

ENGINEERING PRACTICES STUDY 1166

TITLE: STUDY TO REVIEW USAGE OF GaN AND SiC DEVICES IN THE FEDERAL
STOCK CLASS 5961.

13 July 2018

STUDY PROJECT

PROJECT NUMBER 5961-2018-069

FINAL REPORT

Study Conducted by DLA LAND AND MARITIME

Prepared by:

Jason Hochstetler

I. OBJECTIVES: DLA Land and Maritime-VAC conducted an EP study to review existing and potential usage of GaN and SiC semiconductors in the 5961 stock class. The purpose of this EP study was to obtain input from the military services, manufacturers, and user communities to determine which device types are currently in use, are desired, or available to add to our existing DLA drawings or specification sheets. The survey results will help prioritize our standardization efforts for new DLA drawings, specification sheets, and MIL-PRF-19500 requirements.

II. BACKGROUND: The requirements of MIL-PRF-19500 and its related specification sheets currently are based on devices using silicon die and do not cover requirements for devices using GaN or SiC die. DLA Land and Maritime is working on identifying the areas in the existing MIL-PRF-19500 requirements that will need updated to accommodate GaN, SiC or other wide bandgap devices device constructions. Updating MIL-PRF-19500 to accommodate these additional designs will allow the standardization program to add new devices for future design demands.

In addition to the survey, DLA also requested that responses include any additional justification that describes why the devices mentioned are desired over the traditional silicon devices and if any unique testing is performed.

III. RESULTS: DLA did not receive any proposed GaN or SiC 5961 stock class devices during this survey. The comments received suggested that GaAs devices also be added to the EP study. In addition DLA received a request to review the physics of failure details and qualification requirements for these new devices not currently covered by MIL-PRF-19500.

IV. CONCLUSIONS: Based on the comments received, DLA is not currently adding any SiC, GaN, or GaAs devices to MIL-PRF-19500 or its specification sheets. DLA is however continually working with device manufacturers and users to add provisions for these device type technologies.

V. RECOMMENDATIONS: DLA Land and Maritime recommends that GaN, SiC, or GaAs devices be added to the applicable MIL-PRF-19500 specification sheets to continue to increase the product offering of high reliability devices and encourage all military and industry representatives to request adding wide bandgap device types when they are needed. DLA will continue to work with the users and the device manufacturers to establish appropriate performance and qualification requirements for these devices.