

## Non-Synchronous PWM Boost Controller for LED Driver



### General Description

The FP7208A is boost topology switching regulator for LED driver. It provides built-in gate driver pin for driving external N-MOSFET. The non-inverting input of error amplifier connects to a 0.2V reference voltage. It has programmable soft start time set by external capacitor, and over voltage protection set by external resistor. The LED current can be adjusted by an external signal connecting to the EN pin. EN pin accepts either a DC voltage or a PWM signal. The PWM signal filter components are contained within the chip.

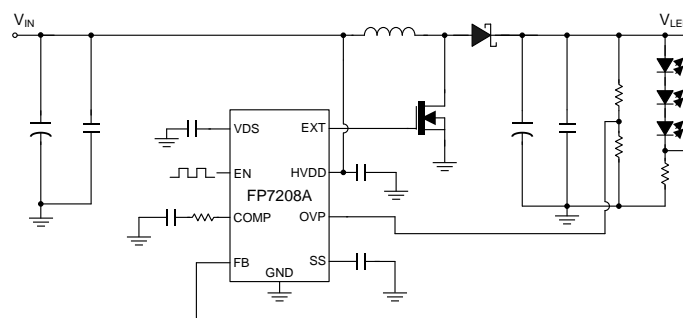
### Features

- Start-up Voltage: 2.5V
- Wide Supply Voltage Operating Range: 4.5V to 24V
- Precision Feedback Reference Voltage: 0.2V (Max.)
- Analog and Digital Dimming Control
- Shutdown Current: 6 $\mu$ A (Max.)
- Internal Fixed Switching Frequency: 300KHz
- Programmable Soft Start Function (SS)
- Programmable Over Voltage Protection (OVP)
- Over Temperature Protection (OTP)
- Package: SOP-8L(EP)

### Applications

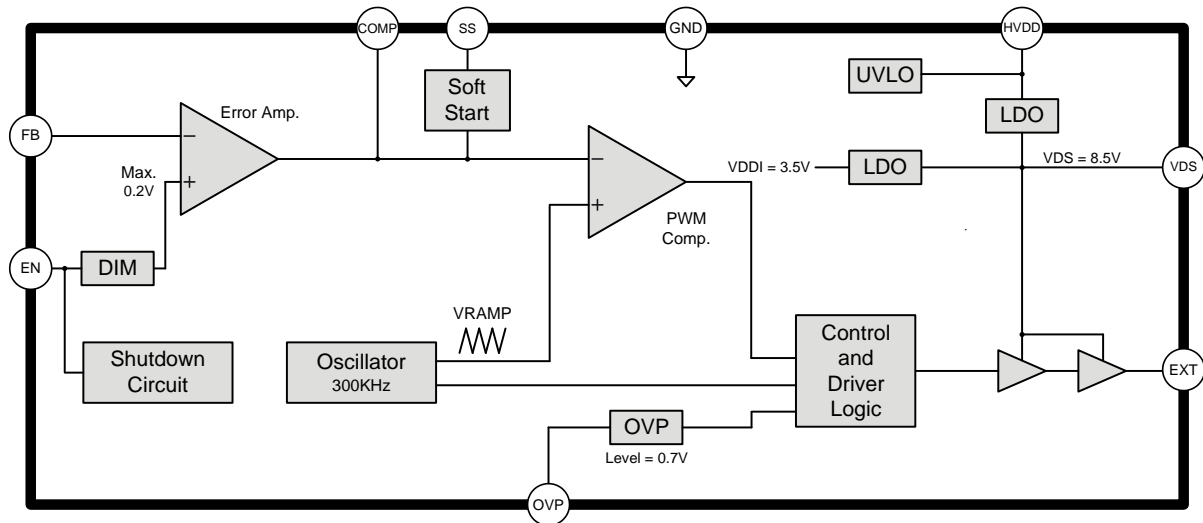
- LED Module
- Display Backlight
- Car Lighting
- Portable LED Lighting

### Typical Application Circuit



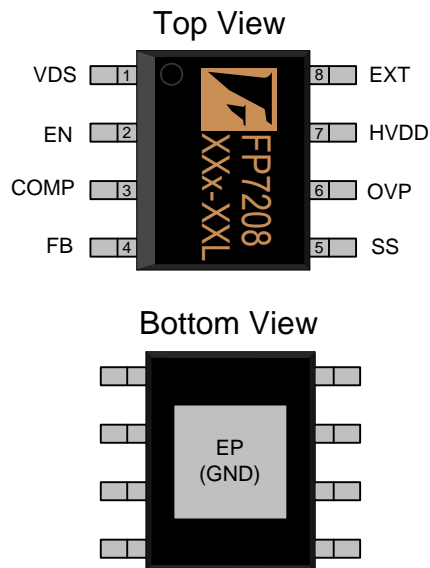
This datasheet contains new product information. Feeling Technology reserves the rights to modify the product specification without notice. No liability is assumed as a result of the use of this product. No rights under any patent accompany the sales of the product.

## Function Block Diagram



## Pin Descriptions

### SOP-8L (EP)

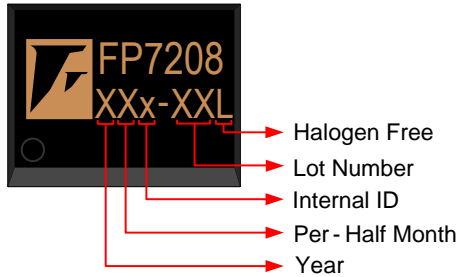


Name	No.	I / O	Description
VDS	1	P	Power Supply for Internal Control Circuits and Gate Drivers
EN	2	I	Enable and Dimming Control
COMP	3	O	Compensation
FB	4	I	Error Amplifier Inverting Input
SS	5	I	Soft Start Programming
OVP	6	I	Over Voltage Protection
HVDD	7	P	IC Power Supply
EXT	8	O	Gate Driver Output
GND	9	P	IC Ground (Exposed PAD) – Must Connect to Ground

This datasheet contains new product information. Feeling Technology reserves the rights to modify the product specification without notice. No liability is assumed as a result of the use of this product. No rights under any patent accompany the sales of the product.

## Marking Information

SOP-8L(EP)



**Halogen Free:** Halogen free product indicator

**Lot Number:** Wafer lot number's last two digits

For Example → Lot : 123456 → XXx-56L

**Internal ID:** Internal Identification Code

**Per-Half Month:** Production period indicator in half month time unit

For Example : A → First Half Month of January

B → Second Half Month of January

C → First Half Month of February

D → Second Half Month of February

**Year:** Production year's last digit

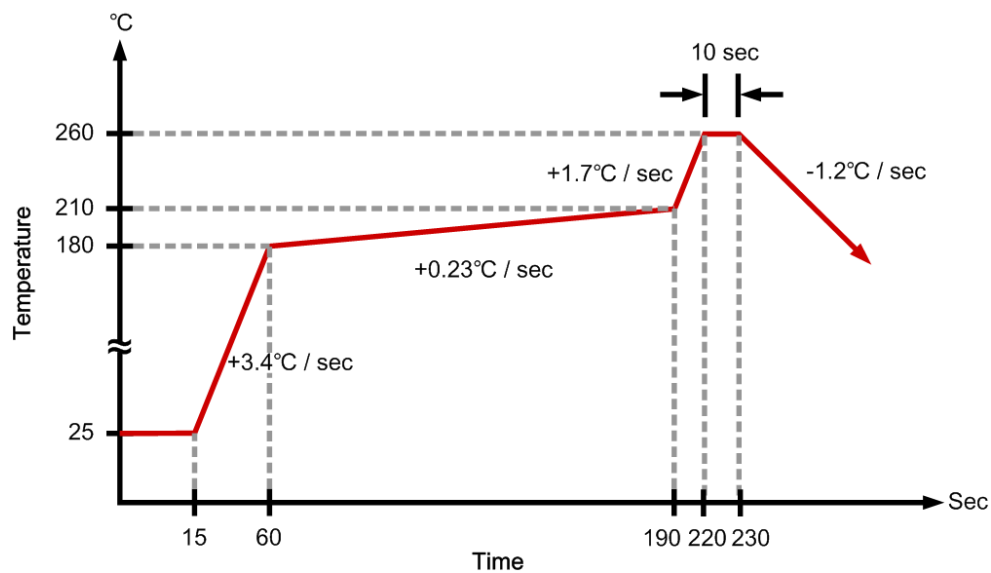
## Ordering Information

Part Number	Operating Temperature	Package	MOQ	Description
FP7208AXR-G1	-25°C ~ 85°C	SOP-8L(EP)	2500EA	Tape & Reel

## Absolute Maximum Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	HVDD	-	0	-	25	V
VDS,EXT Voltage	-	-	0	-	16	V
Others Pin Voltage	-	-	0	-	6	V
Thermal Resistance (Junction to Ambient)	$\theta_{JA}$	SOP-8L (EP)	-	-	+60	°C / W
Thermal Resistance (Junction to Case)	$\theta_{JC}$	SOP-8L (EP)	-	-	+10	°C / W
Junction Temperature	$T_J$	-	-	-	+150	°C
Operating Temperature	$T_{OP}$	-	-25	-	+85	°C
Storage Temperature	$T_{ST}$	-	-65	-	+150	°C
Lead Temperature	-	(soldering, 10 sec)	-	-	+260	°C

## IR Re-flow Soldering Curve



This datasheet contains new product information. Feeling Technology reserves the rights to modify the product specification without notice. No liability is assumed as a result of the use of this product. No rights under any patent accompany the sales of the product.

## Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	HVDD	-	4.5	-	24	V
Operating Temperature Range	T <sub>A</sub>	Ambient Temperature	-25	-	+85	°C

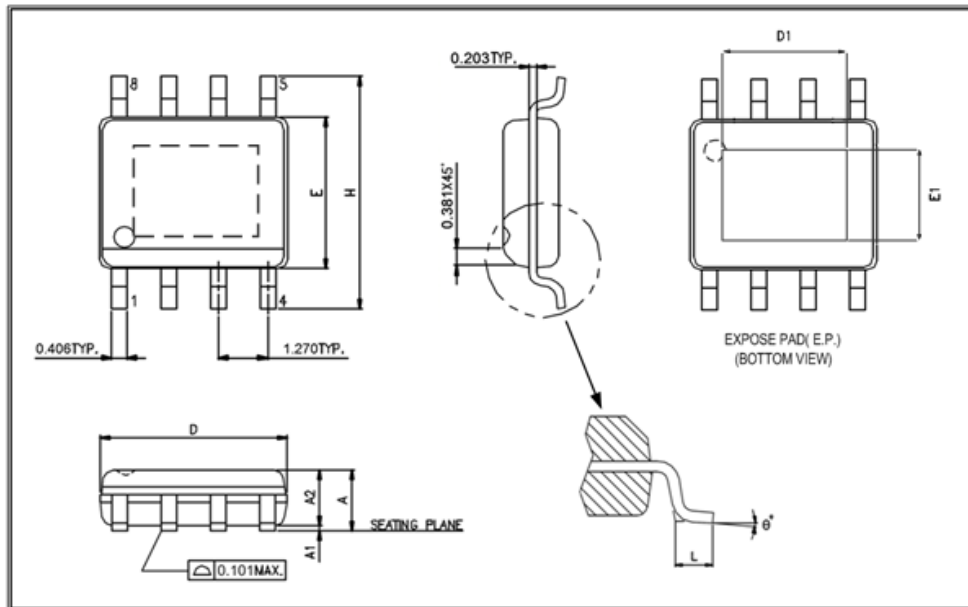
## DC Electrical Characteristics (HVDD=12V, T<sub>A</sub>=25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>System Supply Input</b>						
Start-up Voltage	HV <sub>DD</sub>	-	2.5			V
Input Supply Range	HV <sub>DD</sub>	-	4.5	-	24	V
Under Voltage Lockout	V <sub>UVLO</sub>	-	-	2.2	-	V
UVLO Hysteresis	-	-	-	0.1	-	V
Average Current	I <sub>CC</sub>	FB=0V, Switching	-	5	-	mA
Quiescent Current	I <sub>CC</sub>	FB=0.55V, No Switching	-	245	-	μA
Shutdown Current	I <sub>CC</sub>	V <sub>EN</sub> =GND	-	-	6	μA
Input Supply Voltage	V <sub>DS</sub>	HV <sub>DD</sub> =12V, I <sub>DS</sub> =0A	-	8.5	-	V
<b>Oscillator</b>						
Operation Frequency	f <sub>OSC</sub>	FB=0V	250	300	350	KHz
Maximum Duty Ratio	%	FB=0V	-	90	-	%
<b>Soft Start</b>						
Soft-Start bias Current	I <sub>SS</sub>	V <sub>SS</sub> =0V	-	1.5	-	μA
<b>Reference Voltage</b>						
Feedback Voltage	V <sub>FB</sub>	Connect EN to V <sub>DS</sub> with a 100kΩ, EN ≈ 3V	0.197	0.2	0.203	V
<b>Enable Control</b>						
Enable Voltage	V <sub>EN</sub>	-	0.25	-	-	V
Shutdown Voltage	V <sub>EN</sub>	-	-	-	0.07	V
<b>External Transistor Connection current</b>						
EXT Pull-UP Resistance	R <sub>EXTH</sub>	V <sub>DS</sub> =8.5V	-	1	-	Ω
EXT Pull-Down Resistance	R <sub>EXTL</sub>	V <sub>DS</sub> =8.5V	-	1	-	Ω
<b>Over Voltage Protection</b>						
OVP Threshold	V <sub>OVP</sub>	-	0.65	0.70	0.75	V
<b>Thermal Shutdown</b>						
Thermal Shutdown Threshold	T <sub>TS</sub>	-	-	+150	-	°C

This datasheet contains new product information. Feeling Technology reserves the rights to modify the product specification without notice. No liability is assumed as a result of the use of this product. No rights under any patent accompany the sales of the product.

## Package Outline

### SOP-8L (EP)



Symbols	Min. (mm)	Max. (mm)
A	1.30	1.70
A1	0	0.15
A2	1.25	1.55
D	4.70	5.10
E	3.80	4.00
H	5.80	6.20
L	0.40	1.27

UNIT: mm

Exposed PAD Dimensions:

Symbols	Min. (mm)	Max. (mm)
D1	2.60	3.45
E1	1.90	2.56

#### Note:

1. Package dimensions are in compliance with JEDEC outline: MS-012 AA.
2. Dimension "D" does not include molding flash, protrusions or gate burrs.
3. Dimension "E" does not include inter-lead flash or protrusions.

This datasheet contains new product information. Feeling Technology reserves the rights to modify the product specification without notice. No liability is assumed as a result of the use of this product. No rights under any patent accompany the sales of the product.