MAGICS TECHNOLOGIES

RAD-HARD FABLESS SEMICONDUCTOR SUPPLIER WITH HQ IN BELGIUM

SOLUTIONS FOR AUTONOMOUS OPERATIONS IN HARSH CONDITIONS

Magics Technologies presents its solutions for the nuclear, space, medical and any other industry with a harsh environment and where the mission is critical.

We offer leveraged rad-hard-by-design (RHBD) methodology in these five ITAR-free product families:

- Motion series
- Power series
- Time series
- Vision series
- AI series

From Resolver/LVDT readout chips, to Lidar readout-systems for space, to AI on-board processing chip, core technology to enable autonomous operations.

The chips designed today, support your innovation for tomorrow to digitize and automate your mission with the highest accuracy. Our team provides you with solutions that have a big impact on the development of the next generation (nuclear) robotic systems (for surveillance, inspection, change, ...) , drones, manipulators, satellites, space launchers, rovers, landers, etc.
Thanks to our unique rad-hard-by-design methodology, all chips benefit from the following features and improvements (compared to older comparable tech):

- No shielding needed
- Small and compact component footprint
- Fewer external components for compact PCB-design
- Less complex cabling or systems needed
- Low power consumption
- Free from ITAR regulations
- Affordable reliability
- Faster go-to-market due to own stock supply
- Proven excellence

Have a chat with us to discuss your needs.
Let's explore how we could help you realize your design or if our current standard parts don't fit your needs, we can discuss a custom solution.
As rad-hard fabless company, our team have an unique design methodology that automatically leads towards the benefits mentioned above.

Magics has proven analog/mixed-signal IPs, compliant with ESCC-Q-ST-60-02C, in-house expertise in chip-design, chip testing and radiation qualification capabilities. A wide spectrum of knowledge for guaranteed success.

Think big. Start small.

Get in touch to explore more !

PRODUCT-LINES

SERVICE-LINES

MAGICS
Cipalstraat 3, 2400 Geel Belgium
+32 (0) 14 58 59 27
www.magics.tech

RADIATION-HARDENED MOTION-SERIES

Motion- and instrumentation control for robotic systems in harsh environments

MAG-POS
Resolver/LVDT Interface IC

Features:

SPI interface

16-bit resolution

40 kHz sampling speed

Offset and gain calibration options

1.25 V supply and control voltage

Programmable without external resistors and capacitors

Diagnostic features:
- loss of tracking (LOS)
- degradation of signal (DOS)

Radiation tolerance:
- min. 1 kGy TID
- max. 1 MGy TID (on request)
> 62.5 MeV*cm²/mg SEL / SEU

MAG-SEI
Sensor interface IC

Features:

SPI interface

16-bit delta-sigma Analog-to-Digital converter

4-differential input channel readout

1.25 V supply and control voltage

Programmable IEXC

On-chip:
- silicon temp. sensor
- oscillator
- Scalable ADC clock frequency
- excitation signal generation
- digital decimation filter

Radiation tolerance:
- min. 1 kGy TID
- max. 1 MGy TID (on request)
> 62.5 MeV*cm²/mg SEL / SEU

MAG-MSW
Limit Switch readout IC

Features:

10.24 MHz 16-bit SPI interface
- 3.3 V or 1.2 V

10 read-out channels:
- up to 48 V input voltage

3.3 V Supply voltage

Switching from supply rail up to 48 V @20 kHz

Radiation tolerance:
- min. 1 kGy TID
- max. 1 MGy TID (on request)
> 62.5 MeV*cm²/mg SEL / SEU

MAG-DRV
PWM driver/pre-driver IC

Features:

10.24 MHz 16-bit SPI interface
- 3.3 V or 1.2 V

8 individual HV FETs drivers:
- 125 mA per driver
- low-side switch

Switching from supply rail up to 48 V

3.3 V supply voltage

Protection and diagn. features:
- PWM control for each driver
- over-current protection
- over-temperature protection
- fault monitoring
- logging of OCP and OTP

Radiation tolerance:
- min. 1 kGy TID
- max. 1 MGy TID (on request)
> 62.5 MeV*cm²/mg SEL / SEU

MAG-BUS
BiSS Communication IC

Features:

BiSS serial comm slave device
- RS-422 PHY interface
- 4Mbit/s over 200m cable
- Multiple MAG-BUS in daisy-chain connection

BISS to SPI bridge:
- bidirectional BiSS Slave
- SPI interface Master
(4 SPI Slave ICs connection per MAG-BUS IC)

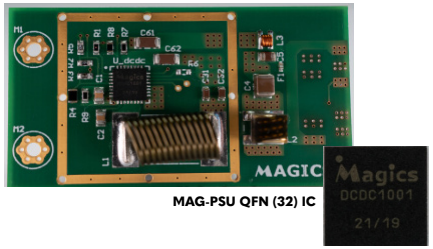
1.25 V and 3.3 V supply voltage

Radiation tolerance:
- min. 1 kGy TID
- max. 1 MGy TID (on request)
> 62.5 MeV*cm²/mg SEL / SEU

RADIATION-HARDENED POWER-SERIES

MAG-PSU : Point-of-Load DC/DC Converter IC

MAG-PSU Module



MAG-PSU QFN (32) IC

Input voltage range 5 to 11 V | Output voltage range 0.9 to 5 V

Adjustable switching frequency 1-3 MHz

Continuous 4A load capability (with active cooling)
Integrated Power N-channel MOSFET

Synchronous Buck topology with continuous mode operation
High bandwidth feedback loop (150 KHz) for good transient performance

Protection features:
- over-current protection
- over-temperature
- input under voltage to improve system-level security
- under-voltage lockup

Radiation tolerance:
- min. 1 kGy TID
- max. 1 MGy TID (on request)
> 62.5 MeV*cm²/mg SEL / SEU

RADIATION-HARDENED AI-SERIES

Low-power neural network inference system-on-chip

MAG-AI Features:

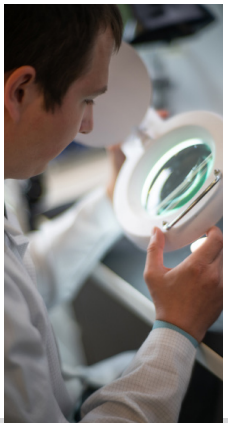
Low power consumption

Efficient frame-rate

Enable real-time video / image processing

Suitable for object detection, on-board path planning, control and machine-learning intelligence for operations in harsh environments

Radiation tolerance:
> 1 kGy TID
> 62.5 MeV*cm²/mg SEL / SEU



CUSTOMIZED RAD-HARD CHIP DESIGN

MAG-CUS expertise:

Rad-hard-by-design chip

Silicon-proven Analog/Mixed-Signal IPs

ESCC-Q-ST-60-02C compliance

Proprietary rad-hard design methodology

Chip design tailored to your applications

Turnkey solution with in-house chip design

Chip testing and rad-assessment capabilities

Access to foundries worldwide

RADIATION-HARDENED TIME-SERIES

Accurate on-board clock-generation and time-of-flight sensors

1. MAG-PLL

Radiation-hardened wideband phase locked loop, capable of delivering frequencies in the 1 MHz to 3 GHz range with additional PWM output. An all-digital solution with integrated VCO and filter which reduces bills of materials and board area.

MAG-PLL Features:

1.2 V core voltage operation

Output frequency range 1 MHz / 3 GHz

Phase noise of -99 dBc / Hz
at 100 kHz offset with 2.5 GHz carrier

Integrated jitter < 500 fs

User selectable input reference
- external crystal or clock generator

User selectable output signaling:
- LVCMOS-12 output + 200 MHz
- LVDS-25 output + 3 GHz

Add. complementary PWM output
- 1 ns pulse width control
- LVCMOS-12

Oscillator with temperature sensor

Serial control and diagnostic interface

Radiation tolerance:
> 1 kGy TID
> 62.5 MeV*cm²/mg SEL / SEU

2. MAG-TDC

Radiation-hardened single shot Time-To-Digital Converter for high precision and accurate time measurements.

MAG-TDC Features:

SPI host interface

Supply voltage: 1.2 V - 1.8 V

Resolution: < 8 ps

Measurement range:
- 0 to 3 s (no dead zone)

Low Power consumption:
< 20 mW

Operating temperature:
- 40 °C and 125 °C

Radiation tolerance:
> 1 kGy TID
> 62.5 MeV*cm²/mg SEL / SEU