

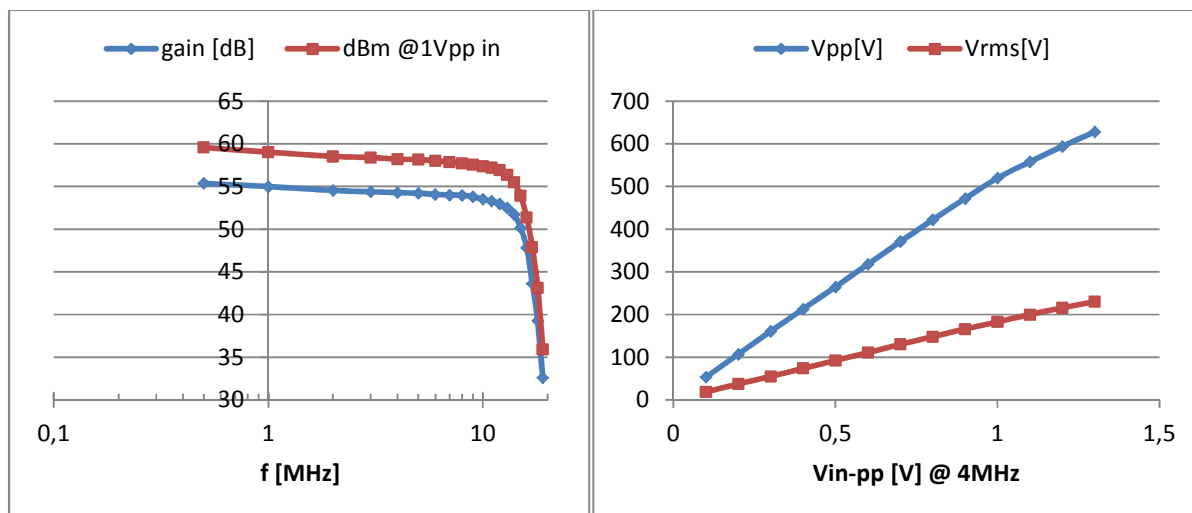
12MHz Pulse Amplifier

Gain @ 4MHz	54.3 dB
Bandwidth	500kHz – 12MHz
Enable	5V 1%
Max load power	1 kW
Max duty cycle	10 %
Max pulse duration	20 ms
Rout @ 4MHz	48.2 Ω
Rin	50 Ω
Blanking delay	≤ 500 ns

Description:

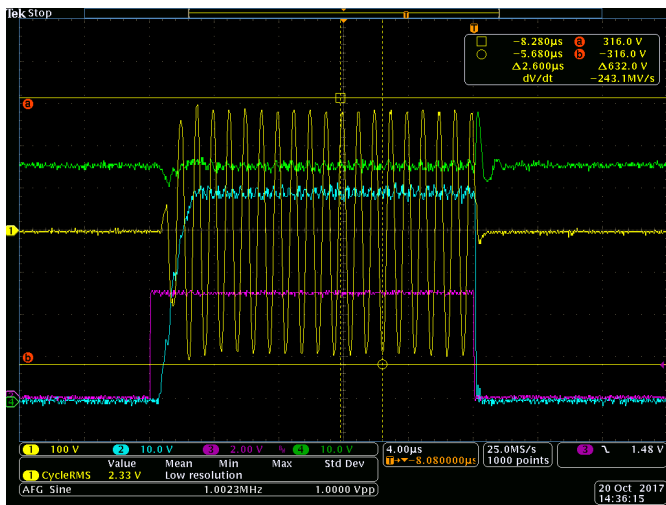
This class A amplifier can deliver 1kW (60 dBm) pulsed power into a 50 Ω load with a maximum duty cycle of 10%. Pulse power is delivered from buffer capacitors that recharge during blanking with 10% of the current that the amplifier requires. The capacitor voltage is made visible at the front of the amplifier. To prevent amplitude drop this buffered voltage is stabilized before the amplifier. The 10% recharge current effectively limits the duty cycle since the supply voltage will drop when the duty cycle is more than 10%.

The TTL enable signal controls the gating of the pre-amplifier and the power supply of the power amplifier simultaneously. Also the level of the enable signal directly controls the voltage of the linear regulator. Therefore it is important to use 5.0V as the enable voltage.



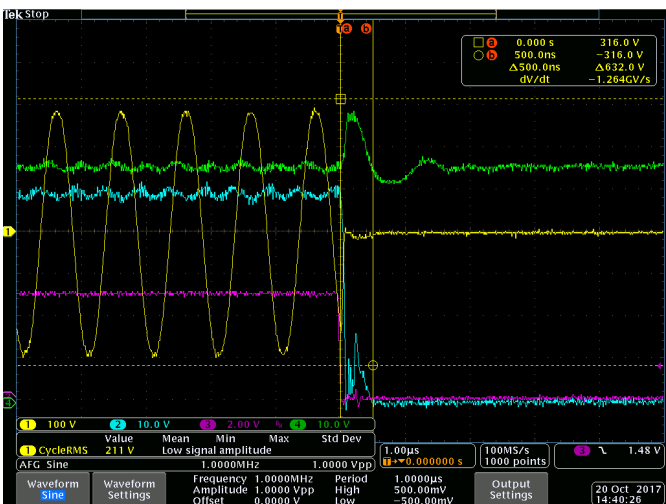
Frequency response

Linearity

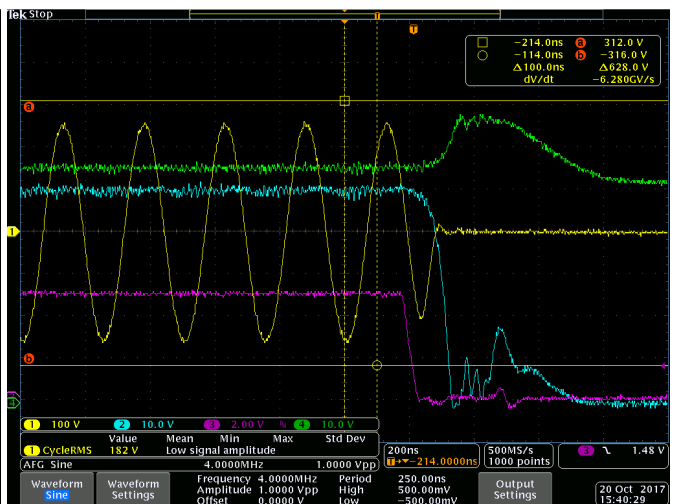


20µs pulse

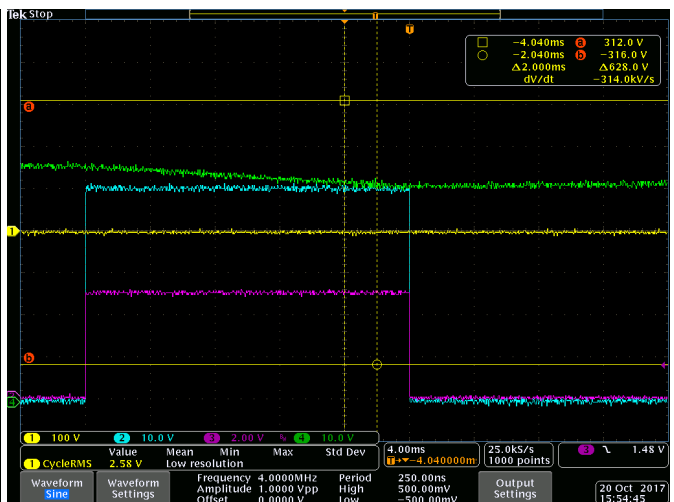
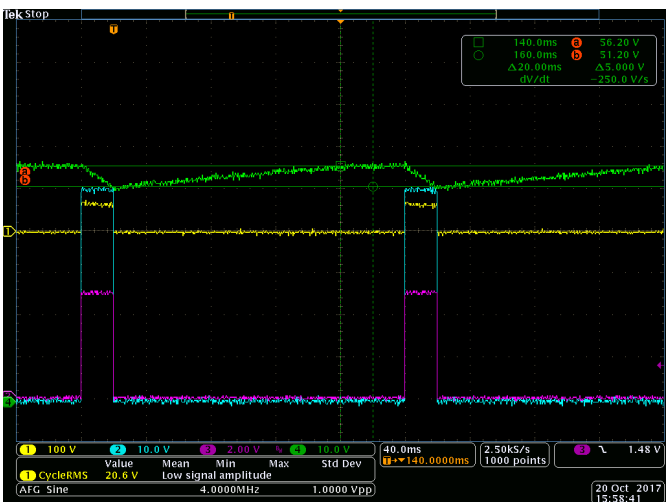
Yellow: RF out
Blue: amplifier DC voltage
Purple: enable
Green: buffer voltage



1MHz blanking



4MHz blanking



Voltage regulation with 20ms pulse



There is no overload protection present, so care must be taken that

- the amplifier is loaded with $50\ \Omega$
- input signals between 0.5 – 12MHz are used
- output power does not exceed 1kW
- enable signal of 5.0V is used

Future ideas:

- Enable the power supply before the RF starts to let it settle first. Disable simultaneously
- Monitor temperature, VSWR, output power + alarms
- Create a digital buffer circuit that guarantees the correct enable level .
- Band filter for the RF input signal.