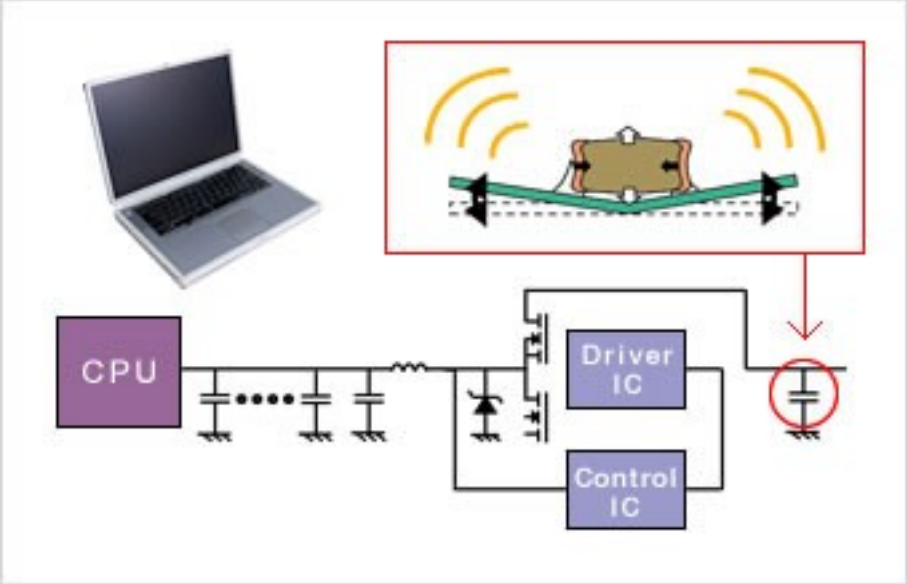
IS31FL3731 acoustic noise recommendations

The acoustic noise is coming from the PCB ceramic capacitors (MLCC). The volume of the noise is proportional to the number of LEDs that are driven because more current is drawn from the power supply with more LEDs. When the IS31FL3731 row and columns switch between sourcing and sinking current the power supply ceramic capacitor chip will expand and constrict due to the electrostrictive effect of the ferroelectric ceramic. Since the capacitors are soldered to the PCB their electrostrictive effect will cause the PCB to amplify the vibration in the frequency range (20 Hz - 20 kHz) making it audible.



Available workarounds:

1. Employ Acoustic Noise Reduction SMT capacitors such as KRM or GJ8 series from Murata, www.murata.com/en-us/products/capacitor/mlcc/solution/naki
2. Use radial through hole capacitors instead of surface mount, leads disperse acoustic energy so PCB doesn't flex
3. Place equal value capacitors directly on opposite sides of the PCB (top/bottom) so they create equal and opposite vibrations to effectively cancel acoustic noise
4. Change from ceramic to tantalum, electrolytic, or Film capacitors which create almost no acoustic noise
5. Modify the PCB
   a) Use thicker material which does not easily flex
   b) Create PCB slot gaps around the capacitor to minimize PCB flex area