

High Efficiency Boost DC/DC Regulator

General Description

The LP6203 is a compact, high efficiency, and low voltage step-up DC/DC converter including an error amplifier, ramp generator, comparator, switch pass element and driver in which providing a stable and high efficient operation over a wide range of load currents. It operates in stable waveforms without external compensation.

The low start-up input voltage below 1.6V makes LP6203 suitable for 2 to 4 battery cells applications of providing up to 1A output current. The high switching rate minimized the size of external components. Besides, the 19 μ A low quiescent current together with high efficiency maintains long battery lifetime.

The output voltage is set with two external resistors.

Ordering Information

LP6203 - ☐ ☐ ☐

F: Pb-Free

Package Type
QV: TDFN-6

Applications

- ✧ AIK. Battery products

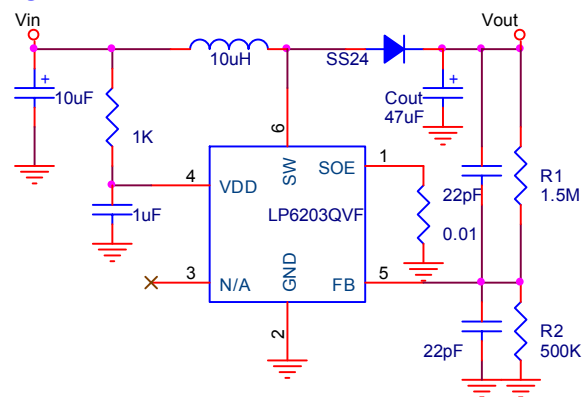
Marking Information

Please see website.

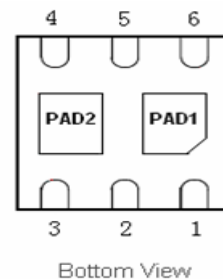
Features

- ◆ 1.6V Start-up Input Voltage
- ◆ Output up to 20V
- ◆ High Supply Capability to Deliver 6V 500mA with 2 Alkaline Cell
- ◆ 19 μ A Quiescent (Switch-off) Supply Current
- ◆ Zero Shutdown Mode Supply Current
- ◆ 90% Efficiency
- ◆ Up to 450KHz Switching Frequency
- ◆ Using Internal Power Switches
- ◆ Small DFN2*2-6 Package

Typical Application Circuit



Pin Configurations

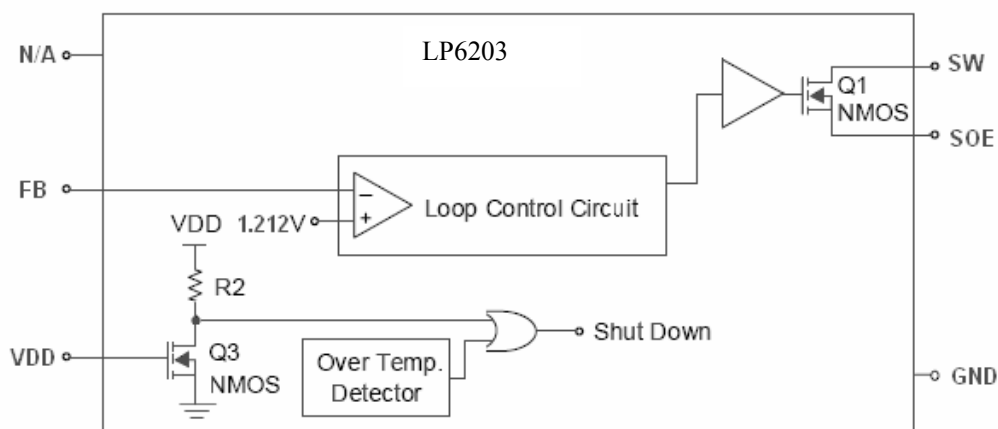


TDFN-6(Top View)

Functional Pin Description

Pin Number	Pin Name	Function
1	SOE	Source of the mosfet.
2	GND	Ground
3	N/A	No Connector
4	VDD	Output
5	FB	Feedback
6	SW	Switch output
PAD1		Connected to PIN 6 internally
PAD2		Need to connect to GND

Function Block Diagram



Absolute Maximum Ratings

Supply Input Voltage-----	6V
SW Pin Switch Voltage-----	-0.3V to (Vout + 0.8V)
Other I/O Pin Voltages-----	-0.3V to (Vout + 0.3V)
SW Pin Switch Current -----	2.5A
SW Pin Voltage(max) -----	23V
Lead Temperature (Soldering, 10 sec.) -----	260°C
Storage Temperature Range -----	-65°C to 150°C

ESD Susceptibility

HBM (Human Body Mode) -----	2kV
MM(Machine-Mode)-----	200V

Recommended Operating Conditions

Supply Input Voltage-----	1.6V to 6.5V
Operation Ambient Temperature Range-----	-40°C to 85°C

Electrical Characteristics

($V_{IN} = 1.5V$, V_{DD} set to $3.3V$, Load Current = 0, $T_A = 25^{\circ}C$, unless otherwise specified)

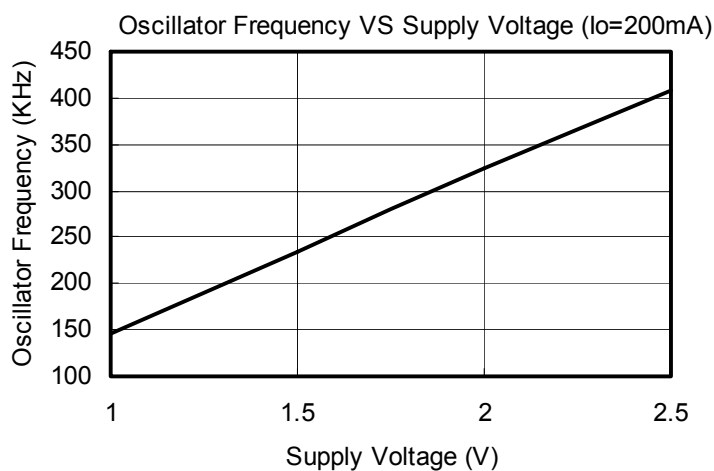
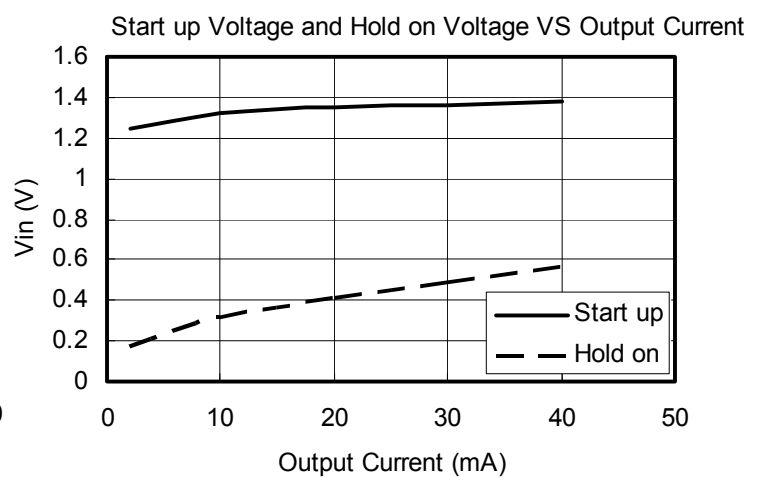
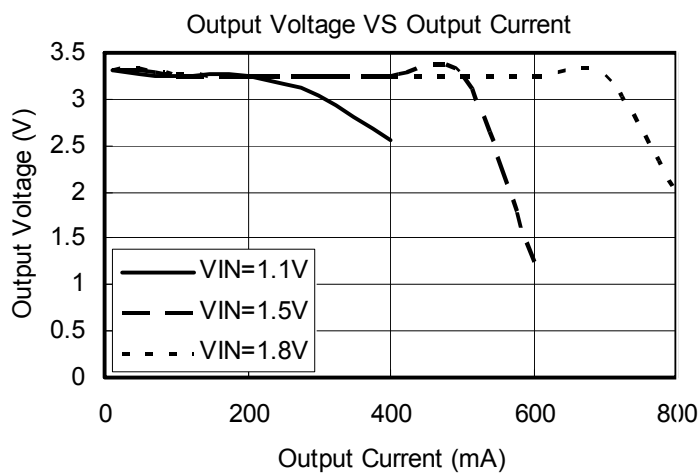
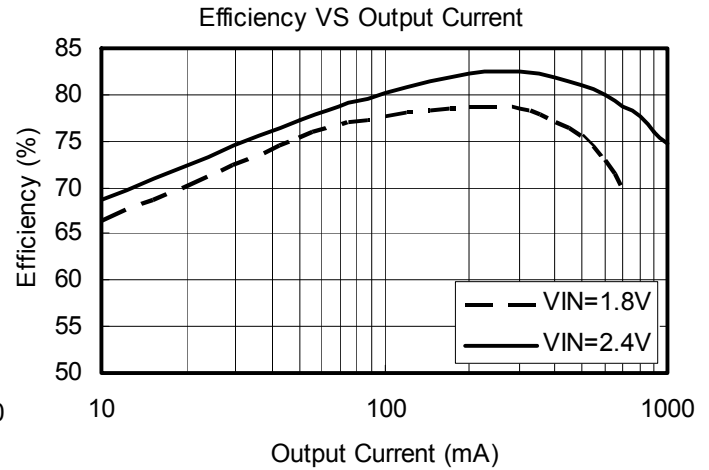
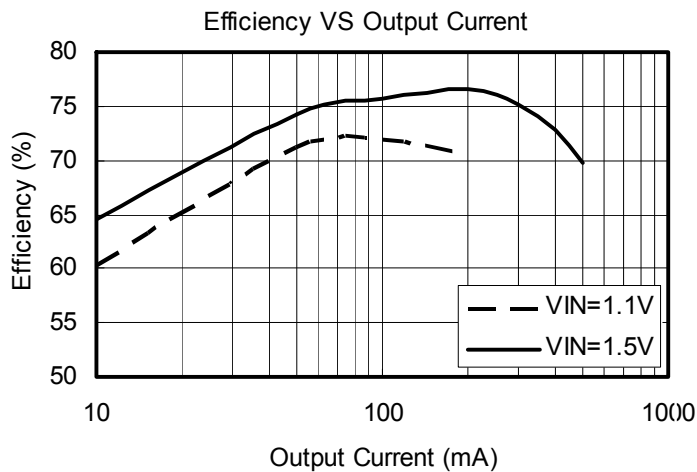
Parameter	Test Conditions	Min	Typ	Max	Units
Start-UP Voltage	$I_L = 1mA$		1.50	1.55	V
Operating VDD Range	VDD pin voltage	2		6.5	V
No Load Current I (V_{IN})	$V_{IN} = 2V$, $V_{OUT} = 6V$		19		μA
Feedback Reference Voltage	Close Loop, $V_{DD} = 3.3V$	1.187	1.212	1.237	V
Switching Frequency	$V_{DD} = 3.3V$				KHz
Maximum Duty	$V_{DD} = 3.3V$		80		%
SW ON Resistance	$V_{DD} = 3.3V$		0.3		Ω
Current Limit Setting	$V_{DD} = 3.3V$		2.5		A
Line Regulation	$V_{IN} = 1.5 \sim 2.5V$, $I_L = 1mA$		10		mV/V
Load Regulation	$V_{IN} = 2.5V$, $I_L = 1 \sim 100mA$		0.25		mV/mA
Temperature Stability for V_{OUT}			50		ppm/ $^{\circ}C$
Thermal Shutdown			165		$^{\circ}C$
Thermal Shutdown Hysterises			10		$^{\circ}C$

Typical Operating Characteristics

TA=25°C, C_{IN}=10 µF, C_{OUT}=20 µF, L=4.7 µH, unless otherwise noted.

Refer to Test Circuit Figure. 1

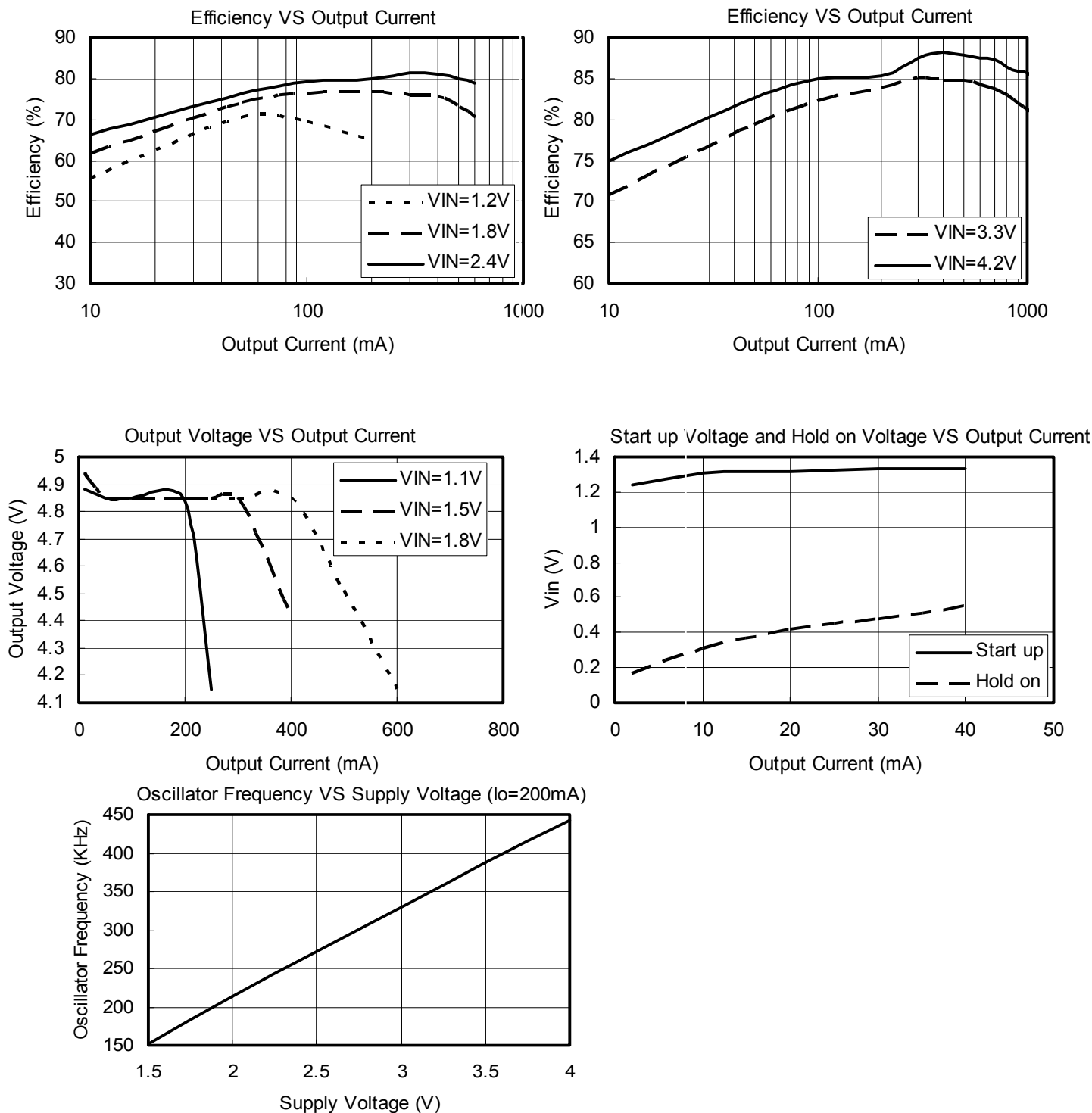
V_{OUT}=3.3V (R_M=0.33/5 Ω)



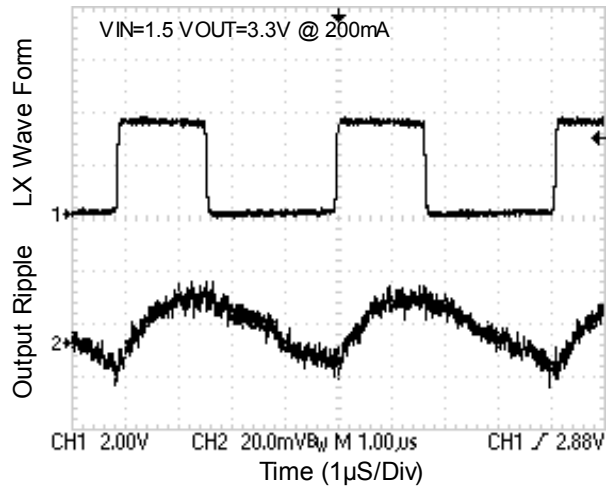
Typical Performance Characteristics

TA=25°C, C_{IN}=10 µF, C_{OUT}=20 µF, L=4.7 µH, unless otherwise noted.

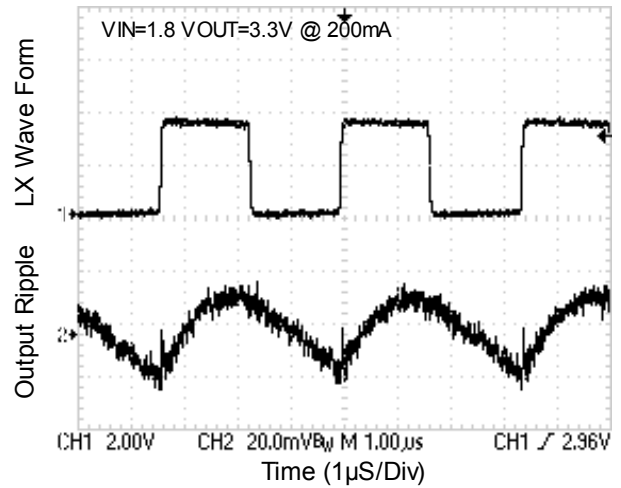
V_{OUT}=5V (R_M=0.33/5Ω)



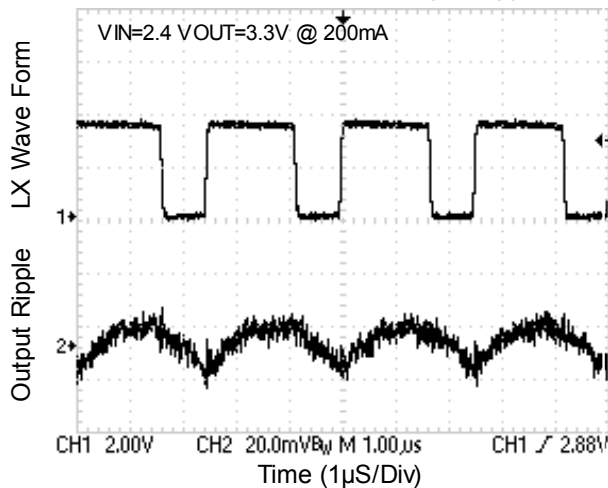
LX Pin Wave Form & Output Ripple



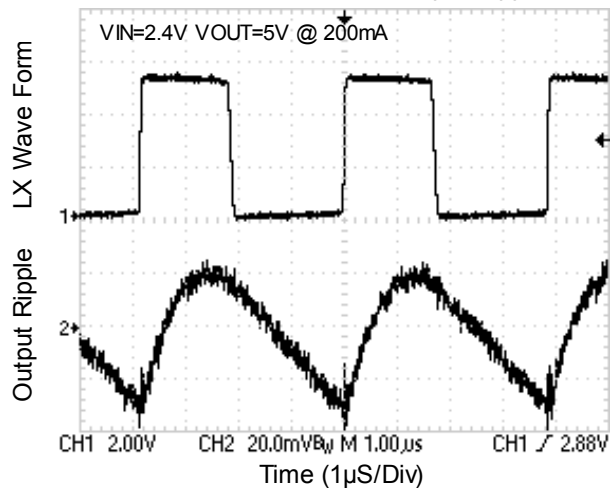
LX Pin Wave Form & Output Ripple



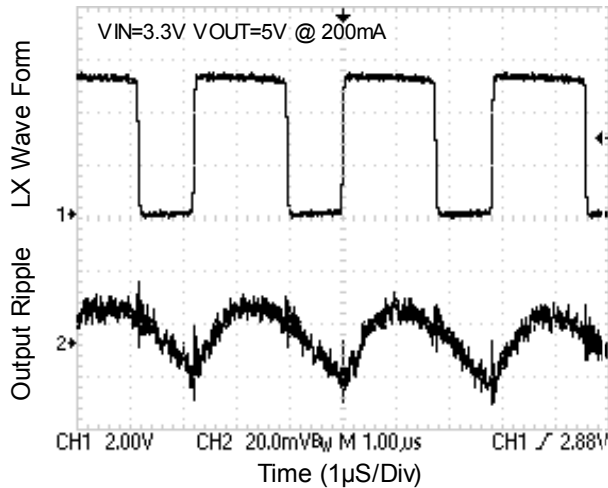
LX Pin Wave Form & Output Ripple



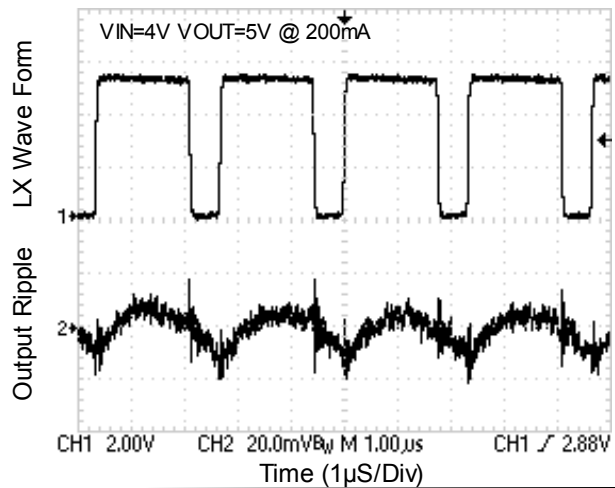
LX Pin Wave Form & Output Ripple



LX Pin Wave Form & Output Ripple



LX Pin Wave Form & Output Ripple

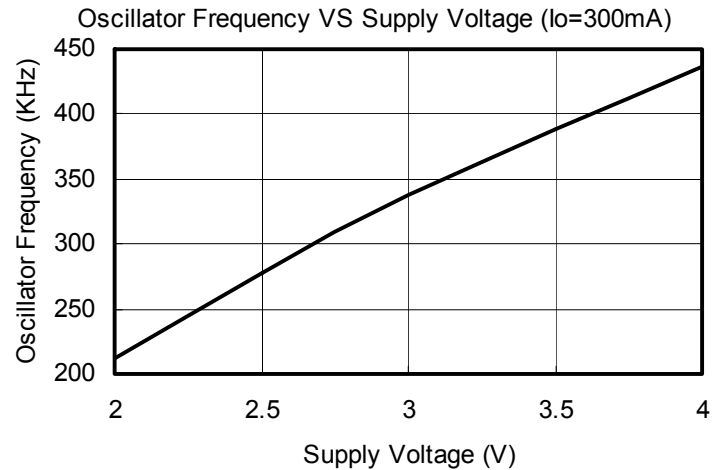
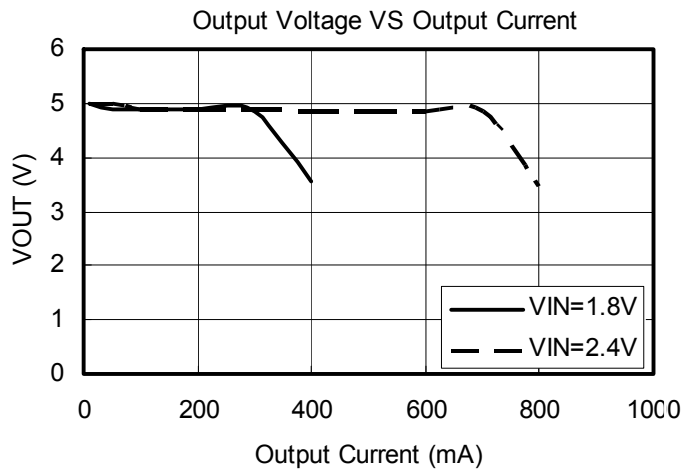
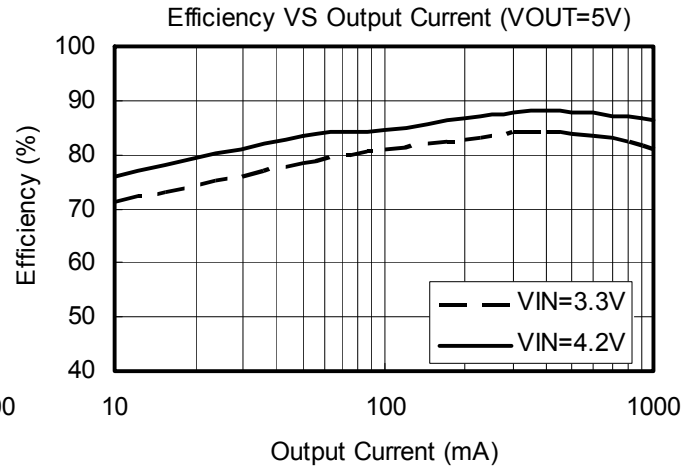
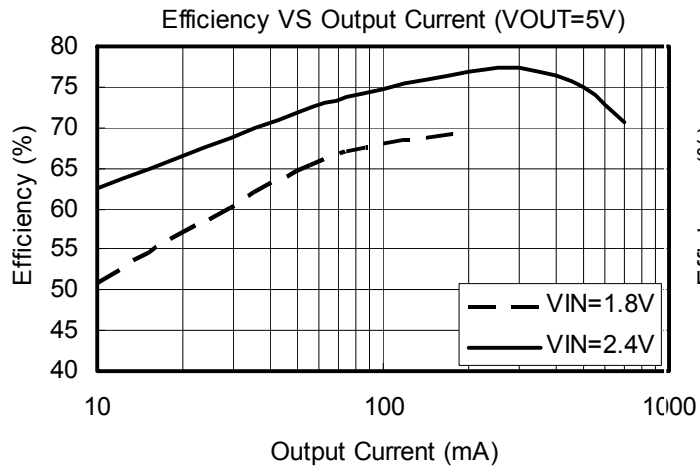


Typical Performance Characteristics

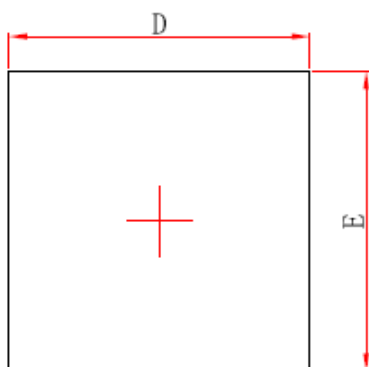
TA=25°C, C_{IN} =10 µF, C_{OUT} =20 µF, L=4.7 µH, unless otherwise noted.

Refer to Test Circuit Figure. 2

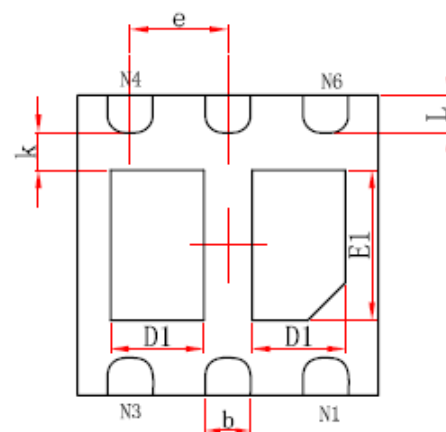
V_{OUT}=5V (RM=0.33/5Ω)



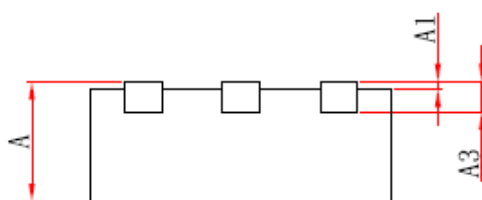
Packaging Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700/0.800	0.800/0.900	0.028/0.031	0.031/0.035
A1	0.000	0.050	0.000	0.002
A3	0.203REF		0.008REF	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.520	0.720	0.020	0.028
E1	0.900	1.100	0.035	0.043
k	0.200MIN		0.008MIN	
b	0.250	0.350	0.010	0.014
e	0.650TYP		0.026TYP	
L	0.174	0.326	0.007	0.013