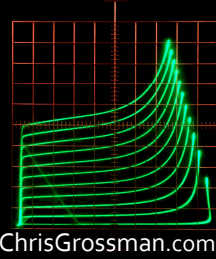


Beich CH9720CU Electronic Load Review



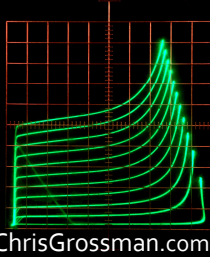
→ Part I. Function & Operation

Part II. Hardware & Tear Down

Part III. Discussion, Recommendations,
& Conclusion

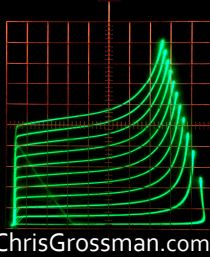
April 11, 2021

Introduction



- I bought and paid for this Beich CH9720CU electronic load in March 2021 with my own funds to use in my home “lab” and in future YouTube videos
- I received no compensation of any kind for this review, nor did I give Beich any prior notice of this review
- A large part of my motivation for doing this review was to help me understand the capabilities and limitations of this instrument so I can deploy it intelligently in future tests
- This is the 1st commercial electronic load I have used
 - I have zero experience with other models or brands
 - Please leave your experience with other models &/or brands in the comments

Beich CH9720CU Electronic Load Hardware & Firmware Version

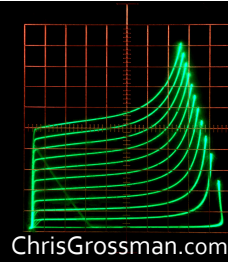


BEICH System Info 25.7°C 22:12:46

Model : CH9720CU
Name : Programmable DC Electronic Load
SerialNo : L0-13-16084
Hardware : V1.03
Firmware : V3.20.1026
Copyright : BEICH Electronic Technology Co.,Ltd
Installed : RS232C,USB HOST

 Use softkeys to select



Beich CH9720CU Electronic Load Operation Area

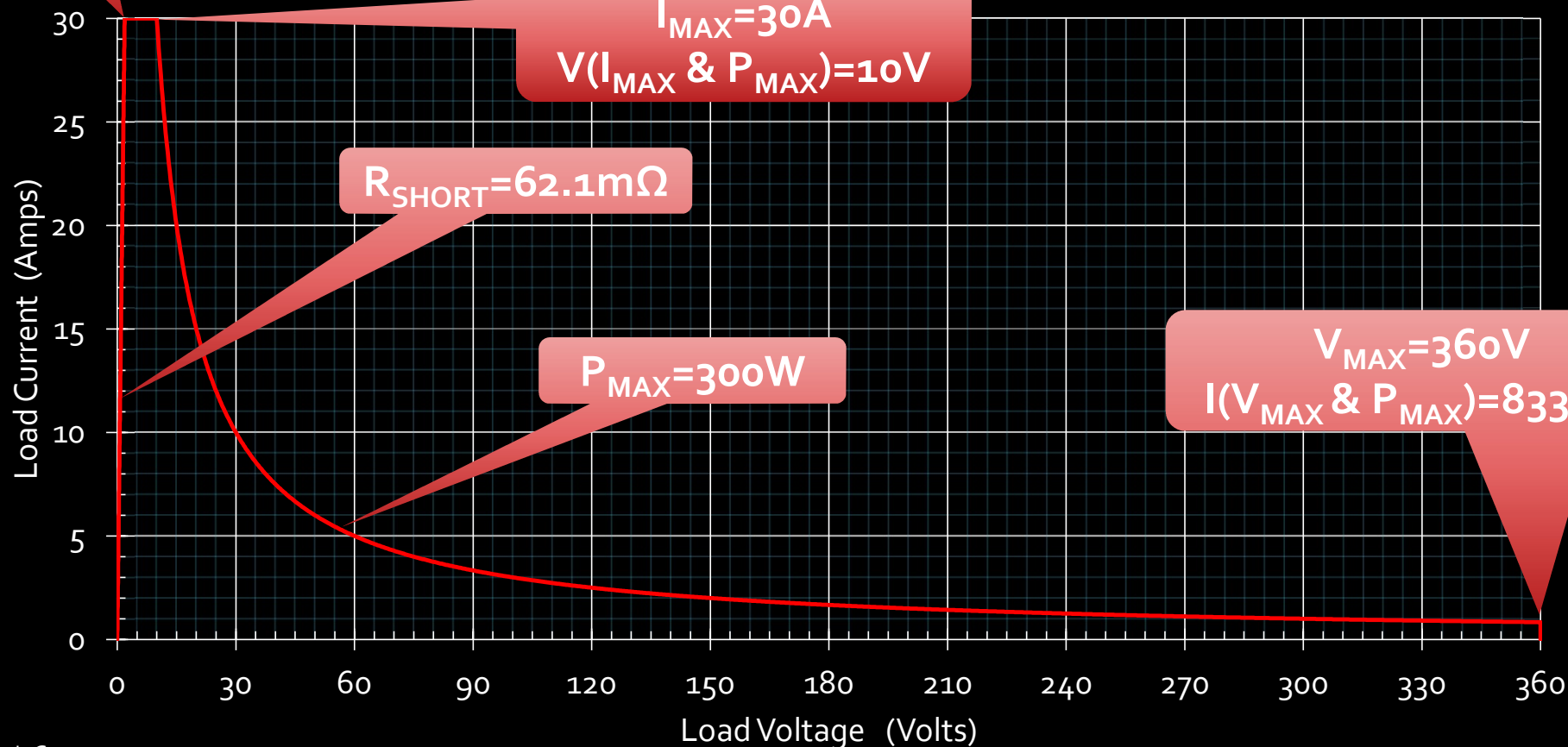
$V_{MIN}(I_{MAX})=1.87V$

$I_{MAX}=30A$
 $V(I_{MAX} \& P_{MAX})=10V$

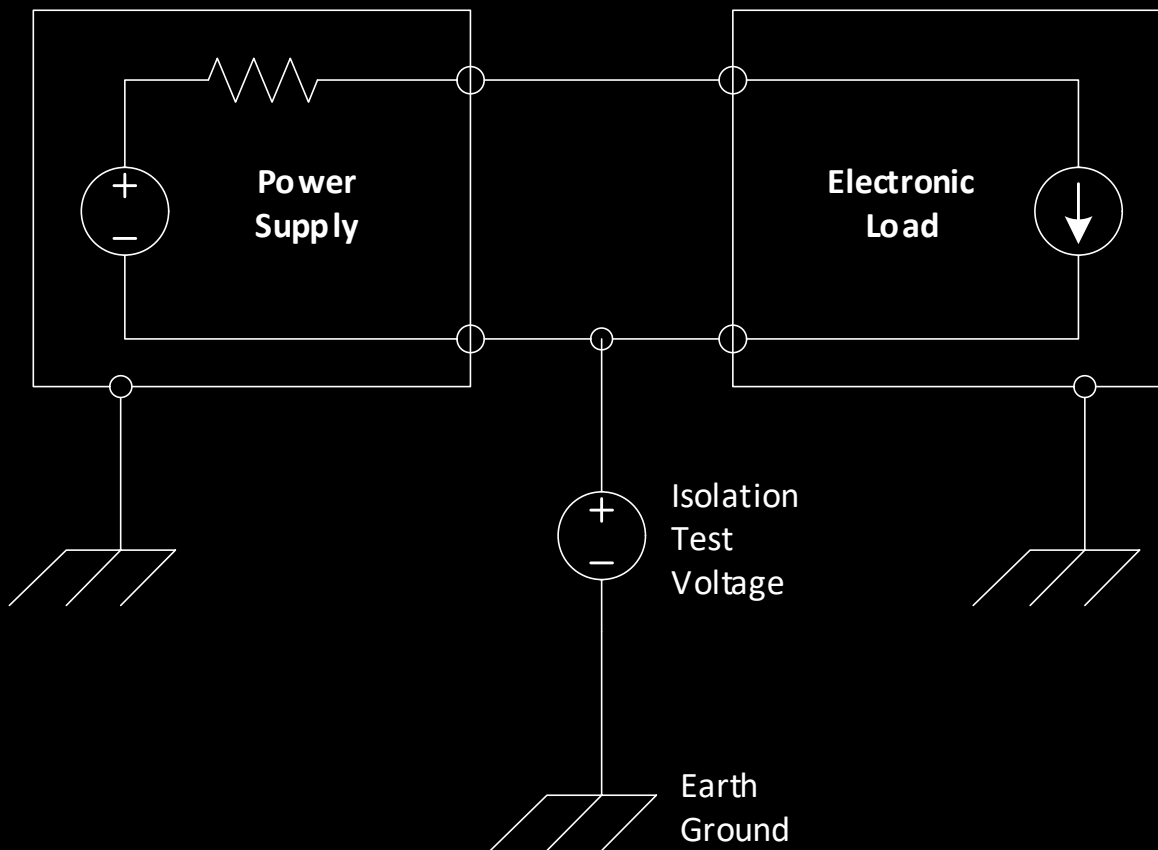
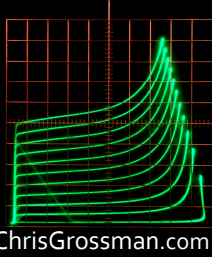
$R_{SHORT}=62.1m\Omega$

$P_{MAX}=300W$

$V_{MAX}=360V$
 $I(V_{MAX} \& P_{MAX})=833mA$



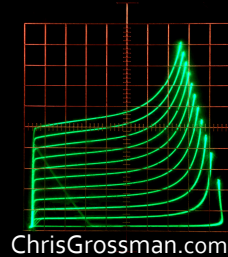
Beich CH9720CU Electronic Load Isolation Voltage



In emails to me Beich claims this unit has an isolation Voltage rating of 1000V

I will discuss this more in Part III after I have done the hardware teardown

Beich CH9720CU Electronic Load Published Measurement & Setting Specifications

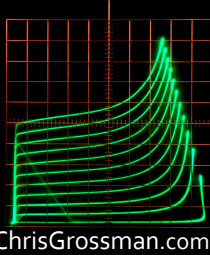


	Range	Accuracy	Resolution
Load accuracy	0- 36V	$\pm (0.05\%+0.03\%FS)$	1mV
	0- 360V	$\pm (0.05\%+0.03\%FS)$	10 mV
	0- 3A	$\pm (0.05\%+0.05\%FS)$	0.1 mA
	0- 30A	$\pm (0.05\%+0.05\%FS)$	1 mA
Rated voltage mode	1.5V - 36V	$\pm (0.05\%+0.03\%FS) \rightarrow 18mV$	1mV
	1.5V - 360V	$\pm (0.05\%+0.03\%FS) \rightarrow 180mV$	10mV
Rated current mode	0- 3A	$\pm (0.05\%+0.05\%FS) \rightarrow 1.5mA$	0.1 mA
	0- 30A	$\pm (0.05\%+0.05\%FS) \rightarrow 15mA$	1mA
Rated resistance mode <small>(When input voltage and current value $\geq 10\%FS$)</small>	0.05 Ω - 5 Ω	$\pm (0.2\%+0.2\%FS) \rightarrow 10m\Omega$	0.001 Ω
	0.5 Ω - 50 Ω	$\pm (0.1\%+0.1\%FS) \rightarrow 50m\Omega$	0.01 Ω
	5 Ω - 500 Ω	$\pm (0.1\%+0.1\%FS) \rightarrow 500m\Omega$	0.1 Ω
	500 Ω - 5K Ω	$\pm (1\%+1\%FS) \rightarrow 50\Omega$	1 Ω
Rated power mode <small>(When input voltage and current value $\geq 10\%FS$)</small>	0- 50W	$\pm (0.1\%+0.1\%FS) \rightarrow 50mW$	1 mW
	0- 150W	$\pm (0.1\%+0.1\%FS) \rightarrow 150mW$	10mW
	0- 300W	$\pm (0.1\%+0.1\%FS) \rightarrow 300mW$	0.1 W
Voltage measurement accuracy	0- 9.9999V	$\pm (0.05\%+0.03\%FS) \rightarrow 3mV$	0.1mV
	10.000 - 99.999V	$\pm (0.05\%+0.03\%FS) \rightarrow 30mV$	1mV
	100.00 - 360.00V	$\pm (0.05\%+0.03\%FS) \rightarrow 108mV$	10mV
Current measurement accuracy	0- 9.9999A	$\pm (0.05\%+0.05\%FS) \rightarrow 5mA$	0.1 mA
	10.000 - 30.000A	$\pm (0.05\%+0.05\%FS) \rightarrow 15mA$	1mA

Setting Accuracy

Measurement Accuracy

Beich CH9720CU Electronic Load Published Measurement & Setting Specifications

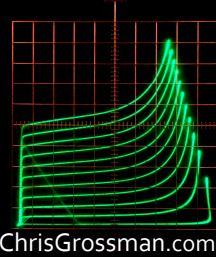


	Range	Accuracy	Resolution	
Load accuracy	0- 36V	$\pm (0.05\%+0.03\%FS)$	1mV	
	0- 360V	$\pm (0.05\%+0.03\%FS)$	10 mV	
	0- 3A	$\pm (0.05\%+0.05\%FS)$	0.1 mA	
	0- 30A	$\pm (0.05\%+0.05\%FS)$	1 mA	
Rated voltage mode	1.5V - 36V	$\pm (0.05\%+0.03\%FS) \rightarrow 18mV$	<div data-bbox="1360 711 1955 963" style="background-color: #e91e63; color: white; padding: 10px; border-radius: 15px;"> Settings I have observed and measured are much better than the specified accuracy and appear to be monotonic </div> <div data-bbox="1360 1008 1955 1360" style="background-color: #e91e63; color: white; padding: 10px; border-radius: 15px;"> The Voltage measurements are as accurate or better than any handheld meter I own. All of the measurements I have checked are much better than the specification limits </div>	
	1.5V - 360V	$\pm (0.05\%+0.03\%FS) \rightarrow 180mV$		
Rated current mode	0- 3A	$\pm (0.05\%+0.05\%FS) \rightarrow 1.5mA$		
	0- 30A	$\pm (0.05\%+0.05\%FS) \rightarrow 15mA$		
Rated resistance mode <small>(When input voltage and current value $\geq 10\%FS$)</small>	0.05Ω - 5Ω	$\pm (0.2\%+0.2\%FS) \rightarrow 10m\Omega$		
	0.5 Ω - 50Ω	$\pm (0.1\%+0.1\%FS) \rightarrow 50m\Omega$		
	5Ω - 500Ω	$\pm (0.1\%+0.1\%FS) \rightarrow 500m\Omega$		0.1Ω
	500Ω - 5KΩ	$\pm (1\%+1\%FS) \rightarrow 50\Omega$		
Rated power mode <small>(When input voltage and current value $\geq 10\%FS$)</small>	0- 50W	$\pm (0.1\%+0.1\%FS) \rightarrow 50mW$		
	0- 150W	$\pm (0.1\%+0.1\%FS) \rightarrow 150mW$		
	0- 300W	$\pm (0.1\%+0.1\%FS) \rightarrow 300mW$		
Voltage measurement accuracy	0- 9.9999V	$\pm (0.05\%+0.03\%FS) \rightarrow 3mV$		
	10.000 - 99.999V	$\pm (0.05\%+0.03\%FS) \rightarrow 30mV$		
	100.00 - 360.00V	$\pm (0.05\%+0.03\%FS) \rightarrow 108mV$		
Current measurement accuracy	0- 9.9999A	$\pm (0.05\%+0.05\%FS) \rightarrow 5mA$		
	10.000 - 30.000A	$\pm (0.05\%+0.05\%FS) \rightarrow 15mA$	1mA	

Setting Accuracy
 Measurement Accuracy

Beich CH9720CU Electronic Load

Modes of Operation



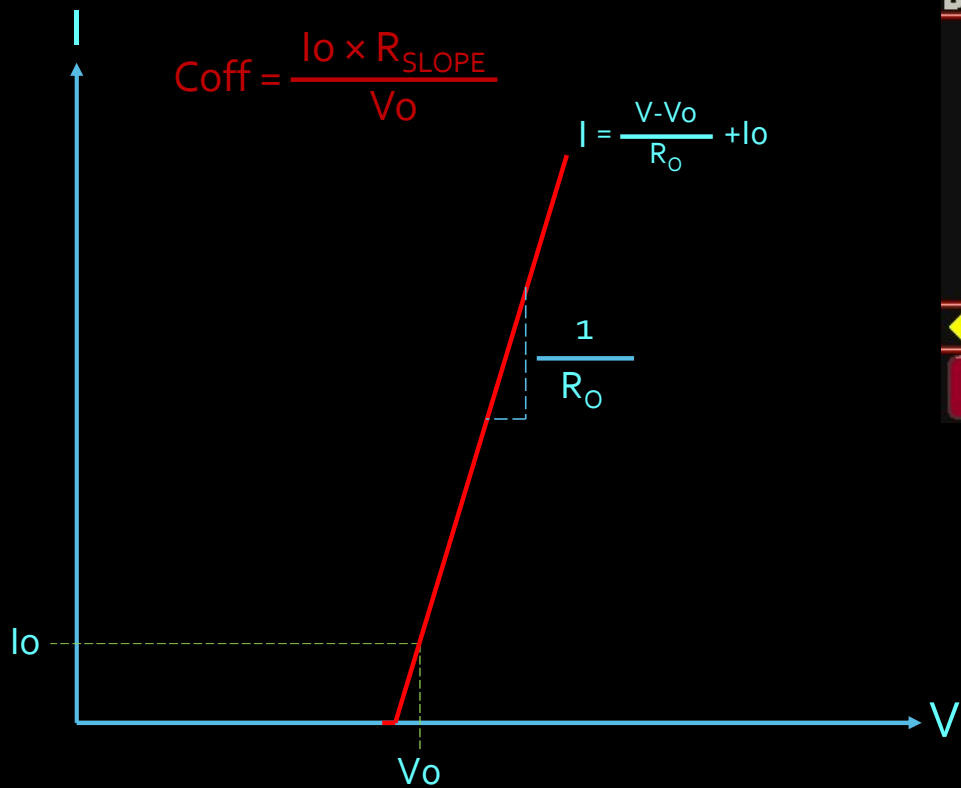
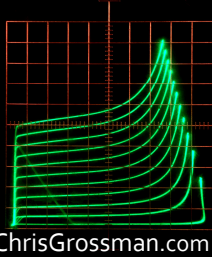
Basic Modes

- Constant Current (CC)
- Constant Voltage (CV)
- Constant Resistance (CR)
- Constant Power (CP)
- Short
- LED Simulation
- Battery Discharge Test
 - 1-3 currents or constant resistance
- Transient
 - slewing between 2 currents

Extended Modes

- Scan Test
 - Sweeps Current or Voltage
- CC + CV
 - Attempts to start in CC mode, if it can not stabilize it switches to CV mode
- CR + CV
 - Attempts to start in CR mode, if it can not stabilize it switches to CV mode
- List Mode
 - A sequence of CC, CV, CR, or CP tests with pass/fail limits
- File List (save all instrument settings)
 - 100 to internal memory
 - 450 to USB drive
- Firmware update

Beich CH9720CU Electronic Load LED Simulation Mode



BEICH LED Test 24.6°C 21:56:00

LED Vo : 5.0000V LED Io : 0.0050A

LED Coff: 0.0050

6.0471V

0.2142A

1.2951W

5.0000Ω

0.2592A

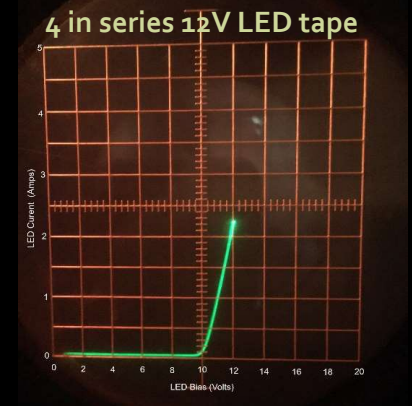
Use number keys to input data

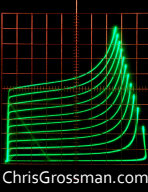
← → SAVE/CALL BACK RUN

user inputs

$R_0 = Coff \times V_0 / I_0$

I_{PEAK} at turn-on ????





remote V sense
high/low I & V settings ranges
maximum V, P, & I
start & stop current slew rate
on/off Voltage
auto off
V & I measurement rate
2nd parameter display

Indicates
remote
Voltage
sense is on

heat sink
temperature
fan on high
when $T \geq 25^{\circ}\text{C}$

USB drive
inserted

user interface
communications
time/date
data save interval

V, I, & P test limits

settings saving & recall
all setting from all modes
100 internal
450 on USB drive

Battery discharge test setup

LIST test setup

LED simulation setup

asks for password

DEICH System Menu Rmt 21.1°C 22:55:59

01. Load Setup	02. Limit Setup
03. System Setup	04. File List
05. Battery Test Set	06. Tran Test Set
07. List Test Set	08. Scan Test Set
09. LED Test Set	10. System Info
11. Calibration	12. Firmware Update

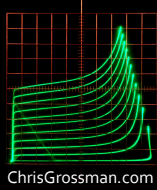
⚠ Move Cursor or put two numbers to enter submenu

← → [] BACK ENT

Transient test setup

SCANTEST
This is the only way to get
to this test, it is not part of
the main test selection

Press the SET key on the keypad do get to this menu
Use the dial selector to select a sub menu and press the dial to
enter the sub menu



remote Voltage sense

disable time in CC, CV, CR and CC mode
zero is off
Setting range 1-99999 seconds (27.8 hours)

LOW: 0-3A : 100µA resolution
HIGH: 0-30A : 1mA resolution

load turns off if this current is exceeded

load turns off if this Voltage is exceeded

LOW: 0-36V : 1mV resolution
HIGH: 0-360V : 10mV resolution

load turns off if this power is exceeded

load turns on when $V \geq$

BEICH Load Setup Rmt 21.1°C 22:56:00

REMOTE	: ON	AUTO OFF	: OFF
CURR RANG	: LOW	MAX CURR	: 3.0000A
VOLT RANG	: LOW	MAX VOLT	: 36.000V
ON VOLT	: OFF	MAX POW	: 300.00W
OFF VOLT	: OFF	RISE RATE	: 0.0500A/uS
CR MODE	: C C	FALL RATE	: 0.0500A/uS
TEST SPED	: FAST	SCND PARA	: LIMIT

⚠ Use 'ENT' to set remote sense

← → [] BACK ENTRYTEST

turn-on current ramp rate

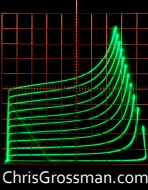
load turns off when $V \leq$

turn-off current ramp rate

CR mode regulation
CC or CV, CC is default

display test limits or maximum values along side of the Voltage, current, & power

V, I, & P reading update rate
FAST or SLOW
I have left mine on FAST



ChrisGrossman.com

color theme: RED or VIOILET

ENGLISH or CHINEESE

power on mode
DEFAULT or LAST used
settings

a key press sound
I don't mind

dontrol locks for
production line
use

date & 24-hour
time for real time
clock

BEICH System Setup Rmt 20.6°C 09:35:25

THEME	: RED	TRIG SOURCE: MAN
LANGUAGE	: ENGLISH	COMM MODE : RS232C
POWERON SET: LAST		LOCAL ADDR : 8
KEY SOUND	: ON	BAUD RATE : 9600
KEY LOCK	: OFF	MULTI MODE : SEPAR
KNOB LOCK	: OFF	DEFAULT SET: RESET
DATE	: 2021-04-06	ACQUIS FREQ: 001
TIME	: 09:35:24	

⚠ Use 'ENT' to select skin

← → BACK ENT

What turns the load on/off?
MANual: front panel
EXTernal: rear connector logic level
BUS: by RS232 command

RS232 or USB mode
with a USB to RS232
converter

Address for shared
serial ines

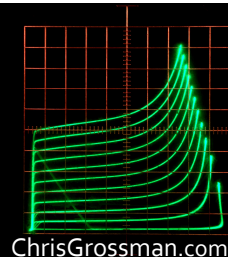
4800, 9600, 19200,
38400. & 57600

single or multiple units
on the RS232

Factory reset or a
stored profile for
default power -up

Rate at which data is written to the USB drive
0.1 second steps
Range: 0.1 secods to 10 seconds

Beich CH9720CU Electronic Load Color Themes



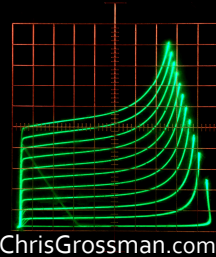
RED

BEICH	Meas	Display	24.3°C	21:57:39
V:	5.9289V	LMT	H:360.00 L:0.0000	
I:	2.9991A	LMT	H:30.000 L:0.0000	
P:	17.781W	LMT	H:300.00 L:0.0000	
⚠ Is = 3.0000A				
I-SET	V-SET	P-SET	MORE	CC

VIOLET

BEICH	Meas	Display	24.3°C	21:58:01
V:	5.9306V	LMT	H:360.00 L:0.0000	
I:	2.9991A	LMT	H:30.000 L:0.0000	
P:	17.786W	LMT	H:300.00 L:0.0000	
⚠ Is = 3.0000A				
I-SET	V-SET	P-SET	MORE	CC

Beich CH9720CU Electronic Load Pass/Fail Test Limit Setup



BEICH		Limit Setup	Rmt 21.1°C	22:56:08
VOLT HIGH	:360.00V	LMT DISP	:ON	
VOLT LOW	:0.0000V	LMT BEEP	:OFF	
CURR HIGH	:3.0000A	VOLT JUDG	:OFF	
CURR LOW	:0.0000A	CURR JUDG	:OFF	
POW HIGH	:300.00W	POW JUDG	:OFF	
POW LOW	:0.0000W			

⚠ Use number keys to input data

← → [] BACK ENTRYTEST

Pass/Fail Limits
They show on the display even when not being used

If OFF shows 0 for all limit values on display

makes an annoying beep on PASS or FAIL

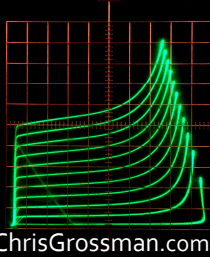
Use Voltage limits

Use Current limits

Use Power limits

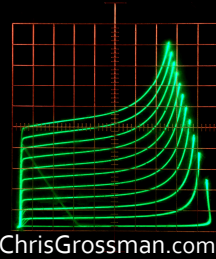
The load will display **PASS** in green or **FAIL** in red based on the limit values
The limit values have no effect load operation except for the pass & logic fail signals on the rear connector
If the load loses lock it will not show PASS or FAIL

Beich CH9720CU Electronic Load Noise in the Load Current

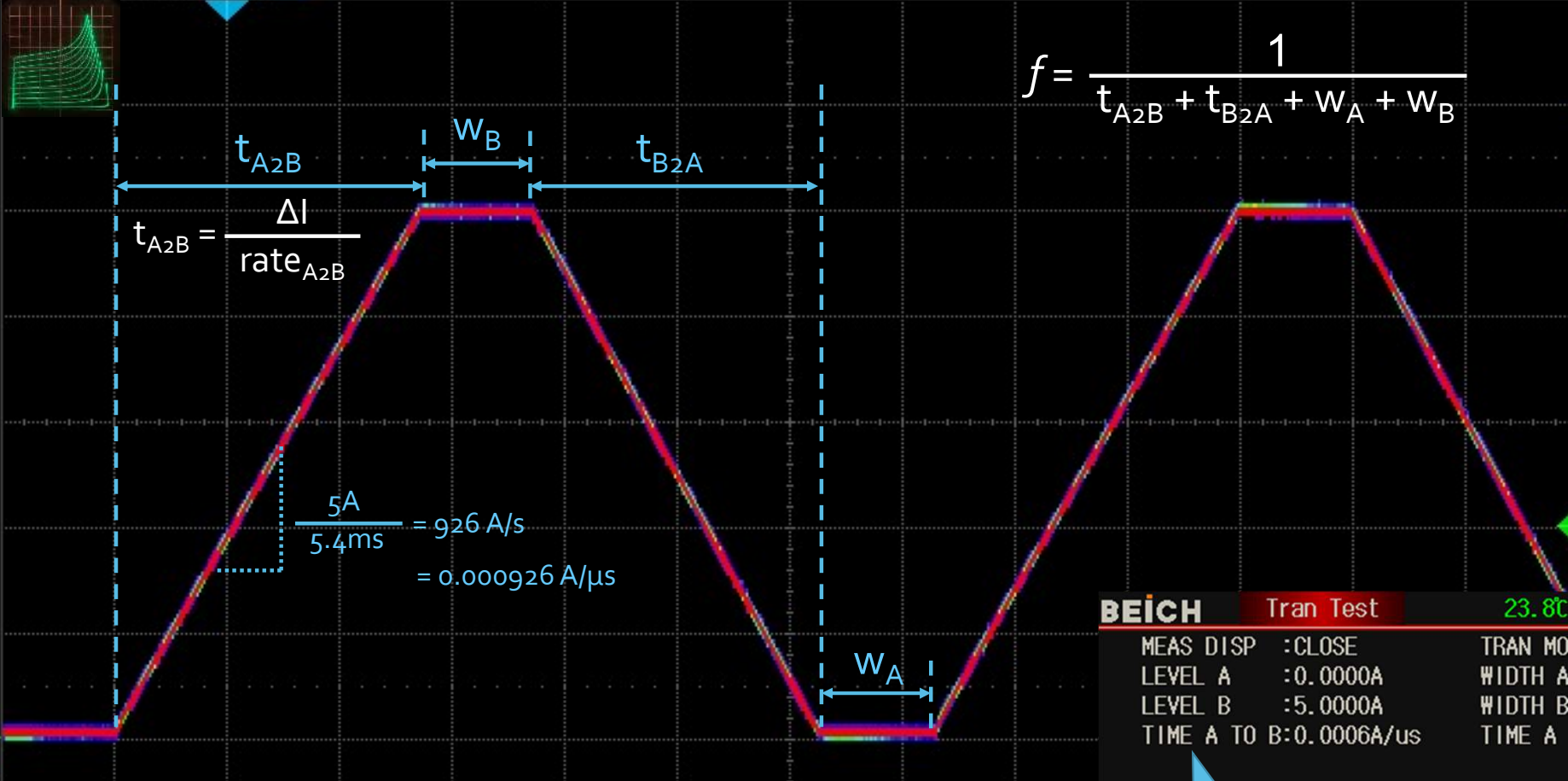


- There is switching noise in the current the Beich load draws
- It seems to be worst at around 1 Amp
 - In comparison the magnitude of the current being drawn
- It seems to have no effect on the DC readings or average current
 - On the values measured by the load
 - On the values measured by external meters
- The current noise is concerning if you are using the load to make noise and/or ripple measurements of a power supply since it may contribute to the values you measure
- The following examples are at the approximately at worst case current

Beich CH9720CU Electronic Load Current Slew Rate Control



- The current slew rates can be set for turn-on, turn-off, & transient test
- The same slew rate range is available for:
 - transient test mode
 - turn-on & turn-off
 - rate settings are independent
- The settable range is:
 - $0.6000 \text{ A}/\mu\text{s}$ to $0.0006 \text{ A}/\mu\text{s}$ (600A/ms to 0.6A/ms) (600KA/s to 600mA/s)
- The usable setting range is:
 - $0.1000 \text{ A}/\mu\text{s}$ to $0.0006 \text{ A}/\mu\text{s}$ (100A/ms to 0.6A/ms) (100KA/s to 600mA/s)
- The actual slew rates are ~50% faster than the setting values
 - $0.1500 \text{ A}/\mu\text{s}$ to $0.00093 \text{ A}/\mu\text{s}$ (150A/ms to 0.93A/ms) (150KA/s to 930mA/s)



$$f = \frac{1}{t_{A2B} + t_{B2A} + W_A + W_B}$$

Sa 500MSa/s
 Curr 14.0Mpts
 Edge CH4
 DC
 L 2.00A
 4 DC1M
 100X 1.00A/
 -3.00A

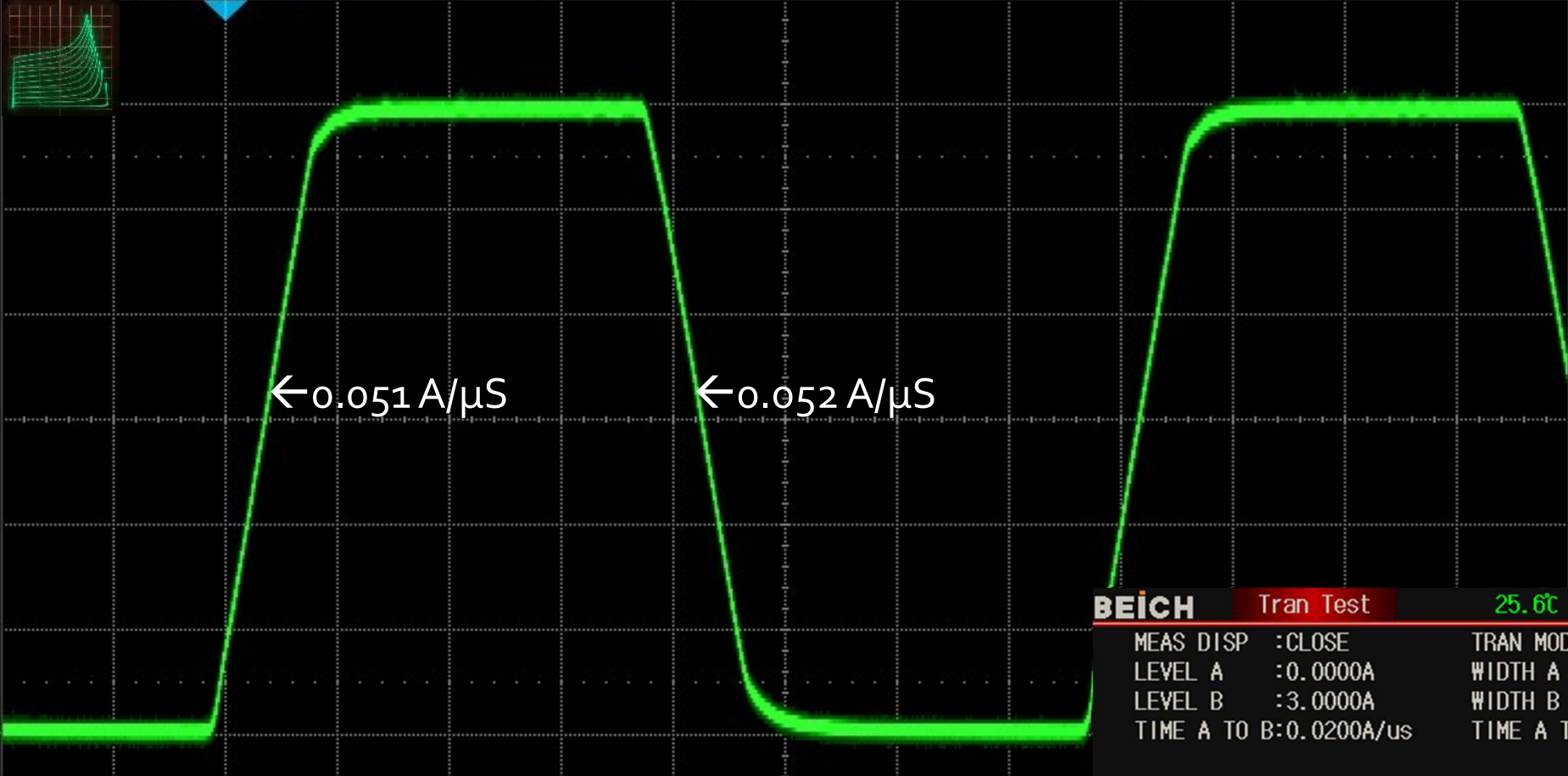
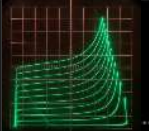
BEICH Tran Test 23.8°C 21:35:07
 MEAS DISP :CLOSE TRAN MODE :CONT
 LEVEL A :0.0000A WIDTH A :2.000ms
 LEVEL B :5.0000A WIDTH B :2.000ms
 TIME A TO B:0.0006A/us TIME A TO B:0.0006A/us

V=12.184V I=0.0000A

This is a slew rate not a time

Measure Item	Current	Mean	Min	Max	Std-Dev	Co
Rise[4]	4.35ms	4.30ms	4.15ms	4.36ms	83.12us	54
Fall[4]	4.07ms	4.02ms	3.86ms	4.08ms	79.52us	54
Freq[4]	68.74Hz	68.76Hz	68.65Hz	68.92Hz	43.85mHz	54
+Duty[4]	50.09%	50.32%	50.06%	50.87%	0.26%	54

BACK
17 START



Sa 1.00GSa/s
 Curr 1.40Mpts
 Edge CH4
 DC
 L 470mA
 4 DC1M
 50X 500mA/
 -1.50A

←0.051 A/μs

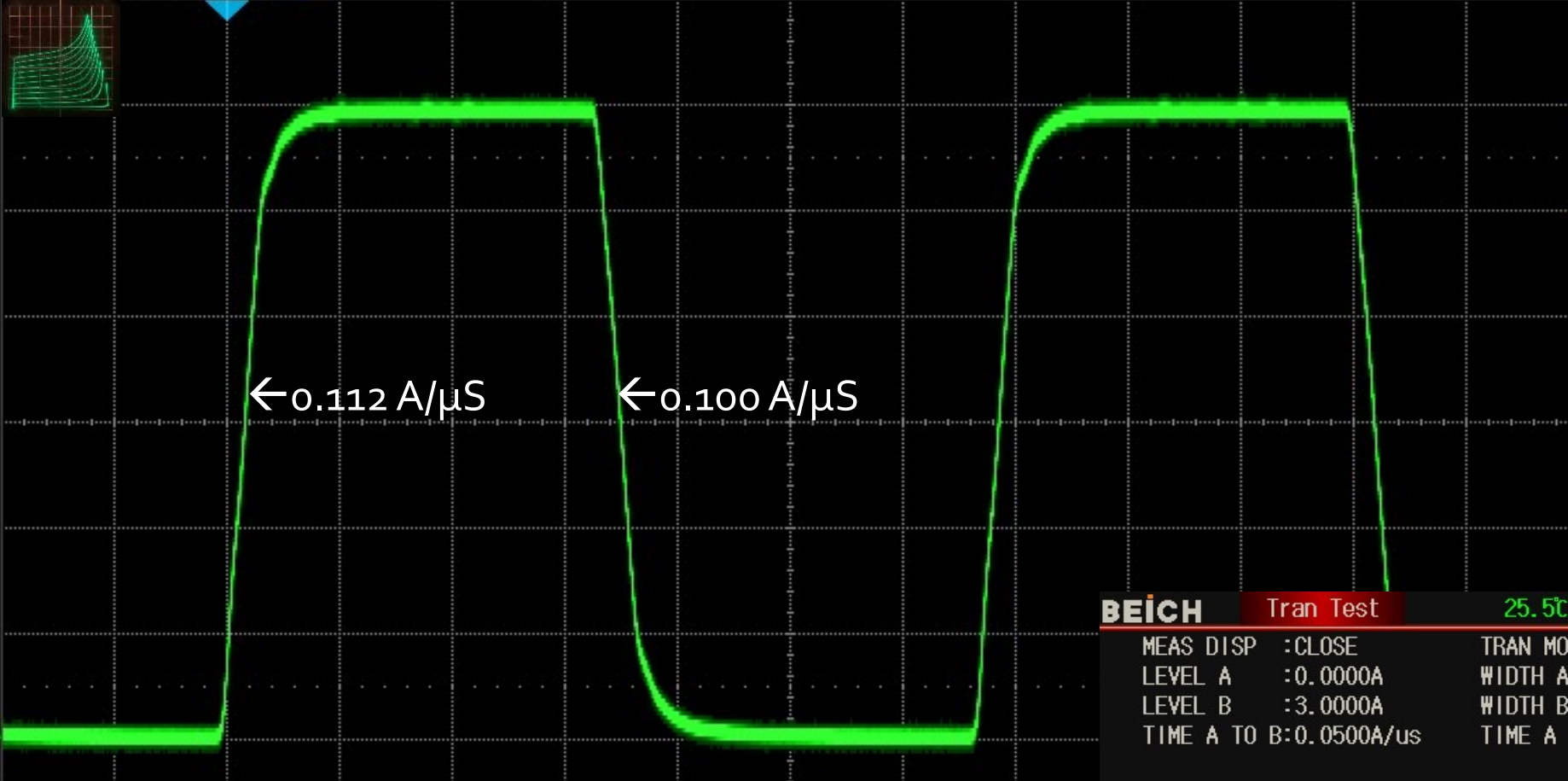
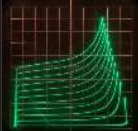
←0.052 A/μs

BEICH Tran Test 25.6°C 11:46:46
 MEAS DISP :CLOSE TRAN MODE :CONT
 LEVEL A :0.0000A WIDTH A :0.300ms
 LEVEL B :3.0000A WIDTH B :0.300ms
 TIME A TO B:0.0200A/us TIME A TO B:0.0200A/us

V=5.0289V I=0.0000A

Measure Item	Current	Mean	Min	Max	Std-Dev	Co
Max[4]	3.04A	3.05A	3.02A	3.10A	14.02mA	18
Rise[4]	73.15us	73.05us	72.02us	74.01us	367.13ns	18
Min[4]	-60.00mA	-60.99mA	-80.00mA	-60.00mA	4.35mA	18
Fall[4]	71.96us	72.79us	71.40us	74.22us	482.79ns	18

BACK 18



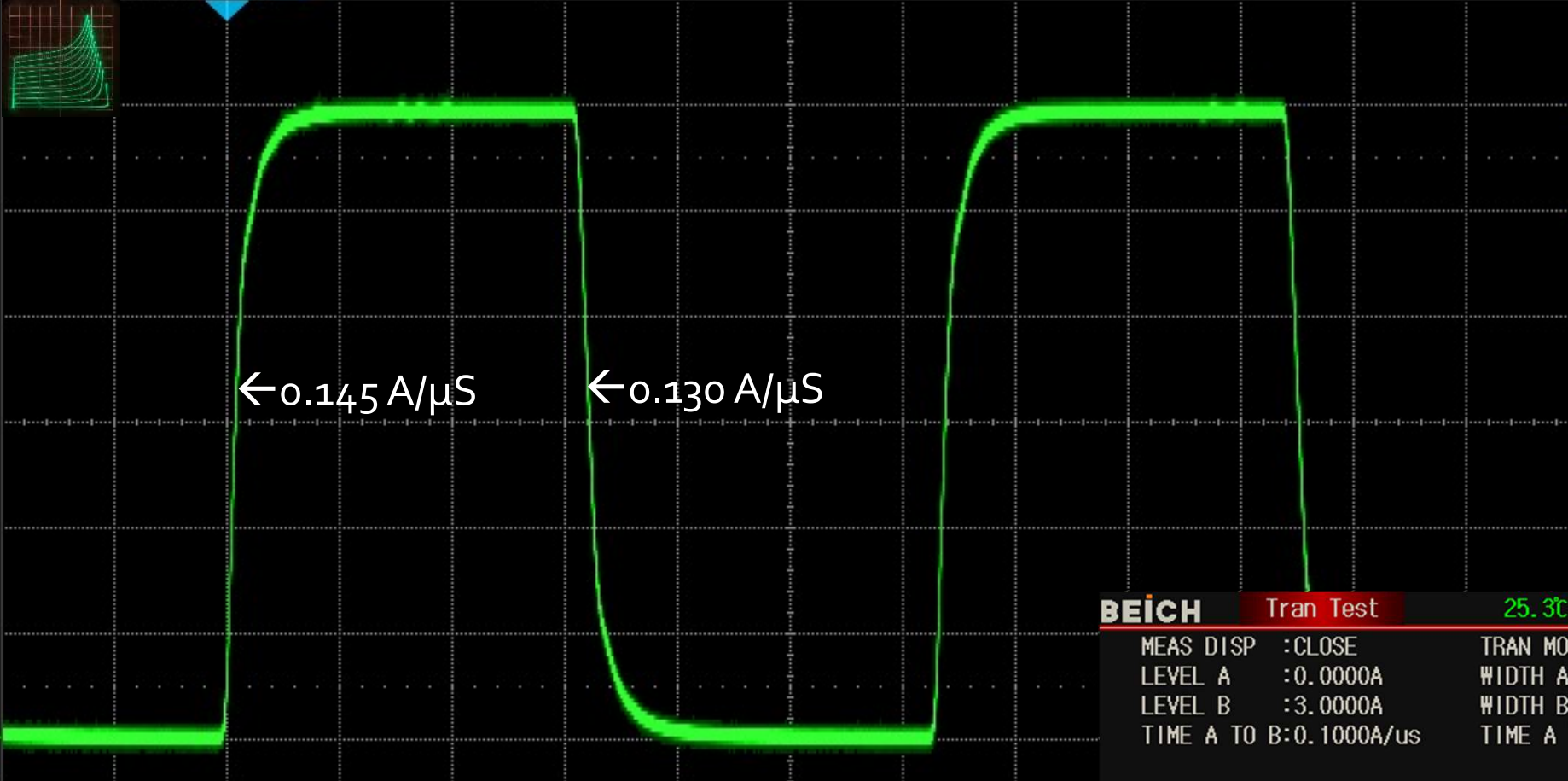
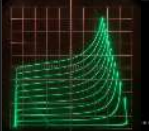
Sa 1.00GSa/s
 Curr 1.40Mpts
 Edge CH4
 DC
 L 470mA
 4 DC1M
 50X 500mA/
 -1.50A

BEICH Tran Test 25.5°C 11:45:43
 MEAS DISP :CLOSE TRAN MODE :CONT
 LEVEL A :0.0000A WIDTH A :0.300ms
 LEVEL B :3.0000A WIDTH B :0.300ms
 TIME A TO B:0.0500A/us TIME A TO B:0.0500A/us

V=5.0289V I=0.0000A

Measure Item	Current	Mean	Min	Max	Std-Dev	Cc
Max[4]	3.04A	3.04A	3.02A	3.12A	12.11mA	26
Rise[4]	33.43us	33.39us	31.91us	34.94us	379.98ns	26
Min[4]	-60.00mA	-62.91mA	-80.00mA	-60.00mA	7.05mA	26
Fall[4]	37.32us	37.65us	35.84us	40.44us	735.03ns	26

BACK 19

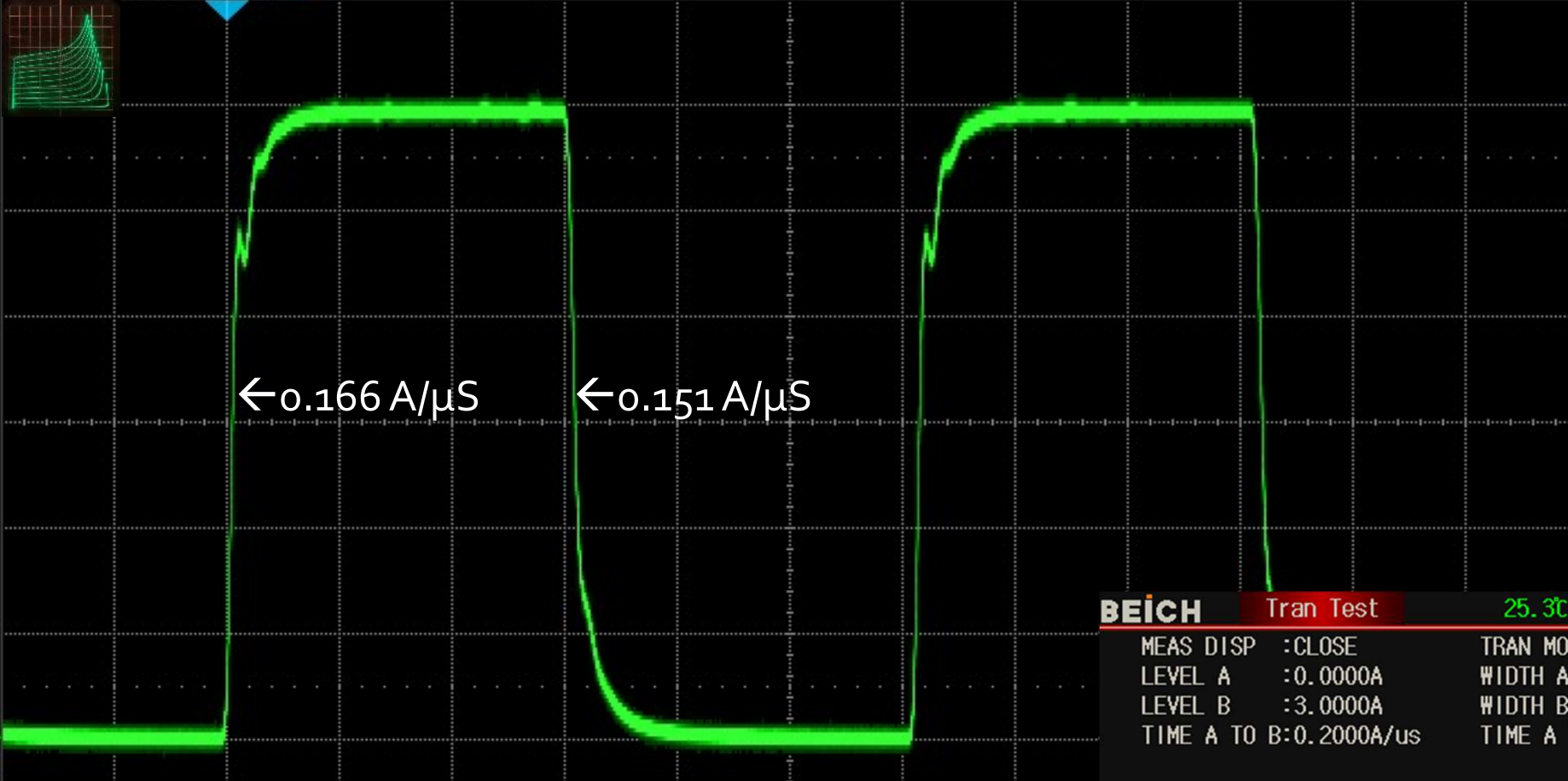
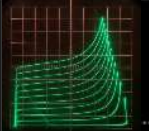


Sa 1.00GSa/s
 Curr 1.40Mpts
 Edge CH4
 DC
 L 470mA
 4 DC1M
 50X 500mA/
 -1.50A

BEICH Tran Test 25.3°C 11:44:51
 MEAS DISP :CLOSE TRAN MODE :CONT
 LEVEL A :0.0000A WIDTH A :0.300ms
 LEVEL B :3.0000A WIDTH B :0.300ms
 TIME A TO B:0.1000A/us TIME A TO B:0.1000A/us

V=5.0289V I=0.0000A

Measure Item	Current	Mean	Min	Max	Std-Dev	Co
Max[4]	3.04A	3.04A	3.02A	3.10A	10.75mA	12
Rise[4]	25.90us	26.07us	25.20us	27.78us	293.03ns	12
Min[4]	-60.00mA	-61.76mA	-80.00mA	-60.00mA	5.67mA	12
Fall[4]	28.88us	28.73us	27.62us	30.06us	440.50ns	12



Sa 1.00GSa/s
 Curr 1.40Mpts
 Edge CH4
 DC
 L 470mA
 4 DC1M
 50X 500mA/
 -1.50A

←0.166 A/μs

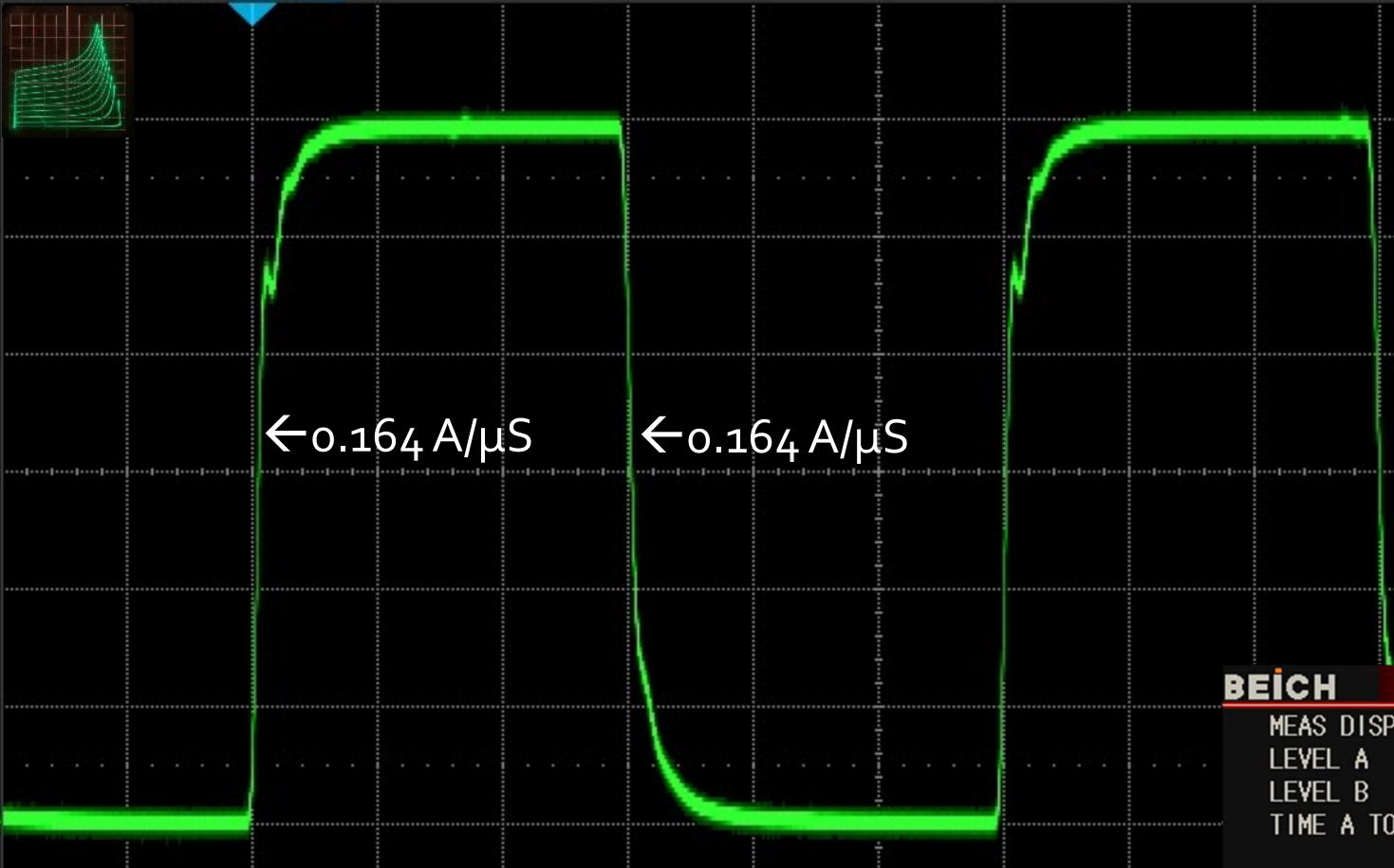
←0.151 A/μs

BEICH Tran Test 25.3°C 11:43:06
 MEAS DISP :CLOSE TRAN MODE :CONT
 LEVEL A :0.0000A WIDTH A :0.300ms
 LEVEL B :3.0000A WIDTH B :0.300ms
 TIME A TO B:0.2000A/us TIME A TO B:0.2000A/us

V=5.0281V I=0.0000A

Measure Item	Current	Mean	Min	Max	Std-Dev	Co
Max[4]	3.06A	3.04A	3.02A	3.10A	14.09mA	10
Rise[4]	22.61us	22.54us	22.02us	22.90us	189.12ns	10
Min[4]	-60.00mA	-64.60mA	-80.00mA	-60.00mA	8.42mA	10
Fall[4]	24.97us	25.25us	24.34us	25.96us	364.11ns	10

BACK 21



V & I readings do not update
They are fixed when entering transient mode

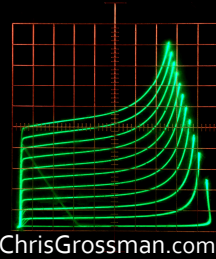
4 DC1M
50X 500mA/V
-1.50A

BEICH Tran Test 25.2°C 11:42:16
MEAS DISP :CLOSE TRAN MODE :CONT
LEVEL A :0.0000 WIDTH A :0.300ms
LEVEL B :3.0000 WIDTH B :0.300ms
TIME A TO B:0.6000A/us TIME A TO B:0.6000A/us

V=5.0281V I=0.0000A

Measure Item	Current	Mean	Min	Max	Std-Dev	Co
Max[4]	3.04A	3.03A	3.02A	3.08A	11.62mA	16
Rise[4]	22.89us	22.91us	22.37us	23.64us	166.65ns	16
Min[4]	-60.00mA	-68.99mA	-80.00mA	-60.00mA	9.95mA	16
Fall[4]	25.86us	25.75us	24.23us	27.00us	374.72ns	16

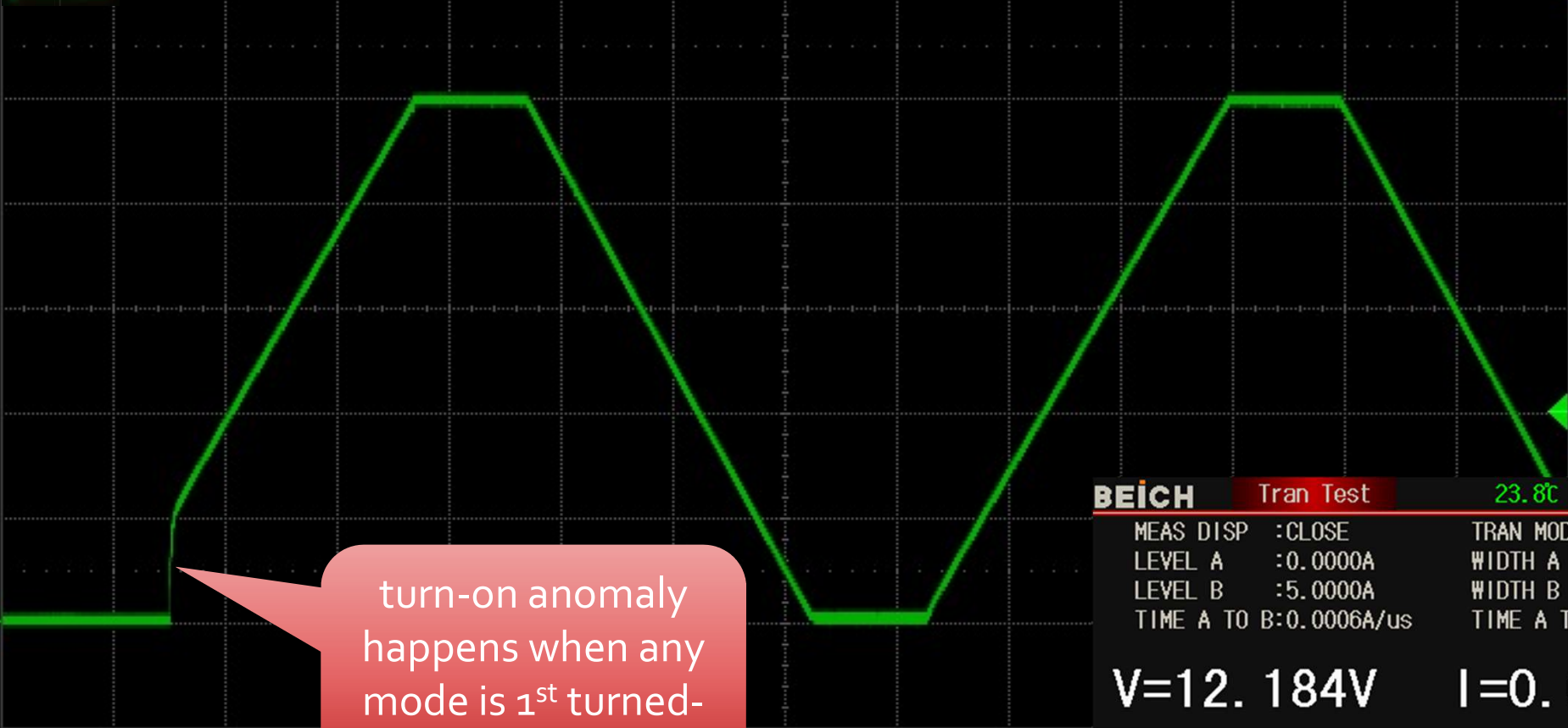
Beich CH9720CU Electronic Load Current Turn-on Anomaly



- The current turn-on anomaly occurs when the current is being ramped up when first turned on
 - When any load mode starts
 - At the start of the 1st cycle of a transient test
- Only occurs on starts
 - Shutdowns behave as expected
 - Transient mode works fine after the start of the 1st cycle
- Manifestations
 - Delayed start with initial fast rise-time
 - Stepped start
- I have not observed any current peaks during turn-ons or turn-offs

This does not seem like a big issue, but one should be aware of it

Transient Start-up Waveform



Sa 500MSa/s
 Curr 14.0Mpts
 Edge CH4
 DC
 L 2.00A
 4 DC1M
 100X 1.00A/
 -3.00A

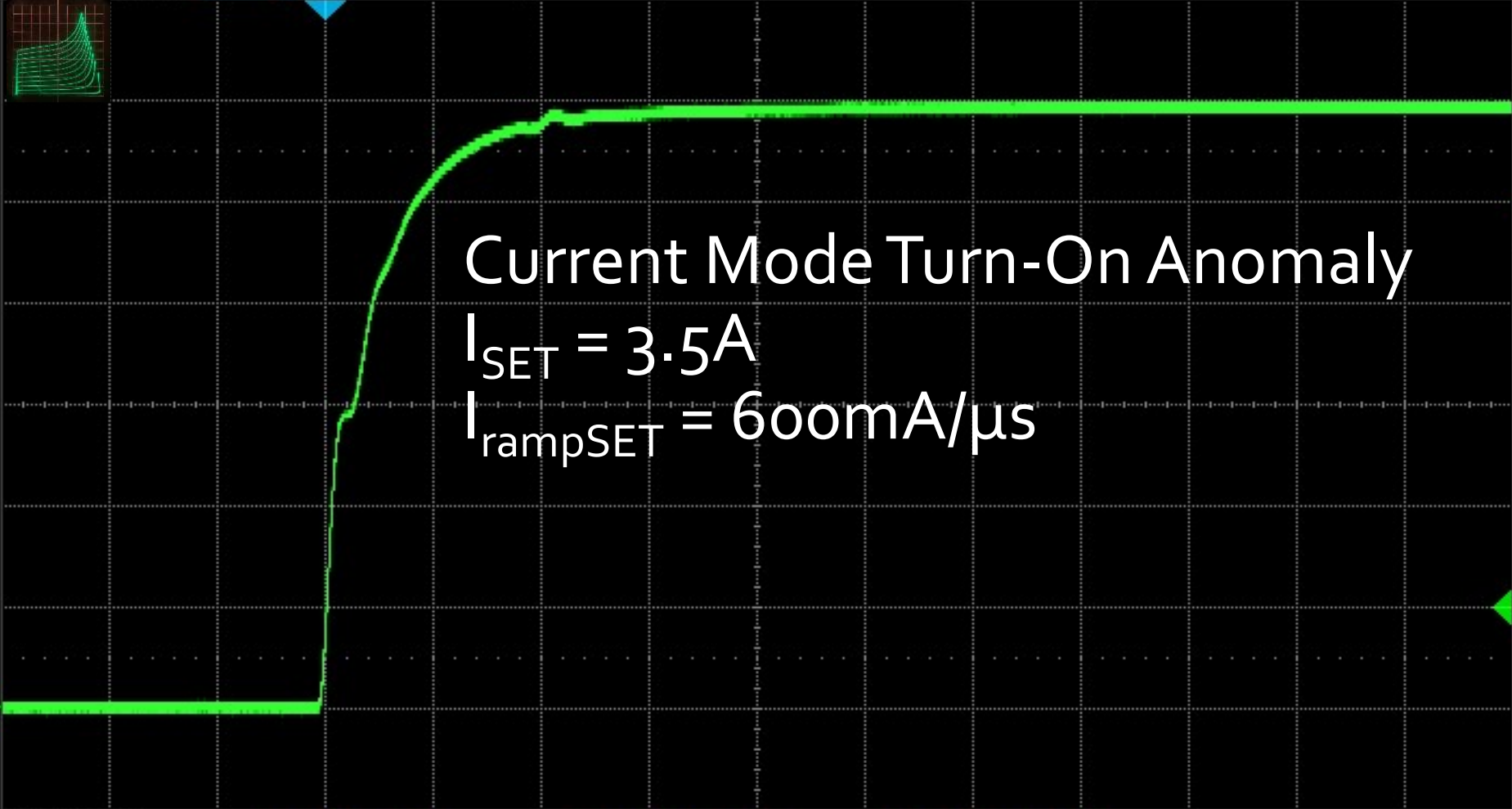
turn-on anomaly happens when any mode is 1st turned-on

BEICH Tran Test 23.8°C 21:35:07

MEAS DISP	:CLOSE	TRAN MODE	:CONT
LEVEL A	:0.0000A	WIDTH A	:2.000ms
LEVEL B	:5.0000A	WIDTH B	:2.000ms
TIME A TO B	:0.0006A/us	TIME A TO B	:0.0006A/us

V=12.184V I=0.0000A

BACK 24 START



Sa 1.00GSa/s
Curr 700kpts
Edge CH4
DC
L 490mA
4 DC1M
50X 500mA/V
-1.50A

Current Mode Turn-On Anomaly
 $I_{SET} = 3.5A$
 $I_{rampSET} = 600mA/\mu s$

TRIGGER

Max[4]=3.00A

Rise[4]=50.82us

Min[4]=-40.00mA

Type Edge

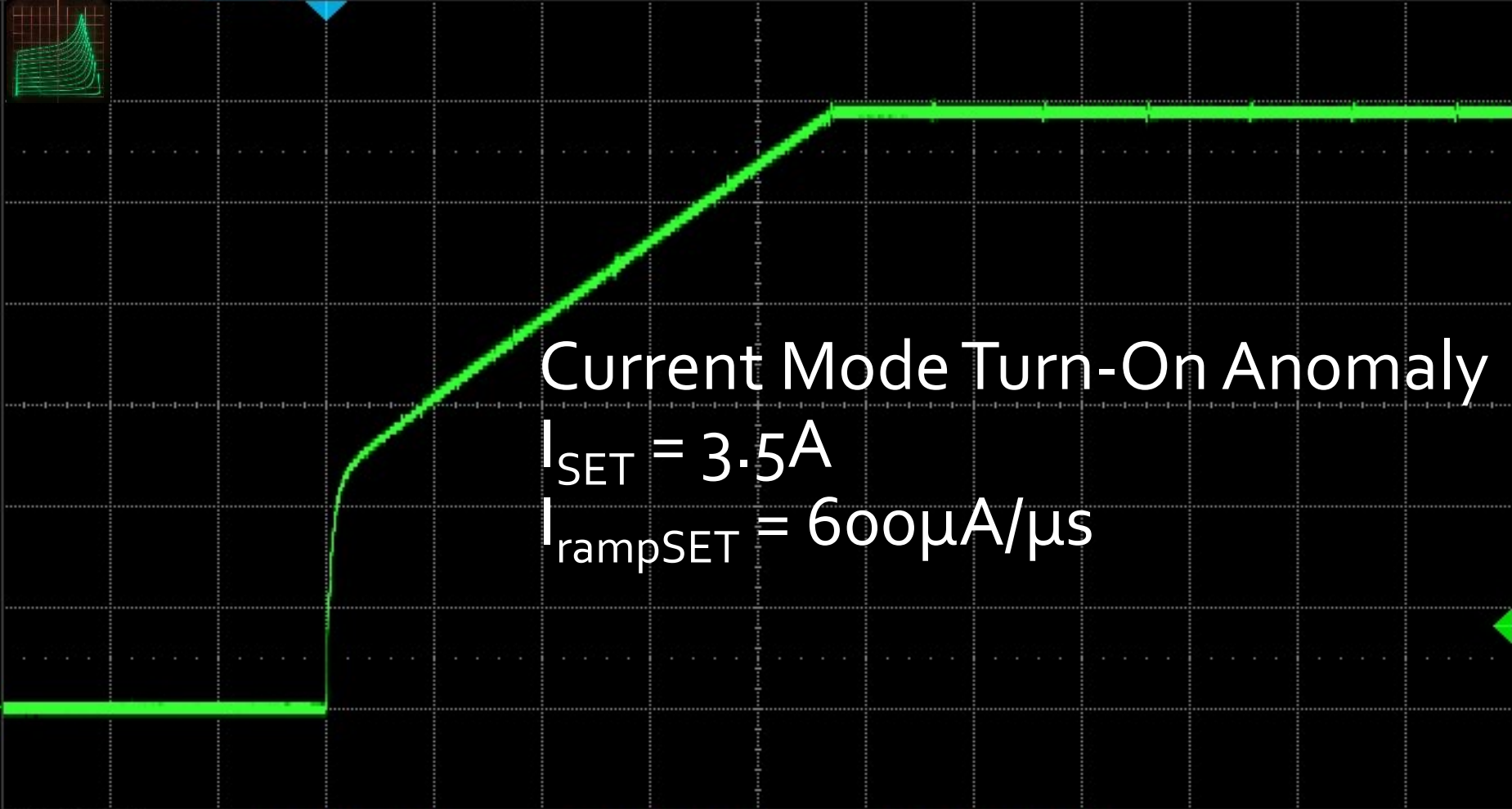
Source CH4

Slope Rising

Holdoff Close

Coupling DC

Noise Reject Off



Sa 1.00GSa/s
Curr 7.00Mpts
Edge CH4
DC
L 400mA
4 DC1M
50X 500mA/
-1.50A

CURSOR Max[4]=3.00A Rise[4]=1.86ms Min[4]=-40.00mA

Mode Manual

X2-X1
-1.124ms

Source CH4

Type X

X Ref Delay

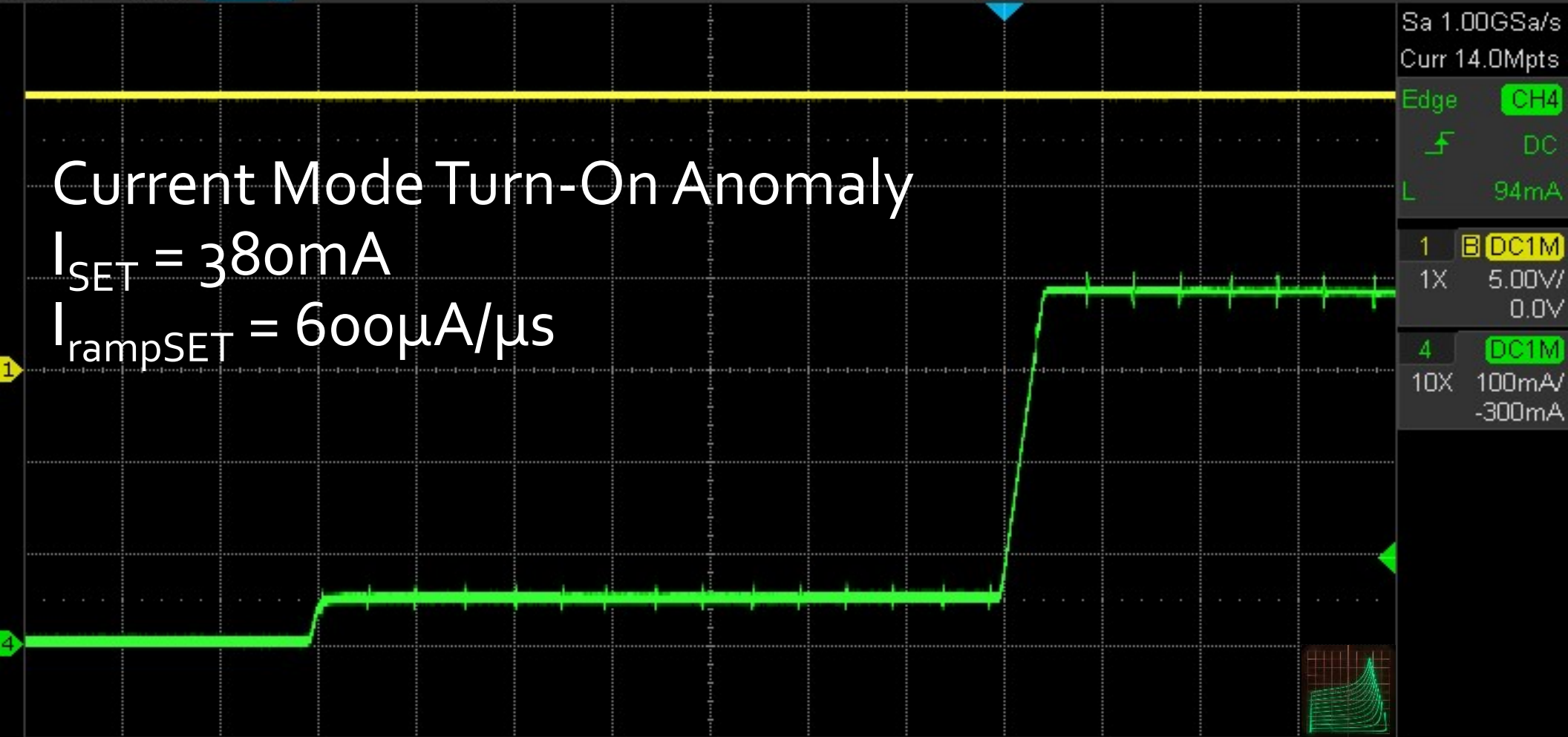
Y Ref Offset



Current Mode Turn-On Anomaly

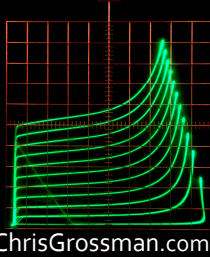
$$I_{SET} = 380\text{mA}$$

$$I_{rampSET} = 600\mu\text{A}/\mu\text{s}$$



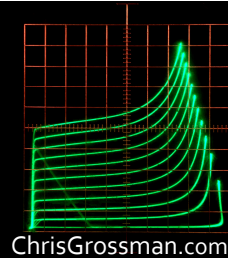
Beich CH9720CU Electronic Load

Saving Data & Screen Shots to a USB drive



- The ability to save data to the USB drive is one of the best features of this load
- Data can be saved to a USB drive anytime the load is enabled
- It saves Voltage & current reading plus a time-stamp per line in a CSV file
- The sampling rate is variable in 100 milli-second steps
 - Range is 100 milli-seconds (10 samples/s) to 10 seconds (1 sample/ 10 seconds)
 - The data save rate is set in the System Setup menu
- BMP screen shots can be saved anytime the data save mode is not active
- I have issues with the time-stamps and data format in the CSV files
 - It is still incredibly useful as is
 - I will detail my concerns in Part III of this review

Beich CH9720CU Electronic Load Battery Test Set-Up Screens



Constant Resistance Mode

BEICH BatTest Setup Rmt 20.6°C 09:35:47

DISCHAG MOD:	CR	CURVE FREQ :	10 S
BAT RES	5.0000Ω	END VOLT	0.0000V

Use 'ENT' to select

← → SAVE/CALL BACK ENTRYTEST

Constant Current Mode

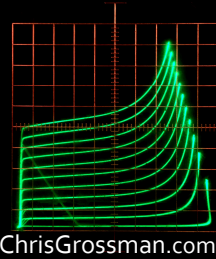
BEICH BatTest Setup Rmt 20.6°C 09:35:52

DISCHAG MOD:	CC	CURVE FREQ :	10 S
BAT CURR 1 :	0.1000A	END VOLT 1 :	0.9500V
BAT CURR 2 :	0.0000A	END VOLT 2 :	0.0000V
BAT CURR 3 :	0.0000A	END VOLT 3 :	0.0000V

Use 'ENT' to select

← → SAVE/CALL BACK ENTRYTEST

Beich CH9720CU Electronic Load Battery Test Set-Up Screens



Constant Resistance Mode

Constant Current Mode

BEICH BatTest Setup Rmt 20.6°C 09:35:47

DISCHAG MOD: **CR** CURVE FREQ : 10 S
 BAT RES 5.0000Ω END VOLT 0.0000V

Use 'ENT' to select

← → SAVE/CALL BACK ENTRYTEST

Curve frequency is the time between points on the voltage discharge graph and can be different than the time between points written to the USB drive

Number of points on graph or USB data file is limited to $2^{16} = 65,536$

BEICH BatTest Setup Rmt 20.6°C 09:35:52

DISCHAG MOD: **CC** CURVE FREQ : 10 S
 BAT CURR 1 : 0.1000A END VOLT 1 : 0.9500V
 BAT CURR 2 : 0.0000A END VOLT 2 : 0.0000V
 BAT CURR 3 : 0.0000A END VOLT 3 : 0.0000V

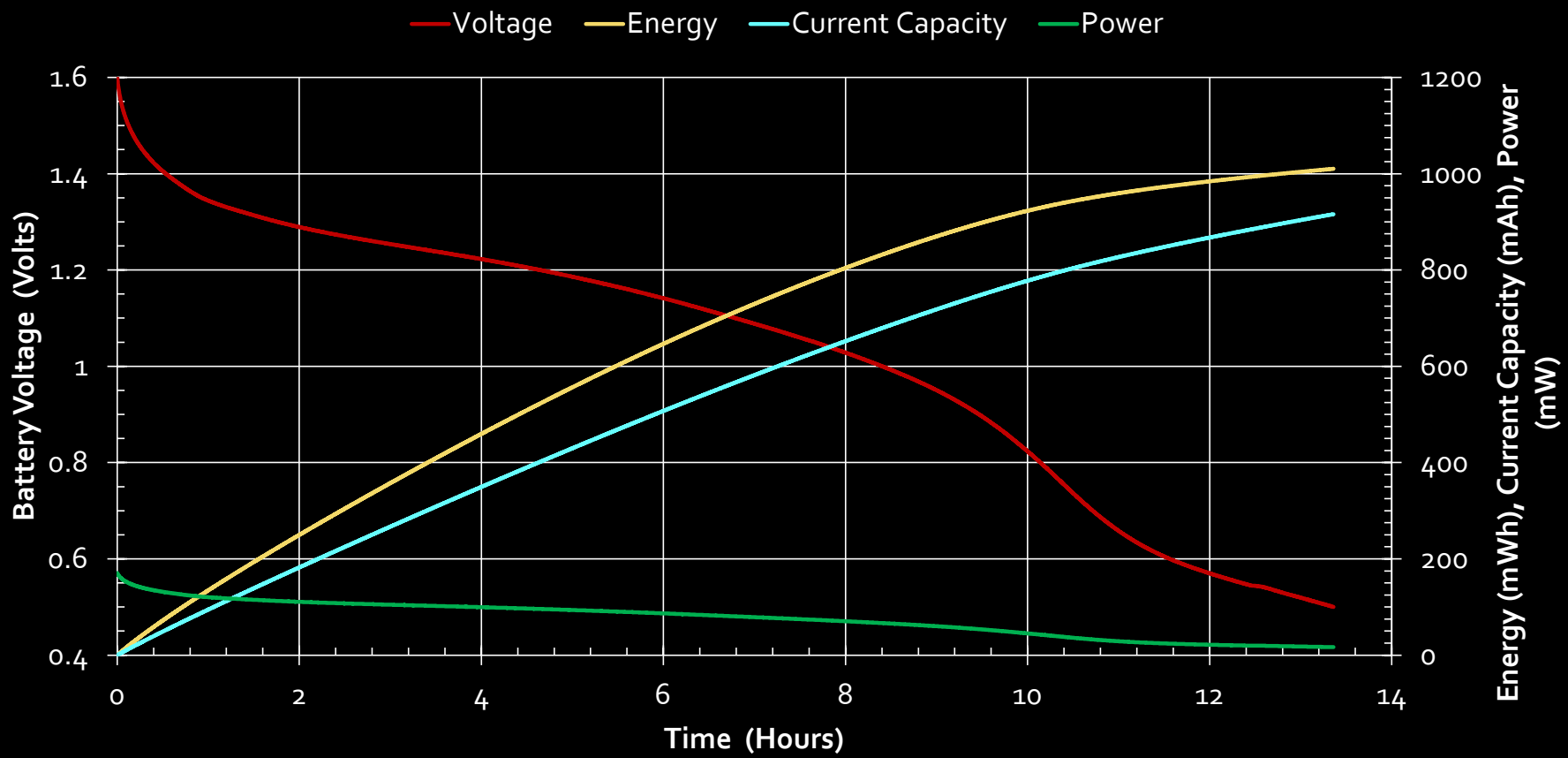
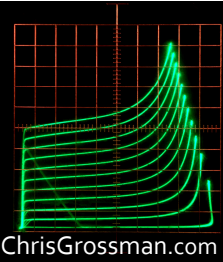
Use 'ENT' to select

← → SAVE/CALL BACK ENTRYTEST

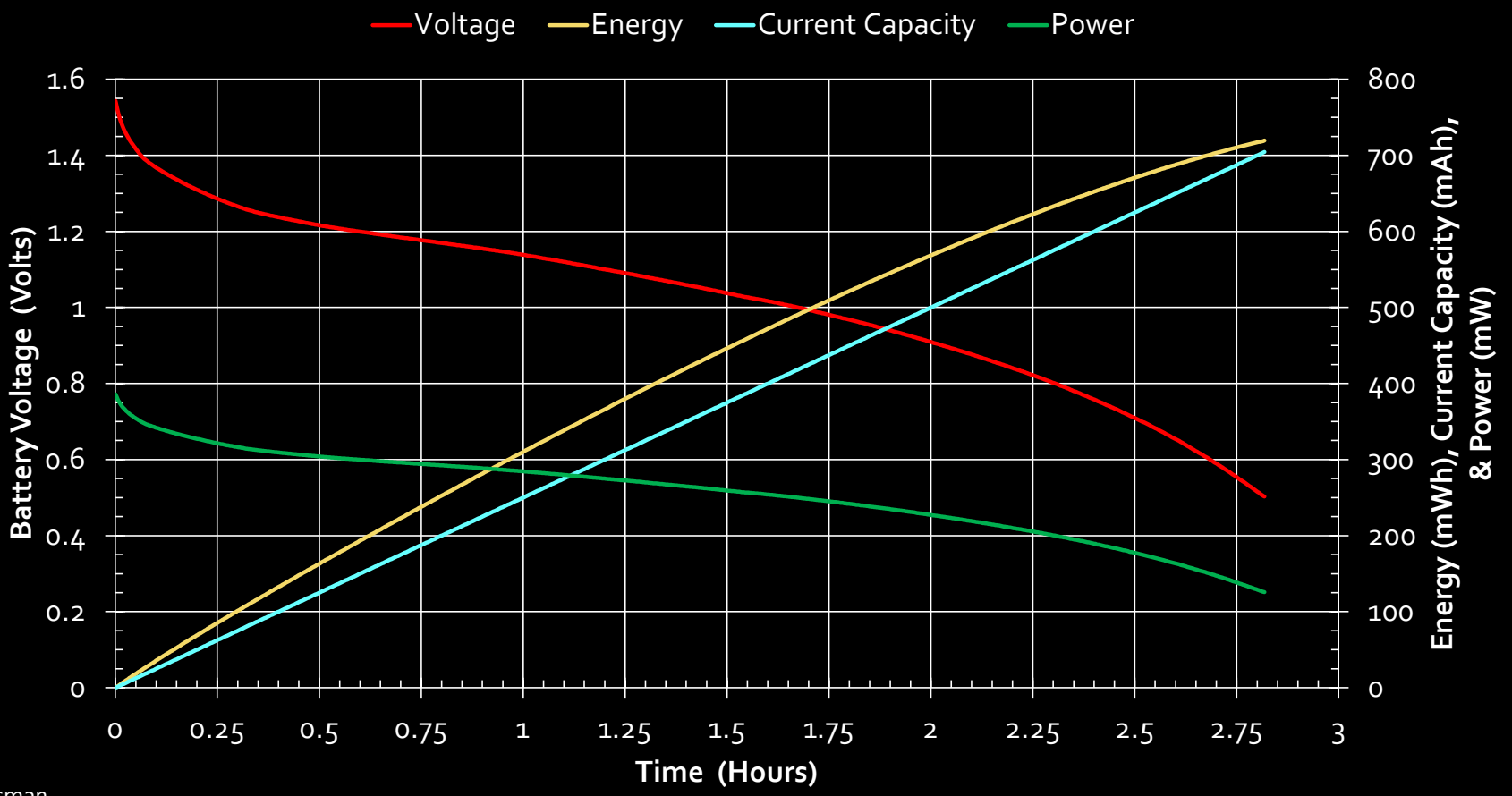
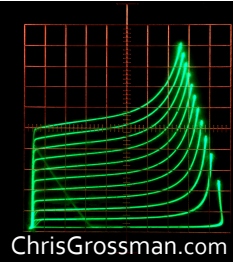
I=V=0 steps are skipped

end voltages must decrease
 $V_1 > V_2 > V_3$

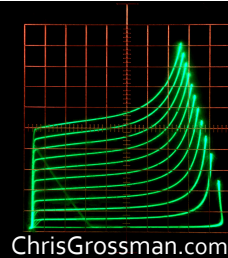
Harbor Freight AA Heavy Duty (Zinc Chloride) Battery 15Ω Constant Resistance Discharge



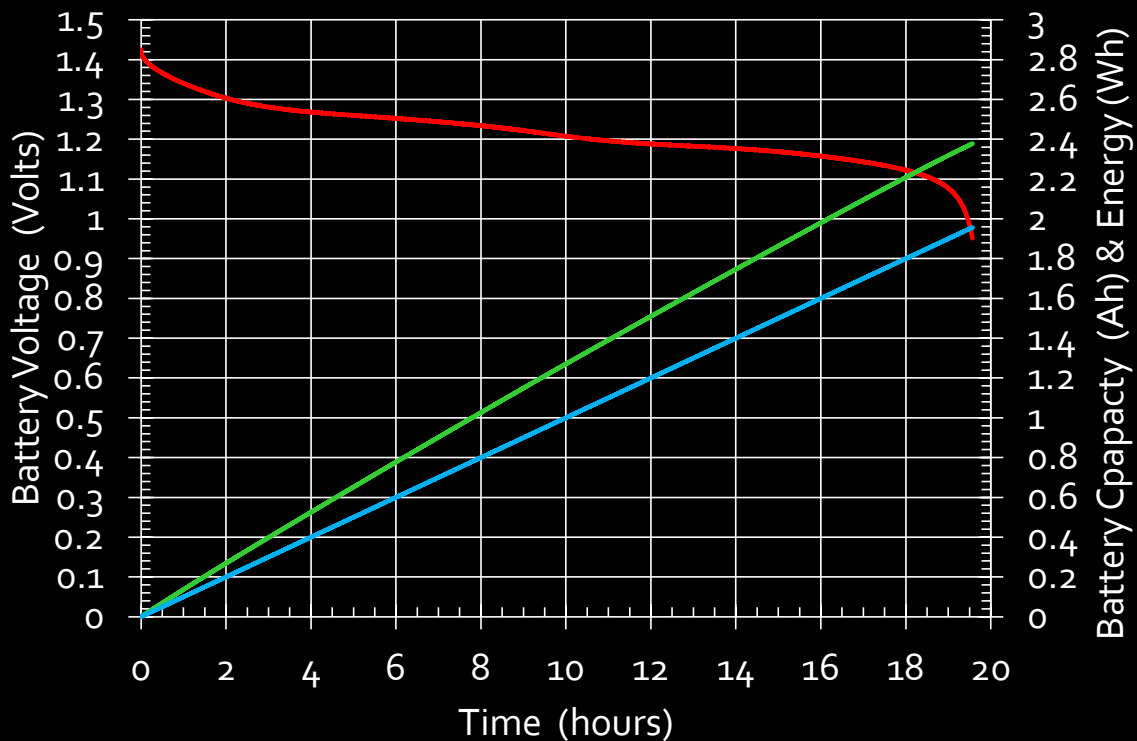
Harbor Freight AA Heavy Duty (Zinc Chloride) Battery 250mA Constant Current Discharge



AA Panasonic Enloop NiMH Battery 100mA Constant Current Discharge



— Voltage — Energy — Capacity



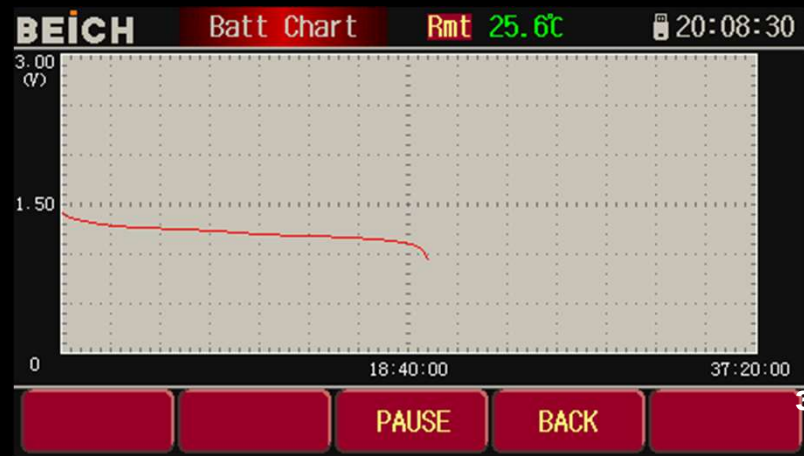
BEICH Batt Test Rmt 25.6°C 20:08:39

DISCHAG MOD: CC	CURVE FREQ :10 S
BAT CURR 1 :0.1000A	END VOLT 1 :0.9500V
BAT CURR 2 :0.0000A	END VOLT 2 :0.0000V
BAT CURR 3 :0.0000A	END VOLT 3 :0.0000V
1.1399V	0.0846Ω
0.0000A	1.9570AH
0.0000W	019h34m12s

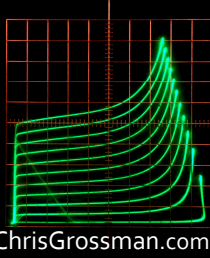
Initial dynamic R??

⚠

FORM PAUSE BACK START



Beich CH9720CU Electronic Load Review



→ ~~Part I. Function & Operation~~

Part II. Hardware & Tear Down

Part III. Discussion, Recommendations,
& Conclusion