

MAGNESIUM® MIL RP0092

High Dynamic Range Dual-Band Digital Pixel 12 μm Pitch, 1280 x 720 DPROIC

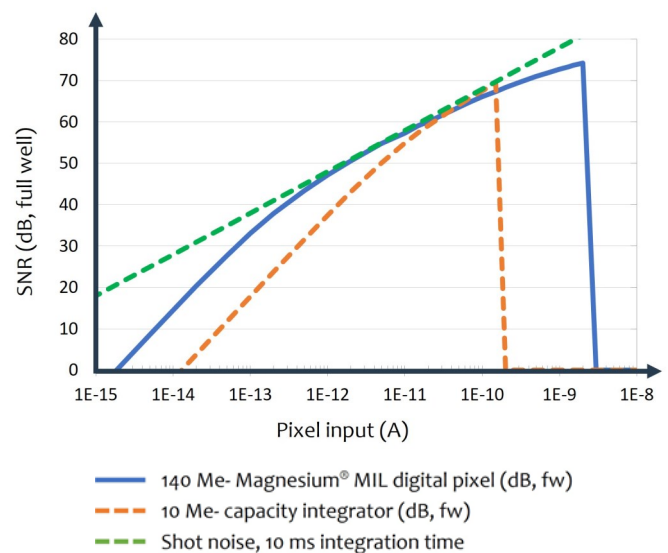
The Magnesium® MIL RP0092 is an advanced digital pixel readout integrated circuit (DPROIC) with a large well capacity and wide dynamic range. It is designed for use with any industry-standard single or dual-band direct-injection compatible detector technology.

Features

- ◆ 12 μm pitch, 1280 x 720, digital pixel readout IC
- ◆ Low power direct injection bias for both polarities
- ◆ Dual-band (2-color) or single-band operation
- ◆ Global shutter (snapshot), integrate-then-read (ITR)
- ◆ Programmable capacity from 8 Me⁻ to over 140 Me⁻
- ◆ Programmable conversion gain as high as 1 LSB/160 e⁻
- ◆ Full-frame operation up to 120 fps
- ◆ Fast windows down to 32 x 6 at 4.7 kfps (at $t_{\text{int}}=100 \mu\text{s}$)
- ◆ Over 110 dB in-pixel dynamic range possible
- ◆ Selectable 2, 4, or 8 hot-swappable LVDS output ports
- ◆ 22-bits of internal selectable range
- ◆ Serialized 20 bits per pixel (19 data, one flag)
- ◆ SPI control interface (SenSPI®) and DDR master clock

Benefits of the Magnesium® MIL DPROIC

The Magnesium MIL RP0092 enables a new level of performance in infrared imaging systems. Digital pixel sensors disconnect well capacity from noise floor, enabling reduced noise and increased sensitivity for extremely high well capacities. The RP0092 has been built to bridge conventional 12 μm pitch analog dual-band pixel performance by boosting the sensitivity for low signals and greatly increasing the maximum well capacity for large signals with long integration times, as shown in the graph below. It is now possible to capture distant ice-cold objects in the same frame in which hot targets are resolved in unprecedented detail.



Test and Evaluation Electronics

Senseeker has created an easy-to-use back-end electronics kit to simplify test and development with the RP0092. This system allows scaling of the 20 bit/pixel packets into 16-bit Camera Link format based on user preferences and provides a seamless interface to a standard PC-hosted Camera Link frame grabber.

The electronics kit solution is a plug-and-play system that can be configured for both cooled and uncooled lab testing. For uncooled evaluation, an RP0092 COB module is slotted into an electronics support board that is connected to a host PC. For cooled operation, the RP0092 COB module is replaced by a connector that routes signals to a Dewar that includes a Magnesium MIL-based focal plane array (FPA).

A PC-based software configuration file is supplied for installation on the host PC. This file contains configuration data to set up the RP0092 internal registers. All cables and adapters are supplied by Senseeker with the electronics kit.

Enabled by Senseeker Innovation

The RP0092 is a cutting-edge design composed of built-for-purpose IP and proprietary readout IP blocks that were developed by Senseeker.

Two Dynamic Resistance Element (DRE) circuits (US Patent 9,628,105) are used for optimized dual-band operation. The DRE is an efficient way to implement a charge transfer mechanism into the delta sigma modulation (DSM) ADC and is advantageous in supporting a wide range of direct-injection compatible detector technologies. The DRE greatly reduces the power consumption requirements of the in-pixel DSM and enables very high speed clocking.

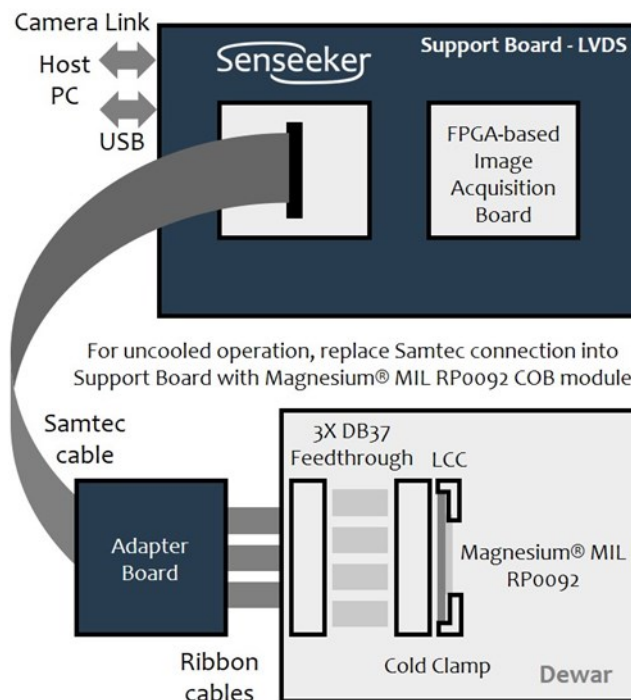
Availability and Contact Information

Part number: RP0092-D120-WS

Available unit: full wafer

Available to order now

Contact sales for pricing information:
products@senseeker.com



Recon, Surveillance and Target Acquisition

The large well capacity digital pixels of the RP0092 address the requirement for wide dynamic range and high sensitivity that are critical in recon, surveillance and target acquisition systems.

Programmable windows can be used to observe targets at much higher frame rates. Sizing can be adjusted for accurate multi-target tracking at the highest possible speed. The digital pixel architecture allows a much higher maximum current to be imaged within windows, providing additional hot object detail. The RP0092 wide dynamic range enables the observation of thermally subtle targets in the presence of high flux events that occur in the same scene. This ensures that the widest range of contrast in targets can be resolved under the most challenging conditions.

Restrictions

This 'MIL' solution was designed for U.S. Military applications. It is available off-the-shelf from Senseeker, with product sales restricted to customers who have approval from the U.S. Government.