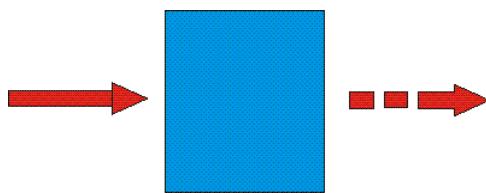


SANOS™ – Saturable Noise Suppressor



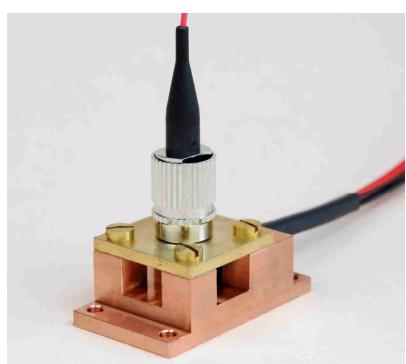
Product Overview

- Cleaning of optical noise between consecutive pulses after a pulse picker or optical amplifier
- All optical wavelength conversion of pulsed optical signals

Mounting Options



Free space (FS) SANOS™



Fiber coupled (FC) SANOS™ with TEC cooler



Fiber coupled SANOS™

| | | |
|-------------------|------------------------------|--|
| SANOS 1064 | Laser wavelength | $\lambda = 1050 - 1064 \text{ nm}$ |
| | FWHM | 17 nm / 15 nm * |
| | Noise suppression ratio | 12 dB / 20 dB * |
| | Insertion loss | 3 dB / 6 dB * |
| | Relaxation time | $\tau \sim 9 \text{ ps}$ |
| | pulse fluence for saturation | $F = 4 \mu\text{J}/\text{cm}^2 / 10 \mu\text{J}/\text{cm}^2$ * |

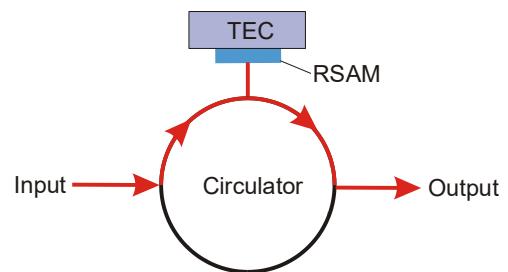
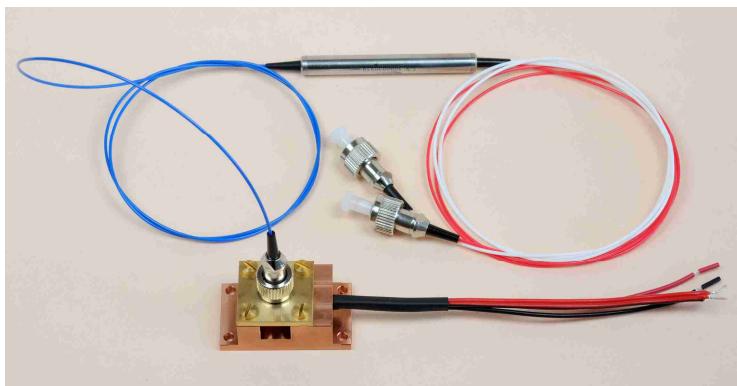
* Two-stage FS-SANOS

| | | |
|-------------------|------------------------------|--|
| SANOS 1550 | Laser wavelength | $\lambda = 1530 \text{ nm} .. 1560 \text{ nm}$ |
| | FWHM | 15 nm |
| | Noise suppression ratio | up to 18 dB ** |
| | Insertion loss | 3 dB |
| | Relaxation time | $\tau \sim 5 \text{ ps}$ |
| | pulse fluence for saturation | $F = 30 \mu\text{J}/\text{cm}^2$ |

** dependent on the input SNR

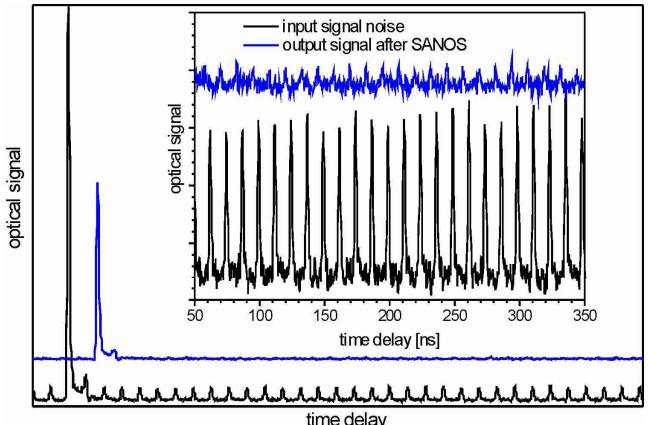
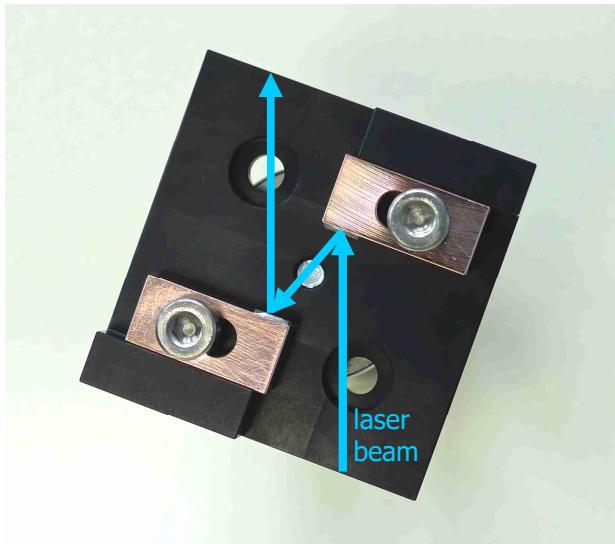
Other wavelengths and parameters on request.

FC-SANOS™ with thermoelectric cooler (TEC)



A FC-SANOS is a resonant saturable absorber mirror (RSAM), mounted on a circulator. The RSAM has a strong non-linear reflectance, therefore the low level input signal transmittance of the FC-SANOS is only 3% (97% loss), whereas high intensity pulses are transmitted with a lower loss of 50%. Because the RSAM is a resonant device, the noise is only suppressed at the resonance wavelength. The RSAM is temperature controlled using a thermoelectric cooler/heater (TEC) for fine tuning of the resonance wavelength with a maximum shift of 6 nm.

FS-SANOS™

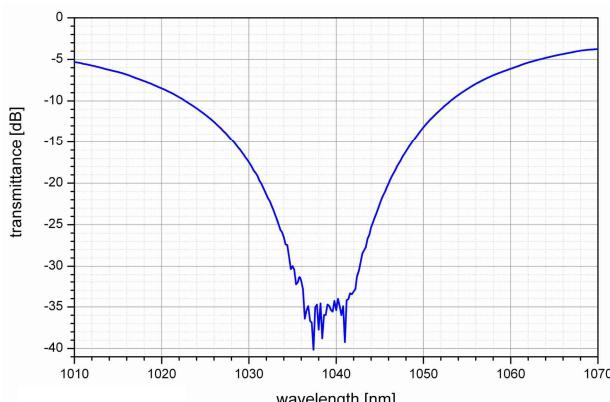


Measured suppression of small pulses (after a pulse picker) using a SANOS. The black curve is the time dependent optical signal, which hits the SANOS and the blue curve is the SANOS output signal.

A FS-SANOS consists of a resonant saturable absorber mirror (RSAM) and a conventional 100% mirror (optional with second RSAM). The beam propagates through the FS-SANOS without changing of the direction, but with a parallel offset of about 2 mm. The RSAM has a strong non-linear reflectance, therefore the low level input signal transmittance is only 2 % (98 % loss), whereas high intensity pulses are transmitted with a lower loss of 50 %.

Spectral transmission:

FS-SANOS-1040-2



FC-SANOS-1550

