

Laser-Induced Damage Threshold (LIDT) Measurement Report

ISO 21254-2: S-on-1 Test Procedure

Sample: 2-CPW-ZO-L/2-1030

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Tester/date: E. Pupka / 2015-01-14

Specimen

Name of sample: 2-CPW-ZO-L/2-1030
Type of specimen: Crystal, AR Coating
Storage, cleaning: Plastic box, dust blow off by compressed air;

Test specification

First harmonic of pulsed Nd:YAG InnoLas Laser: SpitLight Hybrid laser ($\lambda = 1064$ nm, linear polarization, pulse duration 10 ns), $\lambda/2$ plate combined with additional polarizer attenuator, online scattered light damage detection, offline inspection of damage detection using Nomarski microscopy (100x).

Laser parameters

Wavelength: 1064 nm
Angle of incidence: 0 deg.
Polarization state: linear
Pulse repetition frequency: 100 Hz
Spatial beam profile in target plane: TEM₀₀
Longitudinal beam profile: Single mode (SLM)
Beam diameter in target plane ($1/e^2$): 235.5 μm (average from 64 pulses)
Pulse duration: 10 ns

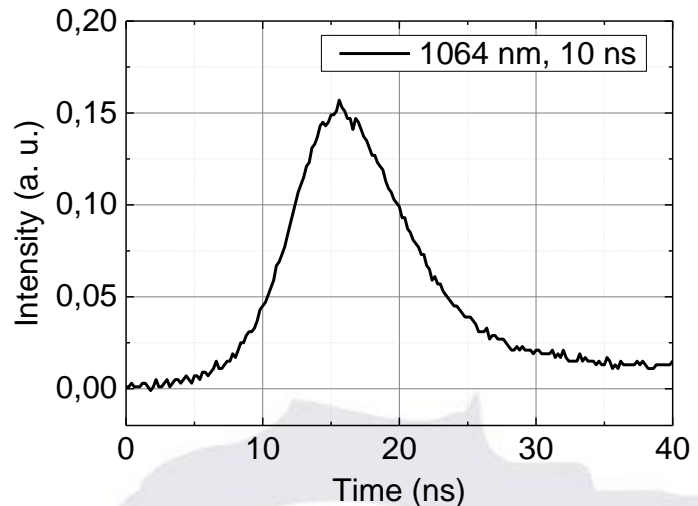
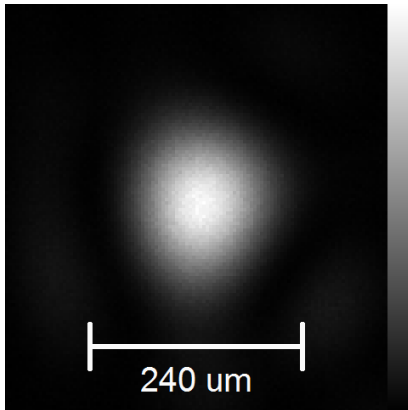


Fig. 1 Spatial beam profile in target plane (left) and oscilloscope trace (right)

Test procedure:

Number of sites per specimen:
Arrangement of test sites:
Minimum distance between sites:
Damage detection:
Storage of the specimen:
Test environment:
Cleaning:
Definition of LIDT:

S-on-1 test

414
Equally spaced
744 μm
Scattered light diode
Plastic box
Industrial environment
Compressed air
Nonlinear fit to 0% of damage probability

Test result:

Table 1 Summarized LIDT's for 2-CPW-ZO-L/2-1030

Test mode	Threshold, J/cm ²
1-on-1	50.30 ≤ 57.68 ≤ 64.43
1000-on-1	20.02 ≤ 24.12 ≤ 27.73

Measured at LIDARIS 2015-01-14
www.lidarisis.com

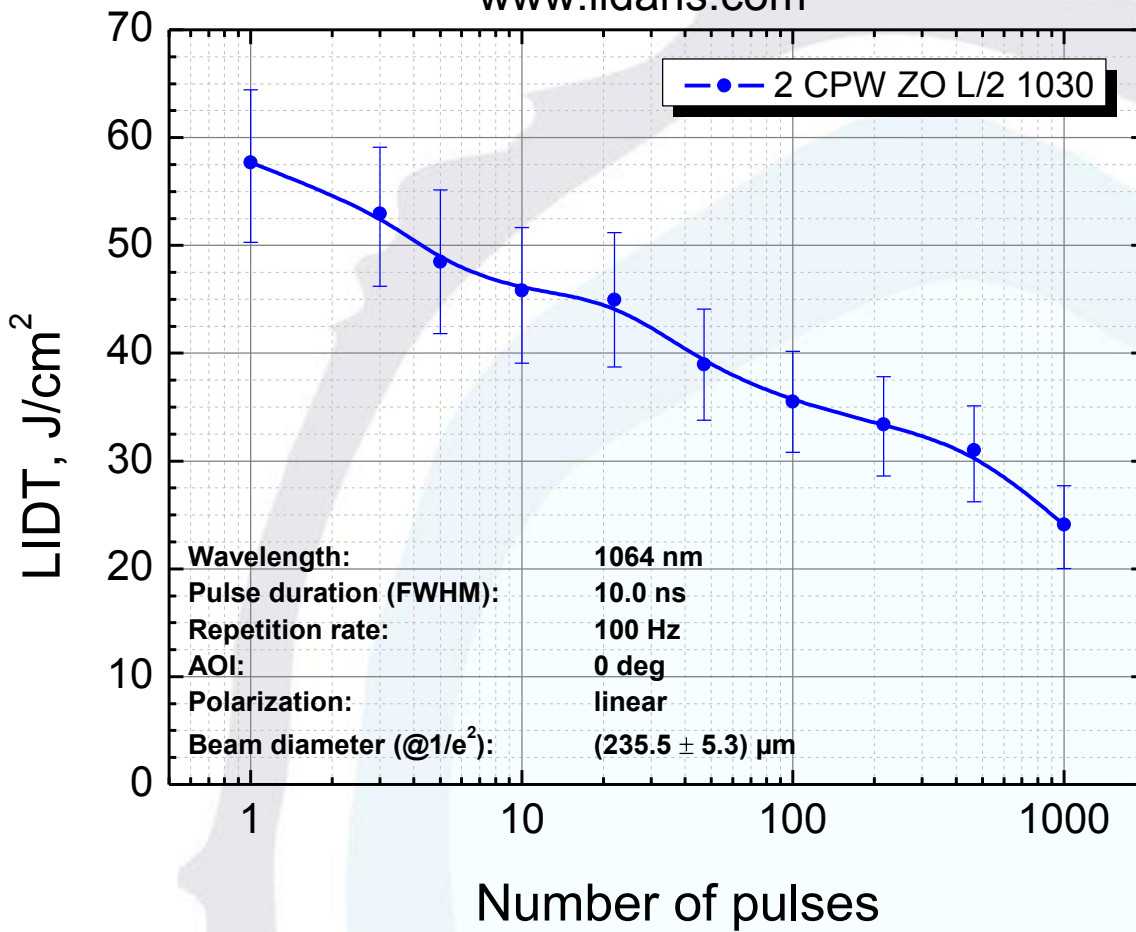
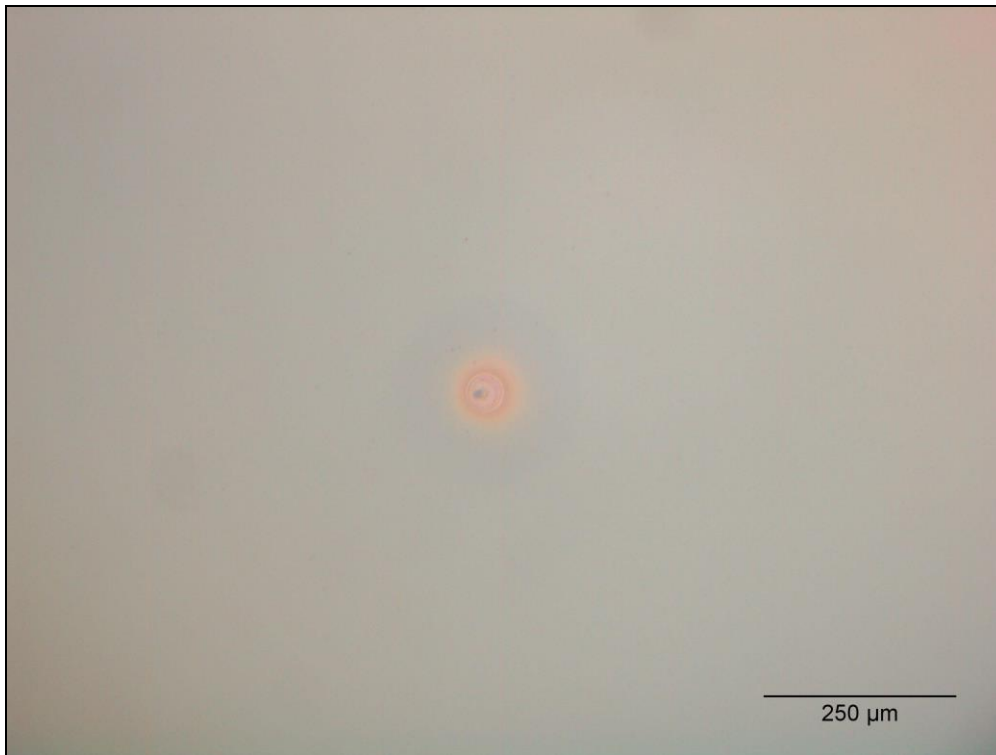


Fig. 2 Characteristic damage curve.

Typical damage morphology:



**Fig. 3 Typical in volume damage morphology
(Energy density 63.13 J/cm², damage after 1 pulse)**



**Fig. 4 Typical front surface damage morphology
(Energy density 26.00 J/cm², damage after 1000 pulses)**