

OPTELEX Optical and RF Engineering

- RF Engineering

- development of high power modules and special amplifiers for scientific applications and for analog/digital TV broadcast equipments;

- customer adaptation of solid state amplifiers for all industrial needs.



OPTELEX Some developments

- Design of the first UHF doherty pallet for industrial broadcast applications (single ended, narrowband);
- Transformation of a standard wideband VHF pallet to a doherty one (differential, narrowband);
- Development of a 2KWrms/4ohm (4KWpep) D class full bridge professional audio amplifier for theatres;
- Design of a new RF power generator (250Wcw @2.45GHz) for medical applications.





NXP (ex Freescale) design support

- Datasheets
- Simulation models
- Demo boards
- Local technical support
- Foundry support

Well, but what happens if there is a customer who is interested to NXP products but have not enough skill or enough money to maintain an R&D dept. to develop new amplifiers by itself?





Demo boards limits

Demo boards are focused to stress performances of new devices, but they are not designed to cover all industrial requirements to make a “pallet”, for example:

- mechanical outline dimensions
- thermal tracking over a wide range of temperatures
- cooling restrictions (holes, screws, etc.)
- output power capability (2 LDMOS per pallet)
- producibility for volumes





Generic customers needs

- They always want to reuse mechanics, cooling systems, power splitters, power combiners, logics and if possible drivers and power supply units.
- This means in the 95% of cases the outline dimensions of a new pallet shall be the same of the one they currently use in the field.
- Screws positions (those to fix carrier and those to fix LDMOS) and I/O pads positions shall be the same too. And this will have a big impact to the overall layout.





High power components and layout criticality

- In the past many customers often tried to reuse the same PCB layout for different devices (NXP, Infineon, Ampleon, etc.). With the new generation of RF power components this “pseudo” interoperability is no longer possible (bad performances).
- In order to maintain the same mechanics some compromises always have to be considered, but the main performances of a new component shall remain unchanged. Only in this way today is possible to convince customers to use an alternative component.



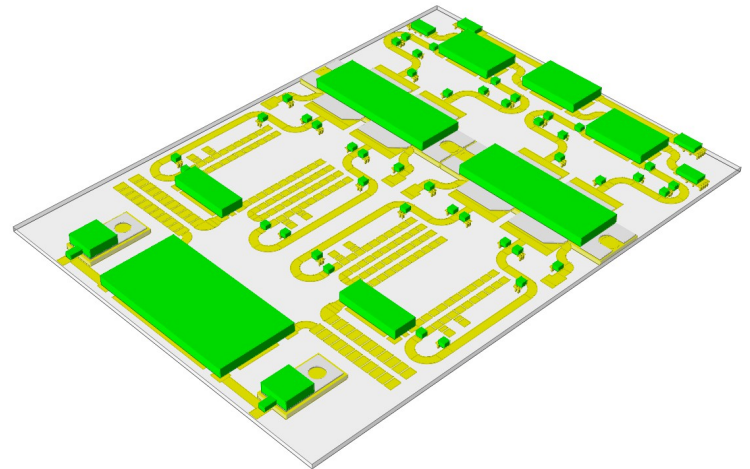


What can do OPTELEX for NXP Customers?

- OpteleX offers knowledge and skill oriented to custom developments of special amplifiers designed ad-hoc for NXP strategic customers who quickly need to upgrade their high-tech products portfolio.
- Furthermore OpteleX is able to design and support specific solutions to help NXP customers for their natural migration from the standard LDMOS technologies to the new high performance and high tech GaN technologies.

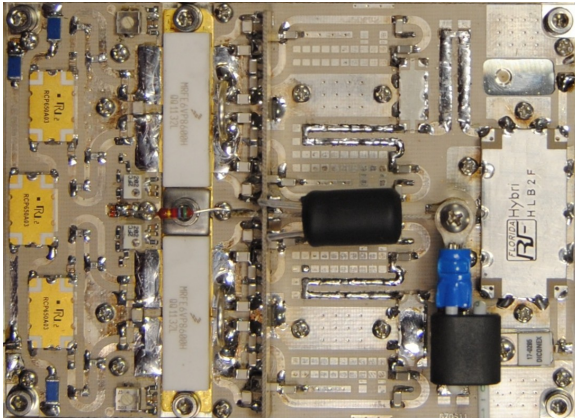
OPTELEX Broadcast experiences

- RF design (UHF/VHF)
- Analog TV (ntsc, pal, secam)
- Digital TV (DVB-T/T2, ATSC, ISDB-T)
- Digital Audio (DAB, DAB+)
- Passive (splitters, combiners filters)
- TV power meters
- High power RF modules
- Transmitters and transposers





OPTELEX Direct consulting



- Problem analysis
- CAD evaluation
- Solution proposal
- Physical implementation
- Setup measurements
- Prototype evaluation
- Industrial optimization
- Project documentation and release





OPTELEX Never leave the customer alone

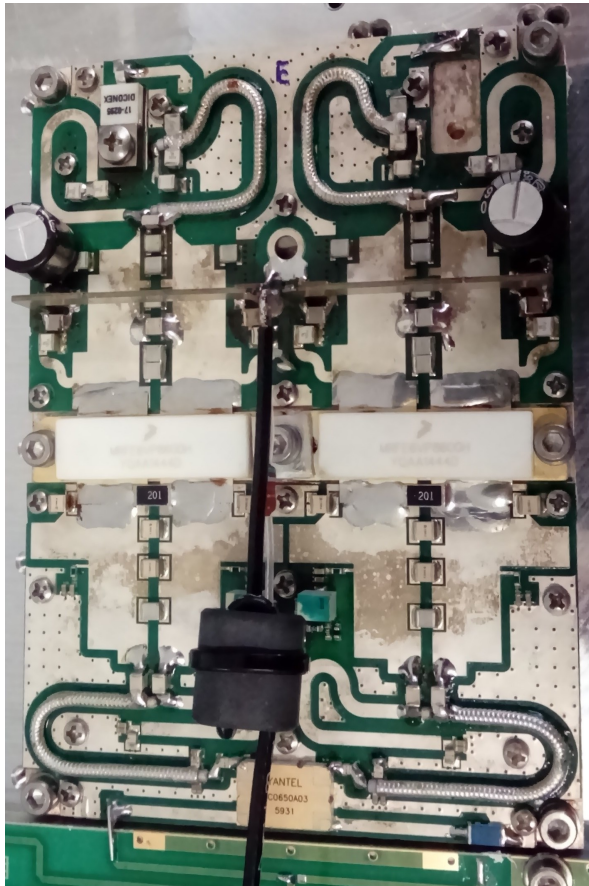
If a customer prefers to buy new pallets from a specific manufacturer instead of trying its possible internal development he takes further risks and extra costs like:

- Unreliable stability due to environment changes (shields)
- Possible faults in the field after short time
- Insufficient guarantee for long terms production
- Extra costs applied to each pallet to maintain continuously the third party rights

All OPTELEX designs are specifically “tuned” for customer requirements and all rights, knowledge and intellectual properties will be always transferred to the customer, without extra costs.



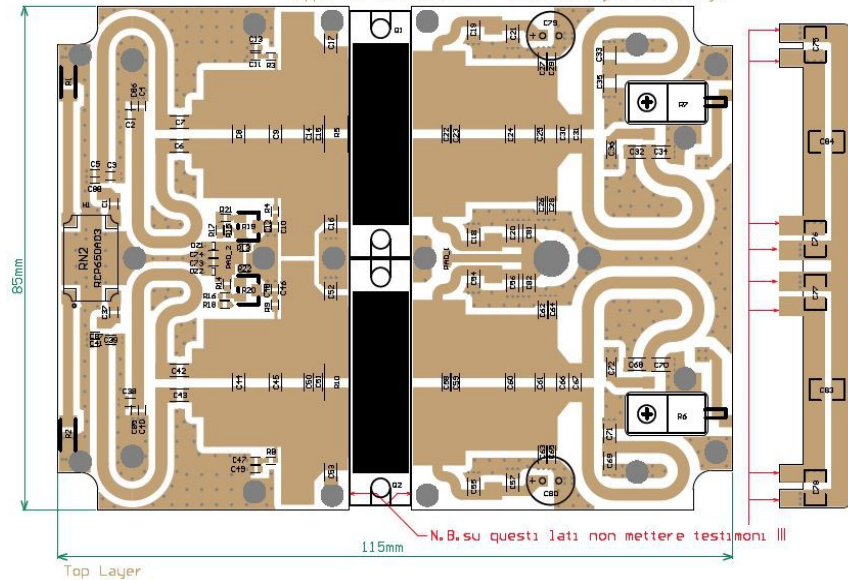
OPTELEX Amplifiers showroom



693S12 UHF Wideband Amplifier rev_B

Finitura superficiale: Ag

Supporto: TACONIC RF35 - H=762micron, 1 oncia/layer



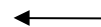
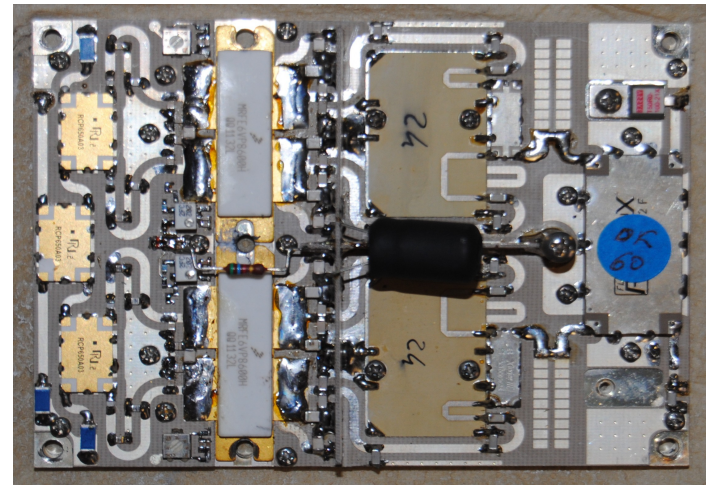
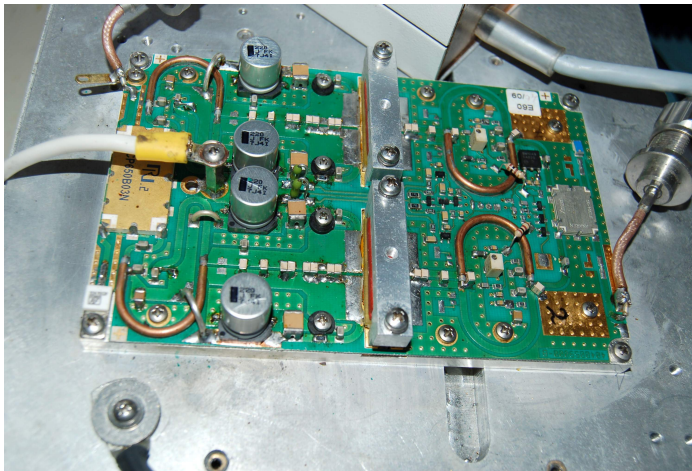
200Wrms DVB-T/T2 mini amplifier module designed by OPTELEX for Screen Services (SSBT)



OPTELEX
Optical and RF Engineering

OPTELEX Amplifiers showroom

180Wrms UHF doherty DVB-T/T2
OPTELEX design for SSBT Screen
Services Broadcasting Technologies

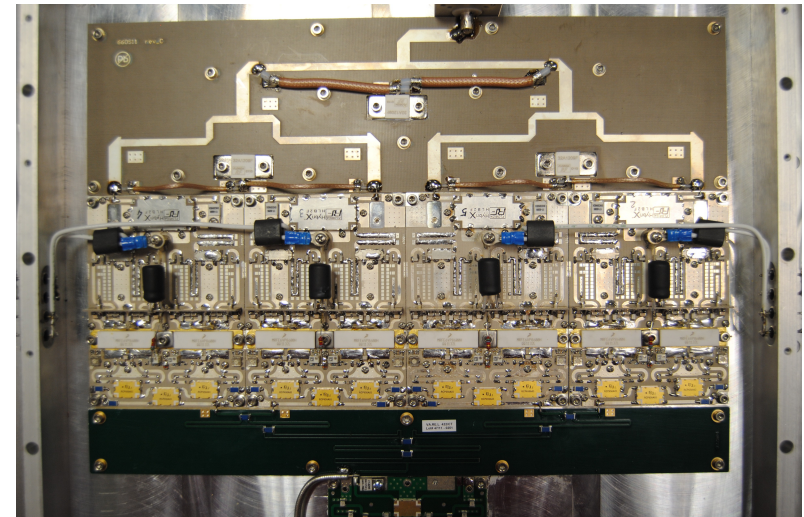
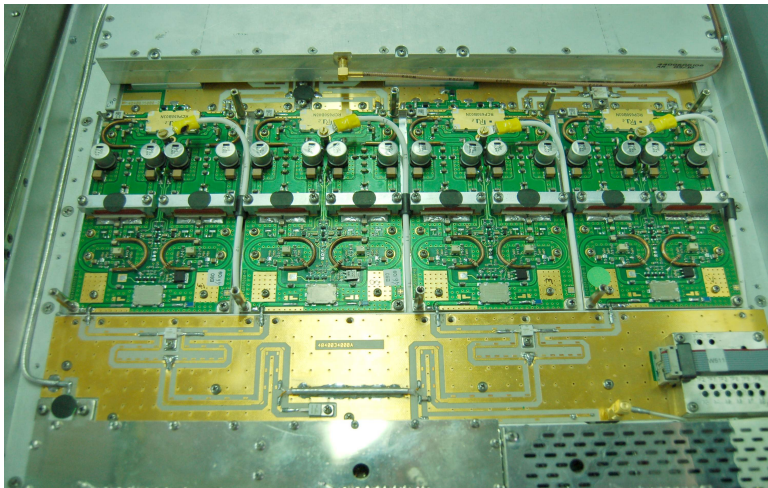


200Wrms UHF AB class DVB-T/T2
OPTELEX design for Electrosys
(ITELCO)



OPTELEX Combining showroom

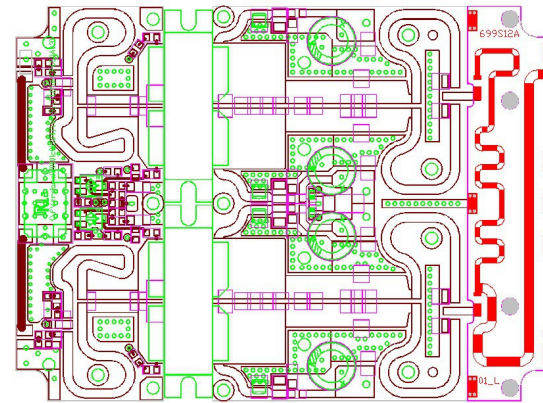
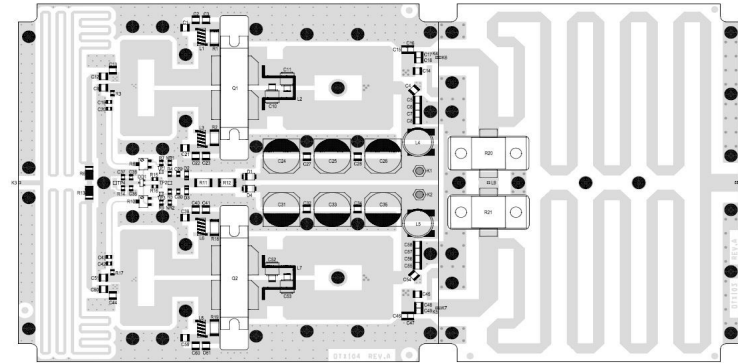
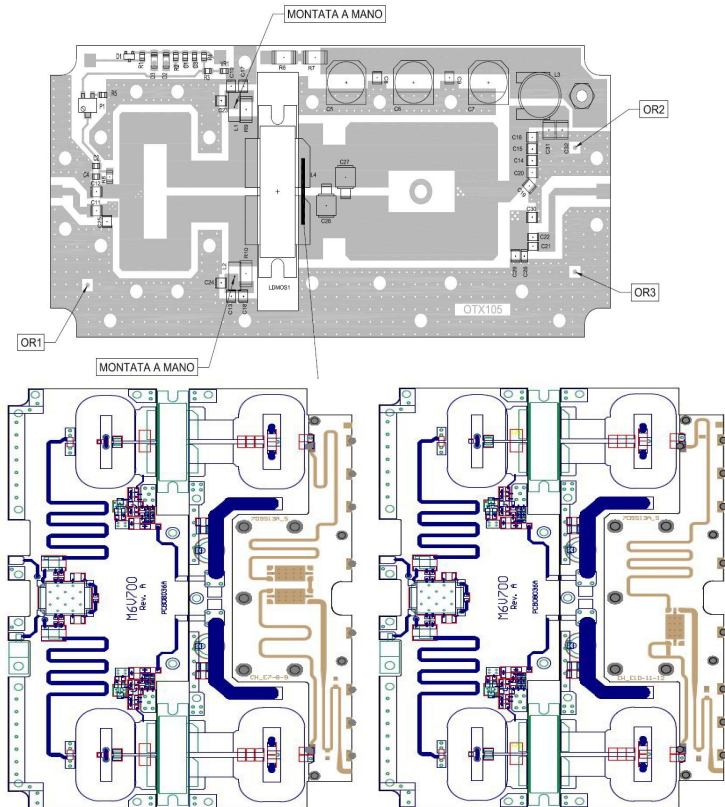
Air cooling combining solution for
700Wrms DVB-T/T2 Screen
Services (SSBT) subracks



Liquid cooling combining solution for
800Wrms DVB-T/T2 Electrosys UHF
subracks



OPTELEX Market adaptations showroom

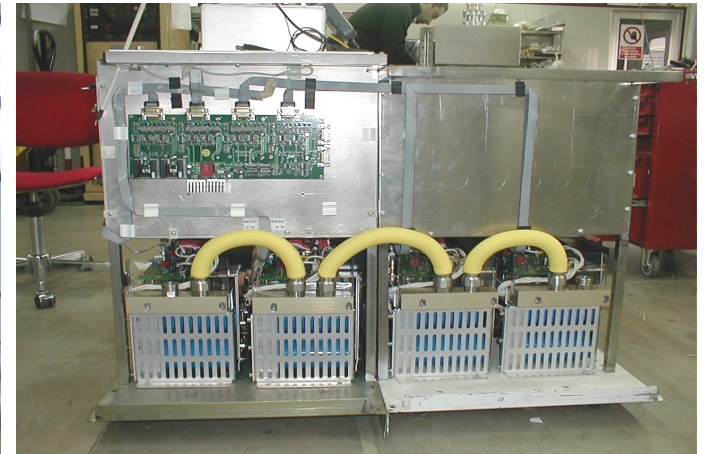


Above:
Single to Dual

Below:
AB to doherty



OPTELEX Systems showroom



Maintenance and upgrade of a
-35KV/120KW switching HVPS
for cathode supply of an IOT
UHF power RF generator
60KW@801MHz



OPTELEX Systems showroom



Design support for the 120KWps
B-I Analog TV and 5x700W+1
UHF doherthy system



OPTELEX Systems showroom

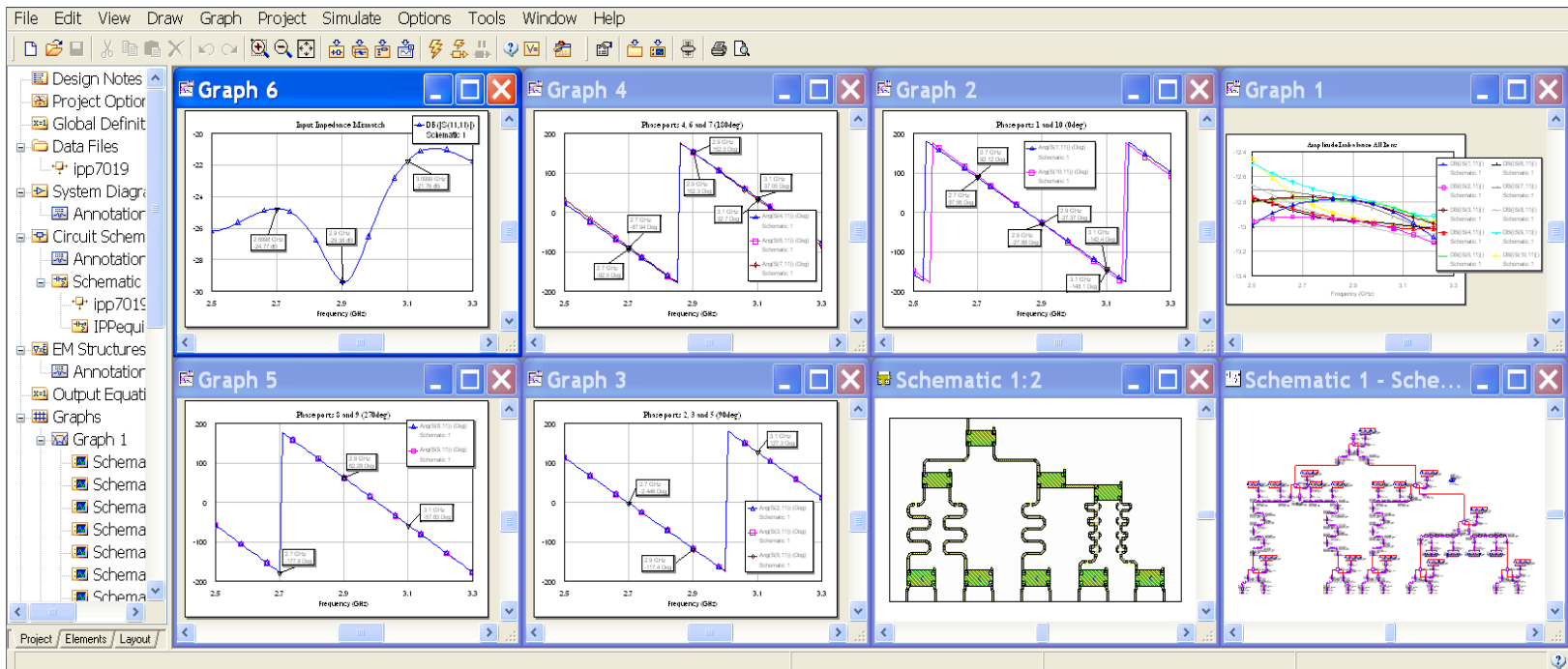


400KW 352MHz pulsed amplifier equipped by two tetrodes made by Thales (TH595).

During the first design phase (5 months) OPTELEX has designed all control interfaces except the G1 polarizer.



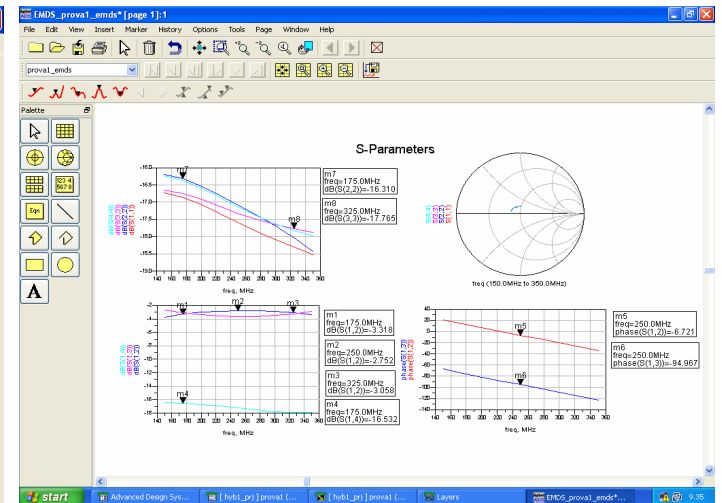
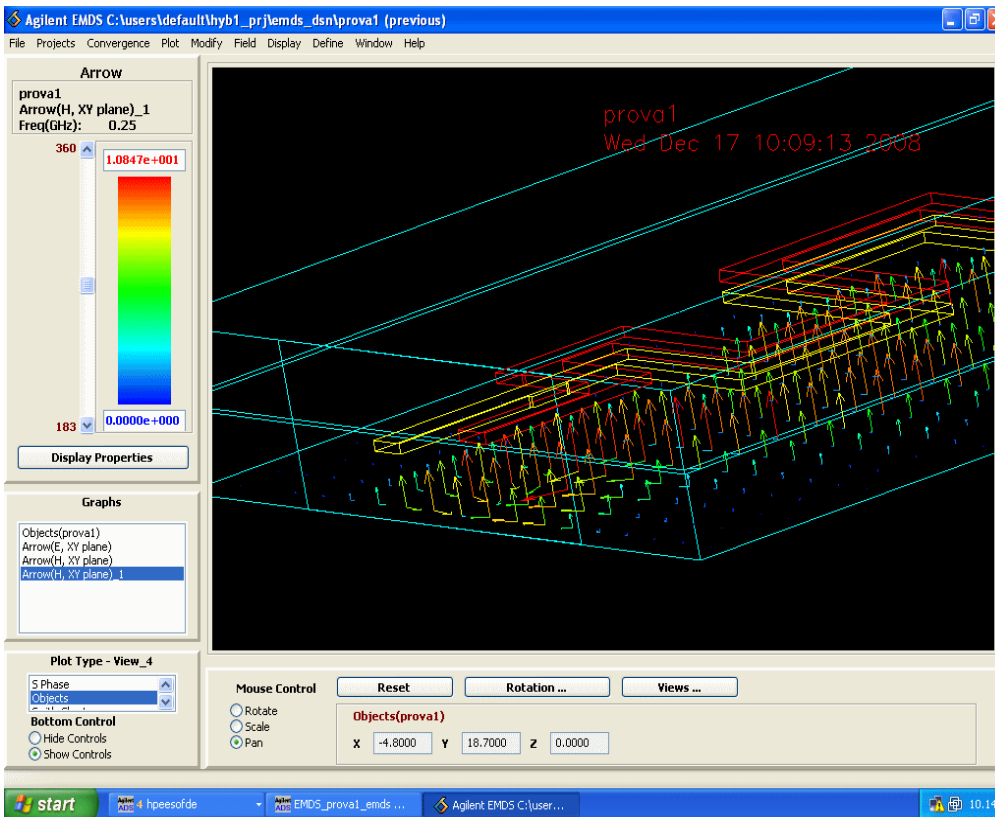
OPTELEX Simulations showroom



Linear simulation of a 2.7-3.1GHz 1:10 power splitter for a long range radar (22KW) equipped by CGHV31500F GaN devices made by Cree

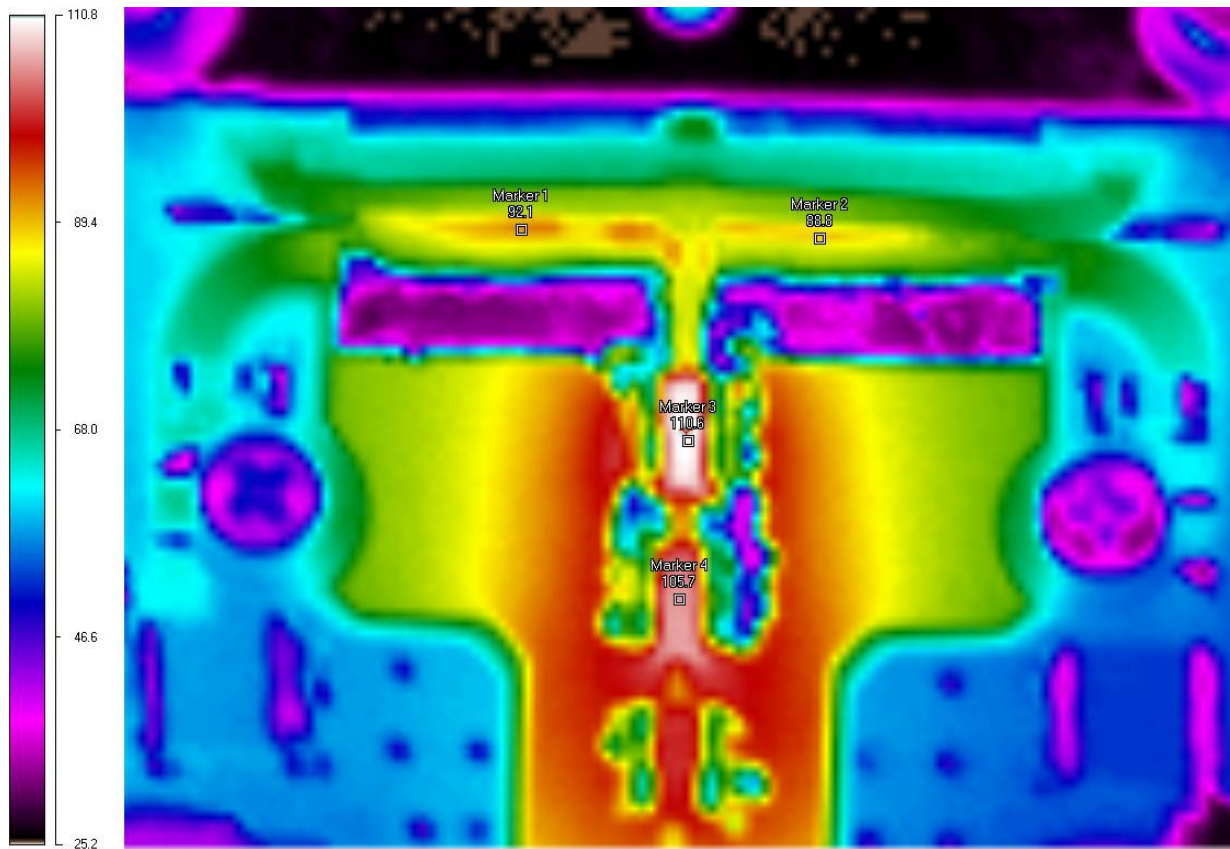


OPTELEX Simulations showroom



Simulation of a VHF hybrid coupler by using Agilent EMDS (3D/EM sim)

OPTELEX Thermal analysis showroom



All devices are always stressed and fully tested before their validation release

On request each amplifier has its own certification of main characteristics (gain, power, phase, etc.)

