

TRIGGER SWEEP CIRCUIT

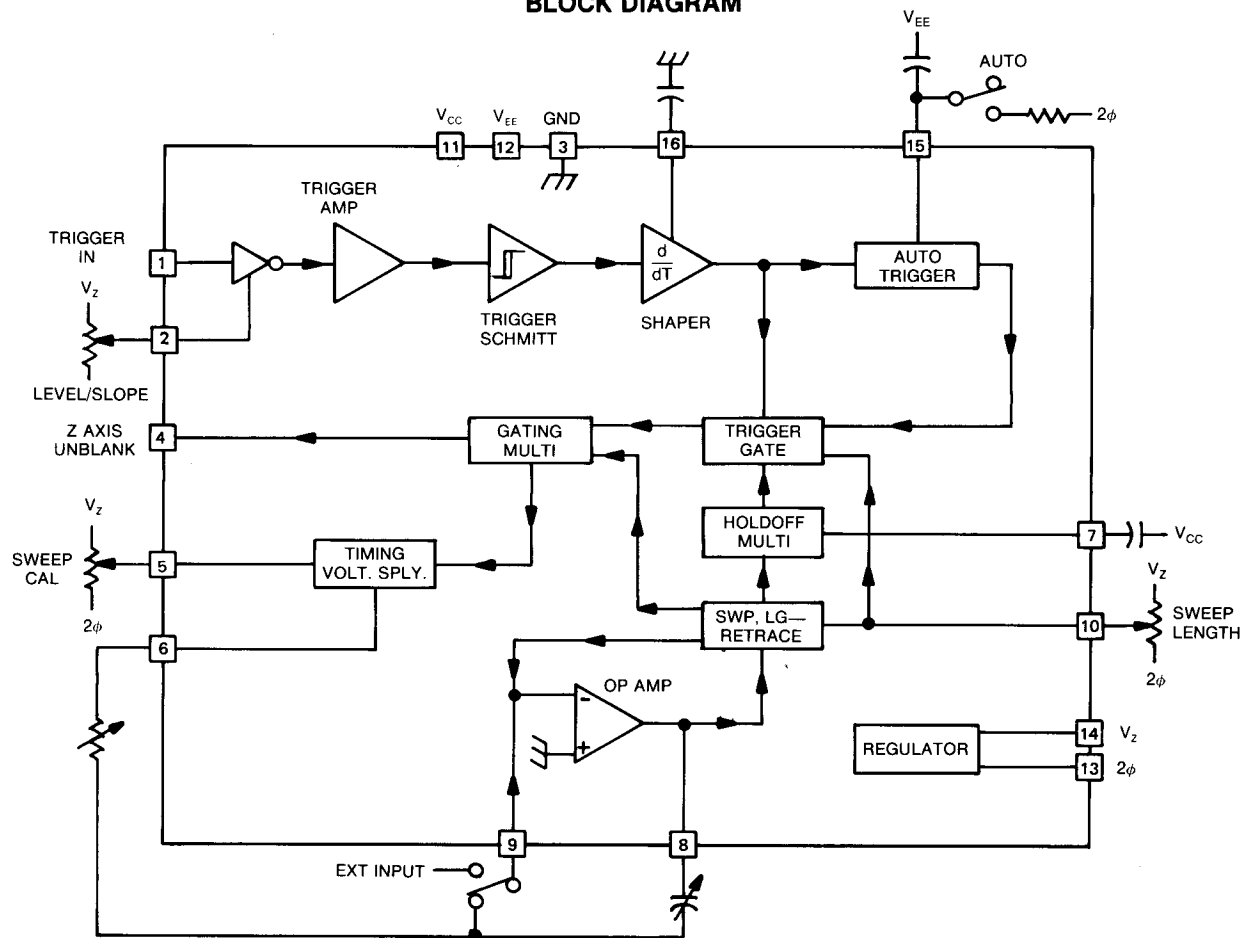
DESCRIPTION

The 155-0048-01 is a monolithic integrated circuit. This trigger sweep circuit is for use in low frequency (below 1 MHz) applications.

FEATURES

- Trigger slope/level selection
- Variable sweep rate and length with controlled timing supply
- High Z BIFET Miller and trigger inputs
- Sweep holdoff
- Auto trigger with adjustable holdoff
- Z-axis blanking
- Reference voltage outputs for stable sweep control
- External X-axis Input
- Available in 2 package styles
minipak (155-0048-01) & DIP (155-0055-00)

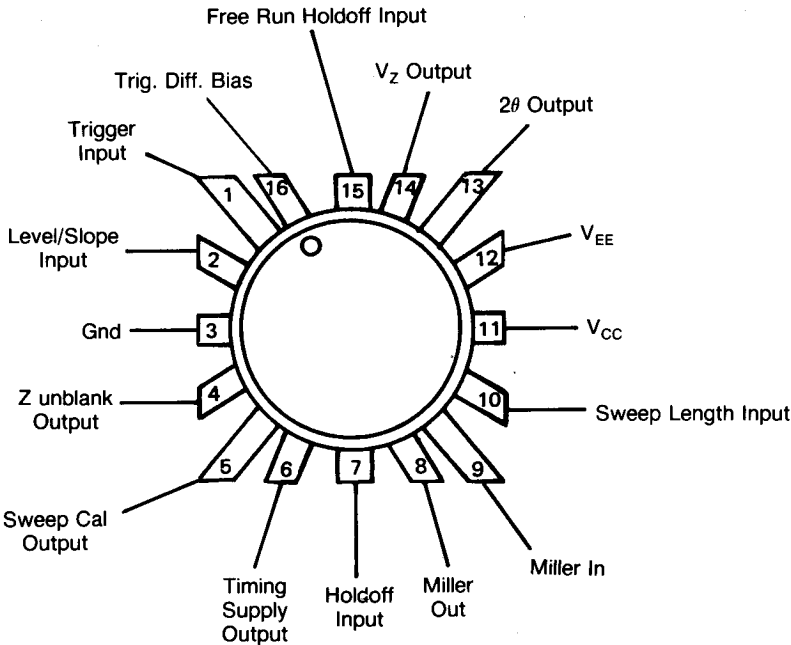
BLOCK DIAGRAM



ABSOLUTE MAXIMUMS

SYMBOLS	IDENTIFICATIONS	VALUES	UNITS
V_{CC}	Maximum positive power supply voltage	+6.5	V
V_{EE}	Maximum negative power supply voltage	-6.5	V
	Trigger Input voltage	± 4.6	V
V_z	Current Load	4.75	mA
2θ	Current Load	4.75	mA
P_d	Power dissipation	300	mV
	Miller Out Source Current	2	mA
	Miller Out Sink Current	0.5	mA
	Voltage on input pins 2, 5, 10*		
$T_{STORAGE}$	Storage temperature range	-55 to +125	°C
$T_{OPERATING}$	Operating temperature range	-15 to +70	°C

* Must not be less than 2θ or greater than V_z .



ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITION	MIN	MAX	UNITS
V_{CC}	Positive Supply Voltage		5.0	6.5	V
V_{EE}	Negative Supply Voltage		-5.0	-6.5	V
I_{CC}	Positive Supply Current	$V_{CC} = +6.5\text{ V}$ $V_{EE} = -6.5\text{ V}$ Miller sweeping in auto mode		23	mA
I_{EE}	Negative Supply Current	Same as I_{CC}	-23		mA
V_{REF}	Internal Reference Voltage	Measure V_Z pin 14 Measure 2θ pin 13 $I_{VZ} = I_{2\theta} = 2.5\text{ mA}$ $V_{REF} = V_Z - 2\theta$	5.8	6.8	V
V_{OS}	Op amp input offset	Force op amp output pin 8 to 0 V Large ($>1\text{ M}\Omega$) feedback resistor pin 8 to pin 9 Measure voltage on input pin 9	-.5	+.5	V
V_{OSTC}	Op amp input offset temperature coefficient	Same as V_{OS} over temperature	-.5	+.5	mV/°C
I_B	Op amp input bias current	Measure current into pin 9 from ground	0	5	nA
A_{OL}	Op amp open loop gain	DC signal on Pin 9 Measure pin 8 swing $A_{OL} = \frac{\Delta V_o \text{ pin 8}}{\Delta V_i \text{ pin 9}}$	80		
V_{OUT+}	+ peak of Miller output	Free run sweep Sweep length pin 10 = -2 V Measure + peak at pin 8	1.5	2.5	V
V_{OUT-}	- peak of Miller output	Same as V_{OUT+} Measure - peak at pin 8	-2.5	-1.5	V
I_{TL}	Timing supply sink current	Measure from pin 6 during sweep pin 5 = V_Z	-.5		mA
V_S	Trigger signal sensitivity	1 kHz square wave input ramped up in amplitude until sweep triggers	50		mV

ELECTRICAL CHARACTERISTICS (cont)

SYMBOL	PARAMETER	CONDITION	MIN	MAX	UNITS
F_{TS}	Maximum usable trigger frequency			1	MHz
I_{CFR}	Free run timing current	Measure pin 16 current in auto mode	35	65	μA
Z_T	Trigger input impedance		20	30	K Ω
I_{BT}	Trigger input bias current	Measure pin 1 current from ground	—	5	nA
T_V	Usable trigger input range	Ramp offset of 1 kHz, 50 mV square wave on Input pin 1 Measure offset at limits of triggering range	-875	+875	mA
I_{OLB}	Unblanking sink current	Measure pin 4 current during holdoff from V_{CC}	200	450	μA
V_{THL}	Timing voltage during holdoff	Voltage on 5 = 2θ Measure pin 6	-.5	+.5	V
V_{THH}	Timing voltage during holdoff	Voltage on pin 5 = V_Z	-4	-2	V
V_{TRL}	Timing voltage during sweep	Voltage on pin 5 = 2θ	-.5	+.5	V
V_{TRH}	Timing voltage during sweep	Voltage on pin 5 = V_Z	2.5	3.5	V
I_{TH}	Timing supply source current	Measure from pin 6 during holdoff pin 5 = V_Z	—	1	mA

5

APPLICATIONS INFORMATION

Applications

The internal reference voltage output should be used as sources on control networks for sweep cal, sweep length, and level/slope. These sources will track internal bias shifts over temperature.

When sweep length input is forced higher than 7.2 volts above V_{EE} , trigger is disabled to gating multi and op amp may be used as external X axis amplifier with Z axis unblanked.

When the auto holdoff timing pin is pulled low, the auto trigger is disabled.

When the holdoff timing pin is held high, the trigger to gating multi is disabled and sweep is "held off".

Typical holdoff capacitor value is one-tenth of C_{TIMING} .

Some low frequency applications may experience a timing supply oscillation which can be squelched with a 390 Ω , 87 pF RC series network connected to Miller/op amp output.

Typical temperature coefficient of $V_Z - 2\theta$ is .03%/°C.

Differentiator capacitor on Pin 11 should be 27 to 100 pF.

Product Precautions

Input Protection

Pins 1 and 9 (BIFET gates) applied voltage should be between -4.6 and $+4.6$ V.

Pins 2, 5, and 10 applied voltage should be between V_{EE} and V_{CC} .

Output Loading

Voltage on pin 4 should be kept 15 V above 2θ .

V_Z and 2θ outputs should be loaded 4.75 mA each.

Pin 8 loading should be kept 2 mA source and 0.5 mA sink.

Power Supply Turn-On/Turn-Off Sequence

Power on sequence:

First: V_{EE} (-6 V)

Second: V_{CC} ($+6$ V)

Handling Procedures

Standard Mini-Pak mounting techniques should be employed. Removal from socket should be accomplished with force applied to the plastic body rather than the leads.

Parts should be handled and transported with materials approved to dissipate static charges and keep the device leads equipotential.

RELIABILITY

λ , Failure rate .02%/1k hours at 75°C T.

$\theta_{jc} = 97.7^\circ\text{C/W}$