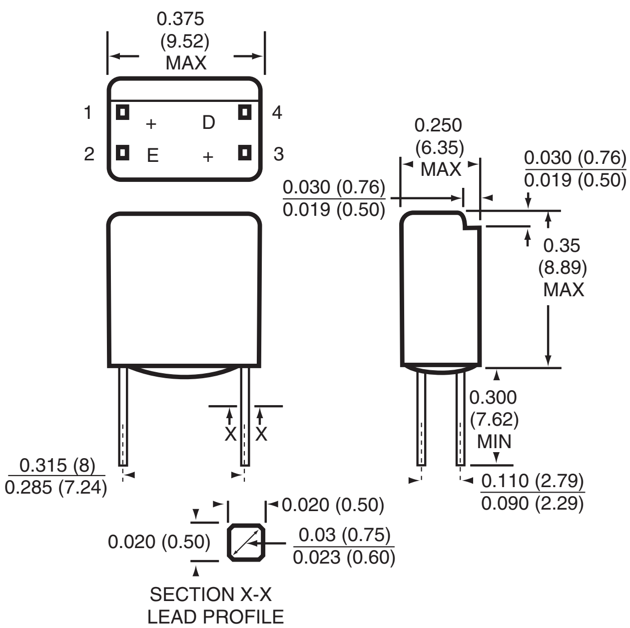
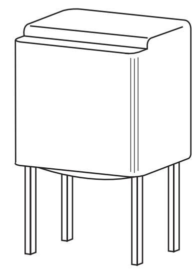
PHOTOTRANSISTOR OPTOCOUPLER

H24A1 H24A2

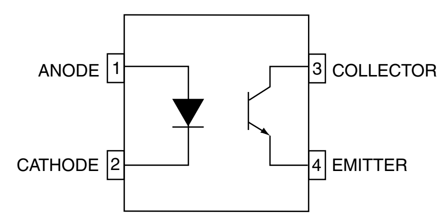
PACKAGE DIMENSIONS



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 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 E50151

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}	6	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}		3.3		pF

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

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} = 10 V, I_F = 10 mA	H24A1	CTR	100			%
		H24A2		20			
Saturation Voltage	I_C = 500 µA, I_F = 10 mA		$V_{CE(SAT)}$		0.1	0.4	V
AC Characteristics	**Test Conditions**		**Symbol**	**Min**	**Typ**	**Max**	**Units**
Turn-on Time	I_C = 2mA, V_{CE} = 10V R_L = 100Ω		ton		9		µs
Turn-off Time			toff		4		µs
Turn-on Time	I_F = 10mA, V_{CC} = 5V R_L = 10kΩ		ton		6.5		µs
Turn-off Time			toff		165		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 10 volts.

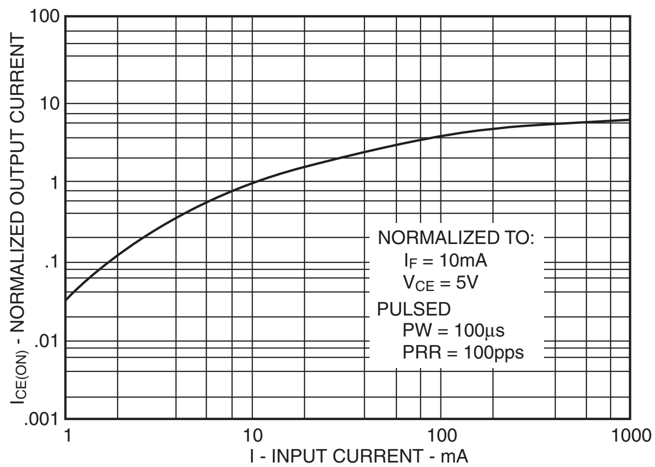


Fig. 1. Output Current vs. Input Current

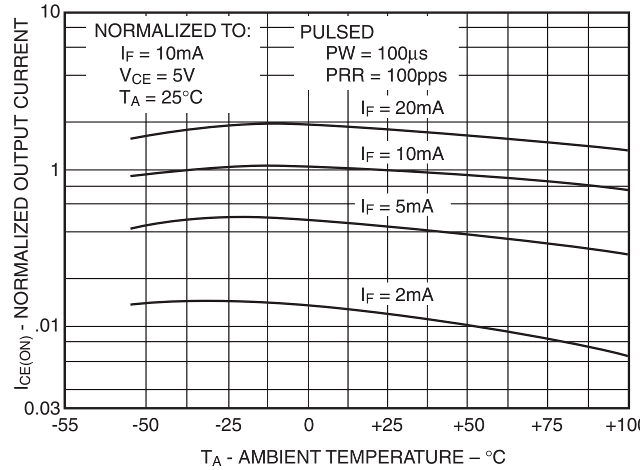


Fig. 2. Output Current vs. Temperature

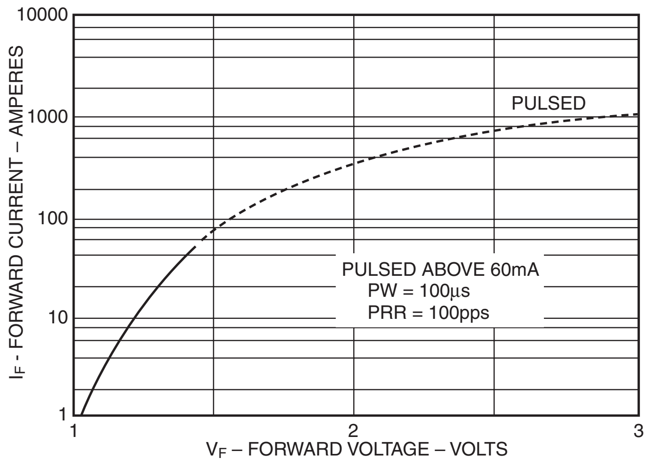


Fig. 3. Input Characteristics

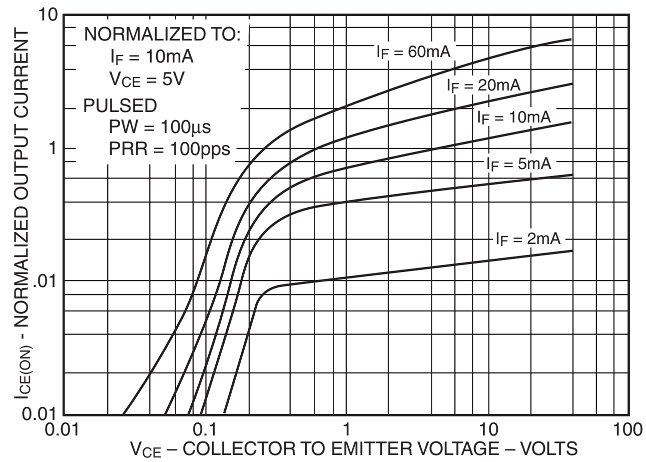


Fig. 4. Output Characteristics

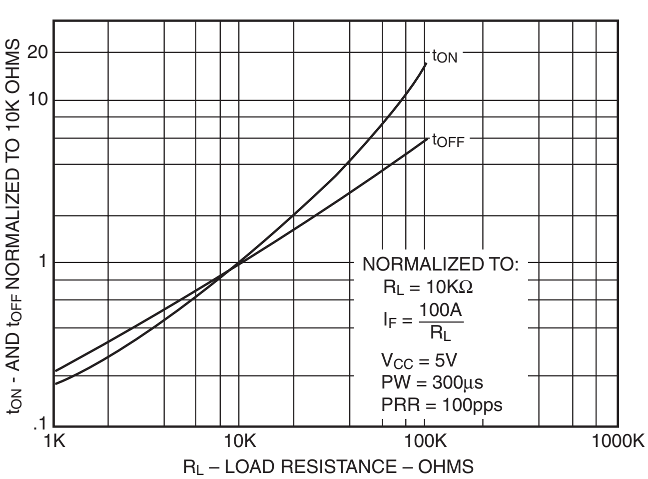


Fig. 5. Switching Speed vs R_L

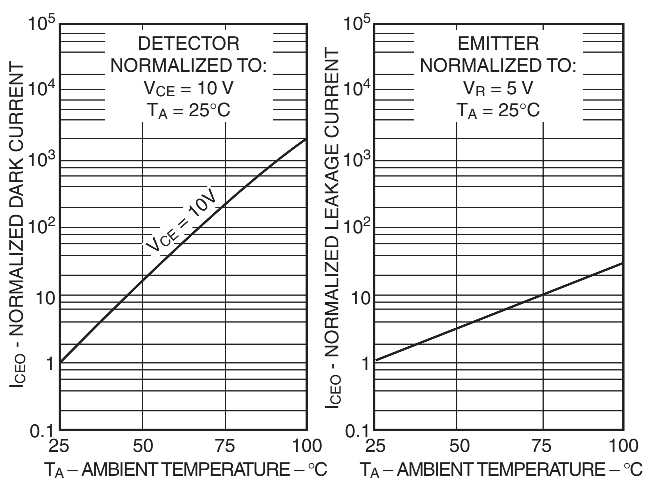


Fig. 6. Leakage Current vs. Temperature

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