Radiation test of LV supply and components in PSI 30.6.2002

- **Requirements:**
  - **tid max 32 krad / 10years**
  - **see 1.75e12 p/cm^2**
  - **beam has 5e8 p/cm^2/s ~ 7 minutes to reach 30krads**
    to get 1.75e12 p/cm^2 for SEE test and in the same time to limit TID we had to multiply the number of components tested by 8

- **Component test**
  - **Tested MOSFETS for SEE**
    - **Primary side of DCDC**
      - **IRFP460 TO247**
      - **IRFP9N60 TO263 (SMD)**
    - **Secondary side of DCDC**
      - **IRF260 TO247**
      - **IRF3710 TO263**
- **Module test**
  - **Original LT converter based on LTC1698 & LT1681**
  - **Half bridge converter with IRFP460, IR2110 & UC3526**
  - **Optically isolated amplifier with HCPL7840 & LM6142**

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- **Component tests**
  - **Test1 - SEE in irfp460 6 samples**
    - **200V Uds , Flux -> 5e8 p/cm^2/s**
      40krads -> 9.5 minutes - 2.91e11p/cm^2
    - **result =NOSEE**
  - **Test 2 - same as 1 but 250 Vce**
    - **result NOSEE**
  - **Test3 - SEE in 8x IRF3710**
    - **unfortunately 200V on collector for 3 minutes then 50V set then conditions as test1**
      resulllt NOSEE
  - **Test 4 - Same as 3**
    - **Increased voltage to 80 V ,other conditions the same**
    - **result NOSEE**
  - **Test5 - 8x IRFP9N60**
    - **200V Uds**
    - **result NOSEE**
  - **Test6 - same as 5**
    - **250V Uds**
    - **result number 4 had SEE after ~8minutes**
    - **rest NOSEE**

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- **Module test**
  - **Test 7 - LT DCDC converter**
    - **40v input 5v/9A output**
    - **Up to 17 krads working well**
    - **6V output shift ~ 17krads & SEE**
    - **then continue 19.2krad next SEE**
    - **then continue up to 28.2krads and there was again SEE**
    - **then continue up to 38 krads and again SEE**
    - **then after stop the beam without power cycling function is back**
  - **Test8 OIA**
    - **two ramps without radiation**
    - **20krads**
    - **ramp**
    - **10krads**
    - **ramp**
    - **10krads**
    - **ramp**
  - **Preliminary result is that transfer function is still linear with constant gain up to 40krads**

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- **Test9**
  DCDC Halfbridge
  30krads withouut on-line
  outp.voltage drop to 0 but fuse still OK. Suspicious high-side driver IR2110 ??

- **Test10**
  8x IRFP260
  result NOSEE