# Tiny Package, High Efficiency, Step-up DC/DC Converter

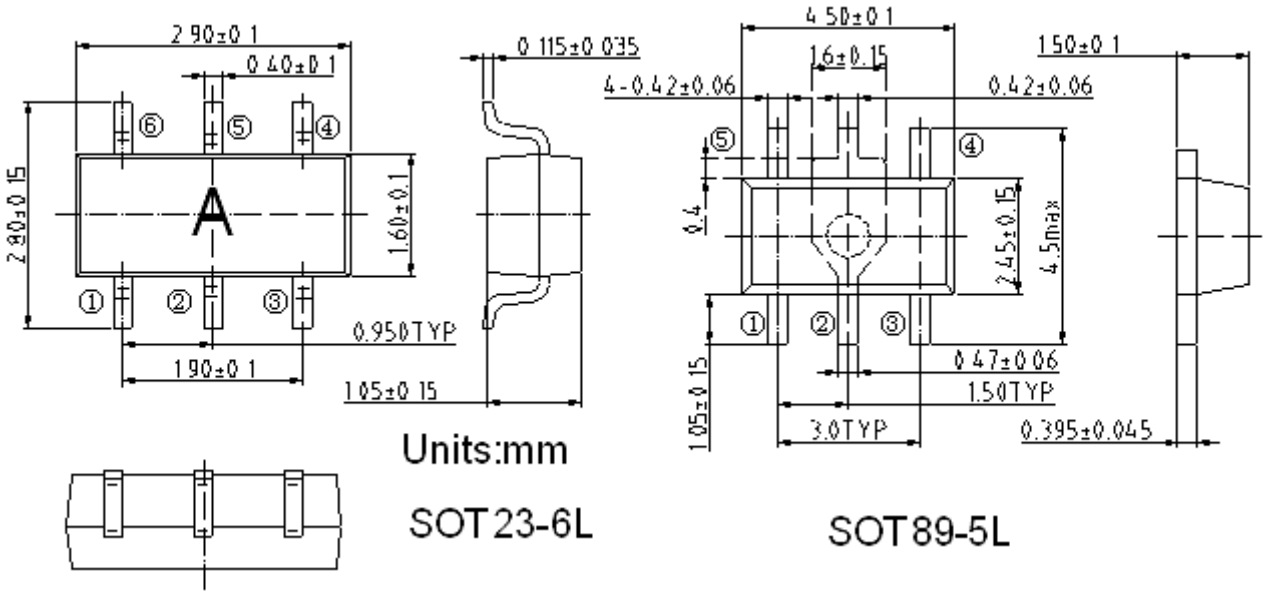
- **Features**
  - 1.0V Low Start-up Input Voltage
  - High Supply Capability to Deliver 3.3V 100mA with 1 Alkaline Cell
  - 17 μA Quiescent (Switch-off) Supply Current
  - Zero Shutdown Mode Supply Current
  - 90% Efficiency
  - 450KHz Fixed Switching Frequency
  - Providing Flexibility for Using Internal and External Power Switches
  - Small SOT23-6L & SOT89-5L Package

- **Applications**
  - PDA
  - DSC
  - LCD Panel
  - RF-Tags
  - MP3
  - Portable Instrument
  - Wireless Equipment

- **Applications**

The FS1066 is a compact, hi gh efficiency, and low voltage step-up DC/DC converter with an Adaptive Current Mode PWM control loop, includes 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 1V makes FS1066 suitable for 1 to 4 battery cells applications of providing up to 300mA output current. The 450kHz high switching rate minimized the size of external components. Besides, the 17 μA low quiescent current together with high efficiency maintains long battery lifetime. The output voltage is set with two external resistors.

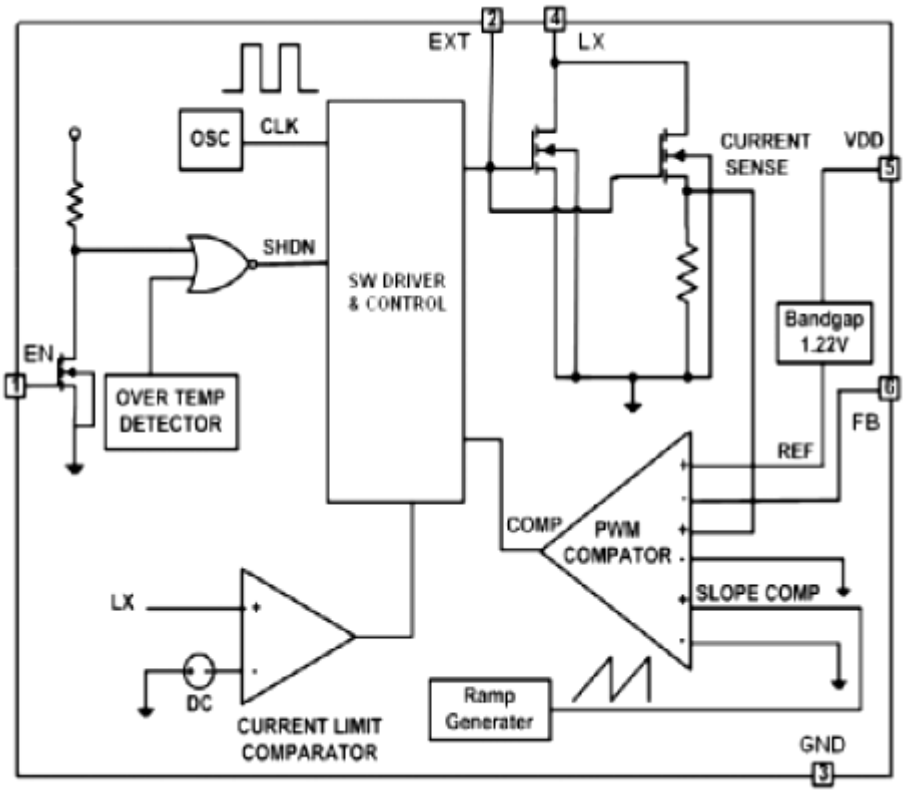
- **Package Information**



- **Pin Configurations**

| Pin Port | | Pin Name | Pin Function |
|---|---|---|---|
| FS1066SN | FS1066SL | | |
| ① | ① | EN | Chip enable FS1066 get s into shutdown mode when CE pin set to low. |
| - | ② | EXT | Output pin for driving external NMOS |
| ⑤ | ③ | GND | Ground |
| ④ | ④ | LX | Pin for switching |
| ② | ⑤ | VDD | Input positive power pin of FS1066 |
| ③ | ⑥ | FB | Feedback input pin Internal reference voltage for the error amplifier is 1.22V. |

- **Functional Block Diagram**




**FS1066**

- **Ordering Information**

**FS1066-①②**

| DESIGNATOR | SYMBOL | DESCRIPTION |
|---|---|---|
| ①② | Package Type: | SL: SOT23-6L SN: SOT89-5L |

## Absolute Maximum Ratings

| Parameter | Symbol | | Ratings | Units |
|---|---|---|---|---|
| Supply Voltage | VDD | | -0.3 to 6V | V |
| LX Switch Voltage | - | | -0.3 to 6V | V |
| Other I/O Pin Voltage | - | | -0.3 to (VDD+0.3V) | V |
| LX Pin Current | - | | 2.5 | A |
| EXT Pin Output Current | - | | 200 | mA |
| Power Dissipation ( TAMB = 25℃) | PD | SOT89-5L | 500 | mW |
| | | SOT23-6L | 400 | |
| Operating Temperature Range | Topr | | -25 to +125 | ℃ |
| Storage Temperature Range | Tstg | | -65 to +150 | ℃ |

## Electrical Characteristics

(VIN = 1.5V, VDD set to 3.3V, Load Current = 0, TA = 25°C, unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| Start-UP Voltage | VST | IL=1mA | - | 0.98 | 1.05 | V |
| Operating VDD Range | VDD | VDD pin voltage | 2 | - | 6 | V |
| Shutdown Current I ( VDD ) | IOFF | IOUT = 1mA, VIN: 0 → 2V | - | 0.01 | 1 | μA |
| Switch-off Current I ( VDD ) | ISWITCH OFF | VIN = 6V | - | 35 | 50 | μA |
| Continuous Switching Current( VDD ) | ISWITCH | VDD =VEN = 3.3V, VFB = GND | - | 0.4 | 0.6 | mA |
| No Load Current I ( VDD ) | INO LOAD | VIN = 1.5V, VOUT = 3.3V | - | 110 | - | mA |
| Feedback Reference Voltage | VREF | Close Loop, VDD = 3.3V | 1.190 | 1.220 | 1.250 | V |
| Switching Frequency | FS | VDD = 3.3V | 425 | 500 | 575 | KHz |
| Maximum Duty | DMAX | VDD = 3.3V | 85 | 90 | - | % |
| LX ON Resistance | - | VDD = 3.3V | 0.3 | 0.3 | 1.1 | - |
| Current Limit Setting | ILIMIT | VDD = 3.3V | - | 2 | 2.5 | A |
| EXT ON Resistance to VDD | - | VDD = 3.3V | - | 11 | 15 | - |
| EXT OFF Resistance to GND | - | VDD = 3.3V | - | 11 | 15 | - |
| Line Regulation | VLINE | VIN = 1.5 ~ 3V, IL = 1mA | - | 1.5 | 10 | MV/V |
| Load Regulation | VLOAD | VIN = 2.5V, IL = 1 ~ 100mA | - | 0.25 | - | Mv/mA |
| EN Pin Trip Level | - | VDD = 3.3V | 0.4 | 0.8 | 1.2 | V |
| Temperature Stability for Vout | TS | - | - | 50 | - | Ppm/°C |
| Thermal Shutdown Hysterises | TSD | - | - | 10 | - | °C |

- **Typical Application Circuit**

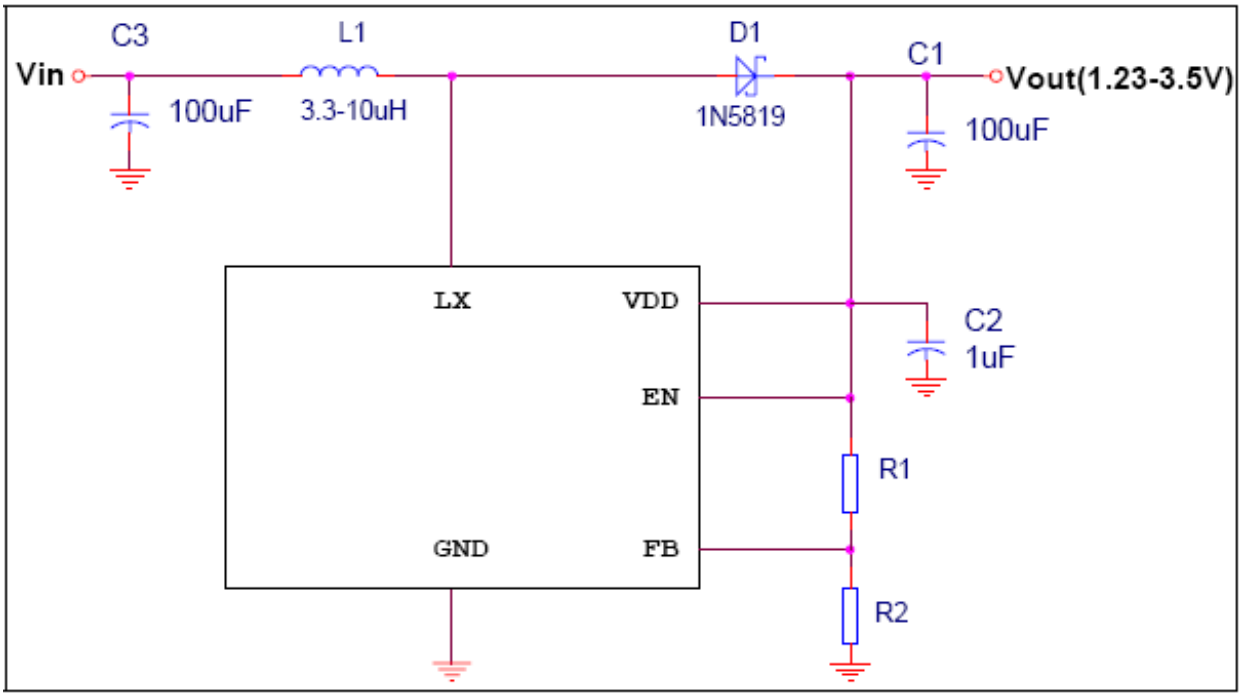



Figure 1A. FS1066 T ypical Application for Portable Instruments

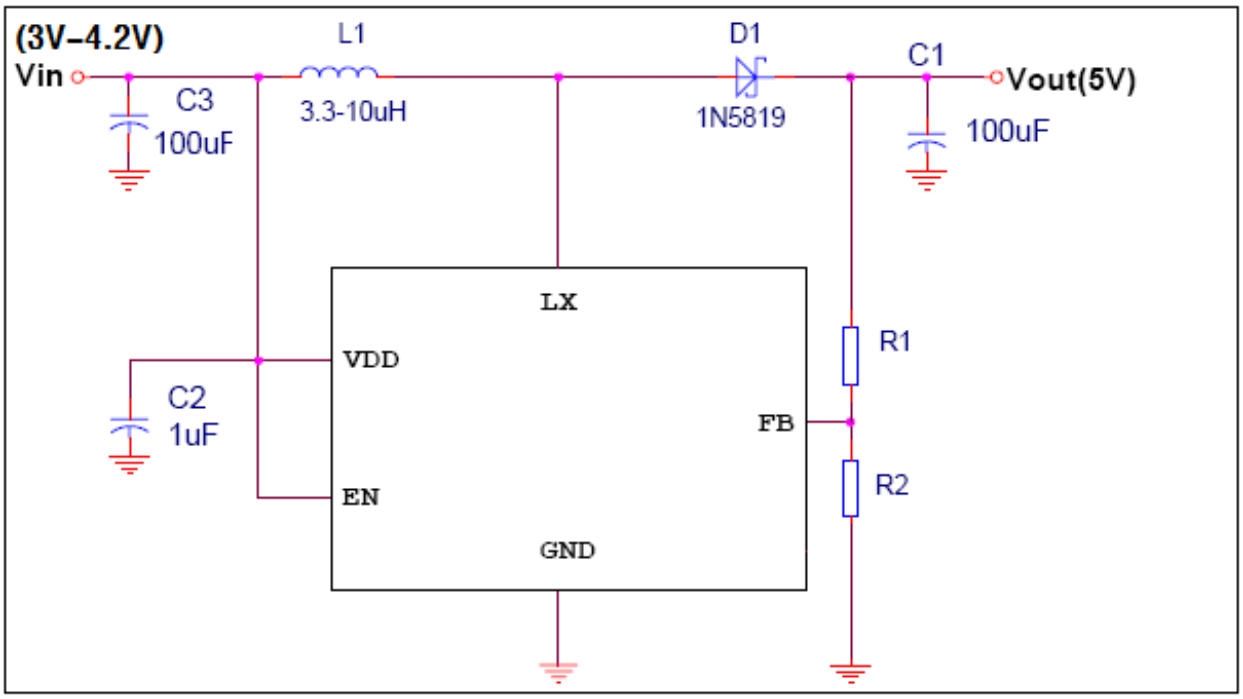



Figure 1B. FS1066 T ypical Application for Portable Instruments

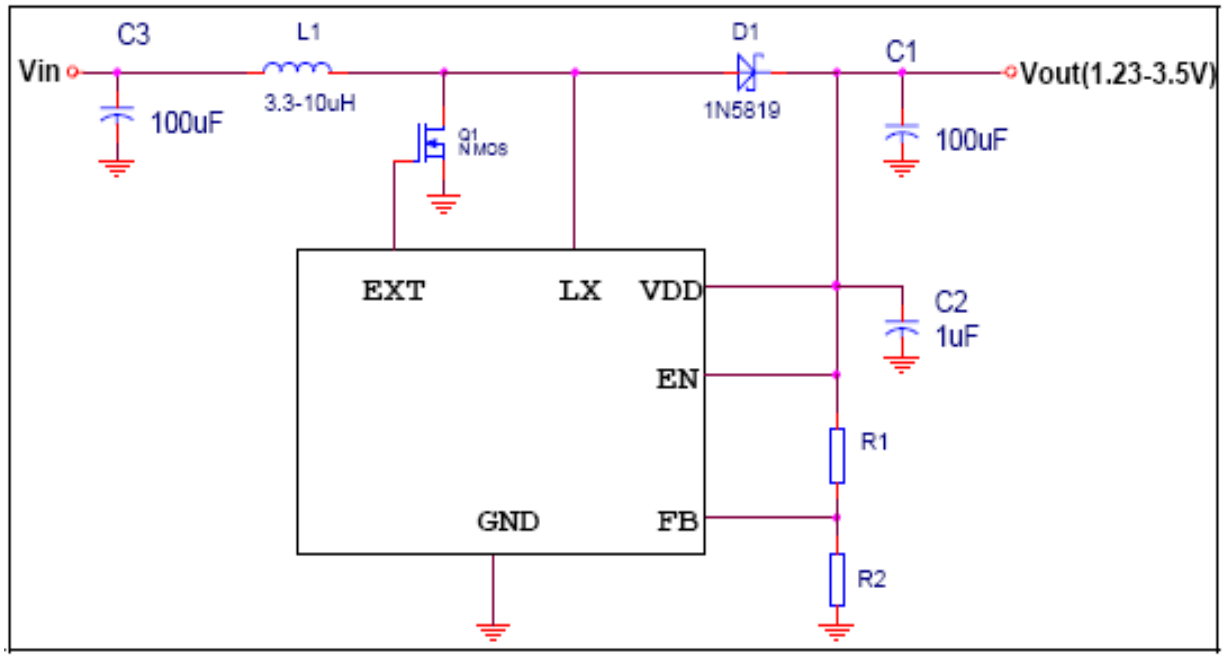



Figure 2A. FS1066 for Higher Current Applications

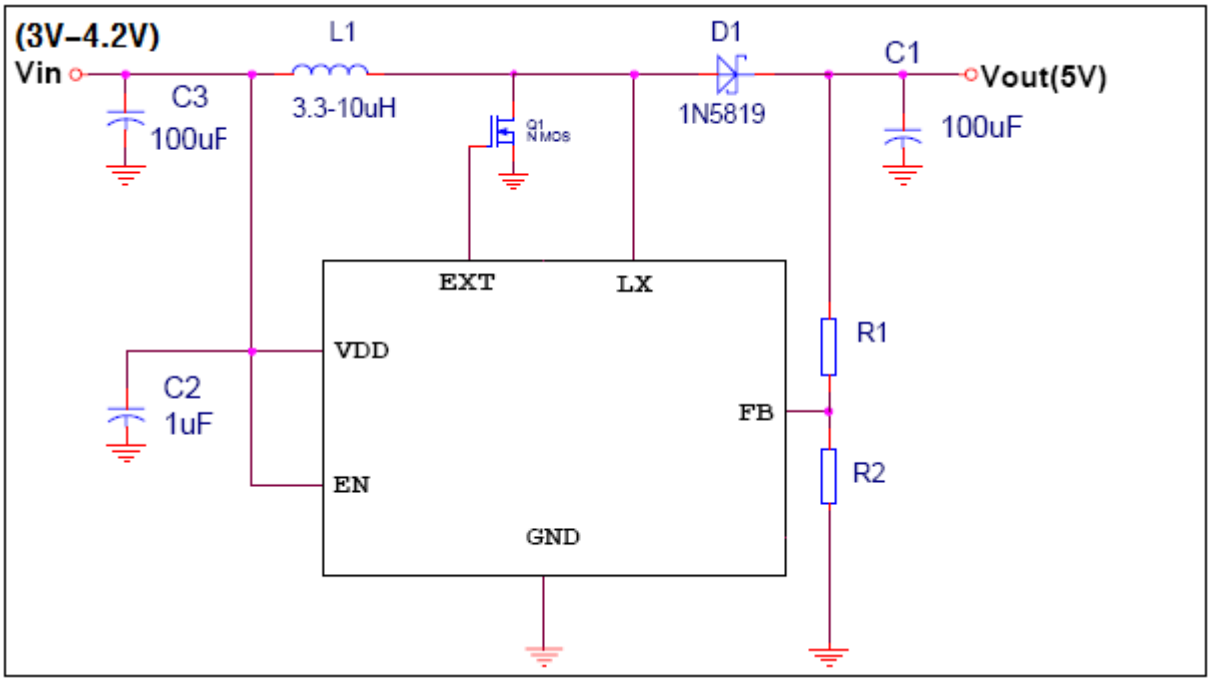
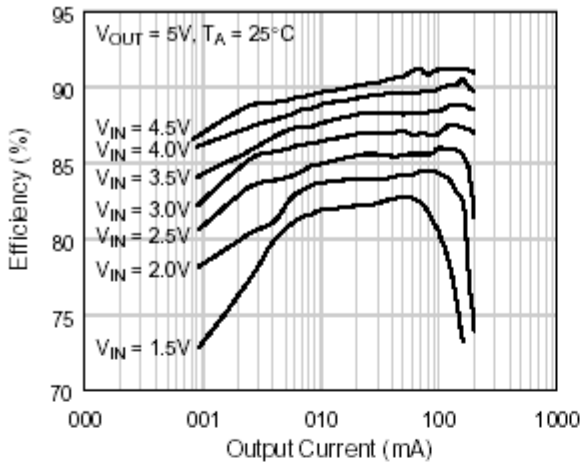



Figure 2B. FS1066 for Higher Current Applications

- **Typical Performance Characteristics**

Efficiency vs. Output Current

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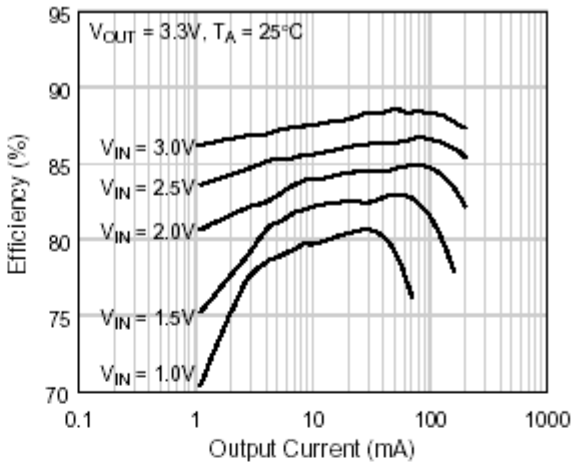
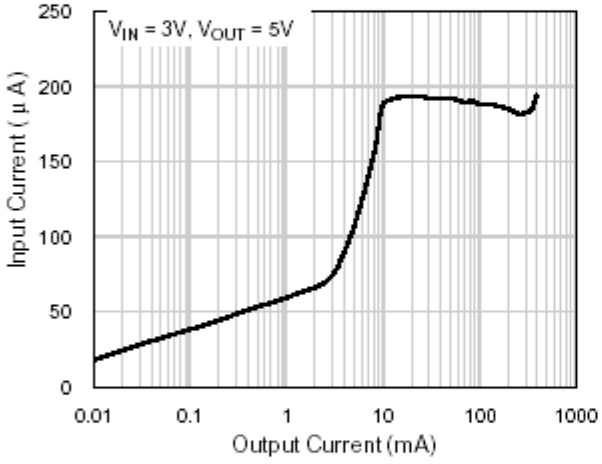
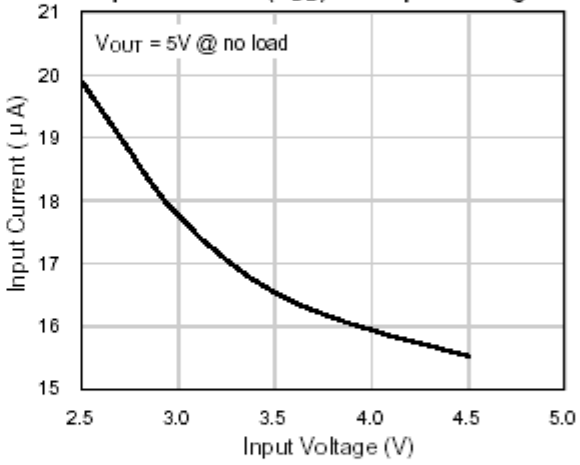


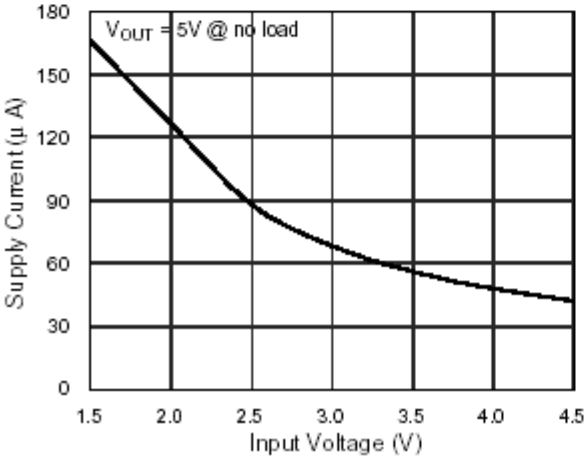

Input Current I($V_{DD}$) vs. Output Current



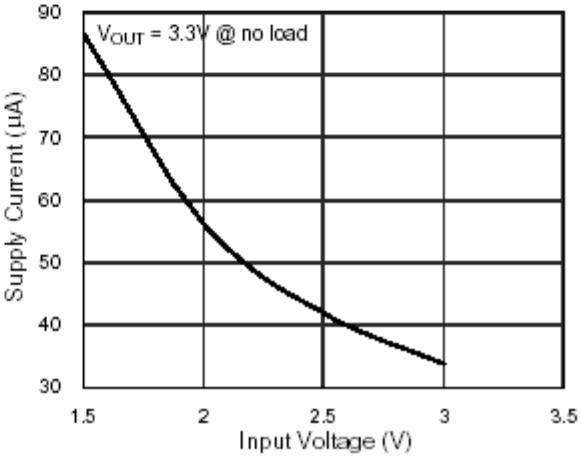

Input Current I($V_{DD}$) vs. Input Voltage



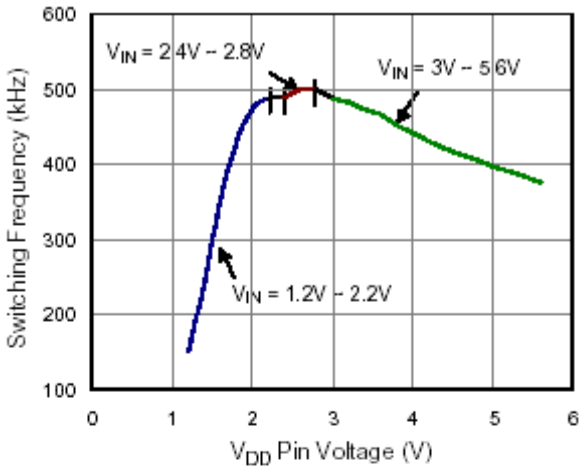

Supply Current I($V_{IN}$) vs. Input Voltage



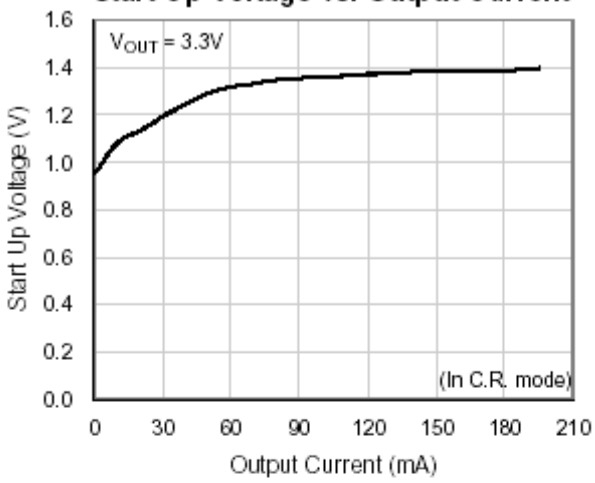

Supply Current I($V_{IN}$) vs. Input Voltage



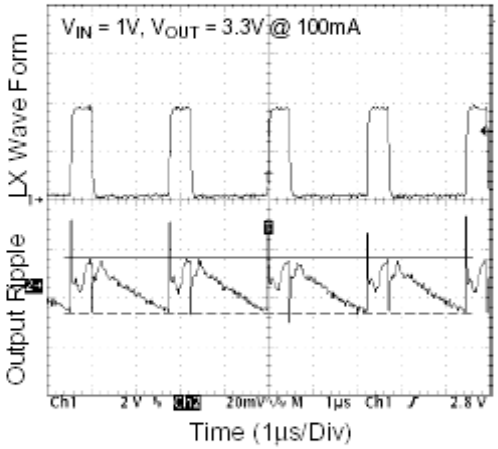
Swichting Frequency vs. $V_{DD}$ Pin Voltage




Start Up Voltage vs. Output Current




LX Pin Wave Form & Output Ripple

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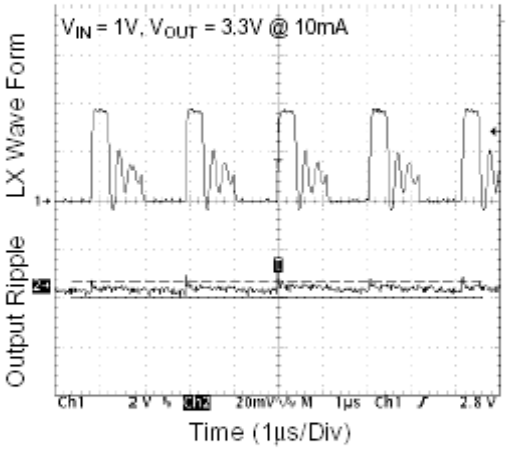


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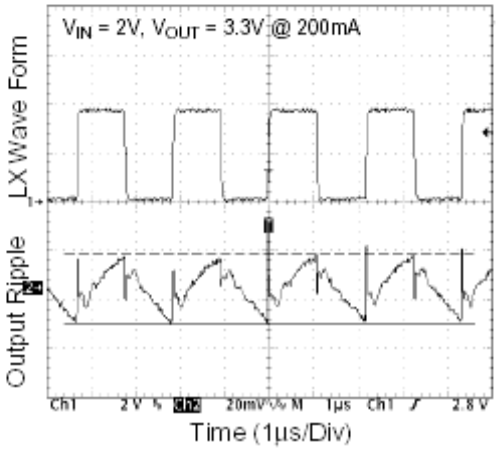


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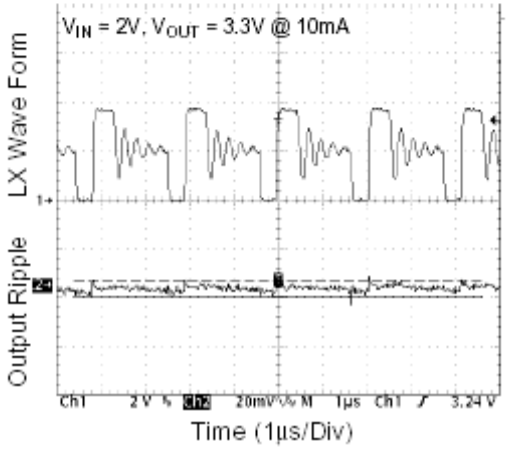

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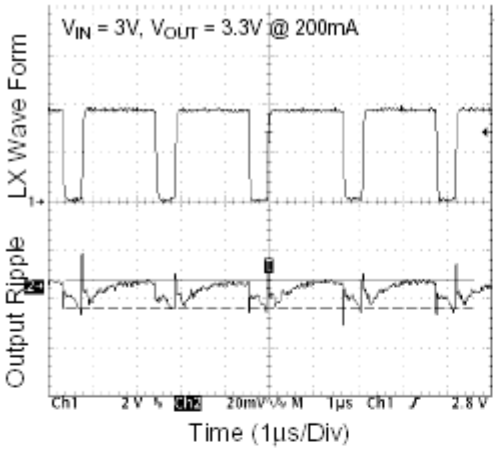


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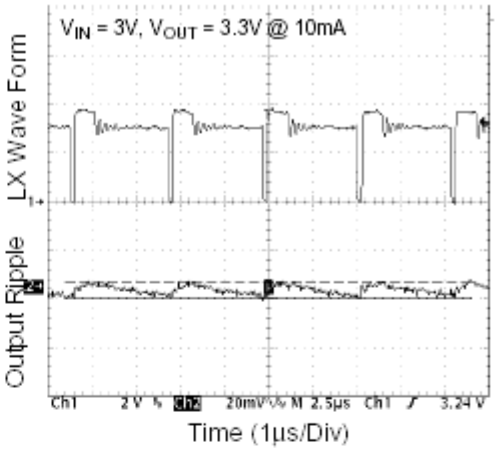


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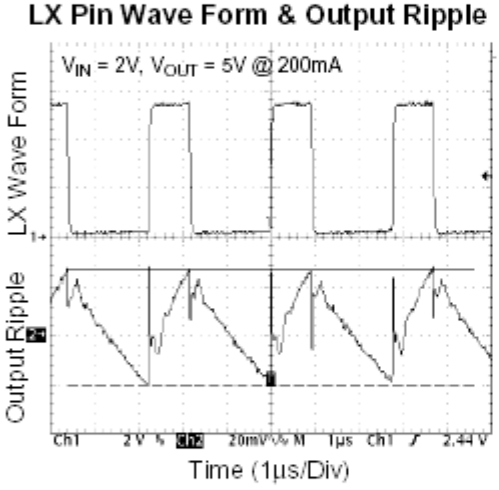


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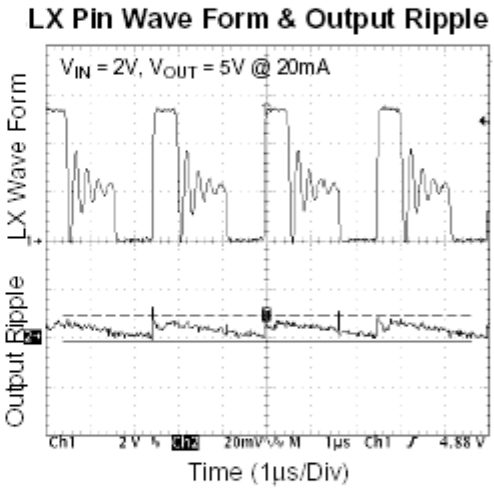


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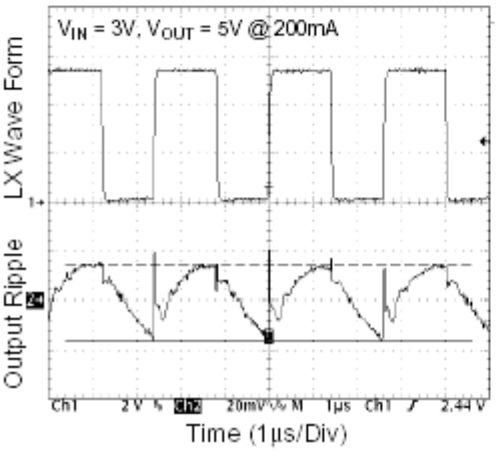


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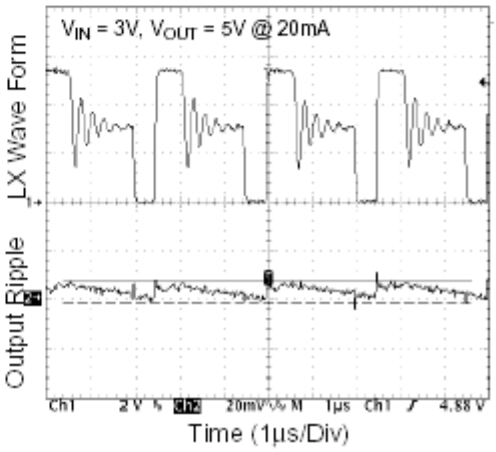

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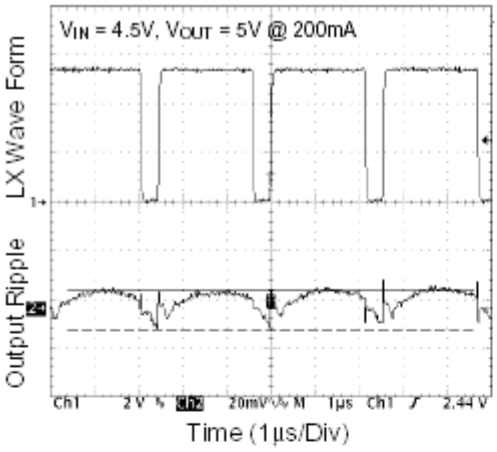


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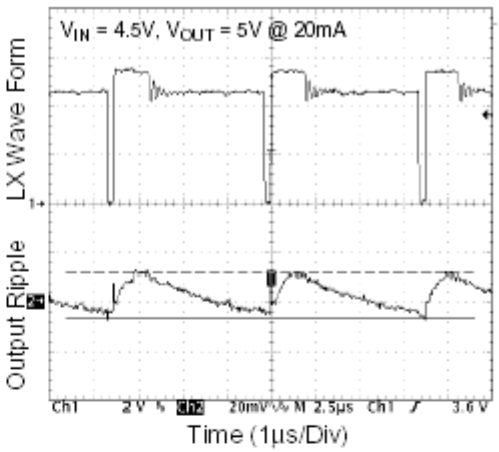
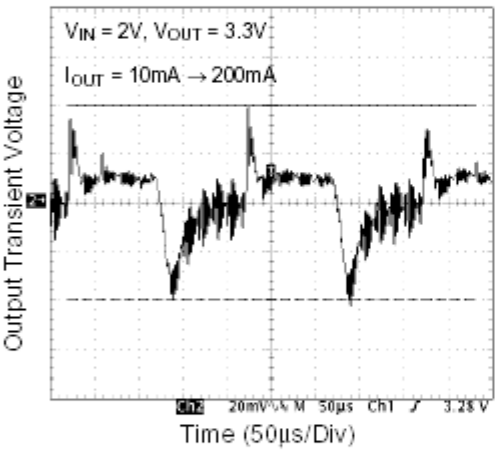



**Transient Response**

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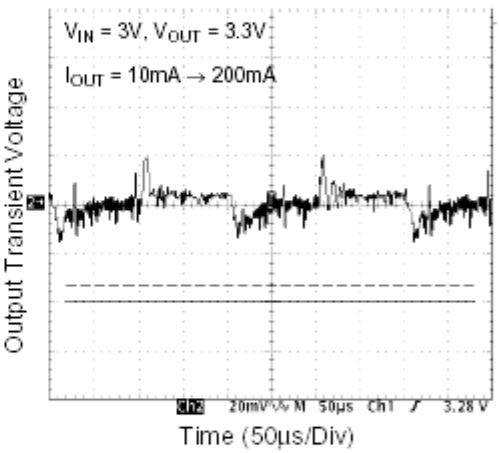


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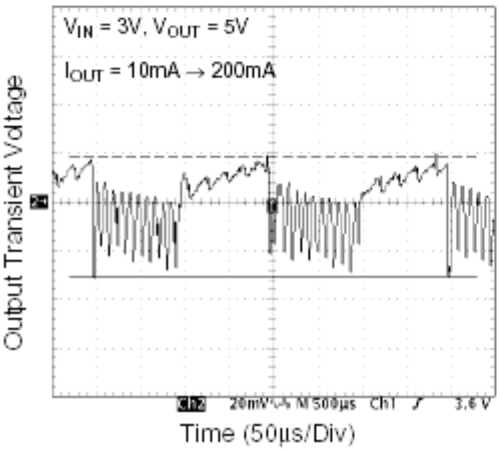

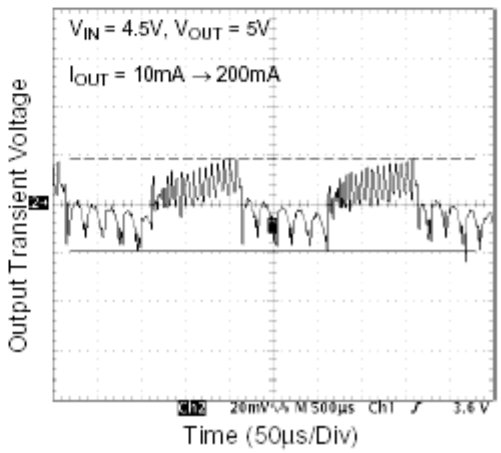
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