

Standard Proposal	Contact PI's surname SCOTT	Initials JB	Application Number 07-UOW-004	Panel PSE
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<b>Response to Referee Number:</b>	7
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This reviewer may have misinterpreted the meaning of the title of the proposal. The reviewer comments ‘*The title of the proposal is misleading: “Unconventional Wide-Bandgap Circuits”*. Only the medical application is “unconventional”’. The “unconventional” in our title refers to the application of GaN to these problems, not necessarily the problems themselves. In fact, RF medical diathermy is in common use, and in its present form is generally considered less “unconventional” than vacuum-tube replacement. As far as the proposers are aware, ‘*Monolithic Switchmode Power Conversion*’ has been neither proposed nor reported previously anywhere in the literature. As reviewer 11 commented, “The proposal shows a high degree of originality in terms of the proposed circuit applications to be investigated... to my knowledge, no work has been done to date on the applications cited...”, while reviewer 9 wrote “All circuit/system applications indicated by the PI are applicable and suitable for implementation using GaN-based devices”. We maintain that all applications cited are unconventional for GaN, while some are entirely novel in the field of electronics.

This reviewer states “as of today there is no [GaN] foundry available”, and later “I have my doubts that the researchers will find a nitride foundry that will fabricate their circuits”. The reviewer may have missed the potential foundries listed in the proposal in section 6, and we understand he or she has not seen the budget that is based upon quotes obtained. In contrast, reviewer 3 recommended we “make sure the foundry is committed to a reasonable and reliable lot fabrication cycle time and to deliver the GaN ICs in a timely manner”, acknowledging the choice of foundries. We value the choice of foundries, and quotes were obtained in preparing the proposal. MicroGaN was identified as a willing collaborator and as our preferred choice over RSC at time of writing. Other GaN foundries appear in publications cited in the proposal, and a major political motivation for this is outlined in section 4 of the proposal. We know of foundry offers from others amongst the ever-growing number, for example HRL and RFMD, and newcomer Northrup-Grumman (NG).

The reviewer states “J. B. Scott ... has not worked with GaN before”. Perhaps the reviewer meant to say that no evidence of this appears in the proposal. The proposal notes that much of Professor Scott’s MMIC work remains confidential to a past employer. Some of this work did involve GaN devices and measurements. More relevantly, reviewer 3 stated “While the public does not know many aspects of the prior industrial experience at Agilent/HP of the PI, his technical expertise clearly matches well with those required to perform successfully in this proposal”. In a similar vein, reviewer 11 stated “The proposal clearly demonstrates that Professor Scott has an intimate knowledge of all aspects of MMIC design”. In addition, Professor Parker is already known to be working on GaN device modeling.

The reviewer says “The circuits they propose are not very advanced or new...”, yet, no *monolithic* switchmode supply circuit, no *embedded* RF diathermy generator, no *successful* tube-replacement circuit, nor a GaN oscillator with any measurement of phase noise, has ever been demonstrated. This and the later comment “I think it would have been better if they would have proposed circuits of increasing difficulty” are hard to reconcile with the present state of practice in electronics. This review stands in stark contrast with the other three reviews.