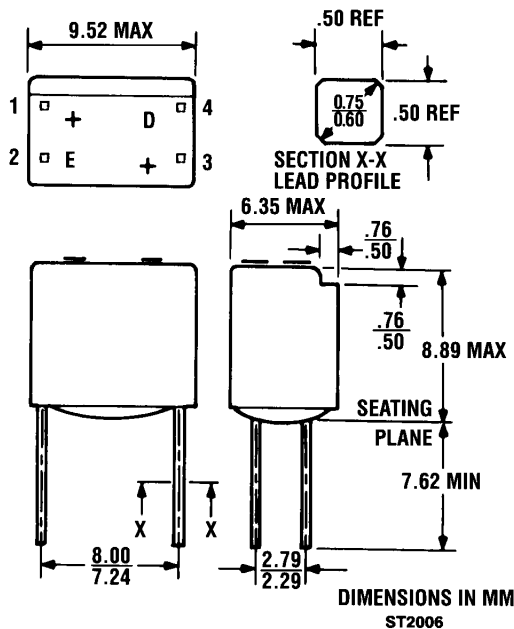


**PACKAGE DIMENSIONS**



**DESCRIPTION**

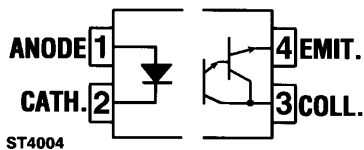
The H24A series consists of a gallium arsenide infrared emitting diode coupled with a silicon phototransistor. The devices are housed in a low-cost plastic package with lead spacing compatible with a dual in-line package.

**FEATURES**

- 4-pin configuration
- Small package size and low cost
- UL recognized-file E51868

**APPLICATIONS**

- Digital logic inputs
- Microprocessor inputs
- Industrial controls



Equivalent Circuit

**ABSOLUTE MAXIMUM RATINGS**

**TOTAL PACKAGE**

Storage temperature . . . . . -55°C to 85°C  
 Operating temperature . . . . . -55°C to 85°C  
 Lead solder temperature . . . . . 260°C for 5 sec

**INPUT DIODE**

Power dissipation (25°C ambient) . . . . . 100 mW  
 Derate linearly (above 25°C) . . . . . 1.67 mW/°C  
 Continuous forward current . . . . . 60 mA  
 Reverse voltage . . . . . 4 V

**DETECTOR**

Power dissipation (25°C ambient) . . . . . 150 mW  
 Derate linearly (above 25°C) . . . . . 2.5 mW/°C  
 $V_{CEO}$  . . . . . 30 V  
 $V_{ECO}$  . . . . . 6 V  
 Continuous forward current . . . . . 100 mA



## PHOTOTRANSISTOR OPTOCOUPLEDERS

### ELECTRICAL CHARACTERISTICS (25°C Temperature Unless Otherwise Specified)

#### INDIVIDUAL COMPONENT CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
<b>INPUT DIODE</b>						
Forward voltage	$V_F$			1.7	V	$I_F=60\text{ mA}$
Reverse current	$I_R$			1	$\mu\text{A}$	$V_R=3\text{ V}$
Reverse breakdown voltage	$V_{BR(R)}$	4			V	$I_R=10\ \mu\text{A}$
Capacitance	$C_i$		30		pF	$V=0, f=1\text{ MHz}$
<b>OUTPUT DETECTOR</b>						
Breakdown voltage Collector to emitter	$BV_{CEO}$	30			V	$I_C=1\text{ mA}, I_F=0$
Breakdown voltage Emitter to Collector	$BV_{ECO}$	7			V	$I_C=100\ \mu\text{A}, I_F=0$
Collector dark current	$I_{CEO}$		5	100	nA	$V_{CE}=10\text{ V}, I_F=0$
Capacitance	$C_{CE}$		3.3		pF	$V_{CE}=5\text{ V}, f=1\text{ MHz}$

#### TRANSFER CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
<b>DC CURRENT TRANSFER RATIO</b>						
H24A1	$I_C$	10.0			mA	$I_F=10\text{ mA}, V_{CE}=10\text{ V}$
H24A2	$I_C$	2.0			mA	$I_F=10\text{ mA}, V_{CE}=10\text{ V}$
Saturation voltage	$V_{CE(SAT)}$		0.1	0.4	V	$I_F=10\text{ mA}, I_C=0.5\text{ mA}$
Turn-on time	$t_{on}$		9		$\mu\text{s}$	$I_C=2\text{ mA}, V_{CE}=10\text{ V}, R_L=100\ \Omega$
Turn-off time	$t_{off}$		4		$\mu\text{s}$	$I_F=2\text{ mA}, V_{CE}=10\text{ V}, R_L=100\ \Omega$
Turn-on time	$t_{on}$		6.5		$\mu\text{s}$	$I_F=10\text{ mA}, V_{CE}=5\text{ V}, R_L=10\text{K}\Omega$
Turn-off time	$t_{off}$		165		$\mu\text{s}$	$I_F=10\text{ mA}, V_{CE}=5\text{ V}, R_L=10\text{K}\Omega$

#### ISOLATION CHARACTERISTICS

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Surge isolation voltage	$V_{ISO}$	6000			$V_{Peak}$	1 Minute
Steady-state isolation voltage	$V_{ISO}$	5300			$V_{RMS}$	1 Minute
Isolation resistance	$R_{ISO}$	$10^{11}$			ohms	$V_{i,o}=500\text{ VDC}$
Isolation capacitance	$C_{ISO}$		0.5		pF	$V_{i,o}=0, f=1\text{ MHz}$

**TYPICAL ELECTRICAL CHARACTERISTIC CURVES**  
(25°C Free Air Temperature Unless Otherwise Specified)

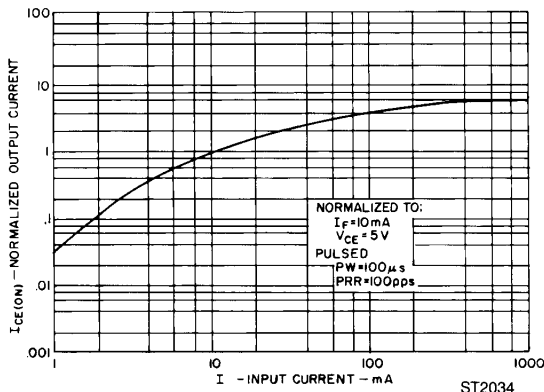


Fig. 1. Output Current vs. Input Current

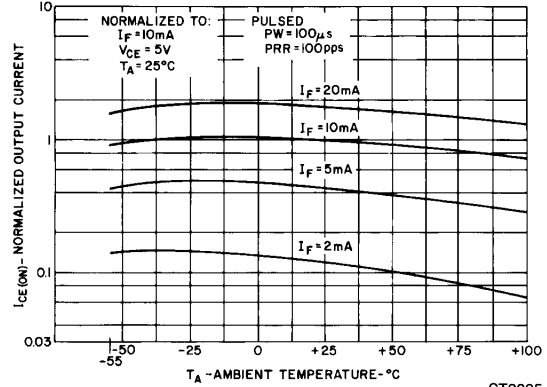


Fig. 2. Output Current vs. Temperature

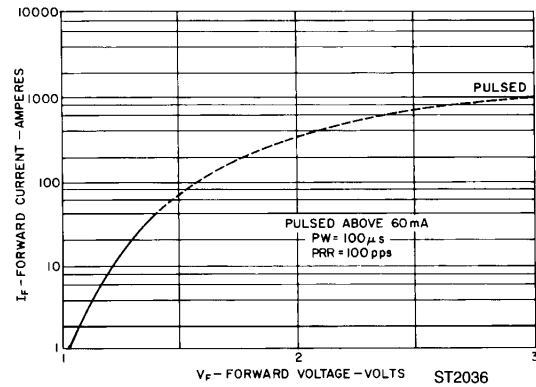


Fig. 3. Input Characteristics

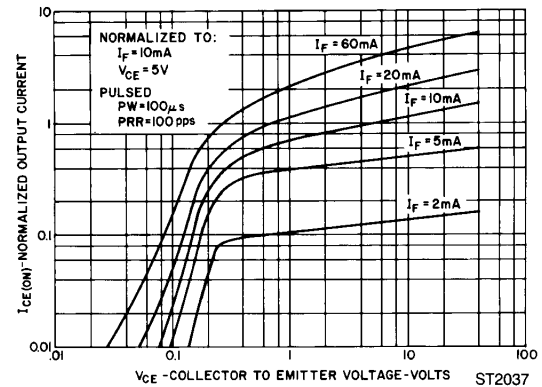


Fig. 4. Output Characteristics

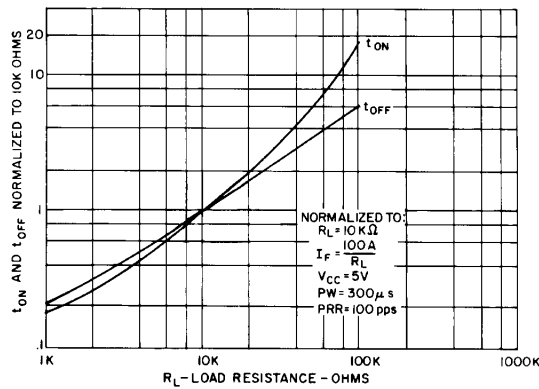


Fig. 5. Switching Speed vs.  $R_L$

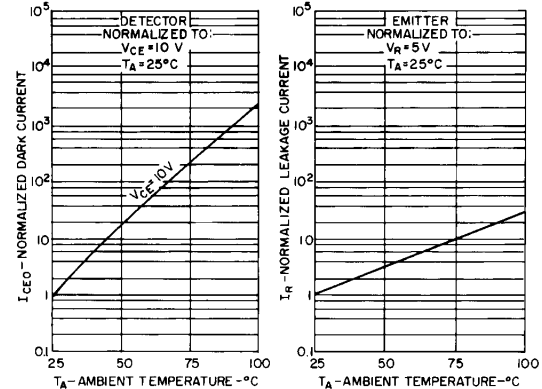


Fig. 6. Leakage Current vs. Temperature