

8.3 MTR3CMOS Series TE-Cooling C-mount USB3.0 CMOS Camera (21)

8.3.1 The Basic Characteristic of MTR3CMOS Series

MTR3CMOS series camera adopts SONY Exmor CMOS sensor as the image-picking device and USB3.0 is used as the transfer interface to increase the frame rate.

With the two-stage peltier cooling sensor chip to -42 degree below ambient temperature. This will greatly increase the signal to noise ratio and decrease the image noise. Smart structure is designed to assure the heat radiation efficiency and avoid the moisture problem. Electric fan is used to increase the heat radiation speed.

MTR3CMOS series comes with advanced video & image processing application ToupView/ToupLite; Providing Windows/Linux/OSX multiple platform SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The MTR3CMOS series can be widely used in low light environment and microscope fluorescence image capture and analysis, as well as the astronomy deep sky application.



MTR3CMOS Series (Cylinder or Square Housing)

The basic characteristic of MTR3CMOS series can be summarized as follows:

- Standard C-Mount camera with SONY Exmor CMOS sensors;
- Two-stage TE-cooling with controllable electric fan;
- Sensor chip cooling up to 42°C below ambient temperature;
- Working temperature can be regulated to specified temperature in 5 minutes;
- Smart structure to assure the heat radiation efficiency and avoid the moisture problem;
- IR-CUT/AR coated windows;
- Up to 1-hour long time exposure;
- USB3.0 5Gbit/second interface ensuring high speed data transmission;
- Ultra-Fine color engine with perfect color reproduction capability;
- With advanced video & image processing application ToupView/ToupLite;
- Support both video and trigger modes;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.NET, DirectShow, Twain control API;

8.3.2 MTR3CMOS Series Datasheet (22)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution ADC	Binning	Exposure
MTR3CMOS45000KMA MTRM145000A	45M/IMX492(M, RS) 4/3"(19.11x13.00)	2.315 x2.315	351mV with 1/30s 0.12mV with 1/30s	8.1@8176x5616 30.0@4080x2808 8.1@7408x5556 33.0@3696x2778 10.4@8176x4320 34.7@4096x2160 62.5@2048x1080 86.5@1360x720 8 Bit / 12 Bit	1x1(3:2) 2x2(3:2) 1x1(4:3) 2x2(4:3) 1x1(17:9) 2x2(17:9) 3x3(17:9) 4x4(17:9)	0.1ms~1h
MTR3CMOS26000KPA MTRP126000A	26M/IMX571(C, RS) 1.8"(23.48x15.67) APS-C	3.76 x3.76	485mv with 1/30s 0.07mv with 1/30s	14@6224x4168 37@3104x2084 110@2064x1386 8 Bit / 16 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS26000KMA MTRM126000A	26M/IMX571(M, RS) 1.8"(23.48x15.67) APS-C	3.76 x3.76	871mv with 1/30s 0.07mv with 1/30s	14@6224x4168 37@3104x2084 110@2064x1386 8 Bit / 16 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS21000KPA MTRP121000A	21M/IMX269(C) 4/3"(17.4x13.1)	3.3 x3.3	400mv with 1/30s 0.1mv with 1/30s	17@5280x3954 17@3952x3952 56@2640x1976 67@1760x1316 192@584x438 8 Bit / 12 Bit	1x1 1x1 2x2 3x3 9x9	0.1ms~1h
MTR3CMOS20000KPA MTRP120000A	20M/IMX183(C, RS) 1"(13.056x8.755)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	19@5440x3648 48.8@2736x1824 59.4@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS20000KMA MTRM120000A	20M/IMX183(M, RS) 1"(13.056x8.755)	2.4 x2.4	388mv with 1/30s 0.21mv with 1/30s (F8.0)	19@5440x3648 48.8@2736x1824 59.4@1824x1216 8 Bit / 12 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS16000KPA MTRP116000A	16M/MN34230PLJ(C) 4/3"(17.6x13.3)	3.8x3.8	2413LSB 89.1LSB (Gain = 0dB)	6@4640x3506 20@2304x1750 48.0@1536x1160 8 Bit / 12 Bit	1x1 2x2 3x3	0.15ms~1h
MTR3CMOS16000KMA MTRM116000A	16M/MN34230ALJ(M) 4/3"(17.6x13.3)	3.8x3.8	2650LSB 89.1LSB (Gain = 0dB)	22.5@4648x3506 43.0@2304x1750 48.0@1536x1168 8 Bit / 12 Bit	1x1 2x2 3x3	0.15ms~1h
MTR3CMOS10300KPA MTRP110300A	10.3M/IMX294(C) 4/3"(19.11x13.0)	4.63 x4.63	419mv with 1/30s 0.12mv with 1/30s	30.0@4128x2808 38.5@4096x2160 59.8@2048x1080 87.2@1360x720 8 Bit / 14 Bit	1x1 1x1 2x2 3x3	0.15ms~1h
MTR3CMOS10300KMA MTRM110300A	10.3M/IMX492(M, RS) 4/3"(19.11x13.0)	4.63 x4.63	701mv with 1/30s 0.12mv with 1/30s	30.0@4128*2808 38.5@4096*2160 59.8@2048*1080 87.2@1360*720 8 Bit / 14 Bit	1x1 1x1 2x2 3x3	0.15ms~1h
MTR3CMOS09000KPA MTRP109000A	9M/IMX533(C) 1"(11.28x11.28)	3.76 x3.76	534mv with 1/30s 0.04mv with 1/30s	40@2992x3000 62@1488x1500 186@992x998 8 Bit / 14 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS09000KMA MTRM109000A(2023,New)	9M/IMX533(M) 1"(11.28x11.28)	3.76 x3.76	877mv with 1/30s 0.04mv with 1/30s	40@2992x3000 62@1488x1500 186@992x998 8 Bit / 14 Bit	1x1 2x2 3x3	0.1ms~1h
MTR3CMOS08300KPA MTRP108300A	8.3M/IMX585(C, RS) 1/1.2"(11.14x6.26)	2.9x2.9	5970mv with 1/30s 0.15mv with 1/30s	45@3840x2160 70@1920x1080 8 Bit / 12 Bit	1x1 2x2	0.1ms~1h
MTR3CMOS07100KPA MTRP107100A	7.0M/IMX428(C, GS) 1.1"(14.4x9.9)	4.5 x4.5	2058mv with 1/30s 0.15mv with 1/30s	51.3@3200x2200 133.8@1584x1100 8 Bit / 12 Bit	1x1 1x1	0.1ms~1h
MTR3CMOS07100KMA MTRM107100A	7.0M/IMX428(M, GS) 1.1"(14.4x9.9)	4.5 x4.5	3354mv with 1/30s 0.15mv with 1/30s	51.3@3200x2200 133.8@1584x1100 8 Bit / 12 Bit	1x1 1x1	0.1ms~1h
MTR3CMOS02300KPA MTRP102300A 20231030	2.3M/SC2110(C,RS) 1.69"(23.0x14.4)	12x12	120000 mV/lux·s @HCG	120@1920x1200 8 Bit / 12 Bit	1x1	0.1ms~1h
MTR3CMOS02300KMA MTRM102300A 20231030	2.3M/SC2110(M,RS) 1.69"(23.0x14.4)	12x12	120000 mV/lux·s @HCG	120@1920x1200 8 Bit / 12 Bit	1x1	0.1ms~1h
MTR3CMOS01700KPA	1.7M/IMX432(C, GS)	9.0 x9.0	4910mv with 1/30s	98.6@1600x1100	1x1	0.1ms~1h

CTR3CMOS Series TE-Cooling C-mount USB3.0/GigE CMOS Camera

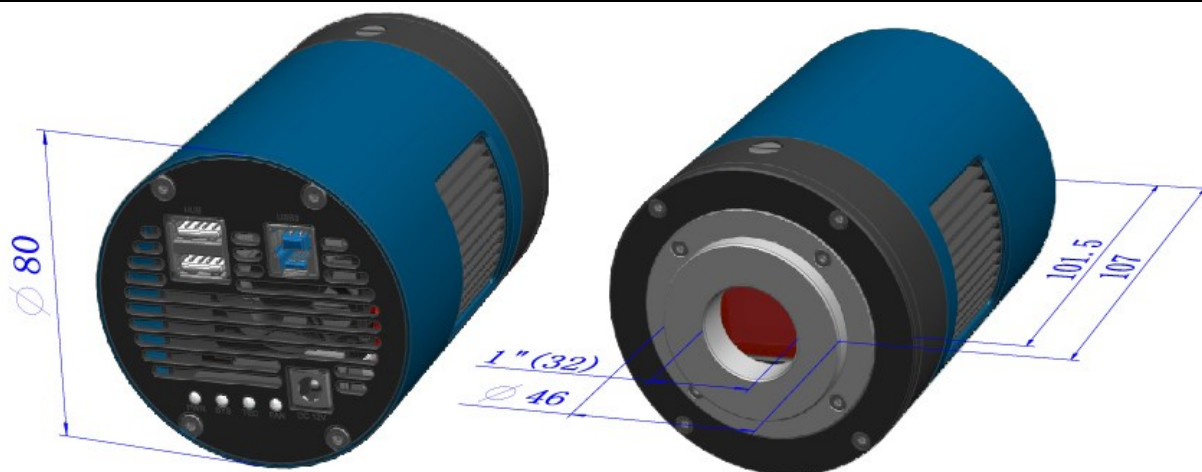
MTRP101700A	1.1“(14.4x9.9)		0.3mv with 1/30s	8 Bit / 12 Bit		
MTR3CMOS01700KMA MTRM101700A	1.7M/IMX432(M, GS) 1.1“(14.4x9.9)	9.0 x9.0	8100mv with 1/30s 0.3mv with 1/30s	98.6@1600x1100 8 Bit / 12 Bit	1x1	0.1ms~1h
MTR3CMOS01300KMA MTRM101300A	1.3M/GLUX9701BSI(M, UV, RS) 1“(12.493x9.994)	9.76 x9.76	2.57x10 ⁸ (e- /(W/m2).s)) QE89%@610nm 0.08(e-/s/pix) @-28C	30fps@1280x1024 30fps@640x512 8 Bit / HDR 16 Bit	1x1 2x2	0.1ms~1h
MTR3CMOS00500KMA MTRM100500A	0.5M/GLUX1605BSI(M, UV, RS) 1“(12.8x9.6)	16.0 x16.0	6.4x10 ⁸ (e- /(W/m2).s)) QE91%@550nm 50(e-/s/pix)	60.0@800x600 60.0@400x300 8 Bit / HDR 16 Bit	1x1 2x2	0.1ms~1h
MTR3CMOS08300KMA	8M/IMX585(M,RS) 1/1.2”(11.2x6.3)	2.9 x 2.9	9560mV with 1/30s	24@3840x2160 8 Bit / 12 Bit/HDR16 Bit	1x1 2x2	0.1ms~1h

C:Color; M:Monochrome;

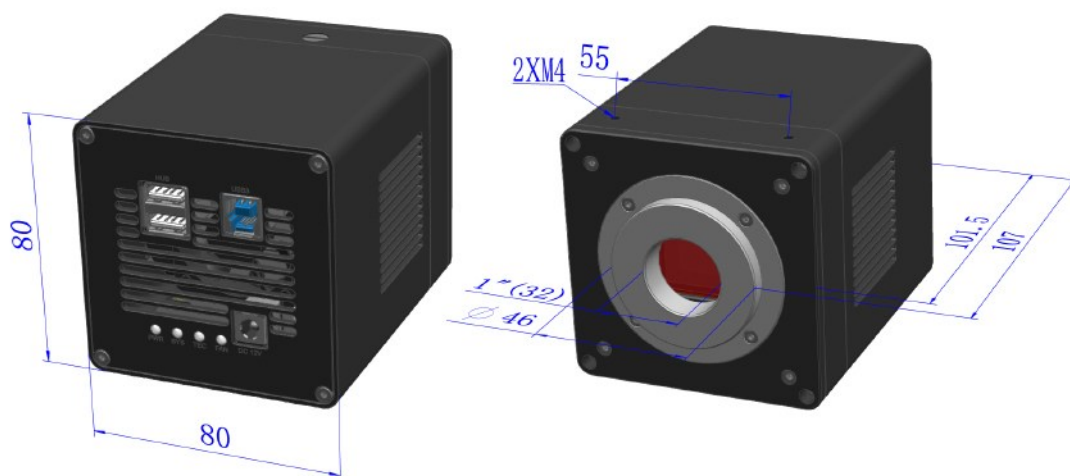
Other Specification	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-Fine Color Engine/NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Cooling System*	Two-stage TE-cooling System -45 °C below Camera Body Temperature
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port External Power Adapter for Cooling System, DC12V, 3A
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 / 10 / 11 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory:2GB or More
	USB Port:USB3.0 High-speed Port
	Display:17” or Larger CD-ROM

8.3.3 Dimension of MTR3CMOS Series

The MTR3CMOS series body, made from tough, alloy with CNC technique, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT or AR to block the IR light or protect the camera sensor. The fan’s vibration is minimized to the low level to eliminate the vibration caused imaging blur. This design ensures a rugged, robust solution with an increased lifespan when compared to the other industrial camera solutions.



Dimension of MTR3CMOS (Cylinder) Series



Dimension of MTR3CMOS (Square) Series

8.3.4 Packing Information for MTR3CMOS Series



Packing Information of MTR3CMOS Series(Cylinder)




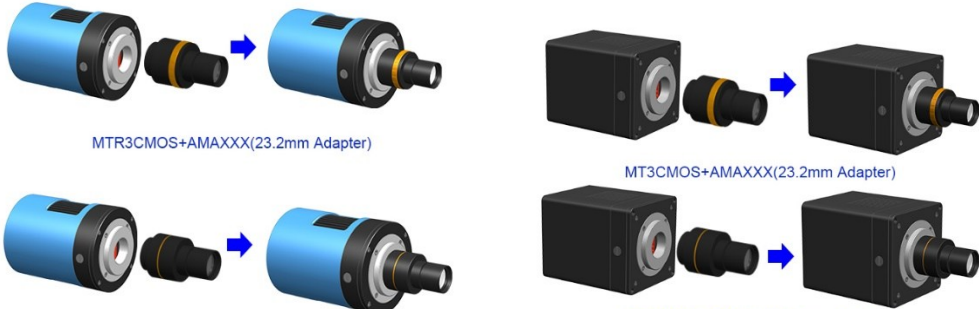
Packing Information of MTR3CMOS Series(Square)

Standard Package	
A	Carton L:50cm W:30cm H:30cm (20pcs, 12~17Kg/ carton), not shown in the photo(TBD)
B	3-A safety equipment case: L:28cm W:23cm H:15cm (1pcs, 2.8Kg/ box); Carton size:L:28.2cm W:25.2cm H:16.7cm(TBD)
C	One MTR3CMOS series camera(C-mount)
D	Drying tube and desiccant
E	Power adapter: input: AC 100~240V 50Hz/60Hz, output: DC12 V 3A
F	High-Speed USB3.0 A male to B male gold-plated connectors cable /1.5m
G	CD (Driver & utilities software, Ø12cm)

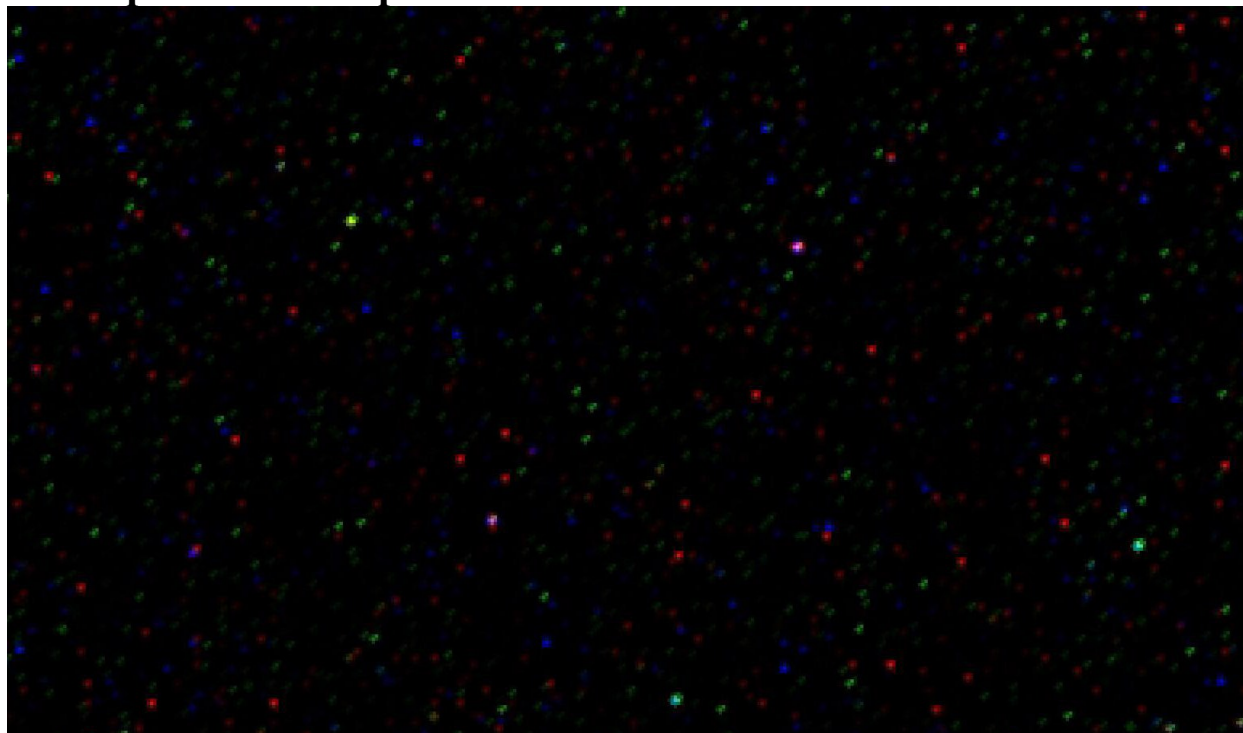
CTR3CMOS Series TE-Cooling C-mount USB3.0/GigE CMOS Camera

Optional Accessory			
H	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-Mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
I	Fixed lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
Note: For H and I optional items, please specify your camera type(C-mount, microscope camera or telescope camera), ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
J	108015(Dia.23.2mm to 30.0mm ring)/Adapter rings for 30mm eyepiece tube		
K	108016(Dia.23.2mm to 30.5mm ring)/ Adapter rings for 30.5mm eyepiece tube		
L	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

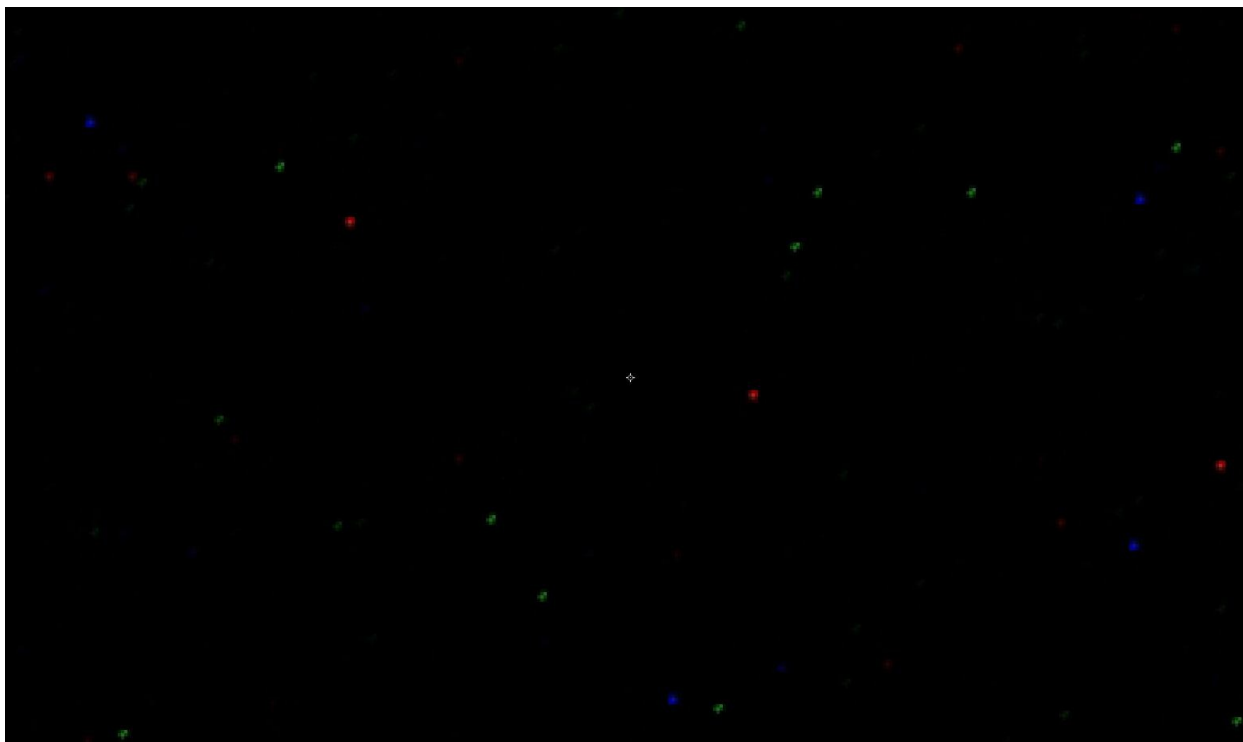
8.3.5 Extension of MTR3CMOS Series with Microscope Adapter

Extension	Picture	
C-mount Camera	 <p data-bbox="1086 342 1477 465">Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;</p>	
Microscope Camera	 <p data-bbox="499 790 783 808">MTR3CMOS+AMAXXX(23.2mm Adapter)</p> <p data-bbox="1034 819 1318 837">MT3CMOS+AMAXXX(23.2mm Adapter)</p> <p data-bbox="499 983 783 1001">MTR3CMOS+FMAXXX(23.2mm Adapter)</p> <p data-bbox="1034 969 1318 987">MT3CMOS+FMAXXX(23.2mm Adapter)</p>	

8.3.6 Sample Photos Captured with MTR3CMOS Series



Hot noise for the MTR3CMOS at Gain 20 , 600 second, 15 Centidegree



Hot noise for the MTR3CMOS Gain 20, 600 second, minus 15 Centidegree