

AD-001: Nitronex NPTB00025 GaN HEMT Tuned for 2.11 to 2.17GHz

Application board AD-001 with a Nitronex NPTB00025 GaN HEMT device outputs approximately 3 Watts of average RF power under single carrier WCDMA modulation¹ with approximately 12.5.0 dB gain, 30+% drain efficiency and an ACPR better than -35dBc. All measurements were collected at 2.11 to 2.17GHz with a drain bias of $V_{DS}=+28.0V$.

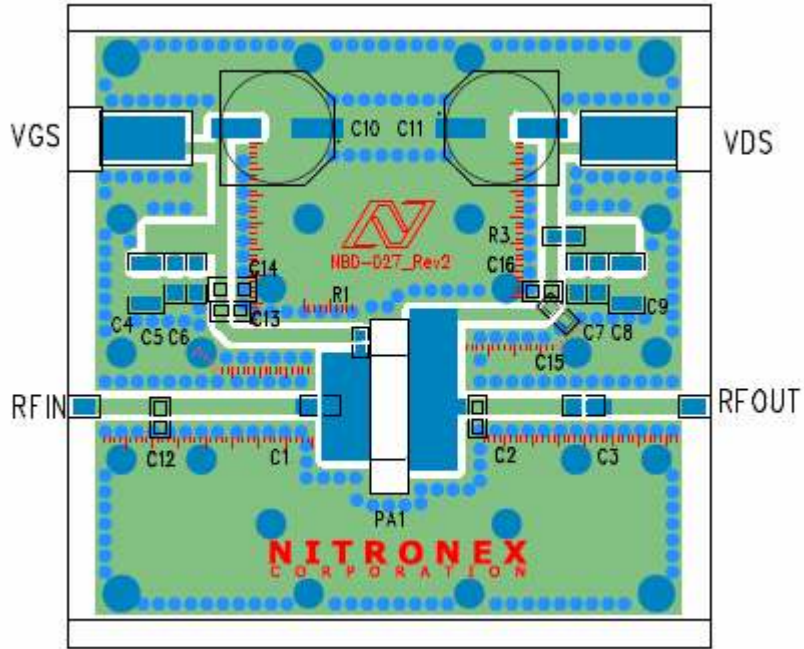
Caution: Do not operate the device with greater than 36 volts of drain-source potential and $I_{DQ} > 250mA$. Note, the gate bias is negative and is fully pinched off at approximately $-2.0V$. It is highly recommended to provide some active cooling in order to maintain the test board at room temperature 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 +30 ma will not harm the device but once the current turns positive it will grow exponentially with additional RF driver level.

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

¹ Channel Width: 3.84MHz, ACP Ch: 3.84MHz BW @5MHz Offset, 8.5dB PAR at 0.01%CCDF..

AD-001 NPTB00025 Application Board/Layout/BOM



Name	Value	Tolerance	Size	Vendor	Vendor Number
C1	0.5pF	+/- 0.1pF	0805	ATC	ATC600F0R5B
C2	1.5pF	+/- 0.1pF	.11"x.11"x.102"	ATC	ATC100B1R5BT
C4, C9	1uF	10%	1210	AVX	12101C105KAT2A
C5, C8	0.1uF	10%	0603	Murata	GRM188R72A104KA35D
C6, C7	0.01uF	10%	0603	AVX	06031C103KAT2A
C6	1uF	10%	1210	AVX	12101C105KAT2A
C7	0.1uF	10%	0603	Murata	GRM188R72A104KA35D
C8	0.01uF	10%	0603	AVX	06031C103KAT2A
C10	150uF	20%	3216(EIA)	Nichicon	UPW1C151MED
C11	270uF	20%	10mm(dia)	United Chmi-Con	ELXY630ELL271MK25S
C14, C16	12pF	5%	0805	ATC	ATC600F120B
C13, C15	1000pF	5%	0805		
C12	3.9pF	+/- 0.1pF	0805	ATC	ATC600F3R9B
C3	1.0pF	+/- 0.1pF	0805	ATC	ATC600F1R0B
Q1				Nitronex	NPTB00025
R1	49.9 ohm	1%	0402	Panasonic	ERJ-2RKF49R9X
R3	0.033 ohm	1%	0402	Yageo Corp	RL0603FR-070R33L
nbd-019_rev2				Alberta Printed Circuits	nbd-020_rev1

