

# Surge Testing – I-Max of CG(P)3 Series

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Test Date: 3/22/2022 – 3/24/2022

Test Location:

Mersen USA EP Corp Surge Testing Center

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Prepared For: ABB Inc

Customer Representative: Martin Guy

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MERSEN USA EP Corp

374 Merrimac St, Newburyport, MA 01950

[mersen.com](http://mersen.com)

The Mersen logo is displayed in a stylized font. The word "MERSEN" is in a light blue-grey color, and the final "N" is a larger, darker blue-grey. The letters are bold and modern.

## Background

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ABB sent a series 8 different models in their CG(P)3 series to Mersen to perform Surge Testing on these products. Products sent were as followed:

CG(P)3-050-208-3Y-xyz\*  
CG(P)3-100-208-3Y-xyz  
CG(P)3-150-208-3Y-xyz  
CG(P)3-200-208-3Y-xyz  
CG(P)3-050-480-3Y-xyz  
CG(P)3-100-480-3Y-xyz  
CG(P)3-150-480-3Y-xyz  
CG(P)3-200-480-3Y-xyz

\*xyz refers to Enclosure, Monitoring or Filter Type on the product

Each product has 7 modes. The modes are as follows: L1-N, L2-N, L3-N, L1-G, L2-G, L3-G and N-G.

Leads on the parts were trimmed to 6 inches before testing.

## Test Details

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Test Spec: ANSI/IEEE C62.41-2002, 8x20uS surge, up to 200kA

The Test for each product was broken into 4 different sections.

1. For each mode on the product, preform a Pre-MLV Shot (UL 6kV/3kA) and record the current and voltage.
2. Calibrate the 8/20uS surge through a short circuit. Adjust voltage on the surge equipment until required short circuit current matches the test current level required. Record the calibration wave, current only.
3. Without Adjusting the test voltage, place the UUT into the circuit and preform the required surge, record the current through the sample. Each mode on the UUT should be tested once.
4. Repeat step one, recording the Current and voltage. Record the percent difference in MLV from before and after the 8/20uS surge. The sample is considered to have passed the testing if the difference in MLV is less than 10%.

A total of 172 shots are to be recorded.

## Results

### Test Conditions:

24.6°C

32% Humidity

### Calibration Results:

| Test Current | Short Circuit Current Actual | Test Voltage         |
|--------------|------------------------------|----------------------|
| 50kA         | 50.4kA                       | 11.4kV               |
| 100kA        | 101kA                        | 23.0kV               |
| 150kA        | 150kA                        | 33.5kV               |
| 200kA        | 194kA *                      | 39.9kV (Max Voltage) |

\* The maximum SSC of the surge generator

| CG(P)3-050-208-3Y-xyz* 50kA Surge |             |                   |           |              |        |        |
|-----------------------------------|-------------|-------------------|-----------|--------------|--------|--------|
| Mode                              | Pre-MLV (V) | Test Voltage (kV) | Actual kA | Post-MLV (V) | % Diff | Result |
| L1-N                              | 552         | 11.4              | 43.6      | 560          | 1%     | Pass   |
| L2-N                              | 496         | 11.4              | 44        | 544          | 10%    | Pass   |
| L3-N                              | 560         | 11.4              | 43.6      | 568          | 1%     | Pass   |
| L1-G                              | 584         | 11.4              | 43.2      | 592          | 1%     | Pass   |
| L2-G                              | 568         | 11.4              | 43.2      | 592          | 4%     | Pass   |
| L3-G                              | 576         | 11.4              | 43.2      | 592          | 3%     | Pass   |
| N-G                               | 592         | 11.4              | 43.2      | 584          | -1%    | Pass   |

| CG(P)3-100-208-3Y-xyz 100kA |             |                   |           |              |        |        |
|-----------------------------|-------------|-------------------|-----------|--------------|--------|--------|
| Mode                        | Pre-MLV (V) | Test Voltage (kV) | Actual kA | Post-MLV (V) | % Diff | Result |
| L1-N                        | 560         | 23.0              | 92        | 560          | 0%     | Pass   |
| L2-N                        | 552         | 23.0              | 91.2      | 560          | 1%     | Pass   |
| L3-N                        | 512         | 23.0              | 93.6      | 536          | 5%     | Pass   |
| L1-G                        | 584         | 23.0              | 91.2      | 600          | 3%     | Pass   |
| L2-G                        | 584         | 23.0              | 90.4      | 624          | 7%     | Pass   |
| L3-G                        | 576         | 23.0              | 91.2      | 600          | 4%     | Pass   |
| N-G                         | 608         | 23.0              | 91.2      | 616          | 1%     | Pass   |

| CG(P)3-150-208-3Y-xyz 150kA |             |                   |           |              |        |        |
|-----------------------------|-------------|-------------------|-----------|--------------|--------|--------|
| Mode                        | Pre-MLV (V) | Test Voltage (kV) | Actual kA | Post-MLV (V) | % Diff | Result |
| L1-N                        | 568         | 33.5              | 138       | 592          | 4%     | Pass   |
| L2-N                        | 560         | 33.5              | 136       | 584          | 4%     | Pass   |
| L3-N                        | 632         | 33.5              | 132       | 656          | 4%     | Pass   |
| L1-G                        | 640         | 33.5              | 132       | 656          | 3%     | Pass   |
| L2-G                        | 616         | 33.5              | 134       | 672          | 9%     | Pass   |
| L3-G                        | 640         | 33.5              | 132       | 672          | 5%     | Pass   |
| N-G                         | 696         | 33.5              | 134       | 712          | 2%     | Pass   |

| CG(P)3-200-208-3Y-xyz 200kA |             |                   |           |              |        |        |
|-----------------------------|-------------|-------------------|-----------|--------------|--------|--------|
| Mode                        | Pre-MLV (V) | Test Voltage (kV) | Actual kA | Post-MLV (V) | % Diff | Result |
| L1-N                        | 552         | 39.9              | 180       | 592          | 7%     | Pass   |
| L2-N                        | 568         | 39.9              | 180       | 616          | 8%     | Pass   |
| L3-N                        | 624         | 39.9              | 178       | 688          | 10%    | Pass   |
| L1-G                        | 632         | 39.9              | 178       | 680          | 8%     | Pass   |
| L2-G                        | 624         | 39.9              | 178       | 672          | 8%     | Pass   |
| L3-G                        | 656         | 39.9              | 174       | 696          | 6%     | Pass   |
| N-G                         | 696         | 39.9              | 178       | 712          | 2%     | Pass   |

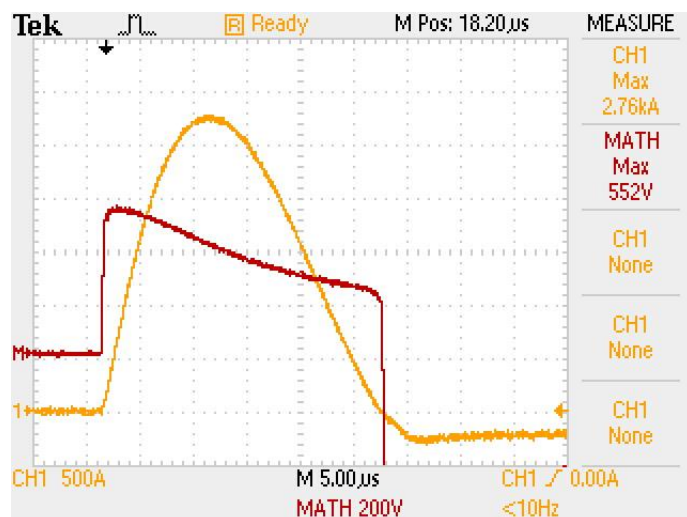
| CG(P)3-050-480-3Y-xyz 50kA |             |                   |           |              |        |        |
|----------------------------|-------------|-------------------|-----------|--------------|--------|--------|
| Mode                       | Pre-MLV (V) | Test Voltage (kV) | Actual kA | Post-MLV (V) | % Diff | Result |
| L1-N                       | 1020        | 11.4              | 41.2      | 1020         | 0%     | Pass   |
| L2-N                       | 1010        | 11.4              | 41.2      | 1040         | 3%     | Pass   |
| L3-N                       | 1010        | 11.4              | 41.2      | 1020         | 1%     | Pass   |
| L1-G                       | 1050        | 11.4              | 40.4      | 1060         | 1%     | Pass   |
| L2-G                       | 1060        | 11.4              | 40.4      | 1060         | 0%     | Pass   |
| L3-G                       | 1060        | 11.4              | 40.4      | 1080         | 2%     | Pass   |
| N-G                        | 1100        | 11.4              | 40.8      | 1040         | -5%    | Pass   |

| CG(P)3-100-480-3Y-xyz 100kA |             |                   |           |              |        |        |
|-----------------------------|-------------|-------------------|-----------|--------------|--------|--------|
| Mode                        | Pre-MLV (V) | Test Voltage (kV) | Actual kA | Post-MLV (V) | % Diff | Result |
| L1-N                        | 1020        | 23.0              | 88.8      | 1100         | 8%     | Pass   |
| L2-N                        | 1000        | 23.0              | 89.6      | 1060         | 6%     | Pass   |
| L3-N                        | 980         | 23.0              | 88.8      | 1060         | 8%     | Pass   |
| L1-G                        | 1040        | 23.0              | 89.6      | 1060         | 2%     | Pass   |
| L2-G                        | 1040        | 23.0              | 88        | 1060         | 2%     | Pass   |
| L3-G                        | 1060        | 23.0              | 87.2      | 1040         | -2%    | Pass   |
| N-G                         | 1080        | 23.0              | 87.2      | 1060         | -2%    | Pass   |

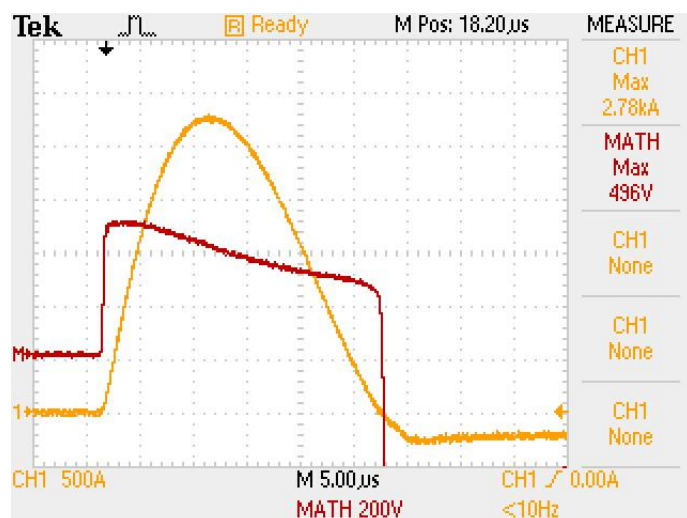
| CG(P)3-150-480-3Y-xyz 150kA |             |                   |           |              |        |        |
|-----------------------------|-------------|-------------------|-----------|--------------|--------|--------|
| Mode                        | Pre-MLV (V) | Test Voltage (kV) | Actual kA | Post-MLV (V) | % Diff | Result |
| L1-N                        | 1000        | 32.2              | 136       | 1090         | 9%     | Pass   |
| L2-N                        | 1000        | 33.5              | 132       | 1100         | 10%    | Pass   |
| L3-N                        | 1060        | 33.5              | 132       | 1100         | 4%     | Pass   |
| L1-G                        | 1040        | 33.5              | 132       | 1120         | 8%     | Pass   |
| L2-G                        | 1020        | 33.5              | 132       | 1120         | 10%    | Pass   |
| L3-G                        | 1040        | 33.5              | 130       | 1140         | 10%    | Pass   |
| N-G                         | 1100        | 33.5              | 130       | 1160         | 5%     | Pass   |

| CG(P)3-200-480-3Y-xyz 200kA |             |                   |           |              |        |        |
|-----------------------------|-------------|-------------------|-----------|--------------|--------|--------|
| Mode                        | Pre-MLV (V) | Test Voltage (kV) | Actual kA | Post-MLV (V) | % Diff | Result |
| L1-N                        | 1040        | 39.9              | 180       | 1080         | 4%     | Pass   |
| L2-N                        | 1000        | 39.9              | 176       | 1080         | 8%     | Pass   |
| L3-N                        | 1060        | 39.9              | 174       | 1120         | 6%     | Pass   |
| L1-G                        | 1080        | 39.9              | 174       | 1180         | 9%     | Pass   |
| L2-G                        | 1080        | 39.9              | 174       | 1140         | 6%     | Pass   |
| L3-G                        | 1120        | 39.9              | 172       | 1180         | 5%     | Pass   |
| N-G                         | 1140        | 39.9              | 176       | 1180         | 4%     | Pass   |

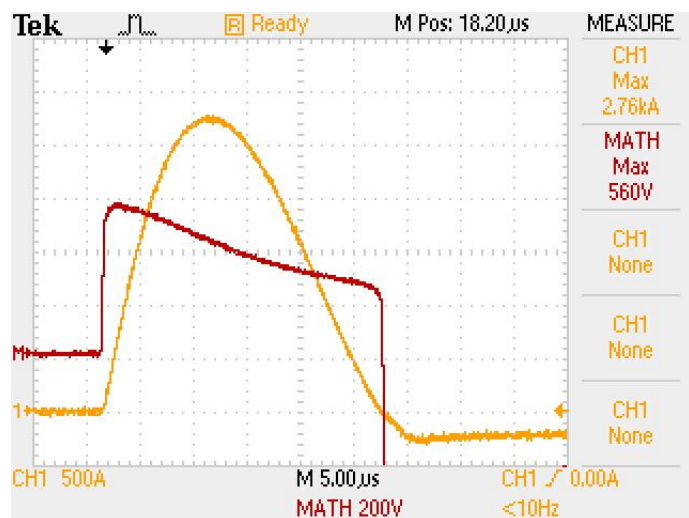
## Scope Traces



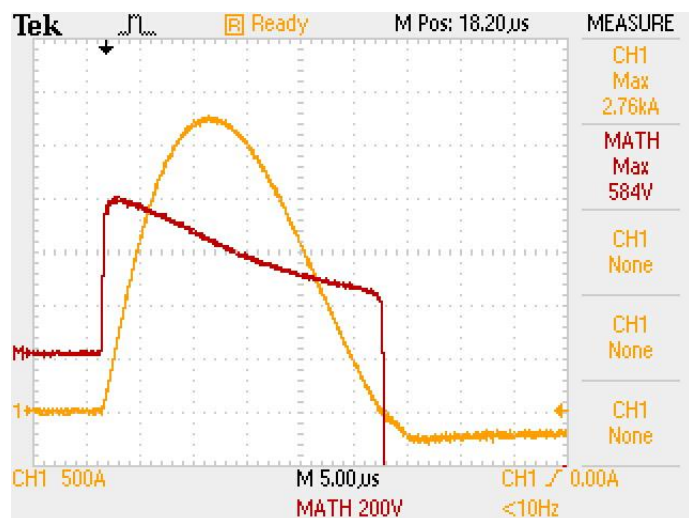
Shot 1A, Sample 1 L1-N Pre-MLV



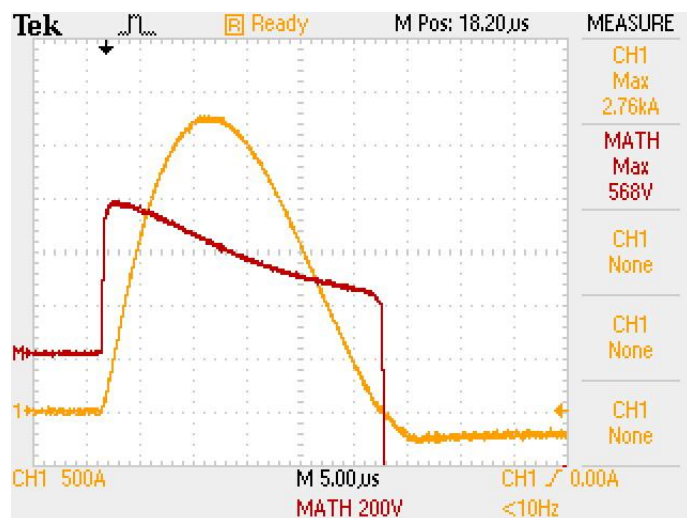
Shot 2A, Sample 1 L2-N Pre-MLV



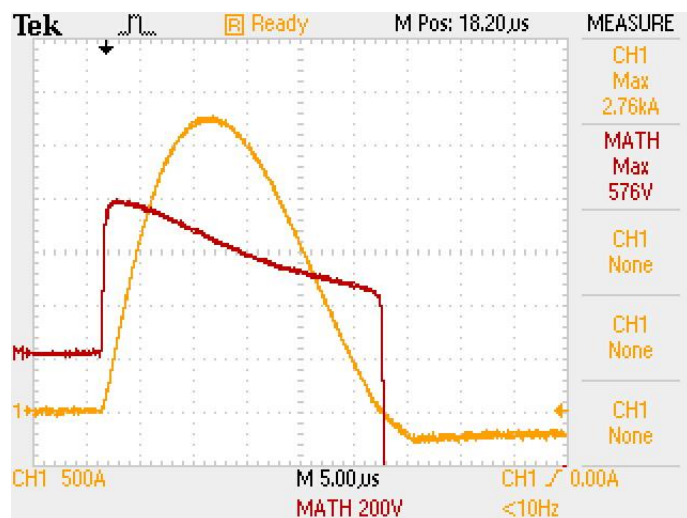
Shot 3A, Sample 1 L3-N Pre-MLV



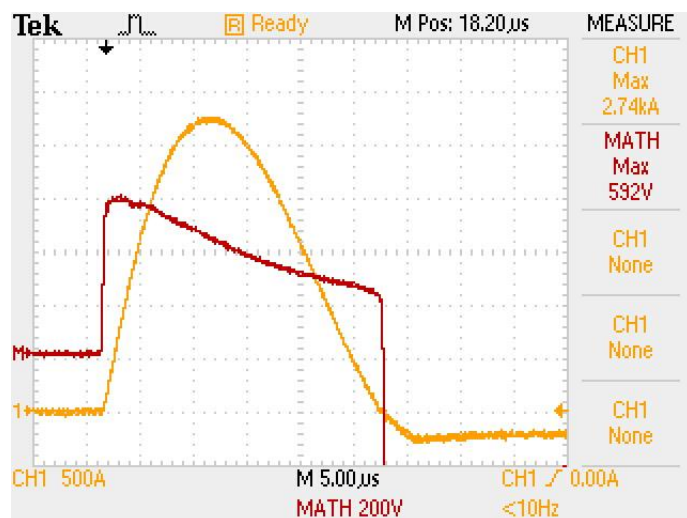
Shot 4A, Sample 1 L1-G Pre-MLV



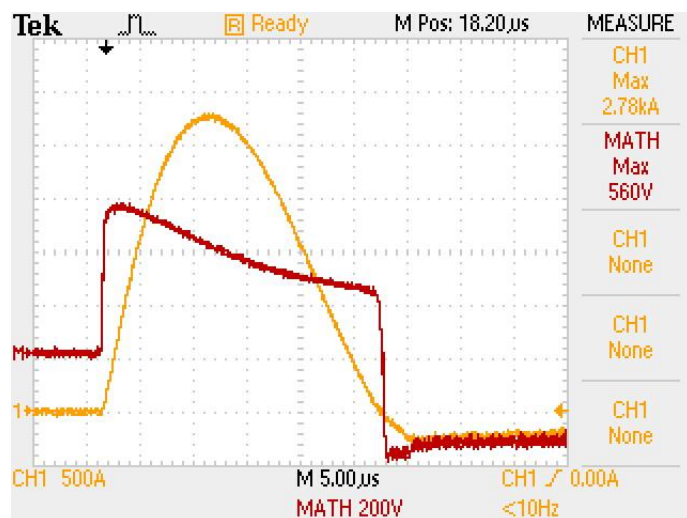
Shot 5A, Sample 1 L2-G Pre-MLV



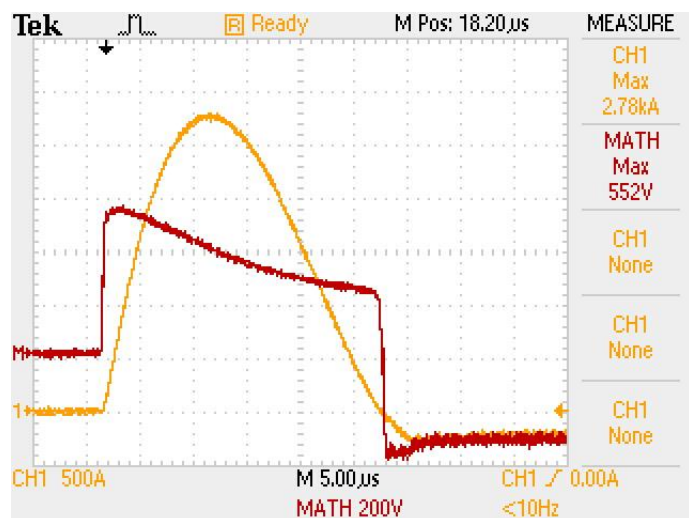
Shot 6A, Sample 1 L3-G Pre-MLV



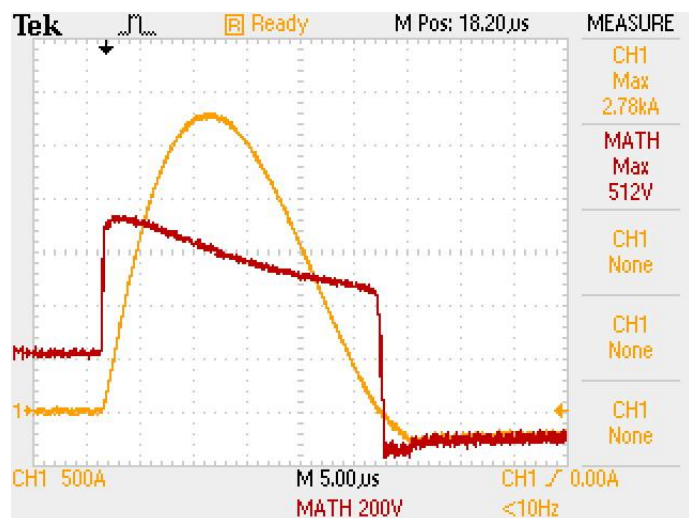
Shot 7A, Sample 1 N-G Pre-MLV



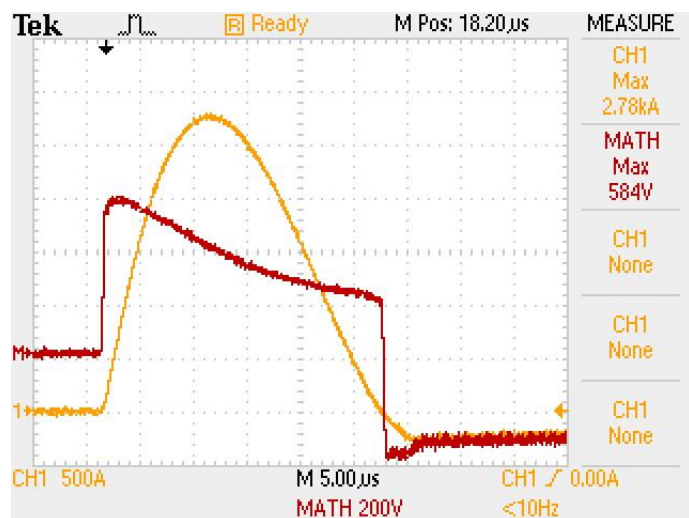
Shot 8A, Sample 2 L1-N Pre-MLV



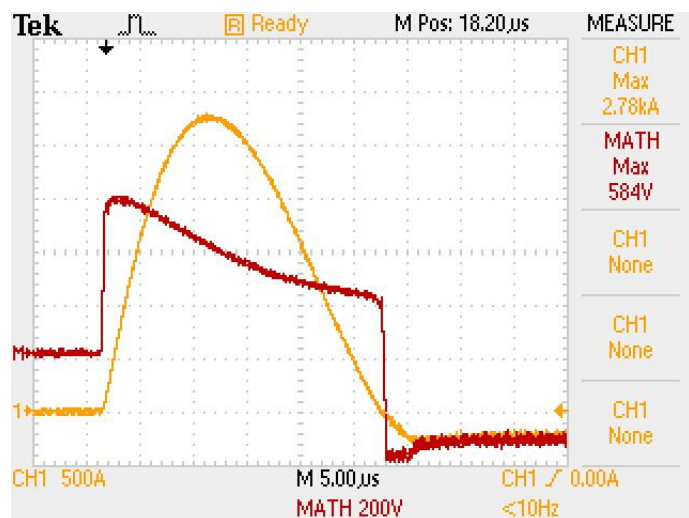
Shot 9A, Sample 2 L2-N Pre-MLV



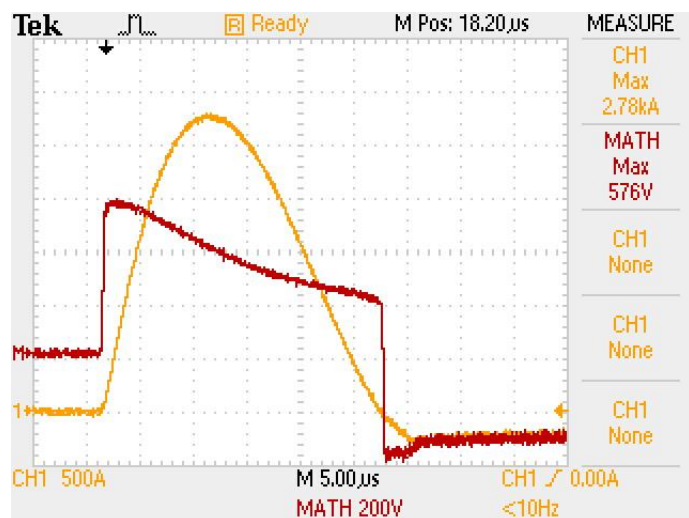
Shot 10A, Sample 2 L3-N Pre-MLV



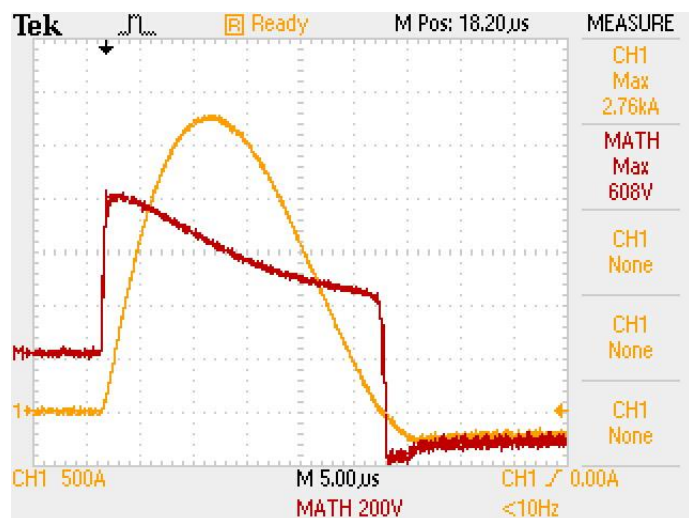
Shot 11A, Sample 2 L1-G Pre-MLV



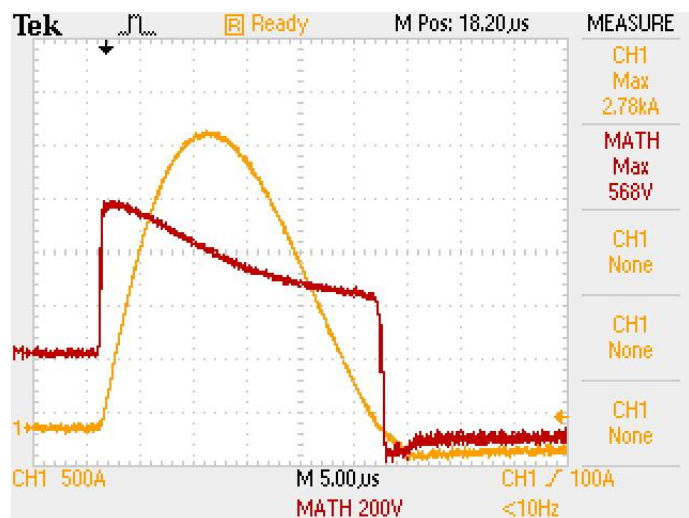
Shot 12A, Sample 2 L2-G Pre-MLV



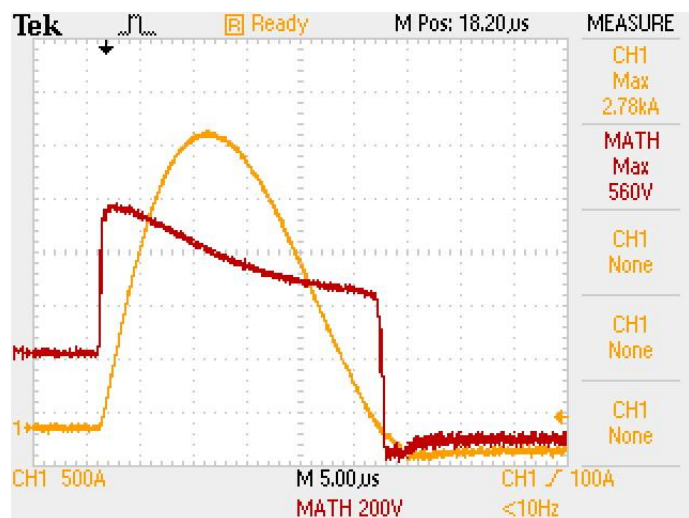
Shot 13A, Sample 2 L3-G Pre-MLV



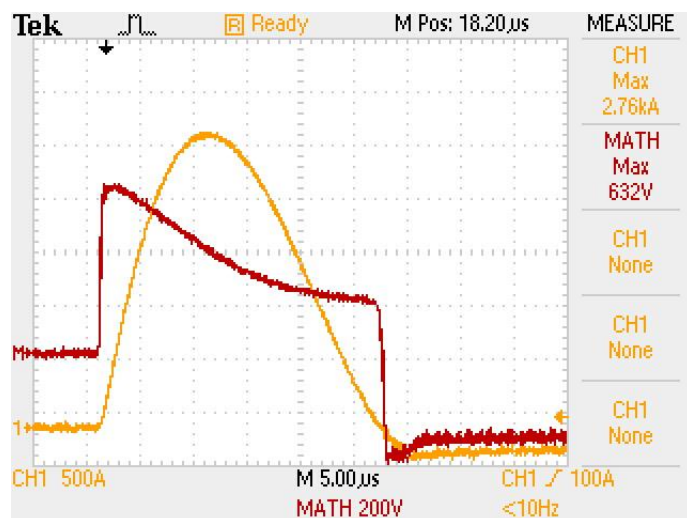
Shot 14A, Sample 2 N-G Pre-MLV



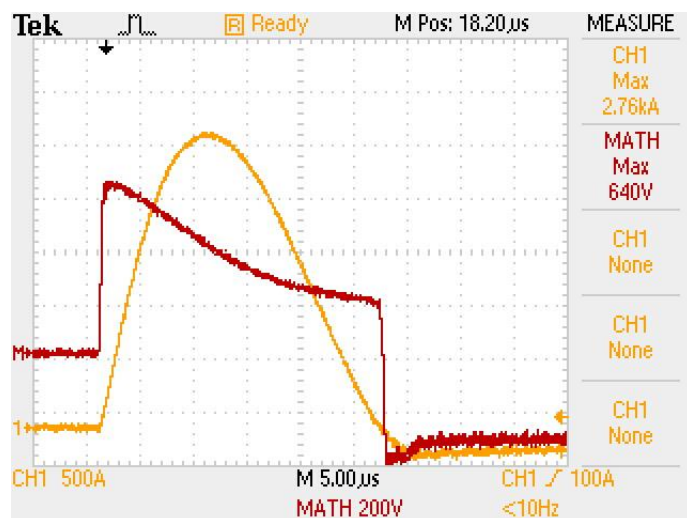
Shot 15A, Sample 3 L1-N Pre-MLV



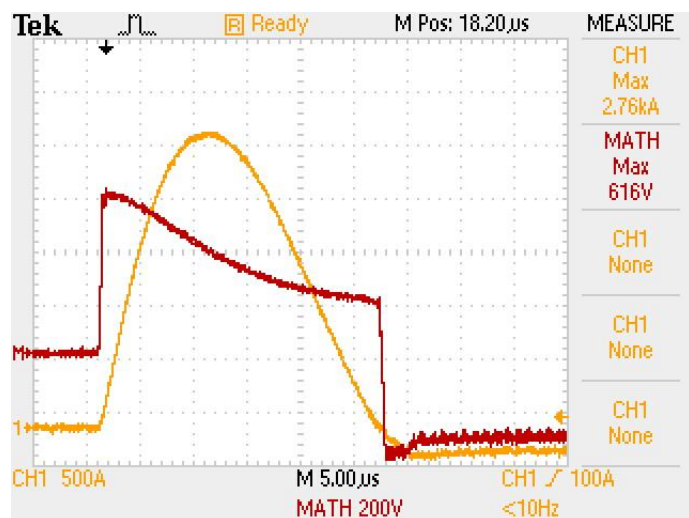
Shot 16A, Sample 3 L2-N Pre-MLV



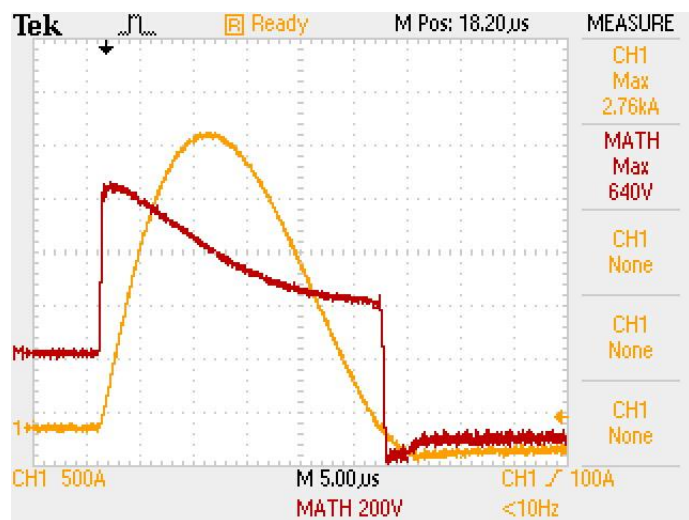
Shot 17A, Sample 3 L3-N Pre-MLV



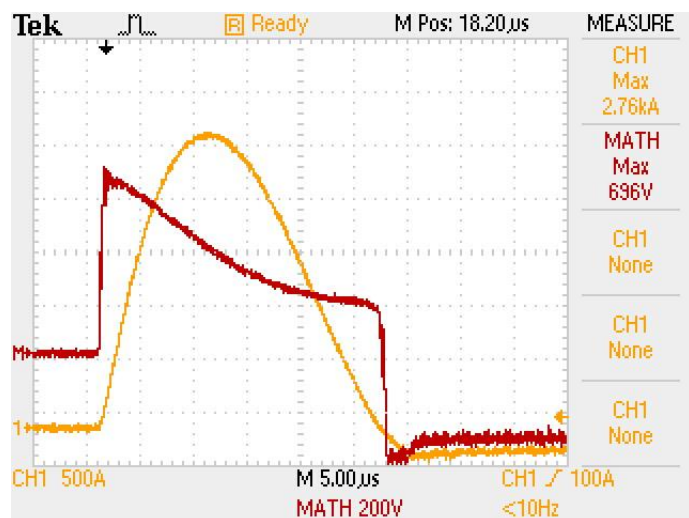
Shot 18A, Sample 3 L1-G Pre-MLV



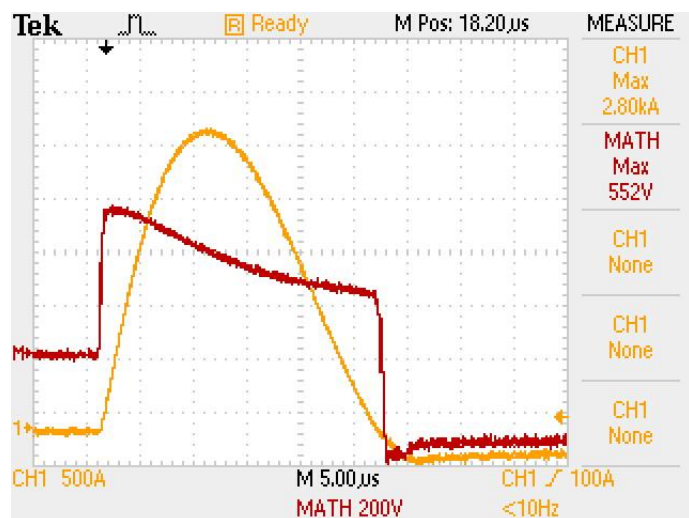
Shot 19A, Sample 3 L2-G Pre-MLV



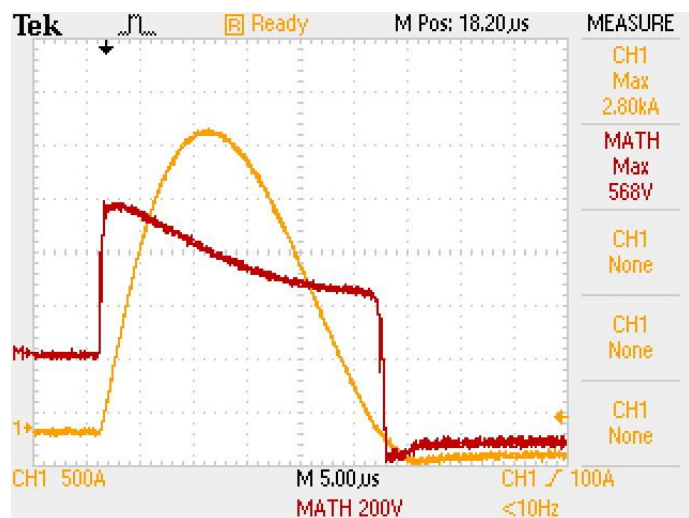
Shot 20A, Sample 3 L3-G Pre-MLV



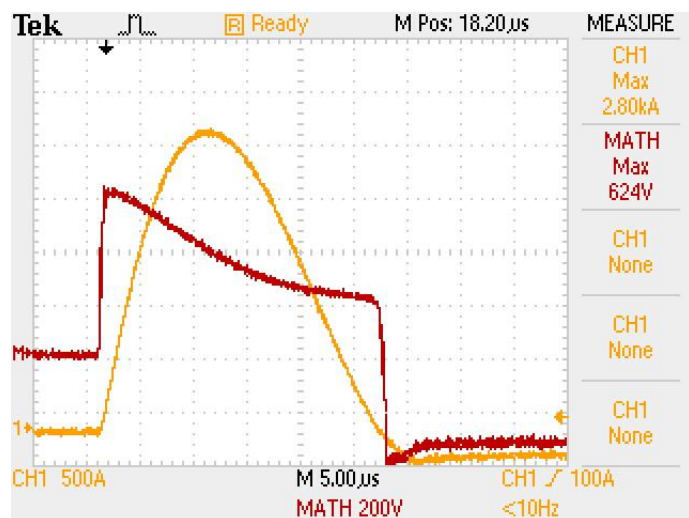
Shot 21A, Sample 3 N-G Pre-MLV



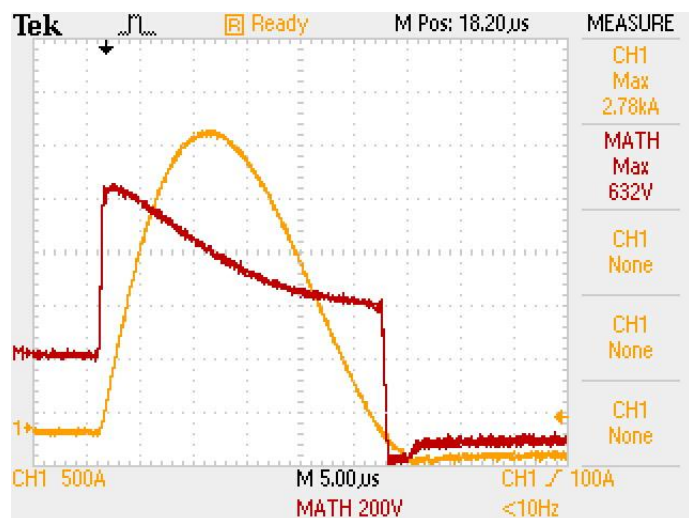
Shot 22A, Sample 4 L1-G Pre-MLV



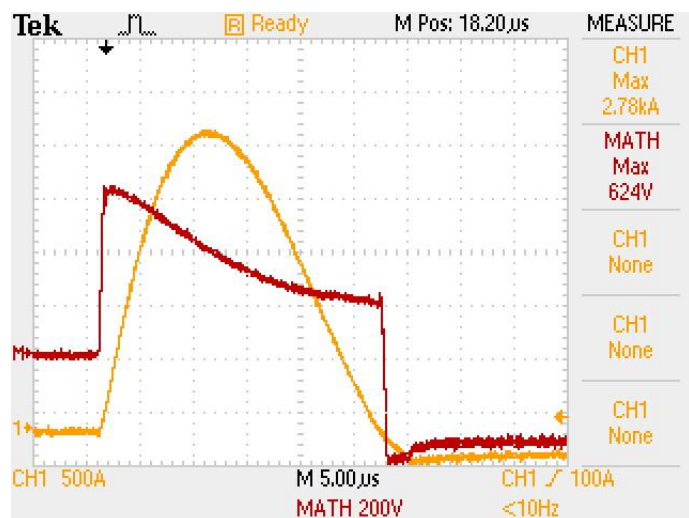
Shot 23A, Sample 4 L2-N Pre-MLV



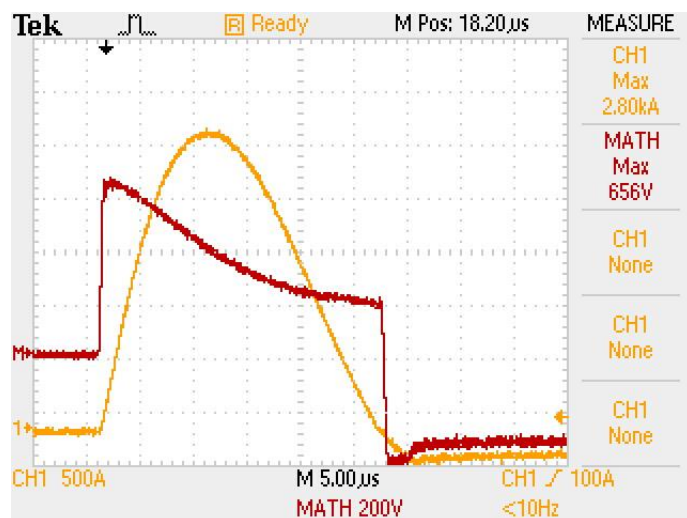
Shot 24A, Sample 4 L3-N Pre-MLV



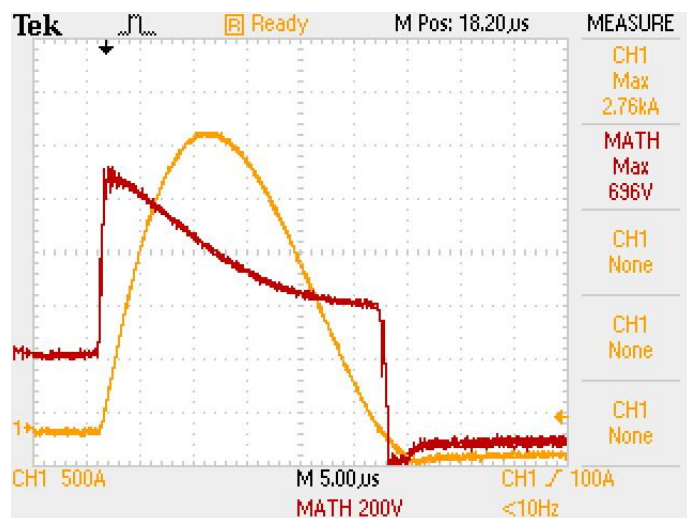
Shot 25A, Sample 4 L1-G Pre-MLV



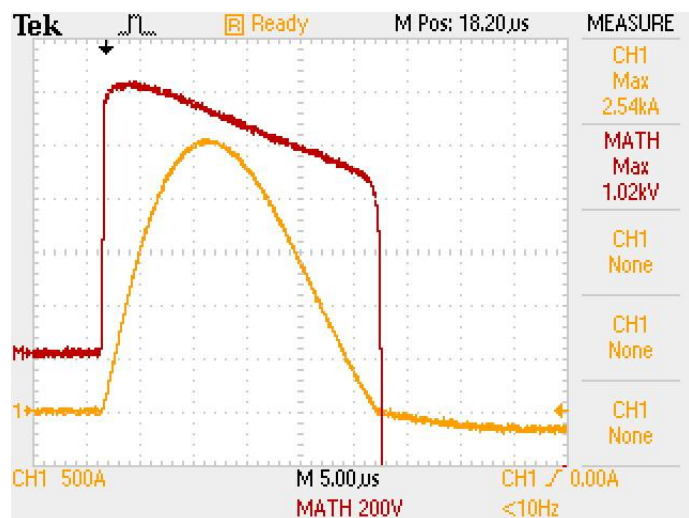
Shot 26A, Sample 4 L2-G Pre-MLV



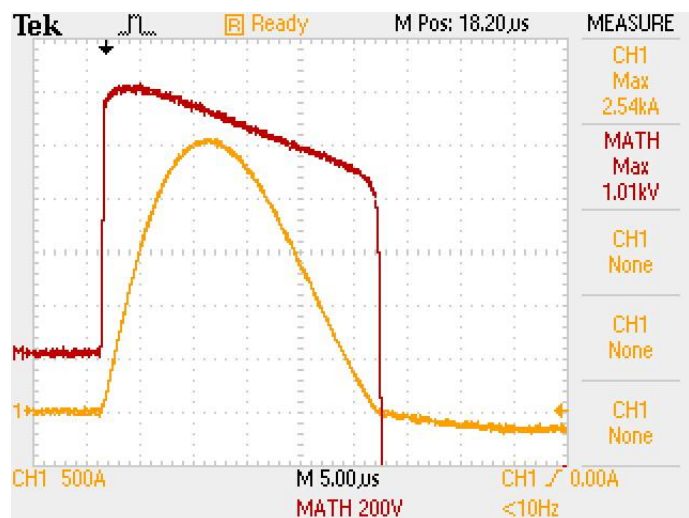
Shot 27A, Sample 4 L3-G Pre-MLV



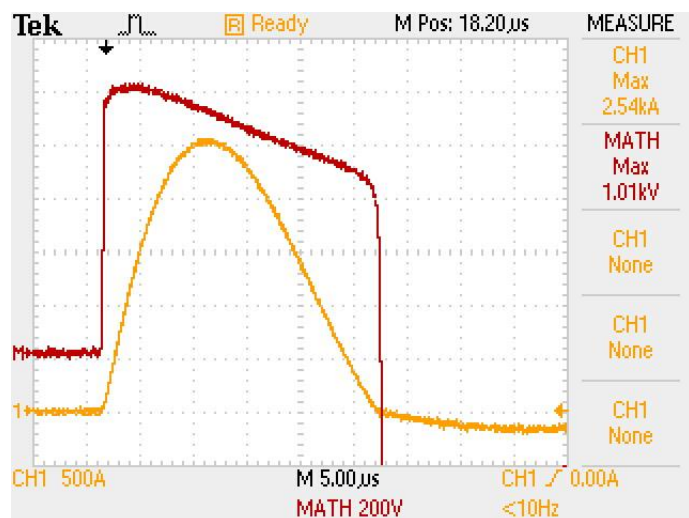
Shot 28A, Sample 4 N-G Pre-MLV



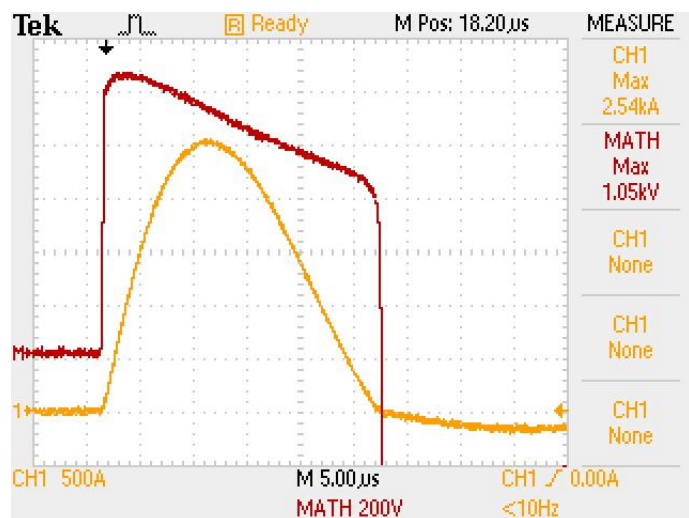
Shot 29A, Sample 5 L1-N Pre-MLV



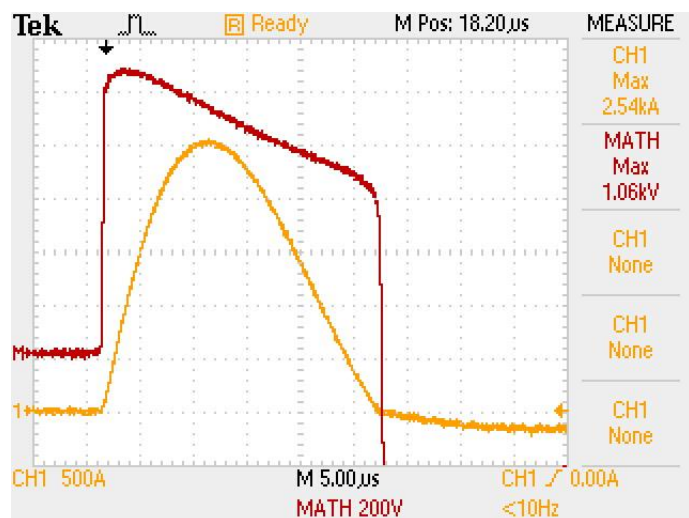
Shot 30A, Sample 5 L2-N Pre-MLV



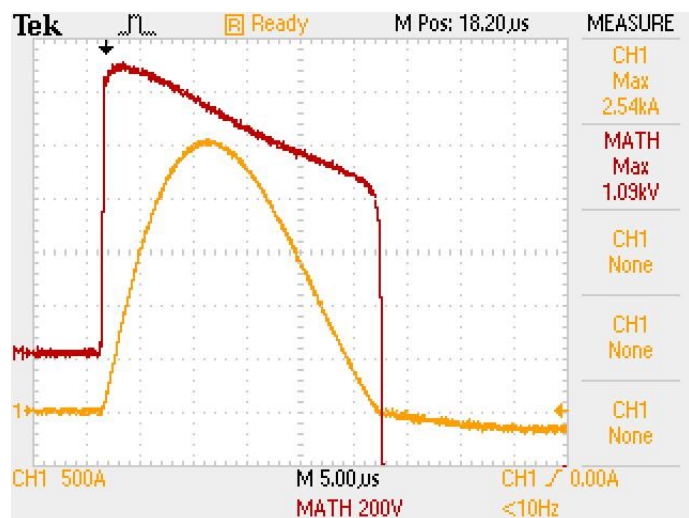
Shot 31A, Sample 5 L3-N Pre-MLV



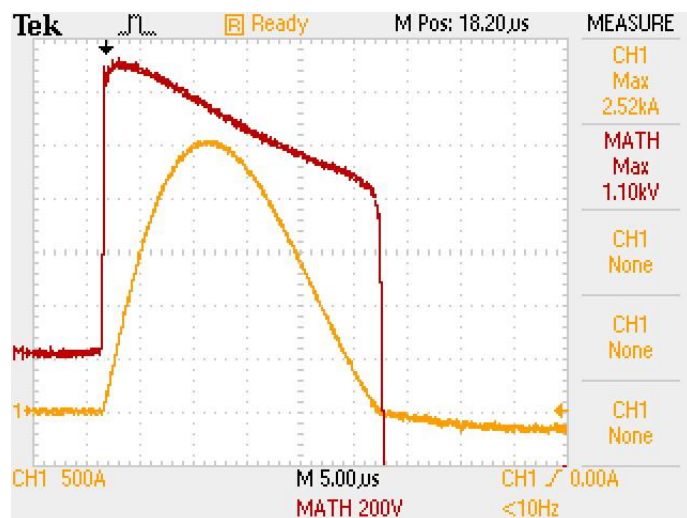
Shot 32A, Sample 5 L1-G Pre-MLV



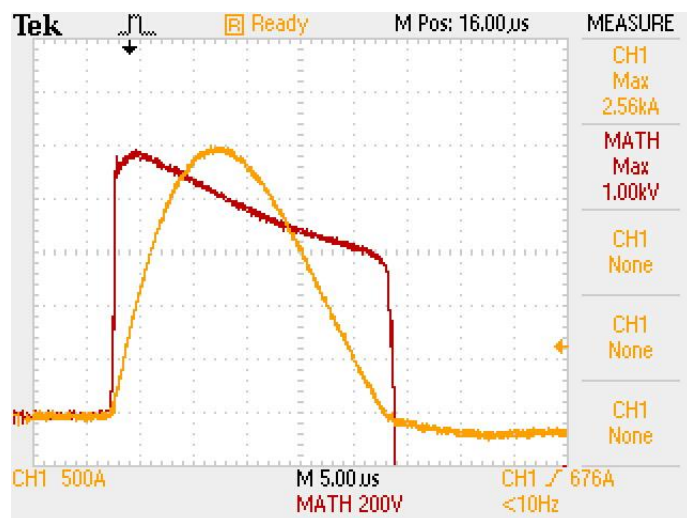
Shot 33A, Sample 5 L2-G Pre-MLV



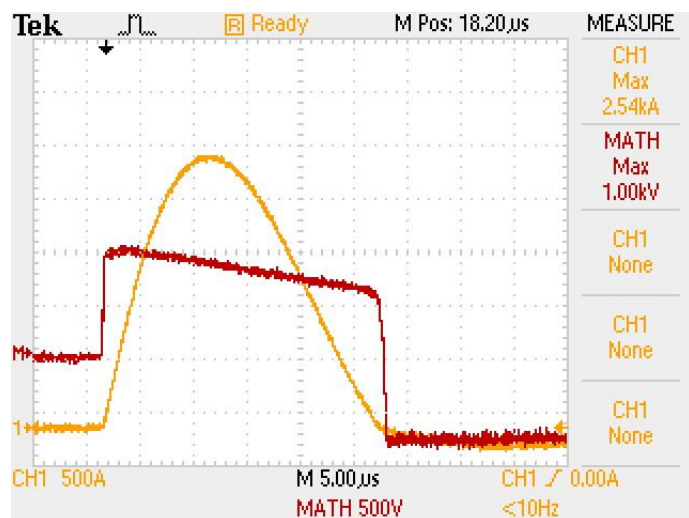
Shot 34A, Sample 5 L3-G Pre-MLV



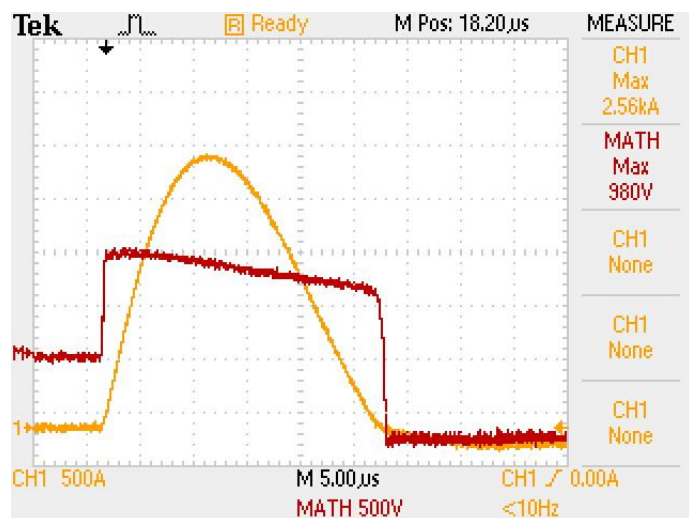
Shot 35A, Sample 5 N-G Pre-MLV



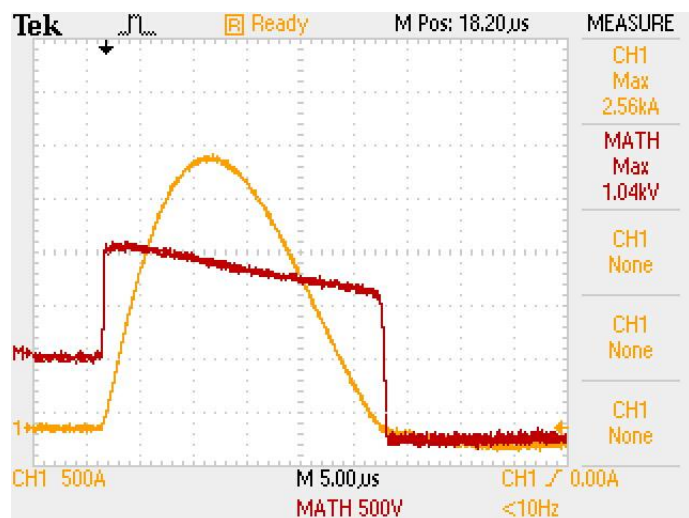
Shot 36A, Sample 6 L1-G Pre-MLV



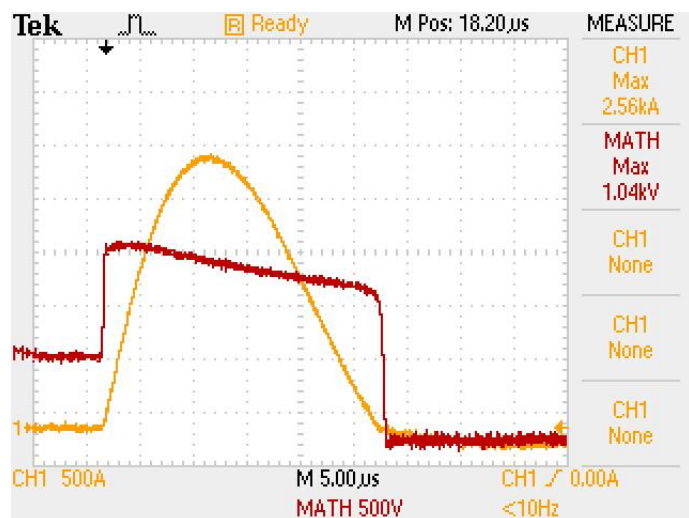
**Shot 37A, Sample 6 L2-N Pre-MLV**



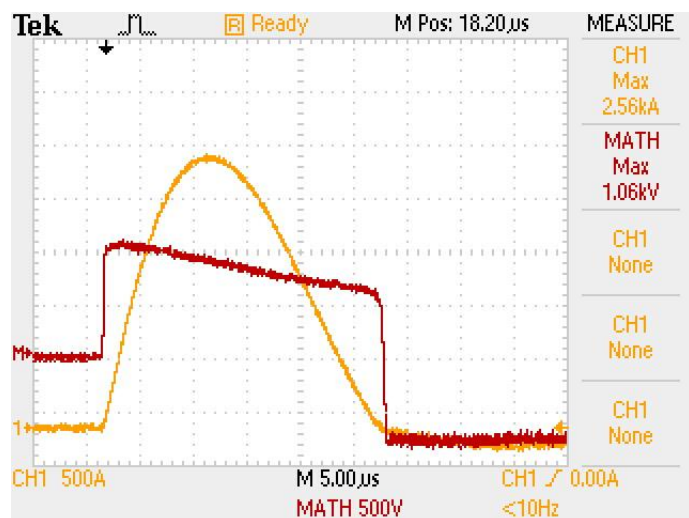
**Shot 38A, Sample 6 L3-N Pre-MLV**



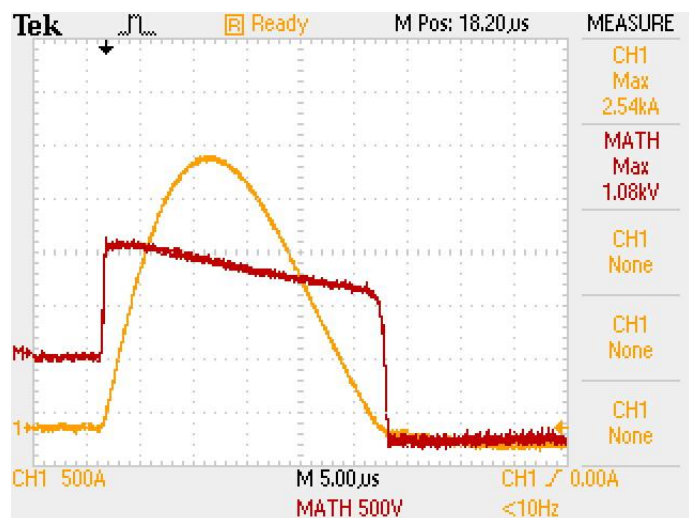
Shot 39A, Sample 6 L1-G Pre-MLV



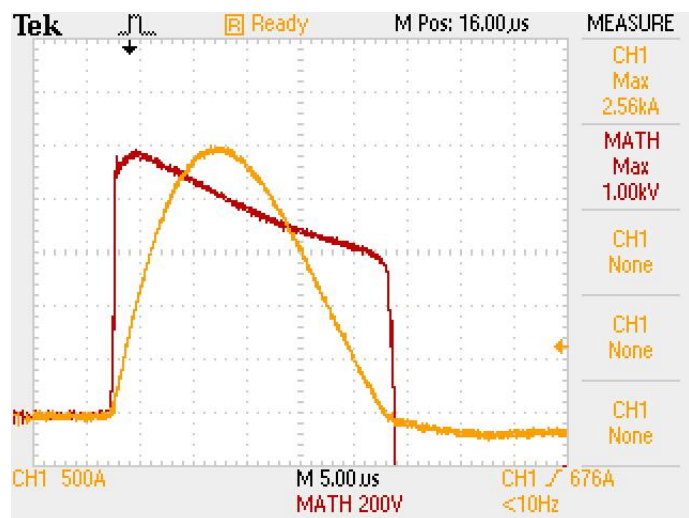
Shot 40A, Sample 6 L2-G Pre-MLV



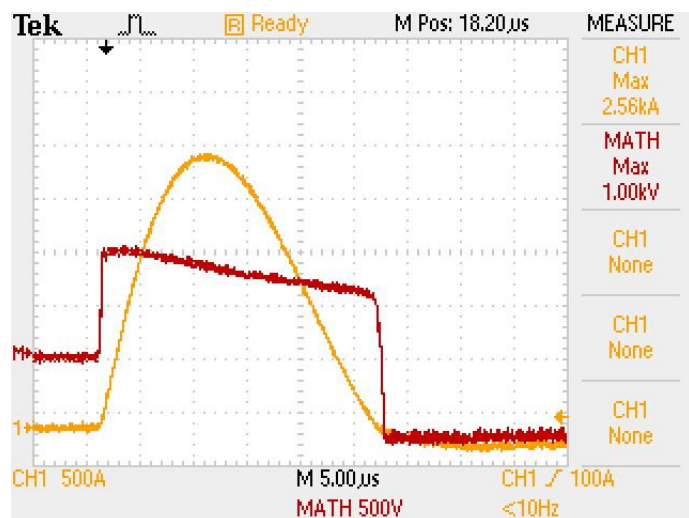
**Shot 41A, Sample 6 L3-G Pre-MLV**



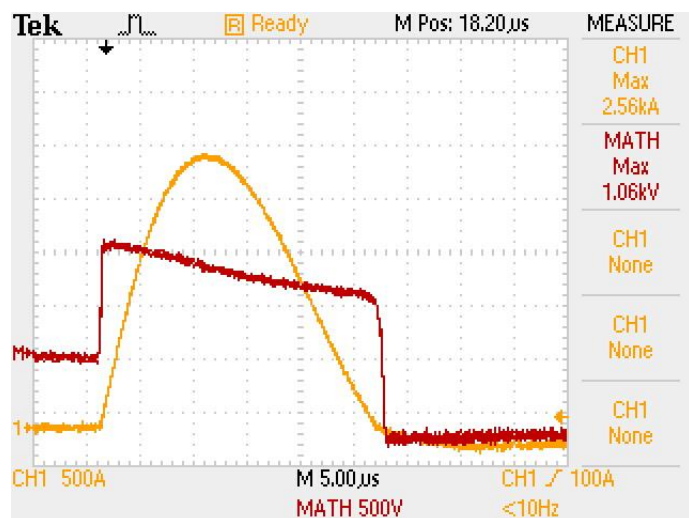
**Shot 42A, Sample 6 N-G Pre-MLV**



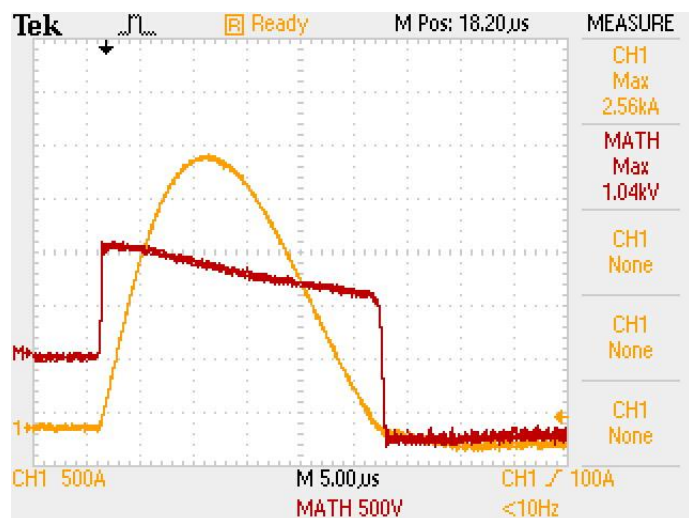
Shot 43A, Sample 7 L1-N Pre-MLV



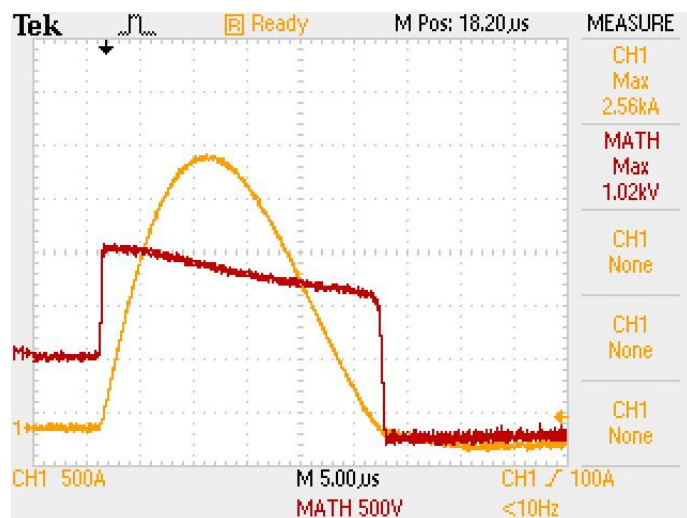
Shot 44A, Sample 7 L2-N Pre-MLV



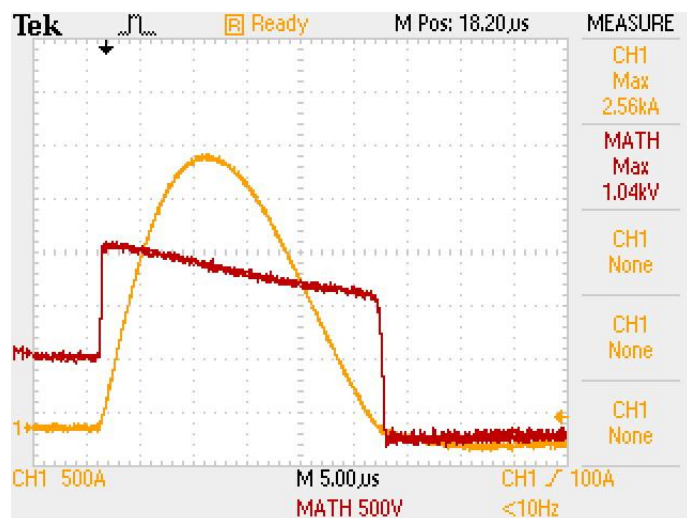
Shot 45A, Sample 7 L3-N Pre-MLV



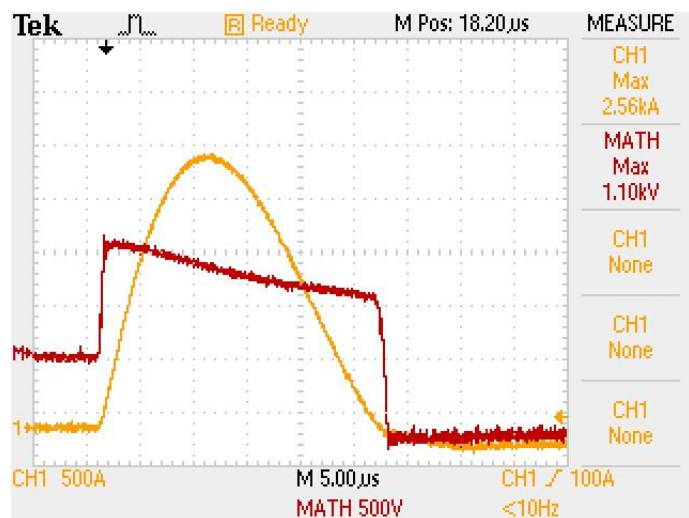
Shot 46A, Sample 7 L1-G Pre-MLV



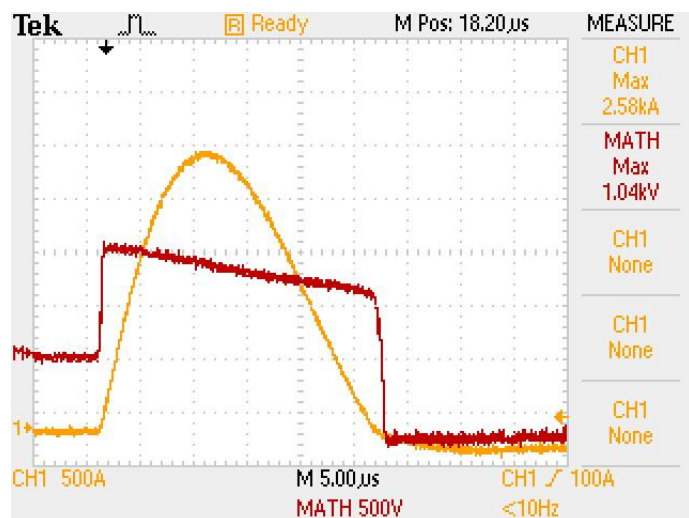
Shot 47A, Sample 7 L2-G Pre-MLV



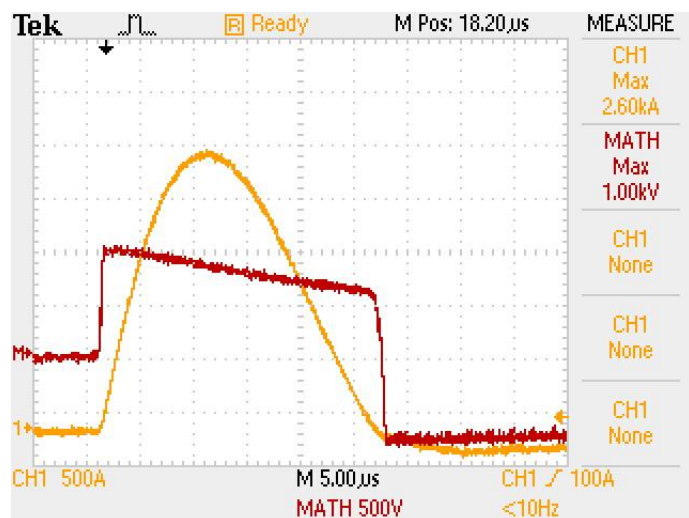
Shot 48A, Sample 7 L3-G Pre-MLV



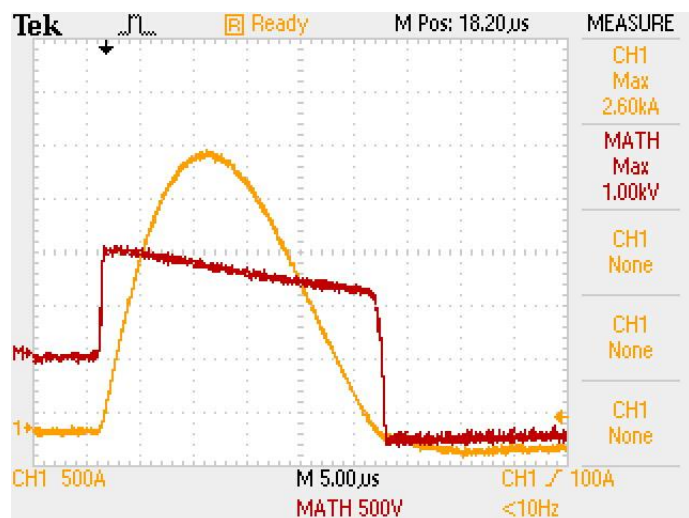
Shot 49A, Sample 7 N-G Pre-MLV



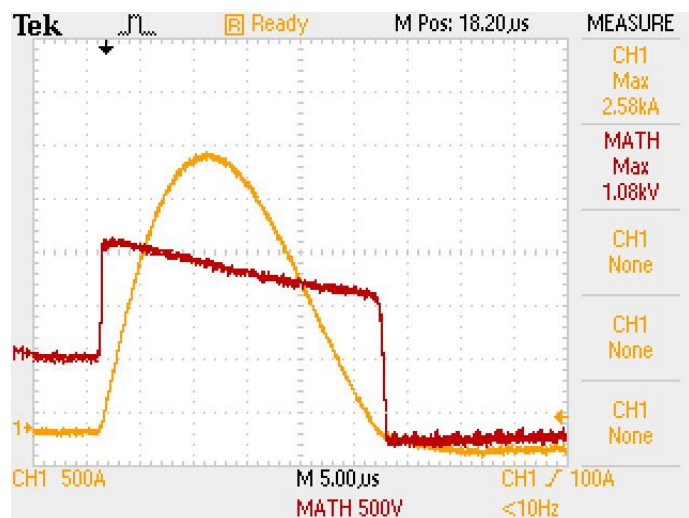
Shot 50A, Sample 8 L1-N Pre-MLV



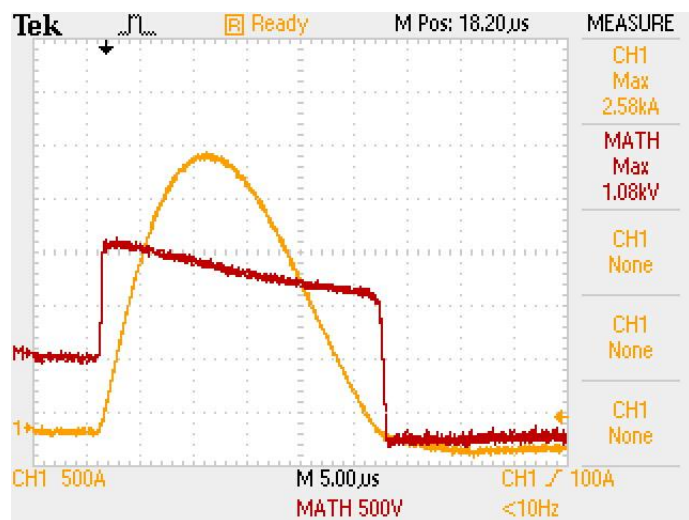
Shot 51A, Sample 8 L2-N Pre-MLV



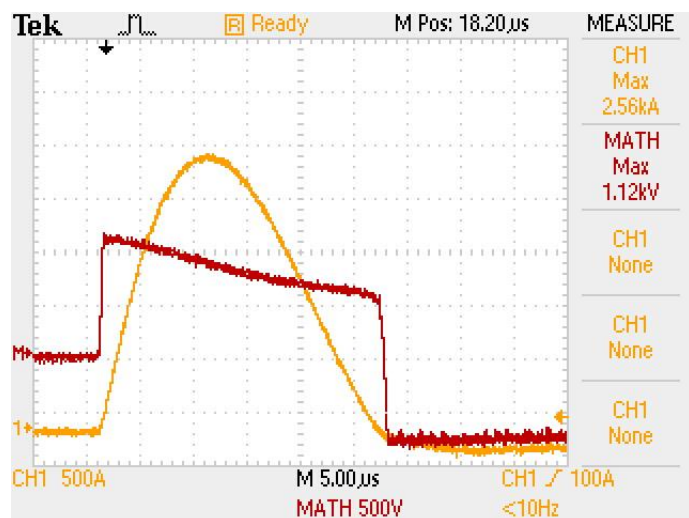
Shot 52A, Sample 8 L3-N Pre-MLV



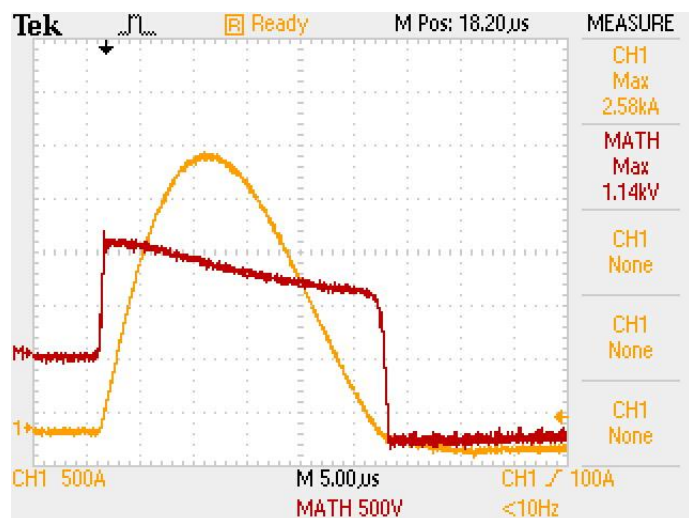
Shot 53A, Sample 8 L1-G Pre-MLV



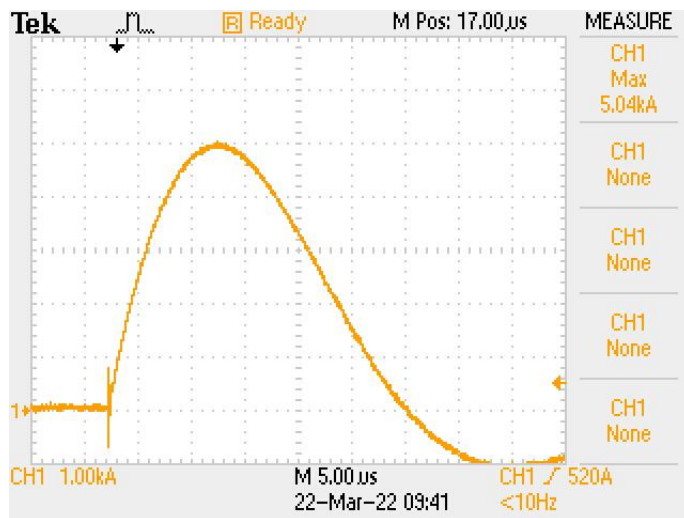
Shot 54A, Sample 8 L2-G Pre-MLV



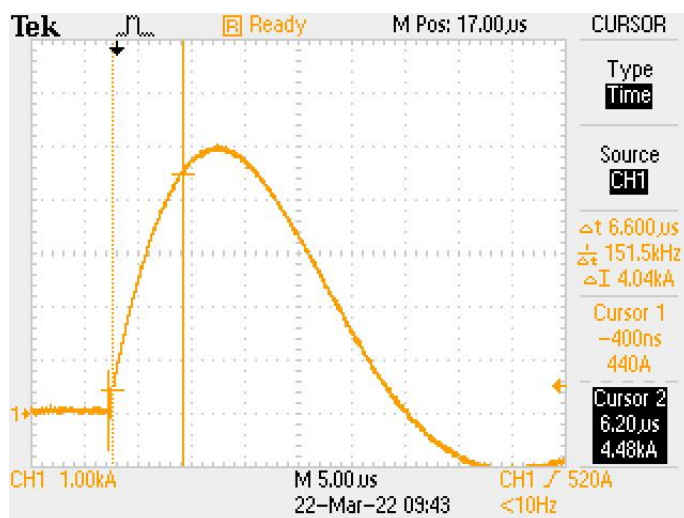
Shot 55A, Sample 8 L3-G Pre-MLV



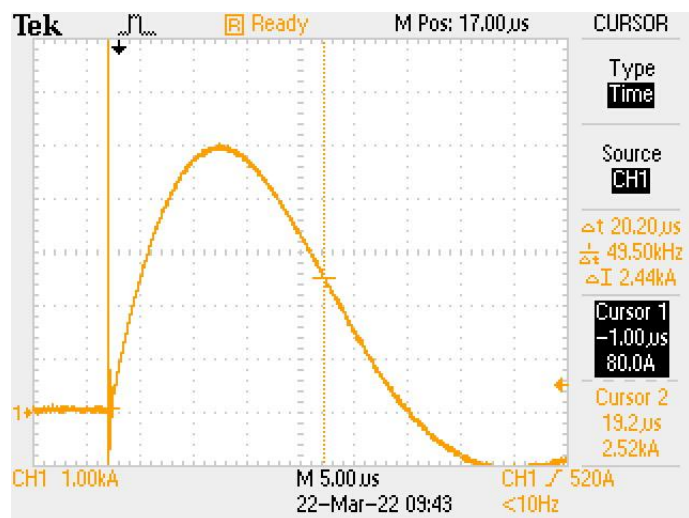
Shot 56A, Sample 8 N-G Pre-MLV



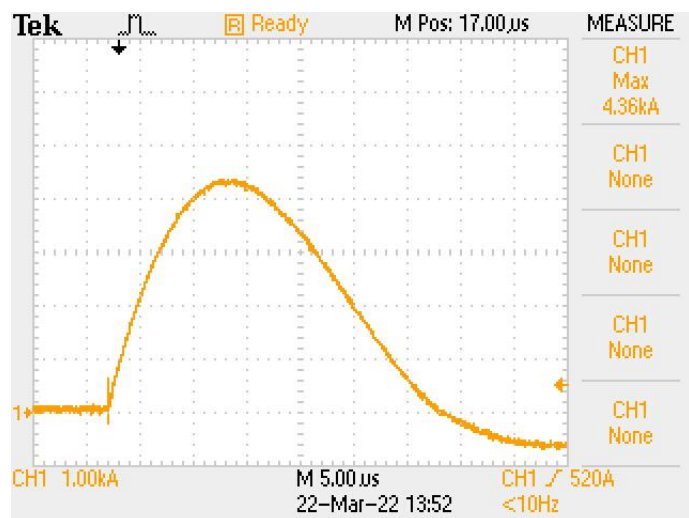
**50kA Calibration Shot Current**



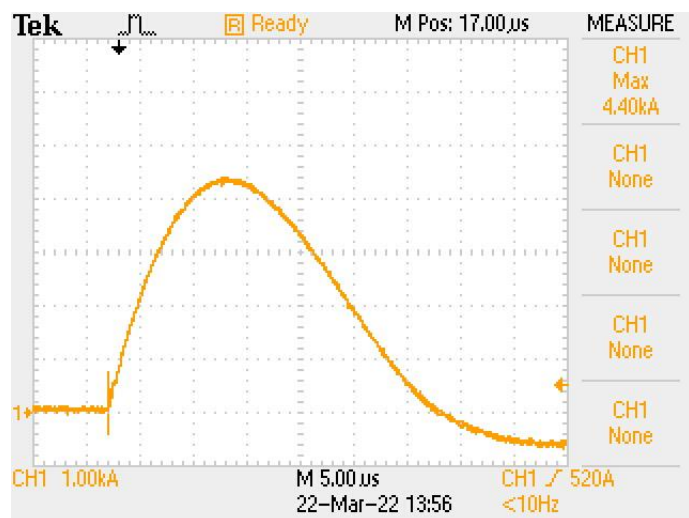
**Surge Table Rise Time Calibration Shot.**



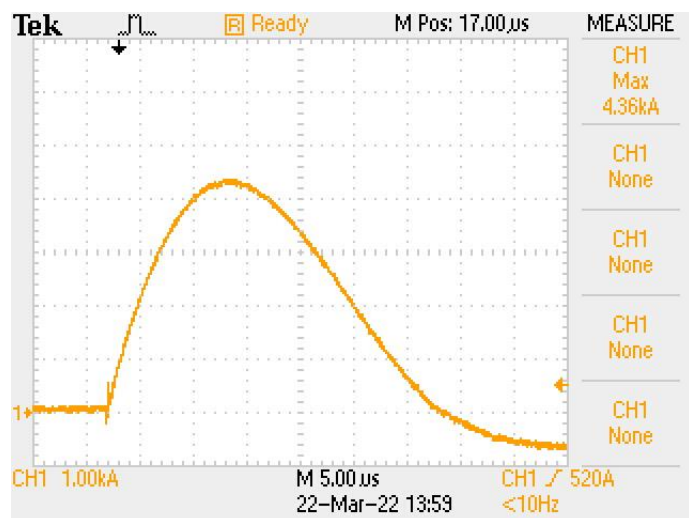
Surge Table Rise Time Calibration Shot.



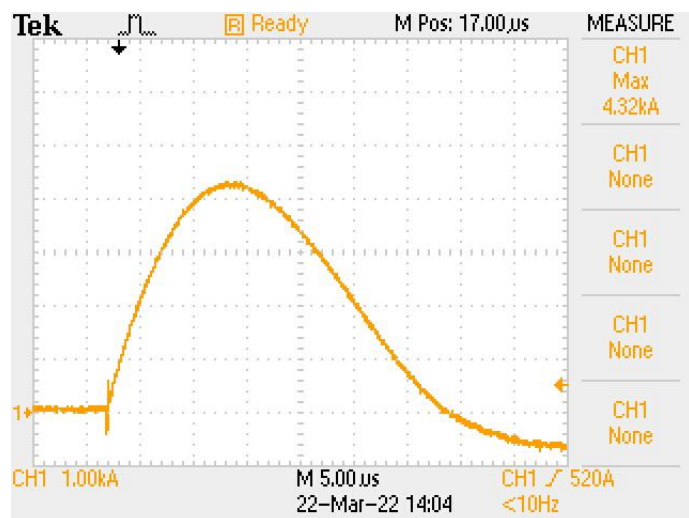
Shot 1B, Sample 1 L1-N 50kA



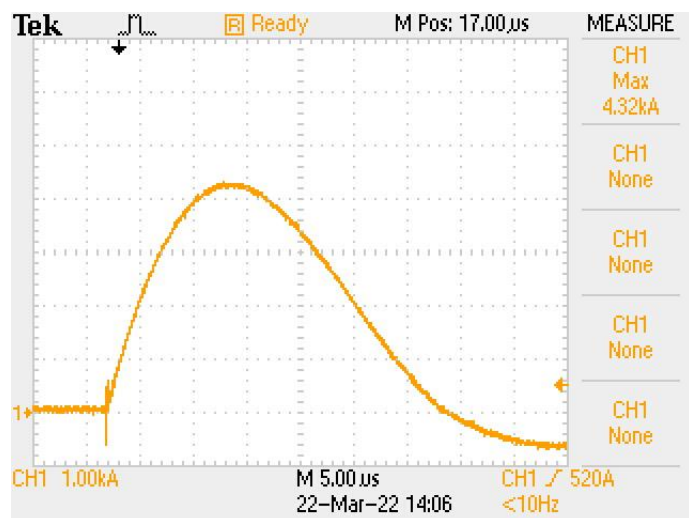
Shot 2B, Sample 1 L2-N 50kA



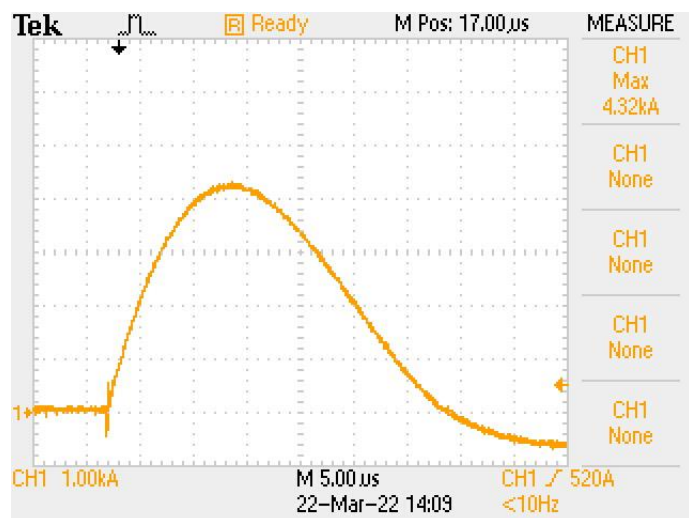
Shot 3B, Sample 1 L3-N 50kA



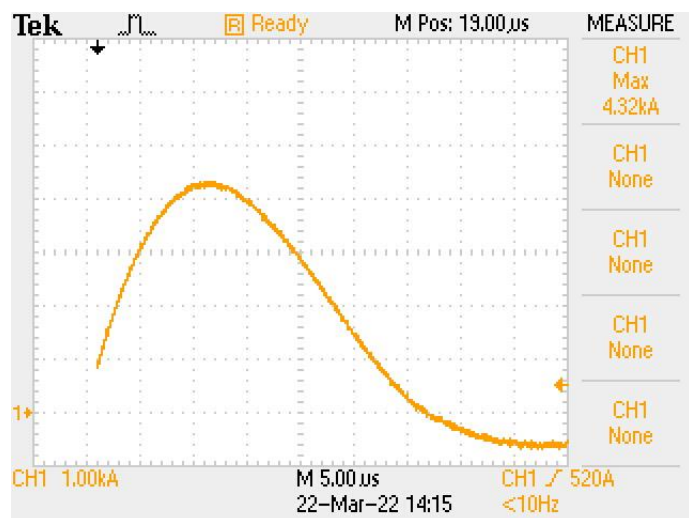
Shot 4B, Sample 1 L1-G 50kA



Shot 5B, Sample 1 L2-G 50kA

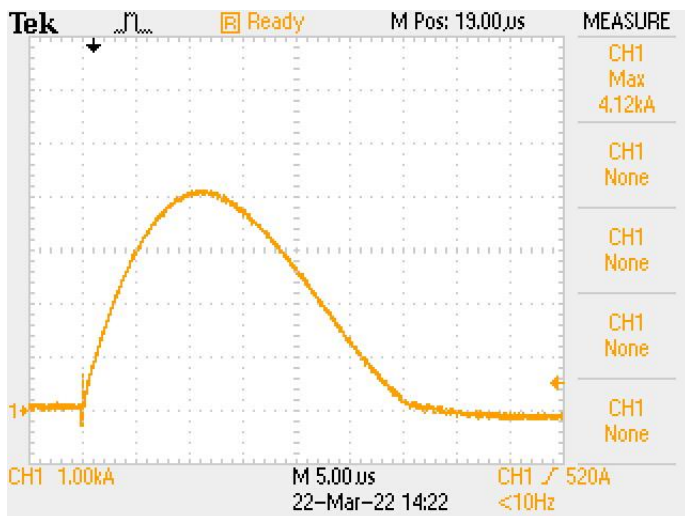


Shot 6B, Sample 1 L3-G 50kA

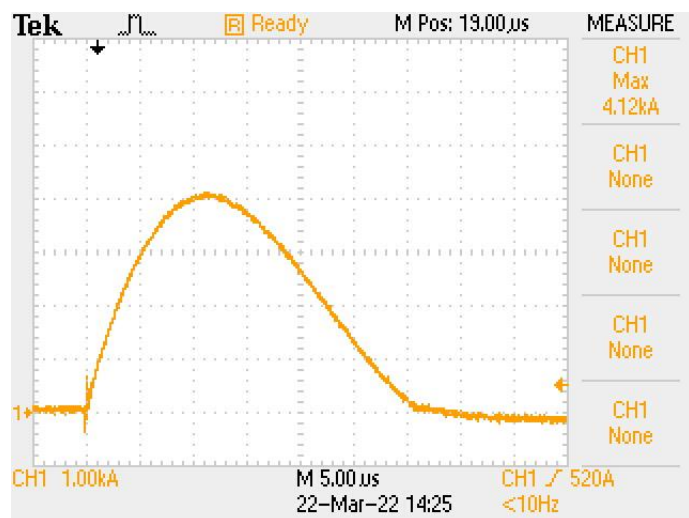


Shot 7B, Sample 1 N-G 50kA

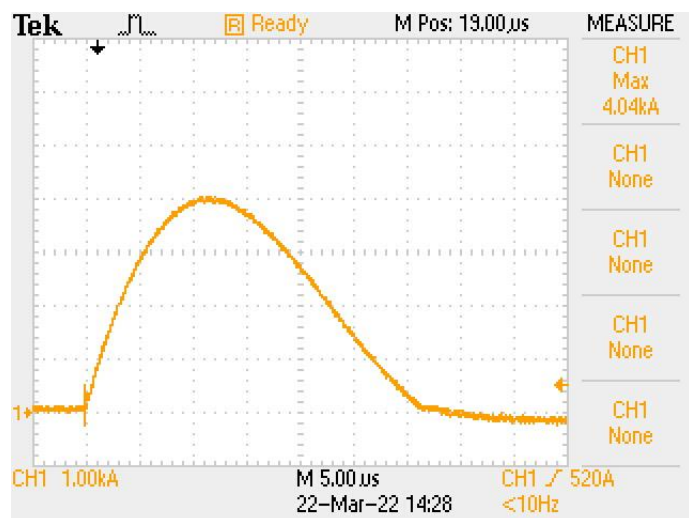
### Shot 29B, Sample 5 L1-N 50kA



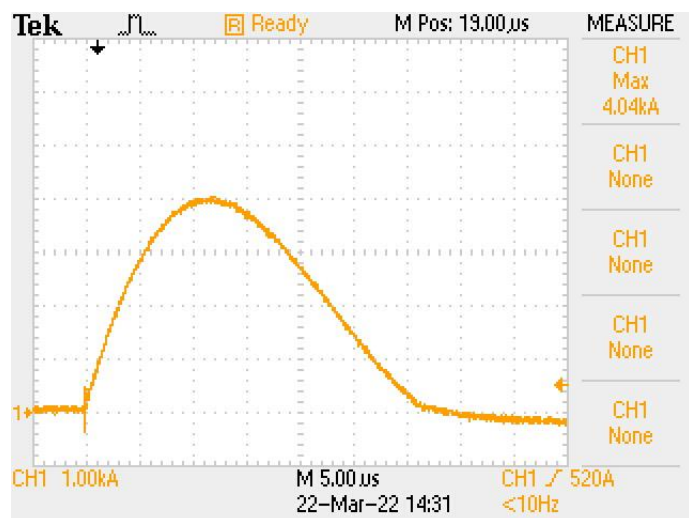
### Shot 30B, Sample 5 L2-N 50kA



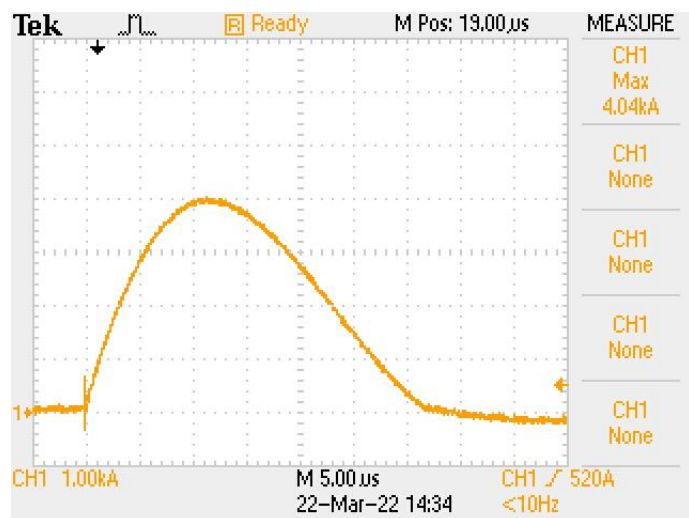
**Shot 31B, Sample 5 L3-N 50kA**



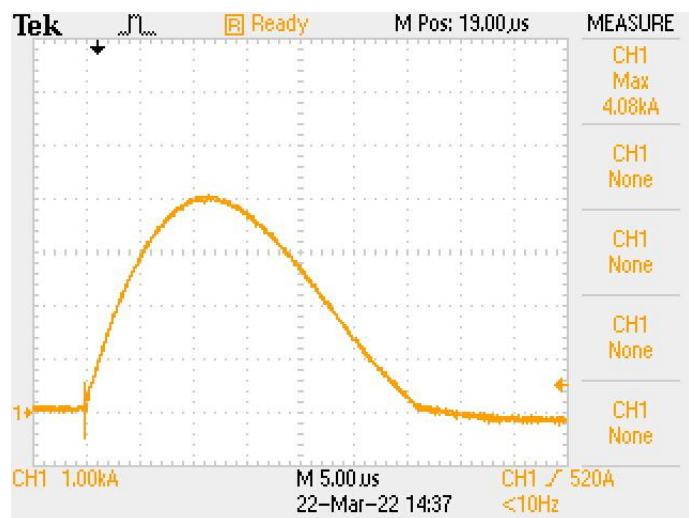
**Shot 32B, Sample 5 L1-G 50kA**



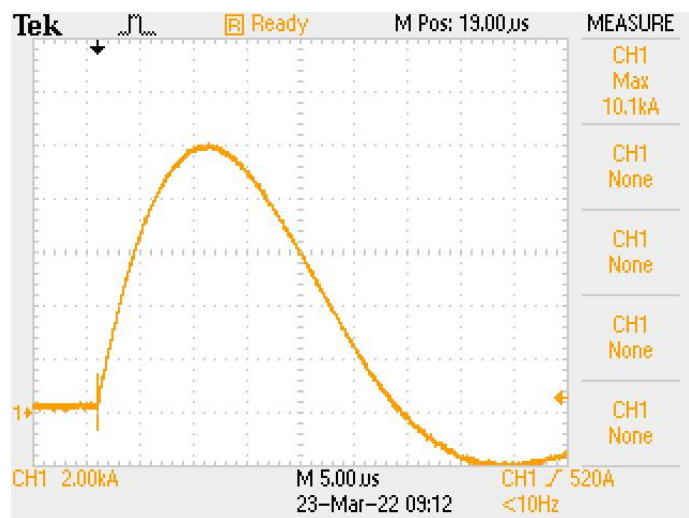
**Shot 33B, Sample 5 L2-G 50kA**



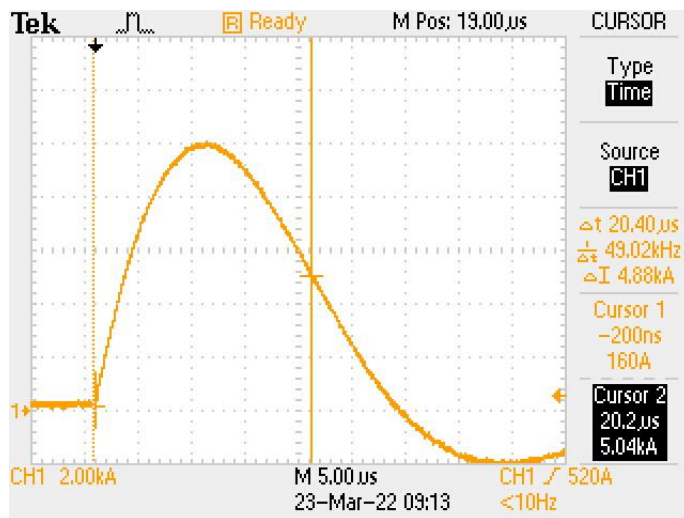
**Shot 34B, L3-G Sample 5 50kA**



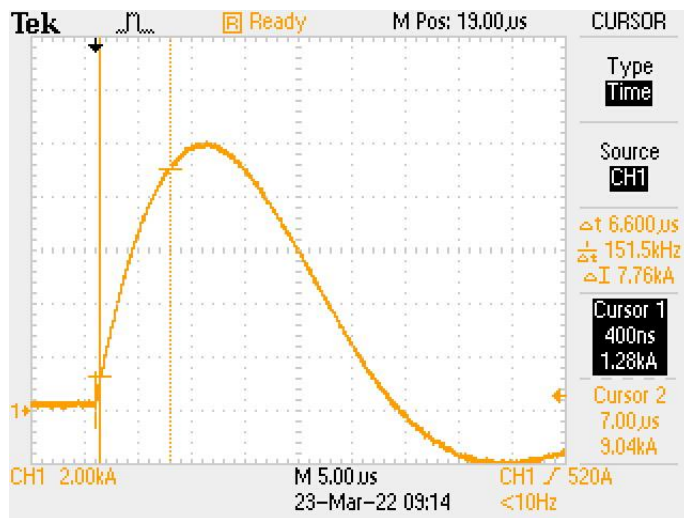
**Shot 35B, N-G Sample 5 50kA**



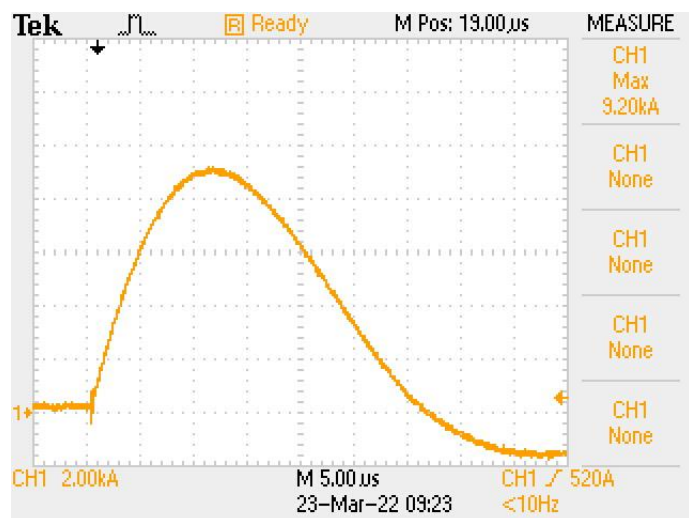
**100kA Calibration Shot**



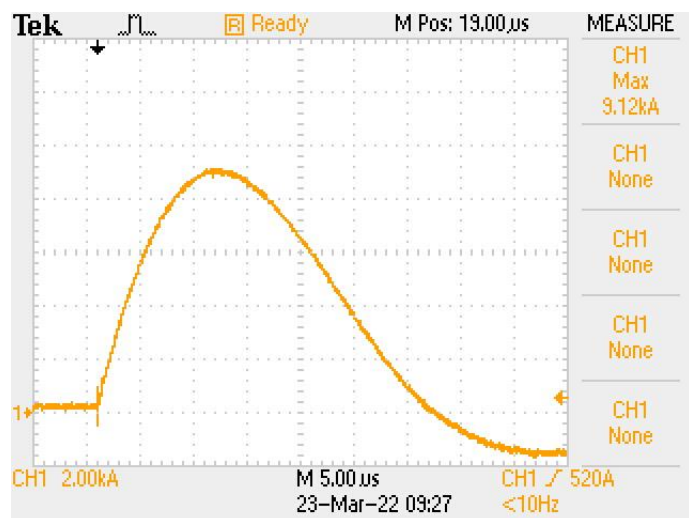
**100kA Fall Time**



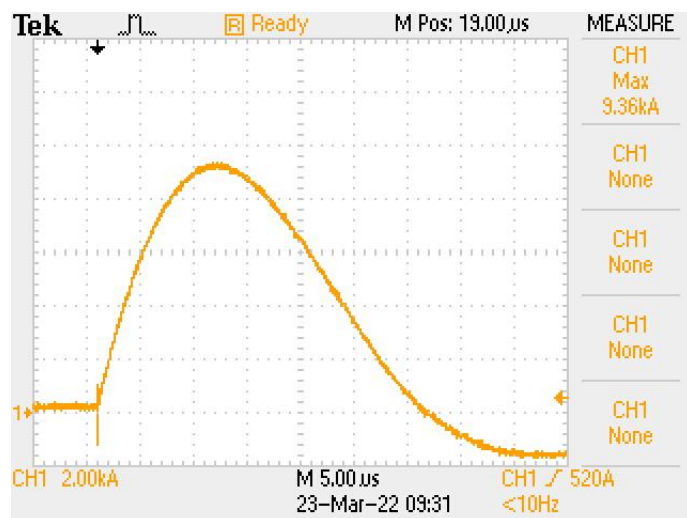
**100kA Rise Time**



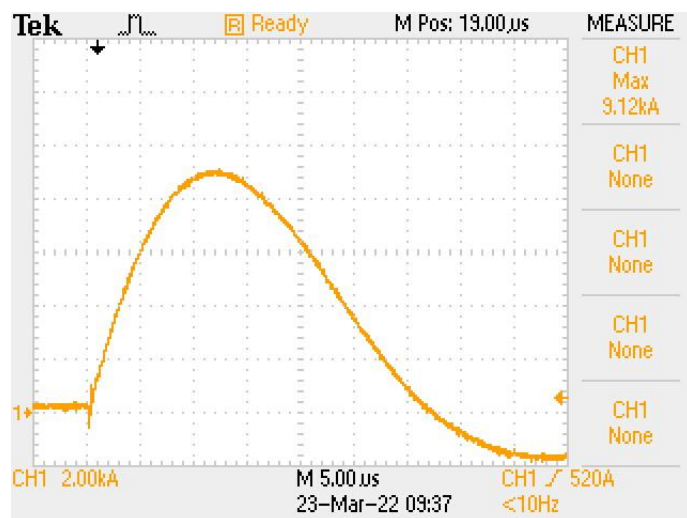
Shot 8B, Sample 2 L1-N 100kA



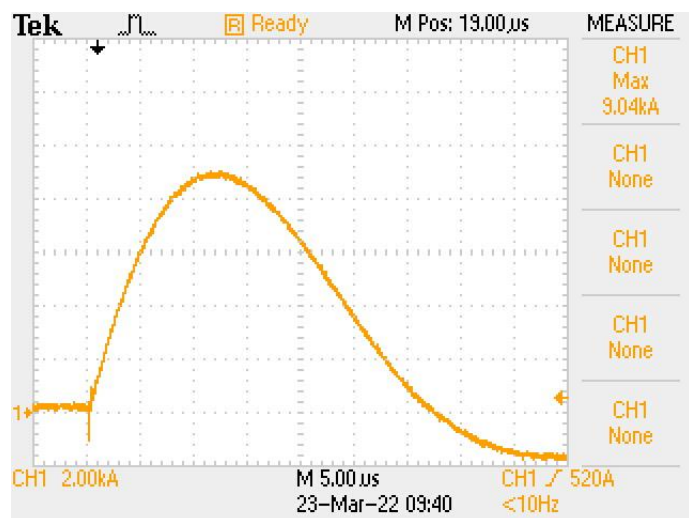
Shot 9B, Sample 2 L2-N 100kA



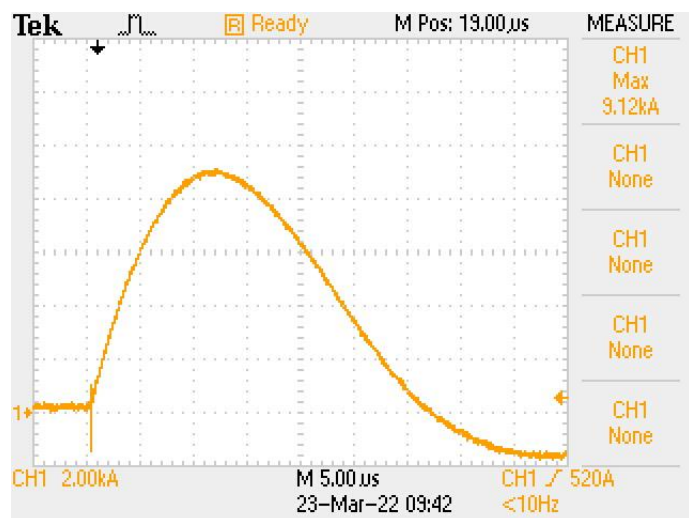
Shot 10B, Sample 2 L3-N 100kA



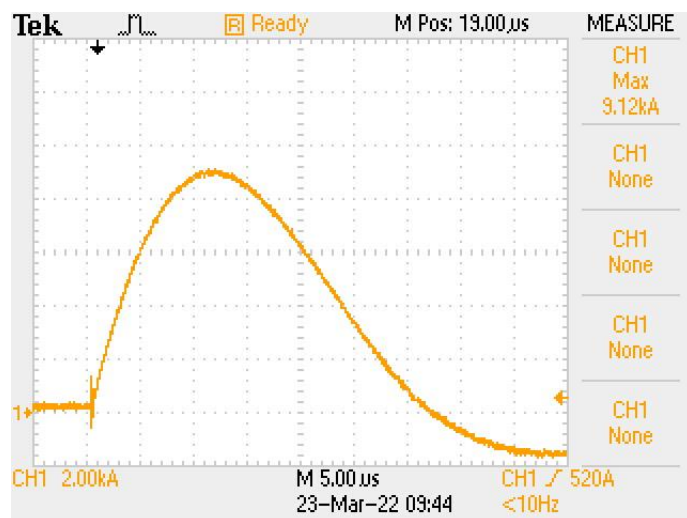
Shot 11B, Sample 2 L1-G 100kA



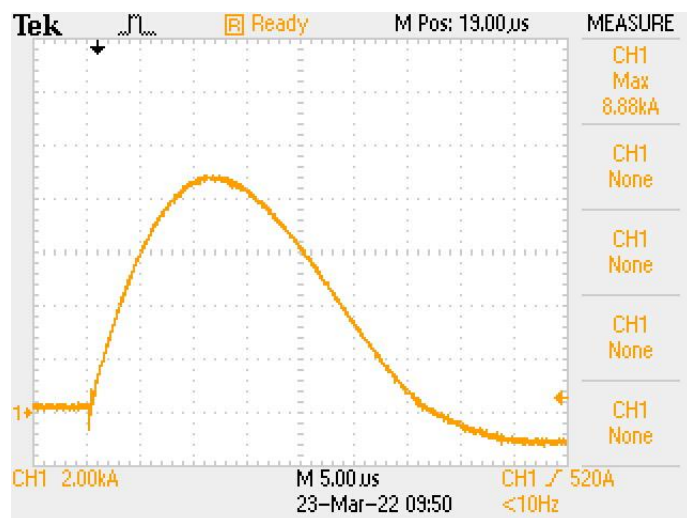
**Shot 12B, Sample 2 L2-G 100kA**



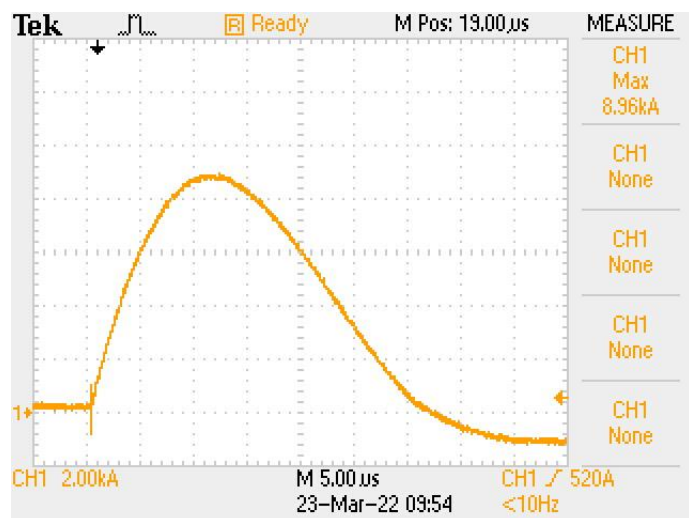
**Shot 13B, Sample 2 L3-G 100kA**



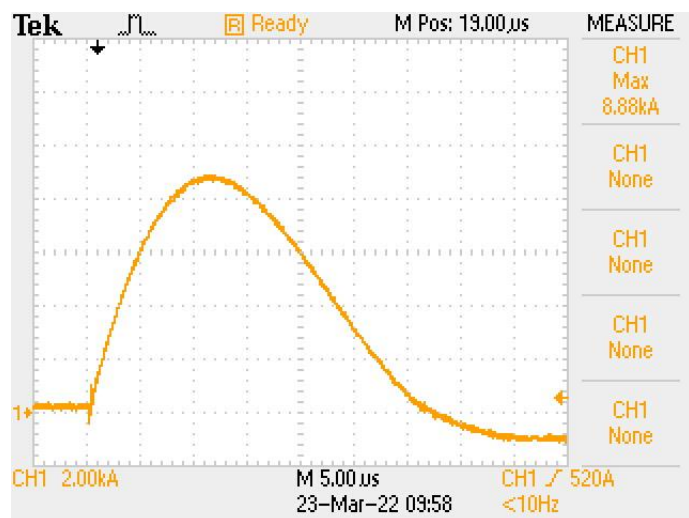
**Shot 14B, Sample 2 N-G 100kA**



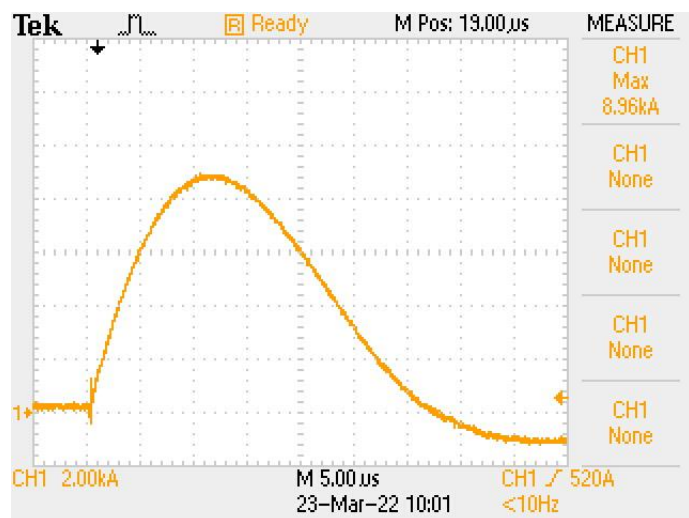
**Shot 36B, Sample 6 L1-N 100kA**



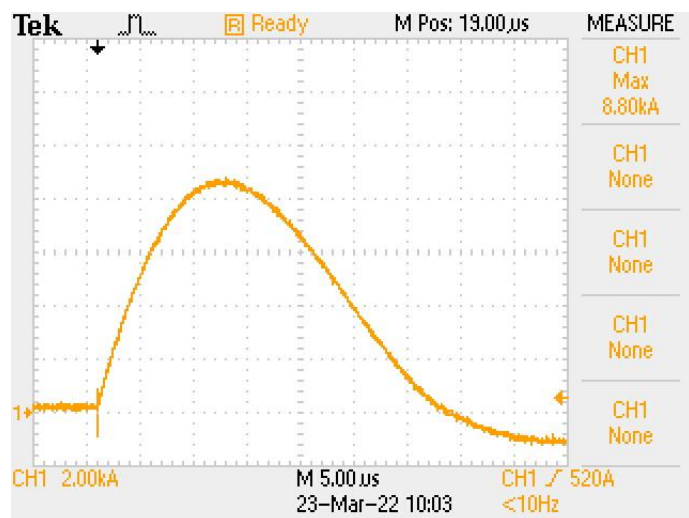
**Shot 37B, Sample 6 L2-N 100kA**



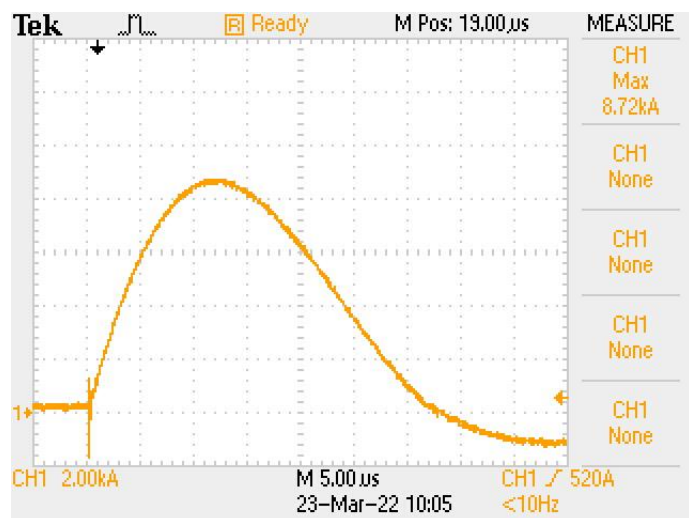
**Shot 38B, Sample 6 L3-N 100kA**



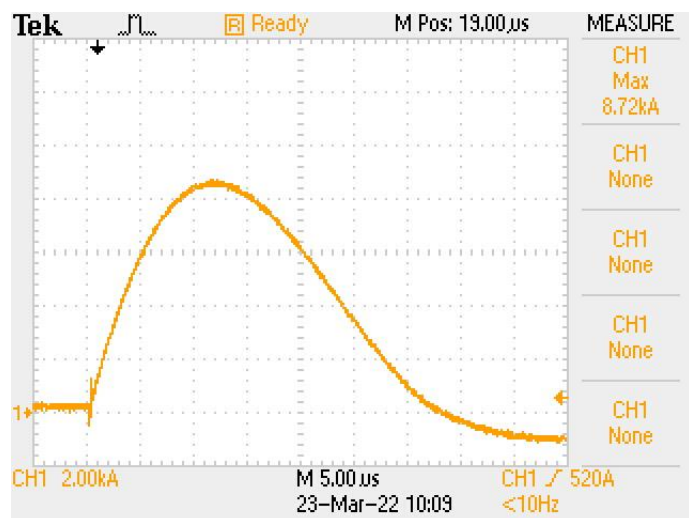
Shot 39B, Sample 6 L1-G 100kA



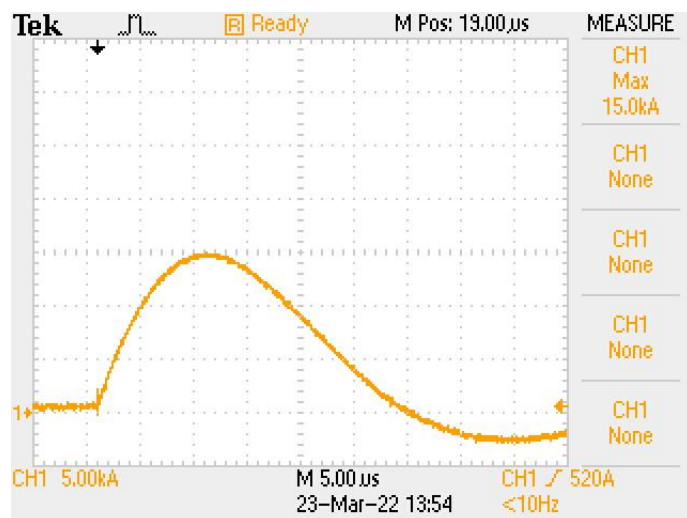
Shot 40B, Sample 6 L2-G 100kA



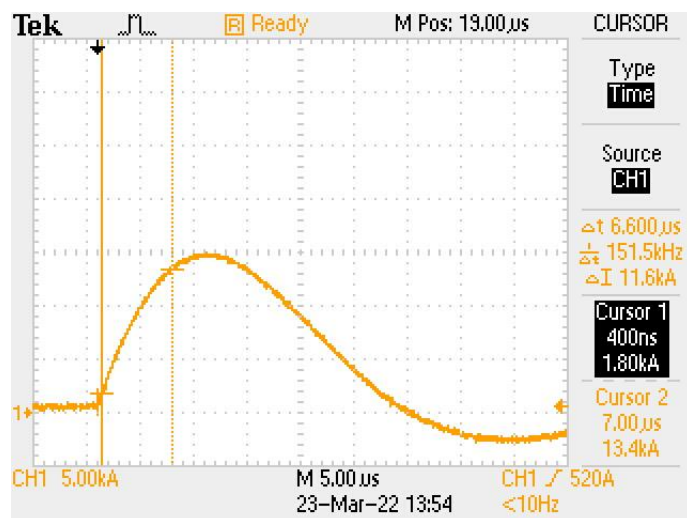
**Shot 41B, Sample 6 L3-G 100kA**



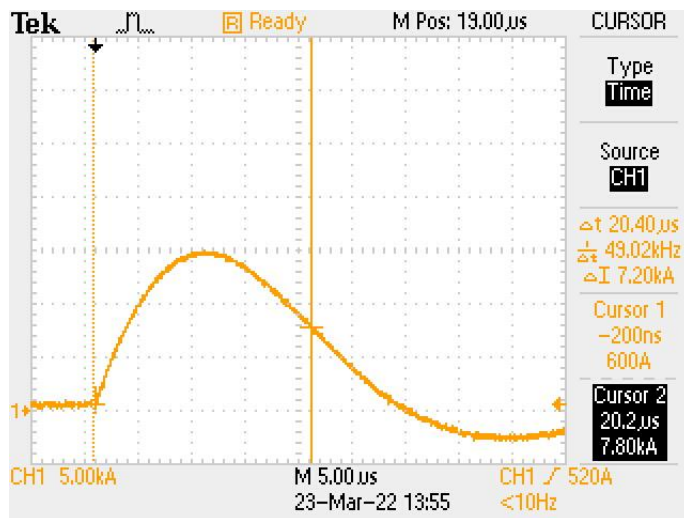
**Shot 42B, Sample 6 N-G 100kA**



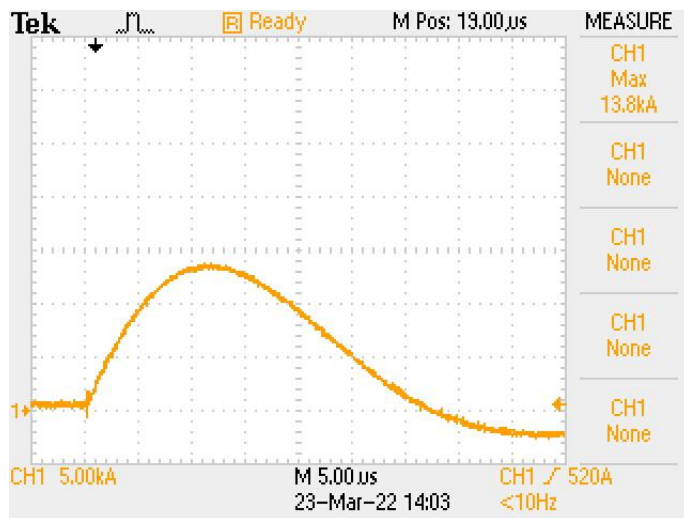
**150kA Calibration Shot**



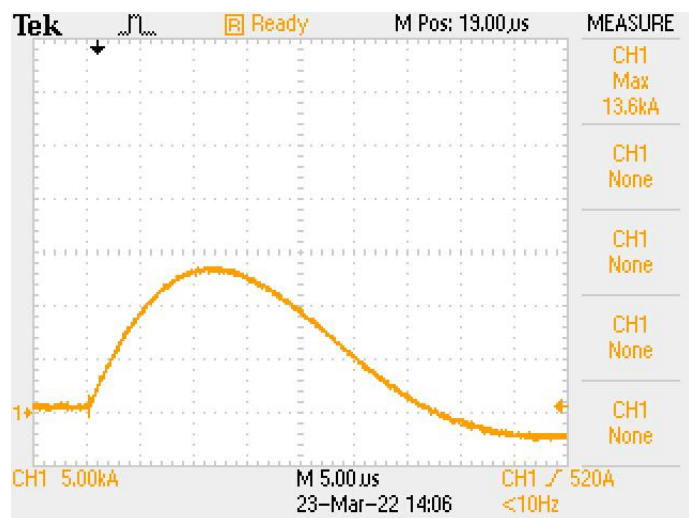
**150kA Rise Time**



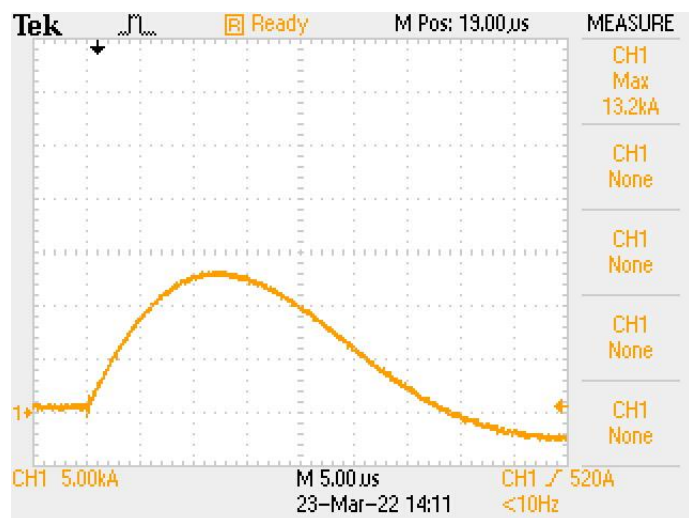
150kA Fall Time



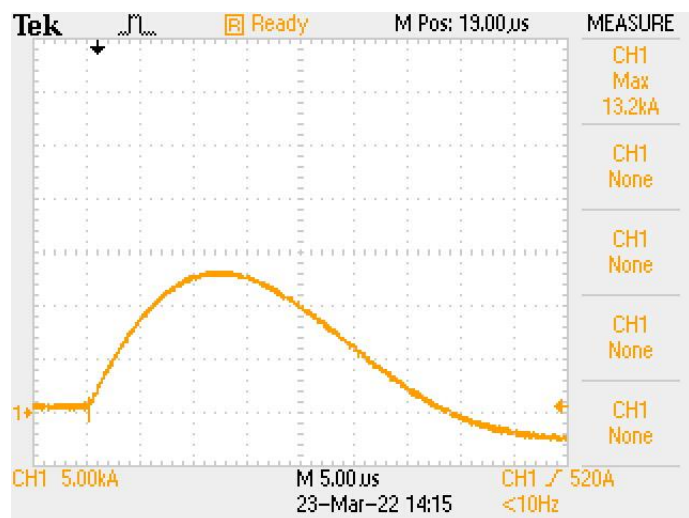
Shot 15B, Sample 3 L1-N 150kA



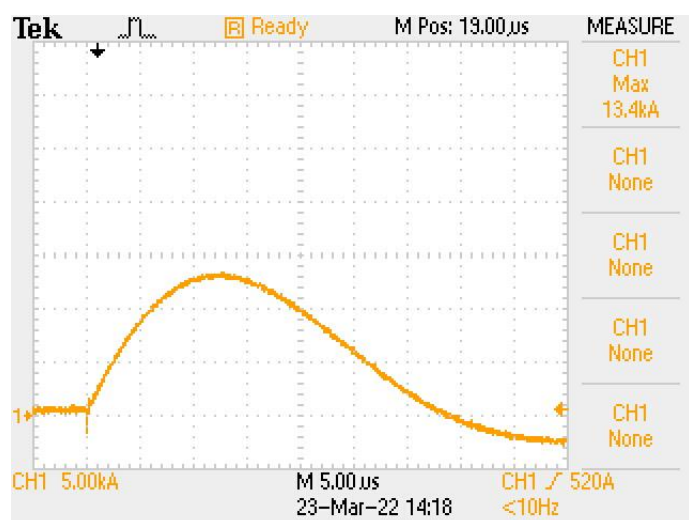
Shot 16B, Sample 3 L2-N 150kA



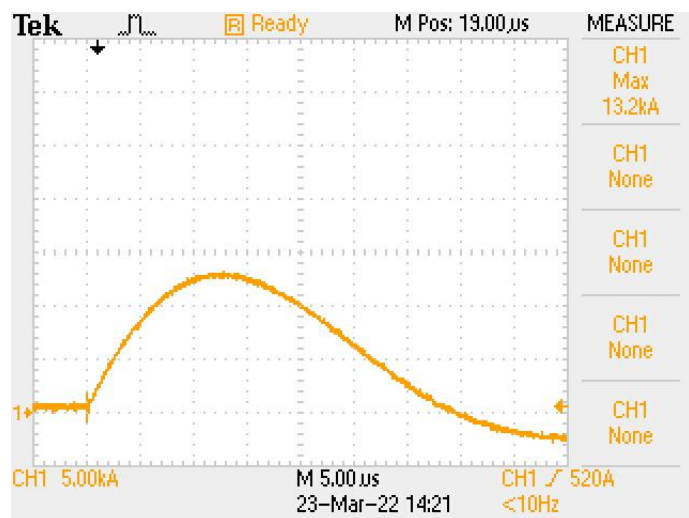
Shot 17B, Sample 3 L3-N 150kA



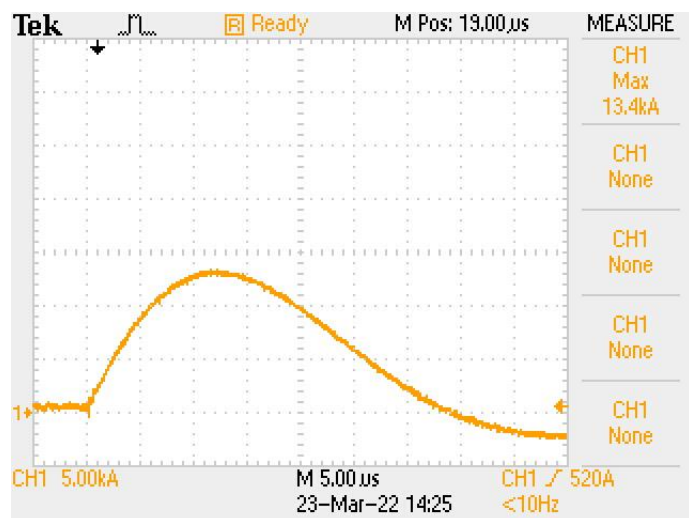
Shot 18B, Sample 3 L1-G 150kA



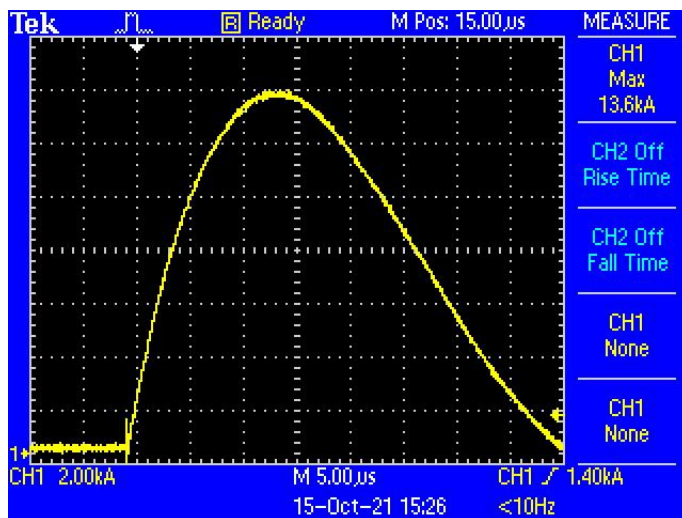
Shot 19B, Sample 3 L2-G 150kA



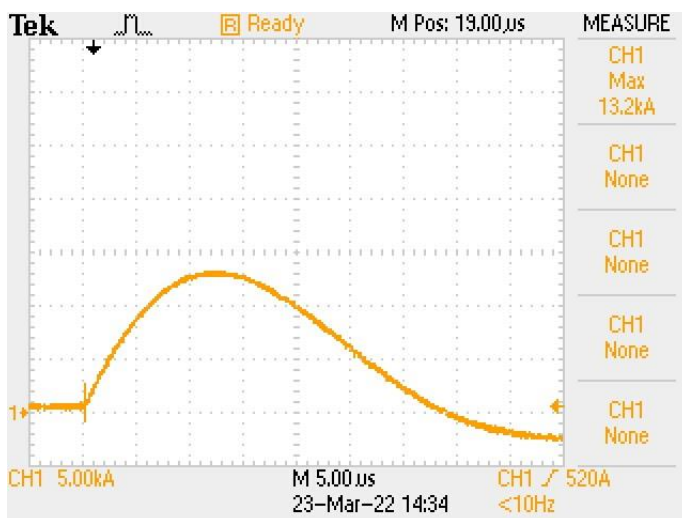
**Shot 20B, Sample 3 L3-G 150kA**



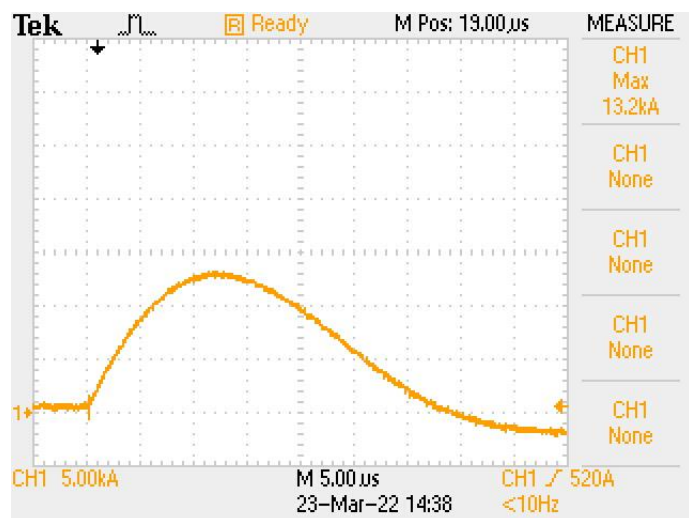
**Shot 21B, Sample 3 N-G 150kA**



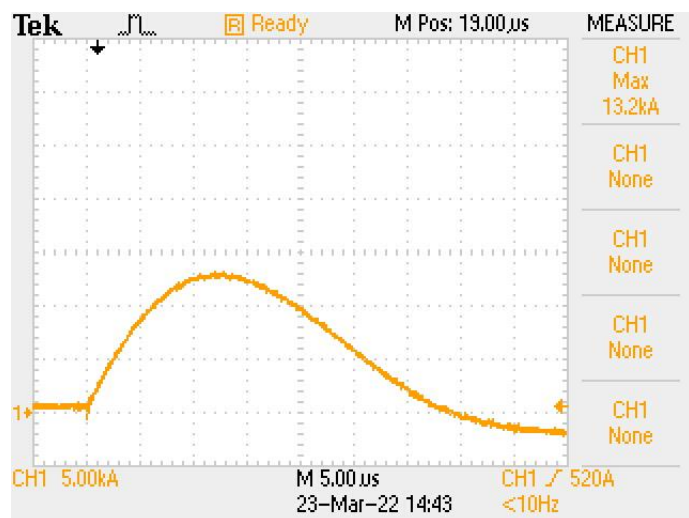
Shot 43B, Sample 7 L1-N 150kA



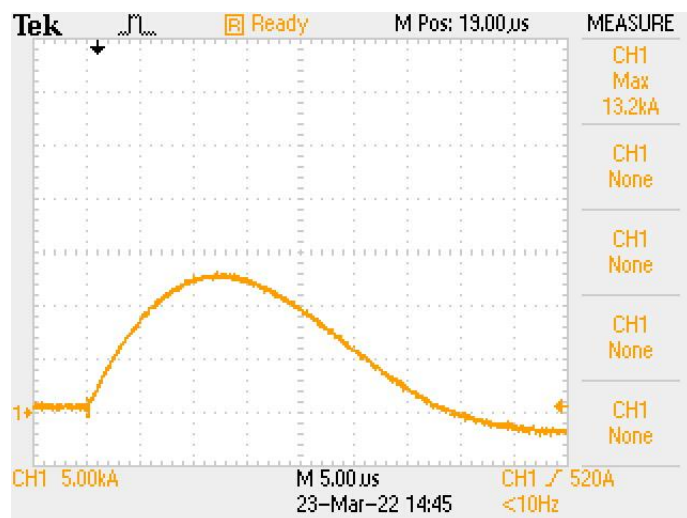
Shot 44B, Sample 7 L2-N 150kA



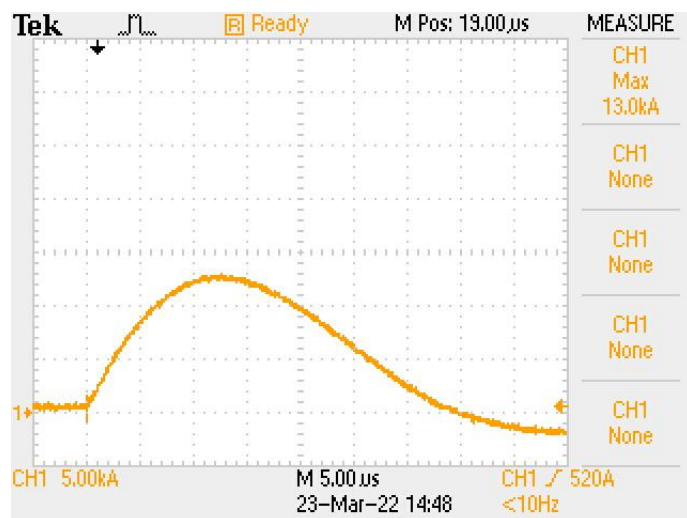
Shot 45B, Sample 7 L3-N 150kA



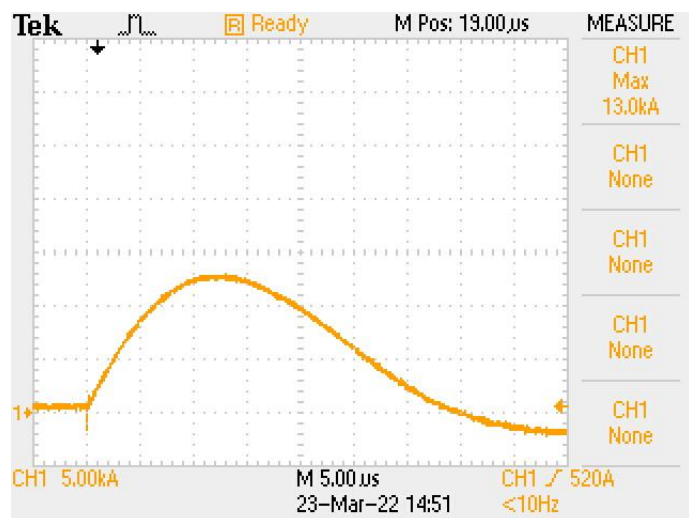
Shot 46B, Sample 7 L1-G 150kA



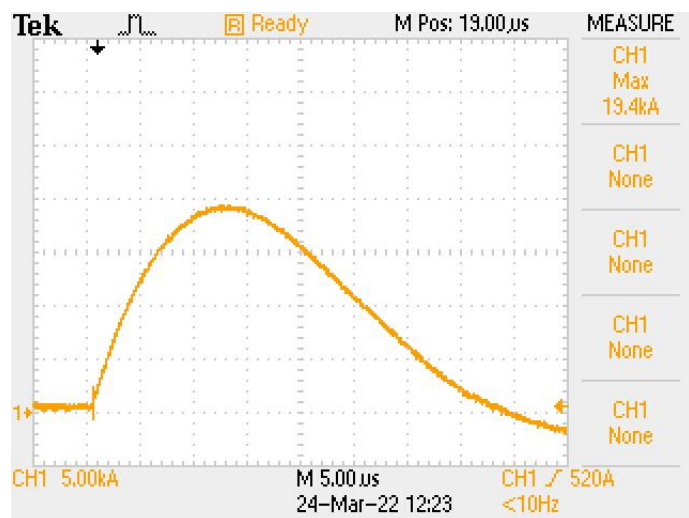
**Shot 47B, Sample 7 L2-G 150kA**



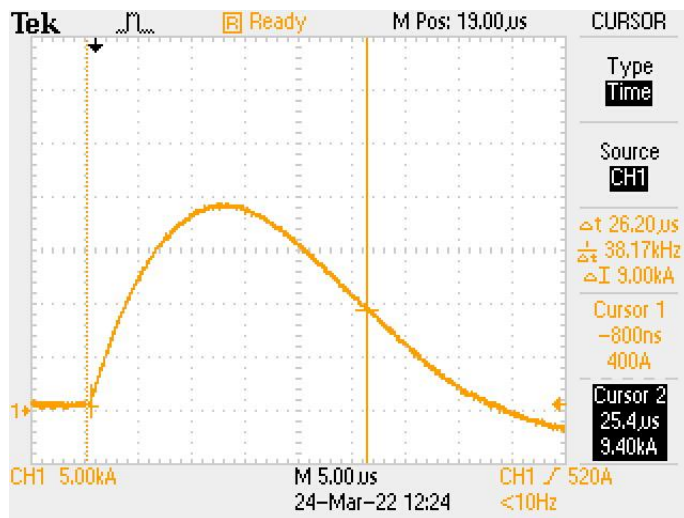
**Shot 48B, Sample 7 L3-G 150kA**



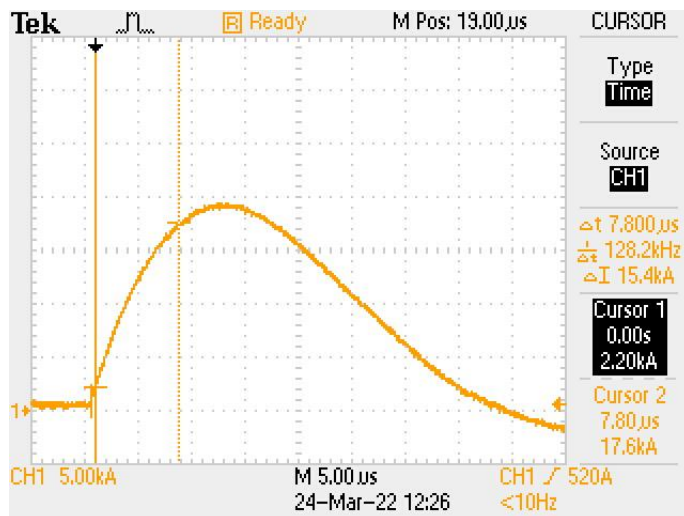
**Shot 49B, Sample 7 N-G 150kA**



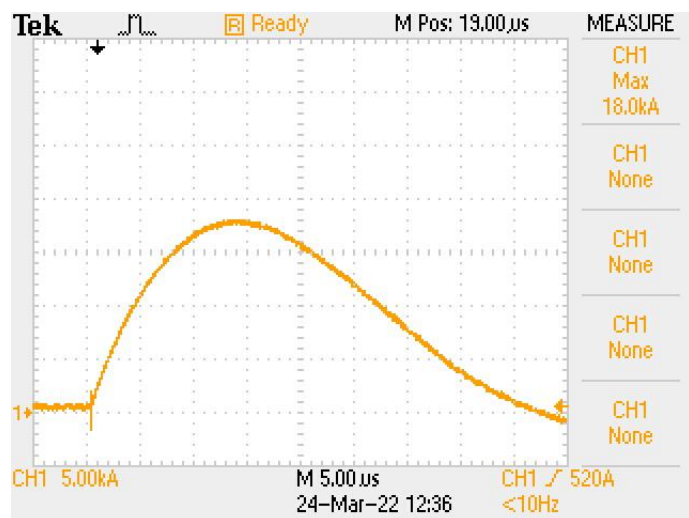
**200kA Calibration Shot 1**



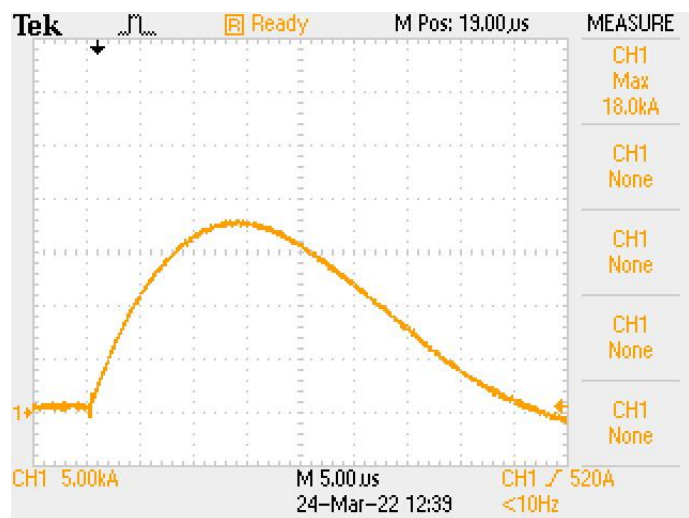
**200kA Fall Time**



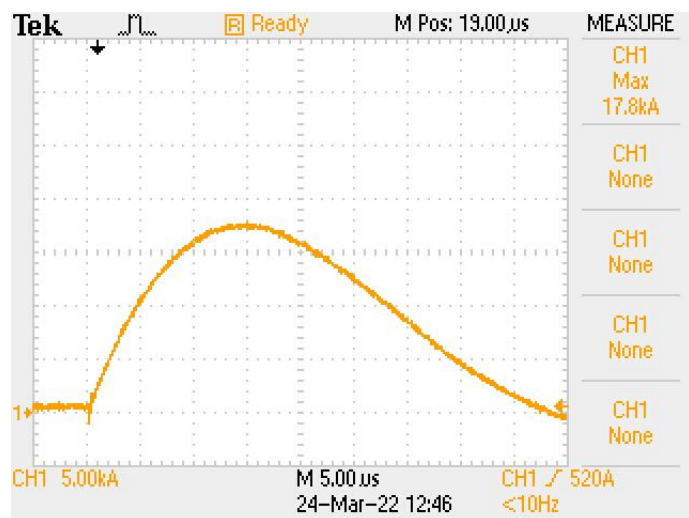
**200kA Rise Time**



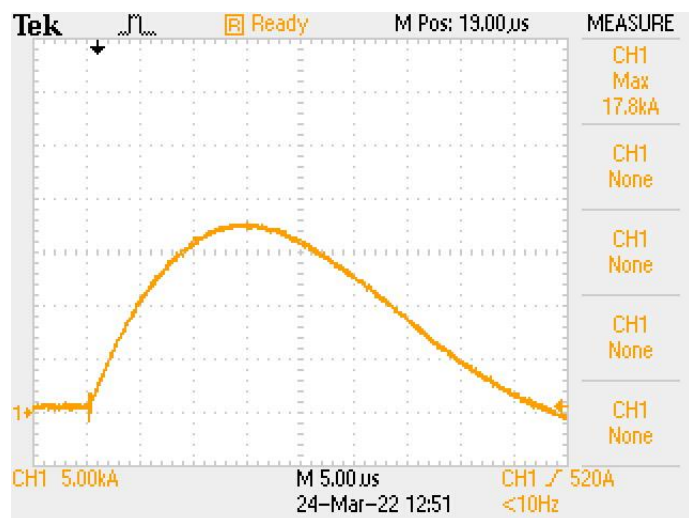
Shot 22B, Sample 4 L1-N 200kA



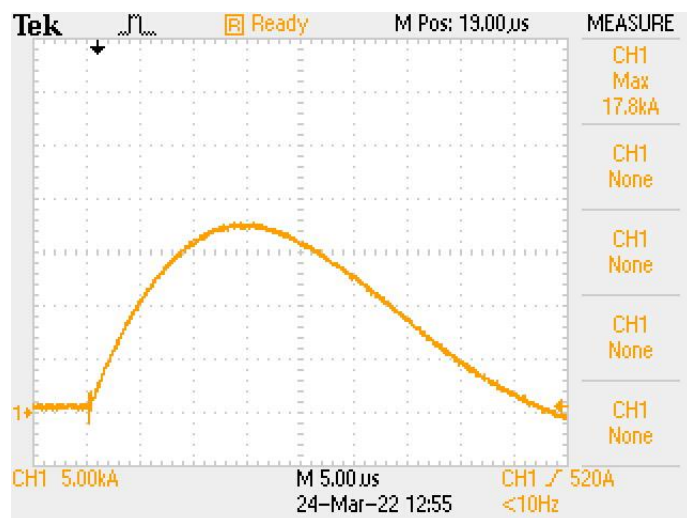
Shot 23B, Sample 4 L2-N 200kA



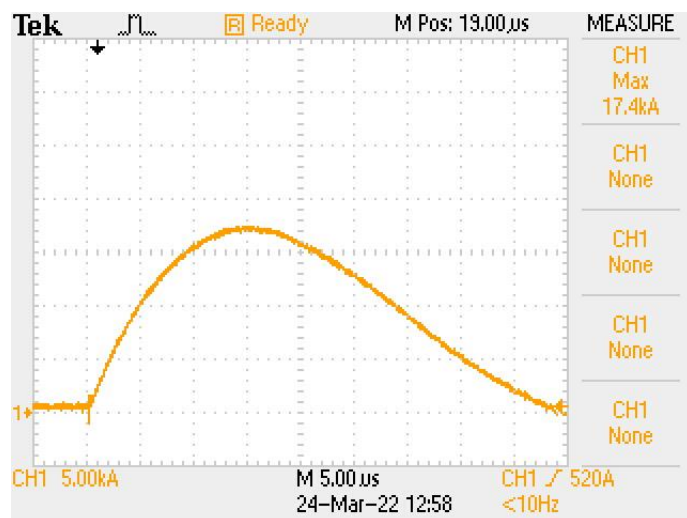
Shot 24B, Sample 4 L3-N 200kA



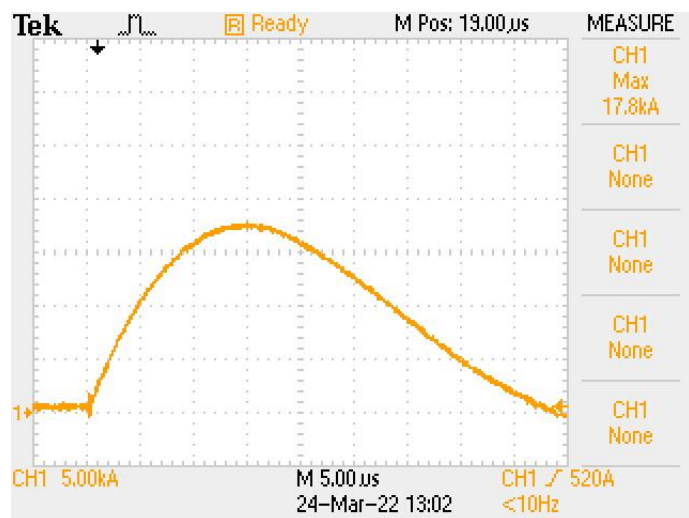
Shot 25B, Sample 4 L1-G 200kA



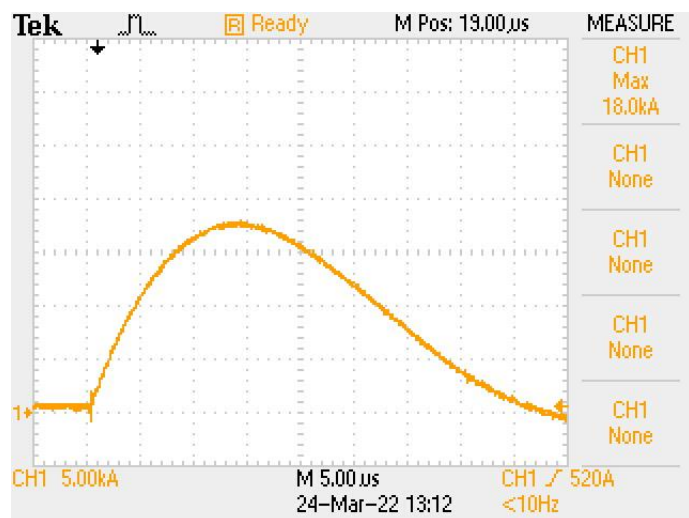
**Shot 26B, Sample 4 L2-G 200kA**



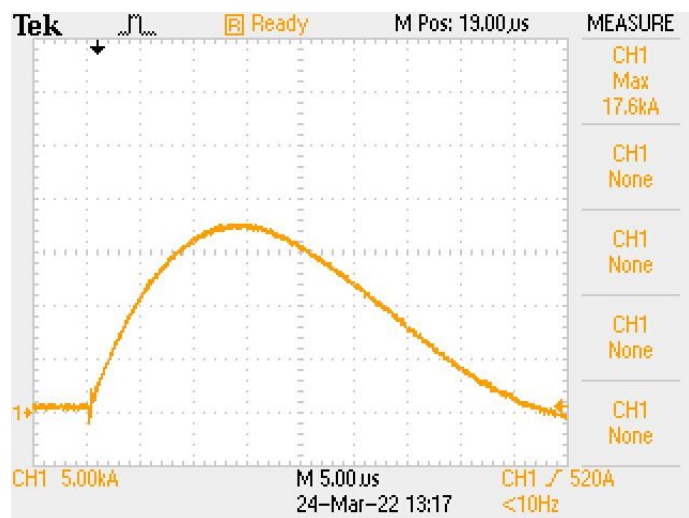
**Shot 27B, Sample 4 L3-G 200kA**



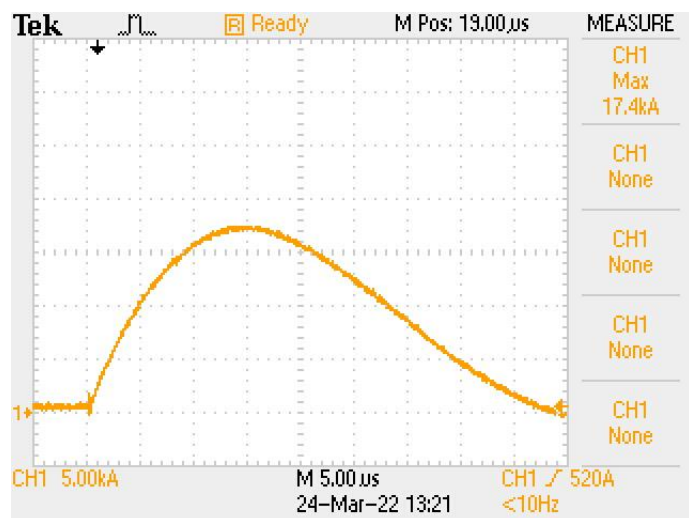
**Shot 28B, Sample 4 N-G 200kA**



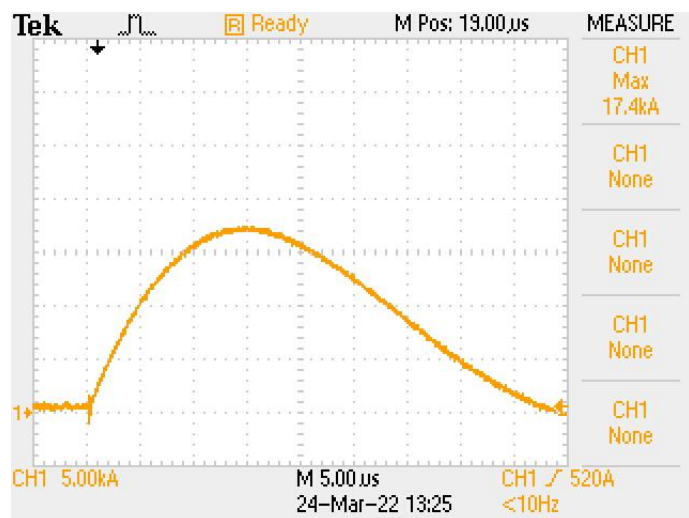
**Shot 50B, Sample 8 L1-N 200kA**



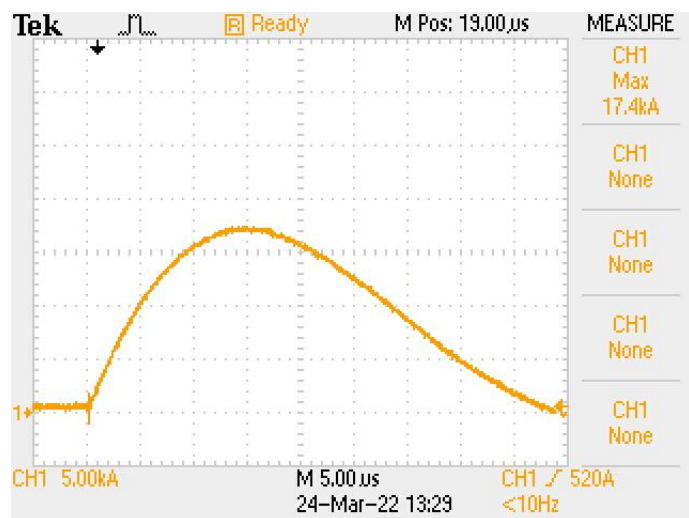
Shot 51B, Sample 8 L2-N 200kA



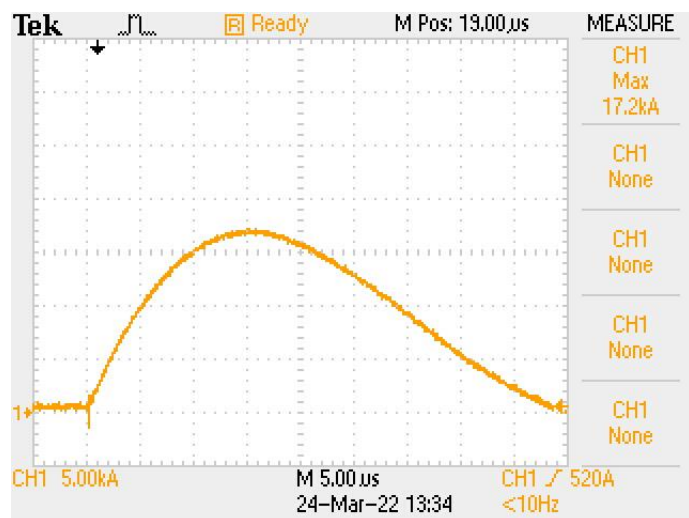
Shot 52B, Sample 8 L3-N 200kA



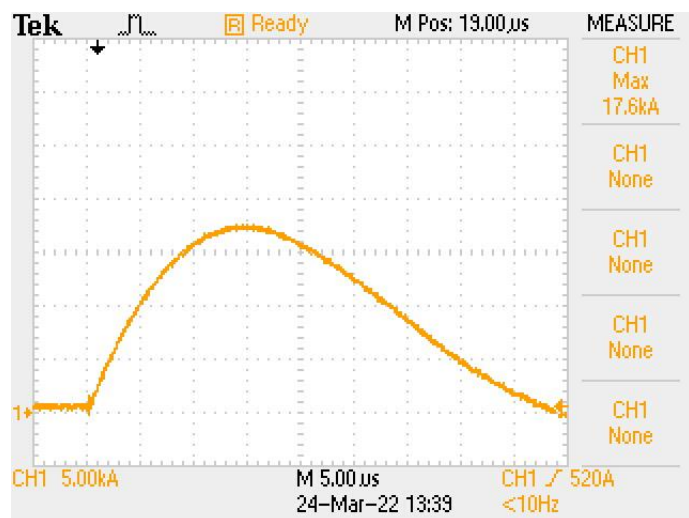
Shot 53B, Sample 8 L1-G 200kA



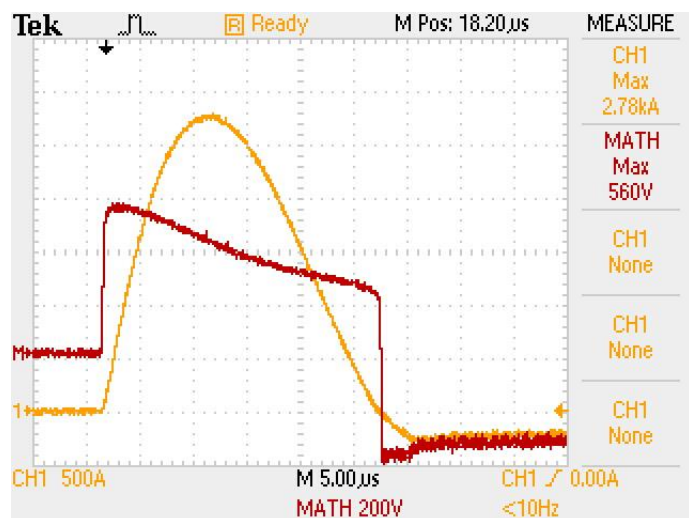
Shot 54B, Sample 8 L2-G 200kA



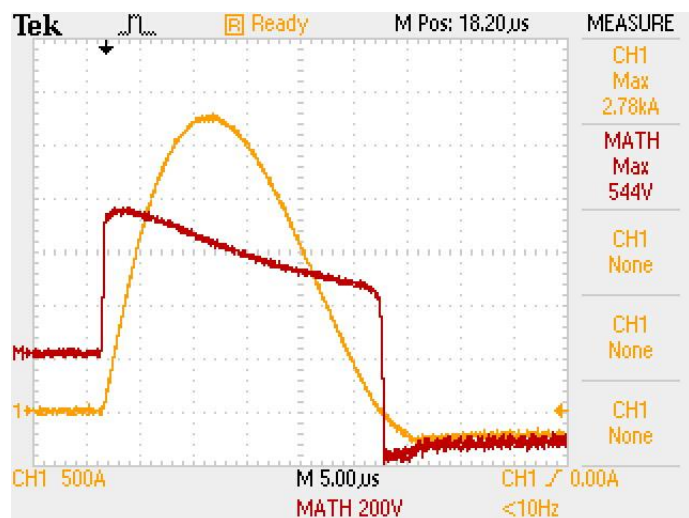
Shot 55B, Sample 8 L3-G 200kA



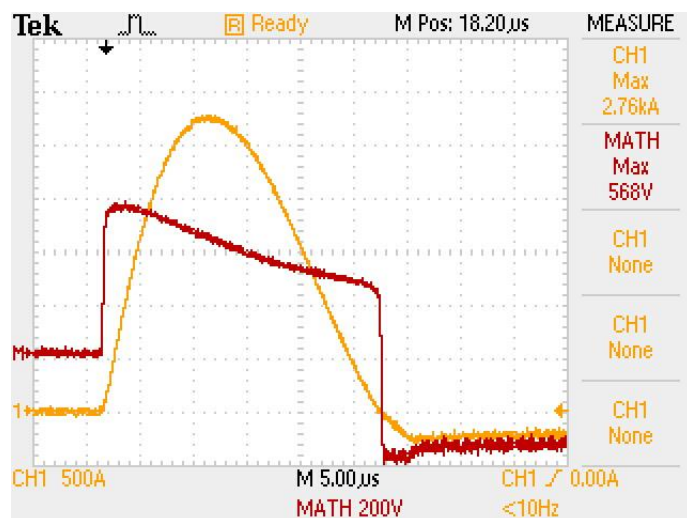
Shot 56B, Sample 8 L4-G 200kA



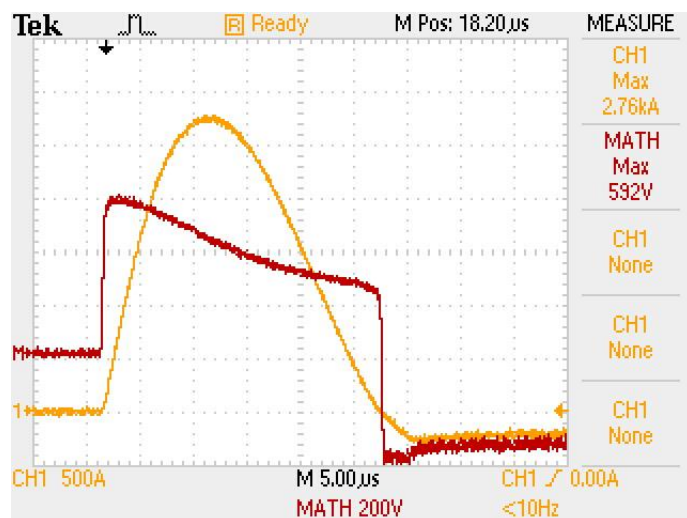
Shot 1C, Sample 1 L1-N Post-MLV



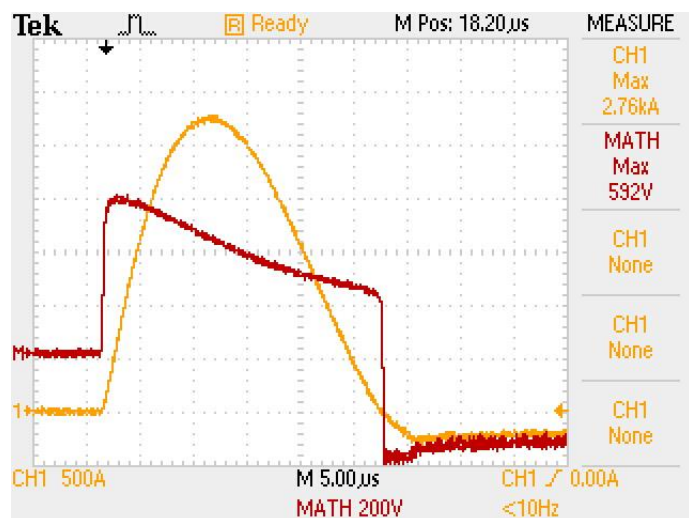
Shot 2C, Sample 1 L2-N Post-MLV



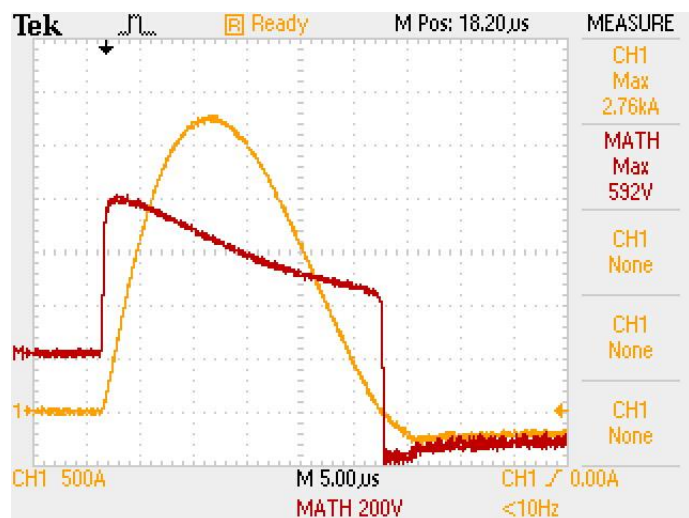
Shot 3C, Sample 1 L3-N Post-MLV



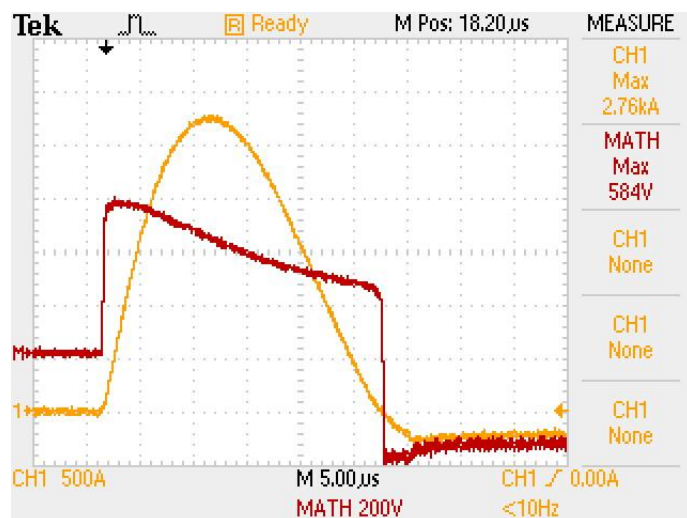
Shot 4C, Sample 1 L1-G Post-MLV



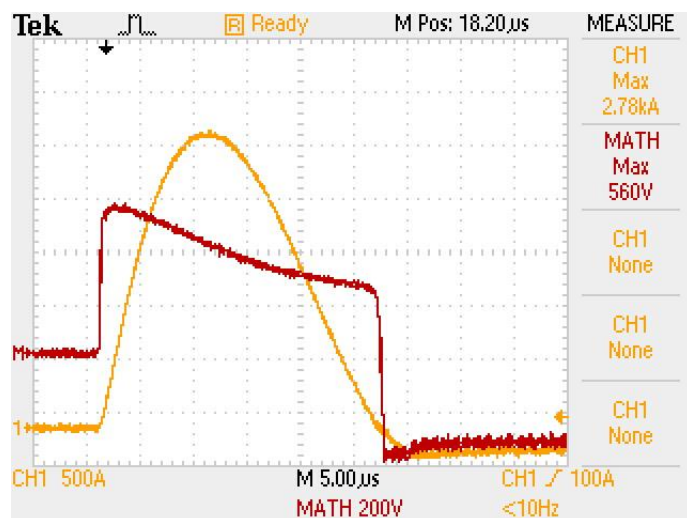
Shot 5C, Sample 1 L2-G Post-MLV



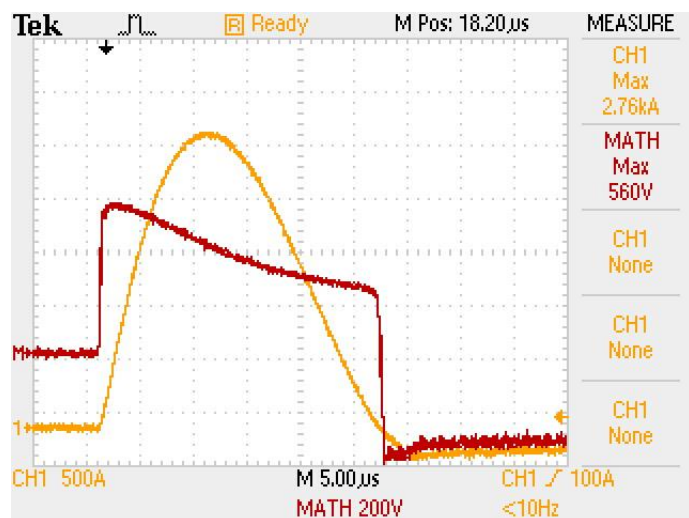
Shot 6C, Sample 2 L3-G Post-MLV



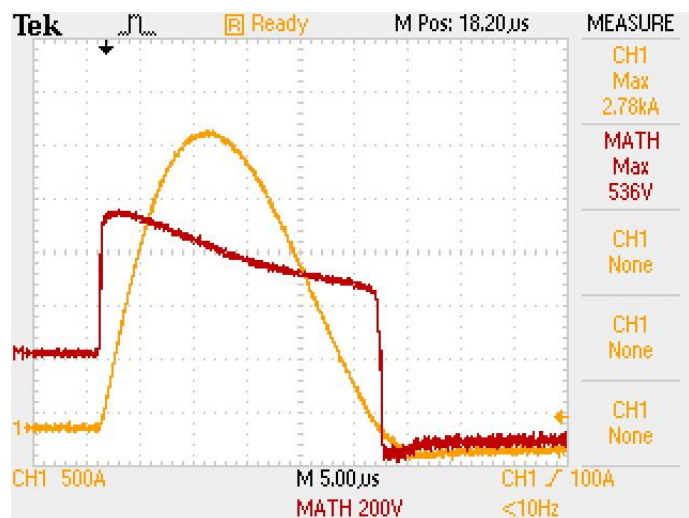
Shot 7C, Sample 1 N-G Post-MLV



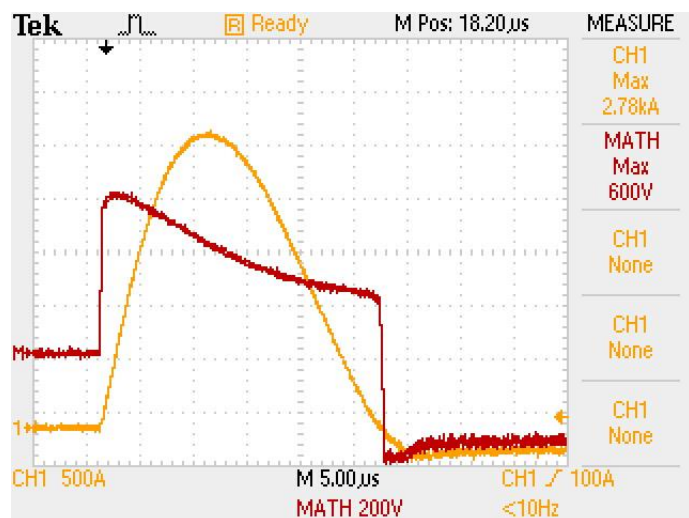
Shot 8C, Sample 2 L1-N Post-MLV



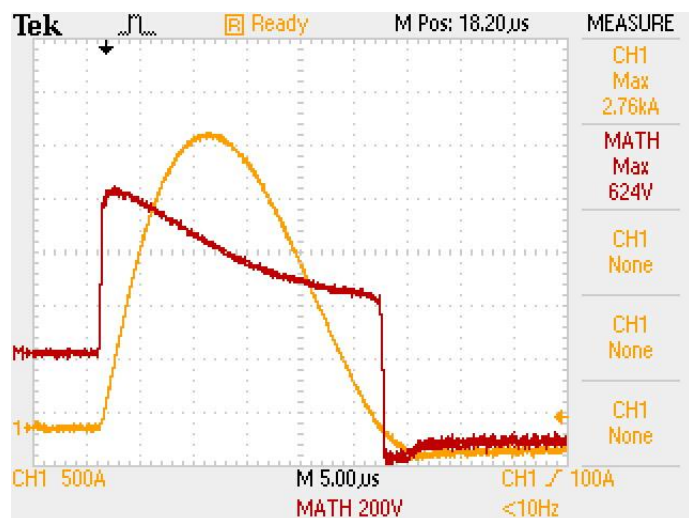
Shot 9C, Sample 2 L2-N Post-MLV



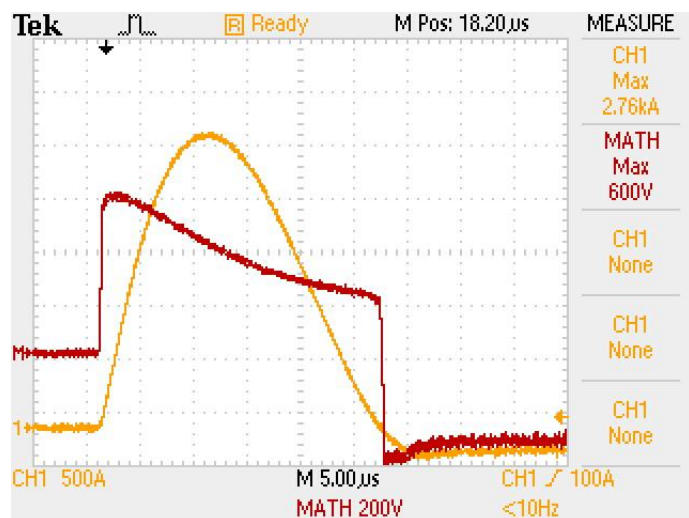
Shot 10C, Sample 2 L3-N Post-MLV



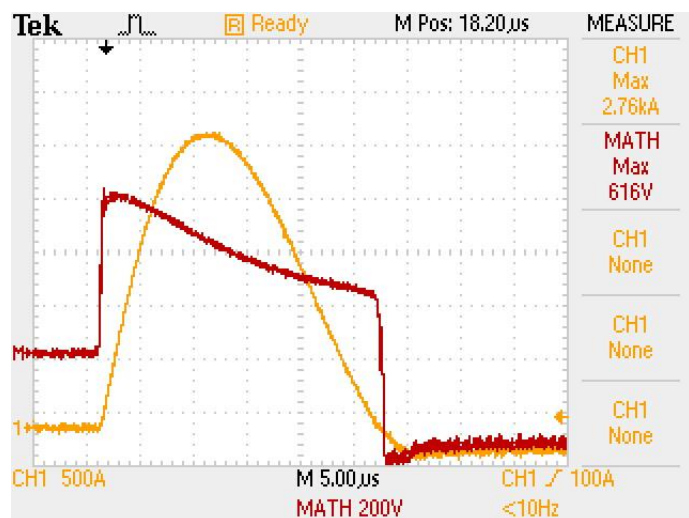
Shot 11C, Sample 2 L1-G Post-MLV



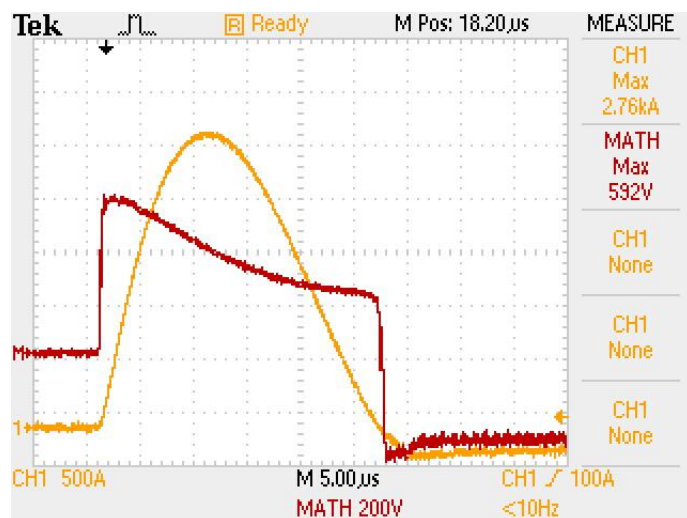
Shot 12C, Sample 1 L2-G Post-MLV



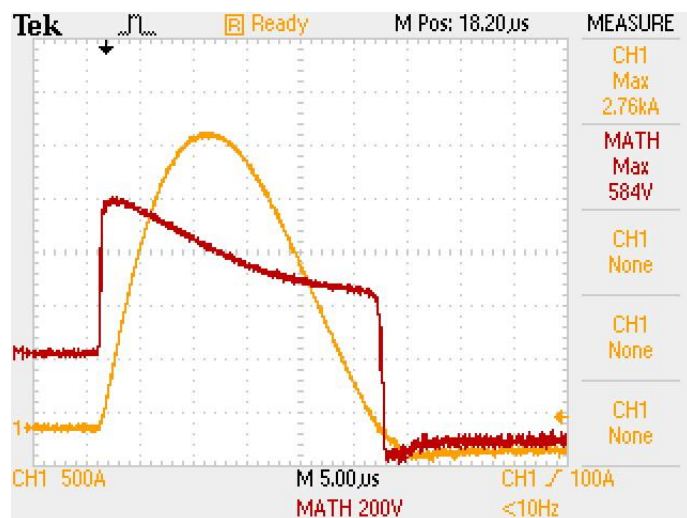
Shot 13C, Sample 2 L3-G Post-MLV



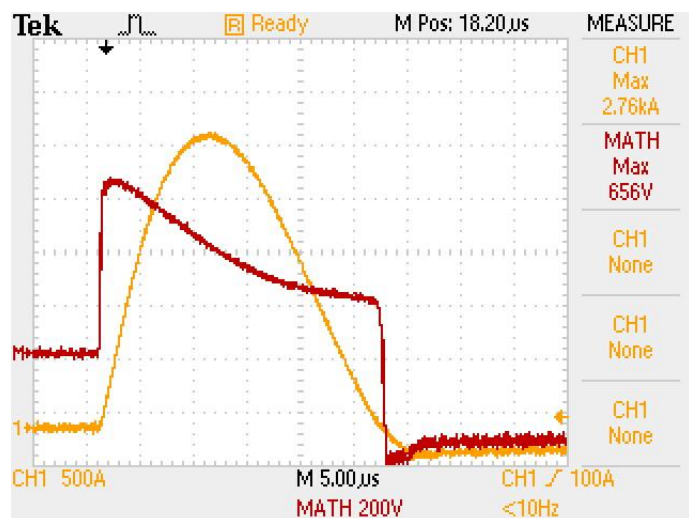
Shot 14C, Sample 2 N-G Post-MLV



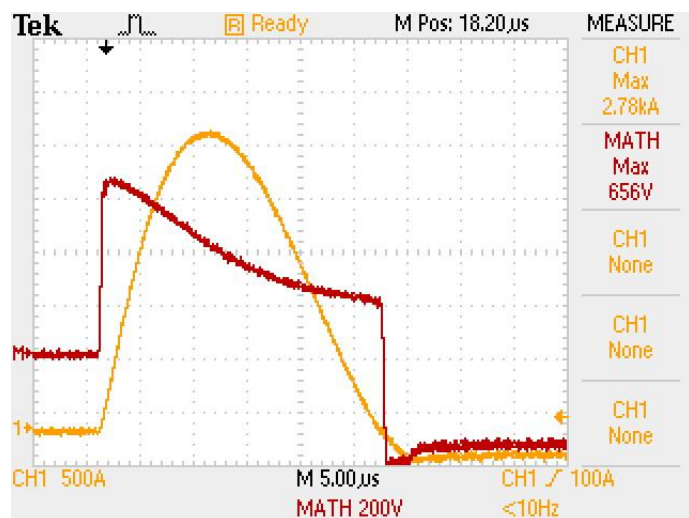
Shot 15C, Sample 3 L1-N Post-MLV



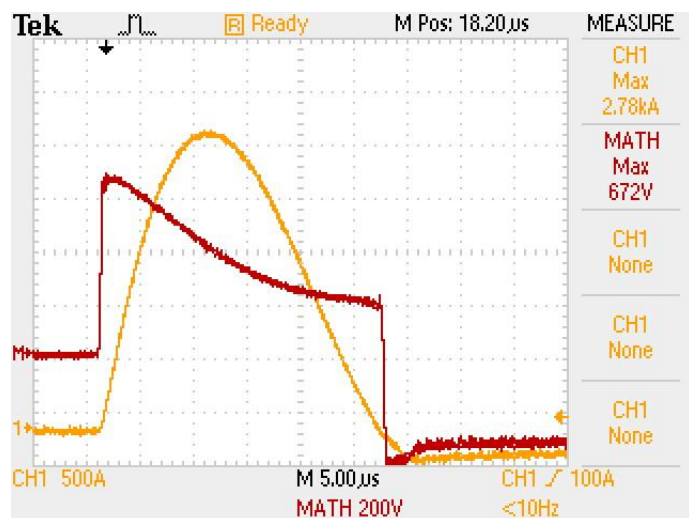
Shot 16C, Sample 3 L2-N Post-MLV



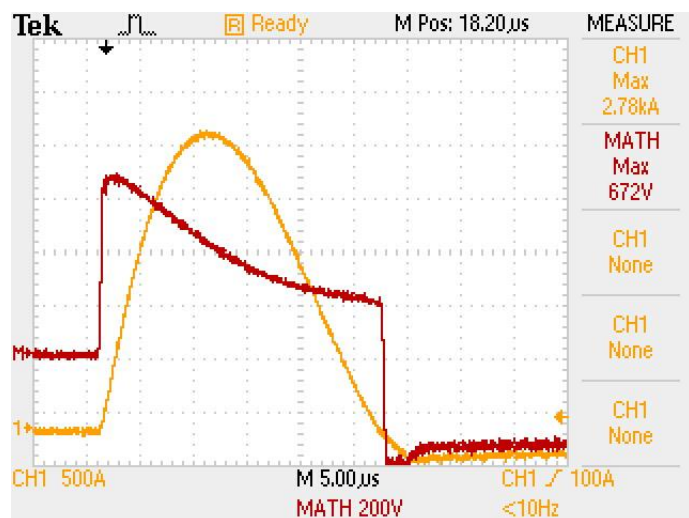
Shot 17C, Sample 3 L3-N Post-MLV



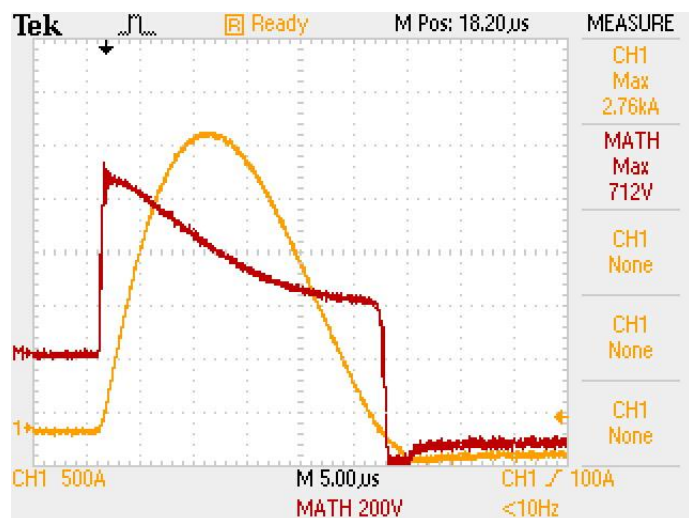
Shot 18C, Sample 3 L1-G Post-MLV



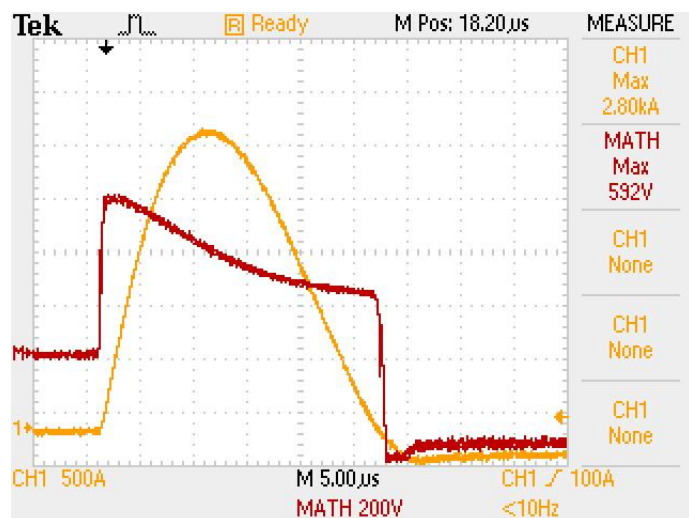
Shot 19C, Sample 3 L2-G Post-MLV



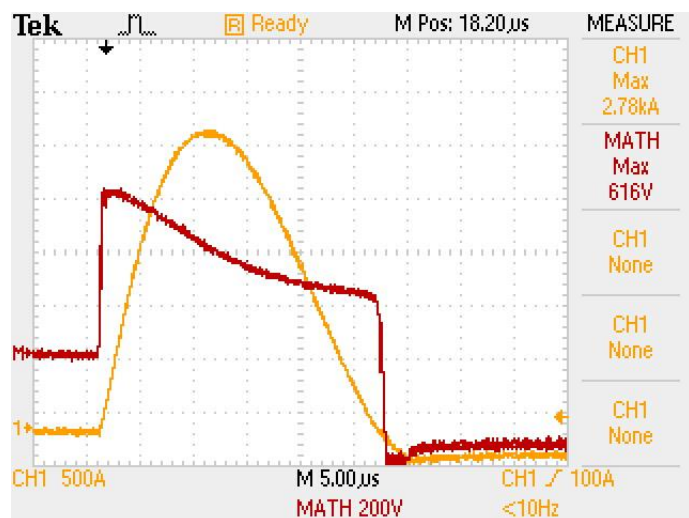
Shot 20C, Sample 3 L3-G Post-MLV



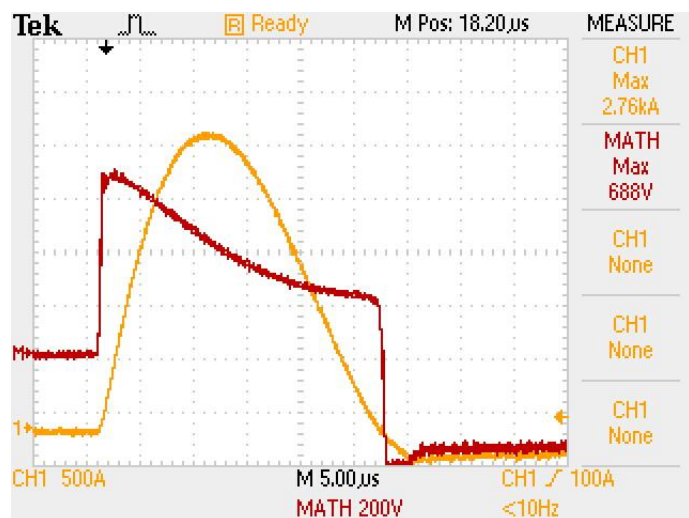
Shot 21C, Sample 3 N-G Post-MLV



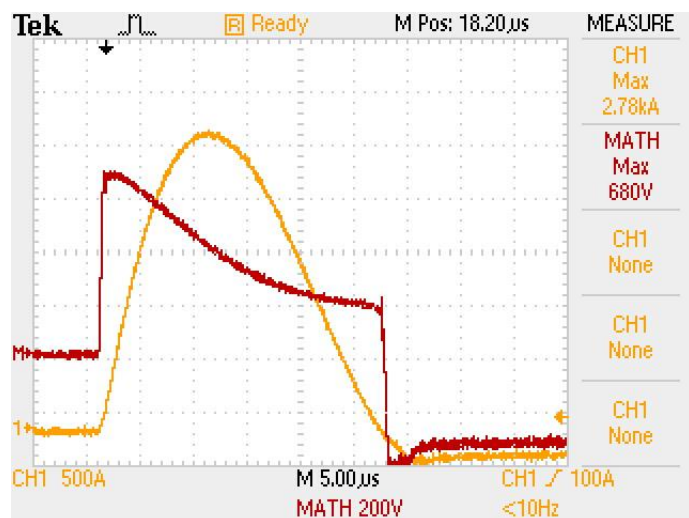
Shot 22C, Sample 4 L1-N Post-MLV



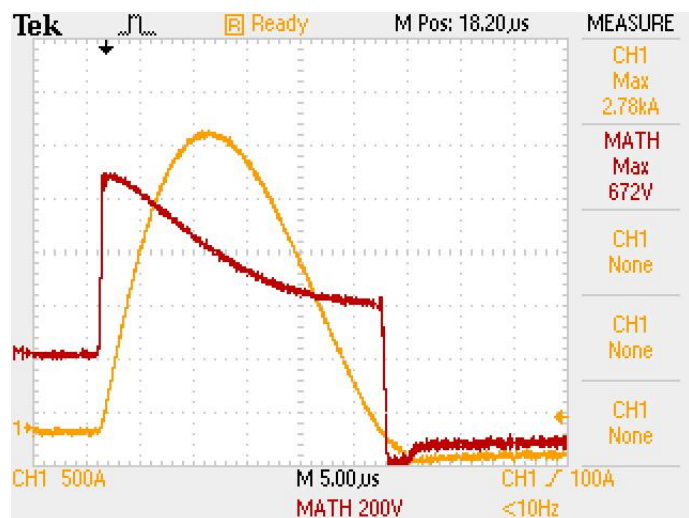
Shot 23C, Sample 4 L2-N Post-MLV



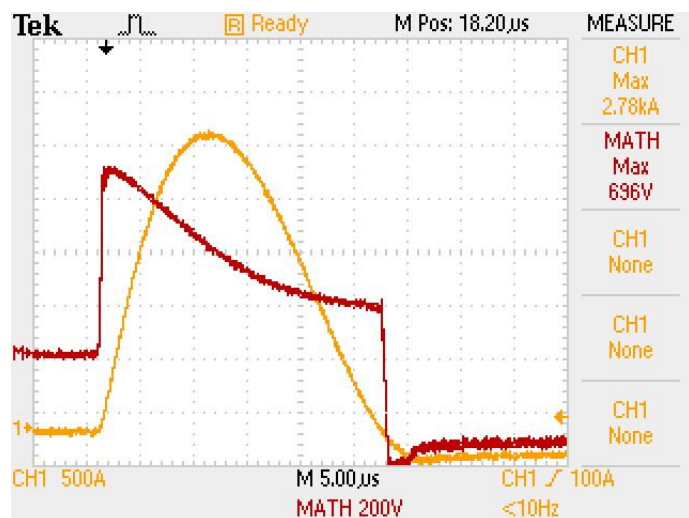
Shot 24C, Sample 4 L3-N Post-MLV



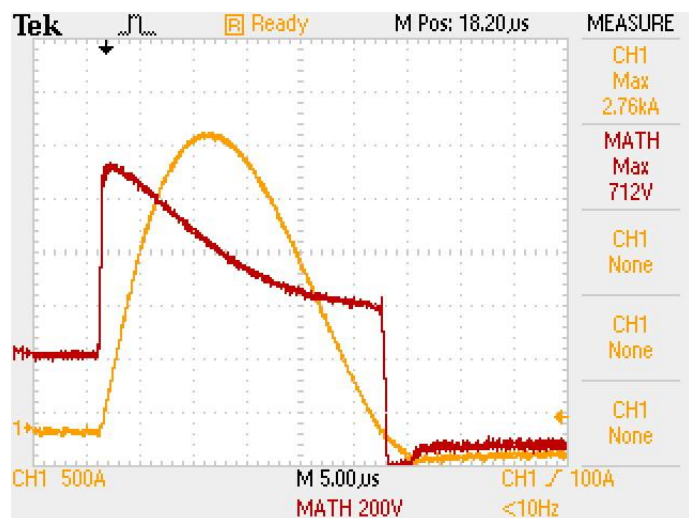
**Shot 25C, Sample 4 L1-G Post-MLV**



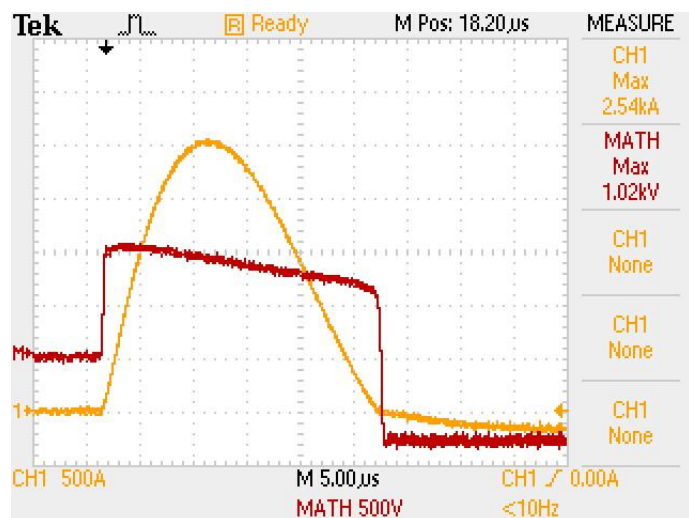
**Shot 26C, Sample 4 L2-G Post-MLV**



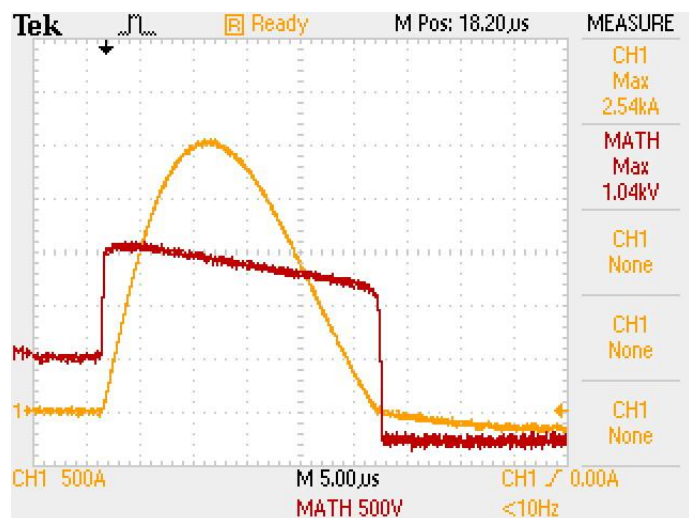
Shot 27C, Sample 4 L3-G Post-MLV



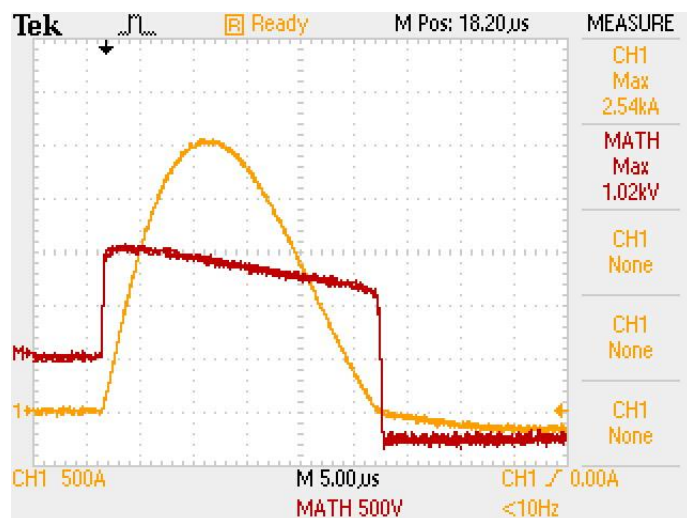
Shot 28C, Sample 4 N-G Post-MLV



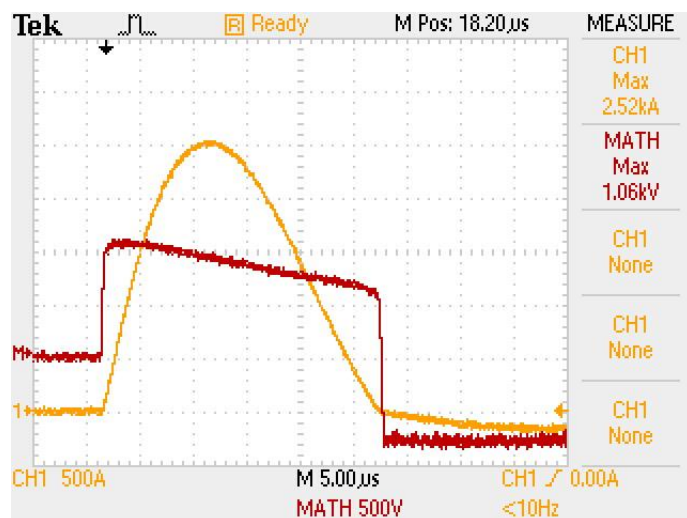
Shot 29C, Sample 5 L1-N Post-MLV



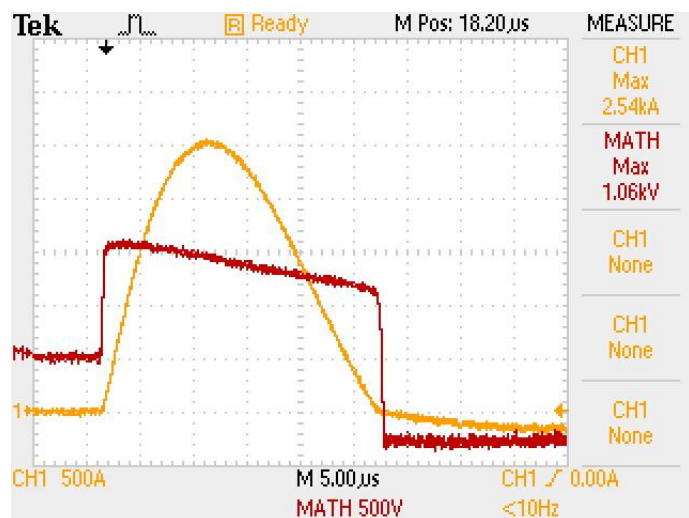
Shot 30C, Sample 5 L2-N Post-MLV



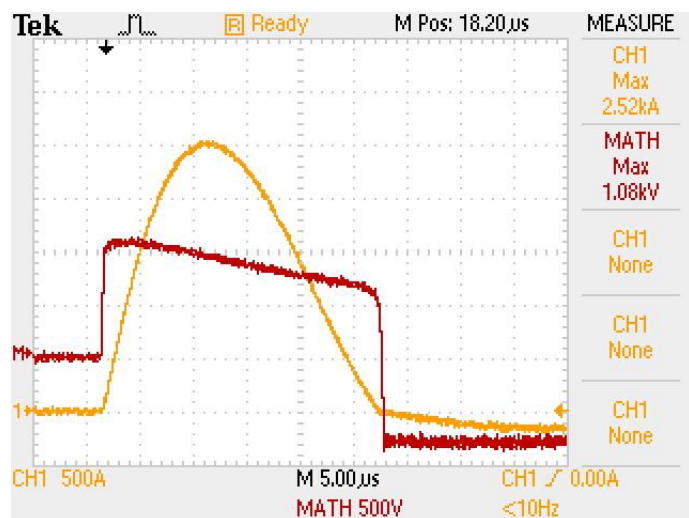
Shot 31C, Sample 5 L3-N Post-MLV



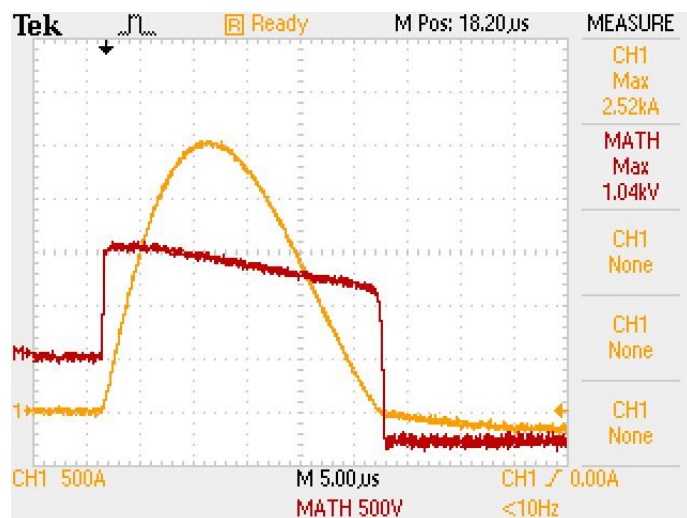
Shot 32C, Sample 5 L1-G Post-MLV



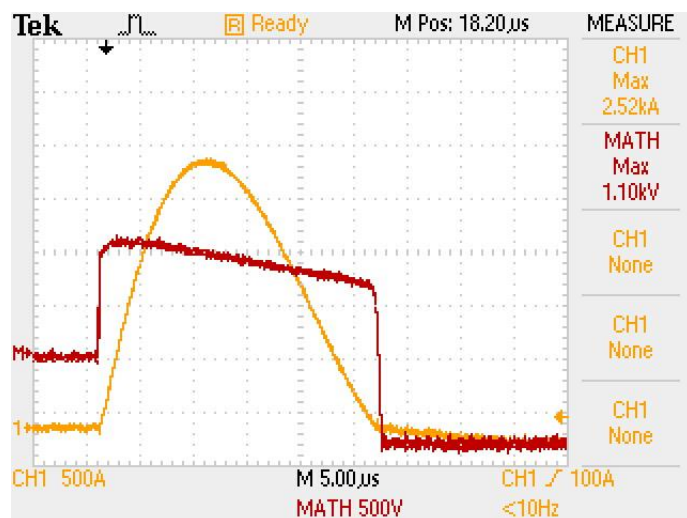
Shot 33C, Sample 5 L2-G Post-MLV



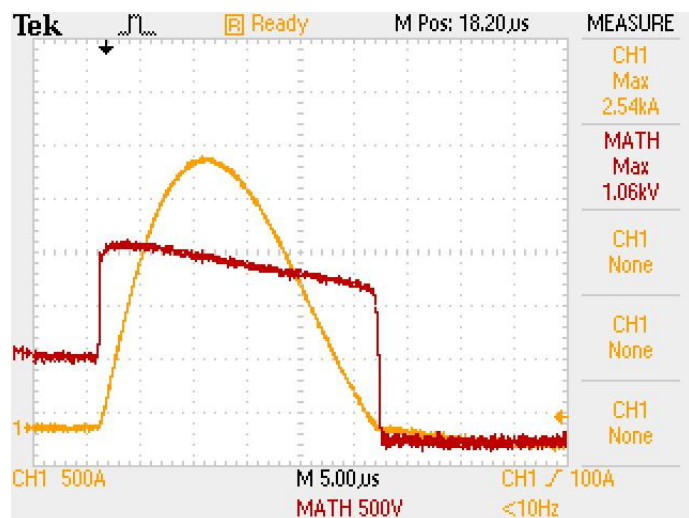
Shot 34C, Sample 5 L3-G Post-MLV



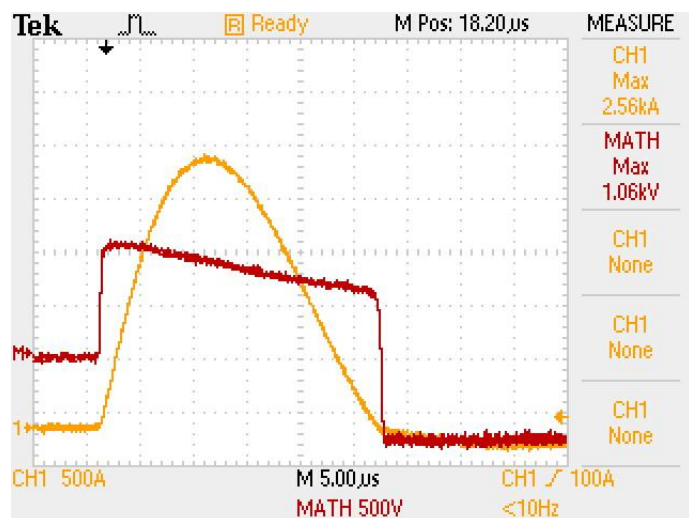
Shot 35C, Sample 5 N-G Post-MLV



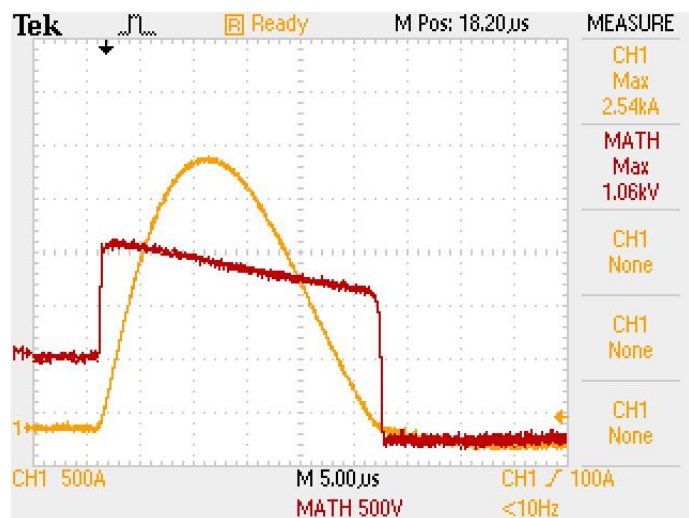
Shot 36C, Sample 6 L1-N Post-MLV



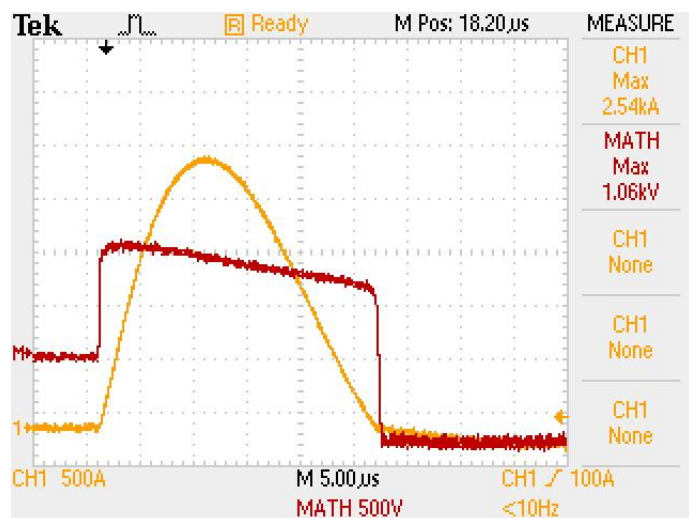
Shot 37C, Sample 6 L2-N Post-MLV



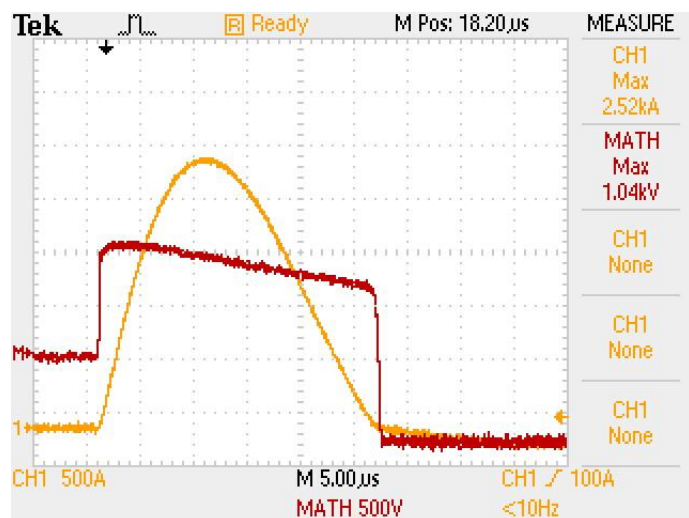
Shot 38C, Sample 6 L3-N Post-MLV



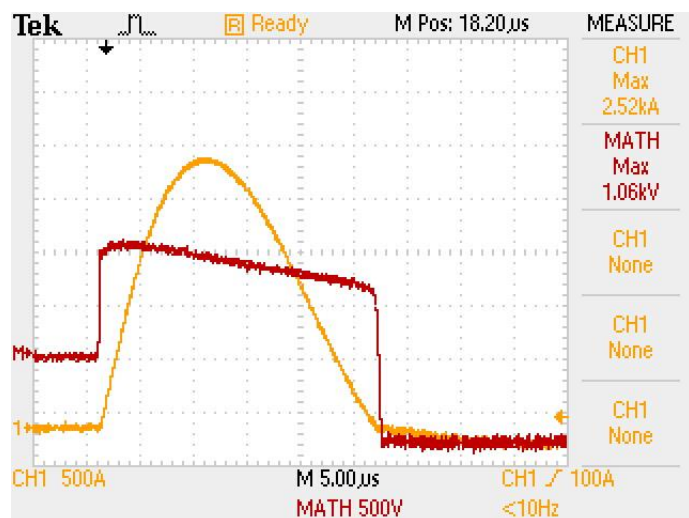
Shot 39C, Sample 6 L1-G Post-MLV



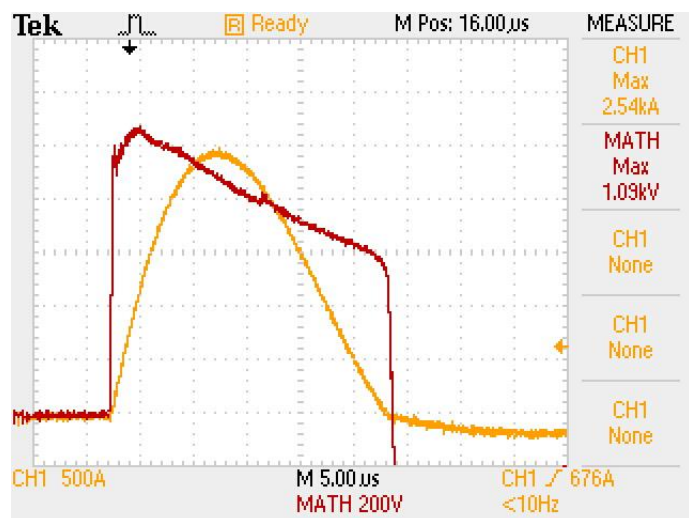
Shot 40C, Sample 6 L2-G Post-MLV



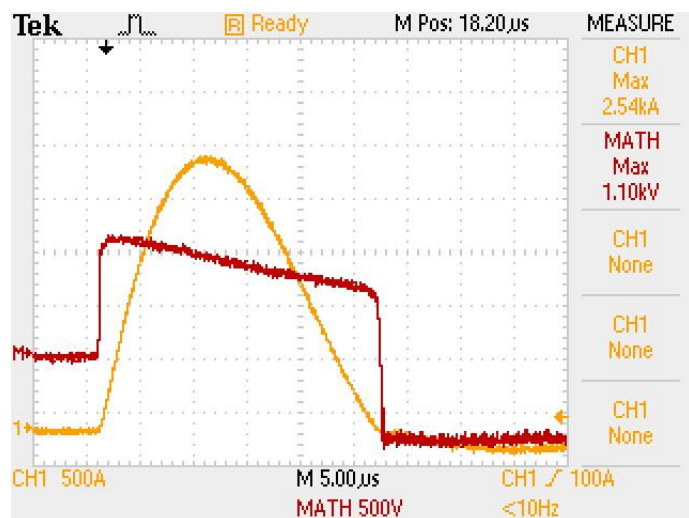
Shot 41C, Sample 6 L3-G Post-MLV



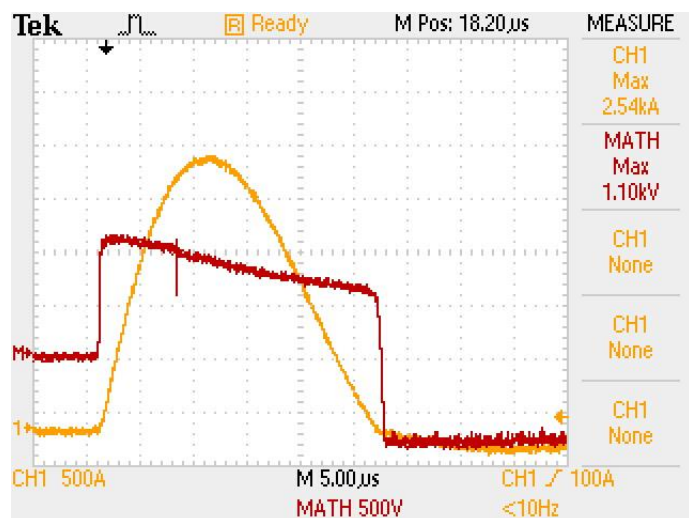
Shot 42C, Sample 6 N-G Post-MLV



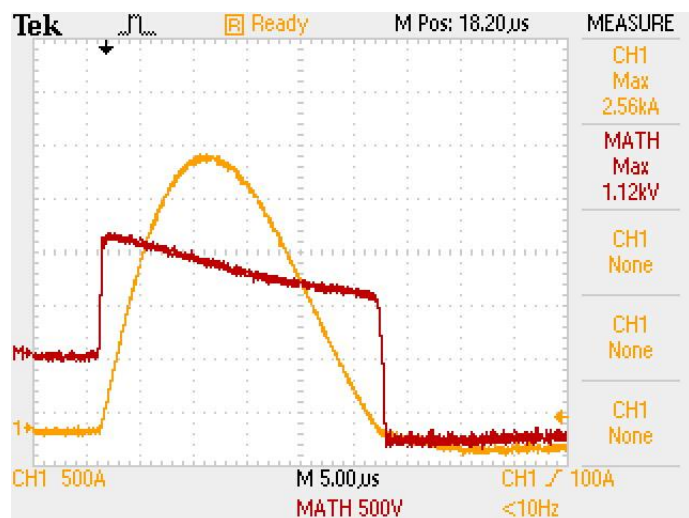
Shot 43C, Sample 7 L1-N Post-MLV



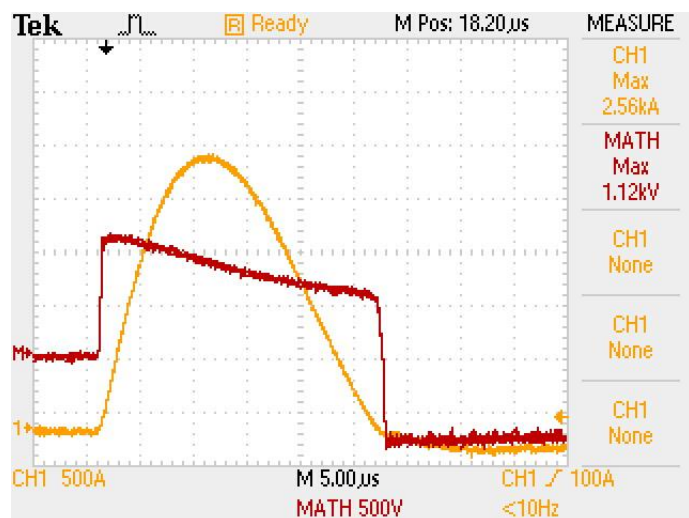
Shot 44C, Sample 7 L2-N Post-MLV



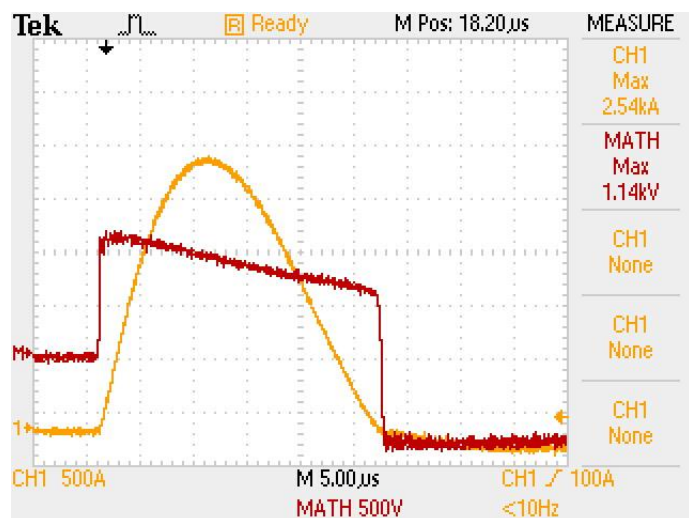
Shot 45C, Sample 7 L3-N Post-MLV



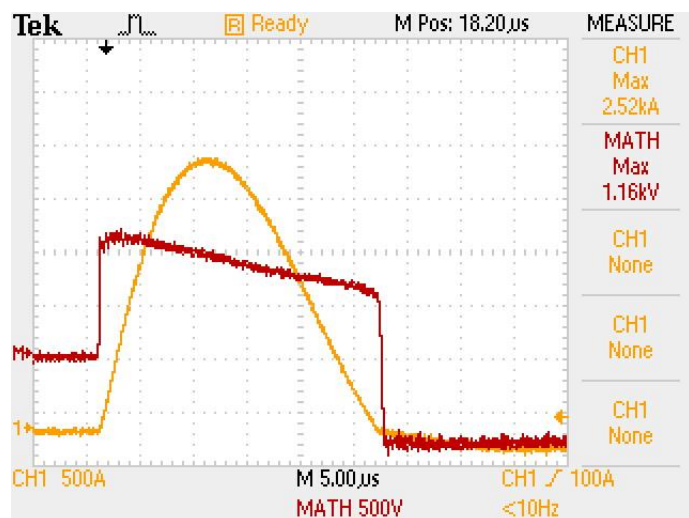
Shot 46C, Sample 7 L1-G Post-MLV



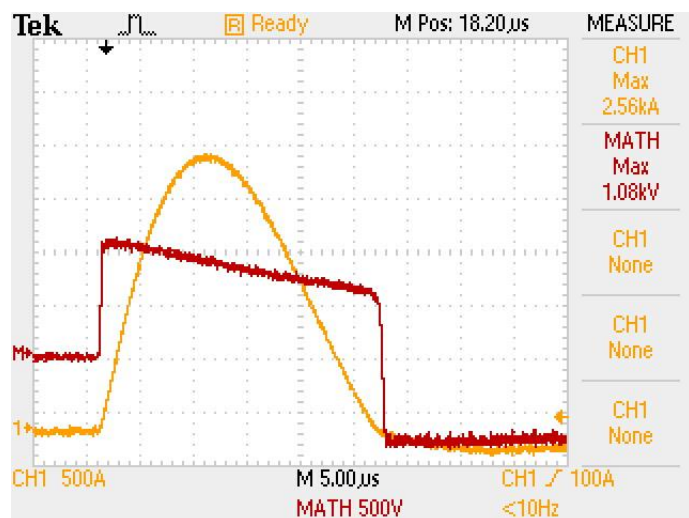
Shot 47C, Sample 7 L2-G Post-MLV



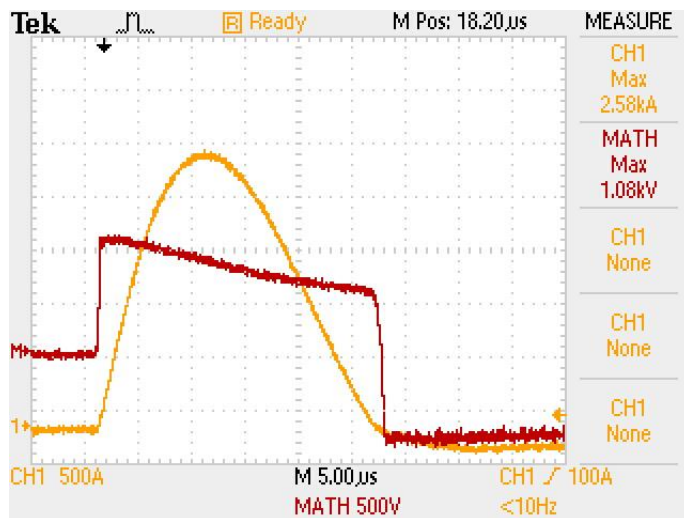
Shot 48C, Sample 7 L3-G Post-MLV



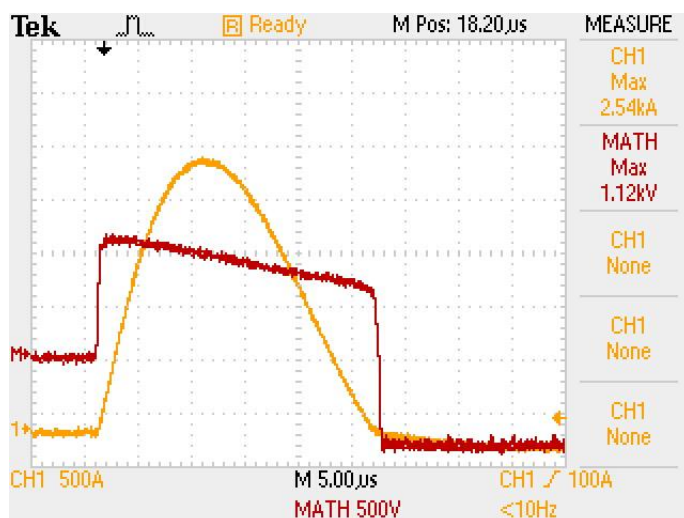
Shot 49C, Sample 7 N-G Post-MLV



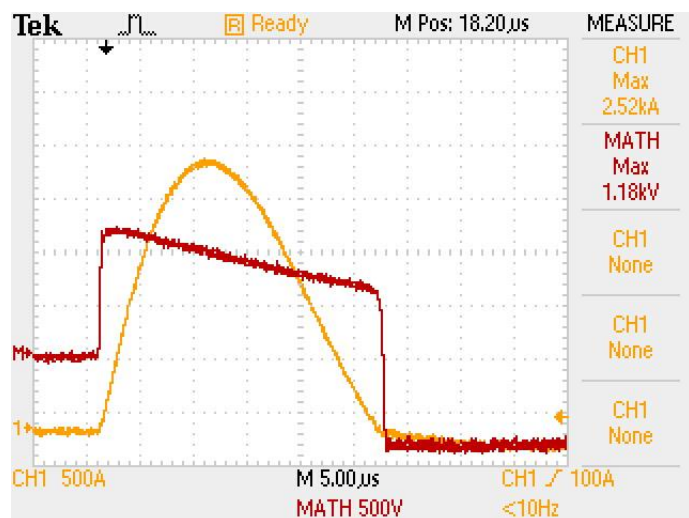
Shot 50C, Sample 8 L1-N Post-MLV



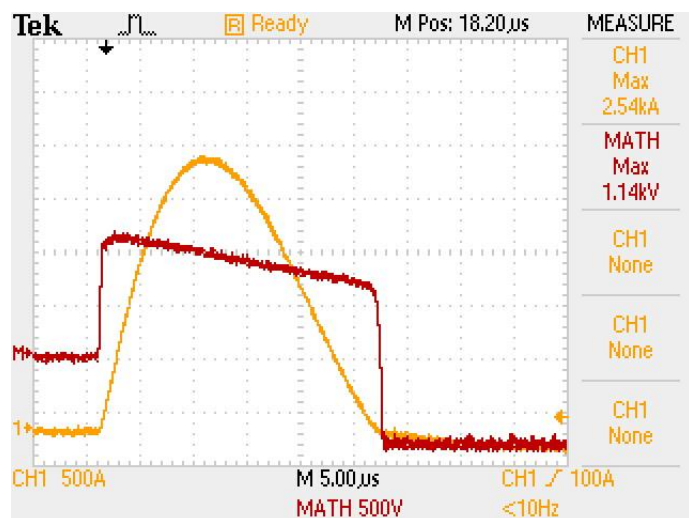
Shot 51C, Sample 8 L2-N Post-MLV



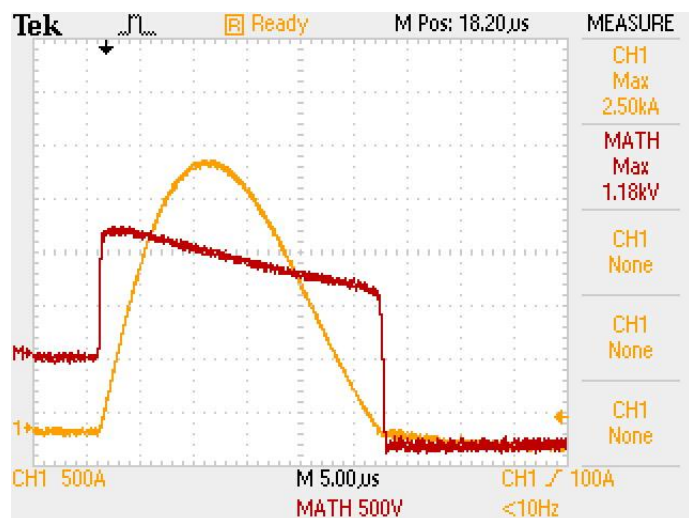
Shot 52C, Sample 8 L3-N Post-MLV



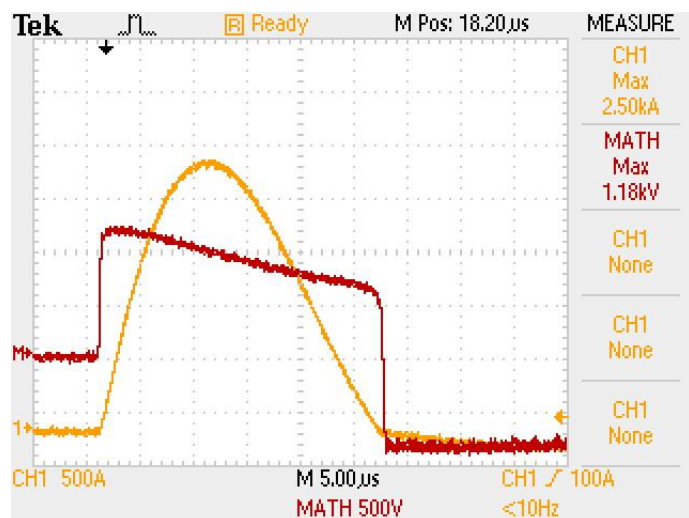
Shot 53C, Sample 8 L1-G Post-MLV



Shot 54C, Sample 8 L2-G Post-MLV



Shot 55C, Sample 8 L3-G Post-MLV



Shot 56C, Sample 8 N-G Post-MLV