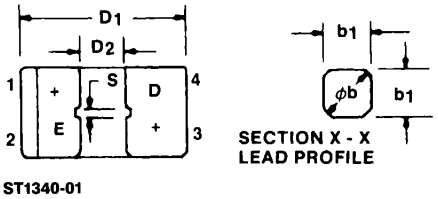
FAIRCHILD
SEMICONDUCTOR™

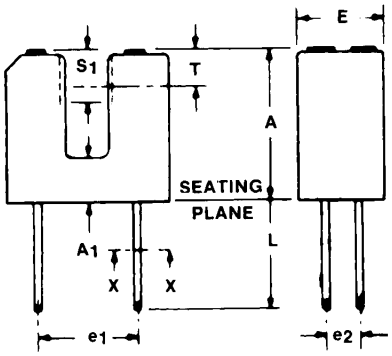
SLOTTED OPTICAL SWITCH

H22A1/2/3

PACKAGE DIMENSIONS



ST1340-01

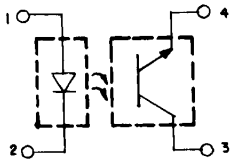


ST1340-02

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	10.7	11.0	.422	.433	
A_1	3.0	3.2	.119	.125	
Ⓜb	.600	.750	.024	.030	2
b_1	.50 NOM.		.020 NOM.		2
D_1	11.6	12.0	.457	.472	
D_2	3.0	3.3	.119	.129	
e_1	6.9	7.5	.272	.295	
e_2	2.3	2.8	.091	.110	
E	6.15	6.35	.243	.249	
L	8.00		.315		
S	.85	1.0	.034	.039	
S_1	3.45	3.75	.136	.147	
T	2.6 NOM.		.103 NOM.		3

NOTES:
1. INCH DIMENSIONS ARE DERIVED FROM MILLIMETERS.
2. FOUR LEADS. LEAD CROSS SECTION IS CONTROLLED BETWEEN 1.27mm (.050″) FROM SEATING PLANE AND THE END OF THE LEADS.
3. THE SENSING AREA IS DEFINED BY THE "S" DIMENSION AND BY DIMENSION "T" ±0.75mm (±.030 INCH).

PACKAGE OUTLINE



ST1609

DESCRIPTION

The H22A Slotted Optical Switch is a gallium arsenide light emitting diode coupled to a silicon photodarlington in a plastic housing. The packaging system is designed to optimize the mechanical resolution, coupling efficiency, ambient light rejection, cost and reliability. The gap in the housing provides a means of interrupting the signal with an opaque material, switching the output from an "ON" to an "OFF" state.

FEATURES

- Opaque housing
- Low cost
- .035″ apertures
- High $I_{C(ON)}$

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ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless Otherwise Specified)

Storage Temperature ..... −55°C to +100°C
Operating Temperature ..... −55°C to +100°C
Soldering:
Lead Temperature (Iron) ..... 240°C for 5 sec.[3,4,5]
Lead Temperature (Flow) ..... 260°C for 10 sec.[3,4]

INPUT DIODE
Continuous Forward Current ..... 60 mA
Reverse Voltage ..... 6.0 Volts
Power Dissipation ..... 100 mW[1]

OUTPUT TRANSISTOR
Collector-Emitter Voltage ..... 30 Volts
Emitter-Collector Voltage ..... 6 Volts
Power Dissipation ..... 150 mW[2]

ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless Otherwise Specified)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward Voltage	V_F	—		1.7	V	I_F = 60 mA
Reverse Breakdown Voltage	V_R	6.0		—	V	I_R = 10μA
Reverse Leakage Current	I_R	—		1.0	μA	V_R = 3 V
OUTPUT TRANSISTOR						
Emitter-Collector Breakdown	BV_{ECO}	6.0		—	V	I_E = 100 μA, Ee = 0
Collector-Emitter Breakdown	BV_{CEO}	30		—	V	I_C = 1 mA, Ee = 0
Collector-Emitter Leakage	I_{CEO}	—		100	nA	V_{CE} = 25 V, Ee = 0
COUPLED						
On-State Collector Current	$I_{C(ON)}$		See page 3.		mA	
Saturation Voltage	$V_{CE(SAT)}$		See page 3.		V	
Turn-On Time	t_{on}		See page 3.		μS	
Turn-Off Time	t_{off}		See page 3.		μS	

NOTES

1. *Derate power dissipation linearly 1.33 mW/°C above 25°C.*
2. *Derate power dissipation linearly 2.00 mW/°C above 25°C.*
3. *RMA flux is recommended.*
4. *Methanol or Isopropyl alcohols are recommended as cleaning agents.*
5. *Soldering iron tip 1/16" (1.6 mm) from housing.*

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SLOTTED OPTICAL SWITCH

$I_{C(ON)}$, $V_{CE(SAT)}$, t_{on}, AND t_{off}

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
ON-STATE COLLECTOR CURRENT						
H22A1	$I_{C(ON)}$	0.15	—	—	mA	I_F = 5mA, V_{CE} = 5V
H22A2	$I_{C(ON)}$	0.30	—	—	mA	I_F = 5mA, V_{CE} = 5V
H22A3	$I_{C(ON)}$	0.60	—	—	mA	I_F = 5mA, V_{CE} = 5V
H22A1	$I_{C(ON)}$	1.0	—	—	mA	I_F = 20mA, V_{CE} = 5V
H22A2	$I_{C(ON)}$	2.0	—	—	mA	I_F = 20mA, V_{CE} = 5V
H22A3	$I_{C(ON)}$	4.0	—	—	mA	I_F = 20mA, V_{CE} = 5V
H22A1	$I_{C(ON)}$	1.9	—	—	mA	I_F = 30mA, V_{CE} = 5V
H22A2	$I_{C(ON)}$	3.0	—	—	mA	I_F = 30mA, V_{CE} = 5V
H22A3	$I_{C(ON)}$	5.5	—	—	mA	I_F = 30mA, V_{CE} = 5V
SATURATION VOLTAGE						
H22A2	$V_{CE(SAT)}$	—	—	0.40	V	I_F = 20mA, I_C = 1.8mA
H22A3	$V_{CE(SAT)}$	—	—	0.40	V	I_F = 20mA, I_C = 1.8mA
H22A1	$V_{CE(SAT)}$	—	—	0.40	V	I_F = 30mA, I_C = 1.8mA
Turn-On Time	t_{on}	—	8	—	μS	V_{CC} = 5V, I_F = 30 mA, R_L = 2.5KΩ
Turn-Off Time	t_{off}	—	50	—	μS	V_{CC} = 5V, I_F = 30 mA, R_L = 2.5KΩ

TYPICAL CHARACTERISTICS

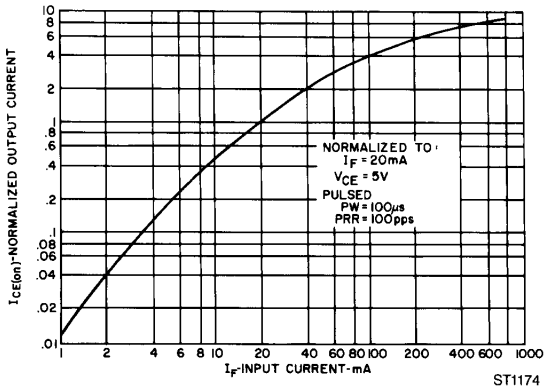

Fig. 1. Output Current vs. Input Current

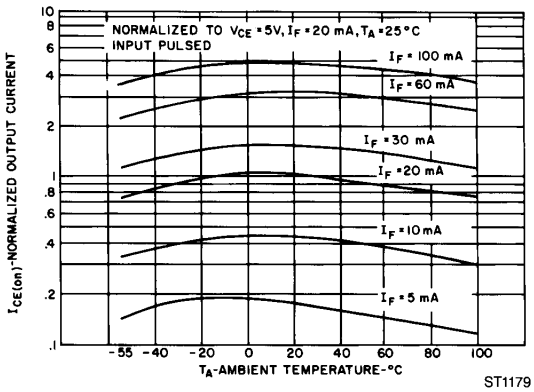

Fig. 2. Output Current vs. Temperature

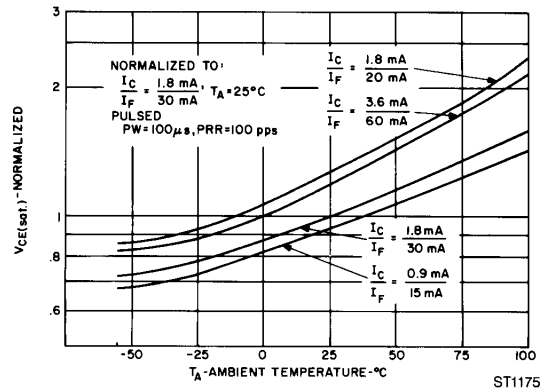

Fig. 3. $V_{CE(SAT)}$ vs. Temperature

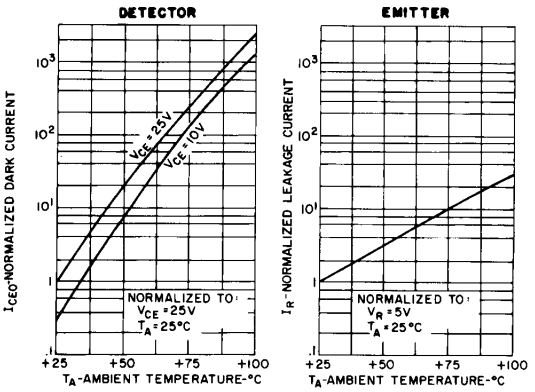

Fig. 4. Leakage Currents vs. Temperature

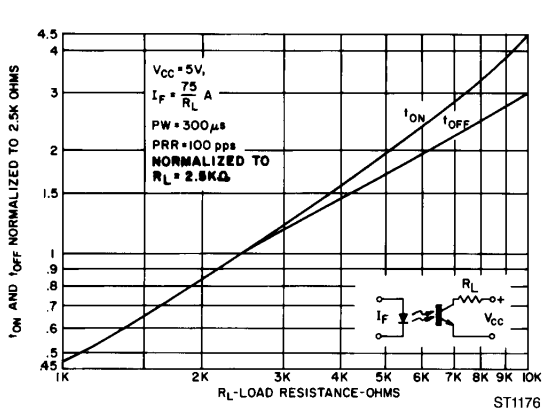

Fig. 5. Switching Speed vs. R_L

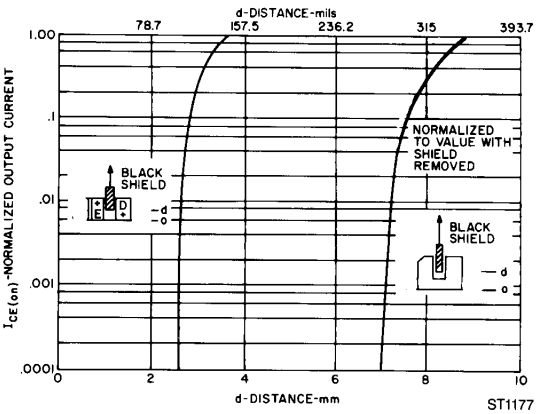

Fig. 6. Output Current vs. Shield Distance

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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.