

Upon analysis to determine why the transmitter was exhibiting out of tolerance transients, we tested the radio and found that there was a power output ramp-up overshoot due to the fact that the control loop was enabled immediately after PTT but the radio transmits after 40 msec (PTT debouncing). We fixed this problem by releasing the control loop after power is detected at the PA input. This eliminated the overshoot since PA gain when power is applied is low, and the gain increases to the required gain level within 1 ms.

On the original submitted design, the PA gain was switched off and on by PTT line trigger. We have now modified it to switch on and off according to the input power sense from the exciter unit.

To accomplish this, we changed the switch device from a 2N7002 to U310. We added a power detection diode, 1N4148, a capacitor and 10K discharge resistor between gate to ground. The U310 conducts when there is no RF input level present. When RF is applied & present the gate voltage is negative, and the FET turns off. The power control process starts as an error between detected input and output power. The error voltage is used to set RF power and applied as a gain control voltage to the PA. This makes the transistion smooth, linear and uniform well within regulatory limits.

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