

LM3478 9V TO 60V IN 12V@1.5A

19-Aug-2004 NSC0269

NATIONAL SEMICONDUCTOR
 3050 W AGUA FRIA FREEWAY
 SUITE 150
 PHOENIX ARIZONA 85027

NSC0269-BOM

11/10/2003

9 to 60V in 12Vout @ 1.5A

Designator	Part Type	Manufacturer/Part No
C1	1uF	TDK/C3225X7R2A105K
C2	47uF	SANYO/50MV47WX
C3	1uF	TDK/C3225X7R2A105K
C4	1uF	TDK/C3225X7R2A105K
C5	33nF	VITRAMON/VJ0805Y333KXXAT
C6	33uF	TDK/C3216X7R1C336K
C7	100pF	VISHAY BC / VJ0805Y101KXATW1BC
C8	100pF	VISHAY BC / VJ0805Y101KXATW1BC
C9	100nF	VITRAMON/VJ0805Y104KXXAT
C10	47uF	SANYO/50MV47WX
C11	1nF	VITRAMON/VJ0805Y102KXXAT
D1	BAT54	PHILIPS/BAT54
D2	MBRB20100	ON SEMI/MBRB20100
D3	BZX84C-10V	PHILIPS/BZX84C-10V
L1	DO5022P	COILCRAFT/DO5022P-153HC
L2	DO5022P	COILCRAFT/DO5022P-153HC
P1	Vin-9V - 60V	
P2	Vout 12V@1.5A	
P3	Gnd	
P4	Gnd	
Q1	MMBTA06	ON SEMI/MMBTA06
Q2	SUD40N10-25	SILICONIX/SUD40N10-25
R1	169k	DALE/CRCW08051693FRT6
R2	24.3k	DALE/CRCW08052432FRT6
R3	20k	DALE/CRCW08052002FRT6
R4	4.7k	DALE/CRCW08054701FRT6
R5	51.1k	DALE/CRCW08055112FRT6
R6	0R	DALE/CRCW0805000ZRT6
R7	0.025	DALE/WSL12100.0251%R86
R8	100R	DALE/CRCW08051000FRT6
R9	100R	DALE/CRCW08051000FRT6

U1

LM3478

NAT SEMI/LM3478

NSC0269-

Efficiency Test Results

Test Results

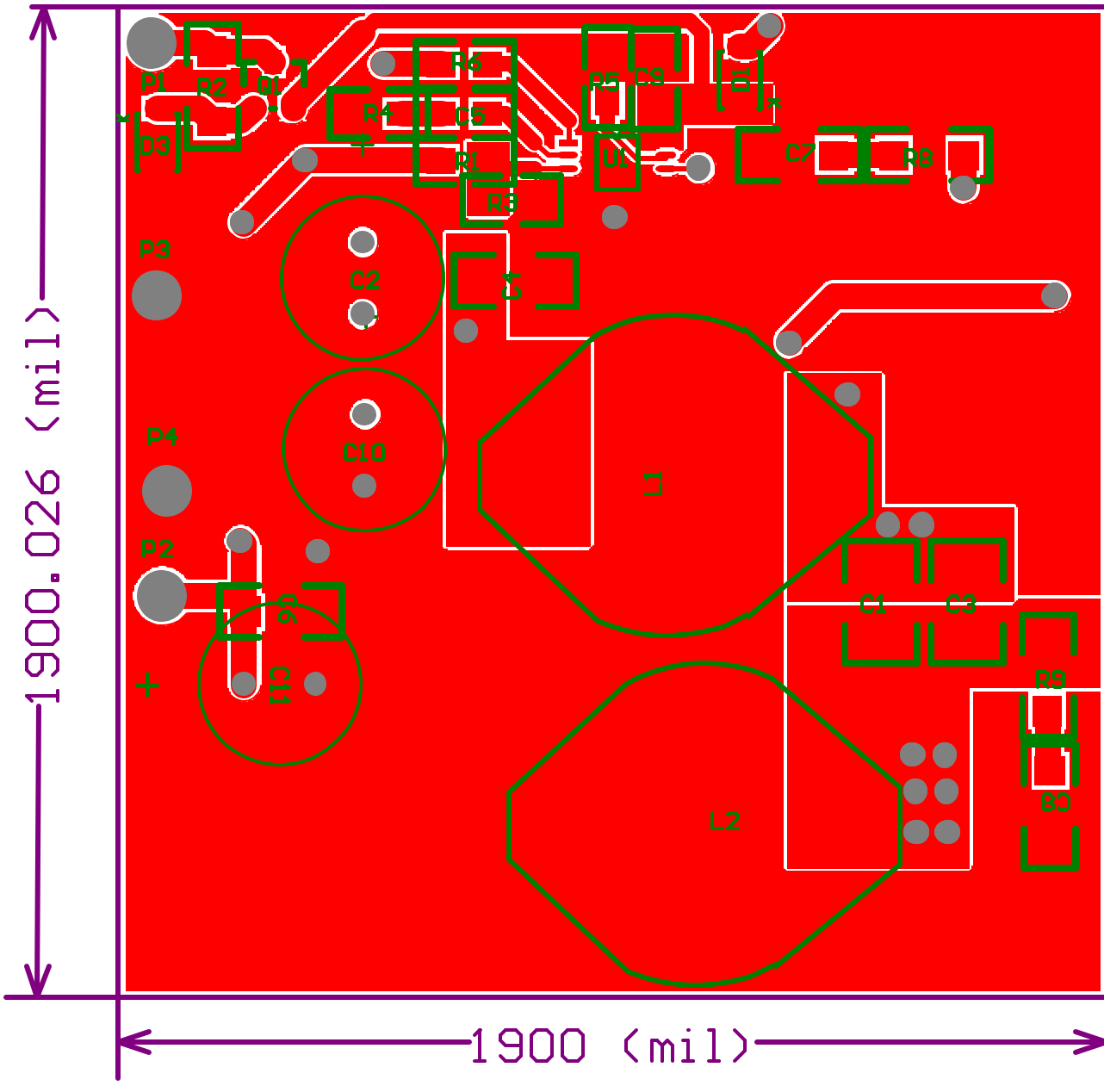
Switching Frequency 350kHz

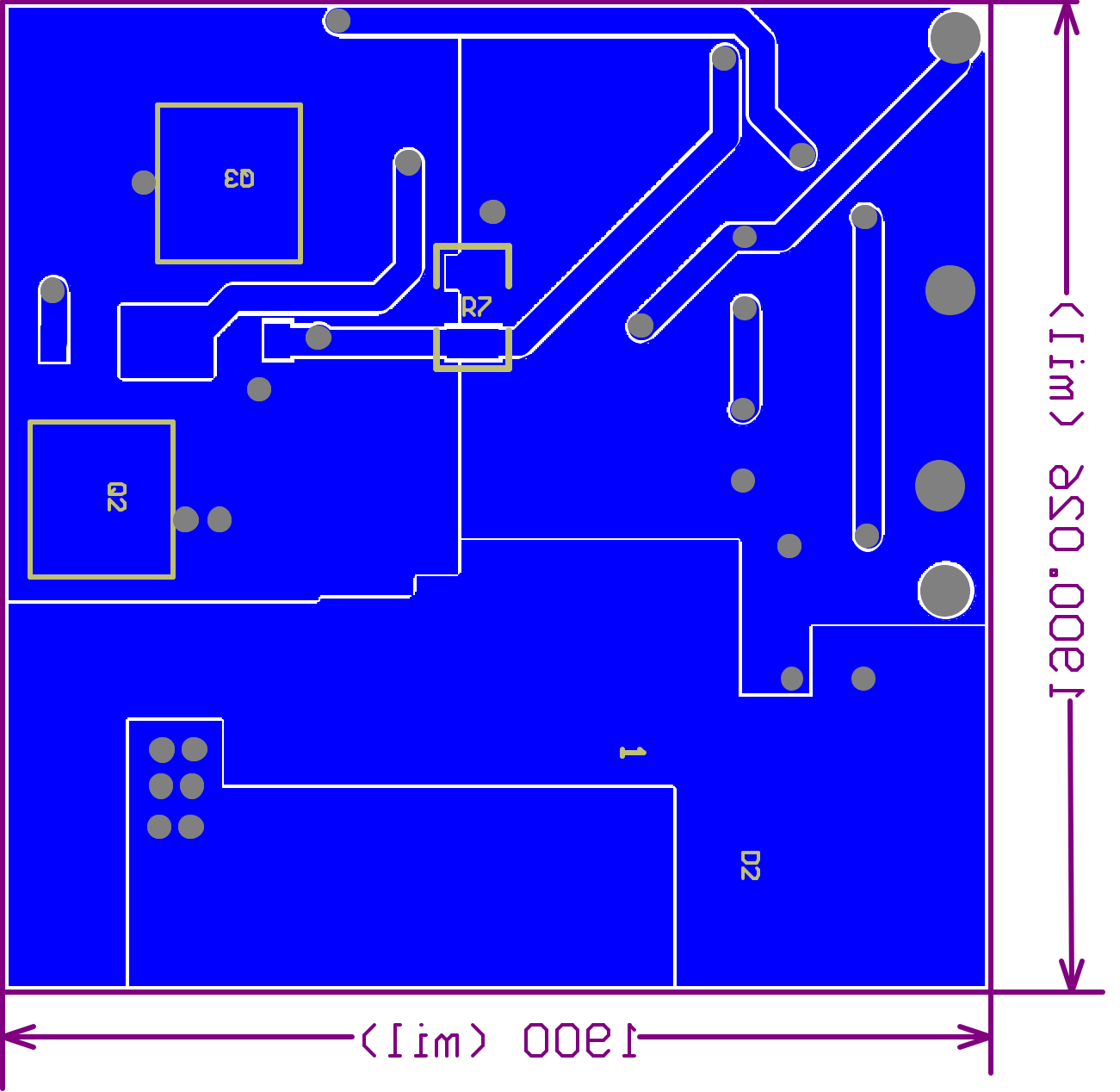
Output Ripple Volts 114mV

Output Ripple Volts During Hysteretic mode 540mV

Efficiency Test Results

Vin	Iin	Vout	Iout	Pin	Pout	Watts loss	Eff (%)
7.5	2.748	11.82	1.498	20.61	17.70636	2.90364	0.859115
9.02	2.254	11.83	1.498	20.33108	17.72134	2.60974	0.871638
12.02	1.678	11.83	1.498	20.16956	17.72134	2.44822	0.878618
13.03	1.548	11.83	1.498	20.17044	17.72134	2.4491	0.87858
24.01	0.848	11.84	1.498	20.36048	17.73632	2.62416	0.871115
26.03	0.789	11.84	1.498	20.53767	17.73632	2.80135	0.863599
30	0.683	11.85	1.498	20.49	17.7513	2.7387	0.86634
45	0.468	11.85	1.498	21.06	17.7513	3.3087	0.842892
60	0.354	11.85	1.498	21.24	17.7513	3.4887	0.835749



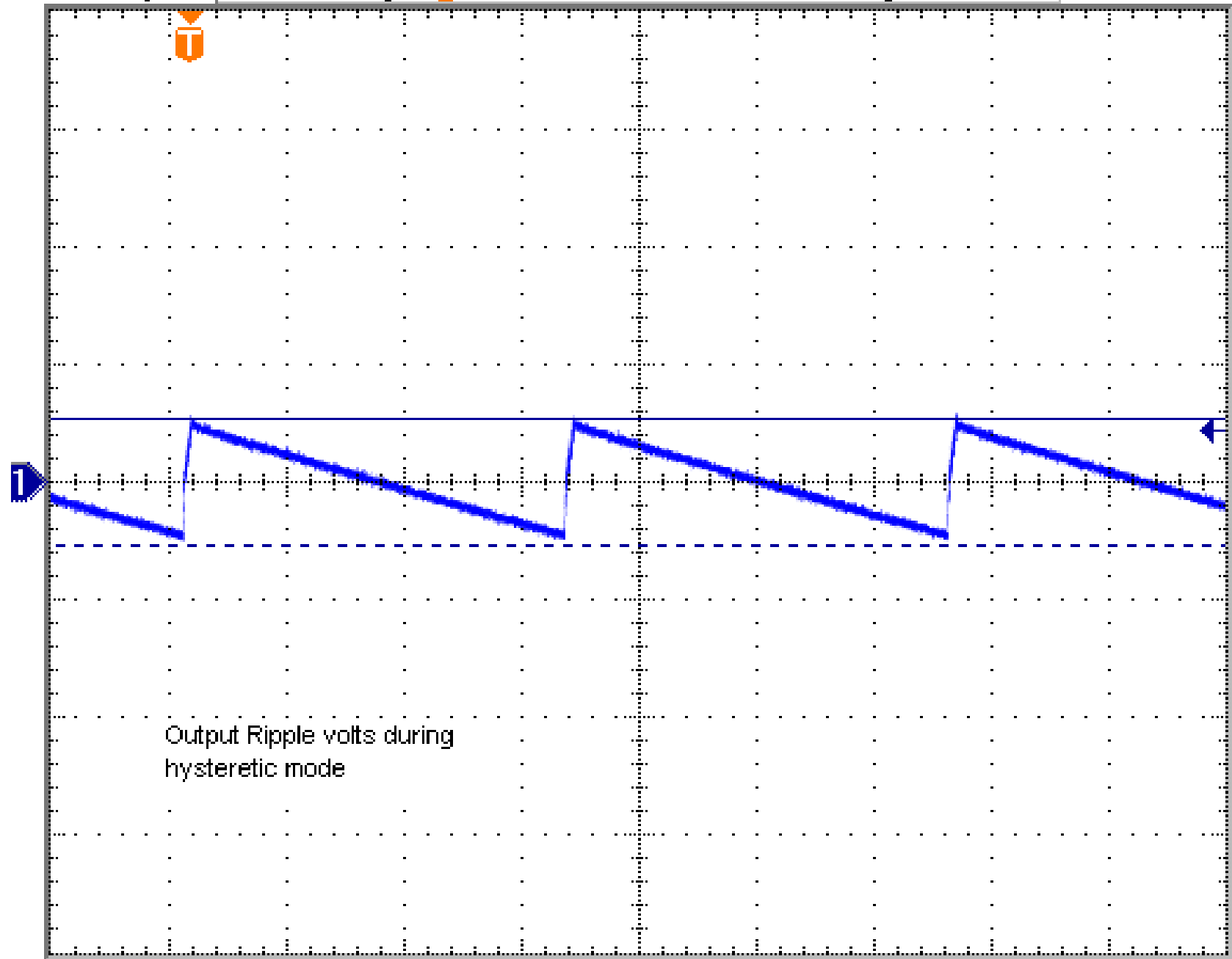


lek Stop



Δ: 540mV
@: 270mV

Ch1 Freq
76.82 Hz



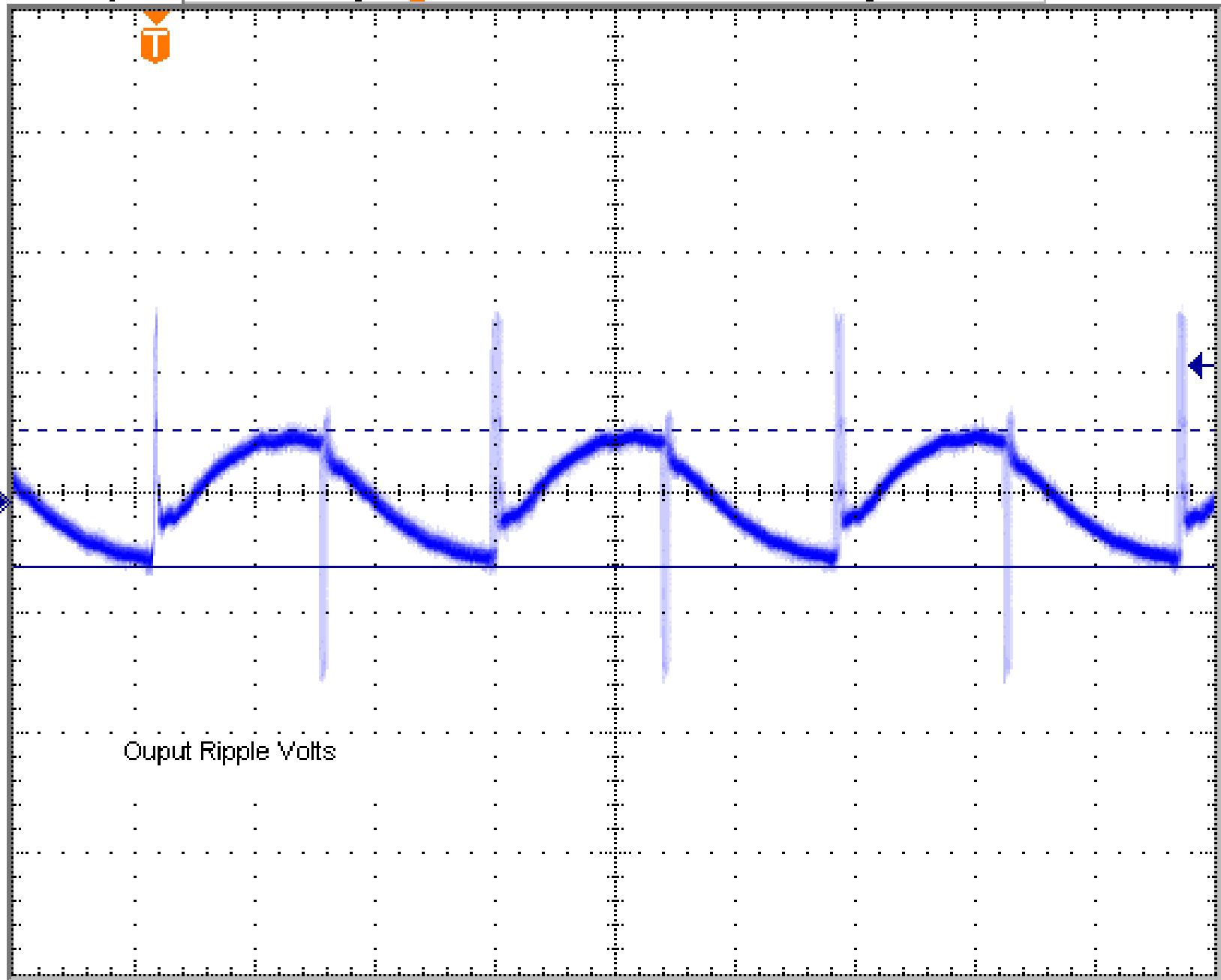
Output Ripple volts during hysteretic mode

Ch1 500mV $\sqrt{B_W}$ M 4.00ms A Ch1 \int 220mV

T 11.80 %

7 Nov 2003
16:45:43

lek Stop



Δ : 114mV
@: -54.0mV

Ch1 Freq
889.2kHz
Low signal
amplitude

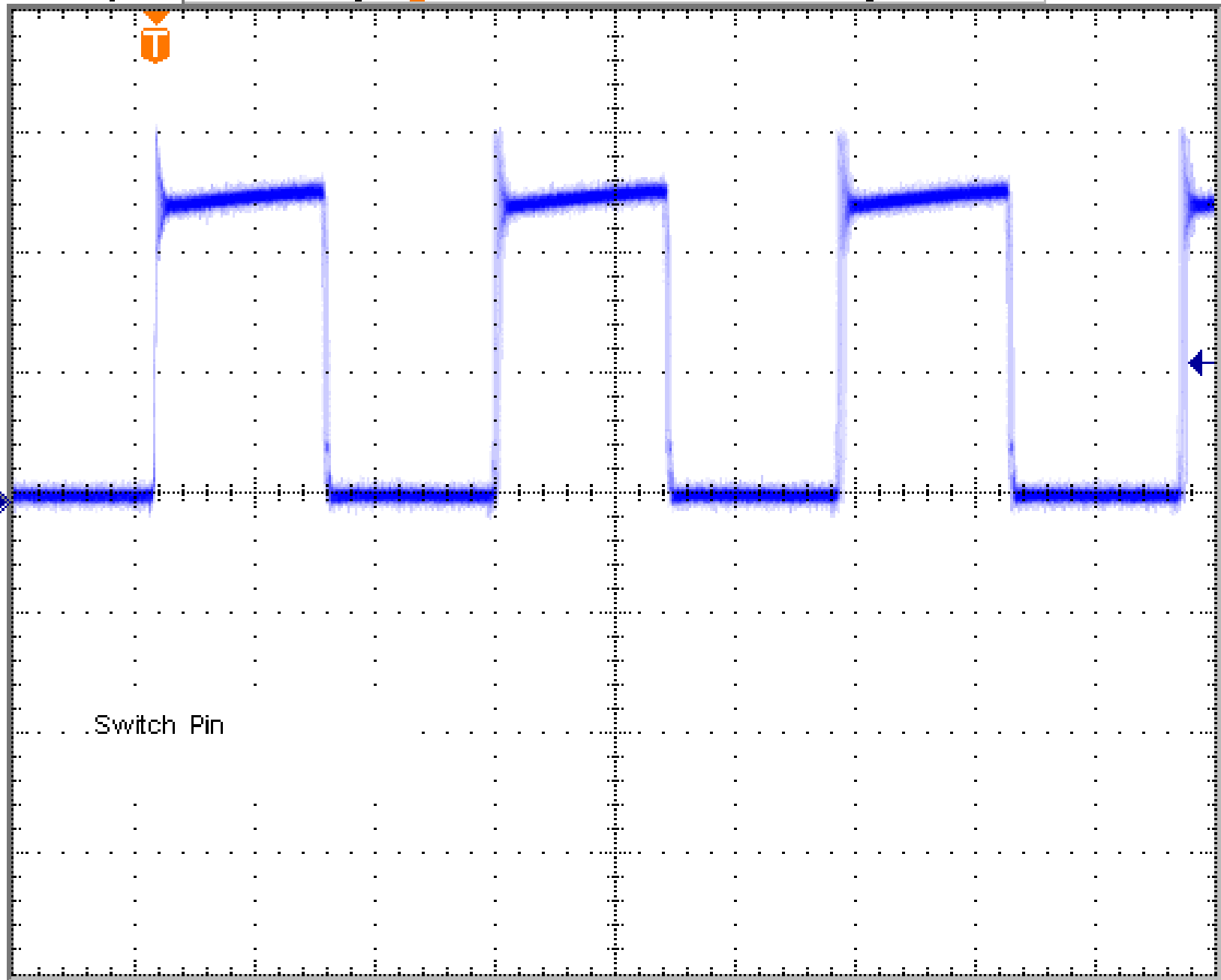
Ouput Ripple Volts

Ch1 100mV \sqrt{B} M 1.00 μ s A Ch1 \int 114mV

T 11.80 %

7 Nov 2003
16:40:13

lek Stop



Ch1 Freq
353.9kHz

Switch Pin

Ch1 10.0 V

M 1.00 μ s A Ch1 11.6 V

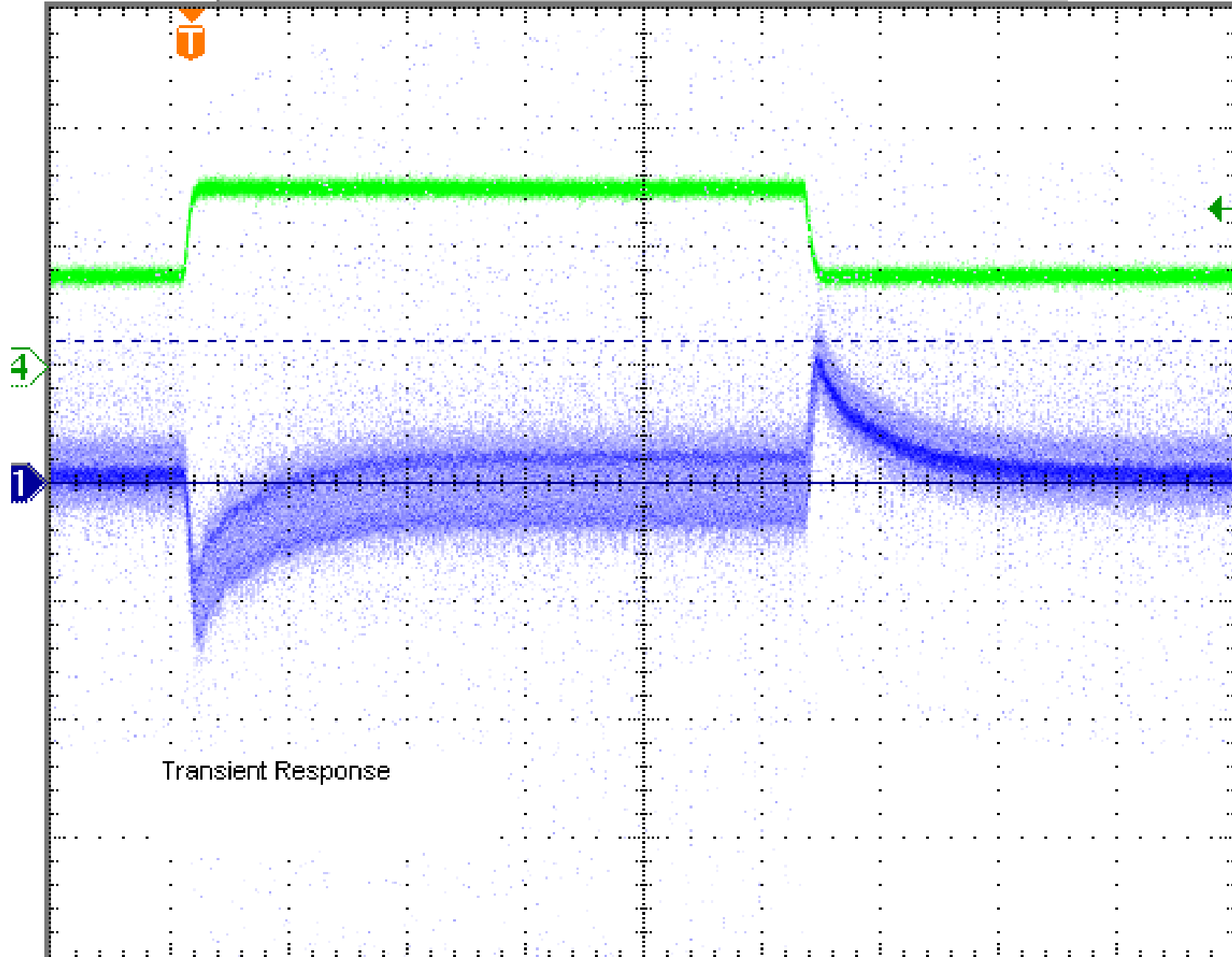
11.80 %

7 Nov 2003
16:37:57

lek Stop



Δ : 120mV
@: 0.00 V



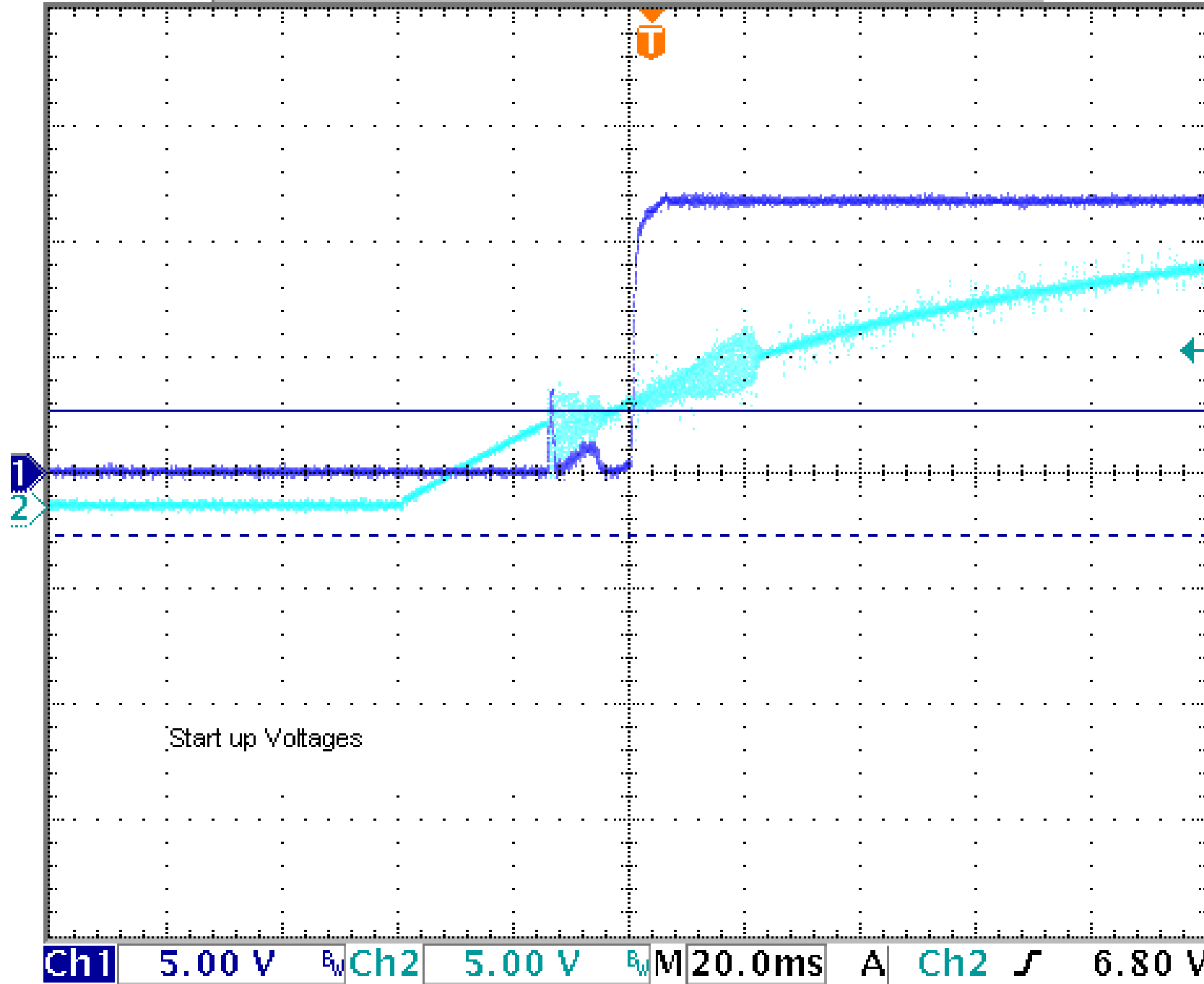
Ch1 Freq
99.24kHz

Transient Response

Ch1 100mV \sqrt{B} M 200 μ s A Ch4 1.34 A
Ch4 1.00 A Ω
11.80 %

7 Nov 2003
16:43:23

lek Stop



Δ: 5.40 V
@: 2.70 V

Ch1 Freq
----.Hz
No period
found

1
2

Start up Voltages

Ch1 5.00 V Bw Ch2 5.00 V Bw M 20.0ms A Ch2 6.80 V

T 52.20 %

7 Nov 2003
16:51:21