL COMPONENT CHARACTERISTICS**

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

NOTE:

1. Derate power linearly 1.67 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$
2. Derate power linearly 2.5 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$

**H24B1**

**H24B2**

**TRANSFER CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  Unless otherwise specified.)

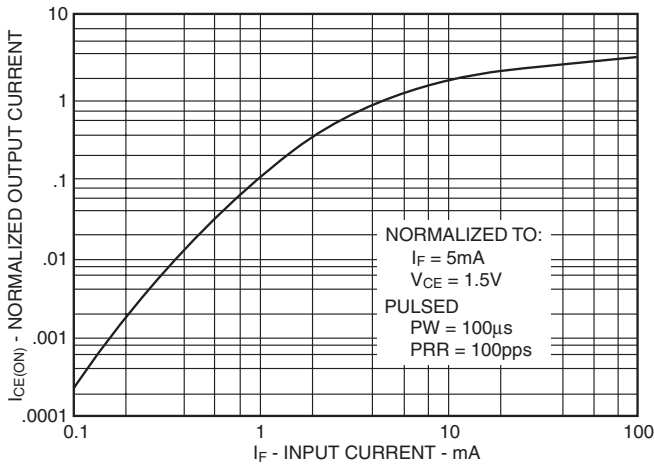
DC Characteristics	Test Conditions	Symbol	Min	Typ	Max	Units
<b>COUPLED</b> DC current Transfer Ratio (note 1)	$V_{CE} = 1.5\text{ V}, I_F = 5\text{ mA}$	H24B1	1000			%
		H24B2	400			
Saturation Voltage	$I_C = 2\text{ mA}, I_F = 5\text{ mA}$	$V_{CE(SAT)}$		0.8	1.0	V
AC Characteristics	Test Conditions	Symbol	Min	Typ	Max	Units
Turn-on Time	$I_C = 10\text{ mA}, V_{CE} = 10\text{ V}$ $R_L = 100\Omega$	ton		105		$\mu\text{s}$
Turn-off Time		toff		60		$\mu\text{s}$
Turn-on Time	$I_F = 10\text{ mA}, V_{CC} = 5\text{ V}$ $R_L = 1.0\text{ k}\Omega$	ton		10		$\mu\text{s}$
Turn-off Time		toff		700		$\mu\text{s}$

**ISOLATION CHARACTERISTICS**

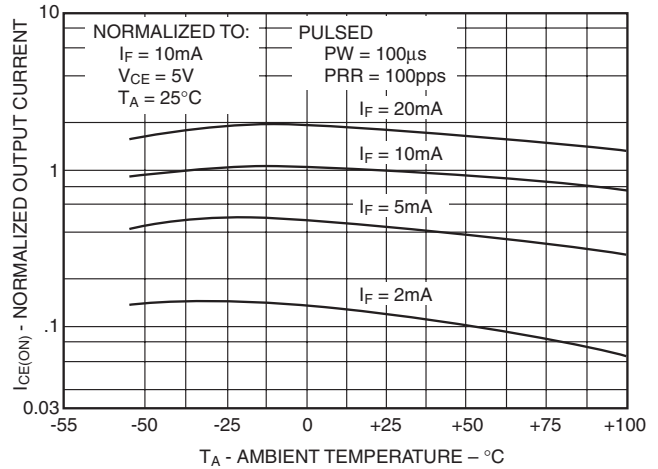
Characteristic	Test Conditions	Symbol	Min	Typ	Max	Units
Surge Isolation Voltage	1 Minute	$V_{ISO}$	6000			$V_{peak}$
Steady-State Isolation Voltage	1 Minute	$V_{ISO}$	5300			$V_{RMS}$
Isolation Resistance	$V_{I-0} = 500\text{ VDC}$	$R_{ISO}$	$10^{11}$			Ohm
Isolation Capacitance	$V_{I-0} = 0, f = 1\text{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

NOTE:

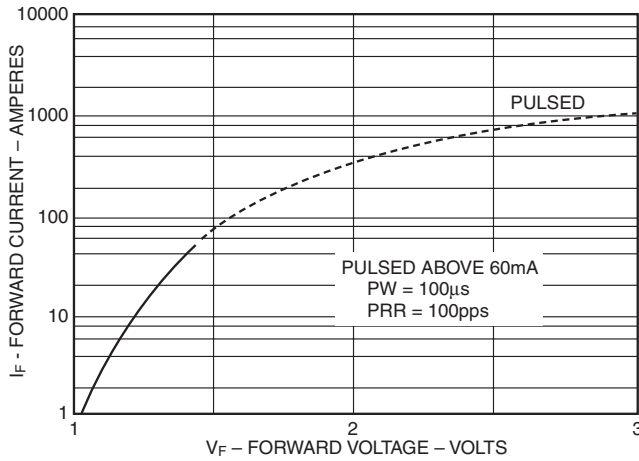
1. The current transfer ratio ( $I_C/I_F$ ) is the ratio of the detector collector current to the LED input current with  $V_{CE}$  at 1.5 volts.



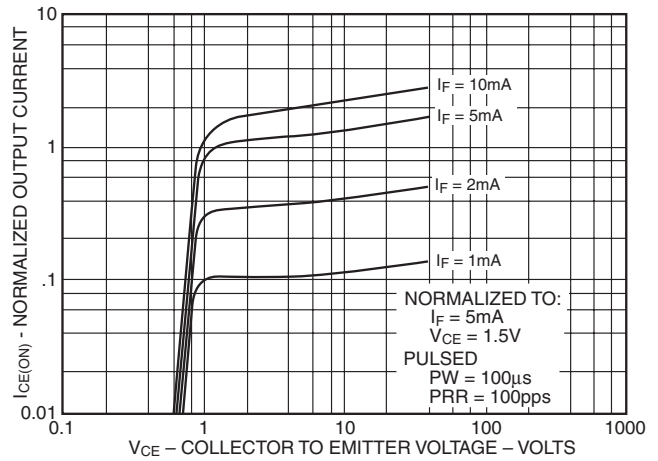
**Fig. 1. Output Current vs. Input Current**



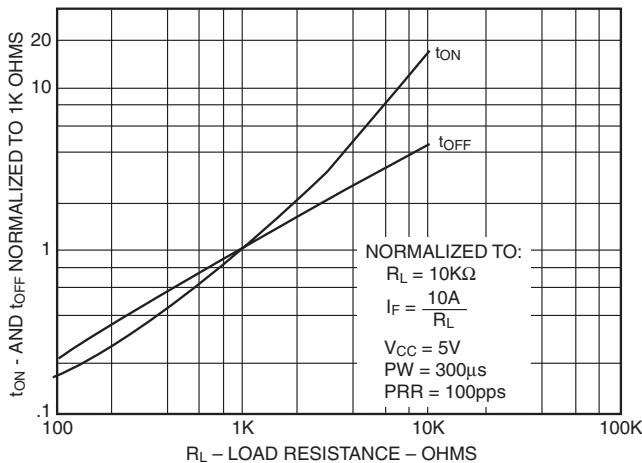
**Fig. 2. Output Current vs. Temperature**



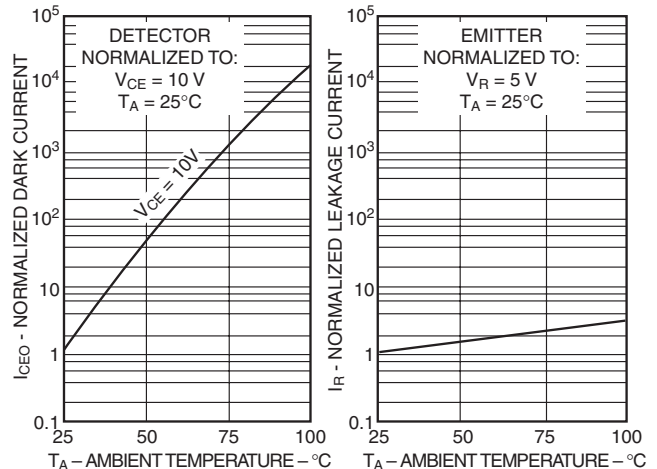
**Fig. 3. Input Characteristics**



**Fig. 4. Output Characteristics**



**Fig. 5. Switching Speed vs RL**



**Fig. 6. Leakage Current vs. Temperature**

**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.