

## **TOUCH DIMMER FOR LED LIGHTING**

### **GENERAL DESCRIPTION**

The **TTP117** is a touch detector IC for the LED lightings with NMOS application. The dimmer function controls by PWM output. It has high frequency for PWM output.

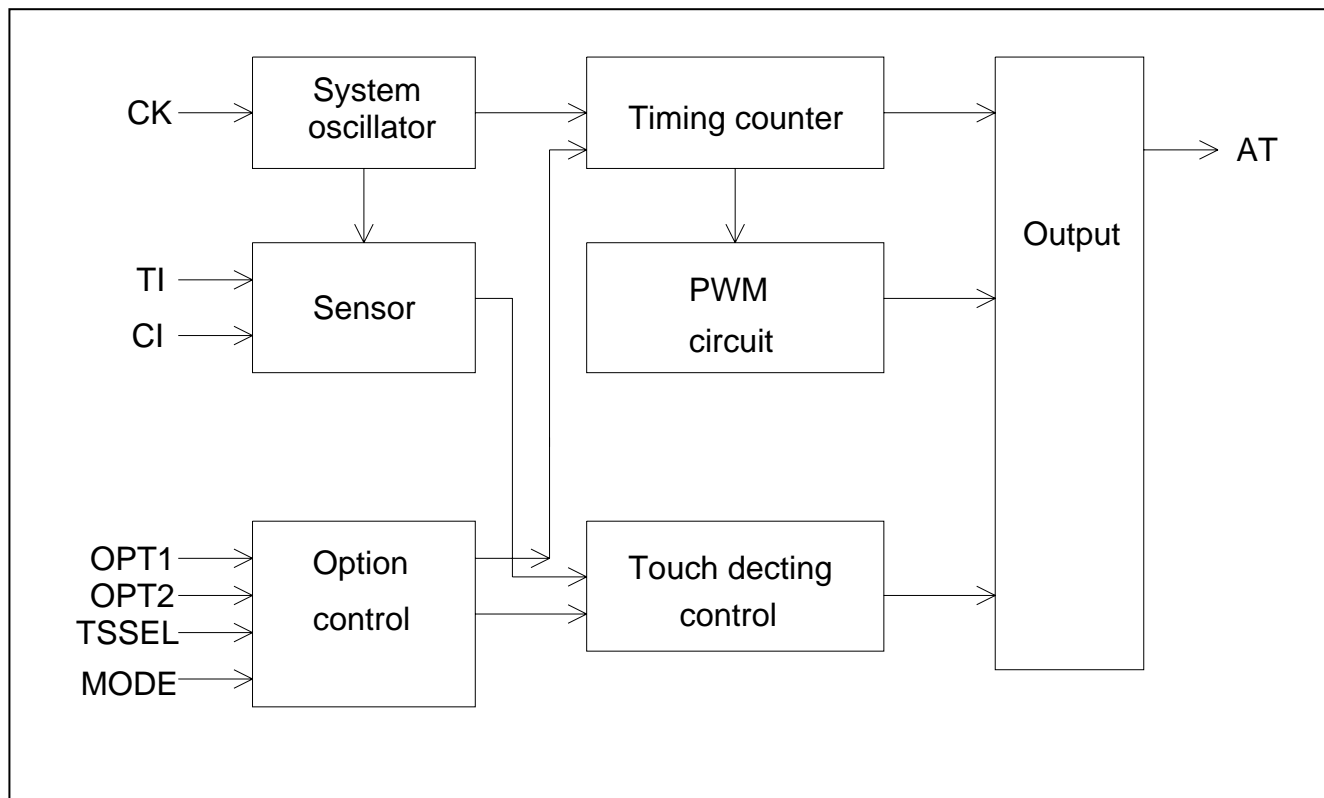
### **FEATURES**

- Operating voltage typical 5.0V
- Operating current @VDD=5.0V, 25 no load <500uA
- Higher frequency 2.2KHz PWM output.
- Support two option pin to select 4 type dimmer modes.
  - (1). 3 steps dimmer initial OFF. OPT2=0, OPT1=1
  - (2). 4 steps dimmer initial OFF. OPT2=1, OPT1=0
  - (3). 3 steps dimmer initial ON (6%). OPT2=0, OPT1=0
  - (4). Toggle ON / OFF initial OFF. OPT2=1, OPT1=1
  
- **TTP117 PWM output active high control NMOS.**
- Two input dimmer modes: touch plate and switch
- The application circuit is simple and easy.
- Can use wire to connect the IC to touch plate.

### **APPLICATION**

- LED LAMP
- For PWM control input

**BLOCK DIAGRAM**



**PAD DESCRIPTION**

Pad No.	Pad Name	I/O Type	Pad Description
1	CK	I	System clock input pin
2	VDD	P	Positive power supply
3	MODE	I-PL	Mode item select
4	TI	I	Touch input (switch mode I-PH)
5	CI	I	Sensor control input
6	OPT2	I-PL	Mode select
7	TSSEL	I-PH	Mode item select
8	VSS	P	Negative power supply, ground
9	OPT1	I-PH	Mode select
10	AT	O	Output control NMOS(active high)

**Pin Type**

- I CMOS input only
- O CMOS output
- I-PH CMOS input and pull-high resistor
- I-PL CMOS input and pull-low resistor
- P Power / Ground

## ELECTRICAL CHARACTERISTICS

### • Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Operating Temperature	T <sub>OP</sub>	—	0 ~ +70	°C
Storage Temperature	T <sub>STG</sub>	—	-50 ~ +125	°C
Power Supply Voltage	VDD	Ta=25°C	VSS-0.3 ~ VSS+5.5	V
Input Voltage	V <sub>IN</sub>	Ta=25°C	VSS-0.3 ~ VDD+0.3	V

Note : VSS symbolizes for system ground

### • DC/AC Characteristics : (Test condition at room temperature=25°C)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Voltage	VDD		3.6	5.0	6.8	V
System oscillator	Fosc	VDD=5.0V, R <sub>CK</sub> =120K	-	1.2M	-	Hz
Operating Current	I <sub>OP</sub>	VDD=5.0V No load touch mode R <sub>CK</sub> =120KΩ	-	250	500	uA
		VDD=5.0V No load Switch mode R <sub>CK</sub> =150K		220	400	uA
Input Ports	V <sub>IL</sub>	Input Low Voltage	0.0	-	0.2	VDD
Input Ports	V <sub>IH</sub>	Input High Voltage	0.8	-	1.0	VDD
Output Port Sink Current	I <sub>OL</sub>	VDD=5.0V, V <sub>OL</sub> =0.5V	12	25	-	mA
Output Port Source Current	I <sub>OH</sub>	VDD=5.0V, V <sub>OH</sub> =VDD-0.5V	4	8	-	mA
Input Pin Pull-low Resistor	R <sub>PL</sub>	VDD=5.0V, Pin: OPT2, MODE		130K		Ohm
Input Pin Pull-high Resistor	R <sub>PH</sub>	VDD=5.0V, Pin : TI		300K		ohm
		VDD=5.0V, Pin : OPT1,TSSEL		140K		

## FUNCTION DESCRIPTION

### 1. Support 6 kinds of package item :

TTP117-AD8, TTP117-FD8: DIP-8 Touch dim mode.

TTP117-CO8, TTP117-HO8: SOP-8 Touch dim mode.

TTP117-BD8: DIP-8 Switch dim mode.

TTP117-DOB: SOP-8 Switch dim mode.

### 2. TTP117-AD8, TTP117-BD8, TTP117-CO8, TTP117-DO8 with Touch (switch) mode select for OPT2 and OPT1

- a. OPT2=0, OPT1=1 : 3 steps dimmer

OFF → Night → Medium → High → OFF....

- b. OPT2=1, OPT1=0 : 4 steps dimmer

OFF → Night → Mood → Medium → High → OFF....

- c. OPT2=0, OPT1=0 : 3 steps dimmer “initial ON”

Night → Medium → High → OFF → Night...

- d. OPT2=1, OPT1=1 : ON / OFF

OFF → High → OFF....

### 3. TTP117-FD8, TTP117-HO8 with Touch mode select for OPT2 and OPT1

- a. OPT2=0, OPT1=1 : 3 steps dimmer

OFF → High → Medium → Night → OFF....

- b. OPT2=1, OPT1=0 : 4 steps dimmer

OFF → High → Medium → Mood → Night → OFF....

- c. OPT2=0, OPT1=0 : 3 steps dimmer “initial ON”

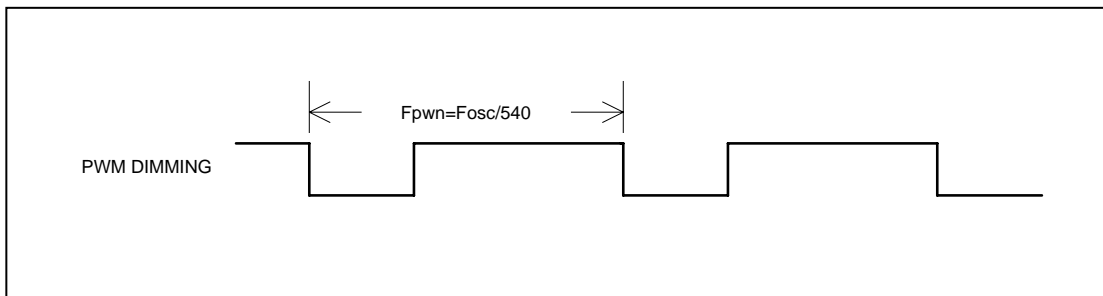
High → Medium → Nigh → OFF → High...

- d. OPT2=1, OPT1=1 : ON / OFF

OFF → High → OFF....

4. PWM Duty Rate Active High

Step	PWM Duty Rate		
	ON/OFF	3 steps	4 steps
Night	--	6%	6%
Mood	-	-	28%
Medium	-	50%	60%
High	99%	99%	99%

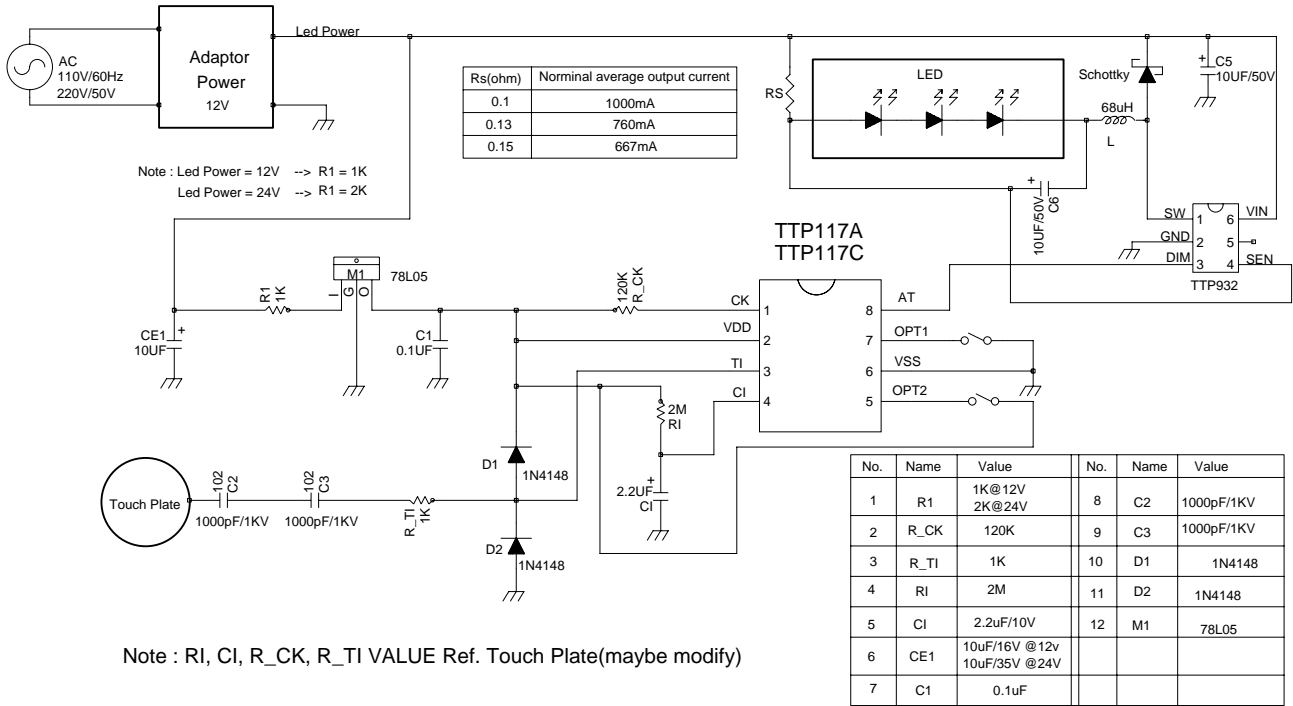


Note : if  $F_{osc} = 1.2\text{MHZ}$  →  $F_{pwm} = 2.2\text{KHz}$

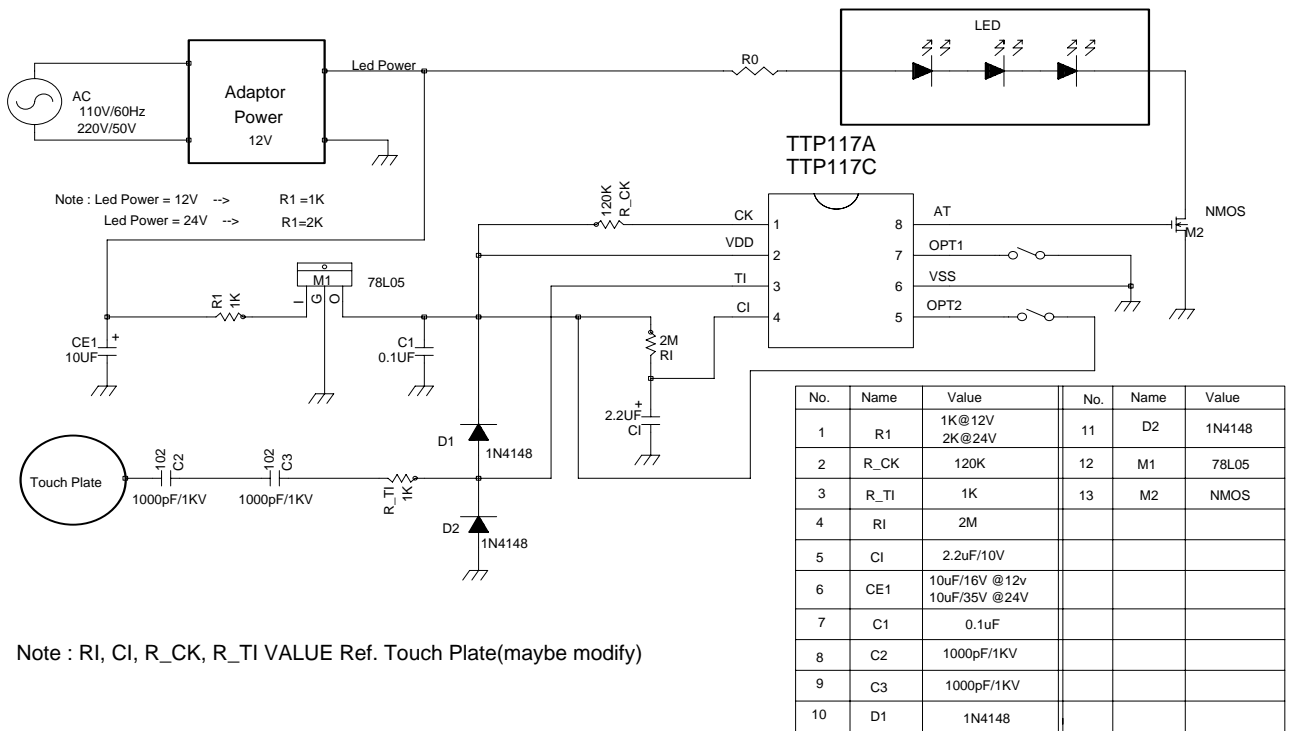
APPLICATION CIRCUIT

TTP117-AD8  
TTP117-CO8

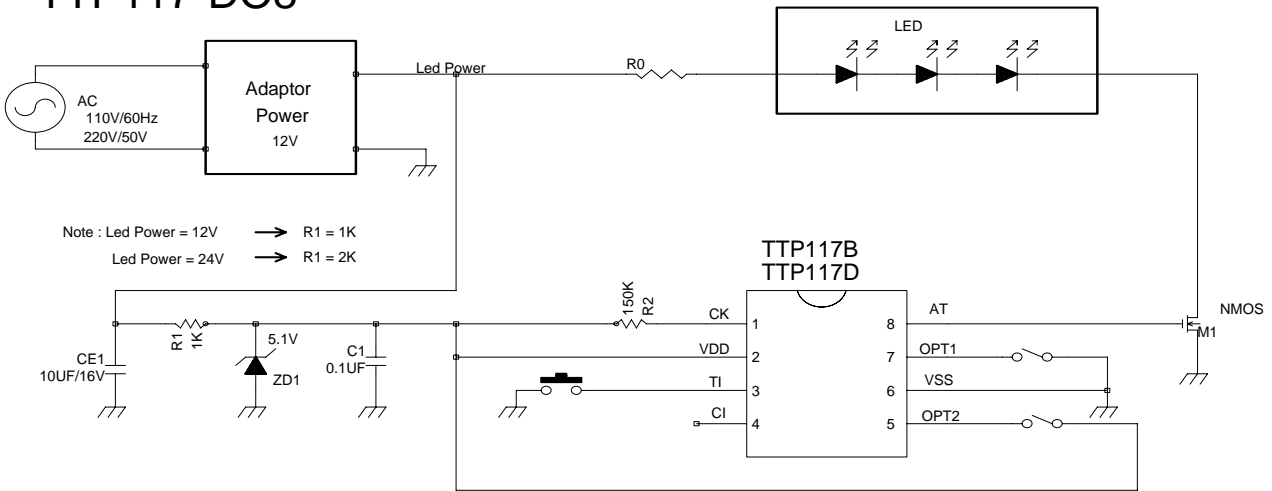
With TTP932 LED Driver



TTP117-AD8  
TTP117-CO8



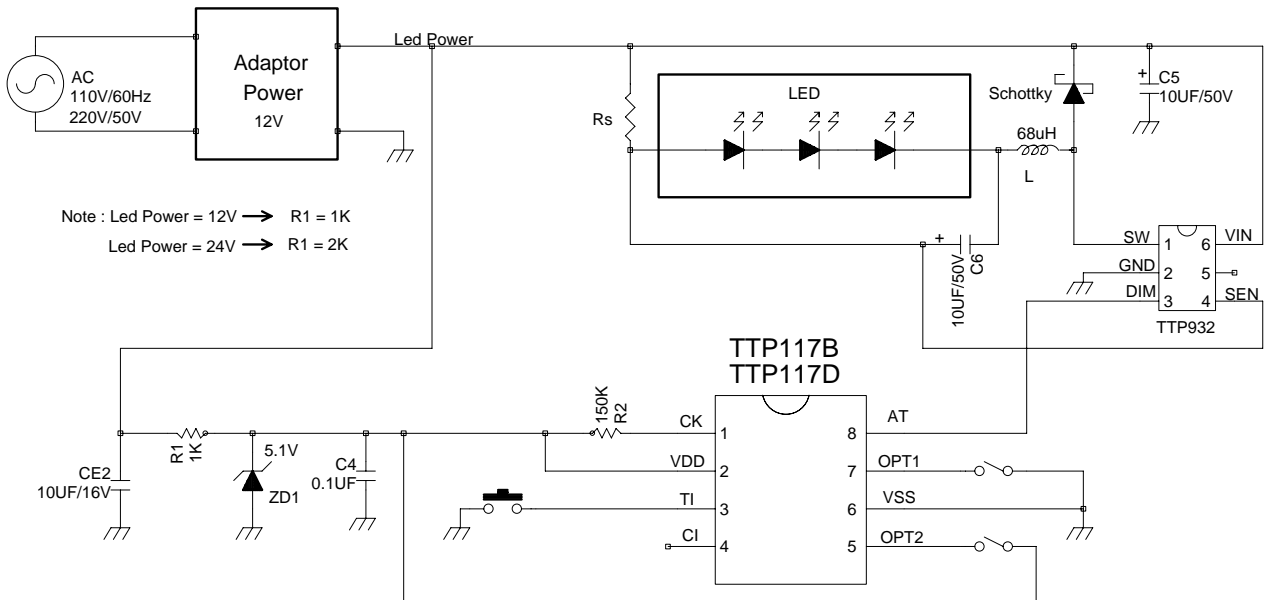
TTP117-BD8  
TTP117-DO8



No.	Name	Value	No.	Name	Value
1	R1	1K@12V 2K@24V	4	CE1	10uF/16V @12V 10uF/35V @24V
2	R2	150K	5	C1	0.1uF
3	ZD1	5.1V	6	M1	NMOS

TTP117-BD8  
TTP117-DO8

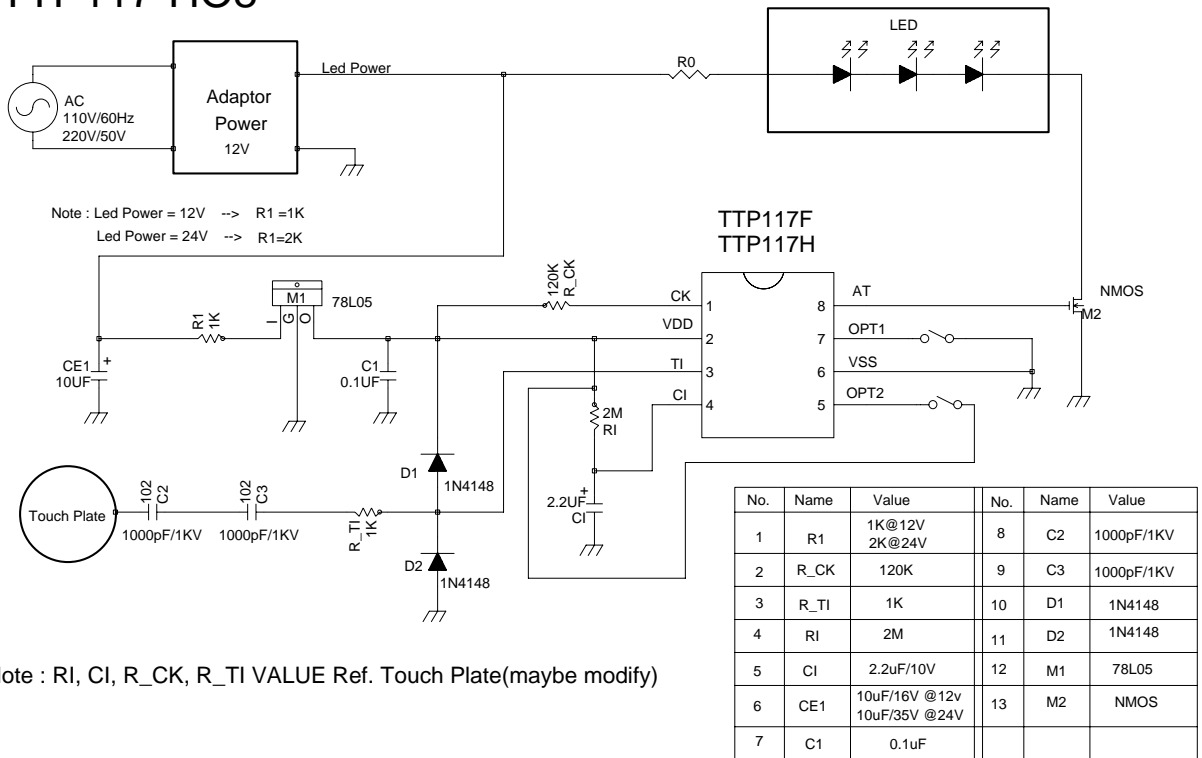
with TTP932 LED Driver



No.	Name	Value	No.	Name	Value
1	R1	1K@12V 2K@24V	4	CE1	10uF/16V @12V 10uF/35V @24V
2	R2	150K	5	C1	0.1uF
3	ZD1	5.1V	6		

Rs(ohm)	Normal average output current
0.1	1000mA
0.13	760mA
0.15	667mA

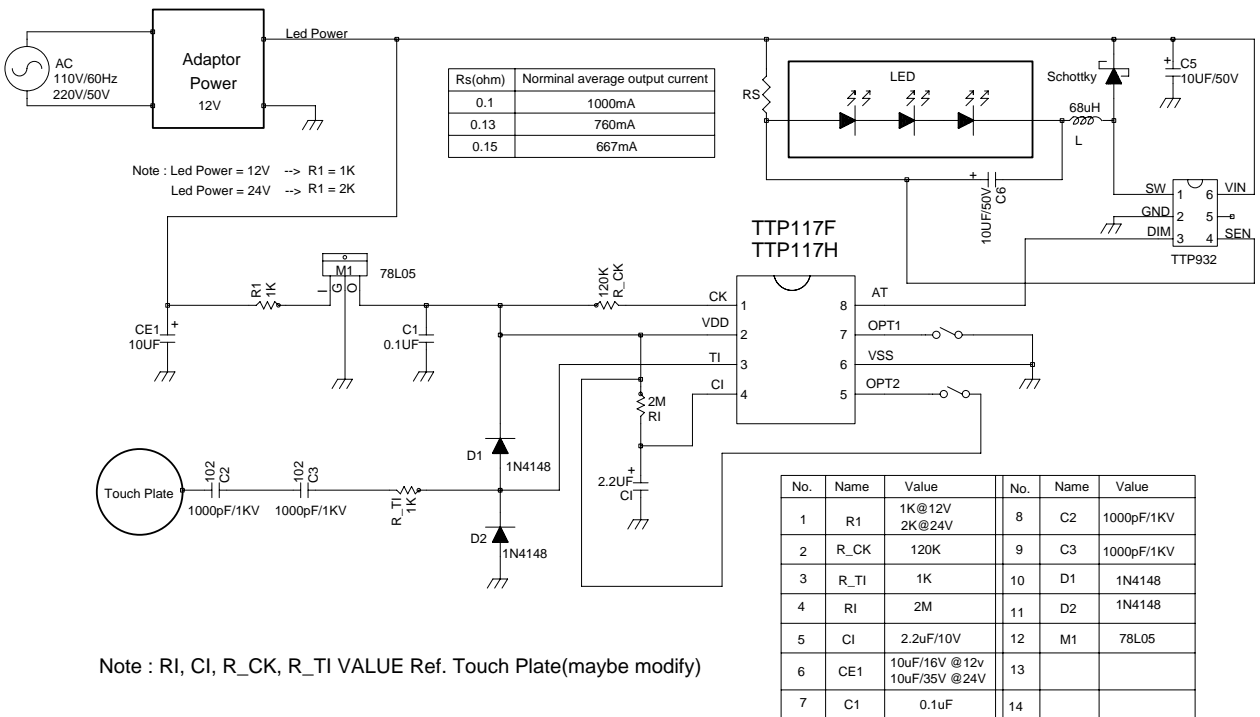
TTP117-FD8  
 TTP117-HO8



Note : RI, CI, R\_CK, R\_TI VALUE Ref. Touch Plate(maybe modify)

FTP117-FD8  
 TTP117-HO8

With TTP932 LED Driver



Note : RI, CI, R\_CK, R\_TI VALUE Ref. Touch Plate(maybe modify)



**PACKAGE LIST**

Package Item	Package Type	DESCRIPTION	Mode Item Select setting	
			MODE	TSSEL
TTP117-AD8	DIP-8	Touch dim mode active high	NC	NC
TTP117-BD8	DIP-8	Switch dim mode active high	VDD	VSS
TTP117-CO8	SOP-8	Touch dim mode active high	NC	NC
TTP117-DO8	SOP-8	Switch dim mode active high	VDD	VSS
TTP117-FD8	DIP-8	Touch dim mode active high	NC	VSS
TTP117-HO8	SOP-8	Touch dim mode active high	NC	VSS

Note: NC : not care.

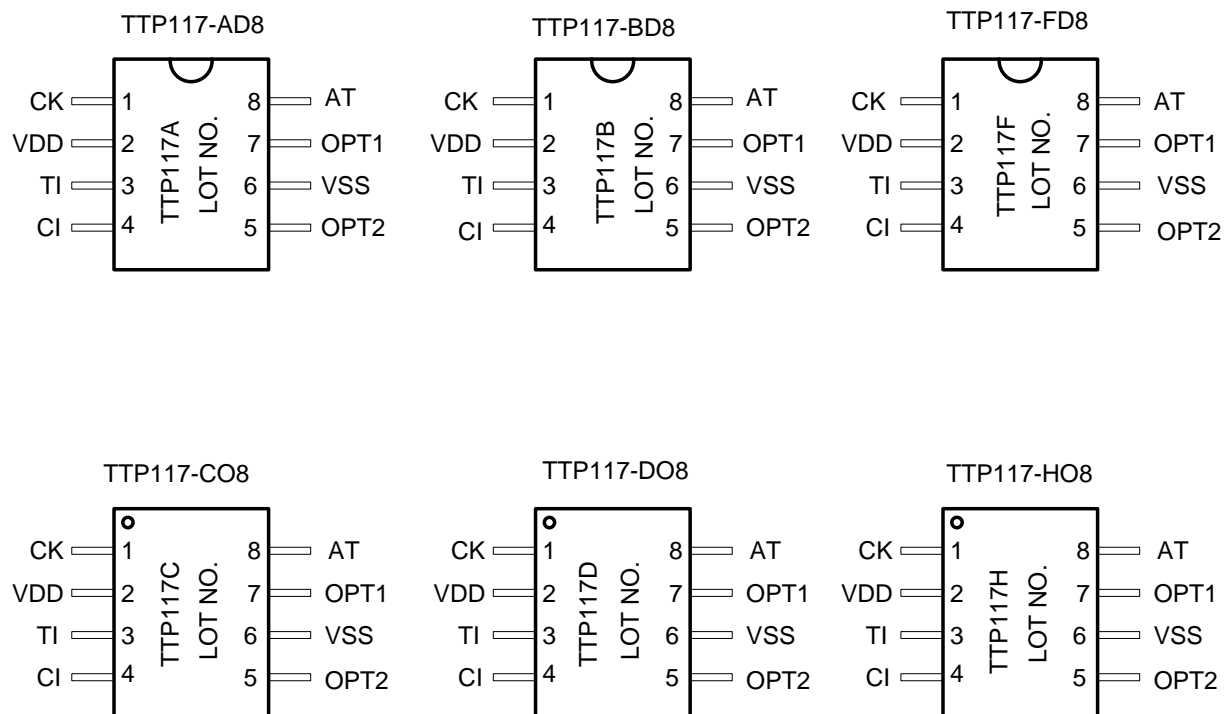
VDD : connect to VDD.

VSS : connect to VSS.

**MODE Select Option Table List**

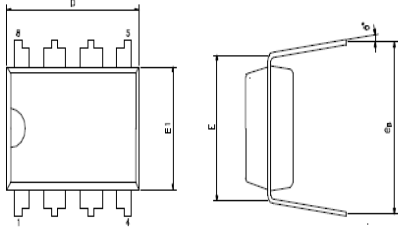
Option pin		DESCRIPTION
OPT2	OPT1	
0	1	3 steps dimmer initial OFF
1	0	4 steps dimmer initial OFF
0	0	3 steps dimmer initial ON (6% Night)
1	1	ON / OFF (High 99%)

**PACKAGE CONFIGURATION:**



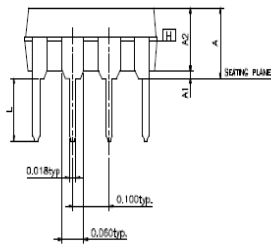
PACKAGE OUTLINE:

(1) DIP-8 : TTP117-AD8, TTP117-BD8, TTP117-FD8



SYMBOLS	MIN.	NOR.	MAX.
A	—	—	0.210
A1	0.015	—	—
A2	0.125	0.130	0.135
D	0.355	0.365	0.400
E	0.300 BSC.		
E1	0.245	0.250	0.255
L	0.115	0.130	0.150
e <sub>R</sub>	0.335	0.355	0.375
e <sub>P</sub>	0	7	15

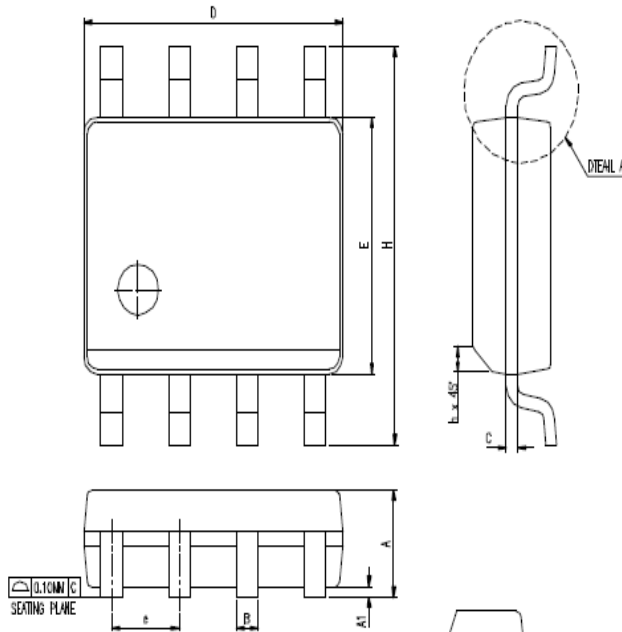
UNIT : INCH



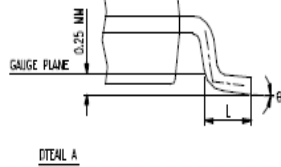
NOTES:

1. JEDEC OUTLINE : MS-001 BA
2. "D","E1" DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED .010 INCH.
3. e<sub>P</sub> IS MEASURED AT THE LEAD TIPS WITH THE LEADS UNCONSTRAINED.
4. POINTED OR ROUNDED LEAD TIPS ARE PREFERRED TO EASE INSERTION.
5. DISTANCE BETWEEN LEADS INCLUDING DAM BAR PROTRUSIONS TO BE .005 INCH MINIMUM.
6. DATUM PLANE [A] COINCIDENT WITH THE BOTTOM OF LEAD, WHERE LEAD EXITS BODY.

(2) SOP-8 : TTP117-CO8, TTP117-DO8, TTP117-HO8



NOTES : DIMENSION "D" DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS AND GATE BURRS SHALL NOT EXCEED 0.15 MM ( 0.006 INCH ) PER SIDE.



SYMBOL	DIMENSION IN MM		DIMENSION IN INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.35	1.75	0.0532	0.0688
A1	0.10	0.25	0.0040	0.0098
B	0.33	0.51	0.013	0.020
C	0.18	0.25	0.0075	0.0098
e	1.27 BSC		0.050 BSC	
D	4.80	5.00	0.1890	0.1968
H	5.80	6.20	0.2284	0.2440
E	3.80	4.00	0.1497	0.1574
L	0.40	1.27	0.016	0.050
h	0.25	0.50	0.0099	0.0196
e	0"	8"	0"	8"
JEDEC	MS-012 (AA)			

**ORDER INFORMATION**

1. For TTP117

- a. Package form: TTP117-AD8, TTP117-BD8, TTP117-CO8, TTP117-DO8, TTP117-FO8,  
TTP117-HO8
- b. Chip form: TCP117

**REVISE HISTORY**

1. 2012/09/24

-Original version : V\_1.0