# VNP-576/864/1152MX2 Series

576/864/1152 Megapixel Pixel Shifting Camera Equipped with Thermoelectric Peltier

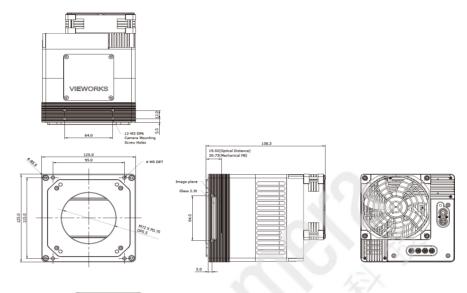




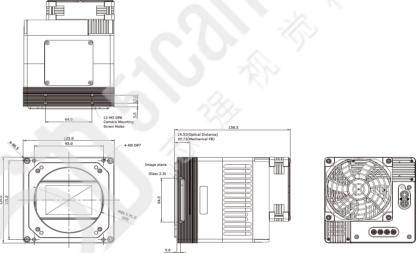
The VNP-576/864/1152MX2, pixel shifting cameras equipped with Thermo-electric Peltier (TEC) cooled, are designed not only for applications where extremely high resolution is required but also where high quality image is essential. The TEC maintains the operating temperature of the image sensor at up to  $10\pm2^{\circ}$ C below ambient temperature to reduce noise significantly. Pixel shifting technology based on a precise piezoelectric stage allows image captures as high as 576/864/1152 million pixels at 3.75 fps. The CoaXPress 2.0 interface adopted by this camera supports transmitting image data at up to 50 Gbps using four coaxial cables. This new camera delivers unique and unparalleled performance in the most demanding applications such as FPD, PCB and semiconductor inspections.

#### MechanicalDimensions

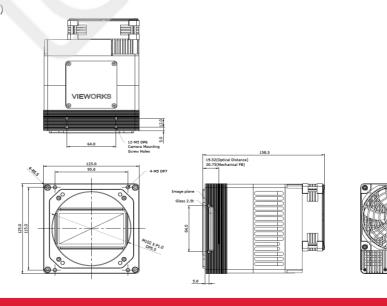
VNP-576MX2 (unit:mm)



VNP-864MX2 (unit:mm)



VNP-1152MX2 (unit:mm)



### VNP-576/864/1152MX2 Series

576/864/1152 Megapixel Pixel Shifting Camera Equipped with Thermoelectric Peltier

#### Main Features

- Nano Stage Pixel Shifting Mechanism
- Thermoelectric Peltier Cooled 10±2℃ below
- CoaXPress 2.0 Interface up to 15 fps at 50 Gbps using 4 Channels
- Global Shutter CMOS Technology
- DSNU and PRNU Correction
- Pixel by Pixel PRNU Correction
- Flat Field Correction with Sequencer Control
- Defective Pixel Correction

#### **Applications**

- Flat Panel Display Inspection
- Electronics Inspection
- Semiconductor Inspection
- Document / Film Scanning

#### Specifications

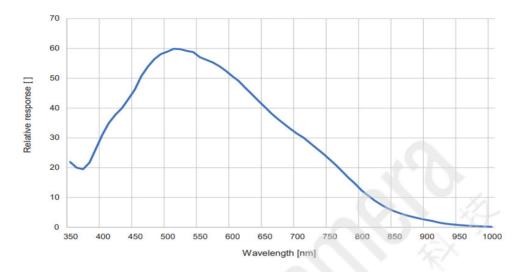
Resolution					
Name		del	VNP-576MX2-M15K	VNP-864MX2-M/C15K	VNP-1152MX2-M15K
Sensor   Sensor   Sensor   Sensor   Sensor   Size (Diagonal)   42.0 mm × 42.0 mm   63.0 mm × 42.0 mm   84.0 mm × 42.0 mm   8		1× (1 Shot)	12000 × 12000	17984 × 12000	24000 × 12000
Sensor Size (Diagonal)   42.0 mm × 42.0 mm   63.0 mm × 42.0 mm   84.0 mm × 42.0 mm × 42.0 mm   84.0 mm ×	Concor		Vieworks Sensor	Vieworks Sensor	Vieworks Sensor
Pixel Size	Jen	1301	(SCG 144M)	(SCG 216M-M/C)	(SCG 288M)
Interface	Sensor Size	(Diagonal)	42.0 mm × 42.0 mm	63.0 mm × 42.0 mm	84.0 mm × 42.0 mm
Max. Frame Rate Exposure Time (1 ≠ step)  Pixel Data Format  Electronic Shutter  Trigger Synchronization Dynamic Range  Gain Control  Black Level Control  Shift Range Shift Resolution Shift Control  Shift Latency Cooling Performance (Standard cooling with a fan)  Dimension / Weight Temperature Power  Power  Max. Frame Rate  15 fps at 8bit 100 ≠ 5 7 s (1 ≠ step)  Mono: 8 bit, 10 bit, 12 bit Color (VP-216MX2-C15K only): RG Bayer 8bit, 10bit, 12bit Global Shutter  Trigger Synchronization Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer Global Shutter  Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer Global Shutter  Trigger Synchronization Free-Run, Hardware Trigger, UserOutput0, CXP, Timer Global Shutter  Tx - 4x  Dx - 4x	Pixel Size		$3.5  \mu$ m $ imes 3.5  \mu$ m		
Exposure Time (1 \( \mu \) step (1 \( \mu \) step (1 \( \mu \) step (2 \) Mono: 8 bit, 10 bit, 12 bit (2	Interface		CoaXPress 2.0 (CXP-6/10/12)		
Mono: 8 bit, 10 bit, 12 bit Color (VP-216MX2-C15K only): RG Bayer 8bit, 10bit, 12bit Electronic Shutter Trigger Synchronization Dynamic Range Gain Control Analog Digital Black Level Control Shift Range Shift Resolution Shift Cotrol Shift Latency Cooling Method Colong Performance (Standard cooling with a fan) Dimension / Weight Temperature Power  Power  Manual Mono: 8 bit, 10 bit, 12 bit Color (VP-216MX2-C15K only): RG Bayer 8bit, 10bit, 12bit Global Shutter Global Shutter Global Shutter Global Shutter Global Shutter Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer Global Shutter  1 × ~ 4× 1 × ~ 32×  1 × ~ 32×  1 × ~ 32×  1 × ~ 32×  1 × ~ 32×  2 × 30× 2 × 30× 3 × 12 bit 3 × ~ 4× 3 × 12 bit 4 × ~ 32×	Max. Frame Rate		15 fps at 8bit		
Pixel Data Format  Color (VP-216MX2-C15K only): RG Bayer 8bit, 10bit, 12bit  Electronic Shutter  Trigger Synchronization  Dynamic Range  Gain Control  Analog Digital  Black Level Control Shift Range Shift Resolution Shift Control Shift Latency Cooling Performance (Standard cooling with a fan)  Dimension / Weight Temperature  Power  External Power  External  Dissipation  Color (VP-216MX2-C15K only): RG Bayer 8bit, 10bit, 12bit Global Shutter Trigger, Software Trigger, UserOutput0, CXP, Timer Global Shutter Tx Global Shutter Trigger, Software Trigger, Software Trigger, UserOutput0, CXP, Timer Global Shutter Trigger, Software Trigger, UserOutput0, CXP, Timer Trigger, Software Trigger, UserOutput0, CXP, Timer Global Shutter Trigger, Software Trigger, UserOutput0, CXP, Timer Ty a 4×  Distinct Type 40.0 W	Exposure Tim	ne (1 #s step)	100 μs - 7 s (1 μs step)		
Color (VP-216MX2-C15K only): RG Bayer 8bit, 10bit, 12bit  Electronic Shutter  Trigger Synchronization  Dynamic Range  Gain Control  Gain Control  Gain Control  Black Level Control  Shift Range  Shift Resolution  Shift Control  Shift Latency  Cooling Performance  (Standard cooling with a fan)  Dimension / Weight  Temperature  Power  External  Power  Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer  Global Shutter  Global Shutter  Global Shutter  Global Shutter  Global Shutter  Global Shutter  In Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer  Global Shutter  Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer  Global Shutter  Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer  Global Shutter  Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer  62 dB at 12 bit  1 × ~ 4×  0 ~ 255 LSB at 12 bit  0 ~ 14 µm, 1 nm step	Pixel Data Format		Mono: 8 bit, 10 bit, 12 bit		
Trigger Synchronization Dynamic Range Gain Control  Gain Control  Black Level Control Shift Range Shift Resolution Shift Latency Cooling Performance (Standard cooling with a fan) Dimension / Weight Temperature Custom mount available upon request) Power  Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer 62 dB at 12 bit 1 × ~ 4× 1 1 × ~ 4× 1 1 × ~ 32× 8 12 bit 0 ~ 255 LSB at 12 bit 0 ~ 255 LSB at 12 bit 0 ~ 14 \( \mu\), 1 nm step 0,001 \( \mu\) Manual Mode or Sequence Mode 5 ms Cooling Performance (5 ms) Cooling Performance 10±2°C below ambient temperature below ambient temperature below ambient temperature below ambient temperature  Dimension / Weight 125 mm × 125 mm × 157 mm, 3.3 kg  Temperature  Operating: 0°C ~ 40°C, Storage: -40°C ~ 70°C  Lens Mount Custom mount available upon request)  Power  External Dissipation  Typ. 40.0 W			Color (VP-216MX2-C15K only): RG Bayer 8bit, 10bit, 12bit		
Dynamic Range  Gain Control  Analog Digital  Digital  Black Level Control Shift Range Shift Resolution Shift Control Shift Control Shift Latency Cooling Method  Cooling Performance (Standard cooling with a fan) Dimension / Weight  Temperature  Power  Analog  1 × ~ 4×  1 × ~ 32×  0 ~ 255 LSB at 12 bit 0 ~ 14     Imm   Imm   step 0.001    Imm   Manual Mode or Sequence Mode   < 5 ms   Thermoelectric Peltier Cooling   Thermoelect	Electronic Shutter		Global Shutter		
Gain Control  Analog Digital  Black Level Control  Shift Range Shift Resolution Shift Control Shift Latency Cooling Method  Cooling Performance (Standard cooling with a fan) Dimension / Weight Temperature  Coustom mount available upon request) Power  Analog Digital  1 × ~ 4×  1 × ~ 32×  1 × ~ 32×  1 × ~ 32×  1 × ~ 12 bit  1 × 12 bit  1 × 12 bit  1 × 1 × 12 bit  1 × 12	Trigger Synchronization		Free-Run, Hardware Trigger, Software Trigger, UserOutput0, CXP, Timer		
Black Level Control   Digital   1 × ~ 32 ×	Dynamic Range		62 dB at 12 bit		
Black Level Control  Shift Range  Shift Resolution  Shift Control  Shift Latency  Cooling Method  Cooling Performance (Standard cooling with a fan)  Dimension / Weight  Temperature  Coustom mount available upon request)  Power  Dissipation  Dissipation  Dissipation  Divided Shift Level Control  Shift Latency  Cooling Method  Thermoelectric Peltier Cooling  10±2°C  10±2°C  7±1°C  below ambient temperature  below ambient temperature  below ambient temperature  Divided Start Sta	Gain Control	Analog	1× ~ 4×		
Shift Range Shift Resolution Shift Control Shift Latency Cooling Method Cooling Performance (Standard cooling with a fan) Dimension / Weight Temperature Couling Mode Couling Method Thermoelectric Peltier Cooling  10±2°C 10±2°C 10±2°C 7±1°C below ambient temperature below ambient temperature below ambient temperature below ambient temperature  125 mm × 125 mm × 157 mm, 3.3 kg  Temperature Coperating: 0°C ~ 40°C, Storage: -40°C ~ 70°C  Lens Mount (Custom mount available upon request)  Power  External Dissipation  Typ. 40.0 W	Gain Control	Digital	1× ~ 32×		
Shift Resolution  Shift Control  Manual Mode or Sequence Mode  Cooling Method  Thermoelectric Peltier Cooling  Cooling Performance  10±2°C  10±2°C  7±1°C  below ambient temperature  below ambient temperature  Dimension / Weight  125 mm × 125 mm × 157 mm, 3.3 kg  Temperature  Operating: 0°C ~ 40°C, Storage: -40°C ~ 70°C  Lens Mount  (Custom mount available upon request)  Power  External  Dissipation  Typ. 40.0 W	Black Level Control		0 ~ 255 LSB at 12 bit		
Shift Control Shift Latency Cooling Method Cooling Performance (Standard cooling with a fan) Dimension / Weight Temperature Coustom mount available upon request)  Shift Latency Shift L	Shift Range		0 $\sim$ 14 $\mu$ m, 1 nm step		
Shift Latency Cooling Method Thermoelectric Peltier Cooling  Cooling Performance (Standard cooling with a fan)  Dimension / Weight Temperature  Dimension / Weight Temperature  Operating: 0°C ~ 40°C, Storage: -40°C ~ 70°C  Lens Mount (Custom mount available upon request)  Power  External Dissipation  Cooling Method Thermoelectric Peltier Cooling  10±2°C 10±2°C Ty±1°C below ambient temperature below ambient temperature below ambient temperature below ambient temperature  Typ. 40.0 W	Shift Resolution		0.001 µm		
Cooling Method  Thermoelectric Peltier Cooling  Cooling Performance (Standard cooling with a fan)  Dimension / Weight  Temperature  Coperating: 0°C ~ 40°C, Storage: -40°C ~ 70°C  Lens Mount (Custom mount available upon request)  Power  External  Dimension / Weight  Thermoelectric Peltier Cooling  10±2°C  10±2°C  5±1°C  below ambient temperature below ambient temperature  Dimension / Weight  125 mm × 125 mm × 157 mm, 3.3 kg  Operating: 0°C ~ 40°C, Storage: -40°C ~ 70°C  M95-mount  M102-mount  M102-mount  Typ. 40.0 W	Shift Control		Manual Mode or Sequence Mode		
Cooling Performance (Standard cooling with a fan) below ambient temperature below ambient tempe	Shift Latency		< 5 ms		
(Standard cooling with a fan) below ambient temperature below ambient temperature below ambient temperature  Dimension / Weight  125 mm × 125 mm × 157 mm, 3.3 kg  Temperature  Operating: 0°C ~ 40°C, Storage: -40°C ~ 70°C  Lens Mount (Custom mount available upon request)  Power  M72-mount,  M95-mount  M102-mount  11 ~ 24 VDC  Typ. 40.0 W	Cooling Method		Thermoelectric Peltier Cooling		
Dimension / Weight  125 mm × 125 mm × 157 mm, 3.3 kg  Temperature  Operating: 0°C ~ 40°C, Storage: -40°C ~ 70°C  Lens Mount (Custom mount available upon request)  Power    External	Cooling Performance		10±2℃	10±2℃	7±1℃
Temperature  Operating: 0 °C ~ 40 °C, Storage: -40 °C ~ 70 °C  Lens Mount (Custom mount available upon request)  Power  M72-mount, M95-mount  M102-mount  11 ~ 24 VDC  Typ. 40.0 W	(Standard cooling with a fan)		below ambient temperature	below ambient temperature	below ambient temperature
Lens Mount (Custom mount available M72-mount, M95-mount M102-mount upon request)  Power External 11 ~ 24 VDC Dissipation Typ. 40.0 W	Dimension / Weight		125 mm $\times$ 125 mm $\times$ 157 mm, 3.3 kg		
(Custom mount available M72-mount, M95-mount M102-mount upon request)  Power External 11 ~ 24 VDC Dissipation Typ. 40.0 W	Temperature		Operating: 0°C ~ 40°C, Storage: -40°C ~ 70°C		
upon request)         11 ~ 24 VDC           Power         Dissipation         Typ. 40.0 W	Lens Mount				
Power External 11 ~ 24 VDC Dissipation Typ. 40.0 W	(Custom mount available		M72-mount,	M95-mount	M102-mount
Power Dissipation Typ. 40.0 W	upon request)				
Dissipation Typ. 40.0 W	Power	External	11 ~ 24 VDC		
API SDK Vieworks Imaging Solution 7.X	rowei	Dissipation	Typ. 40.0 W		
	APIS	SDK		Vieworks Imaging Solution 7.>	ζ

#### VNP-576/864/1152MX2 Series

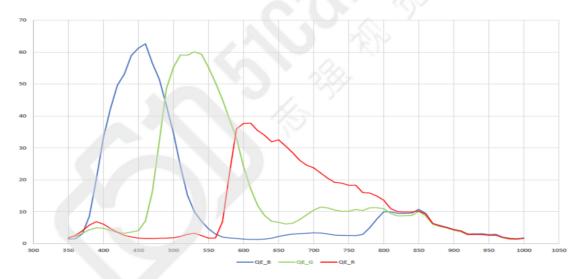
576/864/1152 Megapixel Pixel Shifting Camera Equipped with Thermoelectric Peltier

### Spectral Response

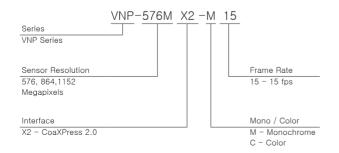
- \* The sensitivity data may not match the measurement on the finished product necessarily because it is measured based on the wafer.
- Mono



• Color (VNP-864MX2-C15K only)



#### Ordering Scheme



#### Connector Specification

## Power



1, 2, 3: +24 VDC 4, 5, 6: GND (HR10A-7R-6PB)

#### Control



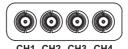
1: Trigger IN+
2: Trigger IN3: Strobe Out-(GND)
4: Strobe Out+

(HR10A-7R-4S)

Data Transfer / Communications

Micro-BNC

CH1: Master Connection 75 Ω, Micro-BNC (HD-BNC)



Connectors on camera body