

T-65-15

# HI-1220

## Touch Activated Light Dimmer/Switch

### Features

- Replaces Mechanical Switches
- Saves Power in Incandescent Lamps
- CMOS Technology provides Low Current Drain and Noise Immunity in the Control Circuit
- Phase Locked Loop to AC Line for Precise Timing of Brightness Levels

### General Description

The HI-1220 is a CMOS integrated circuit designed for use in products that control the brightness of incandescent lamps. The HI-1220 includes a resistive touch sensing circuit, a phase locked loop (PLL), a power on reset, and logic to sequence the brightness level. The brightness level is controlled by gating that provides a pulse to OUT to drive a Triac. The gating selects the sequence of brightness levels according to the status of the MODE Pin as follows:

MODE PIN	BRIGHTNESS SEQUENCE
VDD	OFF→HIGH→OFF
OPEN	OFF→LOW→MEDIUM→HIGH→OFF
VSS	OFF→NIGHT LIGHT→LOW→MEDIUM→HIGH→OFF

The brightness levels are established by delaying the OUT pulse from the detected zero crossing of the AC line signal. These delays are shown below:

BRIGHTNESS	NOMINAL DELAY
NIGHT LIGHT	5.7ms
LOW	4.7ms
MEDIUM	2.9ms
HIGH	1.3ms

### Pin Description

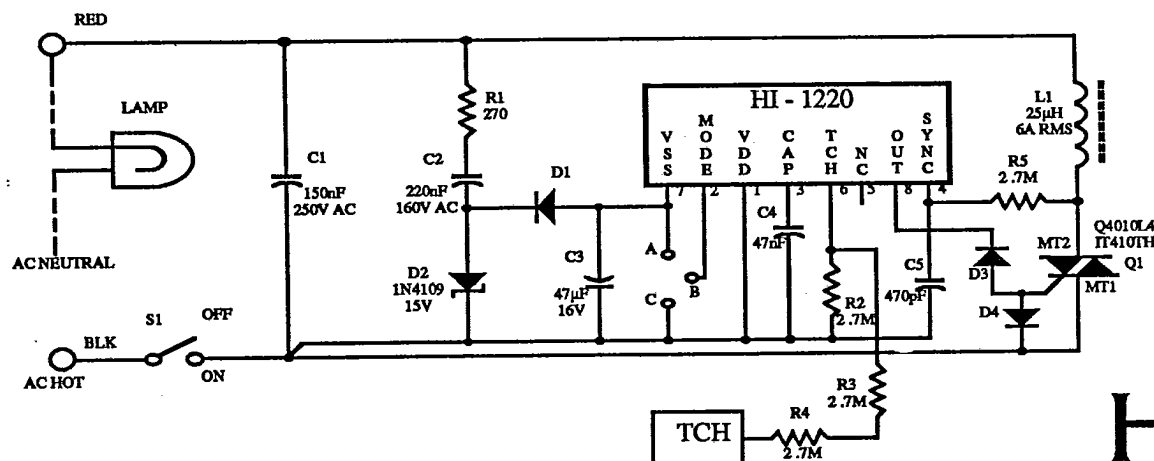
- Pin 1 - VDD - Nominally 0V.  
 Pin 2 - MODE - Option pin to choose brightness sequencing.  
 Pin 3 - CAP - Nominally requires a 47nF capacitor to VDD for PLL filter.  
 Pin 4 - SYNC - Input for PLL synchronization.  
 Pin 5 - NC - No Connection.  
 Pin 6 - TCH - Input for sensing a touch plate and thereby sequencing brightness levels.  
 Pin 7 - VSS - Nominally -15V.  
 Pin 8 - OUT - Output drives Triac with a 50μs negative pulse.

### Pin Assignment

VDD	1	8	OUT
MODE	2	7	VSS
CAP	3	6	TCH
SYNC	4	5	NC

(Top View)

### Application Diagram


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## Absolute Maximum Ratings

SYMBOL	PARAMETER	VALUE	UNITS
$V_{DD} - V_{SS}$	DC POWER SUPPLY VOLTAGE	+20	V
$V_{IN}$	ANY INPUT VOLTAGE	$V_{DD} + 0.3$ $V_{SS} - 0.3$	V
$T_A$	OPERATING TEMPERATURE	0 TO +80	°C
$T_{stg}$	STORAGE TEMPERATURE	-65 TO +150	°C

NOTE: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## DC Electrical Characteristics

$V_{DD} - V_{SS} = 15V$  at 25°C (Unless Otherwise Stated)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
$V_{DD}$	SUPPLY VOLTAGE		+12	+15	+18	V
$I_{DD}$	SUPPLY CURRENT			650	1000	μA
$V_{IN}$ MODE	MODE PIN – THREE LEVEL INPUT HIGH INPUT OPEN INPUT LOW INPUT		13 2 $V_{SS}$		$V_{DD}$ 13 2	V V V
$V_{IN}$ SYNC	HIGH INPUT LOW INPUT		10		5	V V
$I_O$ SYNC	SOURCE CURRENT SINK CURRENT	$V_{SYNC} = 0V$ $V_{SYNC} = 15V$		15 700		nA μA
$V_{IN}$ TCH	HIGH INPUT LOW INPUT		13		7	V V
$I_O$ TCH	SOURCE CURRENT SINK CURRENT	$V_{TCH} = 0V$ $V_{TCH} = 15V$		15 250		nA μA
$I_O$ OUT	SOURCE CURRENT SINK CURRENT	$V_{OUT} = 0V$ $V_{OUT} = 5V$	50	6 70		mA mA
$R_{IN}$ CAP	INPUT IMPEDANCE			700K		Ω

## Frequency And Timing Characteristics

FREQ = 60Hz at 25°C

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS
FS	CAPTURE RANGE	40	20 TO 100	70	Hz
TW	OUTPUT PULSE WIDTH	40	49	55	μs

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