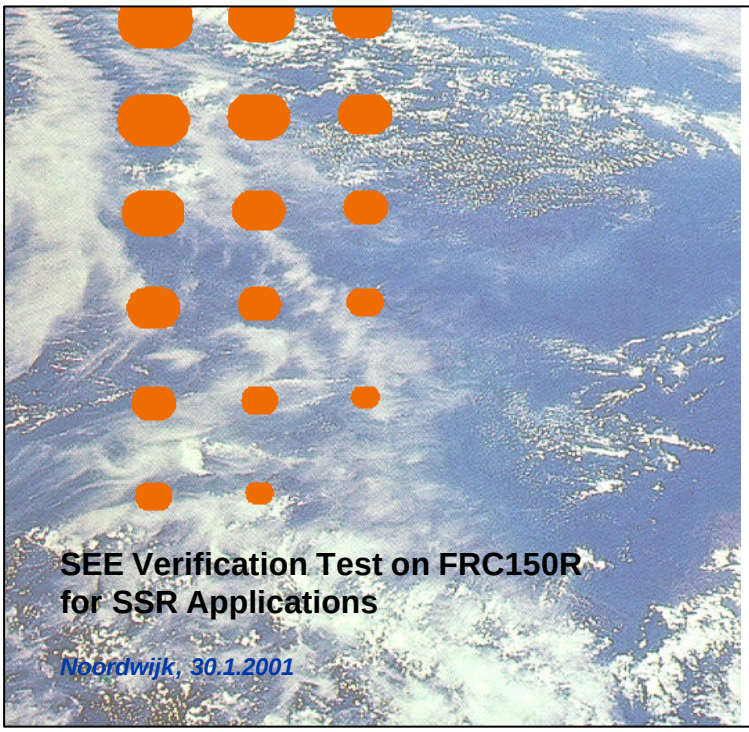

SEE Verification Test on FRC150R for SSR Applications

Noordwijk, 30.1.2001

astrium

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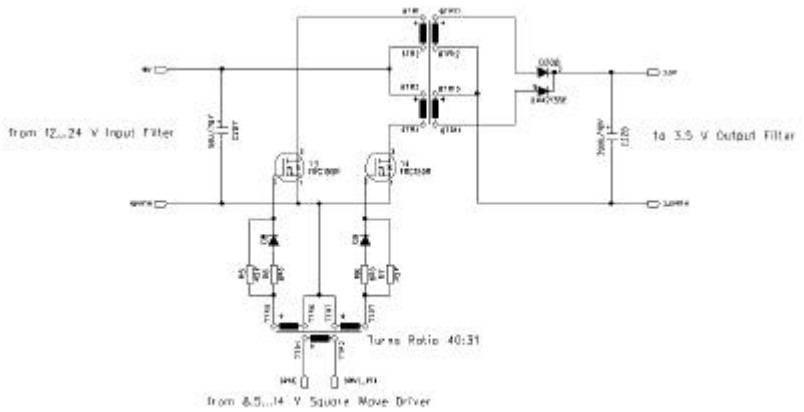
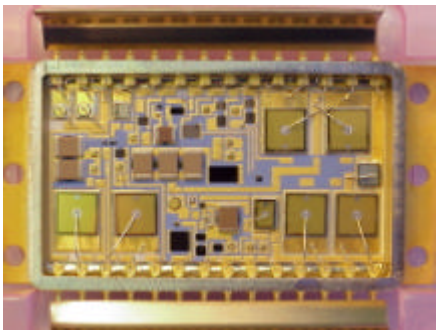
FRC150R Application

Push-pull converter, mosfet gate drive via signal transformer:

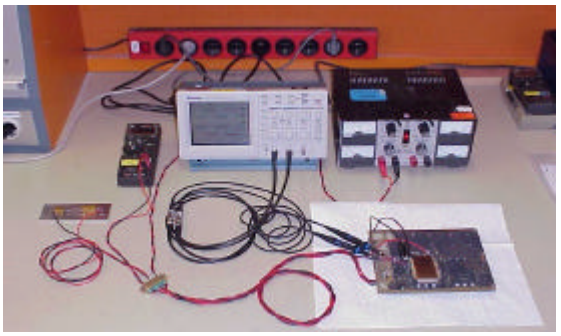


FRC150R

Device Tested: Harris FRC150R, V_{DS} = 100 V
rad-hard, not SEU specified



Die inside hybrid circuit



Test setup outside vacuum chamber

FRC150R

Single Event Effects Observed:

- Single Event Gate Rupture, destructive
- Single Event Burn-out, non-destructive

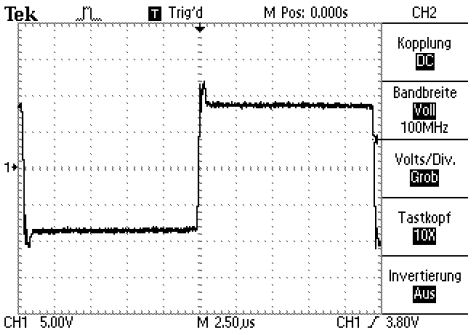
both observed by oscilloscope

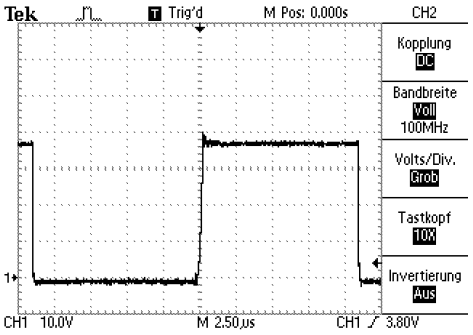
Parameter Variation:

- Drain voltage: 25, 41 (nominal) and 50 V
- Gate voltage: ±7, ±9 (nominal) and ±11 V
- LET: 14, 34, 38 MeV/mg/cm²
- Fluence: 100,000 /cm² in all runs

FRC150R

Gate and Drain Voltages of DUT:





Gate Voltage 5 V/Div **Drain Voltage 10 V/Div**

Time: 2.5 µs/Div

FRC150R

TEST RUN SUMMARY					
TEST RUN	VGS (V)	VDS (V)	ION	LETeff [MeV/mg/cm²]	FLUENCE [cm²]
01	-7,0	41,0	AR	14,1	1000000
02	-9,0	41,0	AR	14,1	1000000
03	-9,0	50,0	AR	14,1	1000000
04	-7,0	25,0	KR	34,0	1000000
05	-7,0	41,0	KR	34,0	1000000
06	-7,0	50,0	KR	34,0	1000000
07	-9,0	25,0	KR	34,0	1000000
08	-9,0	41,0	KR	34,0	1000000
09	-9,0	50,0	KR	34,0	1000000
10	-9,0	41,0	KR	38,0	1000000
11	-11,0	25,0	KR	34,0	1000000
12	-11,0	41,0	KR	34,0	1000000
13	-11,0	50,0	KR	34,0	1000000
14	-11,0	41,0	KR	38,0	1000000
15	-11,0	50,0	KR	38,0	1000000

FRC150R

Result:

No SEB nor SEGR failures were observed

up to:

- **-11 V gate voltage**
- **50 V drain voltage**
- **LET of 38 MeV/mg/cm²**