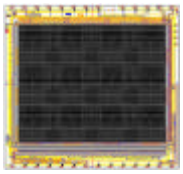
ISC9809 Low Background 320

Advanced Readout Multiplexer



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The ISC9809 is a high performance, 320 x 256 pixel, readout integrated circuit (ROIC) for infrared detectors with snapshot mode integration. This state-of-the-art ROIC is suitable for use with p-on-n or n-on-p detector materials such as indium antimonide (InSb), mercury cadnium telluride (MCT), quantum well infrared photo diodes (QWIPs) and indium gallium arsendide (InGaAs). The ISC9809 is especially adapted for very low background conditions to support night glow and day time operation. A capacitive transimpedance amplifier input circuit (CTIA) provides a low noise front end including an anti-blooming transistor. The input CTIA has 2 selectable integration capacitors handling a charge capacity range of 0.17 and 3.5 million electrons.
Using four outputs, frame rates up to 346 frames per second can be achieved for full 320 x 256 frames. One output allows full frame rate of 110Hz. A convenient buffered temperature sensor output is available for monitoring of the ROIC substrate temperature.

There are two operation modes in the ISC9809, a simplified default mode and a user configurable command mode. These modes provide the flexibility necessary to support a wide range of applications. From handheld cameras, which use a single channel, video rate output to high speed scientific testing where multiple outputs and dynamic windowing are needed, the ISC9809 surpasses the requirements. The windowing feature allows two-dimensional subarrays to be read out at frame rates of up to 15,000 frames/sec for small window sizes. Other advanced on-chip features of the ROIC includ, multiple output channels, snapshot integration with variable integration time settings, signal skimming, selectable high and low gain states, dynamic image transposition which allows inversion of the image in either or both axes. This is useful in systems where optics change the image orientation. The detector bias setting and overall power control for the chip are also user adjustable. The ISC9809 supports biasing techniques for both high and low reverse bias detectors.

Fully tested wafers are delivered to customers with a CD ROM containing the complete set of test data for each die. Viewing software for examining the data is also provided. A Mechanical Interface Database, for use in detector mask design, and a User's Guide are included with the delivery of this standard ROIC.

ISC9809 devices can be delivered in wafer form (minimum quantity of 100 "A" grade die) or as part of an Evaluation Kit Package. This package can be made up of 20 or 100 "A" grade die, an LN_2 test dewar, 84 pin LCC packages and complete set of imaging electronics including the power supply. The Evaluation Kit supports operation of the ISC9809 in full frame, single output mode with a maximum 6Mpixel data rate.

Specifications:

(at 80K operating temperature)

Format:	320 x 256 pixels
Pixel Pitch:	30µm
Storage Capacity:	$0.17e^6$ or $3.5e^6$ electrons
Operability:	≥ 99.99%
Dynamic Range:	> 72 dB
Readout Noise:	<70 electrons *
Non-Linearity:	< ± 0.5%
Cross Talk:	< 0.1%
Input Polarity:	p on n or n on p
Integration Time	> 500nsec, adjustable
Outputs:	1, 2 or 4 selectable
Output Signal Swing:	2.7 volts
Power Consumption:	< 90mW at 60 Hz single output <150mW at 346 Hz, 4 outputs
Max Frame Rates: (full frame)	1 output, 110 Hz 2 outputs, 202 Hz 4 outputs, 346 Hz
Video Output:	NTSC or PAL

* at max gain setting

Specifications subject to change without notice

5385 Hollister Ave. #103, Santa Barbara, CA 93111 Tel (805) 964-9797 Fax (805) 964-7708 www.indigosytems.com