



# Genie™ Nano Cameras

Smaller, faster, stronger, cheaper.

최상의 속도와 이미지 품질을 제공하는 초소형 GigE Vision Camera

Genie Nano는 Teledyne DALSA 제품군 중 가장 저렴하고 강력한 성능을 가진 CMOS Area Scan 카메라로 GigE vision, CameraLink 두 가지의 인터페이스를 지원합니다. Genie Nano는 업계 선도적인 CMOS 센서를 장착하였으며, 더불어 독자적인 카메라 기술을 통한 혁신적인 스피드, 혹독한 환경을 대비한 강건한 바디 설계, 그리고 가격 대비 그 이상의 다양한 기능을 제공합니다.

Teledyne DALSA의 특허인 TurboDrive™ 기술은 Genie Nano가 최상의 이미지 품질을 유지함과 동시에, GigE 카메라의 한계보다 150% 또는 그 이상의 높은 프레임 속도를 가능케 합니다. 모든 Teledyne DALSA의 GigE 카메라와 마찬가지로, Genie Nano는 AIA GigE Vision 표준을 기반으로 카메라를 PC로 직접 연결할 수 있습니다.



**TURBODRIVE** BY TELEDYNE DALSA

**GigE**  
VISION

## 주요 특징

- 표준 PC의 이더넷 포트와 하드웨어 사용
- 최대 100m 케이블 길이 지원 (CAT-5e 또는 CAT-6)

## 품질 보증

- CE, FCC 및 RoHS

## 프로그램 가능성

- Partial 스캔 모드에서 더욱 빠른 프레임 속도
- 노출제어 기능을 탑재한 글로벌 셔터
- 다중 노출 가능
- 멀티 ROI 가능( 최대16 ROI)
- MetaData 지원
- IEEE1588 (네트워크 간 정확한 동기화 가능) 지원
- Binning
- Look-up table

## 안정성

- 내구성을 고려한 강건한 바디 설계
- 3년의 보증기간
- 이미지 신뢰성 진단( Trigger to Image-Reliability) 프레임워크를 활용해 전송된 이미지에 대해 완벽한 시스템 수준의 모니터링과 제어, 진단 가능

## 대표 어플리케이션

- 전자 제품 제조 검사
- 산업용 계측
- ITS( 지능형 교통 시스템)
- 스포츠 시뮬레이션
- 의료기기

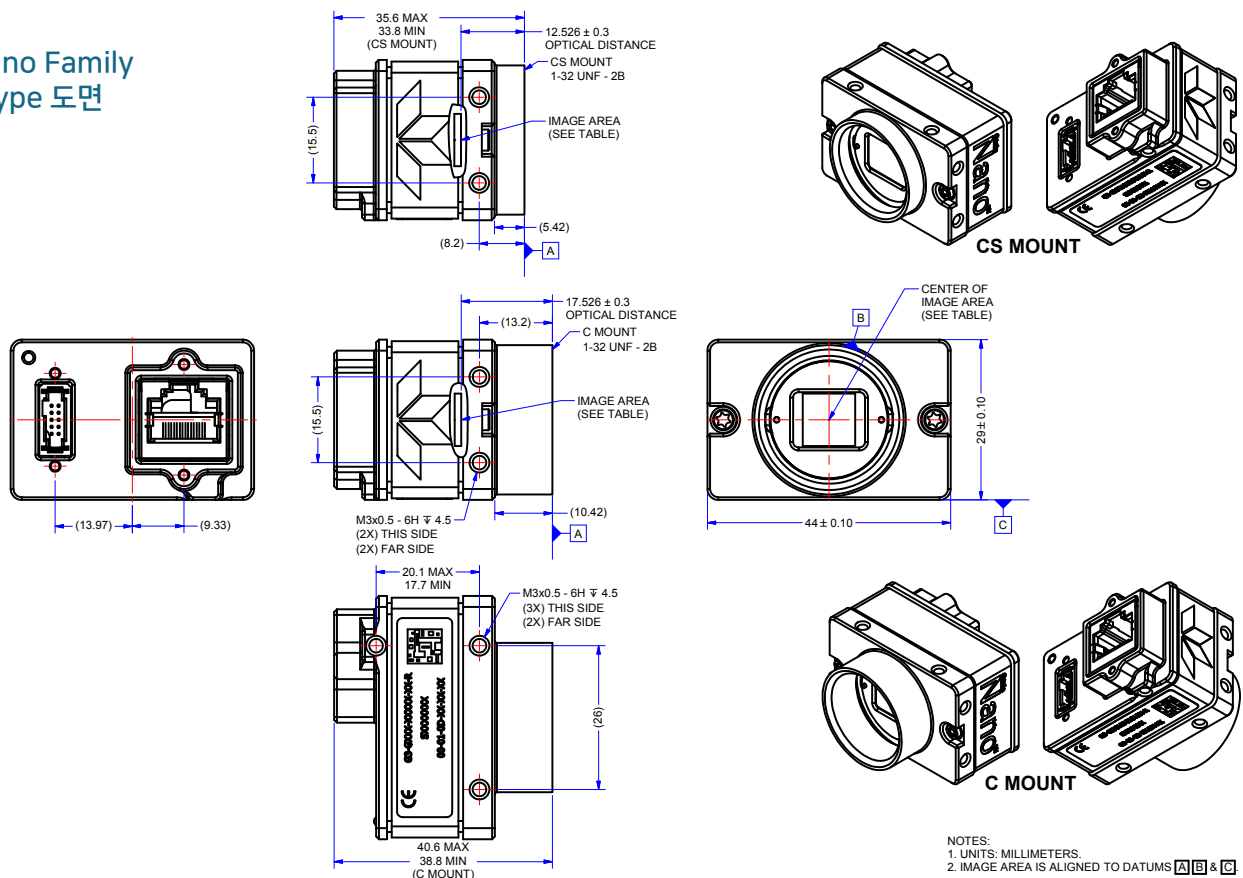
# Specifications: M640, M640-NIR, C640

| Supported Features                                                                         | M640, M640-NIR                                                                                                                                                                                                                                                                                                                          | C640                        |                                                                            |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------|
| Resolution                                                                                 | 672 x 512                                                                                                                                                                                                                                                                                                                               |                             |                                                                            |
| Sensor                                                                                     | OnSemi Python300 P1 (0.3M)                                                                                                                                                                                                                                                                                                              |                             |                                                                            |
| Pixel Size                                                                                 | 4.8 μm x 4.8 μm                                                                                                                                                                                                                                                                                                                         |                             |                                                                            |
| Shutter type                                                                               | Full frame electronic global shutter function                                                                                                                                                                                                                                                                                           |                             |                                                                            |
| Full Well charge                                                                           | 10ke (max)                                                                                                                                                                                                                                                                                                                              |                             |                                                                            |
| Firmware option<br>(Field programmable)                                                    | Standard Design<br>Monochrome                                                                                                                                                                                                                                                                                                           | Standard Design<br>Bayer    | RGB-Output<br>Design                                                       |
| Max. Internal Frame Rate                                                                   | 862 fps at 640 x 480 (Fast Readout Enable)<br>603 fps at 640 x 480 (Normal Readout Enable)                                                                                                                                                                                                                                              |                             |                                                                            |
| Maximum Sustained Frame Rate<br>Output (with TurboDrive v1)                                | 720 fps (8-bit)<br>360 fps (10-bit)                                                                                                                                                                                                                                                                                                     |                             | N/A                                                                        |
| Maximum Sustained Frame Rate<br>Output (without TurboDrive)                                | 345 fps (8-bit)<br>172 fps (10-bit)                                                                                                                                                                                                                                                                                                     |                             | 86 fps (RGBA)<br>115 fps (RGB)<br>172 fps (Yuv422)<br>345 fps (8-bit mono) |
| Pixel Data Formats                                                                         | Mono 8-bit<br>Mono 10-bit                                                                                                                                                                                                                                                                                                               | Bayer 8-Bit<br>Bayer 10-Bit | RGBA 32-bit<br>RGB 24-bit<br>Yuv422 16-bit<br>Mono 8-bit                   |
| Trigger to Exposure Minimum delay<br>(Synchronous Exposure Alignment)                      | 4 μs if exposureAlignment = Synchronous With No Overlap<br>between the new exposure and the previous readout<br>26.2 μs if exposureAlignment = Synchronous With Overlap<br>between the new exposure and the previous readout                                                                                                            |                             |                                                                            |
| Trigger to Exposure Minimum delay<br>(Reset Exposure Alignment)                            | 4 μs                                                                                                                                                                                                                                                                                                                                    |                             |                                                                            |
| Trigger to Exposure Start jitter (best<br>case with Synchronous Exposure<br>Alignment)     | Up to 1 line time                                                                                                                                                                                                                                                                                                                       |                             |                                                                            |
| Trigger to Exposure Start jitter<br>(Reset Exposure Alignment) *                           | 0 μs                                                                                                                                                                                                                                                                                                                                    |                             |                                                                            |
| Exposure Time Minimum<br>(see “exposureTimeActual” in <a href="#">Sensor<br/>Control</a> ) | 34 μs<br>(increment steps of 1μs)                                                                                                                                                                                                                                                                                                       |                             |                                                                            |
| Min. Time from End of Exposure to<br>Start of Next Exposure (second<br>frame)              | 19 μs – Normal Readout<br>18 μs – Fast Readout                                                                                                                                                                                                                                                                                          |                             |                                                                            |
| Horizontal Line Time:                                                                      | 3.3 μs – Normal Readout<br>2.28 μs – Fast Readout                                                                                                                                                                                                                                                                                       |                             |                                                                            |
| Readout Time                                                                               | 1602 μs – <b>Normal Readout</b> for 640 x 480<br>Add 75μs when overlapping Exposure and Readout<br>1107 μs – <b>Fast Readout</b> for 640 x 480<br>Add 62μs when overlapping Exposure and Readout<br><i>Specifically: ( Horizontal line time at current resolution * number of lines ) + ( 3 *<br/>( line time of the 1280 model ) )</i> |                             |                                                                            |
| Auto-Brightness                                                                            | Yes , with Auto-Exposure and AGC (FPGA Gain)                                                                                                                                                                                                                                                                                            |                             |                                                                            |
| Black offset control                                                                       | Yes (in DN)                                                                                                                                                                                                                                                                                                                             |                             |                                                                            |
| Gain Control                                                                               | In-sensor Analog Gain (1.0x to 8x) in 11 gain steps<br>(1.0, 1.14, 1.33, 1.6, 2.0, 2.29, 2.67, 3.2, 4.0, 5.33, 8.0)<br>In-sensor Digital Gain (1x to 32x) in 0.01x steps<br>In-FPGA Digital Gain (1x to 4x) in 0.007x steps                                                                                                             |                             |                                                                            |
| Binning Support                                                                            | Yes In-FPGA<br>(summing and average,<br>2x2, 4x4 )<br><br>Yes In- Sensor<br>(averaging 2x2)                                                                                                                                                                                                                                             | No                          |                                                                            |

|                             |                                                                |     |
|-----------------------------|----------------------------------------------------------------|-----|
| Color Correction Support    | No                                                             | Yes |
| Decimation Support          | No                                                             |     |
| Defective Pixel Replacement | Yes, up to 512 positions                                       |     |
| Image Correction            | Yes, Sensor FPN correction feature                             |     |
| Image Flip Support          | Yes, In-Sensor, Vertical Only                                  |     |
| Multi-ROI Support           | Yes, in Sensor, up to 16 ROI (mutually exclusive with binning) |     |
| On-Board Image Memory       | 90MB                                                           |     |
| Output Dynamic Range (dB)   | 61.56 dB (in 10-Bit Pixel Format)                              |     |
| SNR (dB)                    | 39.8 dB (in 10-Bit Pixel Format)                               |     |

\* Note: The actual internal minimum exposure may be different than what is programmed. Use the feature "exposureTimeActual" from the [Sensor Control](#) category to read back the actual sensor exposure. The exposure start sensor event is delayed 4  $\mu$ s from the actual start.

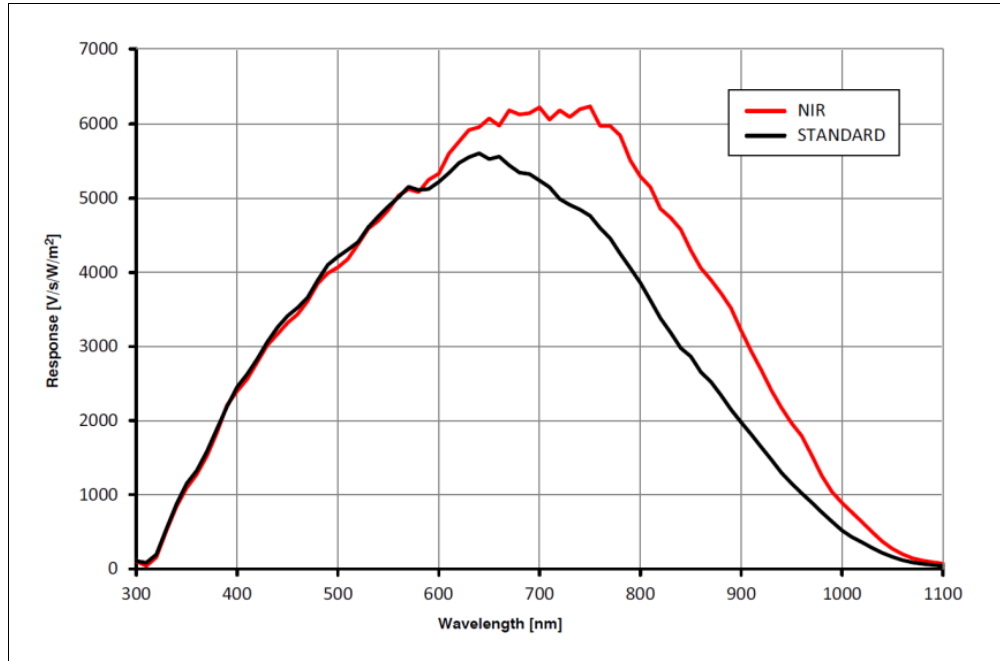
## Genie Nano Family - GigE Type 도면



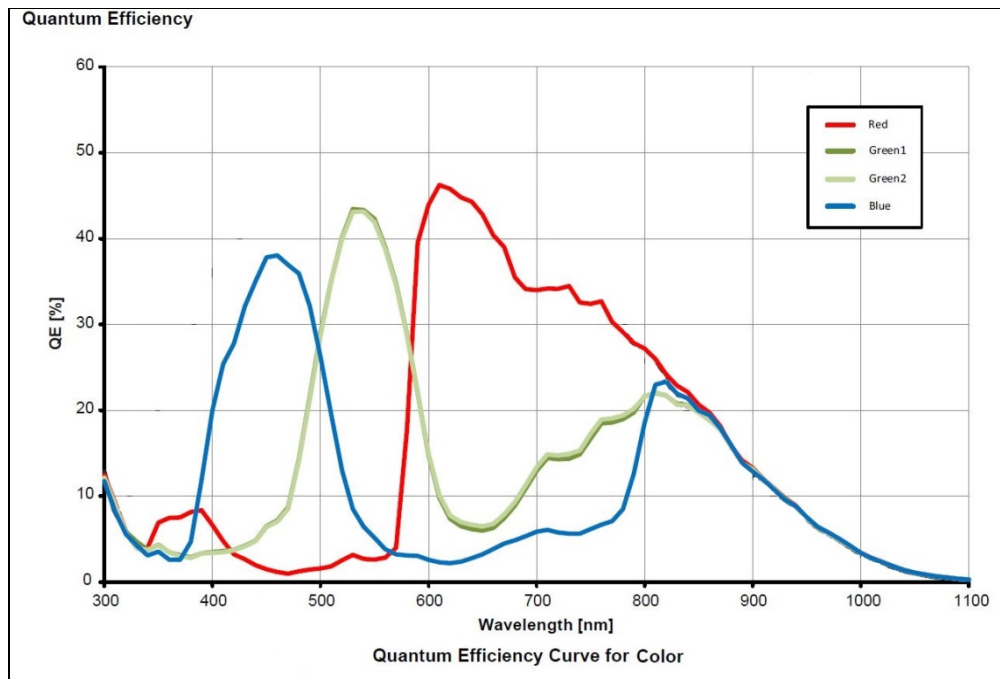
# Spectral Response

Model specific specifications and response graphics for the On-Semi Python (25K & 16K) series are provided here. The response curves describe the sensor, excluding lens and light source characteristics.

## On-Semi Python Series (P1 & P3) — Monochrome and NIR



## On-Semi Python Series (P1 & P3) — Bayer Color



## Genie Nano Family - GigE Type 상세 스펙

| GENIE NANO                                 |                                                                                                                            | GENIE NANO XL                                                                                                     |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Data Output Transfer</b>                | Gigabit Ethernet (1000 Mbit/s) only                                                                                        |                                                                                                                   |
| <b>Exposure Control</b>                    | Automatic, programmable, or via external trigger (Note: C4900 rolling shutter supports only programmable exposure control) |                                                                                                                   |
| <b>I/O Ports</b>                           | 2 opto-isolated inputs, 2 opto-isolated outputs, 1 input/3 outputs option available on demand                              | 2 opto-isolated inputs, 3 opto-isolated outputs                                                                   |
| <b>Image Buffers (On-board memory)</b>     | 90MB for VGA to 5 Mpixel models<br>200 MB for the 9M, 12M and 18 Mpixels models                                            | 500 MB for the 16 and 25 Mpixels models                                                                           |
| <b>Lens Mount</b>                          | C and CS-Mount available                                                                                                   | M42                                                                                                               |
| <b>Size (L x H x W) (C-mount option)</b>   | 21.2 mm x 29 mm x 44 mm (no lens adapter or connectors)<br>38.9 mm x 29 mm x 44 mm (with lens adapter and connectors)      | 30 mm x 59 mm x 59 mm (no lens adapter or connectors)<br>30 mm x 59 mm x 59 mm (with lens adapter and connectors) |
| <b>Mass</b>                                | ~46 g                                                                                                                      | ~163 g                                                                                                            |
| <b>Operating Temp</b>                      | -20 to +60°C (housing temperature)                                                                                         |                                                                                                                   |
| <b>Power Supply</b>                        | 10 to 36V or Power Over Ethernet (POE)                                                                                     |                                                                                                                   |
| <b>Power Dissipation (model dependent)</b> | 3.6 W to 4.6 W(12V)<br>4.0 W to 4.9 W (PoE)                                                                                | 6.5 W @ 24 Volt Aux.                                                                                              |
| <b>Data Connector</b>                      | Standard or screw mount RJ-45                                                                                              |                                                                                                                   |
| <b>Power and I/O Connector</b>             | SAMTEC TFM-105 type                                                                                                        |                                                                                                                   |
| <b>Camera Specification</b>                | GigE Vision v1.2 compliant                                                                                                 |                                                                                                                   |
| <b>Software Platform</b>                   | Teledyne DALSA Sapera LT 8.0 for Windows, Teledyne DALSA GigE-V for Linux or 3rd Party GenICam compliant SDK               |                                                                                                                   |



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