1. Product information

Name: Endoscopic camera system

Model specifications: YCSX-50

2. Software release version

Product number	software release version	parameter
TU-LSD100A	V1.0.1	4K
TU-LSD100B	V1.0.1	1080P

3. Structural composition

This product consists of a camera control system, a handle camera, a light source module, and an optical adapter (optical interface).

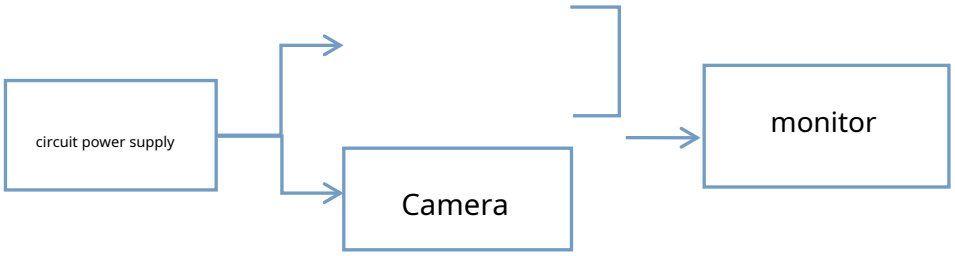
4. Working principle

The light source of the equipment can be connected to the endoscope through the optical connector and light guide, and then extended to the surgical site to accurately illuminate the patient.

On the stove. The camera randomly tracks and records the diseased tissue illuminated by the endoscope in real time, and sends it to the image as an electrical signal.

Like processing system. After processing by the image processing system, the No distortion Video letter signal to the display or external image monitor for

line image display. The working principle block diagram is as follows:



5. Scope of application

This product is used in medical institutions and is connected to endoscopes during endoscopic diagnosis or treatment. Observing human body cavities with endoscope

It provides an illumination source for the endoscope when images of the field of view are collected, processed, stored and transmitted to the monitor.

6. Product main performance parameters

Tie system ginseng number	enter	SDI/HD
	output	HDMI/SDI/CVBS
	U disk	U disk USB2.0/USB3.0 (up to 32GB) video recording and photo taking
	Shortcut key function	Freeze/White Balance/Video/Photo/Digital Zoom
	resolution	1920(H) × 1 0 8 0 (V)
	signal-to-noise ratio	45dB
	Screen freeze	support
	white balance	One-click white balance
	Image digital enlargement	00-08
	brightness	1-30 steps
	sharpness	1-40 steps
	endoscopic mode	Otolaryngoscope/Laparoscope/Cystoscope/Hysteroscope/Arthroscope/Foraminoscope/Fiberscope/Customized
	language	Chinese Simplified CHN(S)traditional ChineseCHNEnglish ENGJapanese JPNKorean KOR
	power supply	AC110V-240V/50Hz
	noise	Less than 55dB(A)
	Working temperature	0℃ to 40℃
	size	Length 336* Width 330* Height 116mm
	net weight	4.3KG
Light source ginseng number	type of light source	led
	rated power	70VA
	color temperature	4500K-6500K
	Dimming	support
	Luminous area (mm_2)	3.8
	life	30000h

7. Contraindications

none

8. Precautions, warnings and tips

- Please read the warnings and precautions provided in the instruction manual carefully to ensure safe and effective use of the cold light source.

- The light guide cannot be bent excessively, and the radius of curvature should not be less than 5CM, otherwise the light guide fiber will be broken and the light transmittance will be affected.

- Before each use, the endoscope and the part where the endoscope is inserted into the human body must be inspected for any rough surfaces that may pose a safety hazard.

surfaces, such as sharp edges and protrusions.

-If the endoscope equipment is damaged (such as broken or broken, etc.), please replace the endoscope equipment in time, otherwise the endoscope may

Overheating occurs, causing internal harm to the human body.

- Do not look directly at the light outlet to avoid permanent damage to your eyes.

- Please do not replace the LED lights by yourself to avoid irreparable damage to the equipment. If you need replacement, please contact the manufacturer.

Tie.

- The light emitted part of the cold light source may exceed 41°C. When used together with an endoscope, the brightness and operation of the light should be appropriately reduced.

Avoid irradiating the same area for a long time to avoid burning the patient.

- If you find a strange smell or abnormal noise from the cold light source during use, please turn off the power immediately and contact us.

Contact us.

- This product is a medical device electronic product. If the product is disposed of casually after it is scrapped, it may cause electronic pollution to the environment.

dye. After the product reaches the end of its life, its disposal methods should be strictly in accordance with the "Electronic Waste Environmental Pollution Prevention" issued by the State Environmental Protection Administration.

Implementation of the Governance and Management Measures. Users should contact units with corresponding qualifications to dismantle and dispose of end-of-life products, or contact

Handed over by the manufacturer. Users are not allowed to dismantle and dispose of end-of-life products without authorization.

-If the LED bulb goes out during use, please have technicians with relevant knowledge and capabilities perform repairs.

During operation, you must disconnect the power supply, wear dark sunglasses, insulating gloves and an electrostatic bracelet. Direct viewing and direct contact with hands is prohibited

light bulb, or please contact the manufacturer. Please do not dismantle or replace other product components without permission. Replace them directly.

Contact the manufacturer.

-When this product is used with high-frequency surgical equipment, the working part of the live electrode should be kept within the operator's view.

range to avoid accidental high-frequency burns and to ensure that the charged electrodes are in the correct position during surgery, in conjunction with the endoscope

There should be sufficient distance between the head end and before high-frequency output excitation, contact with the endoscope's metal parts and conductors should be avoided, including possible

The liquid spout may be a conductor, and the insulated non-high-frequency stimulation accessory may come into contact with the guard of the live electrode during surgery.

To avoid high-frequency burns on the contralateral side, during excitation using a charged electrode, its high-frequency current is directed at the lesion without allowing contact with normal

of mucous membranes, use non-conductive eyepiece caps to reduce the risk of high-frequency burns to the face around the eyes. To choose for the intended surgery

Set an appropriate high-frequency output power to avoid thermal damage to the tissue caused by too low a setting and ineffective coagulation caused by too high a setting.

The result is excessive bleeding.

-The AC power socket and AC power cord must be well grounded and able to withstand sufficient current demand.

-The power input voltage required for this product is AC110V-240V/50Hz, and the current depends on the selected light source and handle.

Depends on the power of the camera.

-Pay attention to good ventilation and ventilation, and do not allow it to be exposed to direct sunlight or other heat sources.

-Care should be taken to avoid excessive humidity and excessive dust to avoid circuit corrosion and failure.

-Pay attention to electromagnetic interference issues when using the product, and try to stay away from high frequencies and high voltages.

-When using the product, do not place it on uneven surfaces or places prone to water leakage.

-This product is suitable for medical use, please follow the instructions for strict disinfection.

-Please unplug the power when not in use for a long time.

-When the product is damaged, for the safety of you and others, please do not repair or disassemble it by yourself.

9. Installation and usage instructions

1.Installation

Install the devices in the following order

1) Connect to AC power

Connect the AC power cord to the AC outlet on the rear console panel and the other end to the power port. Pay attention

Stability of streaming power can affect camera system shutdown and loss of surgical images.

2) Connect video output (optional expansion):

The camera control system provides HDMI/SDI/CVBS output ports.

3) Install the handle camera

There are camera jacks on the front panel of the camera control system. Above the camera socket, there is a cable to connect to the camera system.

After the two red points are aligned in the horizontal direction, push the connecting plug until it locks. Unplugging

When you press it, hold this place with your hand, push the buckle backward gently, and then pull it back firmly.

4) Install optical adapter and light guide

① Connect the optical adapter to the handle camera, hold the adapter, and screw the adapter to the front end of the handle camera (clockwise

pin) until it is tight and secure.**(Note: Before each use, check the outer surface of the adapter window glass to see if there is any foreign matter.**

Sharp edges or protrusions. When attaching or removing the adapter, simply grasp the front of the adapter and twist the other parts of the adapter to

May cause mechanical damage. Do not connect the adapter too tightly to avoid damaging the front end of the handle camera)

② Connect the endoscope to the optical adapter

If the endoscope has a dust cover, remove the dust cover. Rotate the endoscope bayonet and insert the endoscope all the way. Release the endoscope bayonet.

③ Install the light guide

Connect a light guide cable to the endoscope, plug the other end directly into the light source interface, and control it through the light source switch and light source

Use the buttons to control the use of the light source. When using the light guide, be careful to prevent dust and falling.

2. Use

Turn on the power switch on the rear console panel to power the device. White balance the device before use. White balance button (AWB)

Used to correct slight color differences that exist between different light sources or endoscopes. Perform whitening before every surgical procedure

Balance program to prevent chromatic aberration, resulting in poor video display. Here's how to do it:

(Note: Make sure an endoscope and light source are connected to the camera system, and before adjusting the white balance, the camera system, light source and monitor are turned on.)

1) Prepare a few stacks of 4x4 white gauze pads, or a white sponge, or any clean white surface. Align the lens Accurate to the surface of the above object. (White balance needs to be reset after entering the menu to adjust parameters)

2) Watch the monitor to make sure there is no glare on the white surface.

3) Click the white balance button (AWB).

4) Continue pointing to the range of the white surface until the video monitor displays the white balance setting words "AWB SETTING" disappears, the white balance is completed, and the image screen will change color. The product is ready for use.

3. Camera control system buttons

1 2 3

1) REC recording indicator light: Insert the U disk recording indicator and the green light will be on. When recording, the green light of the recording indicator flashes.

2) SIG video signal light: When the signal is connected, the video signal green light is on.

3) PWR power indicator light: When the power is connected, the red light of the power indicator lights up.

Five-way button **RECORD** **PHOTO** **Light source switch** **Light source adjustment button**

4) Five-way button: ▲▼◀▶M is the five-way button of the camera mainboard menu. M enters the menu. ▲▼◀▶M controls up, down, left and right, M Confirm selection. You can set the up, down, left, and right shortcut keys through the menu, +/- to control brightness and digital zoom, etc., AWB Control white balance with one click and freeze with one click. Press and hold the M key for 3 seconds to enter the system menu interface and set the system menu.

5) RECORD: Recording button, when the U disk is connected, the RECORD green light will be on. Press the RECORD button, and the RECORD green light will be on. Flashes to start recording; press the RECORD button again to stop recording, the RECORD green light stops flashing, and the video is saved to U plate.

6) PHOTO: The camera button can record the screen and capture pictures, and save the pictures to a USB flash drive.

7) Light source switch: Resettable switch, control light source switch.

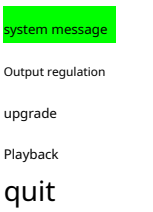
8) Light source adjustment button: Control the brightness of the light source, adjustable from 5 to 100 in steps of 5.

4. System menu button

Long press the M key for 3 seconds to enter the system menu interface and set the DVR system menu.

▲▼◀▶M is the five-way button of the camera control system menu, M enters menu, ▲▼◀▶Control up, down, left, and right, and press M to confirm the selection.

As shown in the figure, the system menu has system information/output adjustment/upgrade/playback



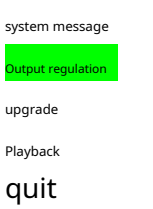
1. System information: time setting/time display/language selection/disk full

Time setting: Set the system time, press the M key to enter the time setting, and then Press the M key twice to enter the modification mode, adjust the size with the M key, and select the unit

Time display: system time display on/off

Language selection: Simplified Chinese/English, etc., can be customized

2. Output adjustment: hue/brightness/contrast/saturation, ◀▶key adjustment size

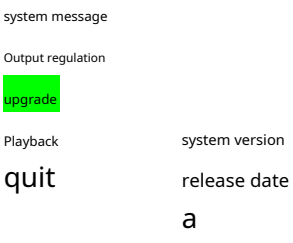


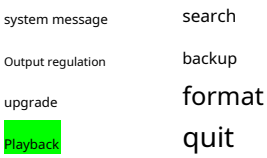
Hue: 0-100 Brightness: 0-100 Contrast: 0-100 Saturation: 0-100

3. Upgrade: system version/release date/upgrade file, upgrade system, View department

System software version information and USB flash drive online upgrade

4. Playback: Search/backup/format functions are not supported





5. Handle camera buttons

-ZOOM+: Image enlargement

zoom out

AWB:white balance

:Freeze with one click

The freeze button on the camera is used to temporarily freeze dynamic images. When this button is pressed, the display screen will remain at the current screen.

1) Press the freeze button to freeze the image. 2) Press the Unfreeze Image button again to return to the dynamic image.

(Note: When observing through frozen images, surgical instruments such as endoscopes are still moving inside the patient's body. The operator must be careful to avoid accidents.)

6. Handle camera menu

AWB

color

brightness

color density

sharp

YELLOW GAIN

BLUE GAIN

GREEN GAIN

RED GAIN

YELLOW HUE

BLUE HUE

GREEN HUE

RED HUE

Control system host panel buttons ▲▼◀▶M can control the handle camera menu

Single, M to enter the menu, ▲▼◀▶Control up, down, left, and right, and press M to confirm the selection.

AWB: One-click white balance, fixed/automatic.

color: Color adjusts the color coordinates, and the colors include YELLOW/BLUE/GREEN/RED, the concentration adjusts the GAIN value, 0-255 is adjustable, the hue adjusts the HUE value, 0-254 is adjustable, and needs to be adjusted together.

brightness: Brightness can adjust the brightness of the screen, 0-30 is adjustable. **Color density:**Adjust color intensity, 0-30 adjustable.

Sharpness: Sharpness can adjust the sharpness of the picture and improve the clarity of the image, 0-40 Adjustable.

Noise reduction: Reduce noise level, OFF/Low/Medium/High.

GAMMA: Can adjust gamma value, 0.45/0.55/0.65/0.75

Automatic gain:0-10 level gear adjustment

Backlight mode: Adjust the backlight area of the camera, including the center peak 1/ Center peak 2/all area average/OFF.

Endoscopic mode: Switch lens modes including otolaryngoscope/laparoscope/bladder Endoscopy/hysteroscopy/arthroscopy/foraminal endoscope/flexible fiberscope, etc. model.

system: The video resolution is 2160P, and the FREQ frequency is divided into 50/60HZ. The electronic shutter is automatic and manual. The manual has 11 adjustable steps from 1/30 to 1/30000. Languages include Simplified Chinese/Traditional Chinese/ English/Japanese/Korean. Shortcut keys can be set up, down, left Right shortcut key function, AWB/FREEZE/ENDOSCOPE+-/ DZOOM+-/BRIGHTNESS+-. Reset restores factory settings.

leave: Save settings and exit the menu.

Note: You need to re-do the white balance after adjusting the handle camera menu.

Otolaryngoscope

Laparoscopy

Cystoscope

hysteroscopy

Arthroscopy

foraminal endoscopy

Fiberscope

customize

video frequency

FREQ

electronic shutter

language

Set shortcut keys

reset

leave

10. Care and maintenance

1. Use ammonia-containing disinfectant to clean the outside of the equipment.

2. To keep the system clean, please gently wipe the surface of the equipment with a soft wet cloth (gauze) soaked in warm water or added with cleaning agent.

At least once a month, but liquids should be absolutely prevented from penetrating into the machine.

3. Do not use dilute ethylene ethylene oxide or other organic solutions to prevent damage to the entire machine casing. Do not use any solvents, polishes and original brighteners.

43. Avoid using flammable and explosive liquids for cleaning and disinfection. If unavoidable, these liquids must evaporate before starting the equipment.

11. Transportation and storage

1.Transportation

According to the requirements of the order contract, the transportation process should be protected from rain and sun, and the product should be handled with care to avoid collision or strong force.

impact.

2.Storage

The packaged cold light source should be stored at an atmospheric pressure of 870hPa~1060hPa, an ambient temperature of -20℃~55℃, and a relative humidity of

The temperature does not exceed 10% to 80%, no corrosive gas, cool, dry, well-ventilated and clean environment.

12. Treatment of waste and residues

Please do not throw away used batteries and hosts at will. The disposal of waste and residues should comply with the corresponding national laws and regulations.

13. Accessories list

serial number	name	quantity
1	Endoscope camera system host	1 set
2	power cable	1
3	handle camera	1
4	manual	1 serving

5	Three certificates	1 serving
6	Warranty Card	1 piece
7	Certificate	1 piece
8	Guide beam (optional)	1 item
9	Optical buckle (optional)	1
10	Optical lens (optional)	1
11	Fuse (spare)	2

Note: In different lens modes, please use matching optical lenses. Some lens matches are as follows:

14. After-sales service

Before calling for service, please perform the following simple checks. The following tips will help you save time.

Fault phenomenon	cause of issue	Solution
After turning on the power, the power indicator does not On, the camera system does not work	The power cord is not connected properly to the floor	Check the lines to make sure they are connected
No image, but power indicator is normal	1. The camera dust cover is not opened open	Open the camera dust cover
	2. The camera cable is not correct Insert into camera jack	Please find the correct jack direction and insert it.
	3. The monitor is damaged or its warranty protection mode automatic	Please contact the monitor manufacturer promptly
There is an image, the image is deformed and cannot be normal	1. The power supply is not single-phase three-wire connection	1. The signal is not grounded, causing distortion of the monitor image. Please

use	Ground power supply	Choose a single-phase three-wire grounded power supply
	2. Too many parallel devices	2. Signal attenuation increases due to too many devices being connected in parallel. Add obvious. Please reduce the amount of parallel devices or prohibit them from Get signal from other devices
There is an image, the image is very dark	1. Endoscope damaged	1. If the image becomes dim due to water ingress, aging, etc., please wait. Contact the endoscope manufacturer
	2. The cold light source is not bright enough or damage	2. Insufficient brightness causes the image in the field of view to be dim. Please adjust If it is damaged, please contact the cold light source manufacturer in time. connect
	3. The display brightness is not enough or damage	3. Please contact the monitor manufacturer promptly
There are images, but images bad color	Endoscope camera system parameters Not adjusted to optimal parameters	Adjust brightness, color, sharpness, clarity, contrast Degree, color, etc.

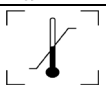
Our company implements three guarantees and quality tracking services for the products it sells:

1) From the date of sale, if the product cannot work normally due to product quality problems within 24 months, we will repair it for free for the user (except for consumables) outside). For failures caused by improper use or maintenance by the user, only the cost and postage will be charged.

2) Lifelong maintenance will be carried out on the products sold outside the three-guarantee period, and preferential fees will be charged according to the specific circumstances.

3) The user shall be solely responsible for any damage or accident caused by disassembling the product without the consent of the company.

15. Explanation of packaging identification symbols

	Note, refer to accompanying documentation		manufacturer
	BF type applied part equipment		up
	Production batch		Protect from rain
	Fragile items		temperature limit
	Sign for separate disposal of waste electrical and electronic equipment (please comply with local laws and regulations)		

16. Electromagnetic compatibility information

Electromagnetic Compatibility

Notice:

- The TU-LSD100A endoscope camera system complies with the electromagnetic compatibility requirements of the YY0505 standard.
- Users should install and use it according to the electromagnetic compatibility information provided in the accompanying documents.
- Portable and mobile RF communication equipment may affect the performance of the TU-LSD100A endoscope camera system, so avoid using it.

Avoid strong electromagnetic interference, such as being close to mobile phones, microwave ovens, etc.;

-Requirements for power cords and other accessories

The TU-LSD100A endoscopic camera system contains cables, when using these cables with the TU-LSD100A endoscopic camera system

Comply with the requirements of 36.202 in YY0505-2012. Requirements of cable manufacturer and model.

serial number	name	Cable length(m)	Whether to block	Remark
1	power cable	1.5m	no	/
2	handle camera	2.8m	no	/

-Guidance and manufacturer's declaration are detailed in the attachment.

Warning:

- The TU-LSD100A endoscope camera system should not be used close to or stacked with other equipment. If it must be used close to or stacked,

  If used, it should be observed and verified that it can operate normally under the configuration used.

- Class A equipment is intended to be used in industrial environments. Due to conductive and radiated disturbances from the TU-LSD100A endoscope camera system,

  There may be potential difficulties in ensuring electromagnetic compatibility in other environments.

- Except for cables sold by the manufacturer of the TU-LSD100A endoscope camera system as spare parts for internal components, the usage regulations

  Unspecified accessories and cables may cause increased emissions or reduced immunity of endoscope camera systems other than TU-LSD100A.

  Low.

- Even if other equipment meets the emission requirements of the corresponding national standards, the TU-LSD100A endoscopic camera system may still be

  Interference from other devices

appendix:

Guidance and Manufacturer's Statement – Electromagnetic Emissions		
The TU-LSD100A endoscope camera system is expected to be used in the electromagnetic environment specified below. The purchaser or user of the TU-LSD100A endoscope camera system should ensure that it is used in this electromagnetic environment:		
launch test	**Conformity**	**Electromagnetic environment – guidance**
GB4824 RF emissions	Group 1	The TU-LSD100A endoscope camera system is only for its internal function using RF energy. Therefore, its RF emissions are very low, And the possibility of causing interference to nearby electronic equipment is very small.
GB4824 RF emissions	Class A	TU-LSD100A endoscopic camera system is suitable for use in non-home Used and not directly connected to the domestic public low-voltage power supply network in all measures.
Gb17625.1 Harmonic emissions	not applicable	
GB17625.2 Voltage fluctuation/flicker emission	not applicable	

Guidance and Manufacturer's Statement – Electromagnetic Immunity			
The TU-LSD100A endoscope camera system is expected to be used in the electromagnetic environment specified below. The purchaser or user of the TU-LSD100A endoscope camera system should ensure that it is used in this electromagnetic environment:			
Immunity test	**GB9706 test level**	**compliance level**	**Electromagnetic environment – guidance**
Electrostatic discharge (ESD) **GB/T 17626.2**	±6 kV contact discharge ±8 kV air discharge	±6 kV contact discharge ±8 kV air discharge	The ground should be wooden material, concrete or ceramic tiles, If the floor is made of synthetic material material covering, the relative humidity Should be at least 30%.

electrical fast transient pulse group **GB/T 17626.4**	±2kV to power line ±1kV vs input/output Wire	±2kV to power line	The network power supply should have Typical business or hospital Quality of use in the environment.
surge **GB/T 17626.5**	±1 kV differential mode voltage ±2 kV common mode voltage	±1 kV differential mode voltage ±2 kV common mode voltage	The network power supply should have Typical business or hospital Quality of use in the environment.
Power on the power input line Voltage sag, short interruption and voltage changes **GB/T 17626.11**	<5%U_T, lasts 0.5 weeks (exist$U_T$on,>95% dip) 40%U_T, lasts 5 weeks (existU_TOn, 60% of the temporary drop) 70%U_T, lasts 25 week (existU_TUp, 30% temporary drop) <5%U_T, lasts 5s (exist$U_T$on,>95% dip)	<5 % UT, lasting 0.5 weeks (on UT, >95% dip) 40% UT for 5 weeks (On UT, 60% of dip) 70 % UT for 25 week (on UT, 30% of dip) <5 % UT, lasting 5s (On UT, >95% dip)	The network power supply should have typical business or hospital environment Lower quality of use. if TU-LSD100A inside view Mirror camera system users During a power outage it is necessary to For continuous operation, it is recommended TU-LSD100A inside view The mirror camera system uses no Intermittent power supply or battery power supply electricity.
Power frequency magnetic field (50/60Hz) **GB/T 17626.8**	3A/m	3A/m	Power frequency magnetic field should be equipped There are in typical business or Typical field in hospital environment

			The power frequency magnetic field level characteristic.
Note:U_TRefers to the AC network voltage before applying the test voltage			

Guidance and Manufacturer's Statement – Electromagnetic Immunity			
The TU-LSD100A endoscope camera system is expected to be used in the electromagnetic environment specified below. The purchaser or user of the TU-LSD100A endoscope camera system should ensure that it is used in this electromagnetic environment.			
Immunity test	**GB9706 test battery**	**compliance level**	**Electromagnetic environment – guidance**
RF conduction GB/T 17625.6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment are not Any parts of the TU-LSD100A endoscopic camera system should be closer than the recommended isolation distance. any part used, including cables. This distance should be Formula calculation corresponding to transmitter frequency. **Recommended isolation distance** $d=1.2P\sqrt{\ }$
RF radiation GB/T 17626.3	3V/m 80 MHz to 2.5 GHz	3V/m	$d=1.2\sqrt{P}$ 80 MHz to 800 MHz $d=2.3\sqrt{P}$ 800 MHz to 2.5 GHz in,$P$is based on the transmitter manufacturer's Maximum output power rating of the supplied transmitter, in watts Special (W) is the unit,$d$is the recommended isolation distance Distance, in meters (m).[b] Field strengths from fixed RF transmitters pass through Electromagnetic field survey[a]to determine, at each frequency scope[b]should be lower than the compliance level. May be used near equipment marked with the following symbols Interference may occur. 

Note 1: At 80MHz and 800MHz frequencies, the formula for the higher frequency band is used.

Note 2: These guidelines may not be suitable in all situations. Electromagnetic propagation is affected by absorption and reflection from buildings, objects and human bodies.

a The field strengths of fixed transmitters such as base stations for wireless (cellular/cordless) telephones and land mobile radios, amateur radio, AM (amplitude modulation) and FM (frequency modulation) radio broadcasts, and television broadcasts are not theoretically accurate. Foreknowledge. To assess the electromagnetic environment of fixed RF transmitters, a survey of the electromagnetic field should be considered. If the measured field strength of the location where the TU-LSD100A endoscope camera system is located is higher than the RF compliance level for the above application, the TU-LSD100A endoscope camera system should be observed to verify its normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the TU-LSD100A endoscopic camera system.

b In the entire frequency range of 150KHz ~ 80MHz, the field strength should be less than 3 V/m.

Recommended isolation distance between portable and mobile RF communications equipment and TU-LSD100A endoscopic camera system

The TU-LSD100A endoscopic camera system is intended for use in an electromagnetic environment where radiated RF disturbance is controlled. in accordance with

The maximum output power of communication equipment, purchasers or users of TU-LSD100A endoscopic camera system can pass the following

Recommended maintenance of portable and mobile RF communication equipment (transmitters) and TU-LSD100A endoscopic camera system

minimum distance to prevent electromagnetic interference.

The transmitter is rated for a maximum	**Isolation distance corresponding to different frequencies of transmitter/m**		
Output power/W	**150kHz～80M**	**80MHz～800**	**800 MHz ~ 2.5**

	Hz $d = 1.2\sqrt{P}$	**MHz** $d = 1.2\sqrt{P}$	**GHz** $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	twenty three

For transmitters rated maximum output power not listed above, recommended isolation distances*d*, in meters (m)

bit, can be determined using the formula in the corresponding transmitter frequency column, here*P*s provided by the transmitter manufacturer

The maximum output power rating of the machine, in watts (W).

Note 1: At frequencies 80 MHz and 800 MHz, the formula for the higher frequency range applies.

Note 2: These guidelines may not be suitable in all situations. Electromagnetic propagation is absorbed by buildings, objects and human bodies.

and reflection effects.