

With Direct Following Mode, Low Power Consumption, 1M@1.2A Step Down Regulator

General Description

IU5512S is a CMOS buck DC/DC regulator composed of a reference voltage source, an oscillation circuit, a comparator, a PWM/PFM control circuit, etc. The PWM/PFM automatic switching control circuit is used to achieve adjustable duty cycle, which has the characteristics of low ripple, high efficiency and large output current in the full input voltage range (2.0-5.5V). When VIN-VOUT (set)<0.1V, until VIN is less than the set VOUT value, IU5512S enters the pass through mode, and the VOUT output value follows the VIN value.

IU5512S has a built-in power MOSFET, which uses many protection circuits such as overvoltage, overcurrent, overheating, short circuit and so on. When the control value is exceeded, it will automatically disconnect to protect the chip. IU5512S adopts a slim SOT23-5L package, which can achieve a minimum leakage of less than 3μA, and is most suitable for use inside the power supply of mobile devices.

Package

- SOT23-5L

Features

- High Efficiency: Up to 95%
- Maximum Current Output Capacity: 1.2A
- Low Power Consumption, Static Current: 3μA
- Operating Voltage Range : 2.0~7V
- Reference Voltage: 0.6V
- Output Ripple : <±0.4%
- Low Voltage Operation, Up to 100% Duty Cycle
- When VIN-VOUT (set)<0.1V or Less, Enter The Direct Follow Mode
- PWM/PFM Switches Automatically and The Duty Cycle is Automatically Adjustable : Maintain High Efficiency and Low Ripple in a Large Load Range
- RoHS Compliant and Halogen Free

Applications

- Low Power Camera
- Smart Lock
- Robot
- Toy

Typical Applications

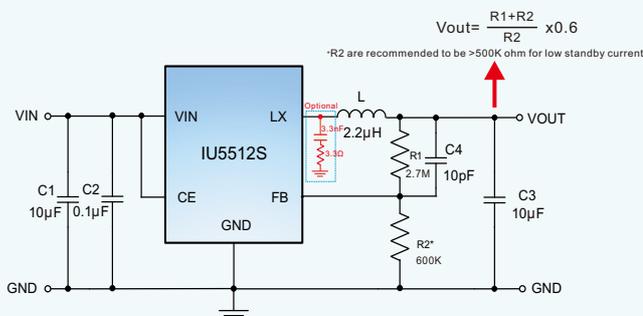


Figure 1. Application Diagram

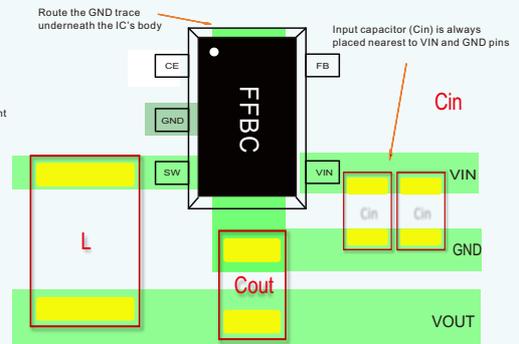
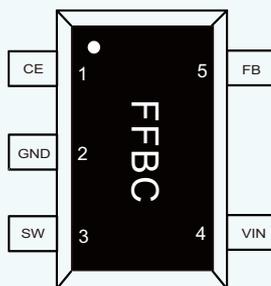


Figure 2. PCB Layout Recommendations

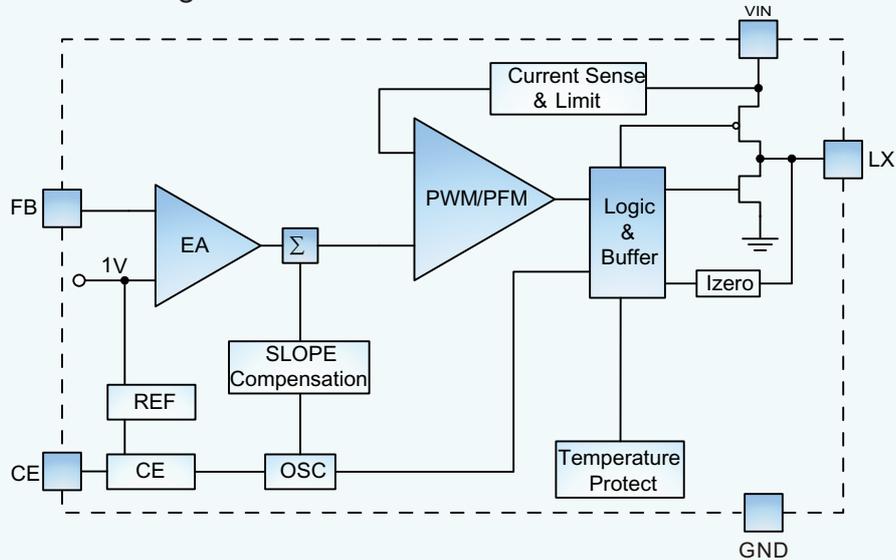
PIN Configuration and Functions



(SOT23-5L)

PIN	NAME	I/O	DESCRIPTION
1	CE	I	Chip enable terminal
2	GND	-	Power ground
3	SW	O	Internal power switch output port
4	VIN	I/O	External power input
5	FB	I	Output voltage feedback port

Functional Block Diagram



Absolute Maximum Ratings ¹

SYMBOL	PARAMETER	VALUE	UNIT
V _{MAX}	V _{IN}	2.0~7.5	V
T _J	Junction operating temperature range	-40~150	°C
T _{STG}	Storage temperature range	-55~150	°C
T _{SDR}	Lead temperature (Soldering, 10 sec.)	260	°C

Recommended Operating Conditions

SYMBOL	PARAMETER	VALUE	UNIT
V _{IN}	Input power supply voltage	2.0~7.0	V
T _J	Junction operating temperature range	-40~125	°C
T _A	Ambient temperature range	-40~85	°C

Thermal Information

SYMBOL	PARAMETER	VALUE	UNIT
θ _{JA}	Package thermal resistance - chip to environment thermal resistance	170	°C/W

Ordering Information

Device	Package Type	Device Marking	Reel Size	Tape Width	Quantity
IU5512S	SOT23_5L		7"	8mm	3000

ESD Ratings

HBM (Human Body Model)	-----	±2kV
MM (Machine model)	-----	±200V

1. The above parameters are only the limit values of device operation. It is not recommended that the working conditions of the device exceed the limit values. Otherwise, the reliability and life of the device will be affected, and even permanent damage will be caused.



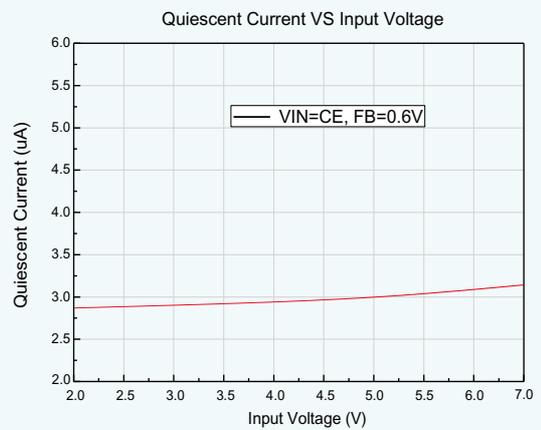
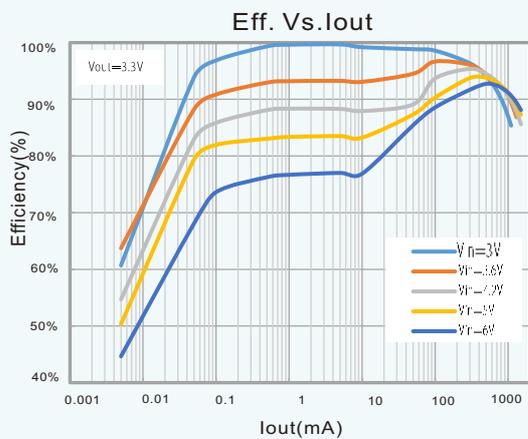
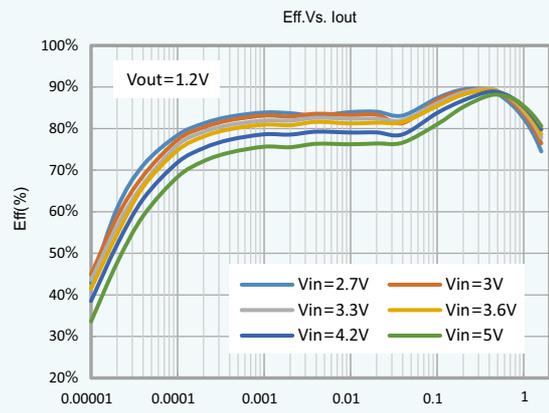
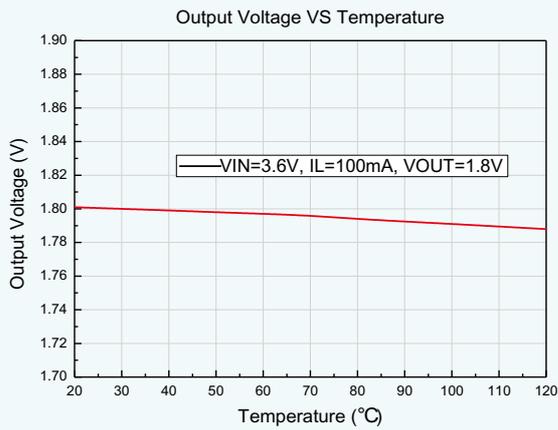
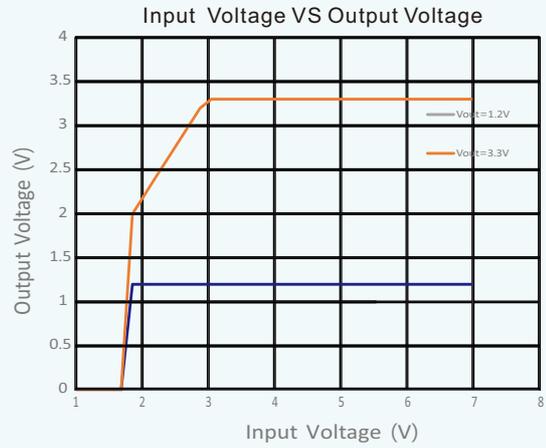
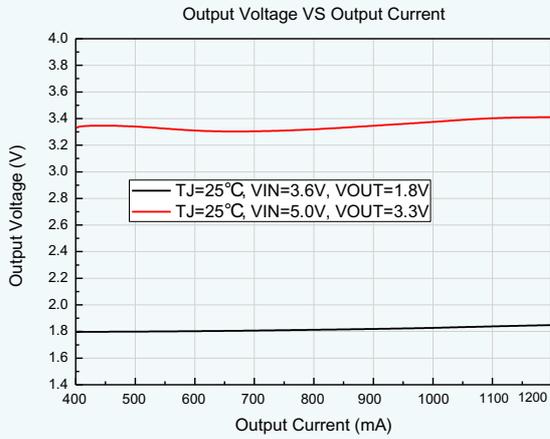
ELECTRICAL CHARACTERISTICS

VIN=3.6V, CIN=4.7uF, C2=10uF, L=2.2uH (Ta=25°C Unless otherwise specified)

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNITS
Input voltage	VIN	-	2.0	-	5.5	V
Feedback voltage	VFB	-	0.59	0.6	0.61	V
Load regulation rate	VOUT	IL _{MAX} =600mA	-	0.5	-	%
Linear adjustment rate	ΔVOUT	VIN=2.5V TO 8.5V	-	0.45	-	%
Efficiency	EFFI	VIN=2.5V ; IL=100mA	-	92	-	%
CE Minimum ON	VCEL	VIN=5V	1.2			V
CE Maximum OFF	VCEH	VIN=5V			0.4	V
Shutdown current	I _{SD}	VCE=0V、VIN=5V	0	-	1	uA
Quiescent current	I _Q	NO LOAD ,R _{FB_R2} =1MΩ	-	3	-	uA
VFB Input current	I _{FB}	VFB=1V	-	-	± 50	nA
Peak current limit	ILIM	-	-	1500	-	mA
PFM Switching point	IL	VIN=3.6V 、 VOUT=1.8V		100		mA
Oscillation frequency	FOSC	VOUT=100%	-	1.0	-	MHz
Maximum duty cycle	MAXDTY	-	100	-	-	%
Internal resistance of PMOS	RDSON_P	ISW=300mA	-	0.25	0.35	Ω
Internal resistance of NMOS	RDSON_N	ISW=300mA	-	0.2	0.3	Ω
SW terminal leakage current	ILEAK_SW	CE=0V , VIN=5V	-	± 0.01	± 1	uA



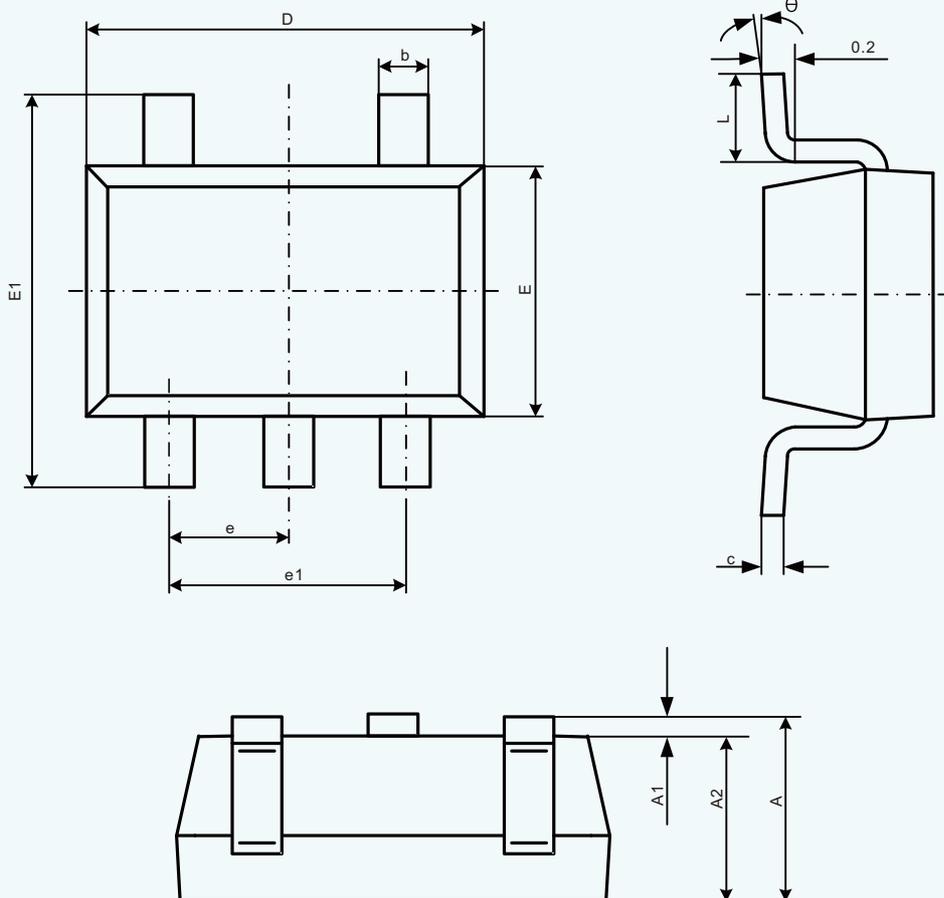
TYPICAL PERFORMANCE CHARACTERISTICS





Package Information

IU5512S SOT23-5L PACKAGE INFORMATION

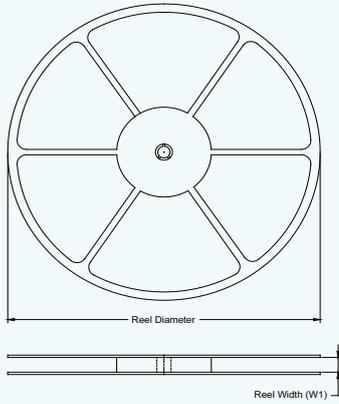


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

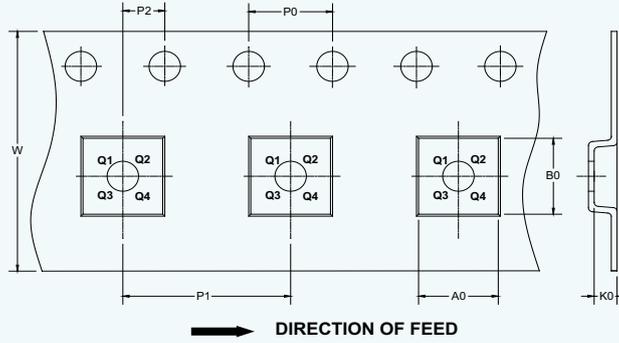


TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOT-23-5	7"	8.0	3.20	3.20	1.40	4.0	4.0	2.0	8.0	Q3