



IT-F2 Series TDI QUIETSENSOR™

T-41-55

IT-F2 Series Two Dimensional Image Sensors for TDI Applications

FEATURES

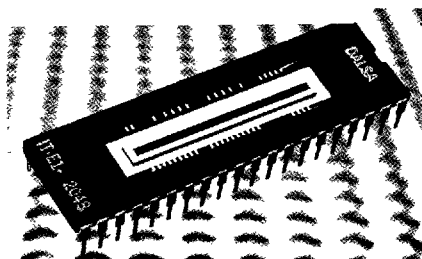
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- 2048 Pixels with 96 TDI Stages
- $13\mu\text{m(H)} \times 13\mu\text{m(V)}$ Pixel Size
- Bi-directional scanning capabilities
- Vertically and Horizontally Summed Signals for Higher Sensitivity
- QUIETSENSOR™ High Sensitivity
- up to 120 MHz effective data rate

DESCRIPTION

The IT-F2 Time Delay and Integration (TDI) series image sensors use DALSA's proprietary QUIETSENSOR™ technology to achieve high output data rates of 15 MHz per output at 8 outputs for an effective data rate of 120 MHz. The device employs buried channel CCD shift registers in order to maximize output speed and reduce noise. The 96 TDI stages of the IT-E1 sensors increase the exposure time of a single line by a factor of 96 over a comparable line scan sensor. This results in 80 times greater sensitivity improvement over compatible linear devices. DALSA also offers the IT-E1 series of sensors, which provide scanning capabilities in only the FORWARD direction.

If a mechanical shutter is employed, the IT-F2 sensors can act as full frame imaging arrays.



Please refer to IT-E1 datasheet #43-00028 for a description of TDI operation.

APPLICATIONS

The IT-F2 series sensors are ideally suited for high speed applications under low light level conditions. A single output version of these sensors, the IL-F2 series, is also available. Typical applications for the IT-F2 series sensors are:

- high sensitivity scanning
- process monitoring and manufacturing inspection

For mechanical information regarding package size and tolerance, refer to package #50-01-40003 in **Optical and Mechanical Considerations of Sensors** on pp. 101-104 of this databook.

Table 1. IT-F2 PIN FUNCTIONAL DESCRIPTION

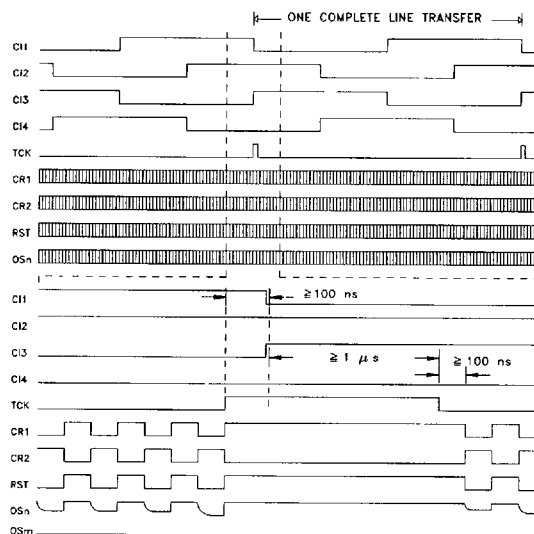
PIN	SYMBOL	NAME				
1,20	CI4	Imager Clock, Phase 4	CI4	1	40	CI1
2,19	CI3	Imager Clock, Phase 3	CI3	2	39	CI2
3,38	VSS	Ground Reference	VSS	3	38	VSS
4	TCK	Transfer Clock	TCK	4	37	TCK
5,36	RST	Output Node Reset Clock	RST	5	36	RST
6,35	CR1	Readout Clock, Phase 1	CR1	6	35	CR1
7,34	CR2	Readout Clock, Phase 2	CR2	7	34	CR2
8	VDDF	Amplifier Supply, forward	VDDF	8	33	VDDR
9,32	VBB	Substrate Bias	VBB	9	32	VBB
10-17	OS1 - 8	Output Signal 1, 1 - 8 forward	OS1	10	31	OS9
18,23	VSET	Output mode, set voltage	OS2	11	30	OS10
21,40	CI1	Imager clock, phase 1	OS3	12	29	OS11
22,39	CI2	Imager clock, phase 2	OS4	13	28	OS12
24-31	OS16-9	Output signal 16-9, reverse	OS5	14	27	OS13
33	VDDR	Amplifier Supply, reverse	OS6	15	26	OS14
37	TCK	Transfer clock	OS7	16	25	OS15
			OS8	17	24	OS16
			VSET	18	23	VSET
			CI3	19	22	CI2
			CI4	20	21	CI1

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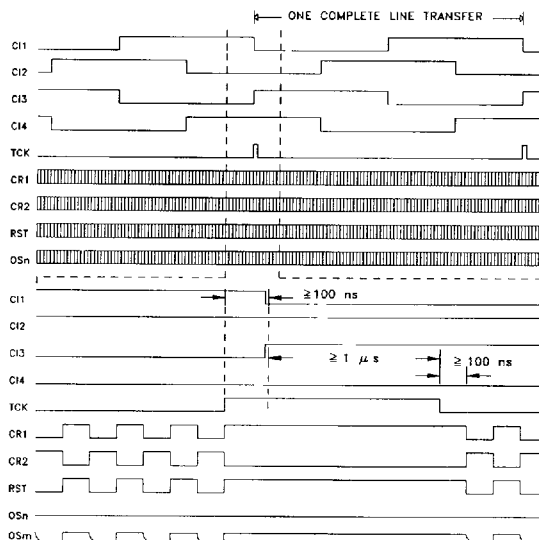
Figure 1. IT-F2 FORWARD CLOCKING



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n+1=outputs 1-8
 m+1=outputs 9-16

Figure 2. IT-F2 REVERSE CLOCKING



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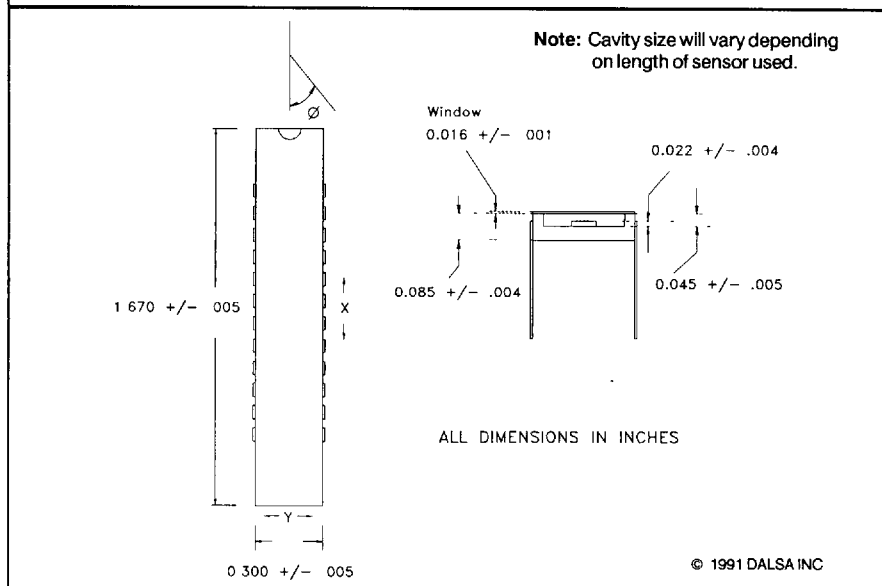
n+1=outputs 1-8
 m+1=outputs 9-16

Optical and Mechanical Considerations of DALSA CCD Image Sensors

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T-90-20

This applications note provides packaging information for the sensors listed in this databook. Please refer to the tables on the following pages for the critical dimensions of each image sensor series. For more information on a particular image sensor, please refer to the specific datasheet.

FIGURE 1. DIMENSIONS OF PACKAGE # 50-01-24005

TABLE 1. PACKAGE # 50-01-24005 TYPICAL DIMENSIONS

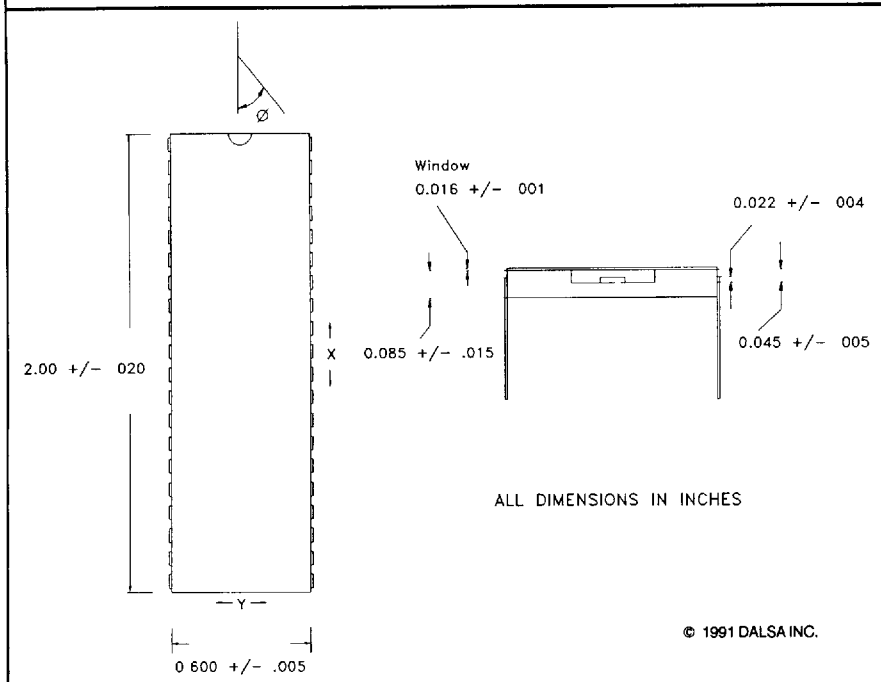
Package #	Part	X	Y	Ø
50-01-24005	IL-C3-0128	$0.55 \pm .09$	$0.15 \pm .02$	$0^\circ \pm 3.0^\circ$
50-01-24005	IL-C3-0256	$0.55 \pm .08$	$0.15 \pm .02$	$0^\circ \pm 2.5^\circ$
50-01-24005	IL-C3-0512	$0.55 \pm .07$	$0.15 \pm .02$	$0^\circ \pm 2.0^\circ$
50-01-24005	IL-C2-0512	$0.55 \pm .07$	$0.15 \pm .02$	$0^\circ \pm 2.0^\circ$
50-01-24005	IL-C9-0512	$0.55 \pm .07$	$0.15 \pm .02$	$0^\circ \pm 2.0^\circ$
50-01-24005	IL-C4-1024	$0.55 \pm .05$	$0.15 \pm .02$	$0^\circ \pm 1.5^\circ$
50-01-24005	IL-C4-2048	$0.55 \pm .04$	$0.15 \pm .02$	$0^\circ \pm 1.0^\circ$
50-01-24005	IL-C5-2048	$0.55 \pm .05$	$0.15 \pm .02$	$0^\circ \pm 1.5^\circ$
50-01-24005	IL-C5-4096	$0.55 \pm .04$	$0.15 \pm .02$	$0^\circ \pm 1.0^\circ$
50-01-24005	IL-C6-2048	$0.55 \pm .04$	$0.15 \pm .02$	$0^\circ \pm 1.0^\circ$
50-01-24005	IL-E1-0512	$0.55 \pm .07$	$0.15 \pm .02$	$0^\circ \pm 2.0^\circ$
50-01-24005	IL-E1-1024	$0.55 \pm .05$	$0.15 \pm .02$	$0^\circ \pm 1.5^\circ$
50-01-24005	IL-E1-2048	$0.55 \pm .04$	$0.15 \pm .02$	$0^\circ \pm 1.0^\circ$
50-01-24005	IL-F2-0512	$0.55 \pm .07$	$0.15 \pm .02$	$0^\circ \pm 2.0^\circ$
50-01-24005	IL-F2-1024	$0.55 \pm .05$	$0.15 \pm .02$	$0^\circ \pm 1.5^\circ$
50-01-24005	IL-F2-2048	$0.55 \pm .04$	$0.15 \pm .02$	$0^\circ \pm 1.0^\circ$

Note: X = center imaging area to center pin 1 along package Y = center imaging area to center pin 1 across package
 Ø = off-axis rotation.

Optical and Mechanical Considerations of Sensors



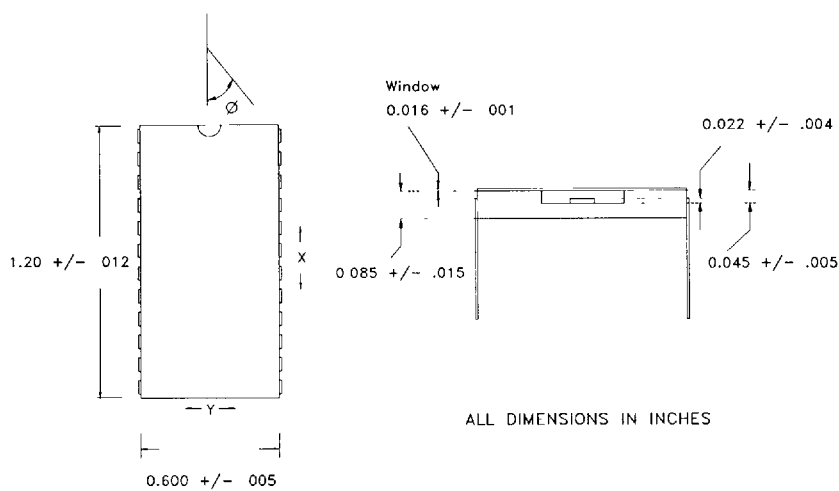
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FIGURE 2. DIMENSIONS OF PACKAGE # 50-01-40003**TABLE 2. PACKAGE # 50-01-40003 TYPICAL DIMENSIONS**

Package #	Part	X	Y	Ø
50-01-40003	IT-C5-2048	0.95 ± 0.1	0.3 ± 0.05	0° ± 2.5°
50-01-40003	IT-C5-4096	0.95 ± 0.08	0.3 ± 0.03	0° ± 1.5°
50-01-40003	IT-E1-1536	0.95 ± 0.08	0.3 ± 0.05	0° ± 2.0°
50-01-40003	IT-E1-2048	0.95 ± 0.06	0.3 ± 0.05	0° ± 1.5°
50-01-40003	IT-F2-2048	0.95 ± 0.06	0.3 ± 0.03	0° ± 1.5°

Note: X = center imaging area to center pin 1 along package. Y = center imaging area to center pin 1 across package
 Ø = off-axis rotation.

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FIGURE 3. DIMENSIONS OF PACKAGE # 50-01-24002

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TABLE 3. PACKAGE # 50-01-40002 TYPICAL DIMENSIONS

Package #	Part	X	Y	Ø
50-01-40002	IA-D1-0032	0.56 ± 0.12	0.3 ± 0.05	0° ± 5.0°
50-01-40002	IA-D1-0064	0.57 ± 0.09	0.3 ± 0.04	0° ± 4.0°
50-01-40002	IA-D1-0128	0.59 ± 0.12	0.3 ± 0.03	0° ± 2.5°
50-01-40002	IA-D1-0256	0.71 ± 0.10	0.3 ± 0.03	0° ± 1.5°

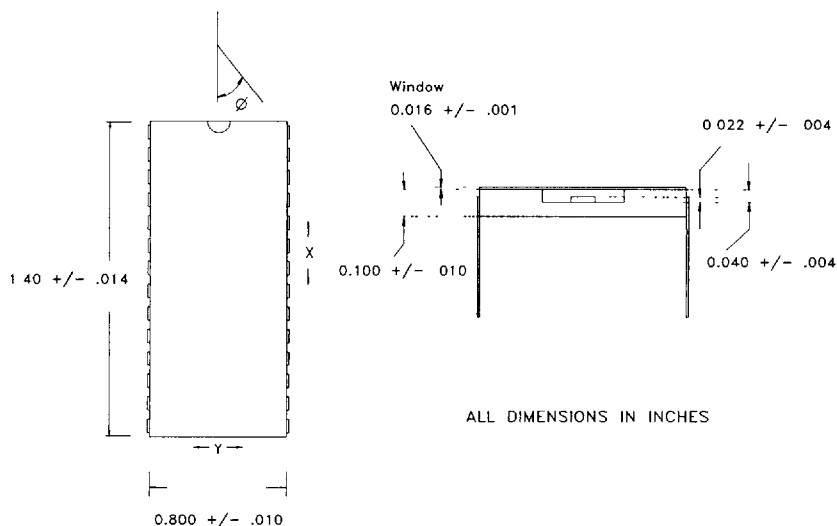
Note: X = center imaging area to center pin 1 along package. Y = center imaging area to center pin 1 across package.
 Ø = off-axis rotation

Optical and Mechanical Considerations of Sensors



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FIGURE 4. DIMENSIONS OF PACKAGE # 50-01-28004



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TABLE 4. PACKAGE # 50-01-28004 TYPICAL DIMENSIONS

Package #	Part	X	Y	Ø
50-01-28004	IA-D2-0512	0.65 ± 0.08	0.4 ± 0.04	0° ± 3.0°

Note: X = center imaging area to center pin 1 along package. Y = center imaging area to center pin 1 across package.
Ø = off-axis rotation