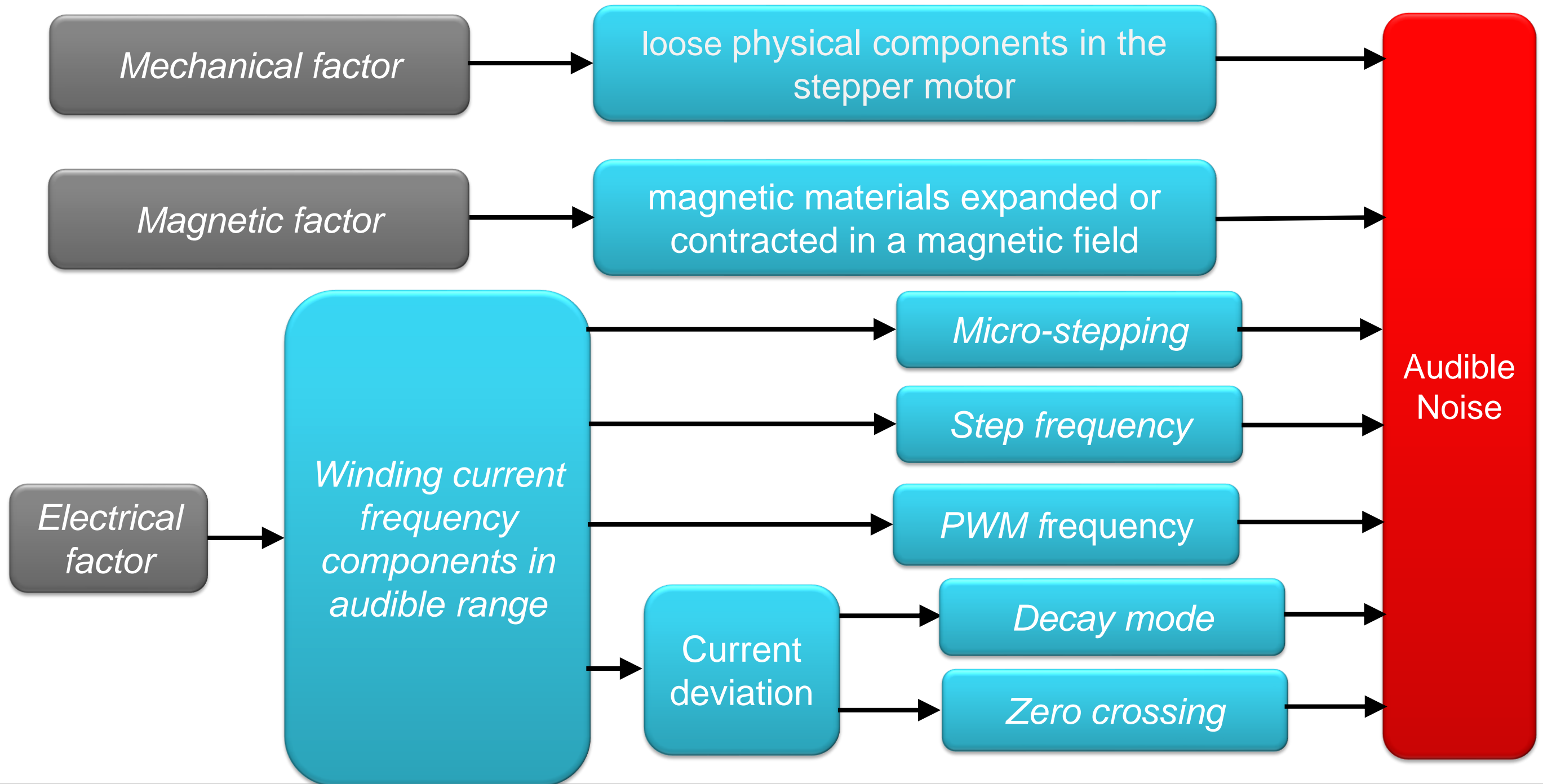


Stepper Motor 9: Audible Noise

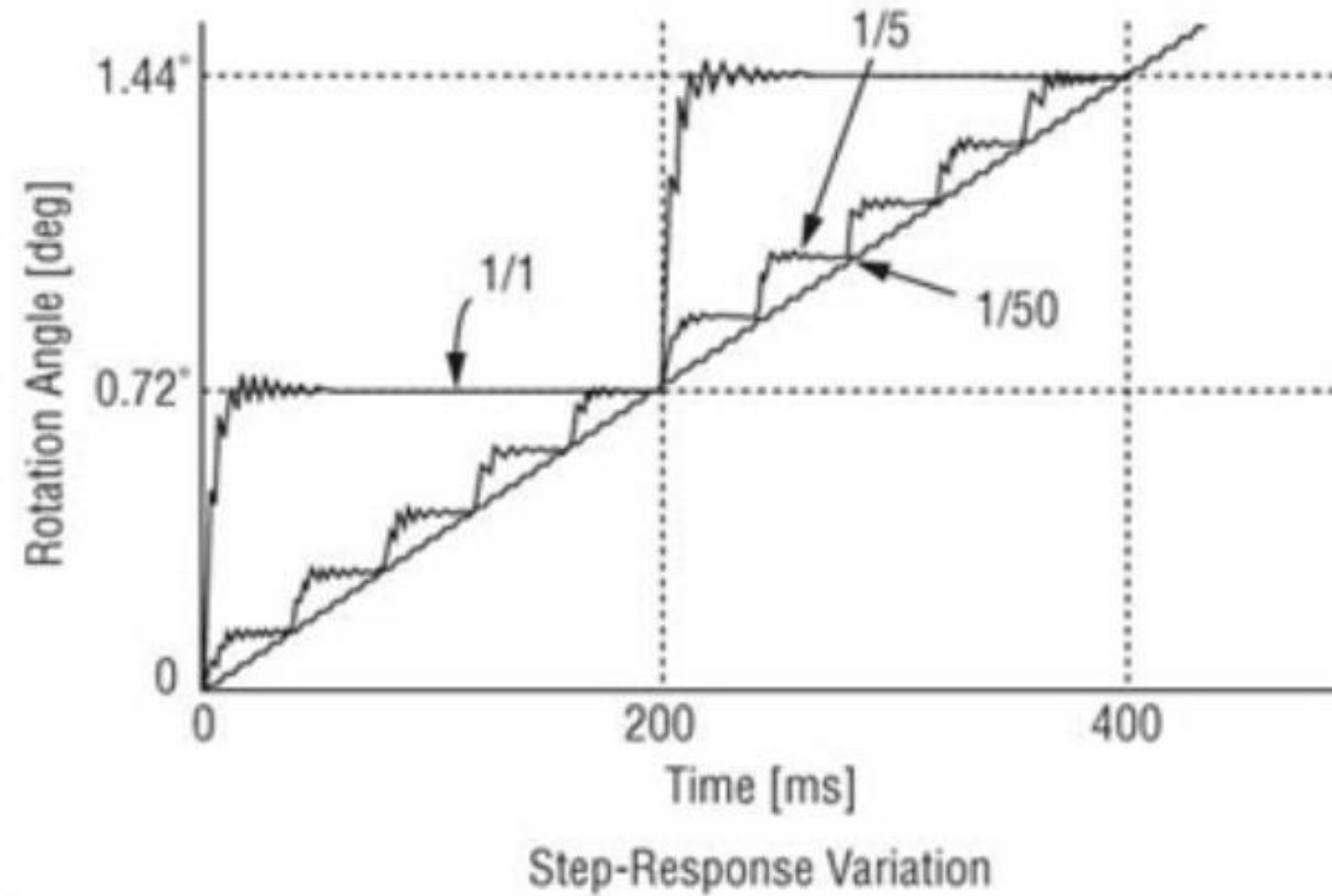
TI Precision Labs – Motor Drivers

Presented and prepared by Wang Li

Common stepper audible noise problem

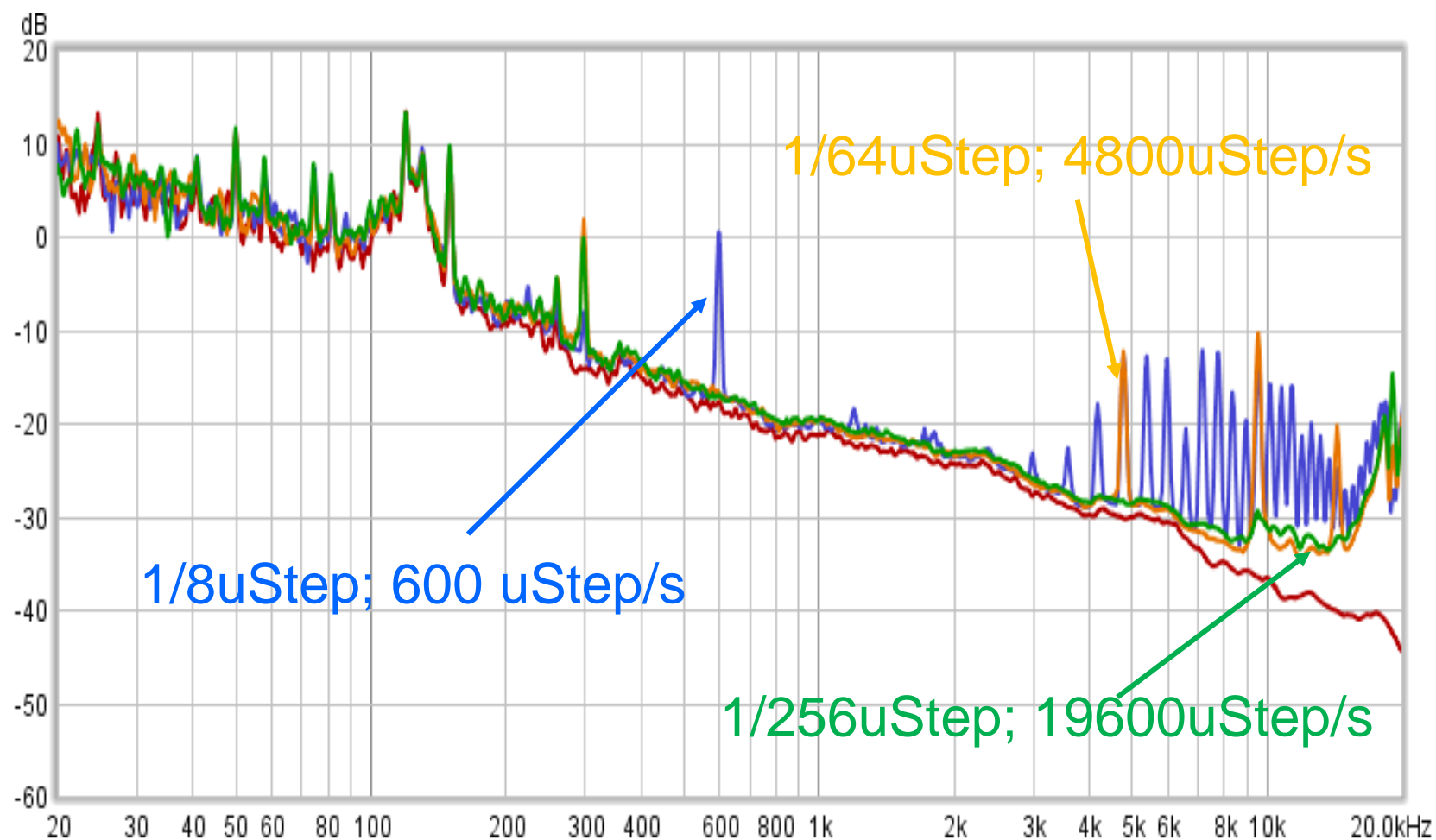


Micro-stepping setting



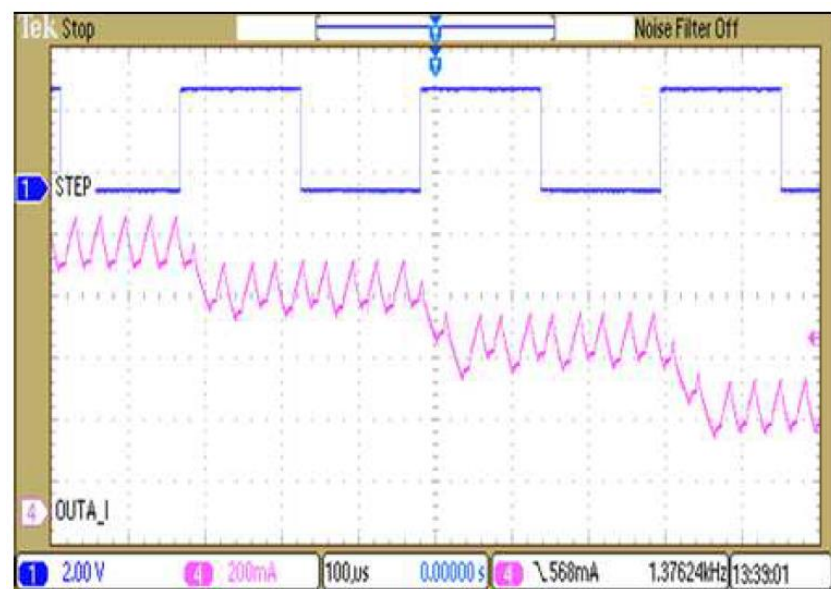
www.orientalmotor.com

Step frequency setting



Sound pressure level plot

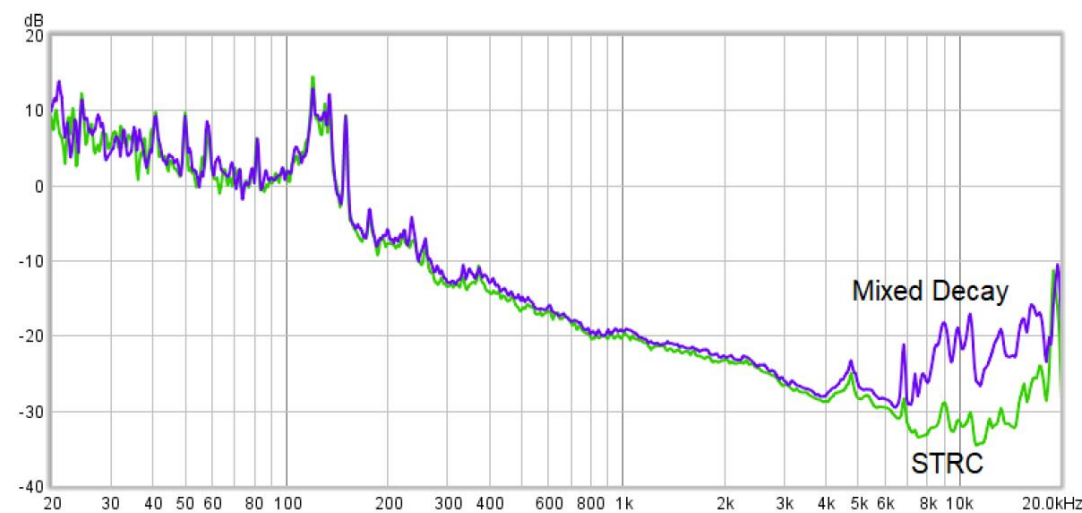
PWM frequency and current ripple



Microstepping Current vs STEP Input, Mixed Decay

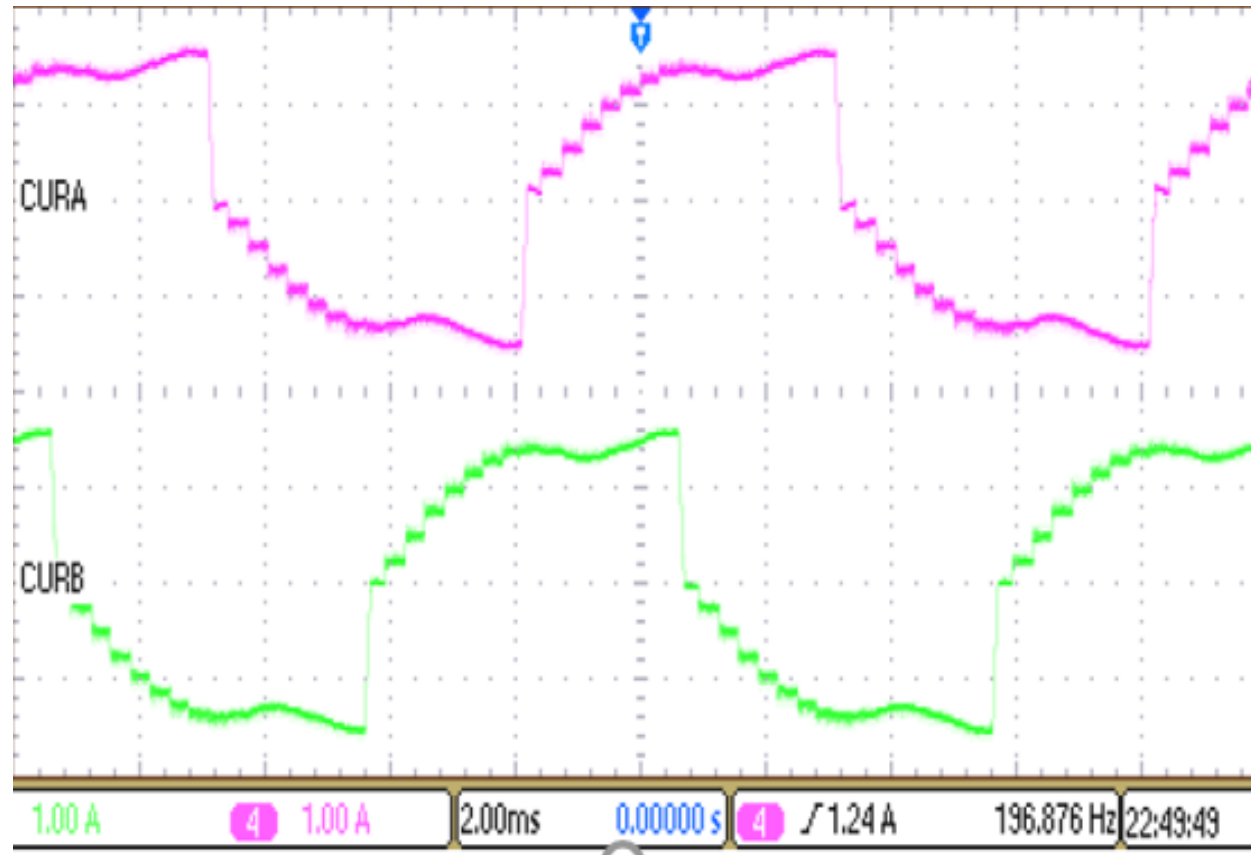


Microstepping Current vs STEP Input, Slow Decay

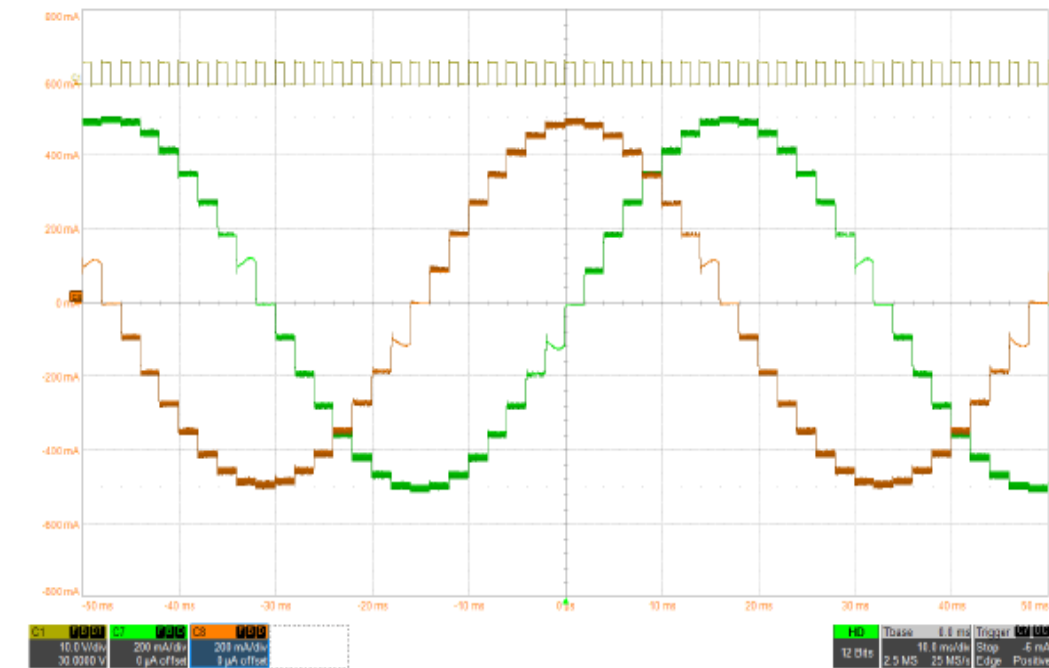


Mixed Decay vs Smart Tune Ripple Control (STRC) at 1/256 Microstepping

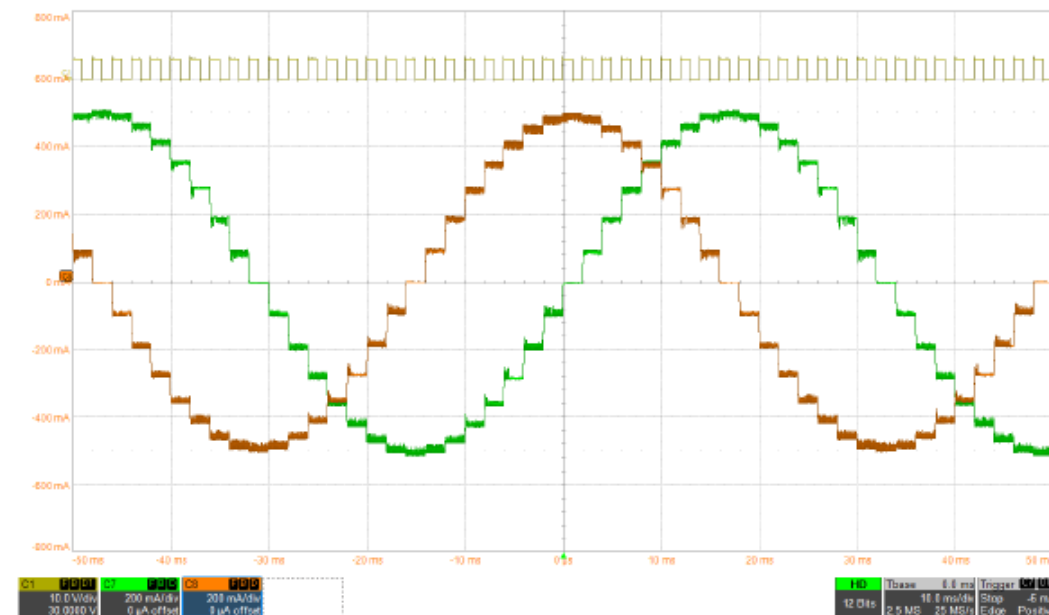
Decay mode setting



Slow Decay on Increasing and Decreasing Steps

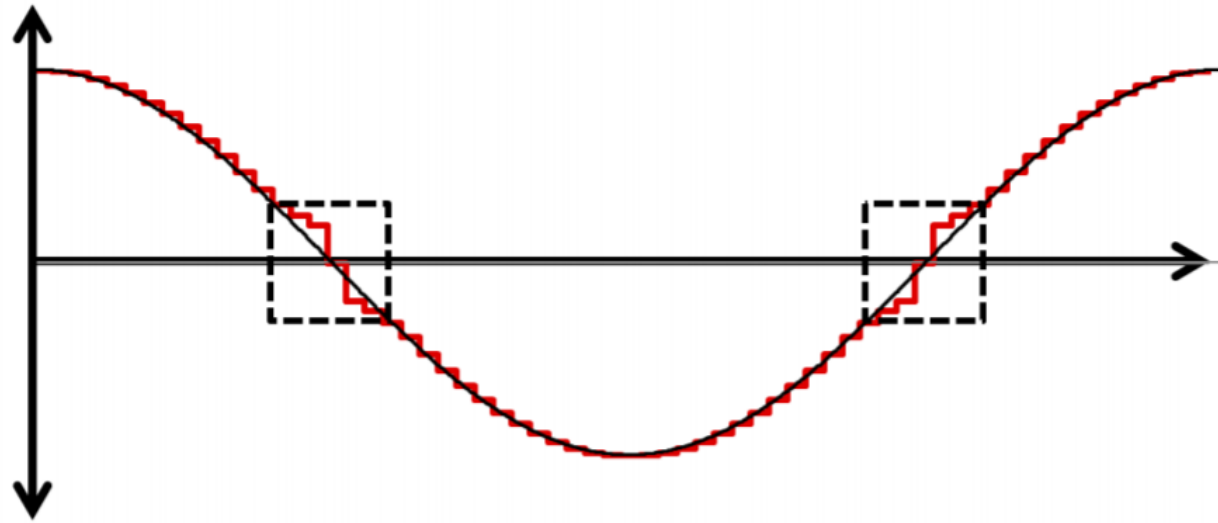


Smart tune ripple control decay

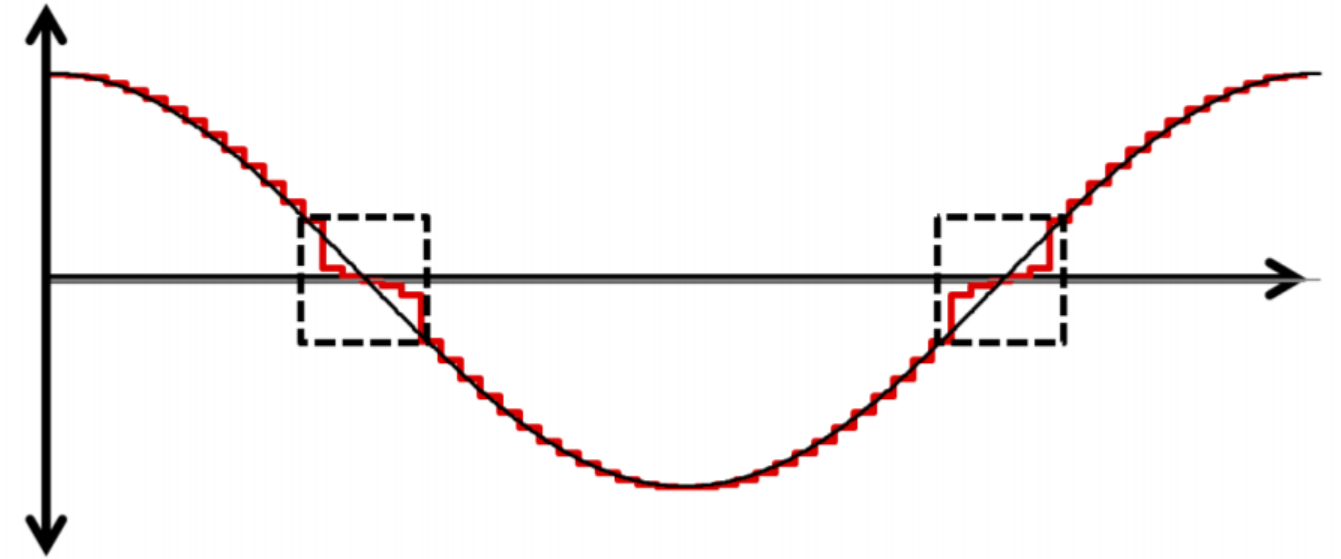


Smart tune dynamic decay

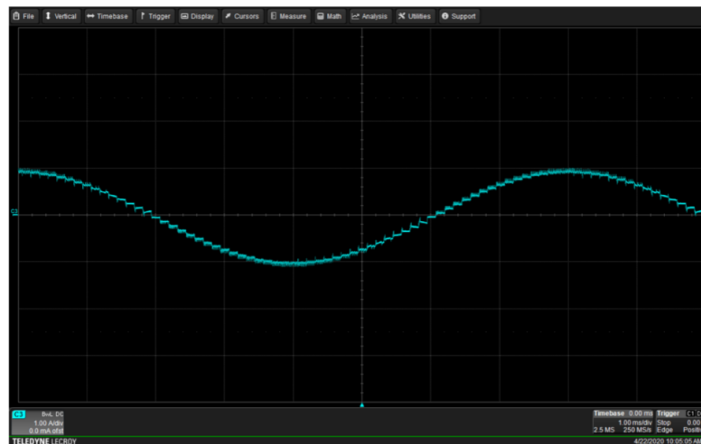
Zero-cross current error



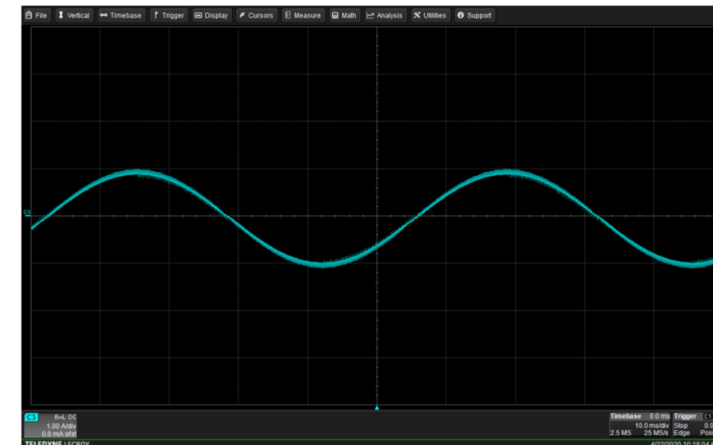
Current Distortion Due to High Blanking Time



Current Distortion Due to High OFF Time



Smoothness of Zero-Cross at 1/16 Microstepping



Smoothness of Zero-Cross at 1/64 Microstepping

Reference

1. [How to Reduce Audible Noise in Stepper Motors](#)
2. [DRV8711 Decay Mode Setting Optimization](#)
3. [Smart tune for quiet and smooth stepper motor operation](#)
4. [stepper motor overview](#)
5. [Minimizing Stepper Motor Vibration](#)

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