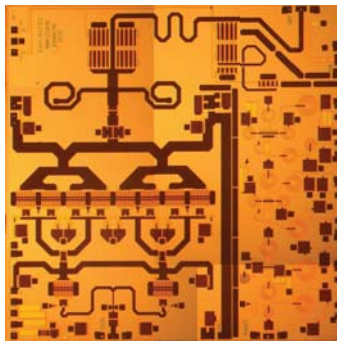


Activity Title:	Single GaN Chip HPA/LNA for Radar Applications		
Contract type	TRP	Budget (k€)	550
Company (-ies) (including country)	TNO - Netherlands UMS - France AIRBUS - Germany		
Team (name of the participants in the project)	Peter de Hek (TNO) Marc van Heijningen (TNO) Jeroen Hoogland (TNO) Philippe Fellon (UMS) Veronique Serru (UMS) Nicolas Poitreaud (UMS) Claude Dourlens (UMS) Grzegorz Adamiuk (AIRBUS)		
(*) Speaker (s)	A.P. de Hek	Email	peter.dehek@tno.nl
Short Speaker Information (experience and involvement in this project – maximum 60 words)	Peter de Hek has for the last 25 years been active in the field of GaAs/GaN/SiGe MMIC design and modeling of the used active and passive components. In the current project involved as project leader		
Summary of the activity (maximum 400 words and 2 pictures)	<p>In this activity a fully integrated transmit receive MMIC suitable for application in C-band SAR phased array radar systems has been defined, designed, fabricated and evaluated. This MMIC has been developed with the help of the GH25-10 GaN technology of UMS. Use of GaN technology offers the following advantages over existing solutions: higher transmit output power, lower weight and size due to absence of the ferrite circulator and there is no need for an integrated limiter in front of the low-noise amplifier.</p> <p>Together with AIRBUS the relevant specifications of the MMIC for application in future SAR systems have been derived. At the start of the design activity the accuracy of the GH25-10 electrical models has been evaluated and a good agreement between measurement and model results was observed.</p> <p>The design of the chip has been performed in close cooperation between the UMS and TNO design teams. The chip consists out of a high-power amplifier, a low-noise amplifier, a transmit-receive switch and a calibration coupler. Two different variants of the chip have been realized. In one variant the gate voltage are generated externally and in the second variation these voltages are generated internally on the chip. Both designs together with the individual high-power amplifier and low-noise amplifier designs have been fabricated by UMS.</p> <p>The realized Single Chip Front End Chip and the test fixture used for its evaluation are shown in the pictures below. The measurements show that the chip is fully functional and complies to the vast majority of the specifications. An output power of 40-Watt with a PAE between 35-40% and a noise figure better than 2.5 dB have been measured. On the basis of the measurement results an evaluation of the MMIC results has been made and recommendations for future developments have been given by AIRBUS.</p>		



(*) The speaker needs to do the registration through this website