

## 30.0V, 2.5A, Synchronous Step-Down DC-DC Converter with Adjustable Soft-start Time

### DESCRIPTION

FH33431 is a wide input voltage of 4.5V to 30.0V, high efficiency current mode, synchronous step-down DC-DC converter capable of delivering 2.5A current with adjustable soft-start time. FH33431 integrates main switch and synchronous switch with low  $R_{DS(ON)}$  to minimize the conduction loss.

The device integrates 120m $\Omega$  High-Side and 80m $\Omega$  Low-side Power MOSFET, and has advanced features include UVLO, Thermal Shutdown, Soft Start, input OVP.

### APPLICATIONS

- Printer
- Vacuum Robot
- Smart Home Applications
- Consumer Applications: TV and Set Top Box(STB)
- General 5.0V, 12.0V, 24.0V DC-DC Power Bus Supply

### FEATURES

- High Efficiency: Up to 95% @ 12.0V to 5.0V
- Wide input voltage: 4.5V ~ 30.0V
- Up to 2.5A Output Current
- Low Typical 3 $\mu$ A Shutdown Current
- Adjustable Soft-Start Time
- Fixed 570kHz Switching Frequency
- Stable with Low ESR Ceramic Output
- Peak Current Mode with External Compensation
- PFM in Light Load Condition
- 0.8V Voltage Reference with  $\pm 2\%$  Accuracy
- Thermal Shutdown
- Cycle-by-cycle Current Limit Protection
- Over Current Protection with Hiccup Mode
- SOP-8L Package

#### Device Information (1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
FH33431	SOP (8)	4.90mm $\times$ 3.90mm

(1) For all available packages, see the orderable addendum at the end of the datasheet.

### TYPICAL APPLICATION

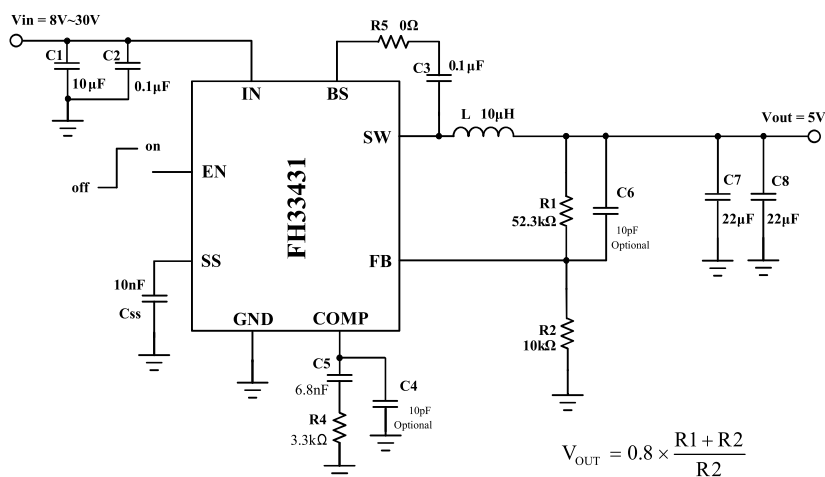
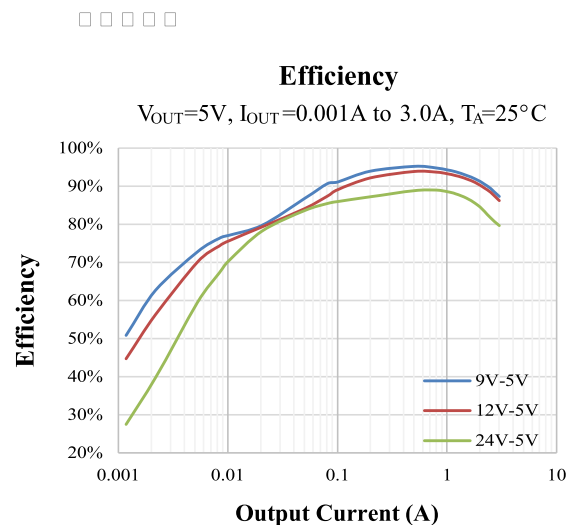
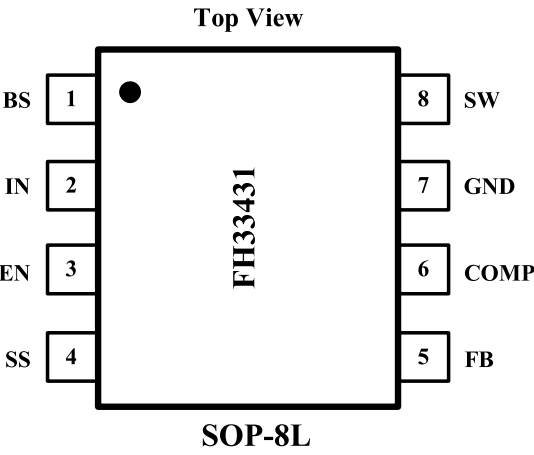


Figure 1. Basic Application Circuit



Pin Configuration



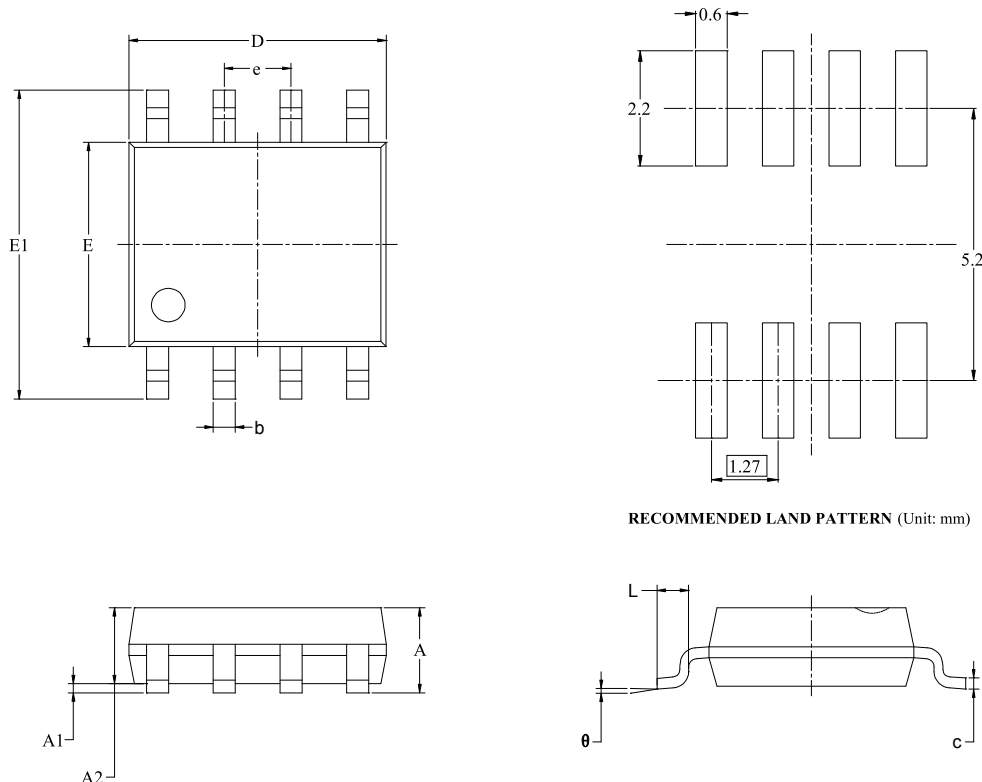
PIN FUNCTIONS

Pin	Name	Function
1	BS	High-side Gate Driver Bootstrap pin, Provide supply to high-side LDMOS Gate Driver. Connect a 100nF capacitor between BS and SW
2	IN	Power Input pin
3	EN	Enable Pin. Drive EN above 1.5V to turn on the device. Drive EN below 0.4V to turn it off. Do not leave EN floating.
4	SS	The SS pin is the soft-start and tracking pin. An external capacitor connected to this pin sets the internal voltage-reference rise time. The voltage on this pin overrides the internal reference.
5	FB	Feedback Pin
6	COMP	External Compensation Pin
7	GND	Ground Pin
8	SW	Switch Pin, Connect to external Inductor



## PACKAGE INFORMATION

Type: SOP-8L



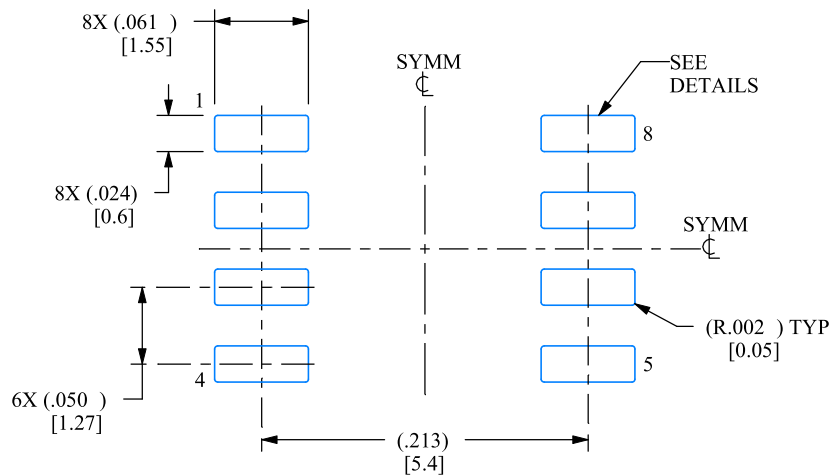
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27 BSC		0.050 BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

**Note:**

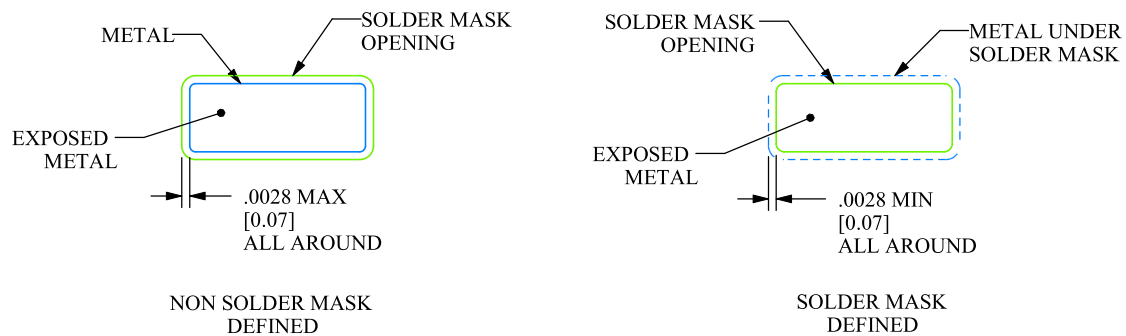
- 1) All dimensions are in millimeters.
- 2) Package length does not include mold flash, protrusion or gate burr.
- 3) Package width does not include inter lead flash or protrusion.
- 4) Lead popularity (bottom of leads after forming) shall be 0.10 millimeters max.
- 5) Pin 1 is lower left pin when reading top mark from left to right.



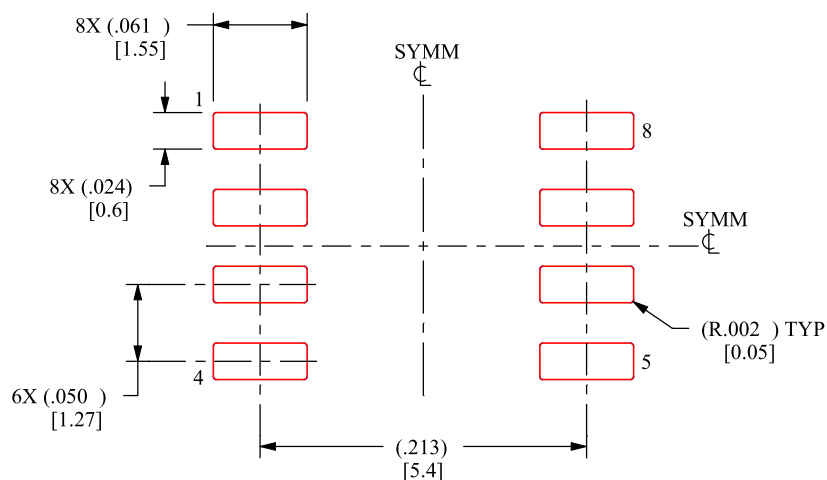
## SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:8X



SOLDER MASK DETAILS



SOLDER PASTE EXAMPLE  
BASED ON .005 INCH [0.125 MM] THICK STENCIL  
SCALE:8X

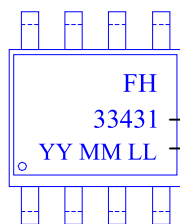


## ORDER INFORMATION

Part Number	Voltage Range	Features	Operating Temperature	Package Type	Top Mark	SPQ
FH33431S8	4.5V ~ 30.0V	<ul style="list-style-type: none"> <li>• Synchronous Buck(Step-down)</li> <li>• 95% Efficiency</li> <li>• Switching Frequency: 570kHz</li> <li>• 2.5A Output Current</li> <li>• Voltage Reference 0.8V(±2%)</li> </ul>	-40°C to 150°C	SOP-8L	*33431 YY MM LL	3000PCS/Reel

**Note:**

- **FH33431** devices are Pb-free and RoHs compliant.
- The surface prints of our semiconductor devices are subject to change during the production process and do not involve changes in electrical parameters, and we will not separately state the notice.
- If you have any other custom purchase needs, please contact our sales department.
- ForDevices reserves the right to amend and legally interpret the electrical parameters of this chip device.

**Device Name: SOP-8L**

→ FH33431: Device Name  
 → YYMMLL: Date Code

**ESD SENSITIVITY CAUTION**

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.



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