

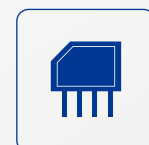
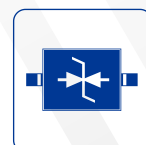
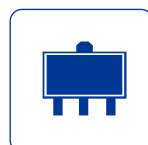
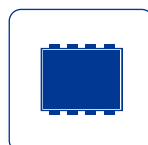
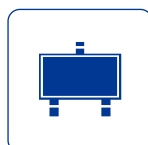
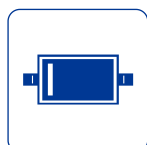
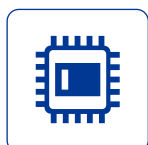
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PRODUCT SPECIFICATION

MAIN PRODUCTS



Features

- 2.5V to 5.5V Input Voltage
- 1.23V Feedback Voltage
- 1.2MHz Fixed Switching Frequency
- Internal 0.6A Switch Current Limit
- Internal Compensation
- Thermal Shutdown
- Available in a 5-pin SOT-23 package

Applications

- Camera Flash White LED
- Digital still cameras
- PDA LED back light

General Description

The TPS61040DBVR is a step-up converter. Its 1.23V feedback voltage reduces power loss and improves efficiency. Optimized operation frequency can meet the requirement of small LC filters value and low operation current with high efficiency. Internal soft start function can reduce the inrush current. Tiny package type provides the best solution for PCB space saving and total BOM cost.

Typical Application Circuit

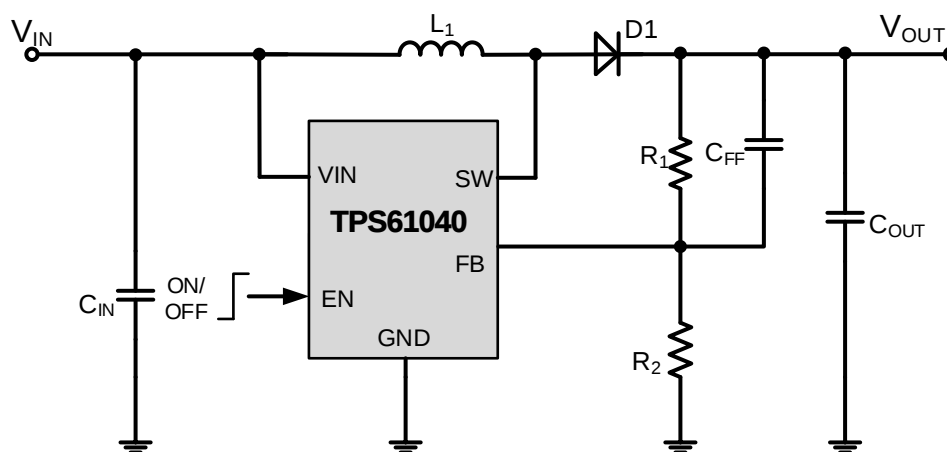
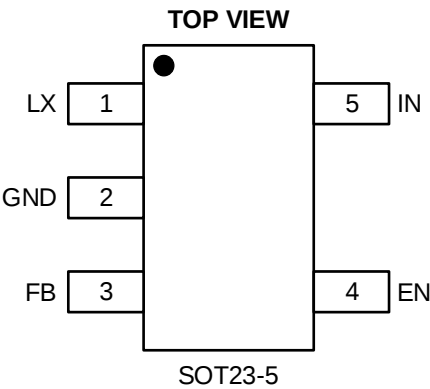


Figure1. Basic Application Circuit

Package and Pin Description



Top Marking: PHOI

Pin	Name	Function
1	LX	Power Switch Output. LX is the drain of the internal MOSFET switch. Connect the power inductor and output rectifier to LX. LX can swing between GND and 30V.
2	GND	Ground Pin
3	FB	Feedback Input. The FB voltage is 1.23V. Connect a resistor divider to FB.
4	EN	Regulator On/Off Control Input. A high input at EN turns on the converter, and a low input turns it off. When not used, connect EN to the input supply for automatic startup.
5	IN	Input Supply Pin. Must be locally bypassed.

Absolute Maximum Ratings

Parameter	Absolute Maximum Ratings	Unit
V_{IN}, V_{EN}	-0.3 to 6	V
V_{SW}	-0.3 to 30	V
All Other Pins	-0.3 to 6	V
Continuous Power Dissipation($T_A=+25^{\circ}\text{C}$)	0.6	W
Junction Temperature	150	$^{\circ}\text{C}$
Operating Temperature Range	-40 to 85	$^{\circ}\text{C}$
Lead Temperature	260	$^{\circ}\text{C}$
Storage Temperature	-65 to 150	$^{\circ}\text{C}$
Thermal Resistance θ_{JA}	250	$^{\circ}\text{C}/\text{W}$
Thermal Resistance θ_{JC}	130	$^{\circ}\text{C}/\text{W}$

Recommended Operating Conditions

Parameter	Recommended	Unit
Supply Voltage V_{IN}	2.5 to 5.5	V
Output Voltage V_{OUT}	V_{IN} to 30	V
Operating Junction Temp.(T_J)	-40 to 125	$^{\circ}\text{C}$

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Current(Shutdown)	I_{IN}	$V_{EN}=0\text{V}$		0.1	1	μA
Quiescent Current		$V_{FB}=1\text{V}$, switch		0.15	0.3	mA
SW Leakage		$V_{SW} = 20\text{V}$			1	μA
SW On Resistance				400	650	m Ω
Operating Input Voltage			2.5		5.5	V
Current Limit	I_{LIMIT}	$V_{IN}= 4\text{V}$, Duty cycle=50%		0.6		A
Oscillator Frequency	f_{SW}			1.2		MHz
Maximum Duty Cycle	D_{MAX}	$V_{FB}=1\text{V}$		90		%
Feedback Voltage	V_{FB}		1.21	1.23	1.25	V
FB Input Bias Current		$V_{FB}=1.23\text{V}$	-50	-10		nA
EN Threshold	V_{EN}			1		V
Thermal Shutdown				160		$^{\circ}\text{C}$
Supply Current(Shutdown)	I_{IN}	$V_{EN}=0\text{V}$		0.1	1	μA

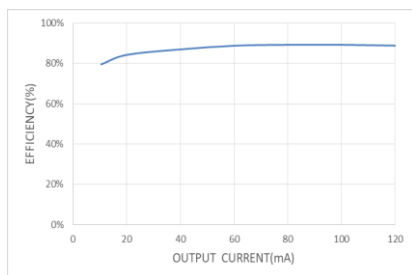
Typical Performance Characteristics

Note (1): Performance waveforms are tested on the evaluation board.

Note (2): $V_{IN}=5V$, $V_{OUT}=24V$, $L=10\mu H$, $C_{OUT}=22\mu F$ $T_A=+25^{\circ}C$, unless otherwise noted

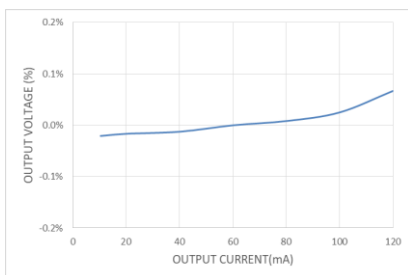
Efficiency vs Output Current

$V_{OUT} = 24V$



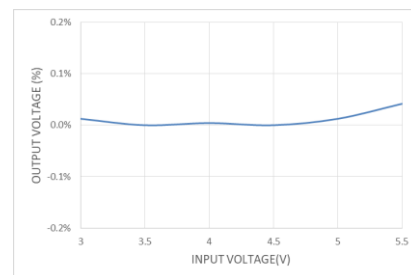
Load Regulation

$V_{OUT} = 24V$



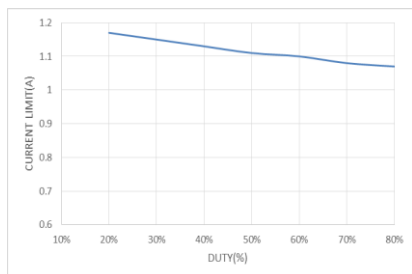
Line Regulation

$V_{OUT} = 24V$, $I_{OUT} = 60mA$



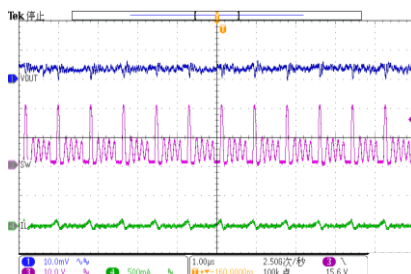
Current Limit vs Duty

$V_{IN}=5V$



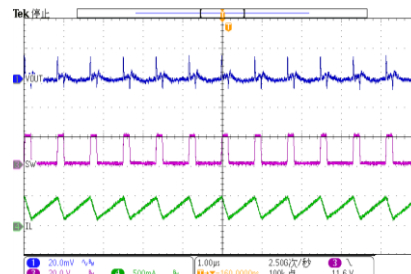
Output Ripple Voltage

$I_{OUT} = 0mA$



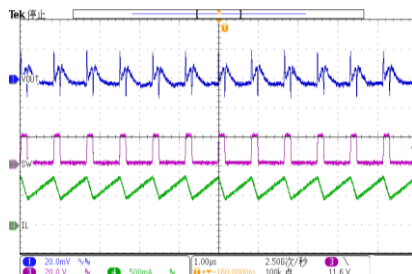
Output Ripple Voltage

$I_{OUT} = 60mA$



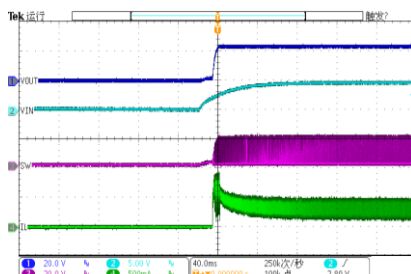
Output Ripple Voltage

$I_{OUT} = 120mA$



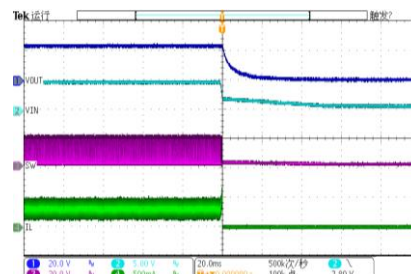
VIN Power On

$I_{OUT} = 60mA$



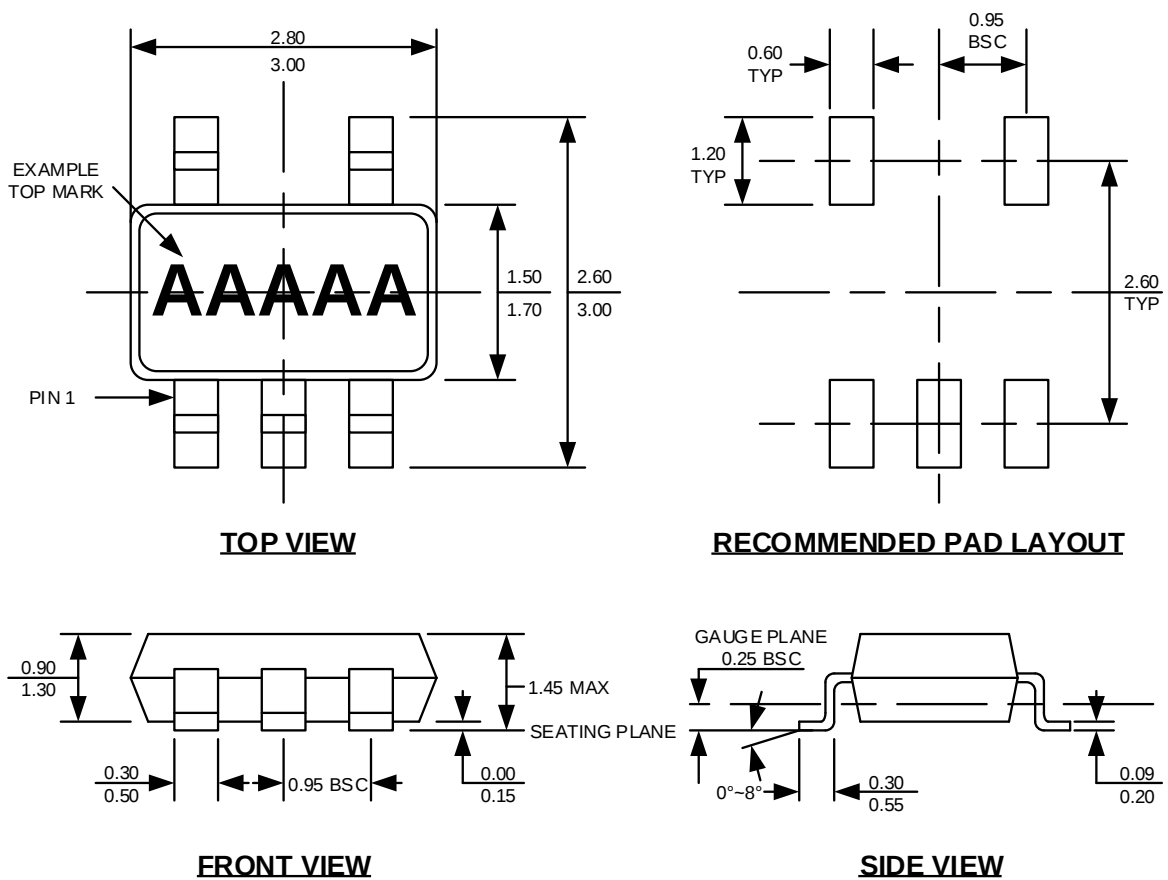
VIN Power Off

$I_{OUT} = 60mA$



Package Description

SOT23-5



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 flash or protrusion.
4. Lead coplanarity (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.