1.5A, 2.0MHz, 5.5V Synchronous Buck(Step-down) Converter

PRELIMINARY DATASHEET

Datasheet Brierf

DESCRIPTION

The FH4507 is a high-efficiency, DC-DC buck(step-down) switching regulators, capable of delivering up to 1.5A of output current. The device operates from an input voltage range of 2.6V to 5.5V and provides an output voltage from 0.6V to VIN.

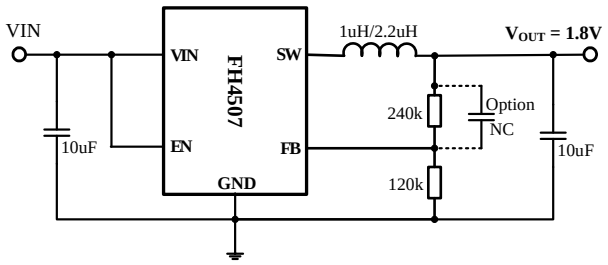
Working at a fixed frequency of 2.0MHz allows the use of small external components, such as ceramic input and output caps, as well as small inductors, while still providing low output ripples.

This low noise output along with its excellent efficiency achieved by the internal synchronous rectifier, making FH4507 an ideal replacement for large power consuming linear regulators.

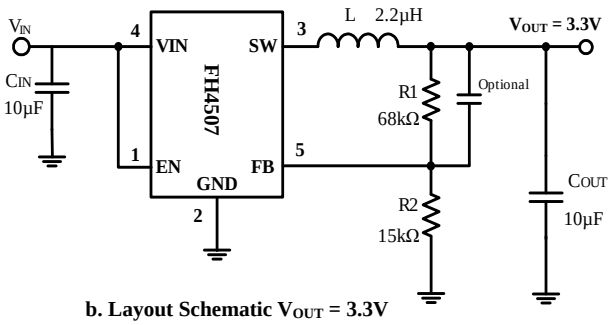
Internal soft-start control circuitry reduces inrush current. Short-circuit and thermal shutdown protection improves design reliability.

The FH4507 is available in 6-PIN DFN and 5-PIN SOT package.

TYPICAL APPLICATION



a. Layout Schematic V_{OUT} = 1.8V



b. Layout Schematic V_{OUT} = 3.3V

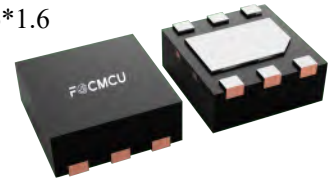
Figure 1. Basic Application Circuit

KEY FEATURES

- 2.6V to 5.5V Input Voltage Range
- Up to 1.5A Max output current
- Switching frequency: 2.0MHz
- High efficiency: up to 97%
- Low dropout 100% duty operation
- Internal compensation and soft-start
- Current mode control
- No Schottky Diode Required
- Input over voltage protection (OVP)
- Reference 0.6V
- Logic control shutdown (I_Q < 1.0uA)
- Thermal shutdown, UVLO

PACKAGE TYPE

- 6-pin DFN2.0*2.0 | DFN1.6*1.6
- 5-pin SOT23



APPLICATIONS

- Cellular and Smart Phones
- Wireless and DSL Modems
- Digital Still and Video Cameras

Device Information (1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
FH4507AD6	DFN2*2 (6L)	1.90mm × 1.90mm
FH4507BD6	DFN1.6*1.6 (6L)	1.55mm × 1.55mm
FH4507CM5	SOT-23 (5L)	2.80mm × 1.50mm

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

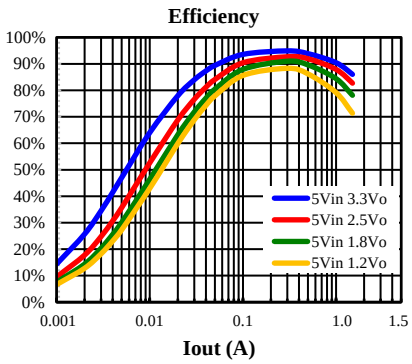
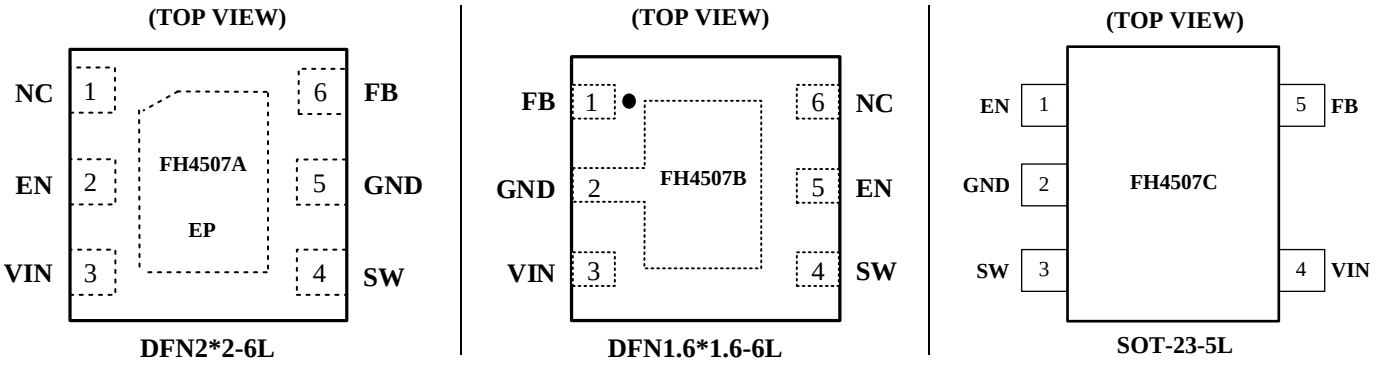


Figure 2. Efficiency(%) vs. Load Current(A)

Pin Configuration



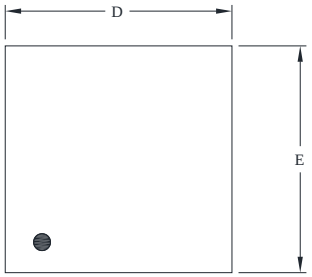
Pin Description

Name	Pin Number			Description
	DFN2.0*2.0-6L	DFN1.6*1.6-6L	SOT-23-5L	
EN	2	5	1	Enable pin for the IC. Drive the pin to high to enable the part, and low to disable.
GND (Note 1)	5	2	2	Ground.
SW	4	4	3	Inductor connection. Connect an inductor between SW and the regulator output.
VIN	3	3	4	Supply voltage. Must be closely decoupled to GND with a 4.7μF or greater ceramic capacitor.
FB	6	1	5	Feedback input. Connect an external resistor divider from the output to FB and GND to set the output to a voltage between 0.6V and Vin.
NC	1	6	/	No connection.
Thermal PAD	7	7	/	Ground.

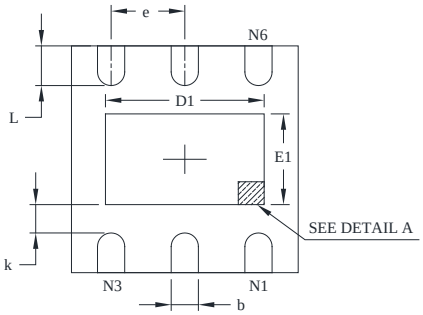
Note 1. The GND of the DFN1.6*1.6-6L package is connected to the Thermal PAD.

PACKAGE OUTLINE DIMENSIONS

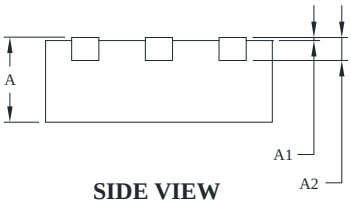
DFN2*2-6L Unit: inches/mm



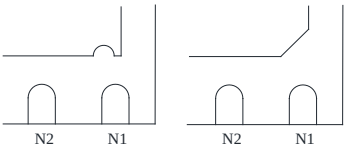
TOP VIEW



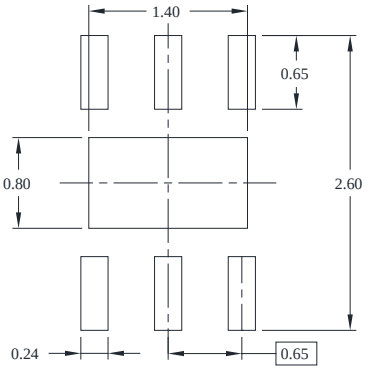
BOTTOM VIEW



SIDE VIEW



DETAIL A



RECOMMENDED LAND PATTERN(Unit: mm)

Pin #1 ID and Tie Bar Mark Options

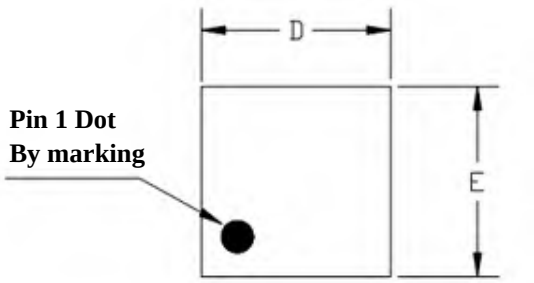
NOTE: The configuration of the Pin #1 identifier is optional, but must be located within the zone indicated.

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	1.900	2.100	0.075	0.083
D1	1.100	1.450	0.043	0.057
E	1.900	2.100	0.075	0.083
E1	0.600	0.850	0.024	0.034
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.650 TYP		0.026 TYP	
L	0.250	0.450	0.010	0.018

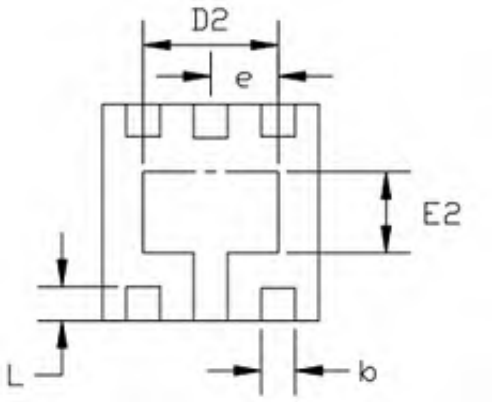
NOTE: This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

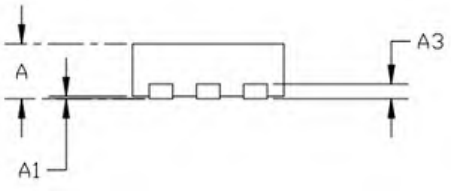
DFN1.6*1.6-6L **Unit: inches/mm**



TOP VIEW



BOTTOM VIEW

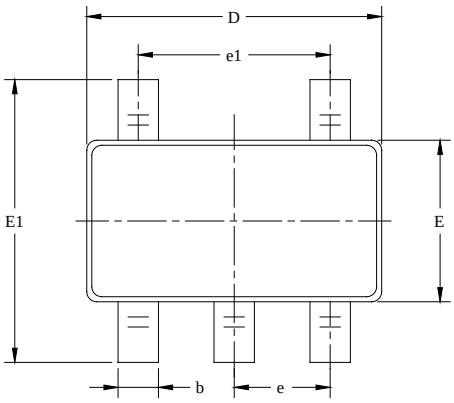


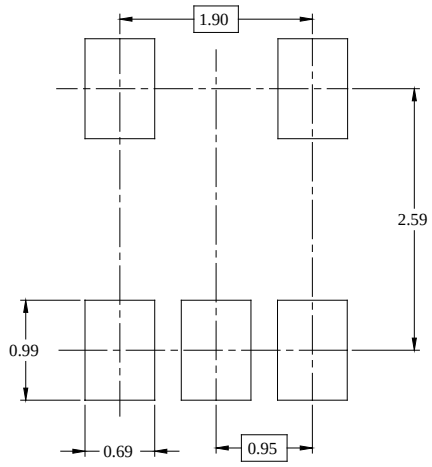
SIDE VIEW

SYMBOLS	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.50	0.55	0.020	0.024
A1	0.00	0.05	0.000	0.002
b	0.20	0.30	0.008	0.012
D	1.55	1.60	0.055	0.063
D1	0.36	0.56	0.014	0.022
E	1.55	1.60	0.055	0.063
E1	0.90	1.10	0.035	0.043
e	0.50 BSC		0.020 BSC	
L	0.200	0.25	0.007	0.013

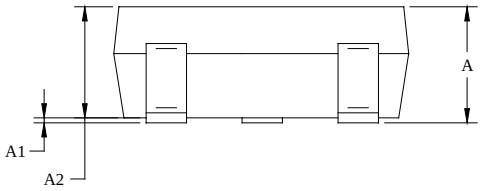
PACKAGE OUTLINE DIMENSIONS

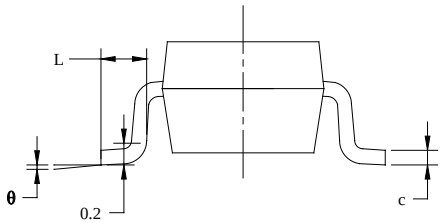
SOT-23-5L





RECOMMENDED LAND PATTERN (Unit: mm)





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

ORDERING INFORMATION

Part Number	Input Voltage	Output Function	Operating Temperature	Package Type	Top Mark	SPQ
FH4507AD6	2.6V ~ 5.5V	● DC-DC Buck(Step-down) ● Output Current: 1.5A(Max.) ● Switching Frequency: 2.0MHz ● V_{FB}: 0.6V ● Max Input Voltage: ~8.0V ● I_Q: 80uA(Typ.)	-40℃ to +85℃	DFN2*2-6L	GU ** YY MM LL	3000EA/Reel
FH4507BD6	2.6V ~ 5.5V		-40℃ to +85℃	DFN1.6*1.6-6L	HU ** YY MM LL	3000EA/Reel
FH4507CM5	2.6V ~ 5.5V		-40℃ to +85℃	SOT-23-5L	GU **	3000EA/Reel

Note:

- **FH4507A | FH4507B | FH4507C** 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.
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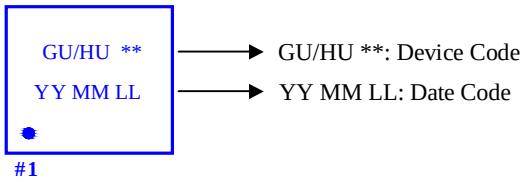
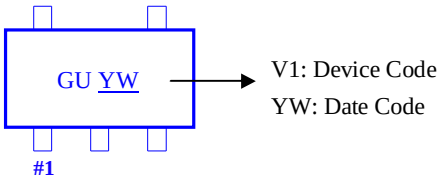
Device Name: DFN2*2-6L | DFN1.6*1.6-6L



Device Name: SOT-23-5L



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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▲ Update by Dec.2024