1A SYNCHRONOUS BUCK SWITCHER WITH FET ON BOARD

ADVANCE DATA SHEET

Pb Free Product

DESCRIPTION

The NX4108 is a current mode PWM buck switcher with internal compensation, can provides up to 1A output current with FET on board. It operates from 2.7V to 5.5V and output as low as 0.6V which is ideal for the application with single cell Li-Ion battery as well as other 3.3V input bus supply applications. Switching frequency is fixed 1MHz, small surface mount inductors and capacitors are allowed to use, make it good for portable applications.
NX4108 is available in 5-pin SOT23 package.

FEATURES

- SOT23-5L package
- Internal Digital Soft Start
- Internally-compensated Current mode controller
- <1uA shut-down current
- Peak Current Limit with HICCUP feature and Over temperature protection
- Prebias start up Operation
- Enable available
- Fixed 1.2V, 1.5V, 1.8V versions and adjustable versions are available
- 100% duty ratio operation capability
- Pb-free and RoHS compliant

APPLICATIONS

- Li-Ion battery operated portable system
- Cellular Phones
- Portable applications
- USB Devices

TYPICAL APPLICATION

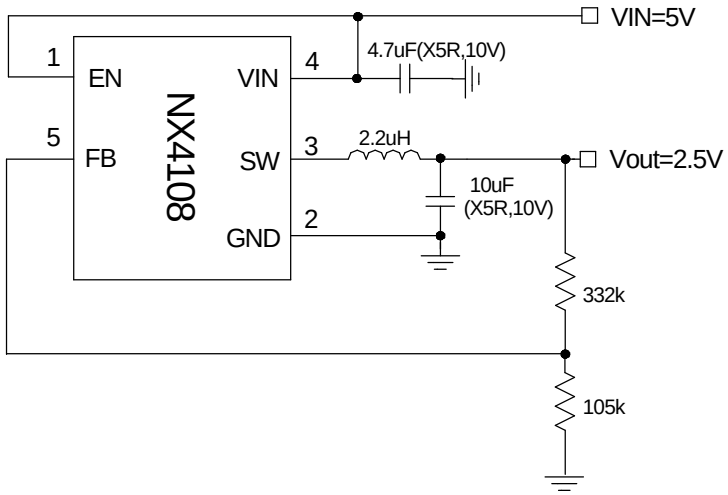


Figure1 - Typical application of NX4108CZ1TR

ORDERING INFORMATION

Device	Temperature	Package	Pb-Free
NX4108CZ1TR	-40°C to 85°C	SOT23-5L	Yes
NX4108-XXCZ1TR	-40°C to 85°C	SOT23-5L	Yes

Note: Fixed output voltage identification.

XX=12 Fixed Output Voltage=1.2V
XX=15 Fixed Output Voltage=1.5V
XX=18 Fixed Output Voltage=1.8V

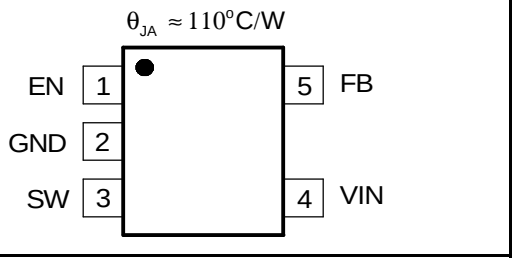
ABSOLUTE MAXIMUM RATINGS

VIN,VDD to GND ..... -0.3V to 6V
SW,FB,EN to GND ..... -0.3V to VIN + 0.3V
ESD Susceptibility 1kV
Lead Temperature(Soldering,10sec.) ..... 300°C
Storage Temperature Range ..... -55°C to 150°C
Operating Junction Temperature Range ..... -40°C to 150°C

CAUTION: Stresses above those listed in "ABSOLUTE MAXIMUM RATINGS", may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

PACKAGE INFORMATION

5-LEAD PLASTIC SOT23



ELECTRICAL SPECIFICATIONS

V_{IN}=5V. Typical data refers to T_A= 25°C. Unless otherwise specified.

PARAMETER	SYM	Test Condition	Min	TYP	MAX	Units
Reference Voltage						
Ref Voltage	V_{REF}			0.6		V
Line Regualtion						
Line Regulation		VIN=3V to 5V,VOUT=1.8V, IOUT=10mA		2		mV
VIN UVLO						
VIN rising threshold				2.5		V
VIN falling threshold				2.4		V
Supply Voltage(VIN)						
VIN Input Voltage Range	V_{IN}		2.7		5.5	V
Shutdown Current	$I_{shutdown}$	EN=GND		1	2	uA
Quiescent Current	I_q	No Load, adjustable output		25	50	uA
Oscillator (Rt)						
Frequency	F_S			1.2		MHz
Max Duty Cycle				70		%
Min ON time				100		nS
Error Amplifiers						
Feedback Input Bias Current					0.05	uA
SS						
Soft Start time	Tss			420		uS

PARAMETER	SYM	Test Condition	Min	TYP	MAX	Units
Current Limit						
Current Limit Threshold				1.8		A
Thermal Shutdown						
Thermal shutdown trip point				155		^{o}C
Hysteresis				15		^{o}C
Internal Switch						
Rdson of Control FET		Vin=5V		400		mohm
		Vin=3.3V		480		
Rdson of Synchronous FET		Vin=5V		300		mohm
		Vin=3.3V		360		
Enable						
En low Threshold voltage					0.4	V
En high Threshold voltage			1.4			V

PIN DESCRIPTIONS

PIN SYMBOL	PIN DESCRIPTION
SW	SW output. Junction of the internal high-side and low-side power MOSFETs, and output inductor.
GND	Ground Connection for Chip. Connect GND with large copper areas to the input and output supply returns, and negative terminals of the input and output capacitors.
FB	Error amplifier inverting input. Connect directly to output voltage for fixed version of chip. Connect to an external resistor divider for the adjustable version. A 400kohm resistor is recommended to be connected from VOUT and FB for adjustable version.
VIN	Supply voltage input for switcher.
EN	Enable input. Set this pin to GND or less than 0.4V will shut down the regulator.

BLOCK DIAGRAM

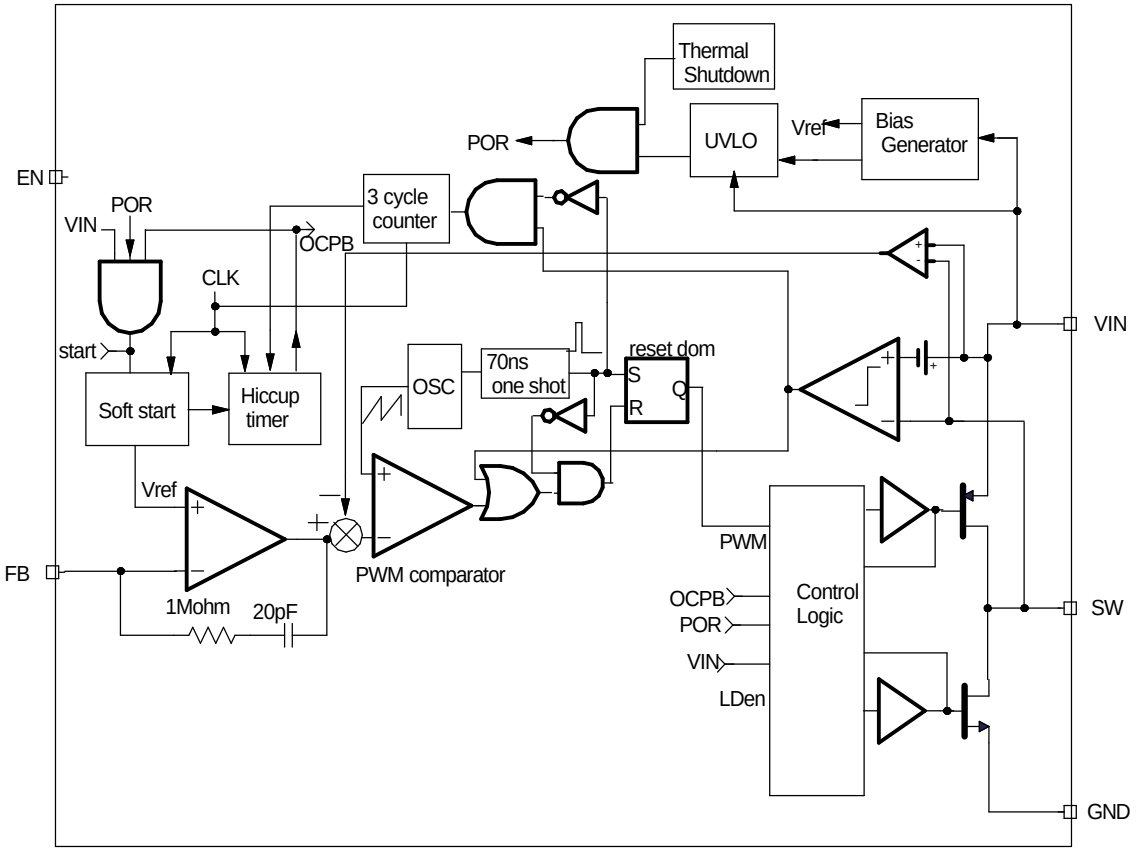


Figure 2 - Simplified block diagram of the NX4108

Typical Operating Characteristics

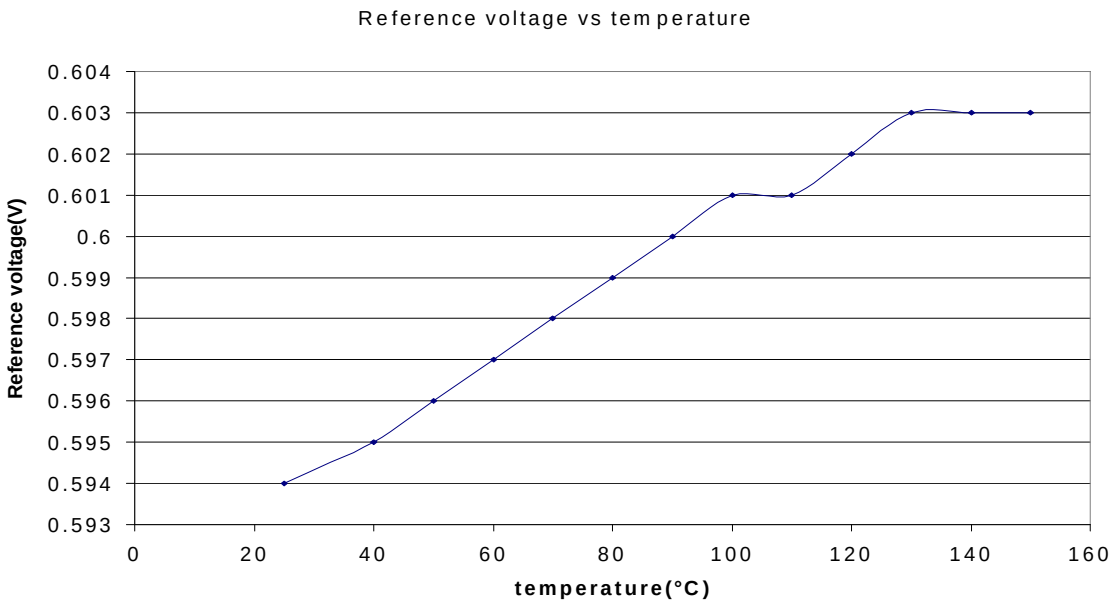


Fig.3 - Reference volateg vs temperature

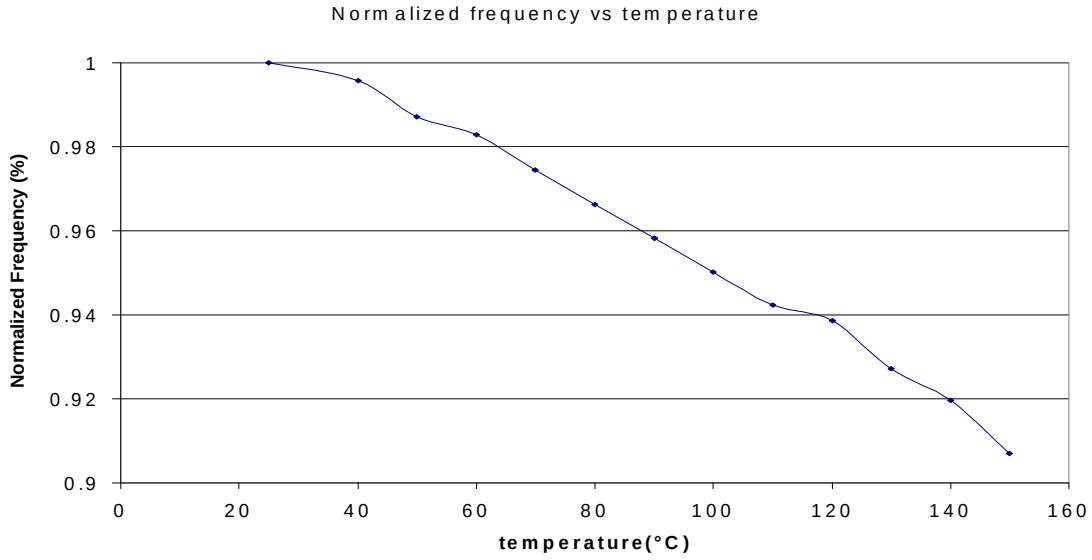


Fig.4 - Normalized frequency vs temperature

Typical Application(VOUT=2.5V)

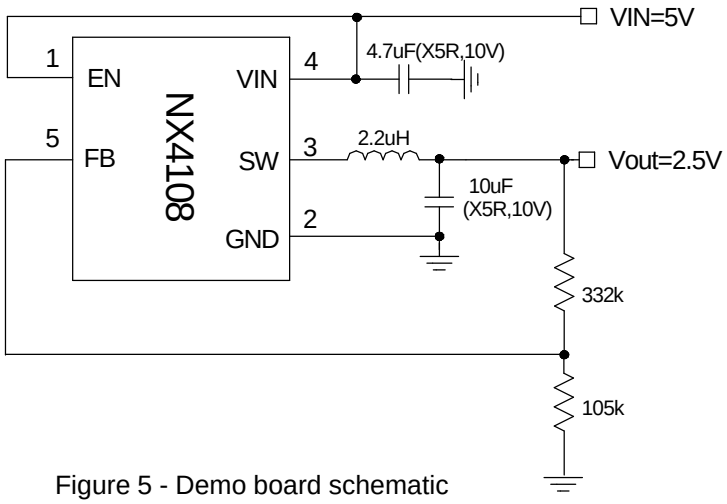


Figure 5 - Demo board schematic

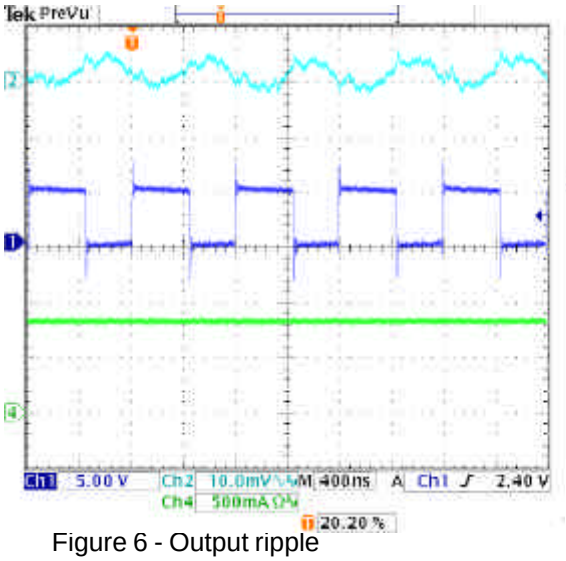


Figure 6 - Output ripple

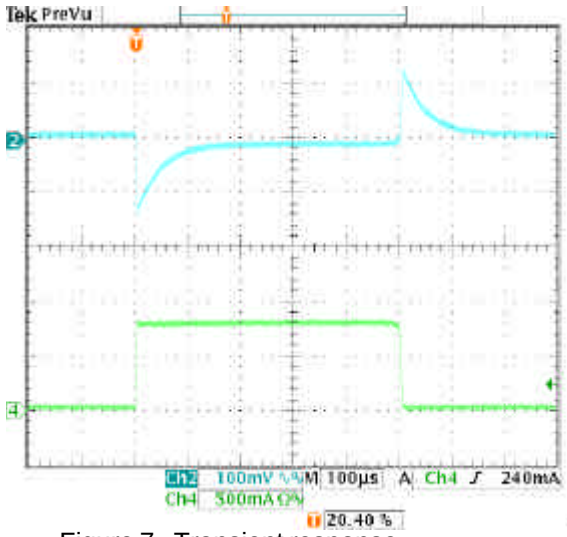


Figure 7 - Transient response

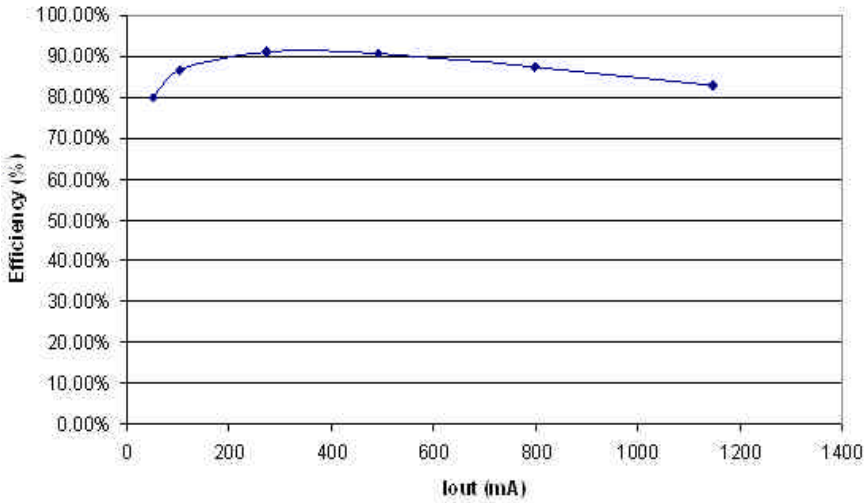


Figure 8 - Efficiency

Typical Application(VOUT=1.8V)

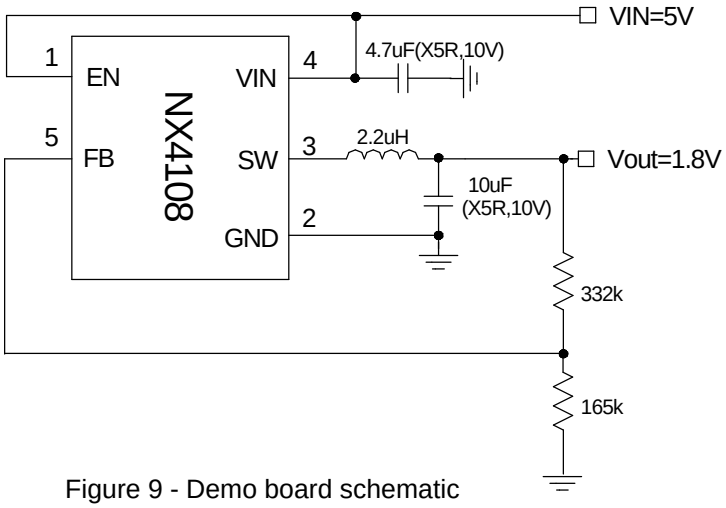


Figure 9 - Demo board schematic

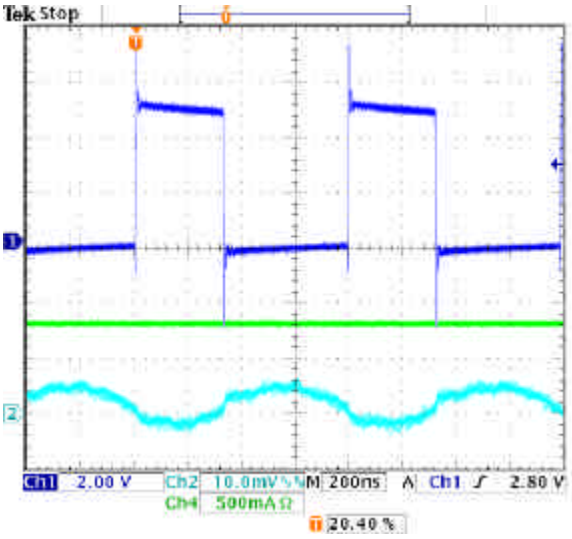


Figure 10 - Output ripple

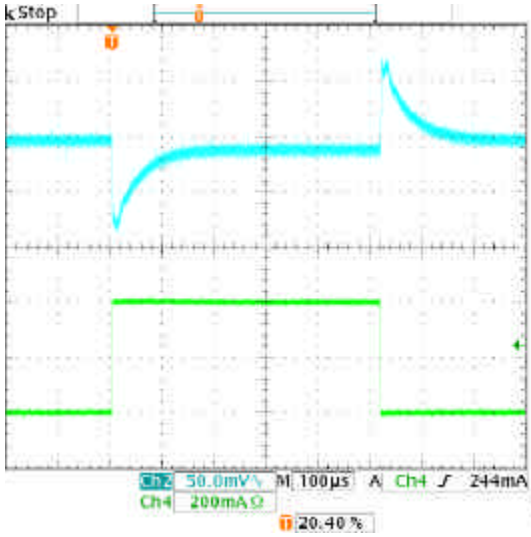


Figure 11 - Transient response

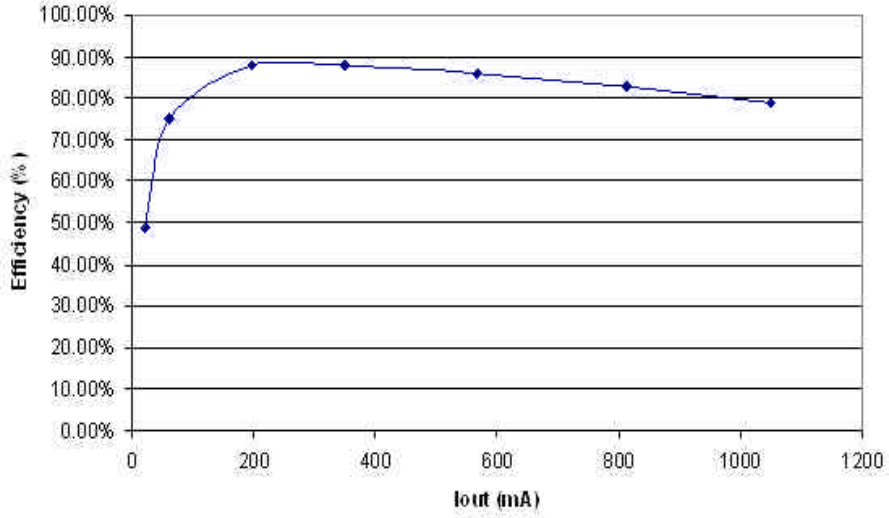


Figure12 - Efficiency

Typical Application(VOUT=1.2V)

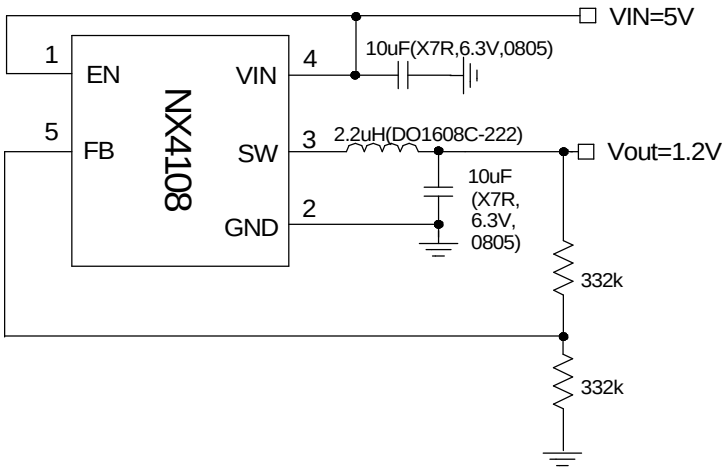


Figure 13 - Demo board schematic

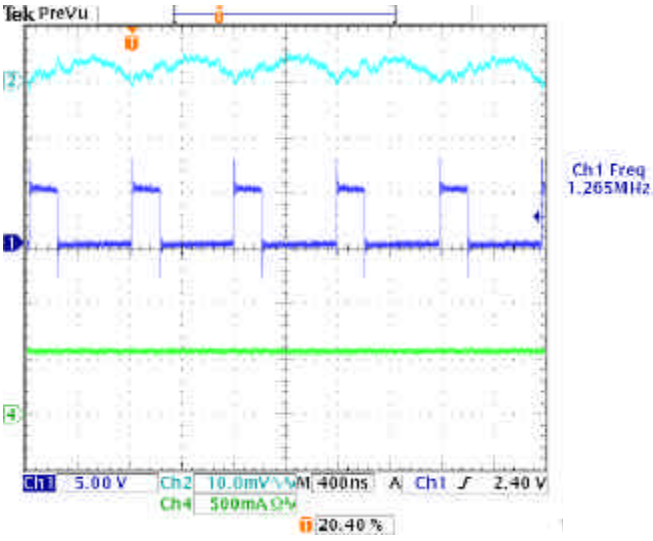


Figure 14 - Output ripple

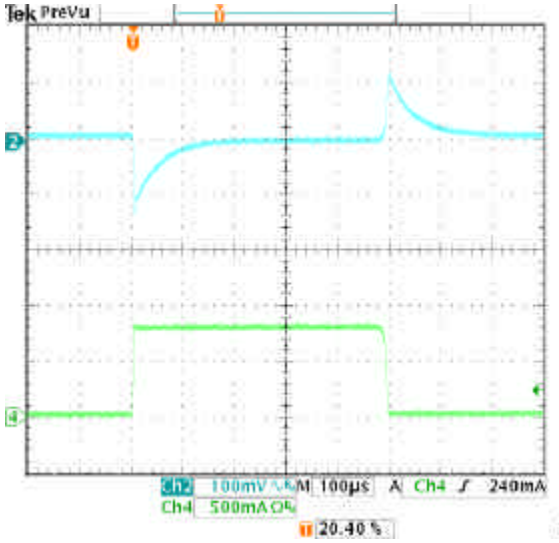


Figure 15 - Transient response

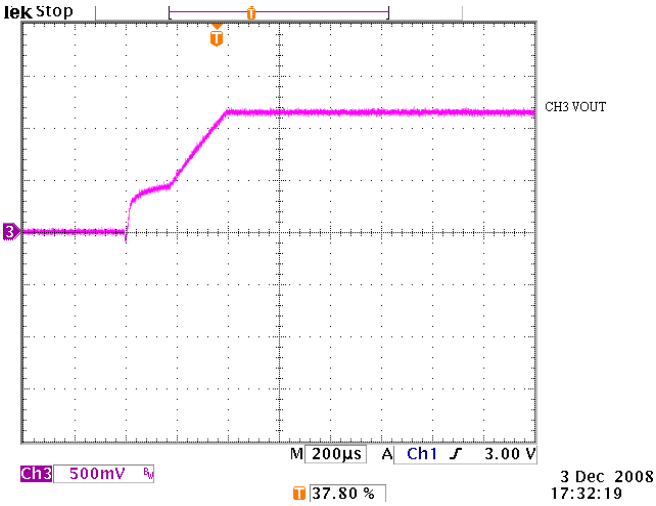


Figure 16 - Startup

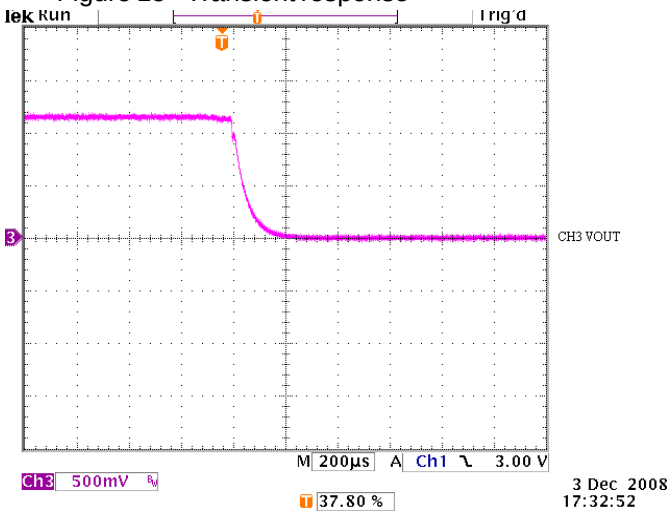


Figure 17 - Shutdown

Typical Application(VOUT=1.2V)

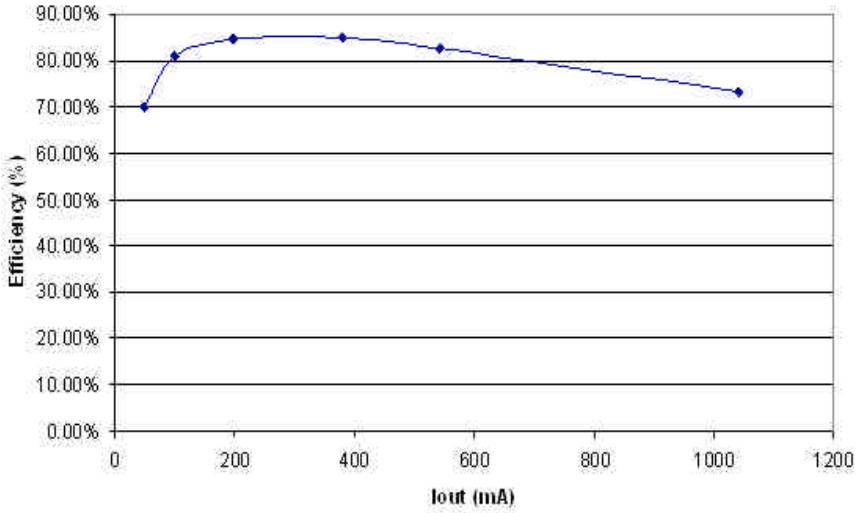


Figure 18 - Efficiency