



Name: Motion sensing LED light timer, basic sensor input, 12V

Line #	Part Destination	Qty.	Digi-key Part #	Description	Notes
1	R1	1	2.2MEBK-ND	Resistor, 2.2M Ohms, 1/8W 5% carbon film	TIMER1 delay time, 1.0M=15-18s, 2.2M=25-30s
2	R2	1	1.0KEBK-ND	Resistor, 1.0k Ohms, 1/8W 5% carbon film	LED1 brightness
3	R3	1	100KEBK-ND	Resistor, 100k Ohms, 1/8W 5% carbon film	TIMER2 delay, R3/VR2
4	R4	1	10KEBK-ND	Resistor, 10k Ohms, 1/8W 5% carbon film	
5	R5	1	1.0KEBK-ND	Resistor, 1.0k Ohms, 1/8W 5% carbon film	R4/R5 TIMER2 V reference (REF2)
6	R7	1	100KEBK-ND	Resistor, 100k Ohms, 1/8W 5% carbon film	C7/R7 N-CH MOSFET gradual LED ON/OFF rate
7			BAT42	Diode, BAT42, schottky, 0.2A	BAT42 parallel R7 for fast LED ON.
8	R8 (optional)	1	100KEBK-ND	Resistor, 100k Ohms, 1/8W 5% carbon film	R7/R8/VR3 low brightness adj. when TIMER1 OFF
9	D1, D4	2	1N4148FS-ND	Diode, 1N4148, 0.2A, signal diode, 500mW	
10	D2, D3	2	BAT42CT-ND	Diode, BAT42, schottky, 0.2A	sensor signal diode
11			1N4148FS-ND	alternative for high input voltage signals.	
12	IC1	1	LM258NFS-ND	IC, LM258 dual op-amp	LM358N alternative
13	VR1	1	3362U-504LF-ND	Resistor, 10k variable, 3362U, top adjust, inline	3362P/M/S/Z alternative
14	VR2	1	3362U-504LF-ND	Resistor, 500k variable, 3362U, top adjust, inline	3362P/M/S/Z alternative
15	VR3 (optional)	1	3362U-504LF-ND	Resistor, 500k variable, 3362U, top adjust, inline	R7/R8/VR3 low brightness adj. when TIMER1 OFF
16	C1, C2	2	P12923-ND	Capacitor, ele, 25V 47uF, 0.1"	input/output power filter
17			P12922-ND	Cap. ele, 16V 120uF, 0.1"	higher ripple current, P14392-ND alternative
18	C3, C4, C5, C8	4	445-8410-ND	Capacitor, mono cer, 25V 1.0uF, 0.1"	C4/C4 TIMER1 delay time, C5 power filter, C8 optional
19			P12922-ND	C5 for higher output ripple current filter	P14392-ND alternative
20	C6	1	P12923-ND	Capacitor, ele, 25V 47uF, 0.1"	TIMER2 delay, R3/VR2 discharge.
21	C7	1	P5148-ND	Capacitor, 25V 10uF, electrolytic, 0.1" spacing	C7/R7 N-CH MOSFET gradual LED ON/OFF rate
22	Q1	1	IRLZ14PBF-ND	Discrete, IRLZ14N, N-MOSFET, TO-220, logic level	Any logic level N-CH power MOSTET IRLZ*4
23	REG1	1	78L05A	Discrete, 5V, 0.1A regulator, TO-92-3	Any small 5V TO-92 regulator
23	H2, H3 (optional)	1	A19470-ND	Header connector, vert, locking, 3-POS 0.1"	locking header
23	LED1	1	67-1098-ND	Display, LED, green 5mm, diffused	TIMER2 ON light, any type of LED would work.
24	PCB	1		PCB, timer, PCB-PEMLT	
25	sensors	2	motion sensor	Sharp GP2Y0A IR distance sensor	Alternative: PIR motion sensor module
26	Heatsink (optional)	1	HS107-ND	TO-220 heatsink. Q1 high power LED use	use suitable Q1 heatsink

Total Quantity: 31

1. Set VR1/2/3 to center. Do not connect sensor or LED lights. Apply power. Measure header for 5V output. Set VR1 (REF1 measurement point) to 0.3V
2. Trigger 5V into sensor input pin 3 with a resistor (1-100k). Measure TIMER1 output at D4 positive pin. 0V=off. TIMER1 triggers TIMER2. LED1 ON=N-CH MOSFET ON
3. Once TIMER1 is 0V (D4)+, TIMER2 starts. Adjust VR2 for ON time (LED1 ON). Connect sensor and LED strip. Trigger sensor, LED strip should turn on.
4. If R8/VR3 are used, trigger sensor, wait for TIMER1 to end, adjust VR3 for low light brightness level. The LED strip will shut off once TIMER2 ends.
5. If there is LED flicker, the sensors maybe inducing noise into the circuit. IR distance sensors require high pulse current during operation. A larger filter capacitor is required at the sensor. Extra filtering at the sensor will help reduce noise and false triggering. A 4.7x-10k resistor inline series with the sensor output will reduce spurious signals.