

Optointerrupter Specifications

H21L1, H21L2

Optointerrupter

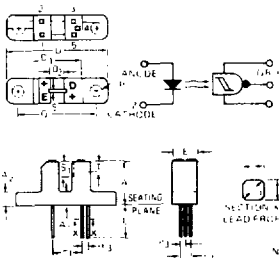
GaAs Infrared Emitting Diode and Microprocessor Compatible Schmitt Trigger Module with 1mm Aperture

The H21L series is a gallium arsenide infrared emitting diode coupled to a high-speed integrated circuit detector. The output incorporates a Schmitt trigger which provides hysteresis for noise immunity and pulse shaping. The gap in the housing provides a means of interrupting the signal with an opaque material, switching the output from an "ON" into an "OFF" state.

absolute maximum ratings: (25°C)

TOTAL DEVICE			
Storage Temperature	T_{STG}	-55°C to +85°C	
Operating Temperature	T_J	-55°C to +85°C	
Lead Soldering Temperature	T_L	260°C	
(5 seconds maximum)			

INFRARED EMITTING DIODE			
Power Dissipation	P_E	*100	mW
Forward Current	I_F	60	mA
(Continuous)			
Forward Current (Peak)	I_F	3	A
(Pulse width $\leq 1 \mu s$ PRR ≤ 300 pps)			
Reverse Voltage	V_R	6	V
*Derate 1.33 mW/°C above 25°C ambient.			



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	10.7	11.0	.422	.433	
A ₁	3.0	3.2	1.19	1.25	
A ₂	3.0	3.2	1.19	1.25	
B	600	750	.024	.030	2
C	50 NOM		.020 NOM		2
D	24.2	24.7	.952	.972	
D ₁	11.6	12.0	.457	.472	
D ₂	3.0		.119		
E	6.3	7.5	.252	.295	
F	2.3	2.8	.091	.110	
G	1.14	1.40	.045	.055	
H	6.15	6.25	.243	.249	
I	3.00		.115		
L	3.2	3.4	.126	.133	
M	18.9	19.2	.745	.755	
N	8.5	1.0	.034	.039	
S	394 NOM		155 NOM		
T	2.6 NOM		.102 NOM		3

NOTES
1. INCH DIMENSIONS ARE DERIVED FROM MILLIMETERS.
2. FOUR LEADS LEAD CROSS SECTION IS CONTROLLED BETWEEN 1.27 MM (.050") FROM SEATING PLANE AND THE END OF THE LEADS.
3. THE SENSING AREA IS DEFINED BY THE S DIMENSION AND BY DIMENSION T. 0.15 MM (.006 inch).

PHOTO DETECTOR			
Power Dissipation	P_D	**150	mW
Output Current	I_O	50	mA
Allowed Range	V_{35}	0 to 16	V
Allowed Range	V_{45}	0 to 16	V
**Derate 2.0 mW/°C above 25°C ambient.			

individual electrical characteristics: (0-70°C) (See Note 1)

EMITTER		MIN.	TYP.	MAX.	UNITS
Forward Voltage	V_F	—	1.10	1.60	volts
(I _F = 20 mA)					
Reverse Current	I_R	—	—	10	micro-ampere
(V _R = 3V)					
Capacitance	C_j	—	—	100	pico-farads
(V = 0, f = 1 MHz)					

DETECTOR		MIN.	TYP.	MAX.	UNITS
Operating Voltage Range	V_C	4	—	15	volts
Supply Current	$I_{3(off)}$	—	1.0	5.0	milli-ampere
(I _F = 0, V _{CC} = 5V)					
Output Current, High	I_{OH}	—	—	100	micro-ampere
(I _F = 0, V _{CC} = V _O = 15V)					

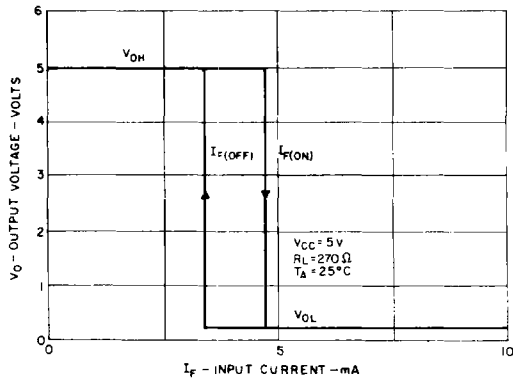
coupled electrical characteristics (0-70°C) (See Note 1)

		MIN.	TYP.	MAX.	UNITS
Supply Current	$I_{3(on)}$	—	1.6	5.0	milliampere
(I _F = 20mA, V _{CC} = 5V)					
Output Voltage, Low	V _{OL}	—	0.2	0.4	volts
(R _L = 270Ω V _{CC} = 5V, I _F = 30 mA)					
Turn-On Threshold Current	I _{F(on)}	H21L1, H22L1		30	milliampere
(R _L = 270Ω, V _{CC} = 5V)					
Turn-Off Threshold Current	I _{F(off)}	H21L1, H22L2		15	milliampere
	I _{F(off)}	H21L1, H22L2		8	milliampere
(R _L = 270Ω, V _{CC} = 5V)					
Hysteresis Ratio	I _{F(off)} /I _{F(on)}	0.50	0.75	0.90	—
(R _L = 270Ω, V _{CC} = 5V)					
Switching Speeds: R _L = 270Ω, V _{CC} = 5V, T _A = 25°C, I _F = 20 mA)					
Rise Time	t _r	—	0.1	—	μsec.
Fall Time	t _f	—	0.1	—	μsec.

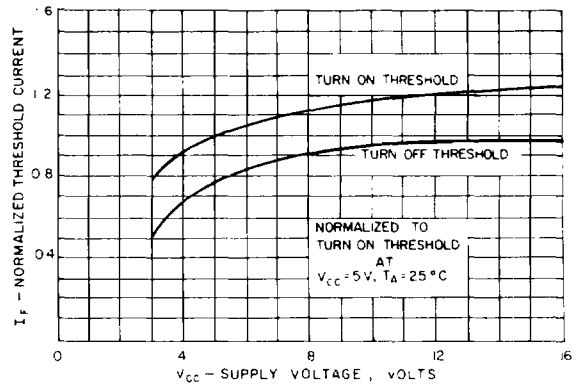
Note 1: Stray irradiation can alter values of characteristics. Adequate shielding should be provided.

H21L1, H21L2

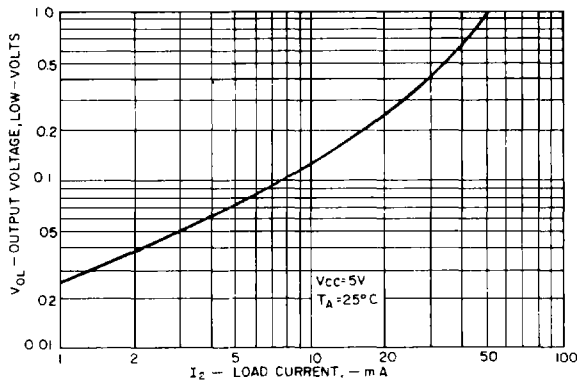
TYPICAL CHARACTERISTICS



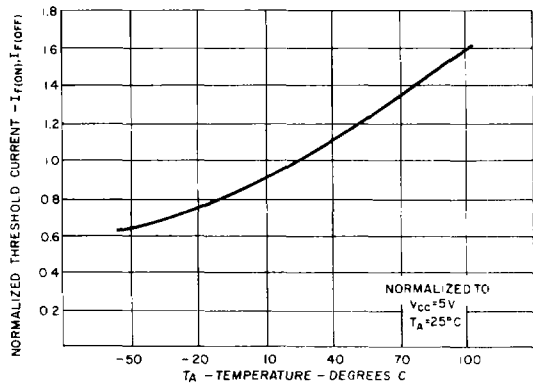
TRANSFER CHARACTERISTICS



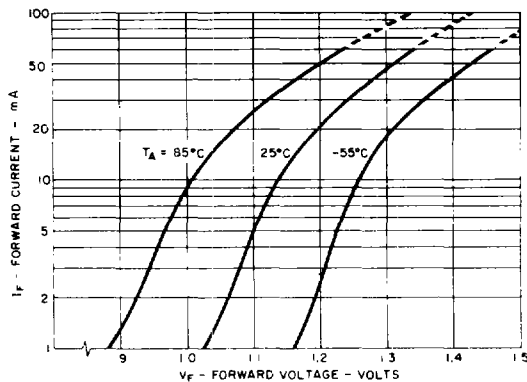
THRESHOLD CURRENT VS. SUPPLY VOLTAGE



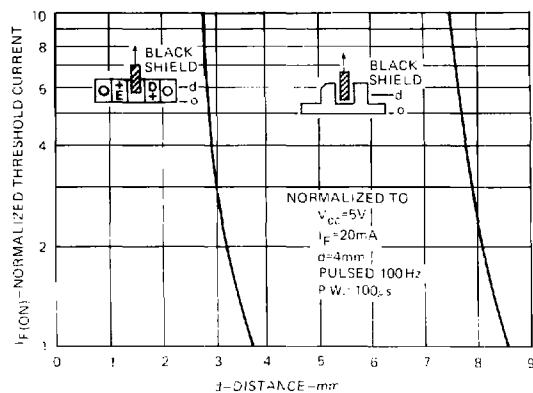
ON VOLTAGE VS. LOAD CURRENT



THRESHOLD CURRENTS VS. TEMPERATURE



FORWARD VOLTAGE VS. FORWARD CURRENT



THRESHOLD CURRENT VS. SHIELD DISTANCE