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 19μA 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

✧ AlK. Battery products

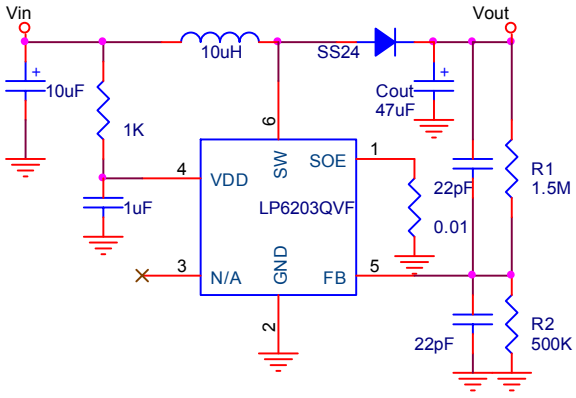
Marking Information

Please see website.

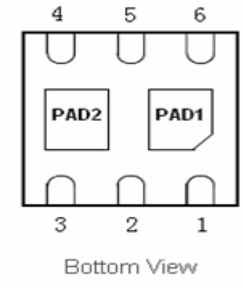
Features

- 1.6V Start-up Input Voltage
- Output up to 20V
- High Supply Capability to Deliver 6V 500mA with 2 Alkaline Cell
- 19μA 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

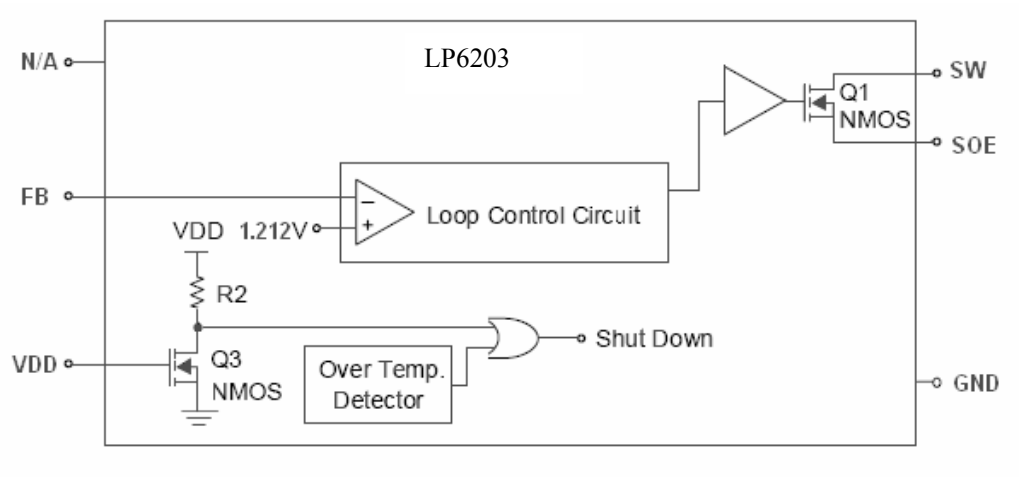


TDFN-6(Top View)

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, VDD set to 3.3V, Load Current = 0, TA = 25°C, unless otherwise specified)

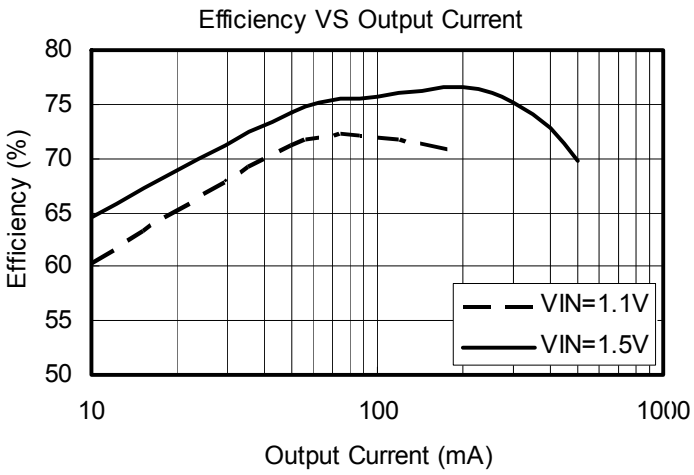
Parameter	Test Conditions	Min	Typ	Max	Units
Start-UP Voltage	IL = 1mA		1.50	1.55	V
Operating VDD Range	VDD pin voltage	2		6.5	V
No Load Current I (V_{IN})	V_{IN} = 2V, V_{OUT} = 6V		19		μA
Feedback Reference Voltage	Close Loop, VDD = 3.3V	1.187	1.212	1.237	V
Switching Frequency	VDD = 3.3V				KHz
Maximum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

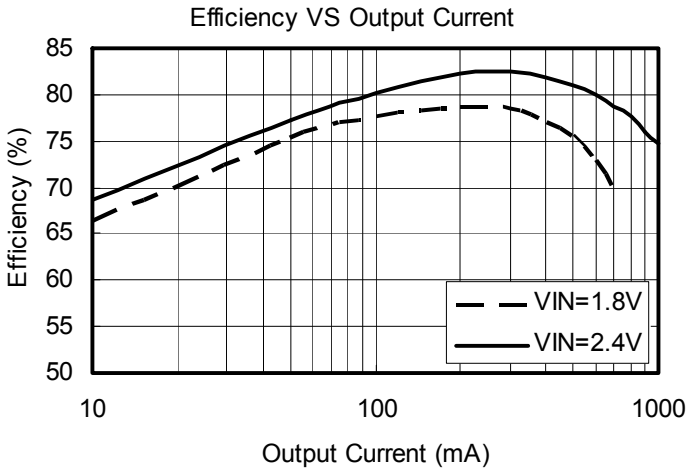
Typical Operating Characteristics

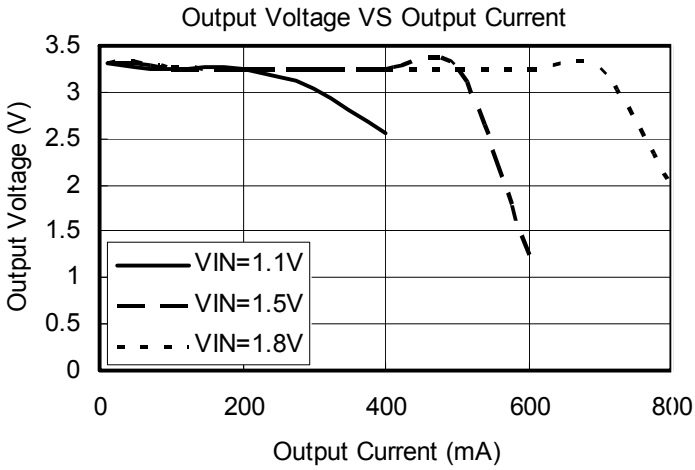
TA=25℃, C_{IN} =10 μF, C_{OUT} =20 μF, L=4.7 μH, unless otherwise noted.

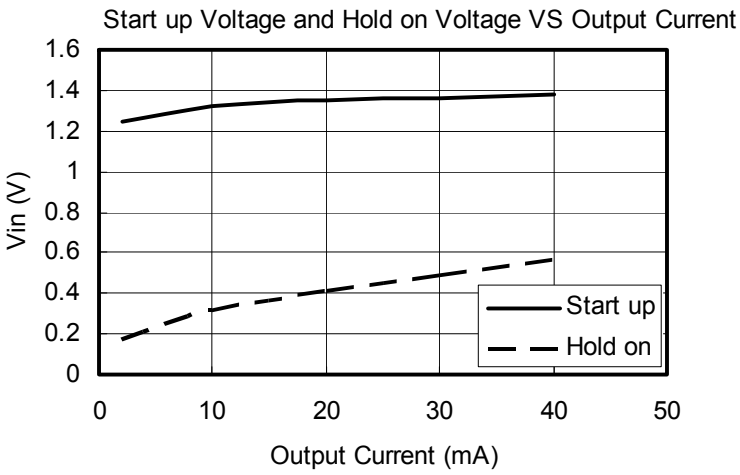
Refer to Test Circuit Figure. 1

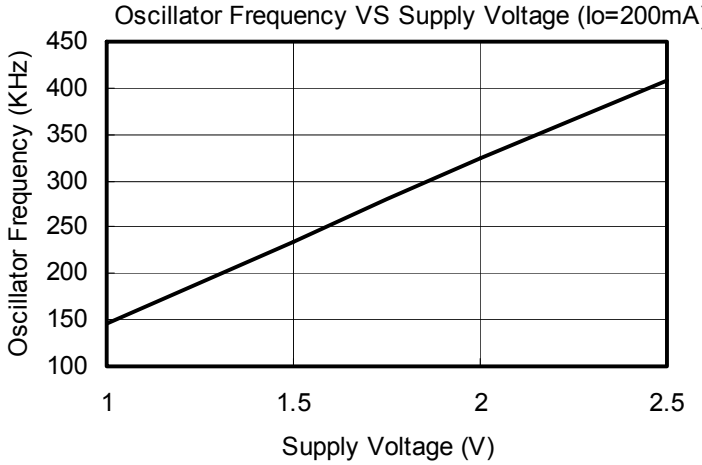
VOUT=3.3V (RM=0.33/5 Ω)







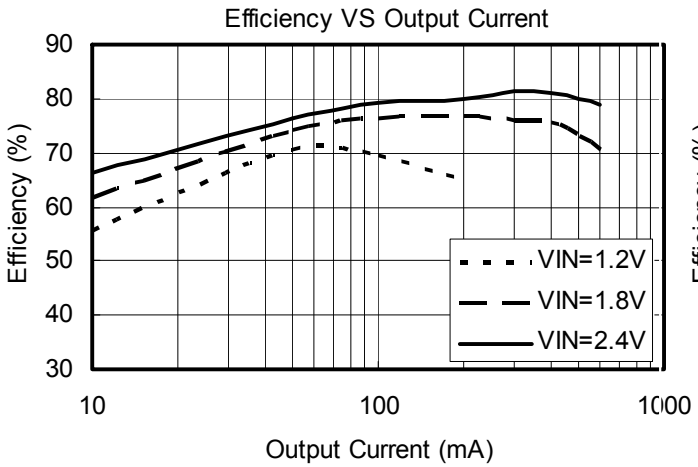


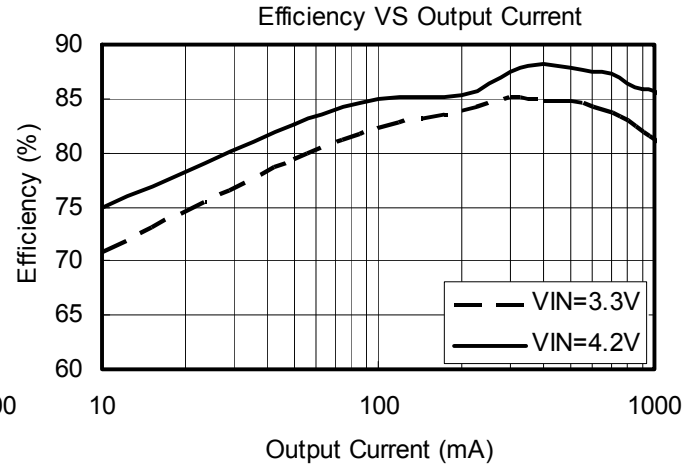


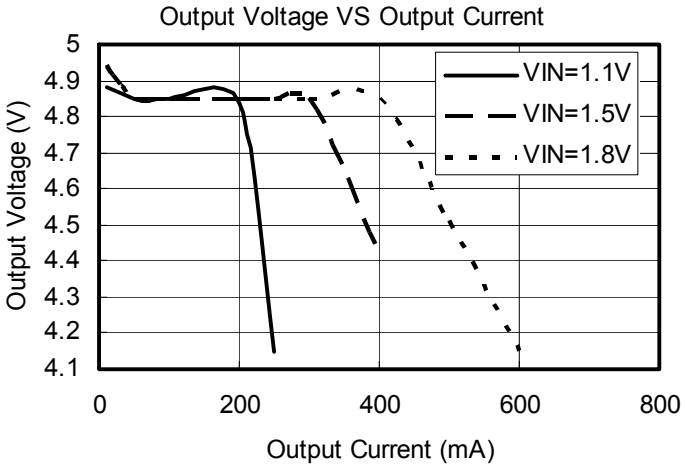
Typical Performance Characteristics

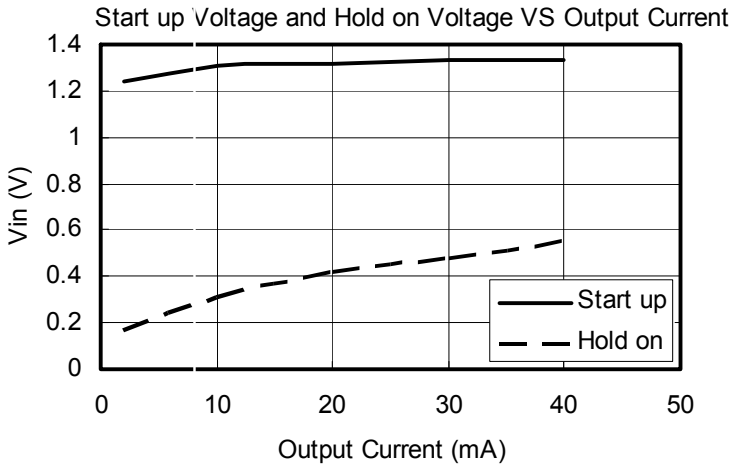
TA=25℃, C_{IN} =10 μF, C_{OUT} =20 μF, L=4.7 μH, unless otherwise noted.

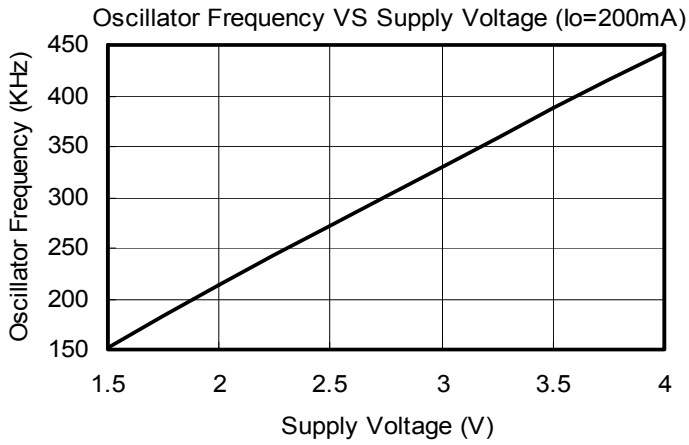
VOUT=5V (RM=0.33/5Ω)



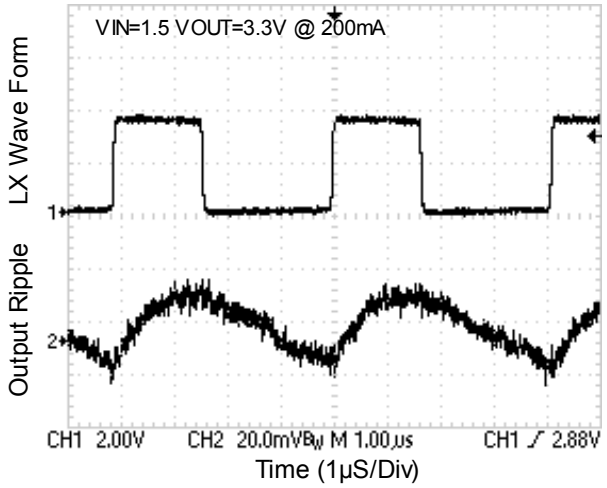




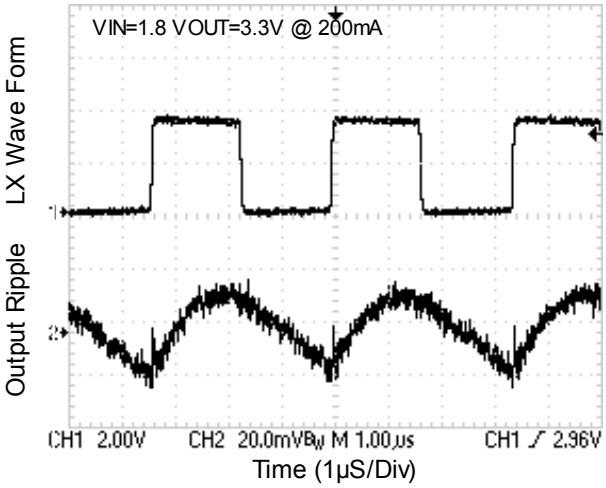




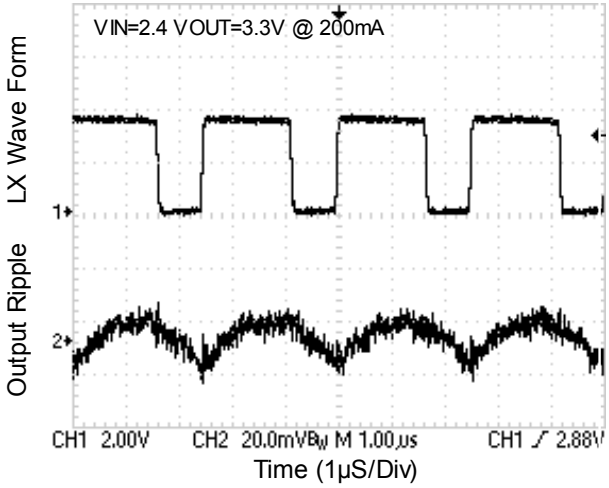
LX Pin Wave Form & Output Ripple



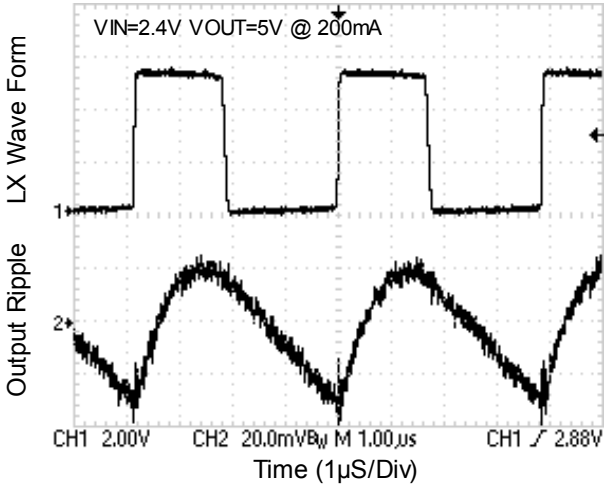
LX Pin Wave Form & Output Ripple



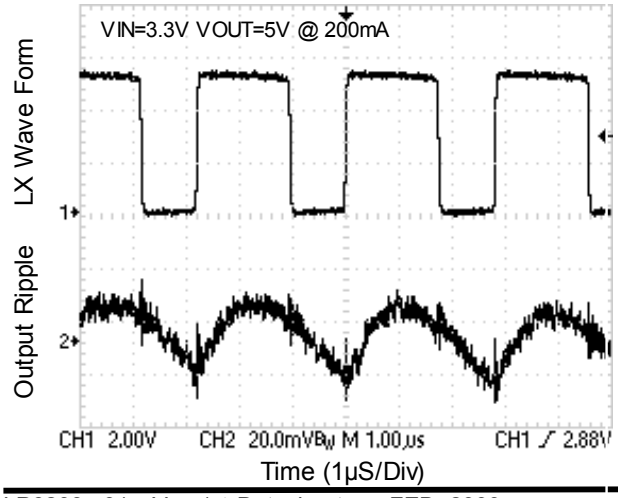
LX Pin Wave Form & Output Ripple



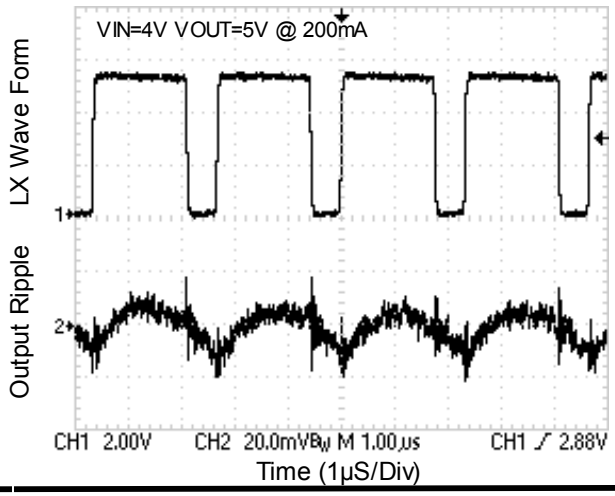
LX Pin Wave Form & Output Ripple



LX Pin Wave Form & Output Ripple



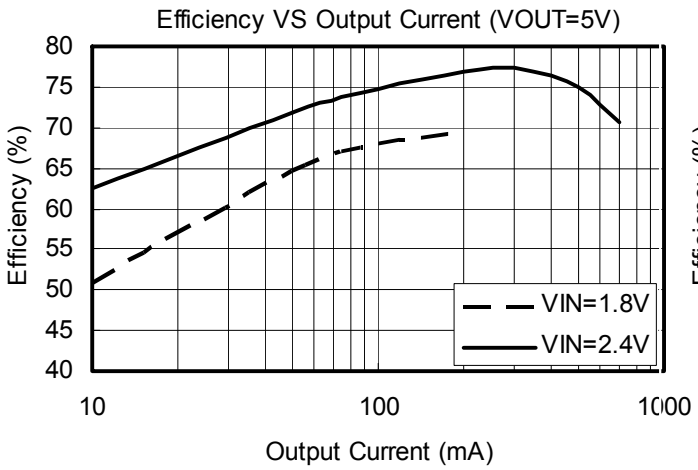
LX Pin Wave Form & Output Ripple

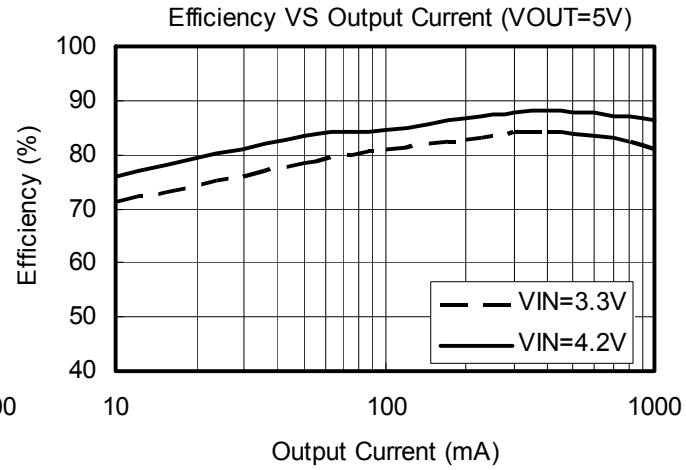


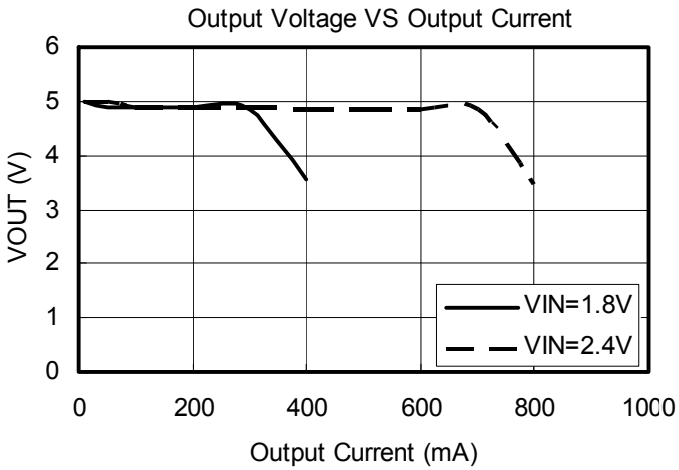
Typical Performance Characteristics

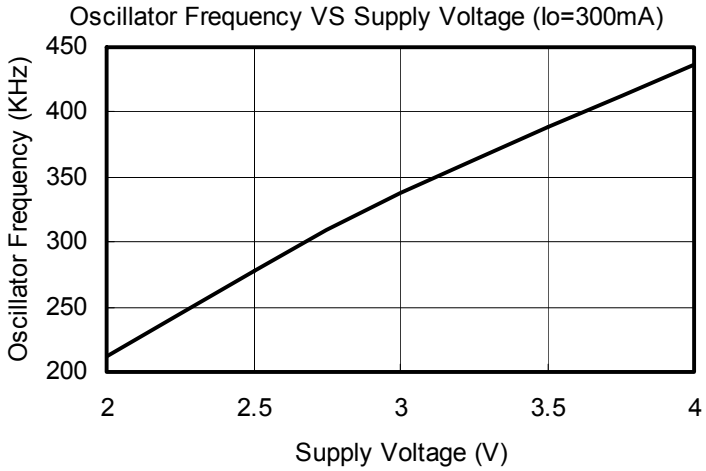
TA=25℃, C_{IN} =10 μF, C_{OUT} =20 μF, L=4.7 μH, unless otherwise noted.
Refer to Test Circuit Figure. 2

V_{OUT}=5V (RM=0.33/5Ω)

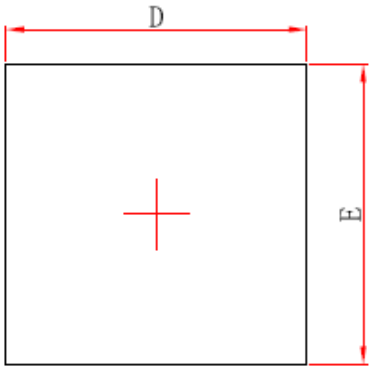




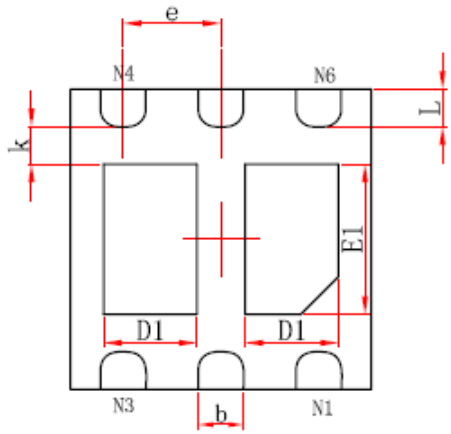




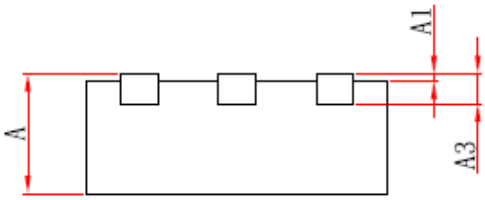
Packaging Information



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