

Marutakatechno Co., Ltd.  
550-1 Yahata  
Fujieda Shizuoka Japan, 426-0009

August 17, 2018

Dear TI support center,

I am an electric engineer from a Japanese company, Marutakatechno Co., Ltd., who is manufacturing home-use electronic therapy devices.

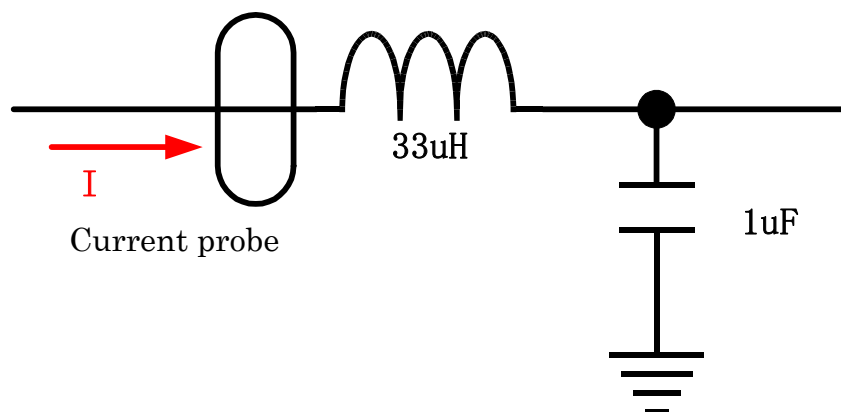
I am writing this because we use your audio power amp, TPA3111D1, for our low frequency, thermal, and electric potential therapy apparatus for home use and encounter a problem with the amp we cannot solve by ourselves. Please read through this letter together with the circuit diagram I attached separately and kindly give us a reply.

The problem is output at FAULT terminal goes from Hi to Lo, which consequently causes output at PWM to stop. I have three questions regarding this problem. The surrounding circuit is formed similar to TPA3111D1EVM with  $8\Omega$  speaker and LC filter of  $33\mu\text{H}$ ,  $1\mu\text{F}$  on output side. The power voltage for audio amp is DC24V.

Q1: What are the conditions for output of FAULT terminal to switch from Hi to Lo? I can see from the data sheet that the phenomenon occurs due to such causes as over current, over heat, short circuit of input capacitor or output printed circuit board, DC detection fault but since their practical values are not specified I cannot figure out the exact conditions.

Q2: The output of FAULT terminal varies even under exact same operation. One time I try put on certain music, voice guidance or beeps on our device, output to FAULT terminal stays high and they are emitted perfectly fine. But another time I try turn them on making the exact same operation, the output is switched to low for some reason and the output to PWM stops resulting no sound coming out of the device. I wonder why that happens? I felt the IC but it was not overheated. I checked the input side but there was no abnormality. Then I replaced the capacitor of the LC filter attached to output side from  $1\mu\text{F}$  to  $1000\text{pF}$  and the phenomenon has not been detected so far. I included the current waveforms of output side in the following sheets. I would appreciate it if you could look at them, point out any problem and suggest countermeasure against the problem. The waveforms were taken by putting current probe before the LC filter.

Q 3: The data sheet specifies  $L=33\mu\text{H}$ ,  $C=1\mu\text{F}$ . I am wondering if there will be any problem to increase the inductance or decrease the capacitance.



Should there be any other information you need to identify the problem and suggest a solution, please

e-mail me at [h\\_akiyama@marutaka.co.jp](mailto:h_akiyama@marutaka.co.jp).

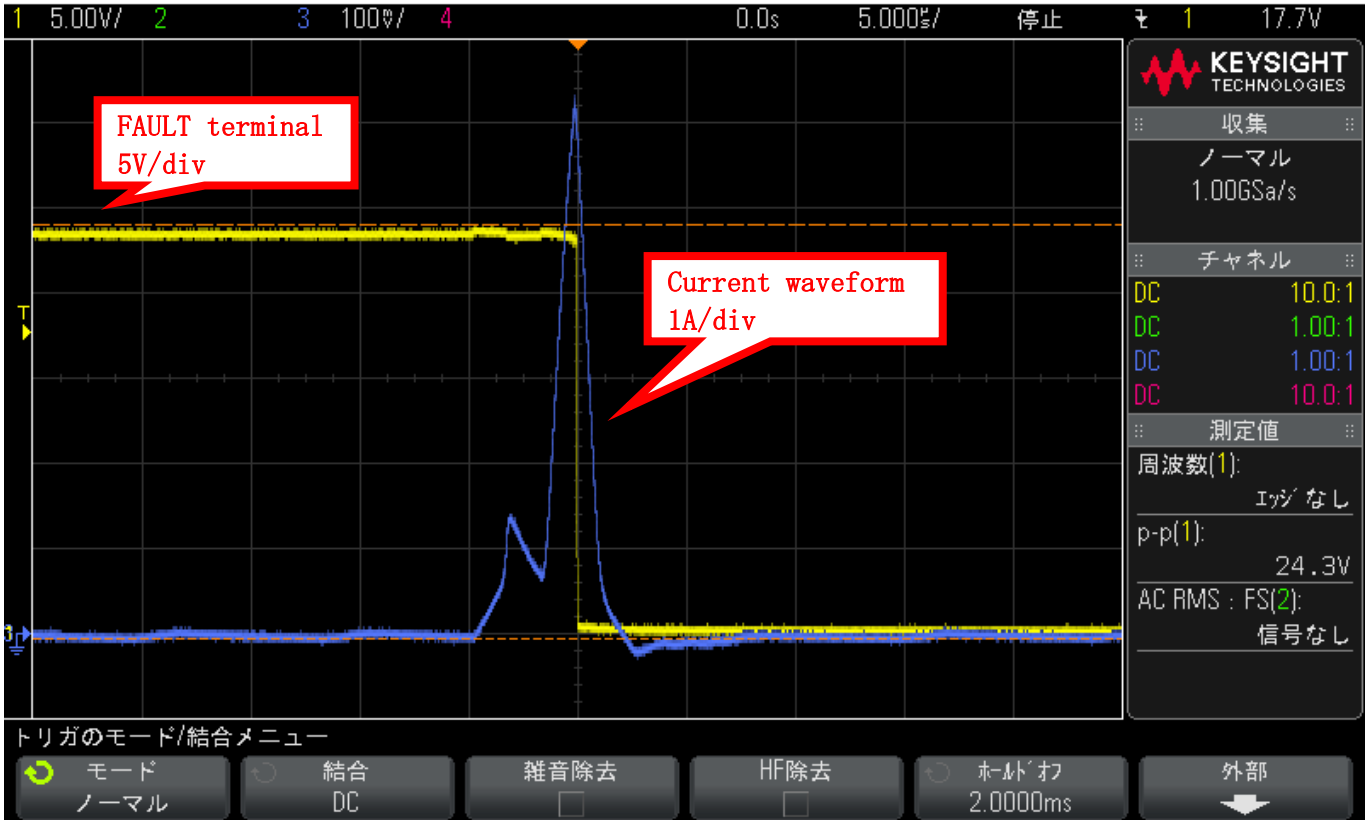
Sincerely,

Hiroki Akiyama  
Senior Electric Engineer

【Current waveform】

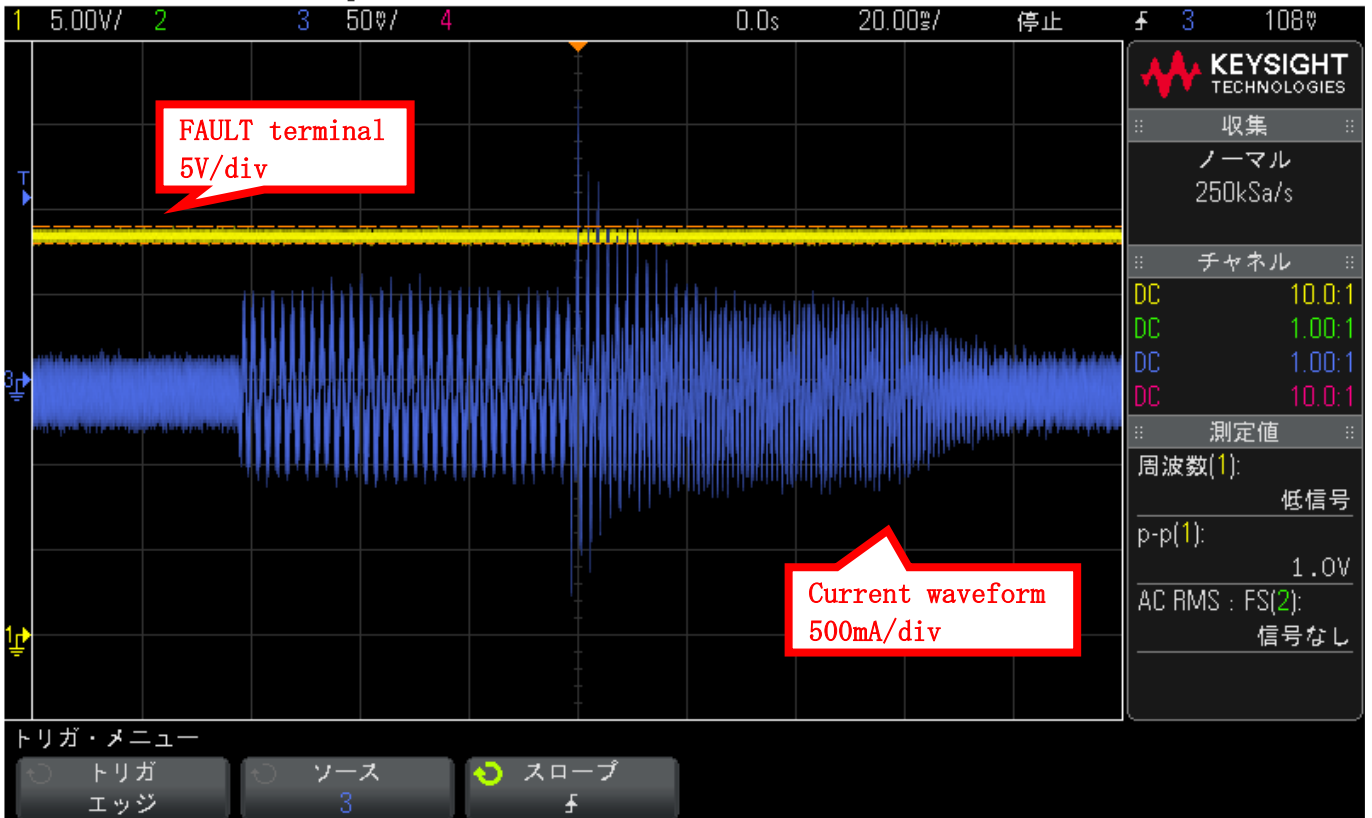
○Waveform of FAULT terminal output when switched from high to low (5us/div)

DSO-X 2024A, MY52160505: Mon Aug 06 15:12:05 2018



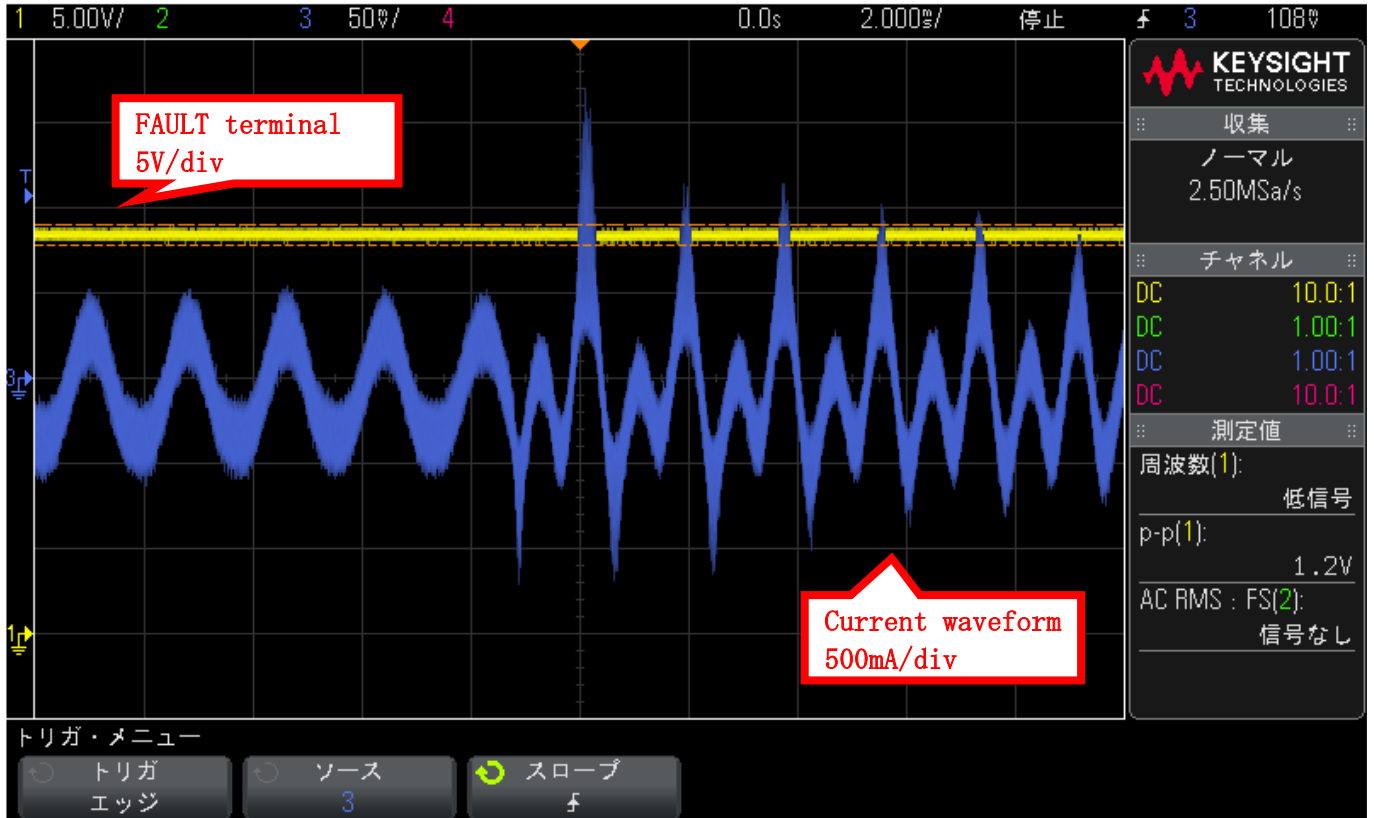
○Current waveform when beep sound is issued (20ms/div)

DSO-X 2024A, MY52160505: Mon Aug 06 15:17:07 2018



○Current waveform when beep sound is issued (2ms/div)

DSO-X 2024A, MY52160505: Mon Aug 06 15:20:12 2018



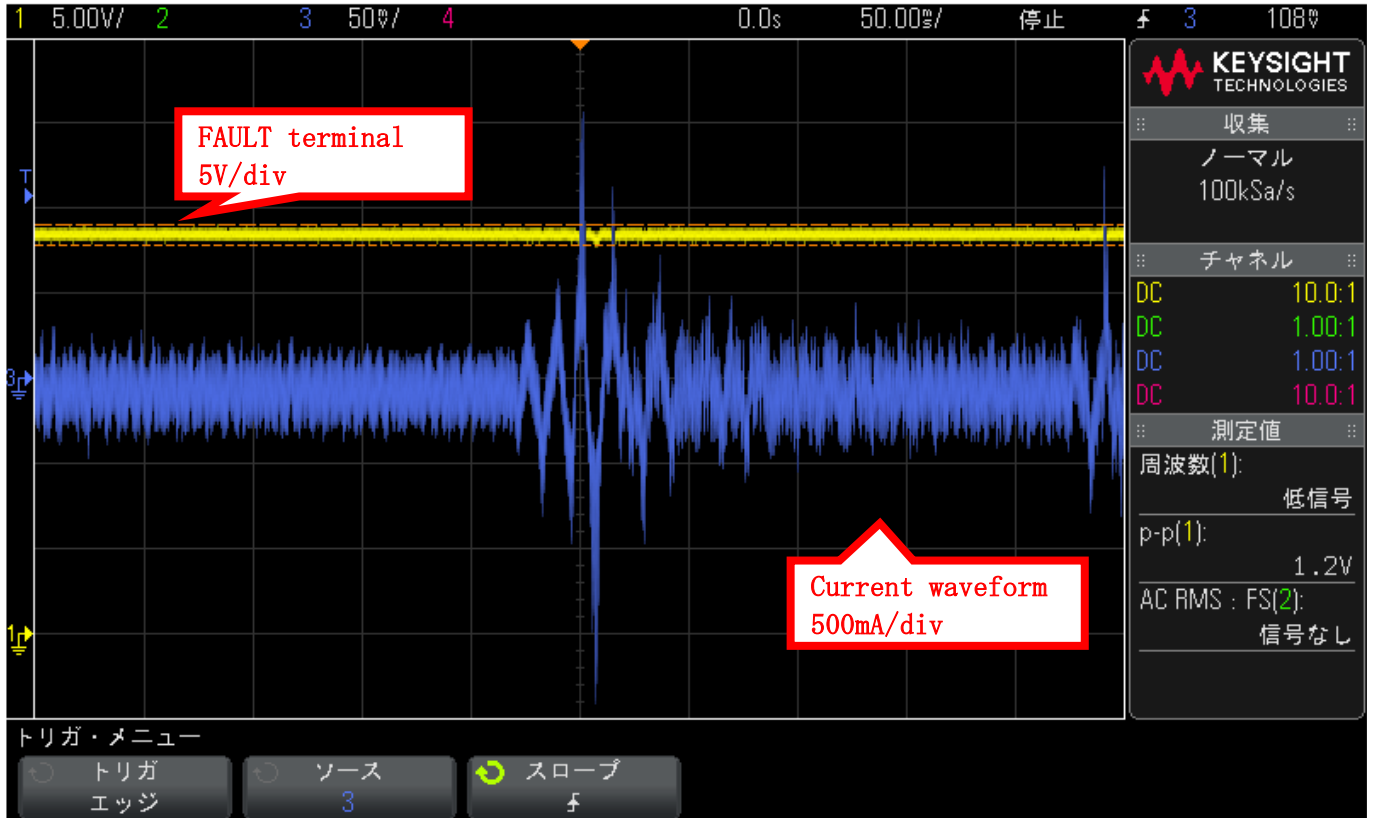
○Current waveform when beep sound is issued (10us/div)

DSO-X 2024A, MY52160505: Mon Aug 06 15:39:03 2018



○Current waveform when music is turned on(50ms/div)

DSO-X 2024A, MY52160505: Mon Aug 06 15:16:00 2018



○Current waveform when music is turned on (50ms/div)

DSO-X 2024A, MY52160505: Mon Aug 06 15:16:11 2018



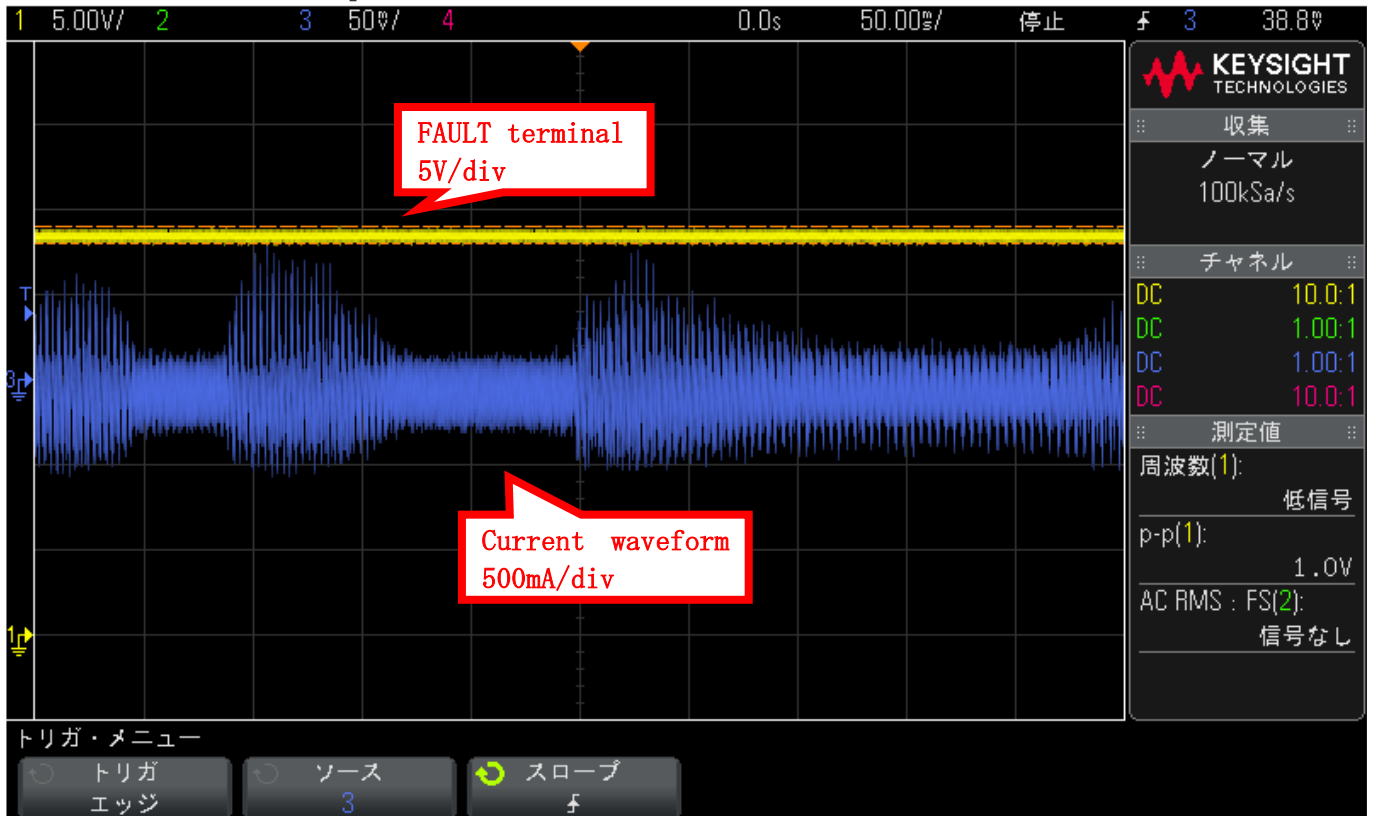
○Current waveform when music is turned on (50ms/div)

DSO-X 2024A, MY52160505, Mon Aug 06 15:20:41 2018



○Current waveform when voice guidance is turned on (50ms/div)

DSO-X 2024A, MY52160505, Mon Aug 06 15:21:59 2018



○Current waveform when voice guidance is turned on (50ms/div)

DSO-X 2024A, MY52160505, Mon Aug 06 15:32:10 2018

