

## AD-003: Nitronex NPTB00050 GaN HEMT Tuned for 2.4 to 2.7GHz

The Nitronex AD-003 application board outputs approximately 8 Watts of average RF power under single carrier OFDM (WiMAX) modulation<sup>1</sup> and approximately 12.5dB gain with 25+% drain efficiency at 2.5% EVM ( $I_{DQ}=300\text{mA}$ ). All measurements were collected at 2.4 – 2.7 GHz with a drain bias of  $V_{DS}=+28.0\text{V}$ .

**Caution:** Do not operate the device with greater than 36 volts of drain-source potential and  $I_{DQ} > 500\text{mA}$ . Drain current can exceed 500ma under RF drive.

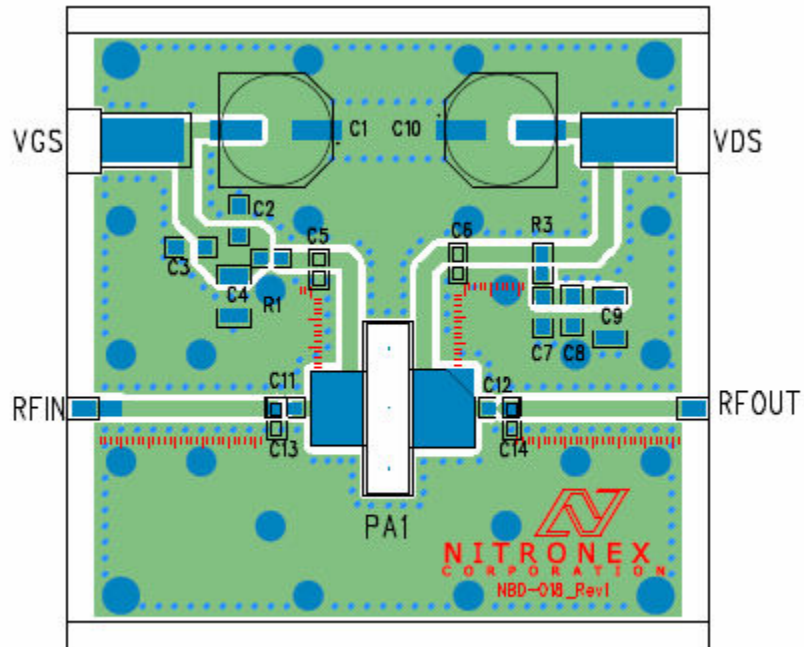
Note, the gate bias is negative and is fully pinched off at approximately  $-1.8\text{V}$ . It is highly recommended to provide some active cooling in order to maintain the test board at room temperature during testing. The device needs to have thermal grease applied to the source lead (package bottom) prior to placement in the test fixture.

**Caution:** Do not exceed 5 dB of gain compression with a single tone signal or expose the device to a strong reversal of the gate leakage current – from negative to positive. Note: Device saturation is reached when the polarity of the gate current turns positive, a small positive gate current of +3 ma will not harm the device but once the current turns positive it will grow exponentially with additional RF driver level. Maximum Pin should not exceed 31 dBm.

**Biassing sequence:** GaN HEMTs are depletion mode devices, therefore set the gate voltage to  $-3.0\text{V}$ , bring drain voltage up to 28VDC, adjust gate to obtain desired  $I_{DQ}$ , and then enable RF. Turn off device in the reverse sequence

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<sup>1</sup>64 QAM ¾, 8 burst, 10 MHz, 10.3 dB PAR @ 0.01% CCDF, full data frame


**AD-003 NPTB00050 Application Board/Layout/BOM**

Ref Des	Package	Value
C1	CAP-AE5	16V, 150uF Aluminum Electrolytic
C10	CAP-AE6.3	63V, 270uF Aluminum Electrolytic
C3, C7	1206	0.01uF 100V Ceramic
C2, C8	1206	0.1uF 100V Ceramic
C4, C8	1812	1.0 uF 100V Ceramic
C5, C6	805	5.6pF
C11	805	2pF
C12	805	10pF
C13	805	0.8pF
C14	805	1.2pF
R2	805	20 ohm
R3	805	0.33 ohm

