General Description

The TP8204H is a fully integrated, high efficiency 2.0A synchronous rectified step-down converter. The TP8204H operates at high efficiency over a wide output current load range.

This device offers two operation modes, PWM control and PFM Mode switching control, which allows a high efficiency over the wider range of the load.

The TP8204H requires a minimum number of readily available standard external components and is available in a 6-pin SOT23 ROHS compliant package.

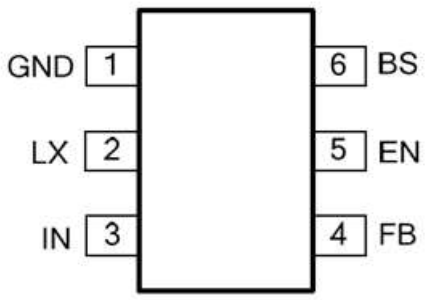
Applications

- Distributed Power Systems
- Digital Set Top Boxes
- Flat Panel Television and Monitors
- Wireless and DSL Modems
- Notebook Computer

Features

- High Efficiency: Up to 95%max
- 600KHz Frequency Operation
- 2.0A Output Current
- No Schottky Diode Required
- 3.5V to 18V Input Voltage Range
- 0.8V Reference
- Slope Compensated Current Mode Control for Excellent Line and Load Transient Response
- Integrated internal compensation
- Stable with Low ESR Ceramic Output Capacitors
- Over Current Protection with Hiccup-Mode
- Input over voltage protection(OVP)
- Thermal Shutdown
- Inrush Current Limit and Soft Start
- Available in SOT23-6 Package
- -40°C to +85°C Temperature Range

PIN CONFIGURATION



(SOT23-6)

PIN	NAME	FUNCTION
1	GND	Ground
2	LX	Switching Pin
3	IN	Power supply Pin
4	FB	Adjustable version feedback input. Connect FB to the center point of the external resistor divider.
5	EN	Drive this pin to a logic-high to enable the IC. Drive to a logic-low to disable the IC and enter micro-power shutdown mode.
6	BS	Bootstrap. A capacitor connected between LX and BST pins is required to form a floating supply across the high-side switch driver.

TYPICAL APPLICATION

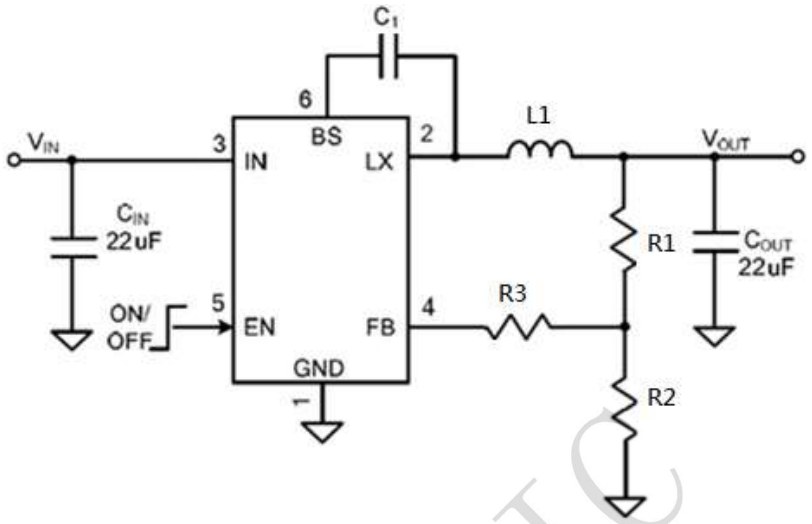


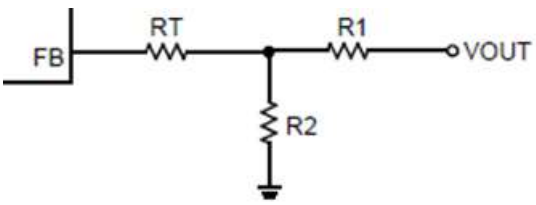
Figure 1. Basic Application Circuit

Setting the Output Voltage

The external resistor divider is used to set the output voltage (see Typical Application on page 1). The feedback resistor R1 also sets the feedback loop bandwidth with the internal compensation capacitor. Choose R1 to be around 10kΩ for optimal transient response. R2 is then given by:

$$R_2 = \frac{R_1}{V_{out}/V_{FB} - 1}$$

Use a T-type network for when VOUT is low.



Vout	R1(KΩ)	R2(KΩ)	RT(KΩ)
5.0V	40.2	7.68	75
3.3V	40.2	13	75
2.5V	40.2	19.1	100
1.8V	40.2	32.4	120
1.2V	20.5	41.2	249
1.05V	10	32.4	300

Absolute Maximum Rating (T_A=25°C unless otherwise noted)

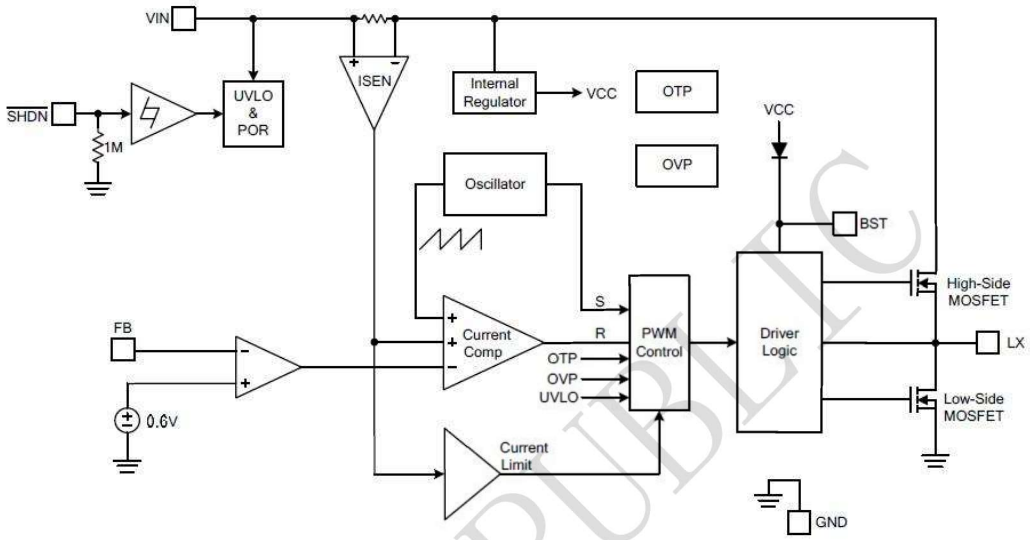
Parameter	Symbol	Min.	Max.	Unit
Input Supply Voltage,EN	Vcc	-0.3	20	V
LX Voltage	VLX	-0.3	20	V
FB Voltage	V	-0.3	6.0	V
BS Voltage		-0.6	25	V
Pink Current limit	I peak		3	A
Junction Temperature			155	°C
Operating Temperature		-40	+85	°C
Storage Temperature Range		-65	150	°C
Lead Temperature			300	°C
Power Dissipation	PD		600	mW
Thermal Resistance	QJA		135	°C/W
	QJC		60	°C/W

Electrical Characteristics (T_A=25°C unless otherwise noted)

(V_{IN}=12V ,V_{OUT}=5V , T_A = 25°C, unless otherwise noted.)

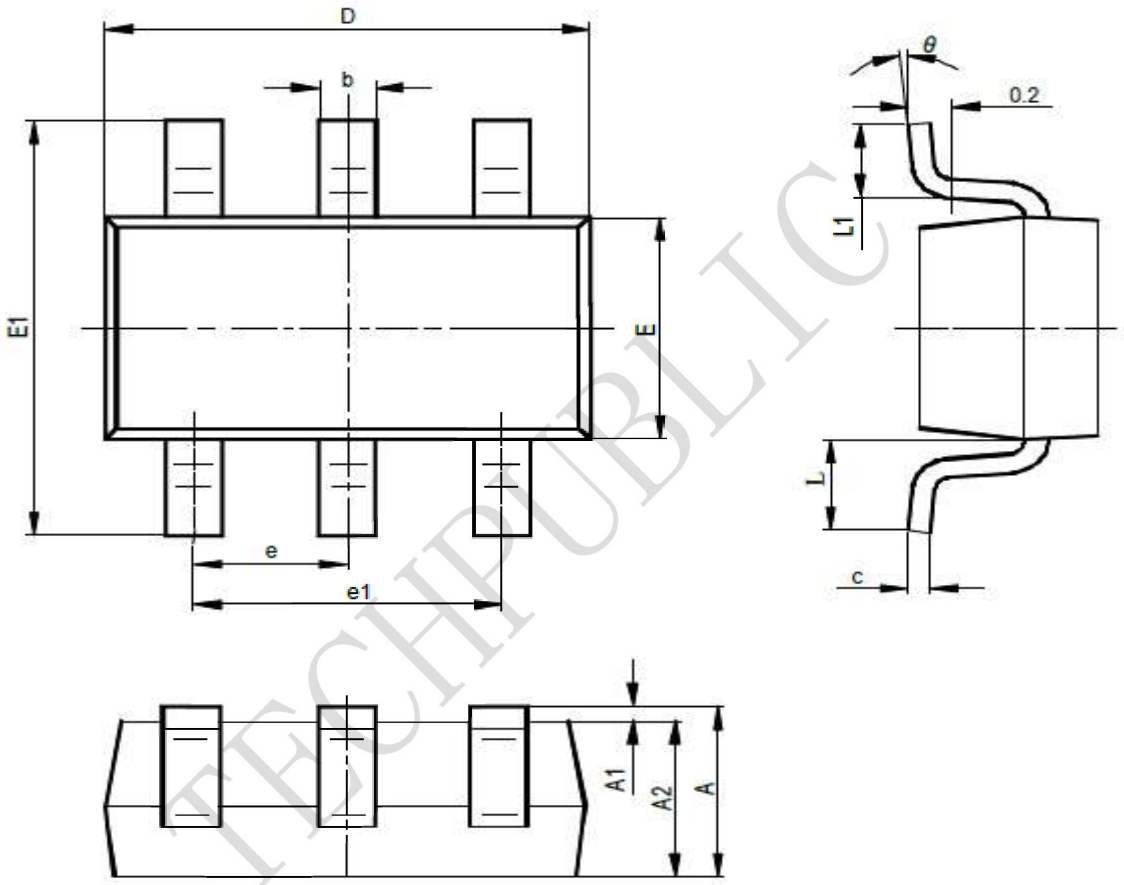
Parameter	Conditions	MIN	TYP	MAX	unit
Input Voltage Range		3.5		18	V
OVP Threshold		18.5		19.5	V
UVLO Threshold		3.0			V
Supply Current in Operation	VEN=2.0V, VFB=1.1V		0.4	0.6	mA
Supply Current in Shutdown	VEN =0 or EN = GND		1		uA
Regulated Feedback Voltage	T_A = 25°C, 3.5V≤VIN ≤18V	0.784	0.8	0.816	V
High-Side Switch On-Resistance			120		m Ω
Low-Side Switch On-Resistance			70		m Ω
High-Side Switch Leakage Current	VEN=0V, VLX=0V		0	10	uA
Upper Switch Current Limit	Minimum Duty Cycle	2.5			A
Oscillation Frequency			600		KHz
Maximum Duty Cycle	VFB=0.8V		95		%
Minimum On-Time			60		nS
Thermal Shutdown			160		℃

BLOCK DIAGRAM



Package informantion

SOT23-6



SYMBOL	MILLIMETERS		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	0.400	0.012	0.016
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	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.700REF		0.028REF	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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