InGyro Test Module

High Parallel Test of Inertial Sensors

Applications

- inertial sensors such as gyroscopes, accelerometers, 6DOF combos, 9DOF combos
- other MEMS applications on request

Facts

- high-parallel test in structures, i.e. strips, panels, or carriers
- scalable modular architecture: convertible to various sensor applications and package types
- support of a large variety of packages incl. tiny and fragile packages
- robust handling with minimum number of device contacts and low jam rates
- real-world (physical) sensor stimulus with high accuracy

Solution for

- all leaded and leadless packages, including tiny and fragile devices
- typical carrier size 215 x 65 mm
- strip sizes from 48 x 150 mm to 70 x 230 mm
- tri-temp test from -40 °C to +125 °C

inertial sensor test equipment

standard strip handler + **physical stimuli module** **tilt axes / rotational axis**

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www.multitest.com/InMEMS
customer.relations@xcerra.com
Semiconductor Handler Group | www.xcerra.com/handlers

Xcerra Corporation
Norwood, MA 02062, USA | Tel. +1 781 461 1000
www.Xcerra.com

InGyro Test Module

High Parallel Test of Inertial Sensors

1. Base System

1.1 InGyro Module
- 3-axis module for physical stimulation of inertial sensors up to 9DOF
- compatible with Multitest InStrip test handler for automatic strip or carrier handling, compliant to InCarrier process
- available as ambient or AHC module

1.2 Temperature Test Options
- ambient / tri-temp (-40 °C to +125 °C)
- cooling standard: LN2 at 1.5 to 6 bar

1.3 Test Interface
- tester interface: IEEE 488.2 (TCP/IP optional)
- angle control from tester: via IEEE 488.2
- index step control from tester: via IEEE 488.2

1.4 Human Machine Interface
- panel PC with 15" touch screen, Windows 7
- remote recipe management
- user configurable menus and run-screen
- online help system

2. Conversion

2.1 Conversion Style
- InCarrier / strip style conversion

2.2 Conversion Time
- package conversion time required: typically <30 min

2.3 Adjustment / Calibration after Conversion
- semi-automatic adjustment at InStrip, e.g. width adjustment of conveyer system
- semi-automatic angle calibration with precision reference inclinometer (0.01°)

3. Packages

3.1 Possible Package Style
- singulated packages (with InCarrier process)
- packages in strips (e.g. leadframes, BGA strips)
- package types: leaded and leadless devices (e.g. BGA, LGA, QFN, MLF, WLCSP, SOIC, SOT, QFT)

3.2 InGyro Panel Specification
- panel size: min. 48 mm x 150 mm; max. 70 mm x 230 mm
- panel thickness: max. 6 mm

4. Contacting

4.1 Number of Contact Sites
- number of signal lines: 1200
- typical contacting force: 0.3 N/pin
- indexing: ±55 mm in x-direction

4.2 Type of Contacting
- typical: spring probe
- lifetime contacting: typical >500k insertions
- max. contactor resistance: 2.5 Ω + resistance of cable dock

5. Performance

5.1 Strip/carrier Alignment and Motion
- 2x tilt axis (α,β), 1x rotational (yaw) axis (Θ)

Tilt axes
- tilt angle: α: -180° to +90°, ß: -90° to +90°
- position accuracy α,β: <= ±0.1°
- time to reach stable position(0° to 90°/-90°): <1.2 sec

Yaw axis
- rotation angle Θ: ± 360°, 720° max. range
- constant velocity (trapezoidal acceleration profile)
- yaw rate: max. 700°/sec
- time to reach stable yaw rate:
  100°/sec: < 180 msec
  200°/sec: < 260 msec
  400°/sec: < 440 msec
- max. possible rotation angle at stable yaw rate – e.g.:
  200°/sec: ~ 650°
  400°/sec: ~ 520°
- yaw rate accuracy: <0.03 % (mean value vs. target value)
- wow and flutter: <0.6% (mean value vs. actual value)
- trigger signal when yaw rate is stable

5.2 Temperature
- range: -40 °C to +125 °C
- accuracy at contact site: ±2 °C
- uniformity across strip/carrier: ±2 °C
- temperature stability ± 1 °C
- DUT reference sensor reading accuracy (optional): e.g. PT100 class A, PT 100/PT 1000 class Y (1/3B)

5.3 Throughput
- depending on tester capability (number of parallel contact sites, number of devices, layout of a panel, test time)
- index time: 0.6 s
- strip exchange time: 15 s

6. Facility Requirements

6.1 Supply Requirements
- power:
  398/416 Vac / 50 Hz /3 phases /N /PE
  208 Vac / 60Hz /3 phases /PE
  230/240 Vac / 50/60 Hz /1 phase /N /PE
- air: 5 – 10 bar (73 – 145 PSI), max. air flow 900l /minute
- LN2: 1.5 - 6 bar (22 – 87 PSI), average consumption: 23l/h

6.2 Weight InGyro module/total system (incl. base unit, loader, unloader)
180 kg / 1250 kg

6.3 Size InGyro system (incl. base unit, loader, unloader)
- 2.15 m (length) x 1.60 m (depth) x 2.10 m (height)

6.4 Mobility
- InStrip+InGyro+loader/unloader moveable on caster by 2 persons as one system

7. Compliance and Standards

7.1 Compliant to CE, E142

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