Fraunhofer IPMS

Evaluation kit for quasi-static MEMS scanners

Complete evaluation kit "QSDrive Scan Kit"

Forschungsfabrik Mikroelektronik Deutschland

The Evaluation Kit "QSDrive Scan Kit" enables customers, especially small and medium-sized companies, to evaluate and correctly drive ResoLin MEMS scanners from Fraunhofer IPMS without having to develop the required driving electronics themselves.

The kit consists of a ResoLin device (a cardanic MEMS scanner with a linear axis and an optional, orthogonally-oriented resonant axis) as well as control electronics to operate components with an optimized trajectory. A scanning head, which due to its special design can be easily integrated into popular optical test setups, is also included.

Controlled operation as well as the synchronized operation of the resonant axis are possible depending on the specific design of the MEMS component. Function control is realized using a software GUI that allows communication via USB interface.

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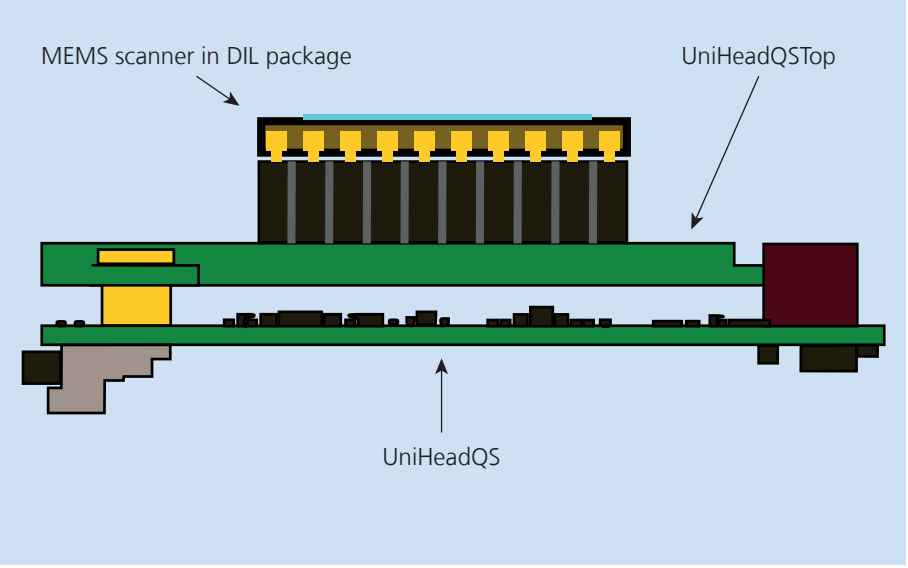
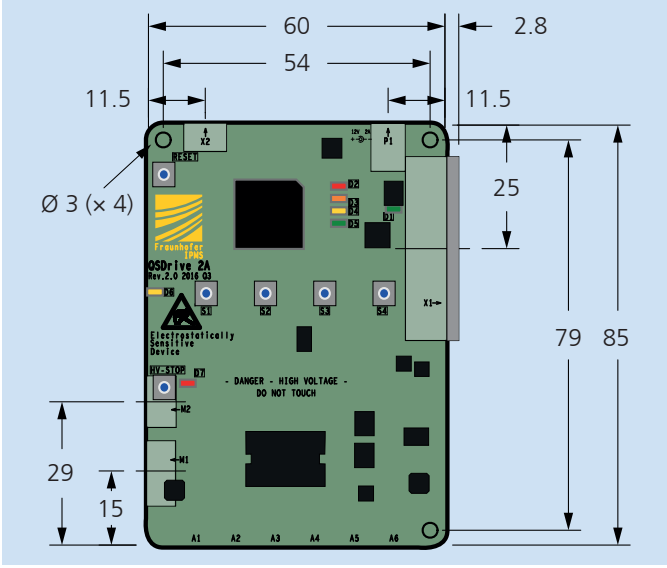


Side view of the scan head, schematized



Dimensions of the driver board

Components

- **Driver Board** "QSDrive02A" – basic driving and controlling unit
- **Scan Head** consisting of the following components:
  - MEMS scanner, type selected in agreement with customer
  - **UniHeadQSTop**: hosts a small PCB board with a socket for the DIL packaged scanner or directly mounted MEMS. The wiring is specifically chosen for the selected MEMS scanner type.
  - **UniHeadQS**: signal conditioning and pre-amplification (driving and sensor signals) and persistent parameter storage for the individual MEMS scanner. The **UniHeadQSTop** is plugged into this module.

Driver Board and Scan Head are connected using FFC cables of appr. 8" length.

Power supply

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V_{S_IN}	Supply voltage		11.5	12	12.5	V
I_{S_IN}	Supply current	(Max. = Starting current)		0.4	2.0	A

Driving parameters of linear drive axis

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V_{outQS}	Output voltage (quasi-static)		0		200	V
I_{outQS}	Output current (quasi-static)				3	mA
f_{S_VT}	Sampling frequency	Voltage trajectory			50	kHz
f_{S_OL}	Sampling frequency	Angular ("theta") trajectory, open loop control			20	kHz
f_{S_CL}	Sampling frequency	Angular ("theta") trajectory, closed loop control			12	kHz

Driving parameters of resonant drive axis

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V_{outRES}	Output voltage (resonant)		24		200	V