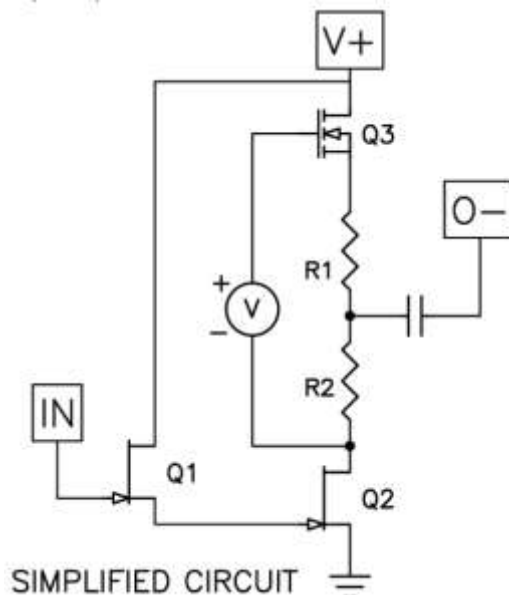


SIT-4

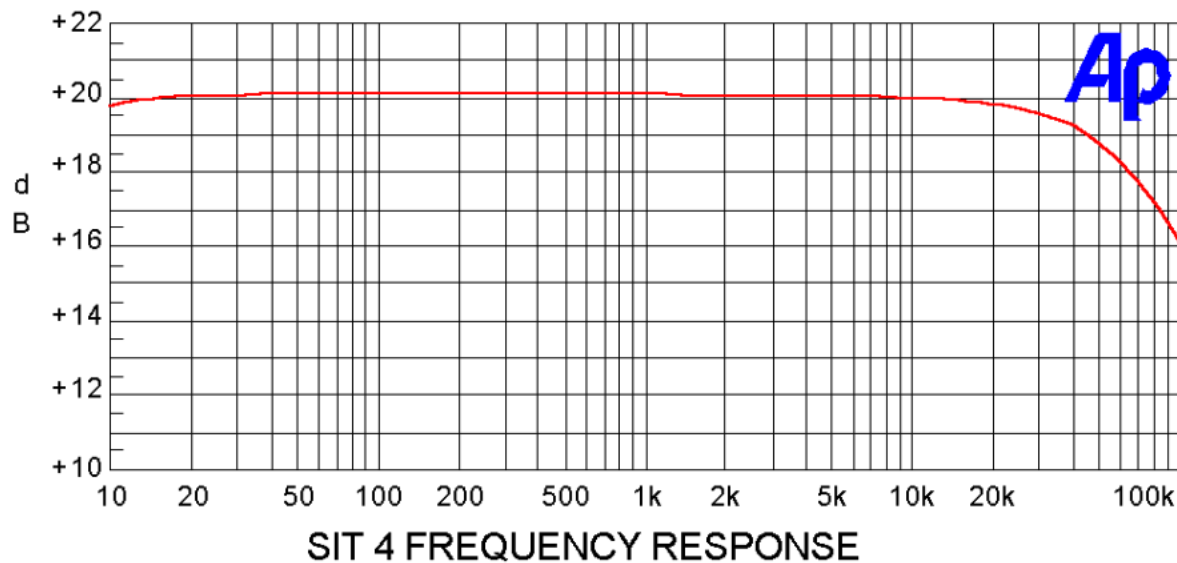
Power Amplifier



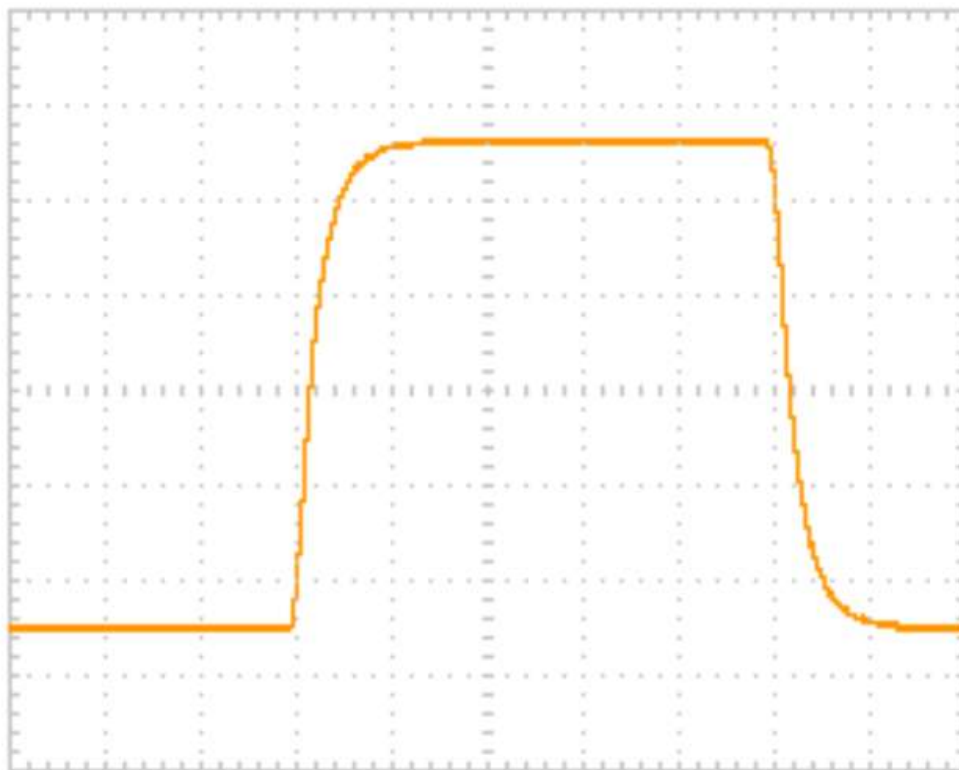
The SIT-4 is the most recent amplifier produced by First Watt, and is the fourth to use Static Induction Transistors (SIT) as the power amplifying device. In 2011 we introduced our first SIT amplifier using a custom Silicon Carbide (SiC) transistor part made by SemiSouth. The amplifier used a single power device, operating without feedback in single-ended Class A “Common-Source” mode to deliver 10 watts of power emulating the characteristic of a Triode, but operating at voltage and currents directly needed by loudspeakers, eliminating the output transformer. Do simple SIT amplifiers sound the same as single-ended Triodes (SETs)? Maybe not – it would be a matter of opinion. Without an output transformer with its significant limitations, the SIT has a bandwidth and distortion edge. I suppose if it glowed as well, it might be perfect ;)



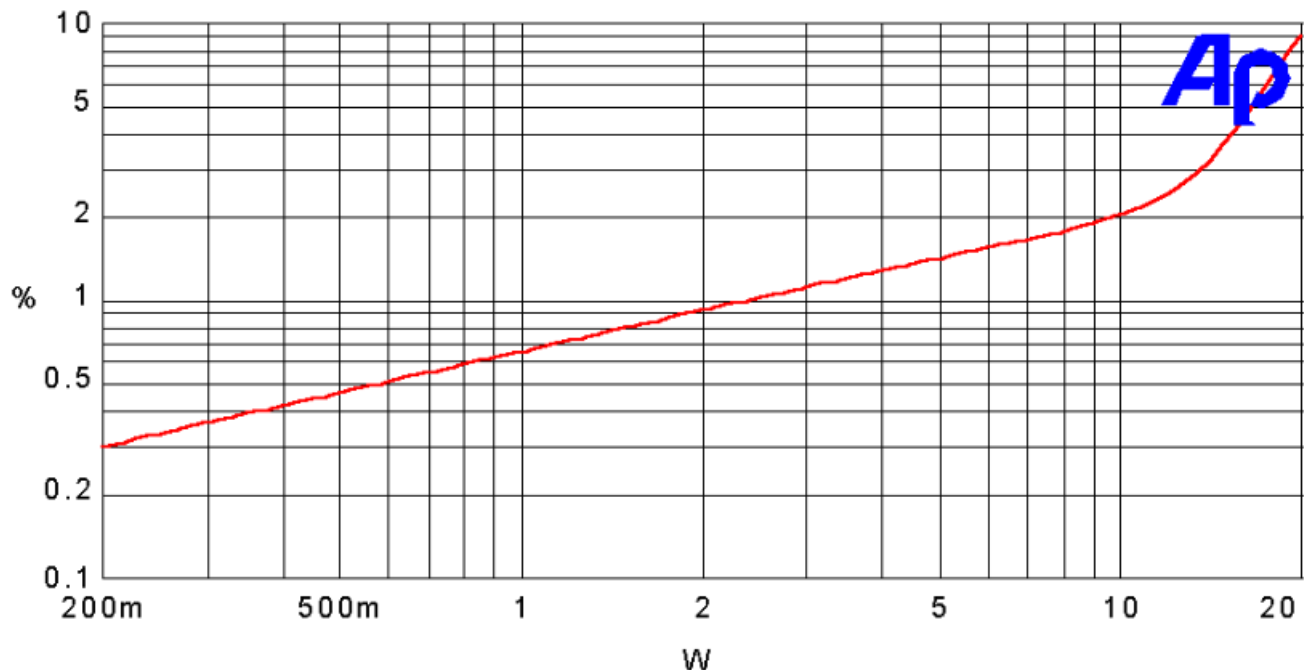
Above is the simplified diagram of the circuit of the SIT-4. This is a single-ended Class A circuit using a SIT (Q2) in common-source mode without feedback. It is biased by a conventional Mosfet “mu follower” current source Q3 and is input buffered by Q1, the NOS Toshiba 2SK170, the finest of Jfets. It has an easily driven high input impedance. It has plenty of gain, and handles 4 ohm loads – my test speakers are SR-1’s at 3.8 ohms with 86 dB/watt sensitivity, and the SIT-4 drives them surprisingly loud, although it was designed around Altec, Klipsch, JBL, Lowthers, and other high efficiency speakers. Here are some performance graphics. Keep in mind that they are achieved in a single-stage without negative feedback. Here is the frequency response curve, showing bandwidth to -3 dB at 80 KHz.



The square wave at 10 KHz at 1 watt, 8 ohms

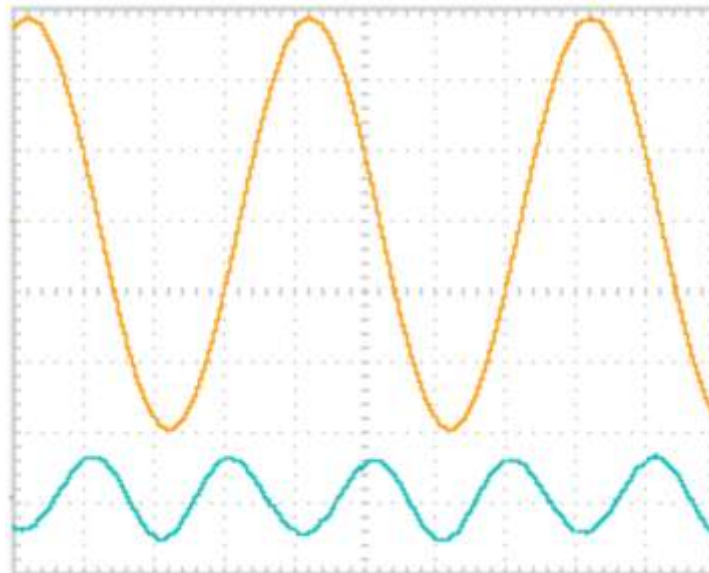


The distortion/power curve shows the 2nd harmonic dominance up to 10 watts:



SIT 4 THD @ 8 OHMS

Distortion waveform (blue trace) @1Watt, showing the negative phase 2nd harmonic.



I always keep in mind that the graphics and numbers only hint at the sonic performance. It's always interesting to compare the test data to the listening experience. Sometimes the two line up well for good or bad, but sometimes an amplifier that tests well still leaves critical listeners disappointed. Sometimes the reverse is true. Objective tests don't necessarily tell the whole story, but they are at least reliably repeatable. Human perception is perhaps not the most reliable, but humans are the customer. When developing product I rely on whatever information I can get, having developed some sense of the relationship between measurements and listening over the last 50 years. Still, developing audio product is a lengthy task if you do it right. The process is simple: Think, Build, Measure, Listen. Then repeat. For the SIT-4 this process began in 2018, and the design is now finished as we enter 2024. This amplifier is generally aimed at those audiophiles who appreciate the detail, warmth, depth and imaging. It is not necessarily for everyone, although I believe it will be generally appreciated for its special subjective qualities. I hope you like it. And Happy New Year. – Nelson Pass 1/1/24