

The European Space Market for EEE Parts

ESCCON 2011

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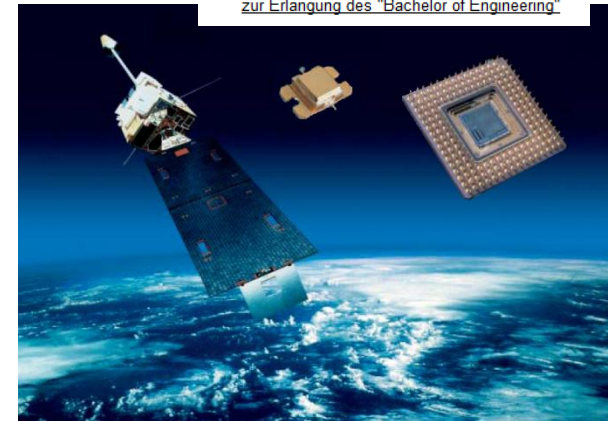
The European Space Market for EEE Parts

- This presentation gives an overview of the European EEE Parts market based on:
 - Statistics on parts procured by Tesat-Spacecom
 - Knowledge of parts procured as a European CPPA
- This Presentation builds on work carried out by Mr. Sven Zeidler between June and September 2009 for his Bachelor's degree
- Mr. Zeidler is currently employed by Tesat-Spacecom




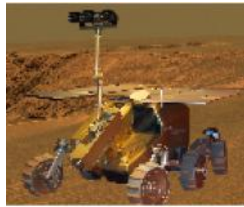




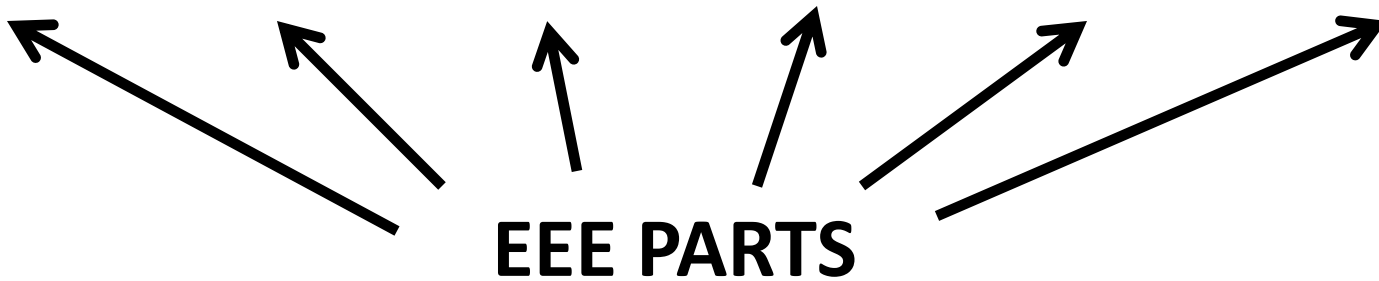
BACHELORARBEIT

zur Erlangung des "Bachelor of Engineering"



EEE Parts for Space

<u>Communication</u>	<u>Earth Observation</u>	<u>Navigation</u>	<u>Scientific</u>	<u>Manned Space Flight</u>	<u>Launcher</u>
					



EEE Parts Procured by Tesat

- Data Basis

- Parts for both Tesat and for external agent business customers
- Time Period 2004 - 2011
- Total Value: 264M€
- Total Number of Suppliers: ~260
- No. of Suppliers delivering 99% of value: 101
- No. of Lots ~36.600
- No. of Parts ~10,6 Million

Tesat-Spacecom

Key Figures

Location	Backnang, Germany
Core Business	Spacecom Satellite Payload Equipment & Subsystems
Employees 2010	approx. 1 100
Turnover 2010	200 Mio Euro
Equipment Capacity	Up to 1 500 Units per Year
Programs	Up to 75 per year
Homepage	www.tesat.de

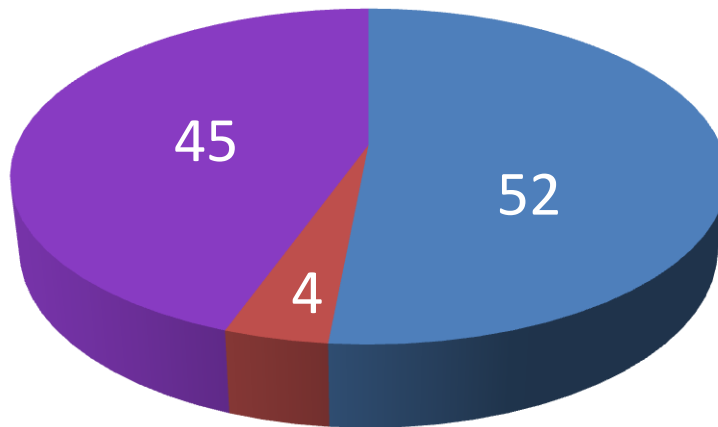


Location
Backnang, Germany

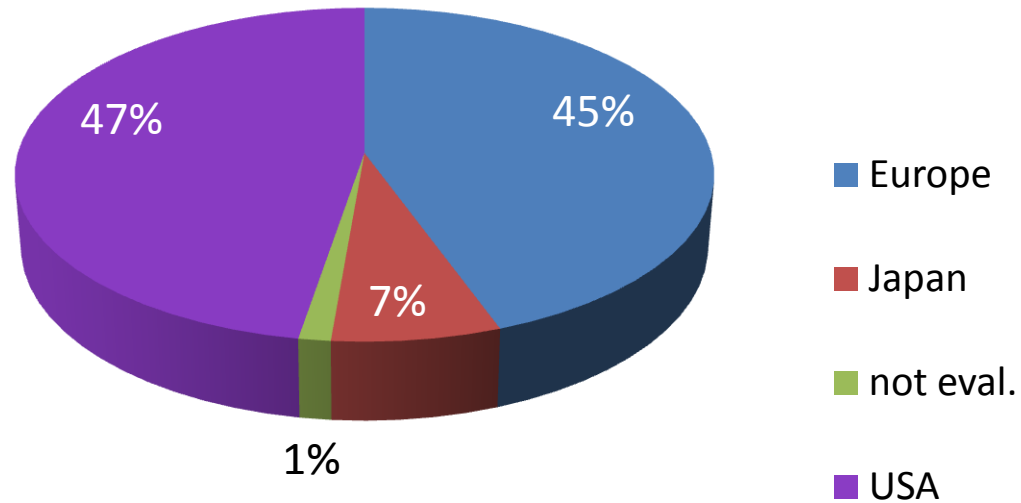
EEE Parts Procured by Tesat 2004-2011

- Origin of the Parts

No. of Suppliers



Total Value



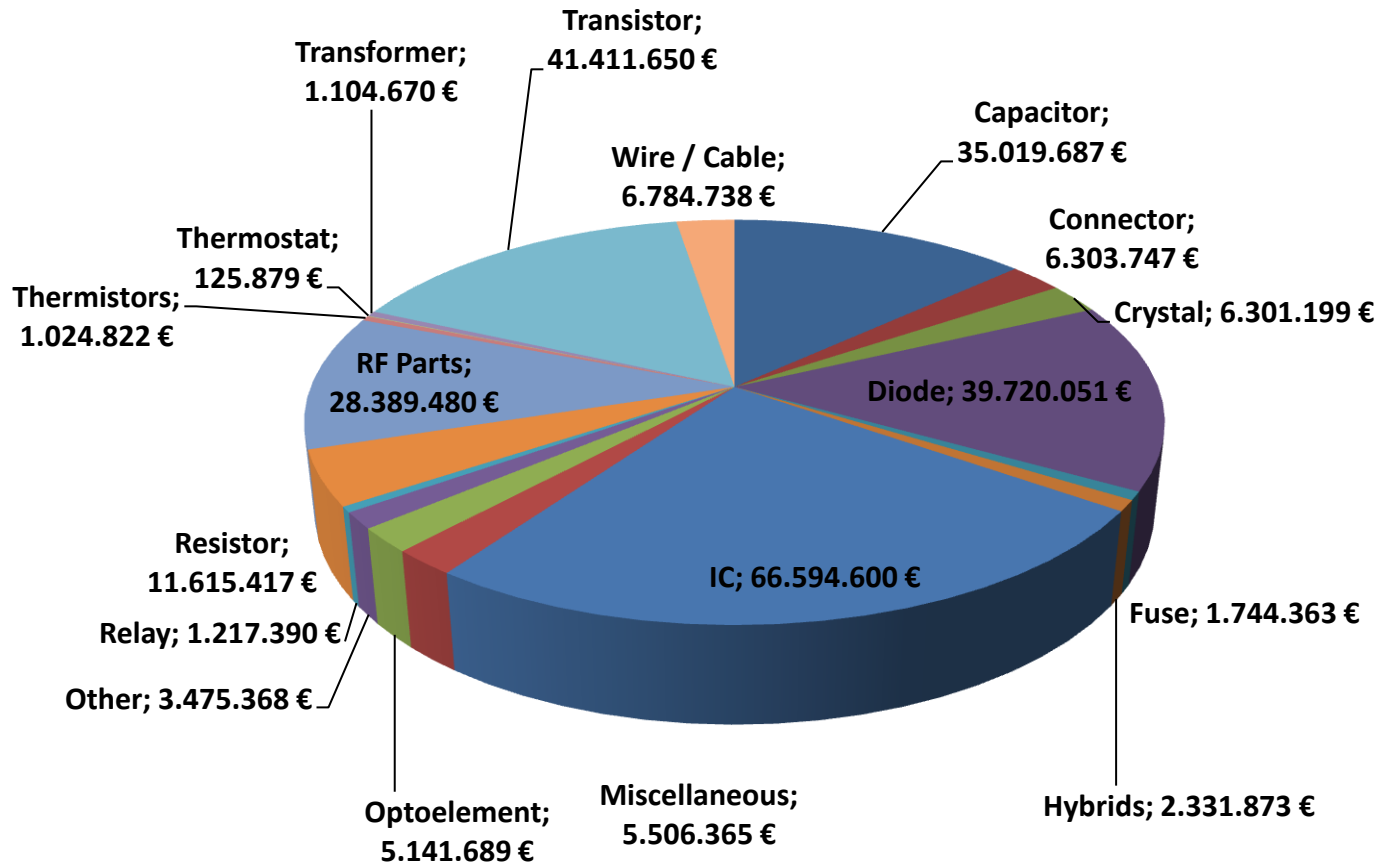
Note:

Only suppliers delivering 99% of value considered

Tesat manufactures RF-Equipment => High Value of μ W Transistors from Japan

EEE Parts Procured by Tesat 2004-2011

- Family of the Parts



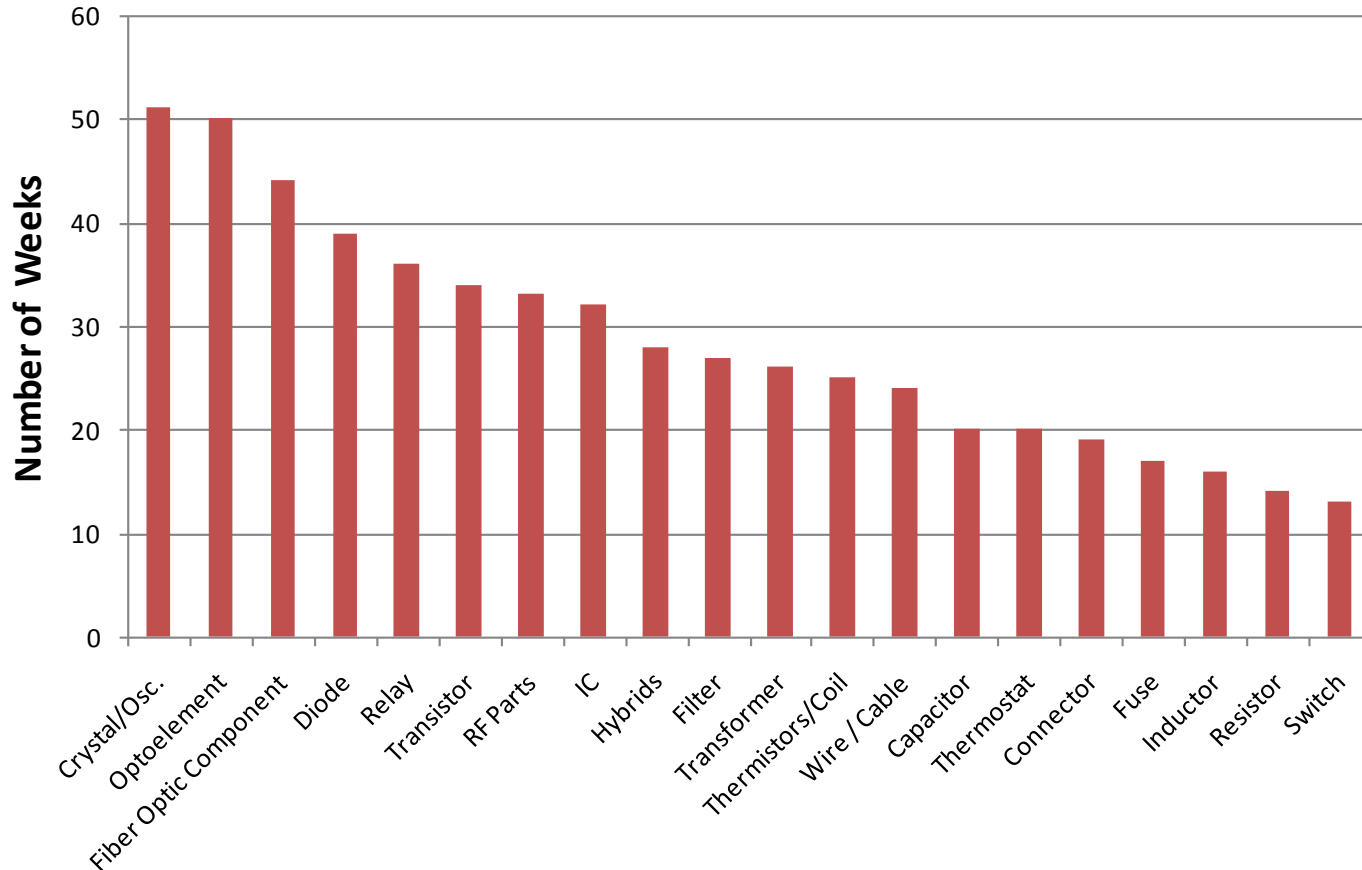
EEE Parts Procured by Tesat 2004-2011

FC	Family	No. of Lots	No. Parts	No. of DPAs	Value	Av. Piece Price
1	Capacitor	6.668	2.439.850	2.382	35.019.687 €	14 €
2	Connector	3.243	426.720	125	6.303.747 €	15 €
3	Crystal	200	1.985	37	6.301.199 €	3.174 €
4	Diode	3.697	1.559.032	1.476	39.720.051 €	25 €
6	Fuse	99	35.328	39	1.744.363 €	49 €
8	IC	2.571	298.863	830	66.594.600 €	223 €
9	Relay	128	4.967	49	1.217.390 €	245 €
10	Resistor	11.240	4.585.998	240	11.615.417 €	3 €
11	Thermistors	171	15.070	73	1.024.822 €	68 €
12	Transistor	1.910	394.896	821	41.411.650 €	105 €
13	Wire / Cable	1.118	213.484	2	6.784.738 €	32 €
14	Transformer	92	6.363	34	1.104.670 €	174 €
18	Optoelement	197	72.531	76	5.141.689 €	71 €
20	Thermostat	12	311	0	125.879 €	405 €
30	RF Parts	1.296	181.166	155	28.389.480 €	157 €
40	Hybrids	11	270	4	2.331.873 €	8.637 €
89	Miscellaneous	3.465	331.810	260	8.981.733 €	27 €
Total or Average		36.118	10.568.644	6.603	263.812.988 €	25 €

EEE Parts Procured by Tesat 2004-2011

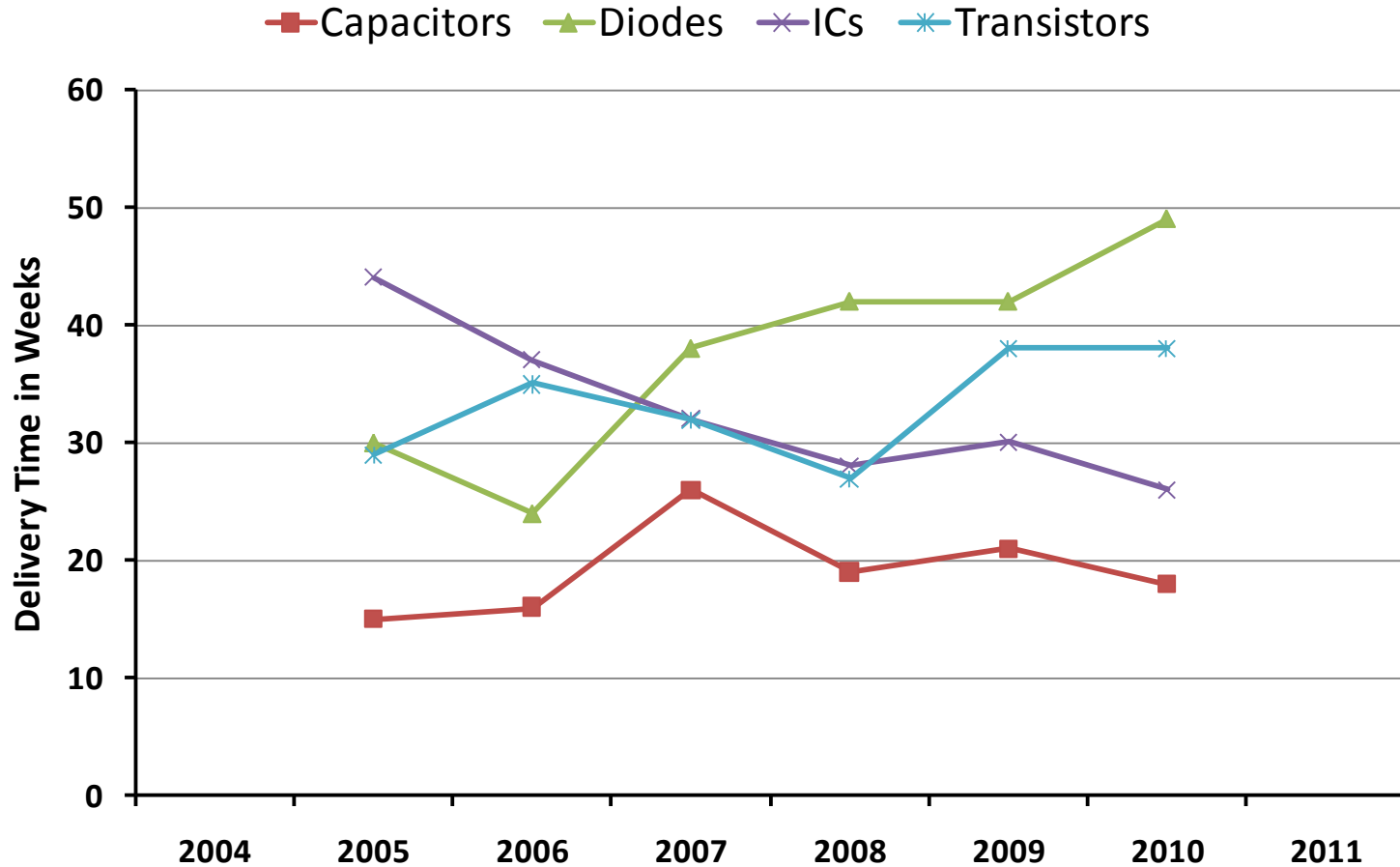
- Delivery Times

Average Delivery Time by Family



EEE Parts Procured by Tesat 2004-2011

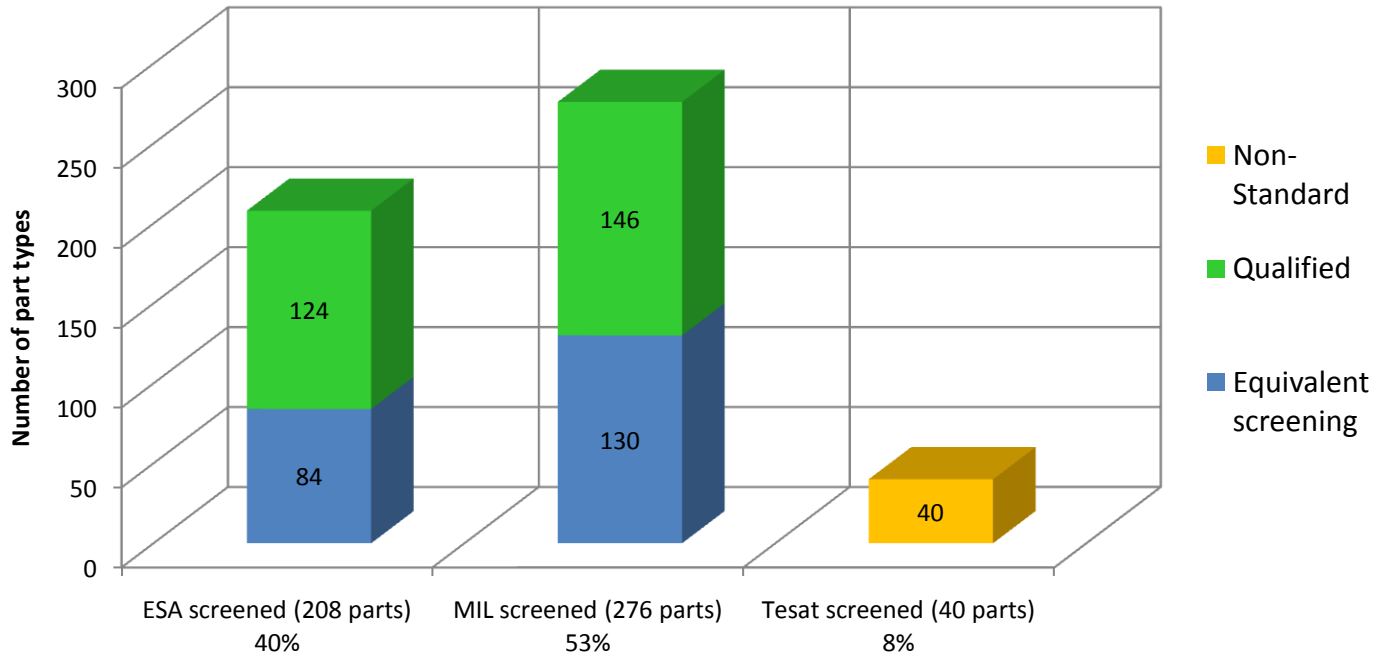
- Trend – Delivery Times



Qualification Status of Parts Used by Tesat in 2010 (Standard Equipment)

MIL/ESCC		
MIL	ESCC	Other
53%	40%	8%
Qualified/Non-Qualified		
Qual	Not Qual.	
52%	48%	

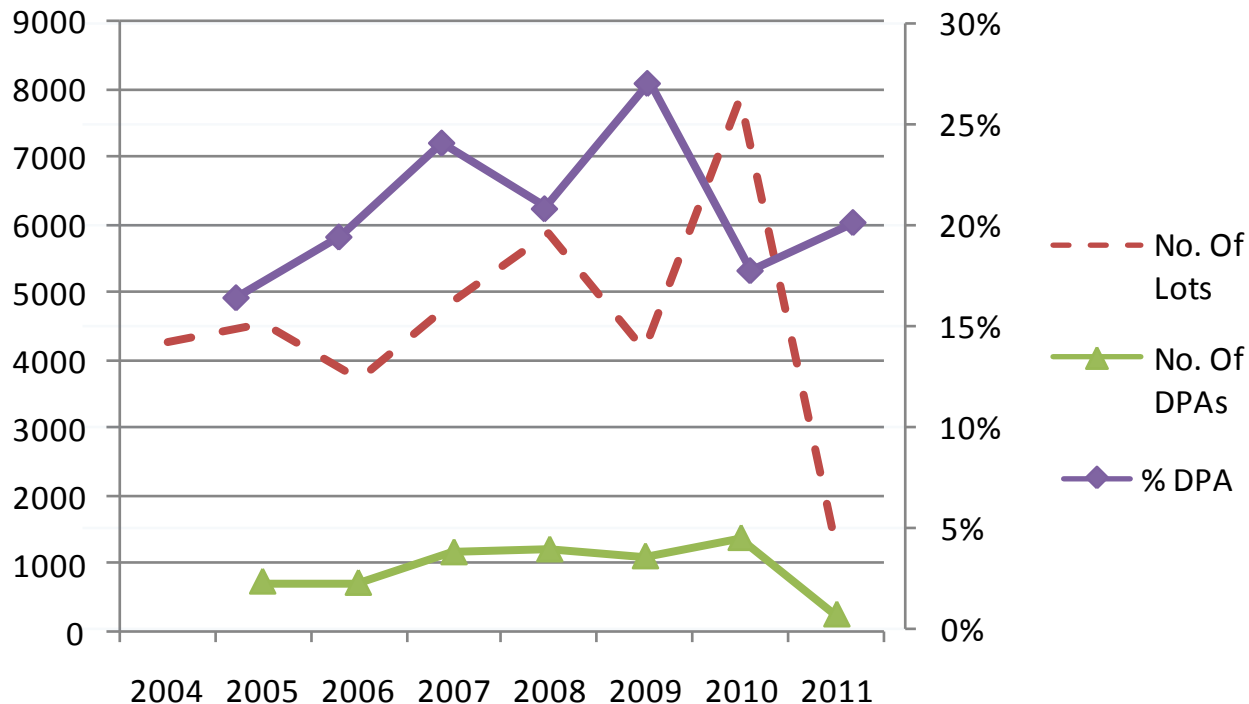
Qualification Status	No. Equip.	Parts per Unit	No. Parts
of Parts used in:			
EPCs	33	849	28.017
TWTAs	187	737	137.819
MPMs	395	1190	470.050
TOTAL UNITS OF EQUIPMENT	615	TOTAL NO. OF PARTS	635.886



The European DPA Market

- Extrapolating from Tesat's figures => DPA on ~8000 Lots/a
- Assuming ~500€/Lot => 4M€/a
- Plus additional work for Failure & Constructional Analysis (+20%) => **5M€/a in Europe for DPA/FA/CA**

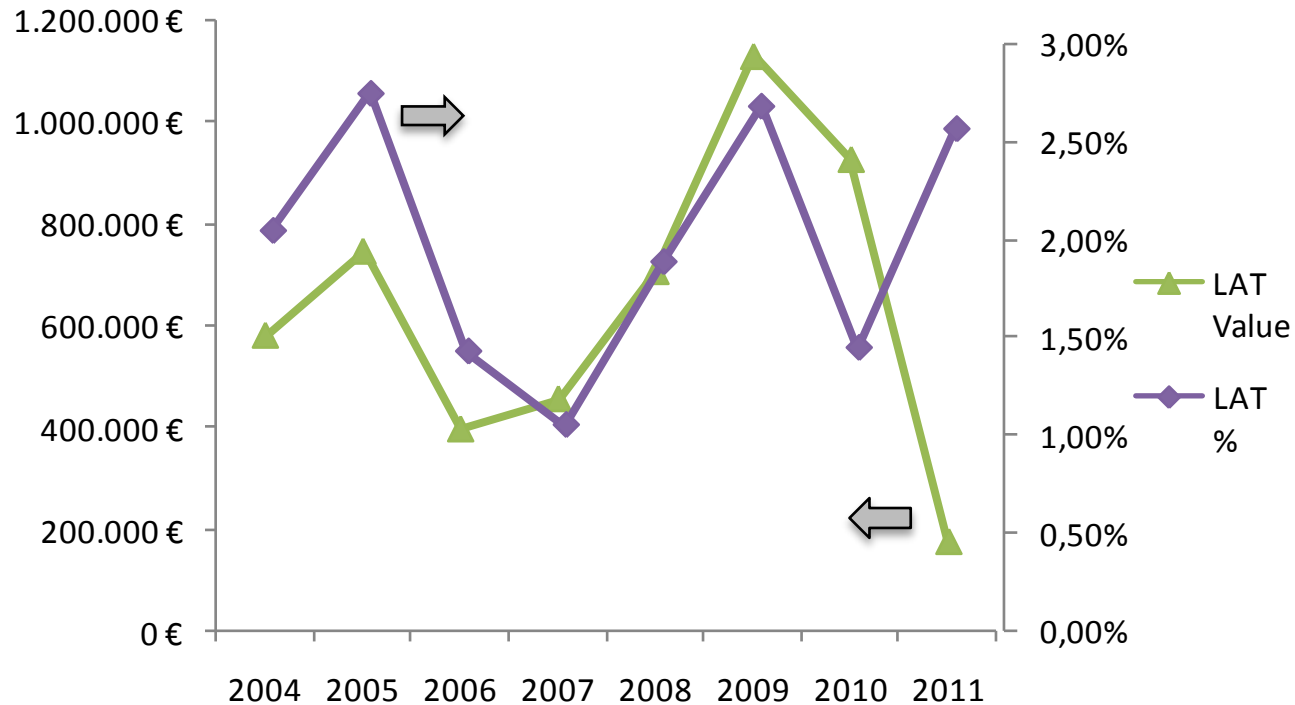
Amount and % of DPAs carried out by Tesat 2005 -2011



LAT/QCI Costs

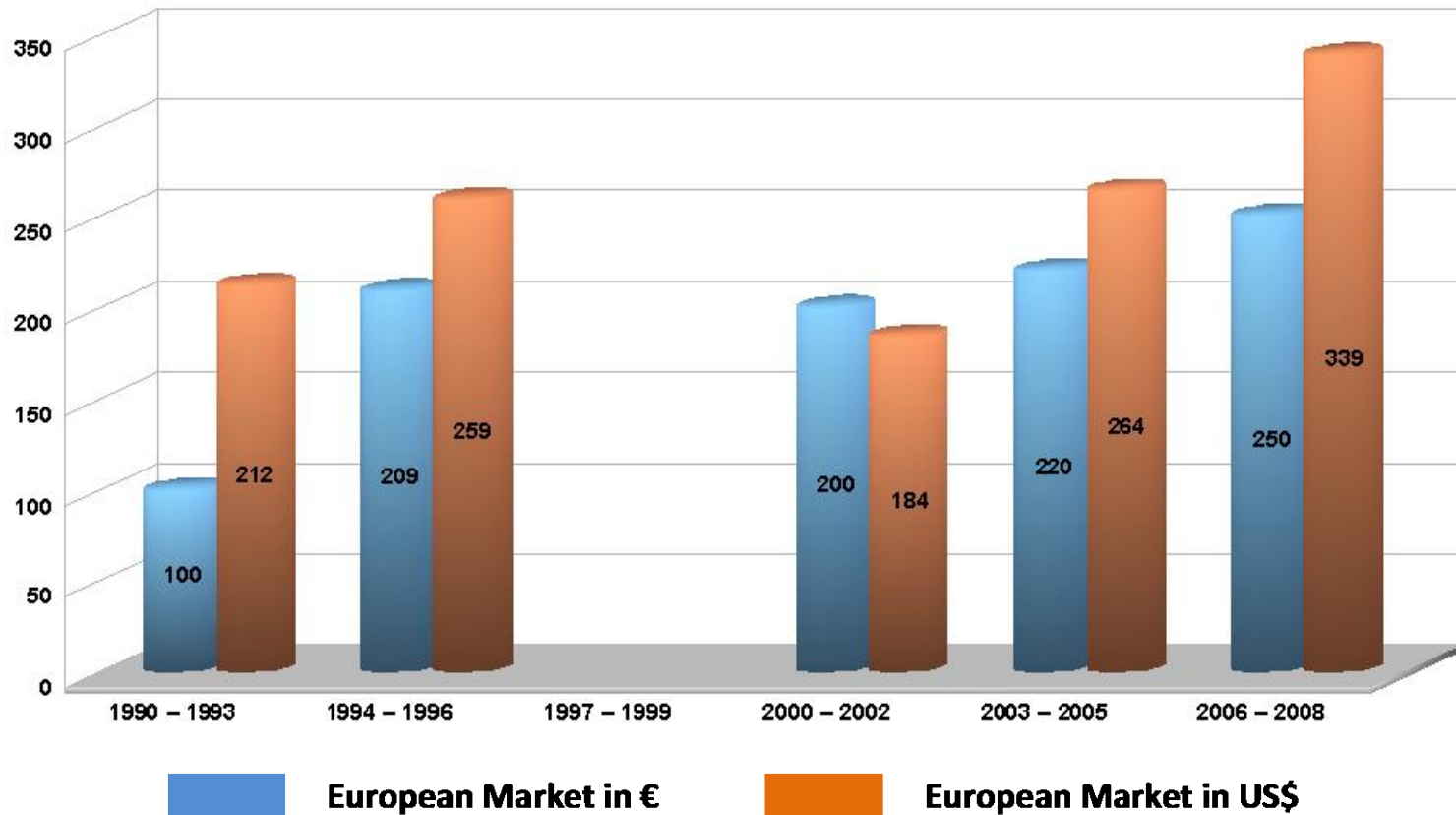
- Tesat LAT/QCI costs ~2% of total EEE costs
- Due to frame contracts with the suppliers and the inclusion of QCI costs in the price of qualified MIL components this value is too low
- Real value estimated to be 4 – 6% of the vendor cost => ~15M€/a

LATs ordered by Tesat at Supplier



Growth of the European EEE Space Parts Market

- Growth since 2000: ~3-4% p.a. in €, ~10% p.a. in US\$
- Market growth is affected by both price increases and the increase of the number of parts used



Conversion according to the exchange rate at that time

Estimation of the European Market for EEE Parts

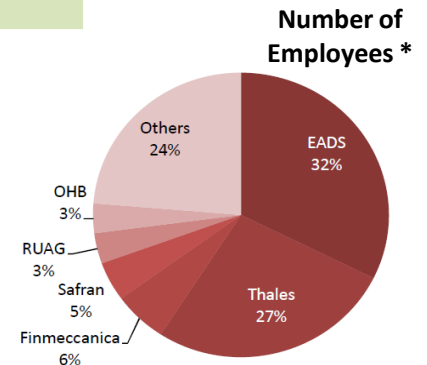
● Total Value ~300M€

	M€ Sales 2009 *	% EEE	Why?		M€ EEE
			EEE Quality	Mission Duration	
Telecom	1940	8%	Full Space	Long	155
Earth Observation	936	8%	Full Space	Med/Long	75
Navigation	204	5%	Full Space	Med	10
Launcher	1072	1%	Ind/Mil	Minimal	11
Manned Space Flight	379	4%	Mil	Mix	15
Scientific	442	5%	Mix	Mix	22
Total	4973				288

* Eurospace Report 2010

● Supporting calculation:

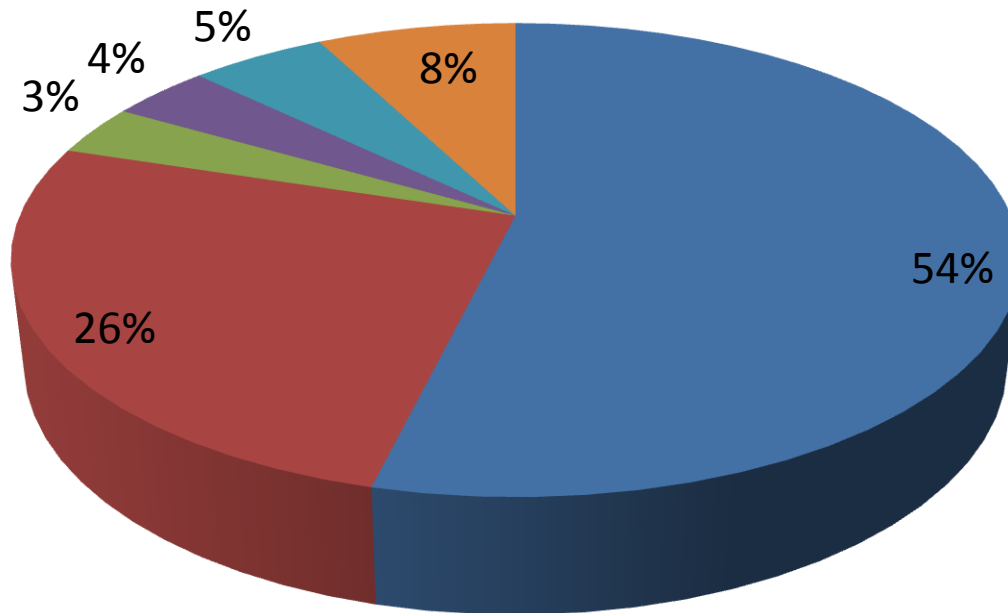
- Astrium procures ~100M€/year EEE
=> 300M€ for European Space



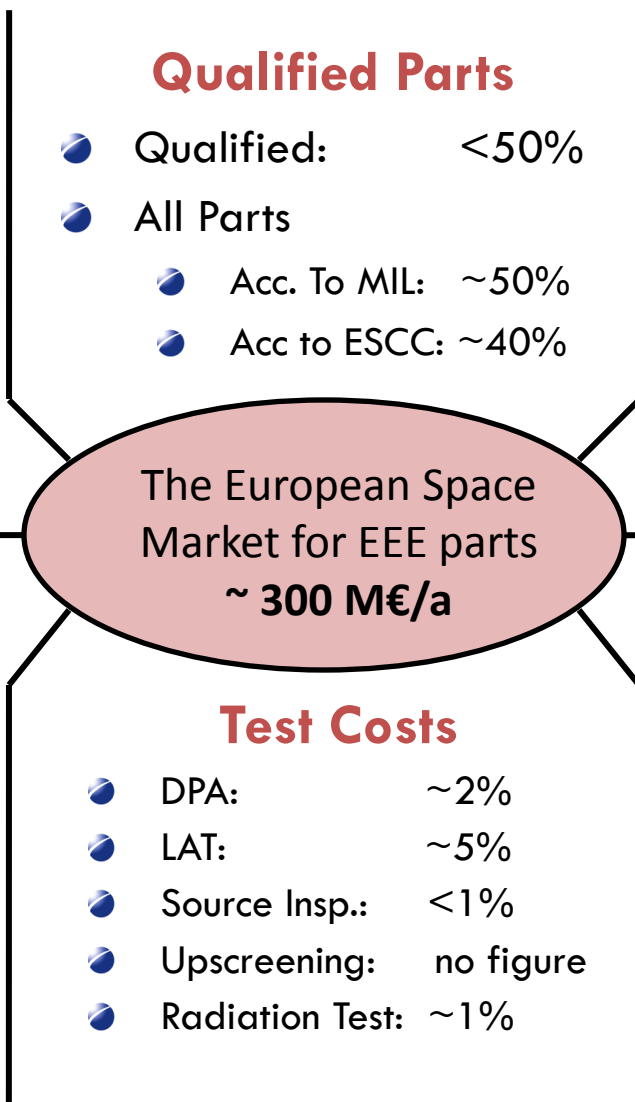
Estimated European Market for EEE Parts

● Total Value 300M€

- Telecom
- Earth Observation
- Navigation
- Launcher
- Manned Space Flight
- Scientific



THE BIG PICTURE



Origin

- USA: >50%
- Europe: <50%
- Japan: ~3%

Qualified Parts

- Qualified: <50%
- All Parts
 - Acc. To MIL: ~50%
 - Acc to ESCC: ~40%

Family (by Value)

- Microcircuits: 25%
- Transistors: 16%
- Diodes: 15%
- Capacitor: 13%
- RF-Parts: 11%
- Resistor: 4%
- Wire & Cable: 3%
- Connector: 2%
- Other: 11%

The European Space Market for EEE parts
~ 300 M€/a

Space Segment

- Communications: 54%
- Earth Observation: 26%
- Scientific: 8%
- Navigation: 3%
- Manned Sp. Fl.: 5%
- Launcher: 4%

Test Costs

- DPA: ~2%
- LAT: ~5%
- Source Insp.: <1%
- Upscreening: no figure
- Radiation Test: ~1%

Quality Level

- Space Level: ~80%
- Military Level ~15%
- Commercial /Industrial ~5%



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