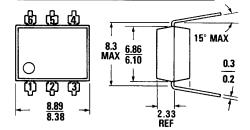
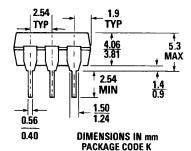


HIGH-SPEED AIGAAS SCHMITT TRIGGER OPTOCOUPLERS

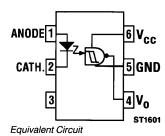
H11N1 H11N2 H11N3

PACKAGE DIMENSIONS





ST1603A



TOTAL PACKAGE

DESCRIPTION

The H11N series has a medium-to-high speed integrated circuit detector optically coupled to a gallium-aluminum-arsenide infrared emitting diode. The output incorporates a Schmitt trigger, which provides hysteresis for noise immunity and pulse shaping. The detector circuit is optimized for simplicity of operation and utilizes an open collector output for maximum application flexibility.

FEATURES & APPLICATIONS

- High data rate, 5 MHz typical (NRZ)
- Free from latch up and oscillation throughout voltage and temperature ranges
- Microprocessor compatible drive
- Logic compatible output sinks 16 mA at 0.5 V maximum
- Guaranteed on/off threshold hysteresis
- High common mode transient immunity 2000 V/µs minimum
- Fast switching: t_r, t_f=10 ns typical
- Wide supply voltage capability, compatible with all popular logic systems
- Underwriters Laboratory (UL) recognized file #E90700
- Logic to logic isolator
- Programmable current level sensor
- Line receiver—eliminates noise and transient problems
- Logic level shifter—couples TTL to CMOS
- A.C. to TTL conversion—square wave shaping
- Isolated power MOS driver for power supplies
- Interfaces computers with peripherals

ABSOLUTE MAXIMUM RATINGS

Storage temperature55°C to 125°C Operating temperature25°C to 85°C Lead solder temperature 260°C for 10 sec
INPUT DIODE Power dissipation (25°C ambient)
$(300 \mu \text{s pulse}, 2\% \text{ duty cycle})$ 50 mA Reverse voltage 6 V

DETECTOR

Power dissipation (at 25°C ambient) 150	mW
Derate linearly (above 25°C ambient) 5 m\	V/°C
$V_{\scriptscriptstyle 45}$ allowed range 0 to	16 V
$V_{\mbox{\tiny 65}}$ allowed range 0 to	16 V
I ₄ output current) mA



HIGH-SPEED AIGAAS SCHMITT TRIGGER OPTOCOUPLERS

ELECTRICAL CHARACTERISTICS (T_A= 0-70°C Unless Otherwise Specified) Note 1

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward voltage	V_{F}		1.6	2.0	V	$I_F = 10 \text{ mA}$
	$V_{\scriptscriptstyle F}$	0.75	1.45		٧	$I_F=0.3 \text{ mA}$
Reverse current	I _R			10	μΑ	V _R =5 V, T _A =25°C
	I _R			100	μΑ	V _R =5 V, T _A =100°C
Capacitance	C,			100	pF	V=0 V, f=1 MHz
OUTPUT DETECTOR						
Operating voltage range	V_{cc}	4		15	V	
Supply current	I _{6(off)}		5.5	10	mA	I _F =0, V _{cc} =5 V
Output current, high	I _{OH}			100	μΑ	I _F =0.3 mA, V _{CC} =V _O =15

CHARACTERISTIC	;	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Supply current		I _{6(on)}		5	10	mA	I_F =10 mA, V_{cc} =5 V
Output voltage, low		V _{oL}		0.3	0.5	V	R_L =270 Ω , V_{cc} =5 V , I_F = $I_{F(on)}$ max.
Turn-on threshold current	(H11N1)	I _{F(on)}	0.8		. 3.2	mA	R _L =270 Ω, V _{cc} =5 V
	(H11N2)	I _{F(on)}	2.3		5.0	mA	R _L =270 Ω, V _{CC} =5 V
	(H11N3)	I _{F(on)}	4.1		10.0	mA	R _L =270 Ω, V _{cc} =5 V
Turn-off threshold current		I _{F(off)}	0.3	1.5		mA	R _L =270 Ω, V _{CC} =5 V
Hysteresis ratio		I _{F(off)} /I _{F(on)}	0.65	0.8	0.95		R _L =270 Ω, V _{cc} =5 V



HIGH-SPEED AIGAAS SCHMITT TRIGGER OPTOCOUPLERS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
SWITCHING SPEED (Figures	7&8)					
Propagation delay, high to low	t _{PHL}		150	330	ns	C=120 pF, t _p =1 μs, R _ε : Note 4
Rise time	t,		10		ns	C=120 pF, t _p =1 μs, R _E : Note 4
Propagation delay, low to high	t _{PLH}		150	330	ns	C=120 pF, t _p =1 μs, R _E : Note 4
Fall time	t,		15		ns	C=120 pF, t _p =1 μs, R _E : Note 4
Data rate			5		MHz	Note 3
OVERDRIVE SWITCHING (FIG	URES 7&8),	NOTE 2				
Turn-off time	t _{on}		0.2	0.5	μs	C=O, R _L =270 Ω, I _F (MAX) H11N1: 5 mA H11N2: 10 mA H11N3: 20 mA
TRANSIENT IMMUNITY (FIGU	RE 9)					
Common mode transient immunity	СМн	±2000	±10000		V/μs	V_{pk} =50 V, V_{cc} =5 V, R_L =270 Ω , I_F =0
Common mode transient immunity	CML	±2000	±10000		V/μs	$V_{pk} = 50 \text{ V}, V_{CC} = 5 \text{ V}, \\ R_L = 270 \Omega, I_F = 0$

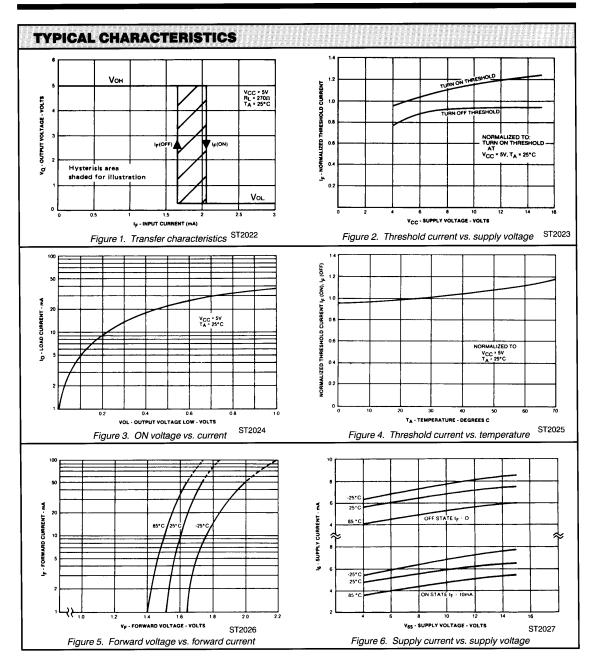
ISOLATION CHA	RACTERIST	ICS				
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Surge isolation voltage	V _{ISO}	7500			V_{peak}	1 Minute
Surge isolation voltage	V _{iso}	5300			V _{RMS}	1 Minute

Notes

- All measurements are with 100nF bypass capacitor from pin 6 to pin 5.
 Steady overdrive increases t_{st}. Use of a large R_E and a small C as in figure 7 is preferred over overdrive current.
 Maximum data rate will vary depending on the bias conditions and is usually highest when R_E and C are matched to I_{F,000} and V_{CC} is between 5 and 15V. With this optimized bias, most units will operate at over 10 MHz, NRZ.
 H11N1: R_E = 910Ω, H11N2: R_E = 560Ω, H11N3: R_E = 240Ω.

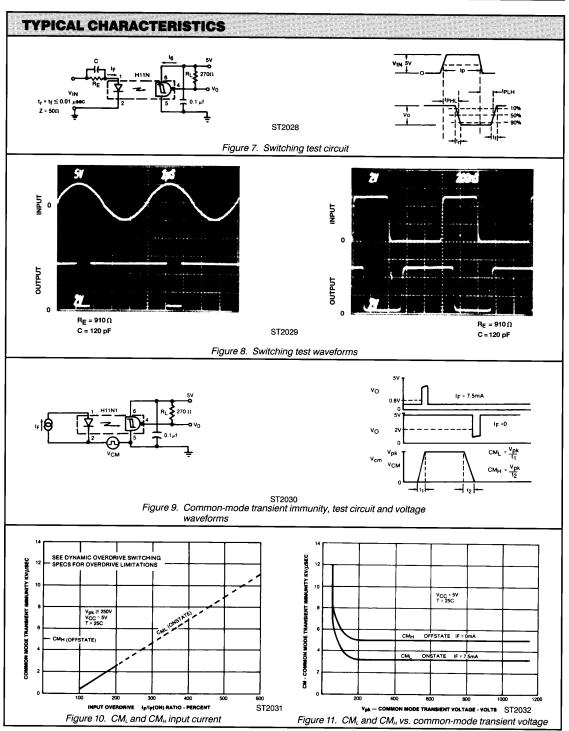


OPTOISOLATOR SPECIFICATIONS





OPTOISOLATOR SPECIFICATIONS





HIGH-SPEED AIGaAs SCHMITT TRIGGER OPTOCOUPLERS

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