

TRIGGER CIRCUIT

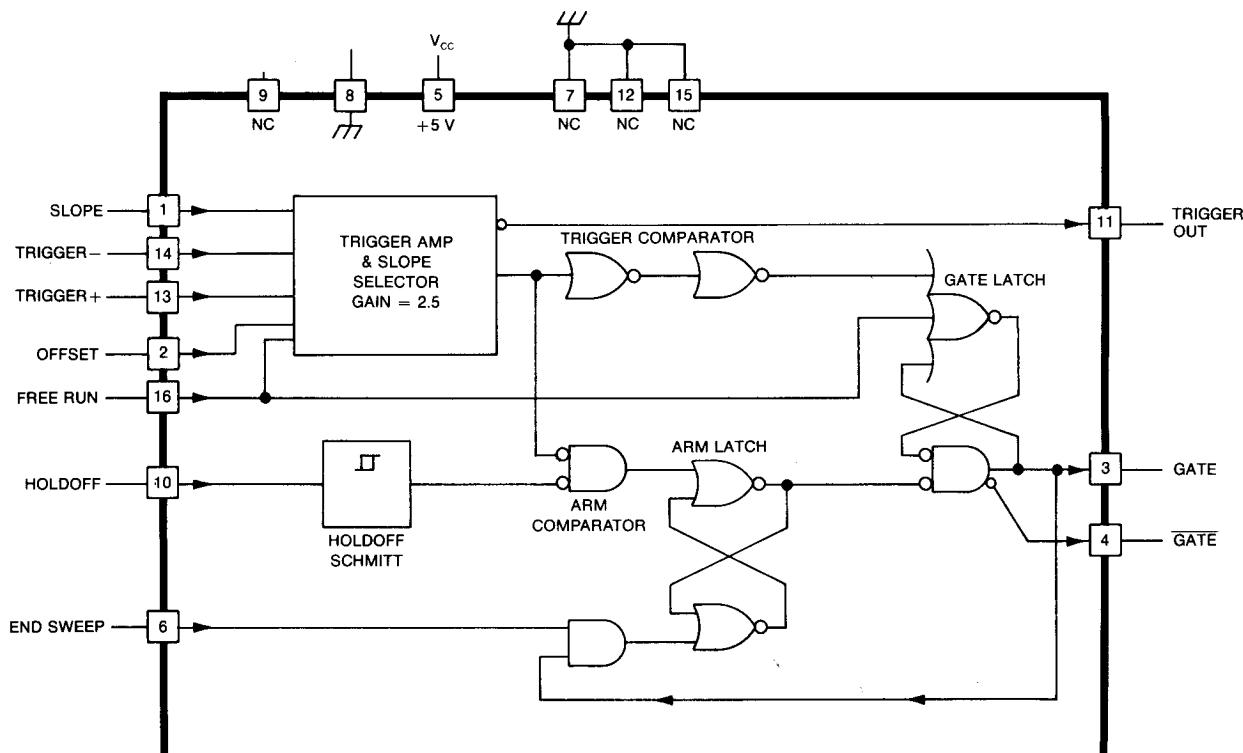
DESCRIPTION

The 155-0109-01 is a 350 MHz trigger circuit. It can be used by itself or in conjunction with the 155-0126-00 trigger amplifier, channel switch and peak to peak auto I.C.

FEATURES

- 350 MHz operation
- ECL input and output levels (slope input is T²L)
- Trigger slope select
- Compatible with the 155-0126-00 trigger amplifier, channel switch

BLOCK DIAGRAM



ABSOLUTE MAXIMUMS

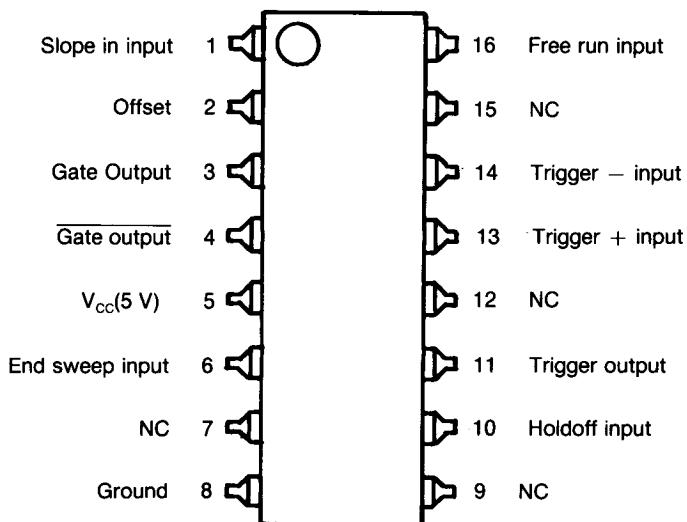
V _{CC} (Pin 5)	+5.25 Volts
Input Voltage (All Inputs)	0 Volts to V _{CC}
Storage Temperature (T _{SG})	-55°C to 125°C
Operating Ambient Temperature (T _A)	-15°C to +75°C
Maximum Power Dissipation (P _D)	600 mW

Derating Factor (Above 70°C Ambient) 11 mW/°C

NOTE 1: Maximum Die Temperature NOT To Exceed 125°C.

NOTE 2: The Trigger Out (Pin 11) is NOT specified herein. It has the following characteristics:

- The Gain from the Trigger Inputs to Pin 11 is 2.5
- Pin 11 output range is ECL and
- Phase, relative to the Trigger Inputs depends on Slope setting.

PIN CONNECTIONS

ELECTRICAL CHARACTERISTICS

PARAMETER	PIN	MIN	MAX	UNITS
Power Supply Current (note 4)	8	70	120	mA
+ Slope, + Trigger Input Bias Current (note 5)	13	-100	100	μ A
+ Slope, - Trigger Input Bias Current (note 5)	14	-100	100	μ A
+ Slope, Trigger Input Offset Current (+ Trigger Input Bias Current Less—Trigger Input Bias Current) (computed)	13, 14	-25	25	μ A
- Slope, + Trigger Input Bias Current (note 6)	13	-100	100	μ A
- Slope, - Trigger Input Bias Current (note 6)	14	-100	100	μ A
- Slope, Trigger Input Offset Current (+ Trigger Input Bias Current Less—Trigger Input Bias Current) (computed)	13	-25	25	μ A
Hold-Off Input Current (note 4)	10	-200	200	μ A
End Sweep Input Current (Note 1) (note 4)	6	-200	200	μ A
Free Run Input Current (note 7)	16	0	500	μ A
Slope In Input Current (note 8)	1	-2.0	0	mA
Slope In Input Current (note 9)	1	-40	40	μ A

ELECTRICAL CHARACTERISTICS (cont)

PARAMETER	PIN	CONDITIONS	MIN	MAX	UNITS
Gate Out (V_{OH}) High Voltage	3	$I_{OH} = -3 \text{ mA}$, Perform Steps 1 through 3 of the Truth Table, then measure (Ignore Note 2)	4.0	4.3	V
Gate Out Low Voltage (V_{OL})	3	$I_{OL} = 1 \text{ mA}$, Perform Steps 17 through 19 of the Truth Table, then measure (Ignore Note 2)	3.2	3.5	V
Gate Out High Voltage (V_{OH})	4	$I_{OH} = -3 \text{ mA}$, Perform Steps 17 through 19 of the Truth Table, then measure (Ignore Note 2)	4.0	4.3	V
Gate Out Low Voltage (V_{OL})	4	$I_{OL} = -1 \text{ mA}$, Perform Steps 1 through 3 of the Truth Table, then measure (Ignore Note 2)	3.2	3.5	V
+ Trigger Absolute Offset	13, 14	Perform Steps 1 through 4 of Table 1 repeatedly, adjusting the input 1 and 0 levels independently until the arm and trigger thresholds are determined. The + Trigger Absolute Offset = $(V_{Trigger} - V_{Arm})/2 - 3.8 \text{ Volts}$.	-40	+40	mV
+ Slope Hysteresis	13, 14	Use data obtained in + trigger absolute offset Hysteresis = $V_{Trigger} - V_{Arm}$	25	50	mV
- Trigger Absolute Offset	13, 14	Perform Steps 1 through 4 of Table 2 repeatedly, adjusting the input 1 and 0 levels independently until the arm and trigger thresholds are determined. The - Trigger Absolute Offset = $(V_{Arm} + V_{Trigger})/2 - 3.8 \text{ Volts}$.	-40	+40	mV
- Slope Hysteresis	13, 14	Use data obtained in - trigger absolute offset Hysteresis = $V_{Arm} - V_{Trigger}$	25	50	m
+ Trigger Slope In, - Trigger Slope Offset	13, 14	(Offset = (+ Trigger Slope Absolute Offset less - Trigger Slope Absolute Offset))	-40	+40	mV*
Propagation Delay (T_{PD+})	3, 13, 14	See Figure 1		4.0	nS

*Adjustable to $\pm 4 \text{ mV}$ with offset adjust (Pin 2), with an offset range of 0.5 to 4.5 Volts.

TRUTH TABLE
(See Note 3)
INPUTS

Step	Function	Slope Pin 1 (T ² L)	End Sweep Pin 6 (ECL)	Holdoff Pin 10 (ECL)	+IN Pin 13	-IN Pin 14	Free Run Pin 16	Gate Pin 3	Gate Pin 4	Notes
1	RESET	0c	1a	1a	0a	1a	0b	VOL	VOL	Power Supply Pin 5 + 5 V Pin 8 Gnd.
2	ARM	0c	0a	0a	0a	1a	0b	VOL	VOH	
3	+ Trigger	0c	0a	0a	1a	0a	0b	VOH	VOL	
4	LATCH	0c	0a	0a	0a	1a	0b	VOH	VOL	
5	RESET	0c	1a	0a	0a	1a	0b	VOH	VOL	
6	RESET	0c	1a	1a	0a	1a	0b	VOL	VOH	
7	ARM	0c	0a	0a	0a	1a	0b	VOL	VOH	
8	DISARM	0c	0a	1a	0a	1a	0b	VOL	VOH	
9	DISARM	0c	1a	1a	0a	1a	0b	VOL	VOH	
10	LATCH	0c	0a	1a	0a	1a	0b	VOL	VOH	
11	+ Trigger	0c	0a	1a	1a	0a	0b	VOH	VOL	
12	LATCH	0c	0a	1a	0a	1a	0b	VOH	VOL	
13	RESET	1b	1a	1a	0a	1a	0b	VOL	VOH	
14	ARM	1b	0a	0a	1a	0a	0b	VOL	VOH	
15	- Trigger	1b	0a	0a	0a	1a	0b	VOH	VOL	
16	LATCH	1b	0a	0a	1a	0a	0b	VOH	VOL	
17	RESET	1b	1a	1a	1a	0a	0b	VOL	VOH	
18	ARM	1b	0a	1a	0a	1a	0b	VOL	VOH	
19	TRIGGER	1b	0a	0a	0a	1a	0b	VOL	VOH	
20	FREE RUN	1b	0a	0a	0a	1a	1a	VOH	VOL	

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INPUT VOLTAGE LEVEL
CODING
0a 3.55 V
0b 3.4 V
0c 0.8 V
1a 3.95 V

OUTPUT VOLTAGE LEVEL
CODING
VOL 3.2 V to 3.5 V
VOH 4.0 V to 4.3 V

(See Note #2)

TABLE #1

Step	Function	INPUTS						OUTPUTS	
		Slope (Pin 1)	End Sweep (Pin 6)	Holdoff (Pin 10)	+ Trigger In (Pin 13)	- Trigger In (Pin 14)	Free Run (Pin 16)	Gate (Pin 3)	
1	RESET	.8 V	3.95 V	3.95 V	LOGIC 0	3.8 V	3.4 V	3.2 V to 3.5 V	
2	ARM	.8 V	3.55 V	3.55 V	LOGIC 0	3.8 V	3.4 V	3.2 V to 3.5 V	
3	+ TRIGGER	.8 V	3.55 V	3.55 V	LOGIC 1	3.8 V	3.4 V	4.0 V to 4.3 V	
4	LATCH	.8 V	3.55 V	3.55 V	LOGIC 0	3.8 V	3.4 V	4.0 V to 4.3 V	

TABLE #2

Step	Function	INPUTS						OUTPUTS		
		Slope (Pin 1)	End Sweep (Pin 6)	Holdoff (Pin 10)	+ Trigger In (Pin 13)	- Trigger In (Pin 14)	Free Run (Pin 16)	Gate (Pin 3)	Gate (Pin 4)	
1	RESET	2.0 V	3.95 V	3.95 V	LOGIC 0	3.8 V	3.4 V	3.2 V to 3.5 V		
2	ARM	2.0 V	3.55 V	3.55 V	LOGIC 1	3.8 V	3.4 V	3.2 V to 3.5 V		
3	- TRIGGER	2.0 V	3.55 V	3.55 V	LOGIC 0	3.8 V	3.4 V	4.0 V to 4.3 V		
4	LATCH	2.0 V	3.55 V	3.55 V	LOGIC 1	3.8 V	3.4 V	4.0 V to 4.3 V		

NOTE 1: Gate Out (Pin 3) held at 5 Volts after Power Supply settles at +5 Volts.

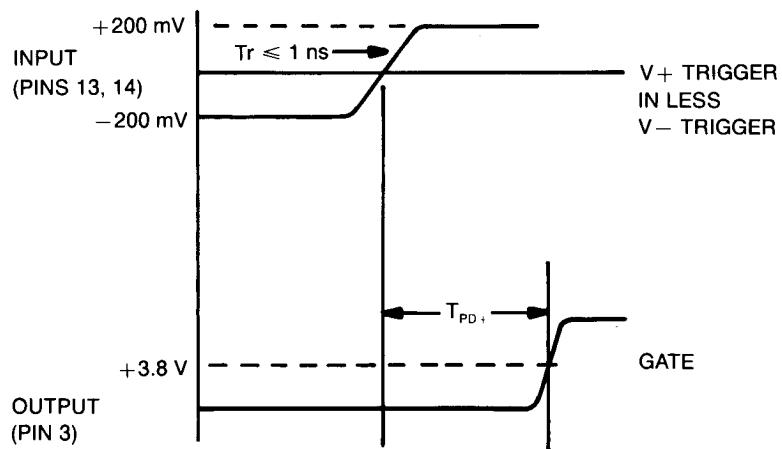
NOTE 2: Pins 3 and 4 loaded with a $2k\Omega$ resistor connected from Output Pin to Ground during testing.

NOTE 3: The Truth Table for Parameter 13 to be accomplished without Power Supply interruption.

CONDITIONS

	+ Trigger In (Pin 13)	- Trigger In (Pin 14)	Free Run In (Pin 16)	End Sweep In (Pin 6)	Slope In (Pin 1)	Holdoff In (Pin 10)
Note 4	3.55 V	3.95 V	3.4 V	3.95 V	.8 V	3.95 V
Note 5	3.8 V	3.8 V	3.4 V	3.95 V	.8 V	3.95 V
Note 6	3.8 V	3.8 V	3.4 V	3.95 V	2.0 V	3.95 V
Note 7	3.55 V	3.95 V	3.95 V	3.95 V	.8 V	3.95 V
Note 8	3.55 V	3.95 V	3.4 V	3.95 V	0 V	3.95 V
Note 9	3.55 V	3.95 V	3.4 V	3.95 V	2.4 V	3.95 V

FIGURE 1



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Reliability λ , failure rate $\leq .02\%/\text{1K hours at } 75^\circ T_j$ Thermal impedance, $\theta_{DA} = 65^\circ \text{C/W}$