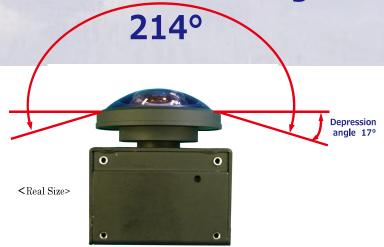
360° Camera module

Model: NM33-M

This camera has no blind spot.

Ultra Wide View angle



Easy to dewarp into 15 patterns



<Fisheye Image>



< Dewarped Wide View Image >

Key Features

- ◆ 214°+ 360° ultra wide Viewing Angle
- ♦ 3 Mega Pixel color CMOS Sensor
- JPEG compressed digital images via USB port provide high-definition image to PCs and VCR
- NTSC/PAL composite output
- max 15 frames per second
- Digital Pan/Tilt/Zoom with no moving parts
- Enbeded Dewarping Software
- Small and light body = High Durability



<Partial Enlarged Image>

Most Effective Usage

(Install on the car roof-top)

Built in Φ12cm, IP66 small dome.



allows to see all around the car even the surface of road.





Separately display as the front 180° view and the rear 180° view.

Specifications

Power Power Voltage $5.0 \text{ V} \pm 0.5 \text{ V}$ Consumption Current 500 mA Max Rated Voltage $-0.3 \sim 6.0 \text{ V}$ Lens ϕ 38 mm Focus Length $10 \text{ mm} \sim \infty$ (from Lens surface) View Angle 214° Image Sensor $1/2 \text{ inch single Color CMOS}$ Effective Pixels H: 2048 x V : 1536 , approx. 3.15 M pixels Usable Pixels approx. 1.7 M pixels Minimum Light Required 5 lux (skin color base) AV Output (Analog) NTSC/PAL switchable (when ex-factory) (VBS mode) (NTSC: 30 fps, PAL: 25 fps) Video Signal system Composite VIDEO 1Vp-p , Negative Sync. Output Drive Capacity 75Ω AV Output (Digital) Video Frame Rate 15 fps (max.) Signal type USB1.1 Image Compression JPEG Image Dimension $640 \times 480 \text{ VGA}$ size $320 \times 240 \text{ QVGA}$ size $1536 \times 1536 \text{ LARGE mode}$ Control Input USB1.1 Dimensions Cubic Body Size $39(\text{W}) \times 30(\text{D}) \times 27(\text{H}) \text{ mm}$ Weight 80 g	Items	Specification
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Power	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Power Voltage	$5.0 \text{ V} \pm 0.5 \text{ V}$
Lens ϕ 38 mm Focus Length $10 \text{ mm} \sim \infty$ (from Lens surface) View Angle 214° Image Sensor $1/2$ inch single Color CMOS Effective Pixels $H: 2048 \times V: 1536$, approx. 3.15 M pixels Usable Pixels approx. 1.7 M pixels Minimum Light Required 5 lux (skin color base) AV Output (Analog) NTSC/PAL switchable (when ex-factory) (VBS mode) (NTSC: 30 fps , PAL: 25 fps) Video Signal system Composite VIDEO 1Vp-p , Negative Sync. Output Drive Capacity 75Ω AV Output (Digital) (USB FS mode) Video Frame Rate 15 fps (max.) Signal type USB1.1 Imager Compression JPEG Image Dimension $640 \times 480 \text{ VGA}$ size $320 \times 240 \text{ QVGA}$ size $1536 \times 1536 \text{ LARGE}$ mode Control Input USB1.1 Dimensions Cubic Body Size $39(\text{W}) \times 30(\text{D}) \times 27(\text{H})$ mm Weight 80 g Operation Environment Temperature: $0 \sim 40^{\circ}\text{C}$ (no condensing) Humidity: $20 \sim 80 \text{ \%Rh}$ Storage Environment Temperature: $-20 \sim 60^{\circ}\text{C}$	Consumption Currer	nt 500 mA
Focus Length $10 \text{ mm} \sim \infty \text{ (from Lens surface)}$ View Angle 214° Image Sensor $1/2 \text{ inch single Color CMOS}$ Effective Pixels $H: 2048 \times V: 1536, \text{ approx. } 3.15 \text{ M pixels}$ Usable Pixels approx. 1.7 M pixels Minimum Light Required $5 \text{ lux (skin color base)}$ AV Output (Analog) NTSC/PAL switchable (when ex-factory) (VBS mode) (NTSC: $30 \text{ fps, PAL}: 25 \text{ fps}$) Video Signal system Composite VIDEO $1\text{Vp-p, Negative Sync.}$ Output Drive Capacity 75Ω AV Output (Digital) (USB FS mode) Video Frame Rate 15 fps (max.) Signal type USB1.1 Imager Compression JPEG Image Dimension $640 \times 480 \text{ VGA size}$ $320 \times 240 \text{ QVGA size}$ Control Input USB1.1 Dimensions Cubic Body Size $39(\text{W}) \times 30(\text{D}) \times 27(\text{H}) \text{ mm}$ Weight 80 g Operation Environment Temperature: $0 \sim 40^{\circ}\text{C}$ (no condensing) Humidity: $20 \sim 80 \text{ \%Rh}$ Storage Environment Temperature: $-20 \sim 60^{\circ}\text{C}$	Max Rated Voltage	$-0.3 \sim 6.0 \text{ V}$
View Angle 214° Image Sensor $1/2$ inch single Color CMOSEffective Pixels $H: 2048 \times V: 1536$, approx. 3.15 M pixelsUsable Pixelsapprox. 1.7 M pixelsMinimum Light Required 5 lux (skin color base)AV Output (Analog)NTSC/PAL switchable (when ex-factory)(VBS mode)(NTSC: 30 fps , PAL: 25 fps)Video Signal systemComposite VIDEO 1Vp-p , Negative Sync.Output Drive Capacity 75Ω AV Output (Digital)Video Frame Rate 15 fps (max.)Signal typeUSB1.1Imager CompressionJPEGImage Dimension $640 \times 480 \text{ VGA}$ size $320 \times 240 \text{ QVGA}$ size $1536 \times 1536 \text{ LARGE}$ modeControl InputUSB1.1DimensionsUSB1.1Cubic Body Size $39(\text{W}) \times 30(\text{D}) \times 27(\text{H}) \text{ mm}$ Weight 80 g Operation EnvironmentTemperature: $0 \sim 40^{\circ}\text{C}$ (no condensing)Humidity: $20 \sim 80 \text{ \%Rh}$ Storage EnvironmentTemperature: $-20 \sim 60^{\circ}\text{C}$	Lens	φ 38 mm
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Focus Length	10 mm $\sim \infty$ (from Lens surface)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	View Angle	214°
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Image Sensor	1/2 inch single Color CMOS
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Effective Pixels	H: 2048 x V: 1536, approx. 3.15 M pixels
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Usable Pixels	approx. 1.7 M pixels
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Minimum Light Requir	red 5 lux (skin color base)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	AV Output (Analog)	NTSC/PAL switchable (when ex-factory)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	(VBS mode)	(NTSC: 30 fps, PAL: 25 fps)
AV Output (Digital) (USB FS mode) Video Frame Rate 15 fps (max.) Signal type USB1.1 Imager Compression JPEG Image Dimension $640 \times 480 \text{ VGA size}$ $320 \times 240 \text{ QVGA size}$ 1536 x 1536 LARGE mode Control Input USB1.1 Dimensions Cubic Body Size $39(W) \times 30(D) \times 27(H) \text{ mm}$ Weight 80 g Operation Environment Temperature: $0 \sim 40^{\circ}\text{C}$ (no condensing) Humidity: $20 \sim 80 \text{ \%Rh}$ Storage Environment Temperature: $-20 \sim 60^{\circ}\text{C}$	Video Signal system	Composite VIDEO 1Vp-p, Negative Sync.
(USB FS mode)Video Frame Rate 15 fps (max.)Signal typeUSB1.1Imager CompressionJPEGImage Dimension $640 \times 480 \text{ VGA size}$ $320 \times 240 \text{ QVGA size}$ Control InputUSB1.1DimensionsUSB1.1Cubic Body Size $39(\text{W}) \times 30(\text{D}) \times 27(\text{H}) \text{ mm}$ Weight 80 g Operation EnvironmentTemperature : $0 \sim 40^{\circ}\text{C}$ (no condensing)Humidity : $20 \sim 80 \text{ \%Rh}$ Storage EnvironmentTemperature : $-20 \sim 60^{\circ}\text{C}$	Output Drive Capac	ity 75Ω
Signal typeUSB1.1Imager CompressionJPEGImage Dimension $640 \times 480 \text{ VGA size}$ $320 \times 240 \text{ QVGA size}$ 1536 x 1536 LARGE modeControl InputUSB1.1DimensionsUSB1.1Cubic Body Size $39(W) \times 30(D) \times 27(H) \text{ mm}$ Weight 80 g Operation EnvironmentTemperature: $0 \sim 40^{\circ}\text{C}$ (no condensing)Humidity: $20 \sim 80 \text{ \%Rh}$ Storage EnvironmentTemperature: $-20 \sim 60^{\circ}\text{C}$	AV Output (Digital)	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(USB FS mode)	Video Frame Rate 15 fps (max.)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Signal type	USB1.1
$320 \times 240 \text{ QVGA size} \\ 1536 \times 1536 \text{ LARGE mode} \\ \hline \text{Control Input} \qquad \text{USB1.1} \\ \hline \text{Dimensions} \\ \hline \text{Cubic Body Size} \qquad 39(\text{W}) \times 30(\text{D}) \times 27(\text{H}) \text{ mm} \\ \hline \text{Weight} \qquad 80 \text{ g} \\ \hline \text{Operation Environment} \qquad \text{Temperature}: 0 \sim 40^{\circ}\text{C} \text{(no condensing)} \\ \hline \text{Humidity}: 20 \sim 80 \text{ \%Rh} \\ \hline \text{Storage Environment} \qquad \text{Temperature}: -20 \sim 60^{\circ}\text{C}$	Imager Compression	JPEG
	Image Dimension	640 x 480 VGA size
$\begin{tabular}{lll} \hline Control Input & USB1.1 \\ \hline Dimensions & & & & \\ \hline Cubic Body Size & 39(W) x 30(D) x 27(H) mm \\ \hline Weight & 80 g & & & \\ \hline Operation Environment & Temperature: 0 \sim 40^{\circ}\text{C} (no condensing) \hline & & & & \\ \hline Humidity: & 20 \sim 80 \ \% Rh \\ \hline Storage Environment & Temperature: -20 \sim 60^{\circ}\text{C} \\ \hline \end{tabular}$		320 x 240 QVGA size
$\begin{tabular}{lllllllllllllllllllllllllllllllllll$		1536 x 1536 LARGE mode
Cubic Body Size $39(W) \times 30(D) \times 27(H) \text{ mm}$ Weight 80 g Operation Environment Temperature: $0 \sim 40^{\circ}\text{C}$ (no condensing) Humidity: $20 \sim 80 \text{ \%Rh}$ Storage Environment Temperature: $-20 \sim 60^{\circ}\text{C}$	Control Input	USB1.1
	Dimensions	
$\begin{tabular}{lllllllllllllllllllllllllllllllllll$	Cubic Body Size	39(W) x 30(D) x 27(H) mm
$\begin{array}{ccc} & \text{Humidity:} & 20 \sim 80 \text{ \%Rh} \\ \text{Storage Environment} & \text{Temperature:} & -20 \sim 60 \text{\%C} \end{array}$	Weight	80 g
Storage Environment Temperature : $-20 \sim 60^{\circ}\mathrm{C}$	Operation Environmen	
		Humidity: $20 \sim 80 \% \mathrm{Rh}$
Humidity: 20 ∼ 90 %Rh	Storage Environment	Temperature : $-20\sim60^{\circ}\mathrm{C}$
		Humidity: 20 ∼ 90 %Rh

^{*} Specification is the subject of change without notice.

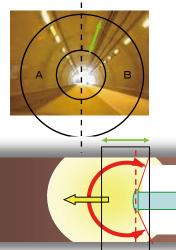
Key Features

- \bullet By using a newly developed large aperture (ϕ 38 mm) small fisheye lens, it has achieved the industry's largest view angle of 214 ° resulting in the light intensity has increased by 130% compared with NM33-F.
- Bright images can be obtained even with a small amount of data, so the image transfer rate is improved.
- Since the image height of the lens fringe area is high, images with a more realistic feeling are obtained than before.
- Even with a larger lens, the camera is lightweight (80 g) and superior in vibration and shock resistance improving durability and handling properties.
- Digital output of clear video from USB.
- Since there is no driving mechanism for P/T/Z, it is a low failure rate.

Examples of Usage

Store monitoring system
Factory monitoring system
TV Conference
Surveillance Camera
In-pipe Inspection Device
In-tunnel Inspection system

<Idea of Tunnel Camera>



Designed by:

OPT Corporation

5423-2 Miyagawa, Chino-shi, Nagano-ken 391-0013 Japan

Phone: +81-266-82-0020, Fax: +81-266-82-0022

http://www.optnagano.co.jp e-mail: opt_info2@optnagano.co.jp