# IC-U20SR

# *PRODUCT GUIDE*

# PREFACE

This product guide is made to promote our new product, the IC-U20SR transceiver. The new product's outline and specifications are described in this document, and you will understand the target users, built-in functions, and sales points of this transceiver.
This product guide is for dealer sales staffs who are going to sell this transceiver for the first time and have already sold Icom analog mode products.

Icom hopes this product guide will help you to promote sales of the IC-U20SR transceiver.

**Trademarks**

# TABLE OF CONTENTS

# SECTION 1    PRODUCT OUTLINE

## 1-1    ABOUT THE IC-U20SR TRANSCEIVER

The IC-U20SR transceiver is a PMR446 handheld transceiver. This model is designed assuming light mission users for short-range communication. This model has been designed to be rugged, even in this product class, and includes practical functions for the targeted market.

This transceiver is useful for various situations, for example, in restaurant, warehouse, or private use for short-range communications.



Restaurant

Warehouse
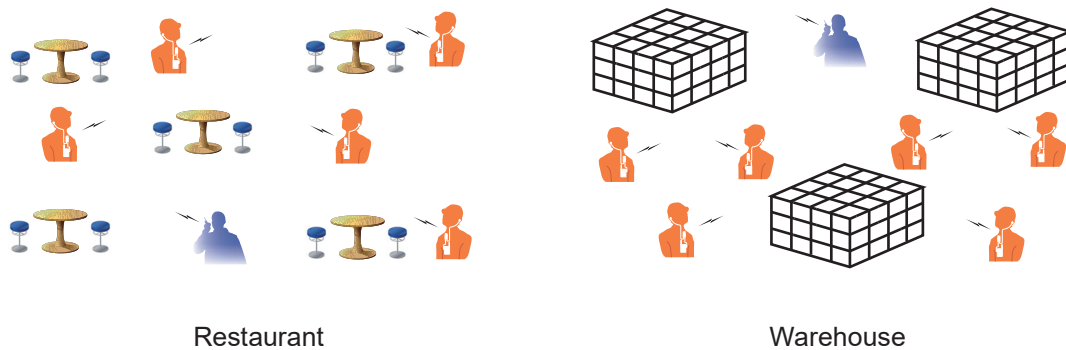
The fixed antenna on the IC-U20SR is designed at the optimum length for good communication performance and to be easy to carry.

## 1-2    SELLING POINTS

**• SMALL SIZE AND LIGHT WEIGHT**

The IC-U20SR is designed to be lighter in weight and smaller than the existing IC-F27SR and IC-F29SR2 PMR446 transceivers. Therefore, users can easily carry this transceiver in their pocket.

|  |  |  |
|---|---|---|
| 94.0 mm / 50.0 mm | 111.5 mm / 58.6 mm | 111.8 mm / 52.2 mm |
| 26.7 mm | 38.3 mm | 39.0 mm |
| IC-U20SR | IC-F27SR | IC-F29SR2 |
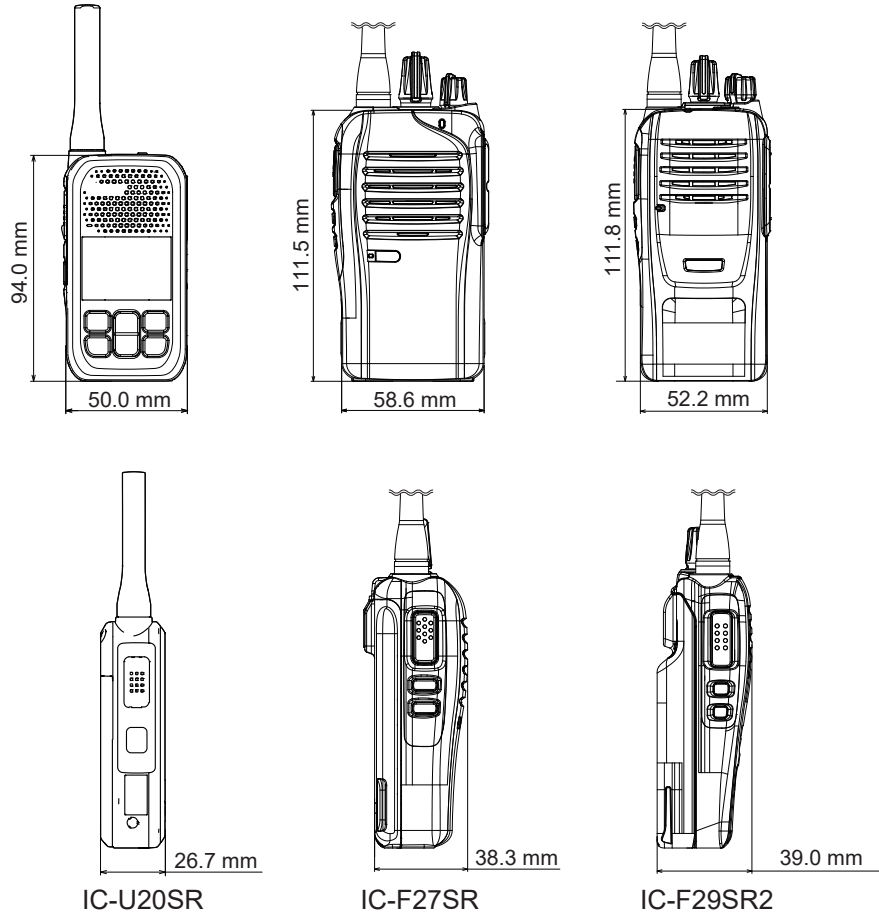
**The IC-U20SR's comparisons of size volume and weight**

| Comparison model | IC-U20SR<br>Size (H: 94.0 × W: 50.0 × D: 26.7 mm)<br>Weight (157 g with BP-304A) | |
|---|---|---|
| | Size volume ratio | Weight ratio |
| **IC-F27SR**<br>Size (H: 111.5 × W: 58.6 × D: 38.3 mm)<br>Weight (340 g with BP-264) | 50% | 54% |
| **IC-F29SR2**<br>Size (H: 111.8 × W: 52.2 × D: 39.0 mm)<br>Weight (270 g with BP-280) | 45% | 42% |

## • EASY OPERATION

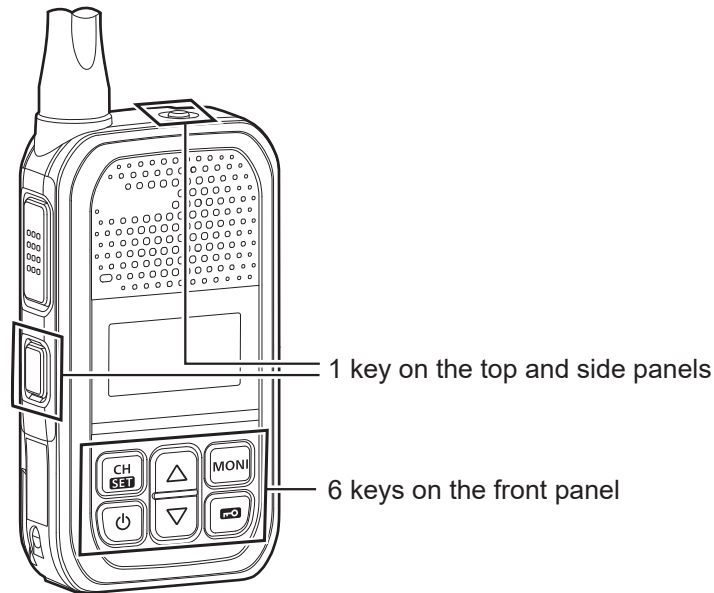The IC-U20SR has 6 keys on the front panel, and 1 each on the top and side panel.
Only one function is assigned to each key, except [CH/SET]. So, users can easily to operate the IC-U20SR.

1 key on the top and side panels

6 keys on the front panel

## • IP54 CONSTRUCTION

The IC-U20SR is rated at the IP54 protection level. Therefore, this transceiver can be used outside.

## • A USB PORT

Charging the installed battery pack is done with the supplied power adapter or other USB charger. The charging period may differ, depending on the charging current of the charging device.
**NOTE:** The USB port is only for battery charging, not for data communication.

The installed battery pack can be charged through the USB port on the side panel.
USB connector type: USB Type-C™
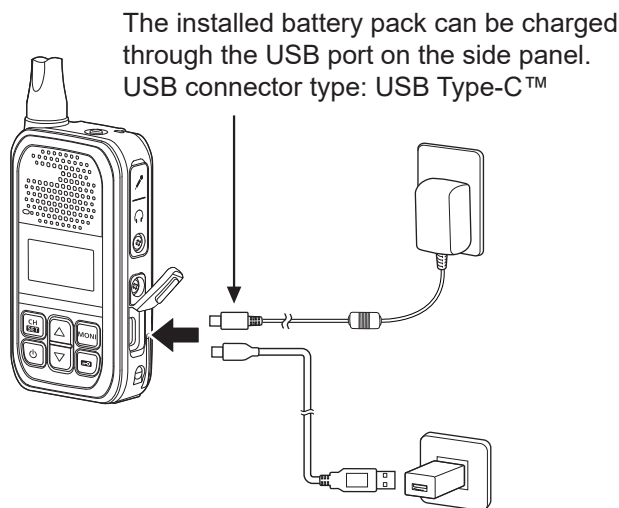
• The charging period is approximately 5.5 hours.

**• PROGRAMMABLE KEYS**

The IC-U20SR has 2 programmable keys on the top and side panels.
The Emergency function, Smart-Ring/Call-Ring function, Scan Start/Stop, or the Surveillance function can be assigned to these keys.

Programmable keys
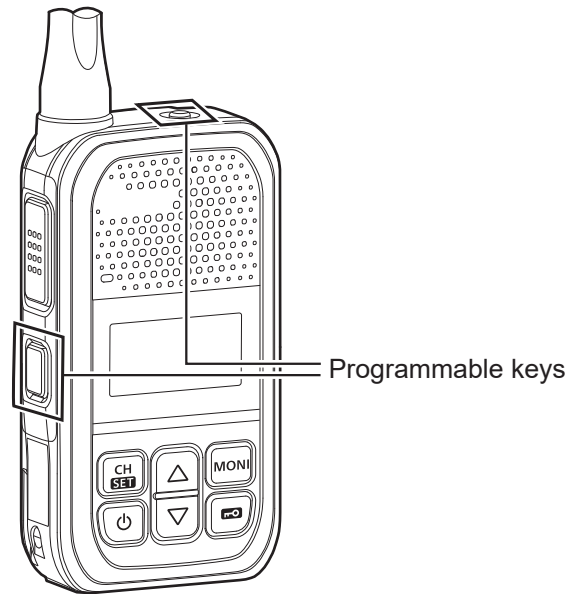
**• HIGH AUDIO OUTPUT POWER**

A 28 mm (1.1 inches) diameter speaker is installed.
The speaker provides 0.5 W high audio output, even in the small body.
Speaker sound pressure level: 83 dB ±3 dB (1 W/0.5 m at 1 kHz)

28 mm (1.1 inches) diameter speaker

FRONT panel back view

## 1-3    PANEL DESCRIPTION

[Top]*

[PTT]

[Side]*

• Entering the Channel
  select mode
• Entering the Set mode
  (Hold down for 1 second)

Power key

Monitor function

Key Lock function
(Hold down for 1 second)

• Audio level setting
• Channel select
  (in the Channel select mode)
• Set mode item select
  (in the Set mode/Key Assignment mode)

Speaker-microphone jack

[USB] port

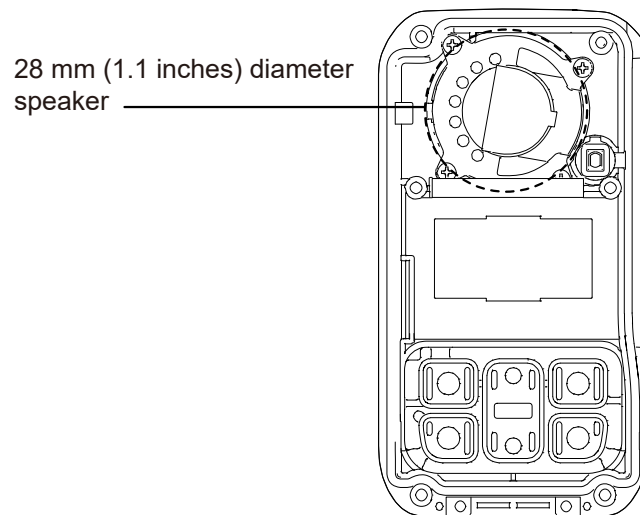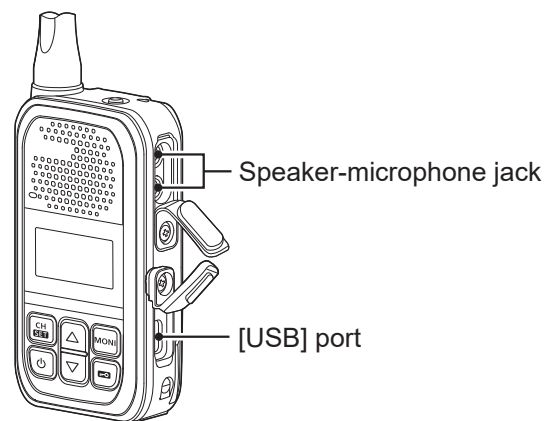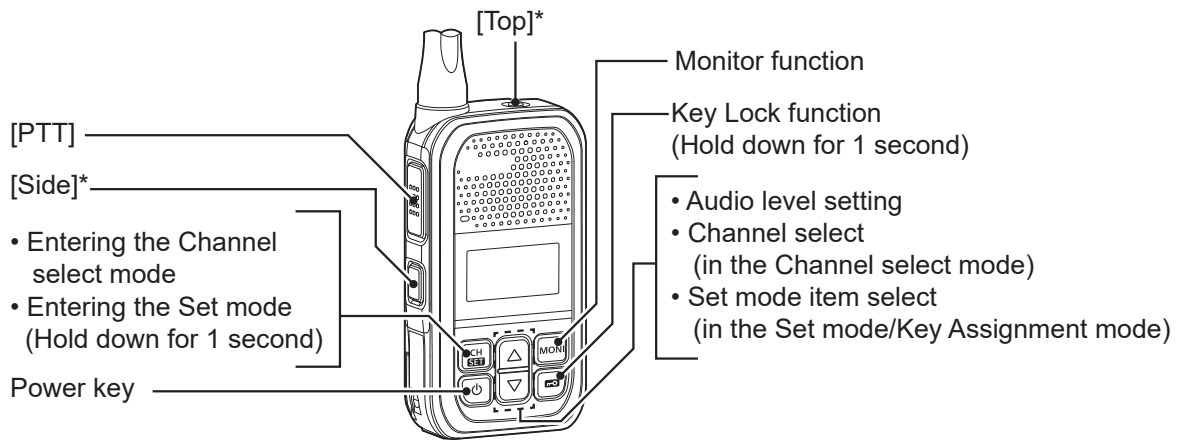*[Top] and [Side] are programmable keys, and the function can be assigned using the optional CS-U20SR programming software or the transceiver operation as follows.

1. Turn OFF the transceiver.
2. While holding down [▭] and [Top], push [⏻] to enter the Key Assignment mode.
   • "KYST" is displayed.

3. Push [Side] or [Top] to select the key that operators want to assign the function to.
4. Push [▲] or [▼] to select a desired key function.
   • There are 5 options as follows.
   1: Null, 2: Emergency, 3: Scan Start/Stop, 4: Surveillance, 5: S-Ring/C-Ring

When the surveillance function
is assigned to [Side].

When the scan function
is assigned to [Top].

5. Push [⏻] to turn OFF the transceiver and exit the Key Assignment mode.

## 1-4    FUNCTION DISPLAY DESCRIPTION



(1)

(2)
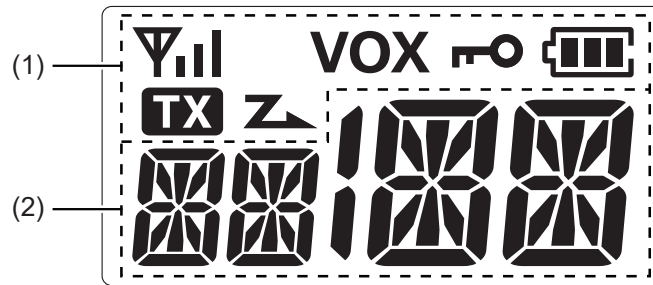
**(1) Icon area**
Displays the icons shown below.

| Icon | Description |
|------|-------------|
|  | • Displayed while the channel is busy (receiving a signal).<br>• Blinks while the monitor function is turned ON. |
|  | Displays the relative receive signal strength level. |
| **VOX** | Displayed when the VOX function is turned ON. |
|  | Displayed when the Key Lock function is ON. |

| Icon | Description | | | |
|------|-------------|---|---|---|
|  | • Blinks while charging.<br>• Displays the remaining battery charge. | | | |
| | Full | Mid | Charging required | Battery exhausted |
| **TX** | Displayed while transmitting. | | | |
|  | • Displayed when the channel is selected as a Scan Target channel.<br>• Blinks while scanning. | | | |

**(2) Alphanumeric readout**
Displays channel number, audio level, or Set mode item.

## 1-5    DIMENSIONS

156.0 mm

94.0 mm

50.0 mm

26.7 mm
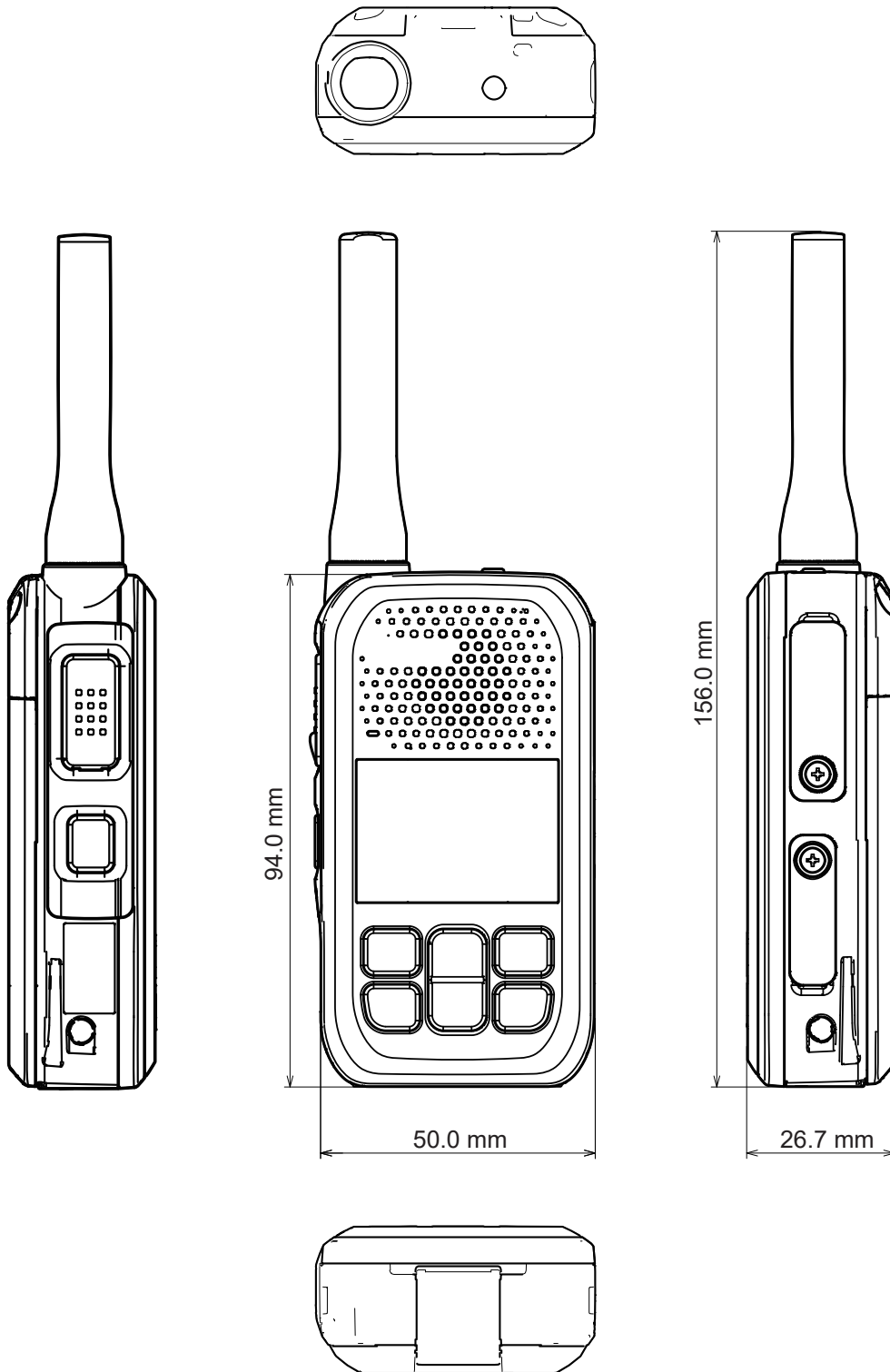
## 1-6    TARGET USERS



Supermarkets



Restaurants



Education Institutions



Event halls



Touring



Hiking

# SECTION 2    PRODUCT RANGE

The IC-U20SR transceiver is positioned as the low-tier PMR446 hand-held transceiver, as shown on the positioning map below.
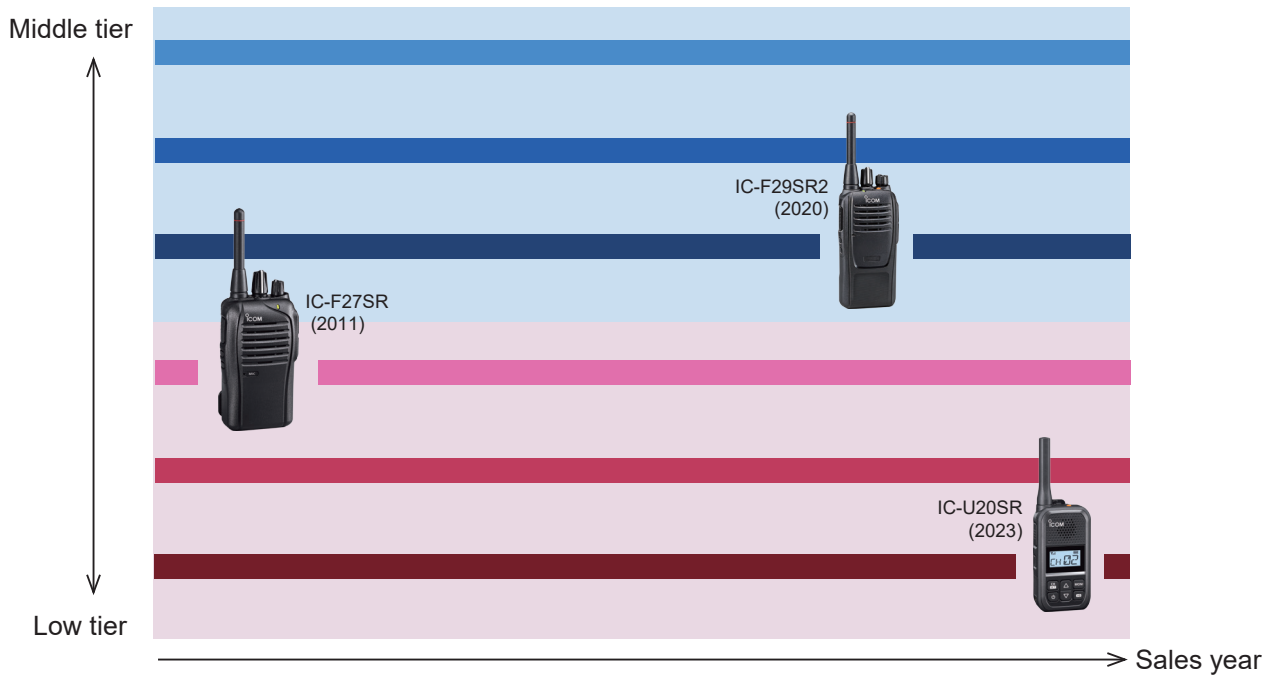
# SECTION 3    COMPARISON WITH OTHER ICOM MODELS

## 3-1    FUNCTION COMPARISON

| | IC-U20SR | IC-F27SR | IC-F29SR2 |
|---|---|---|---|
| SIGNALING | | | |
| CTCSS | YES | YES | YES |
| DTCS | YES | YES | YES |
| EMERGENCY AND SECURITY FUNCTIONS | | | |
| Voice scrambler | NONE | NONE | YES |
| Emergency call | YES (TX only)* | NONE | NONE |
| Lone Worker function | YES (TX only)* | NONE | NONE |
| Surveillance function | YES | YES† | YES |
| CHANNEL ANNOUNCEMENT AND VOX FUNCTIONS | | | |
| Channel Announcement function | YES | NONE | YES |
| VOX function | YES | YES | YES |
| SMART-RING CALL/CALL-RING CALL | | | |
| Smart-Ring Call | YES | NONE | YES |
| Call-Ring Call | YES | NONE | YES |
| HARDWARE | | | |
| Number of programmable keys | 2 keys | 2 keys | 3 keys |
| Compatible IP rating | IP54 | IP54 | IP67 |

*An MDC 1200 compatible transceiver is necessary for receiving.
†Programming is required.

## 3-2    SPECIFICATION COMPARISON

| | IC-U20SR | IC-F27SR | IC-F29SR2 |
|---|---|---|---|
| **GENERAL** | | | |
| **Frequency coverage (MHz)** | 446.00625~446.19375 | 446.00625~446.19375 | 446.00625~446.19375 |
| **Number of channels** | 16 | 16 | 32 |
| **Power source voltage (Negative ground)** | 3.6 V DC nominal | 7.2 V DC nominal | 7.5 V DC nominal |
| **Current drain (Approximate) RX** | 0.8 A maximum | 0.33 A (Internal speaker) | 0.5 A (Internal speaker) |
| **TX** | 1.0 A maximum | 0.4 A | 0.5 A |
| **Dimensions (projections not included: H×W×D)** | 94.0 × 50.0 × 26.7 mm | 111.5 × 58.6 × 38.3 mm (with the BP-264) | 111.8 × 52.2 × 39.0 mm (with the BP-280) |
| **Weight (Approximate)** | 157 g (with the BP-304A) | 340 g (with the BP-264) | 270 g (with the BP-280) |
| **TRANSMITTER** | | | |
| **Rated output power** | 0.5 W ERP | 0.5 W ERP | 0.5 W ERP |
| **Maximum permissible frequency deviation** | ±2.5 kHz | ±2.5 kHz | ±2.5 kHz |
| **Frequency error** | ±500 Hz | ±2.5 ppm | ±2.5 ppm |
| **Spurious emissions ≤1 GHz** | 0.25 µW maximum, 0.01 µW typical | 0.25 µW | 0.25 µW |
| **>1 GHz** | 1.00 µW maximum, 0.01 µW typical | 1.00 µW | 1.00 µW |
| **Adjacent channel power** | 60 dB minimum, 63 dB typical | 60 dB | 60 dB |
| **Audio harmonic distortion** | 5.0% maximum (at AF 1 kHz 40% Deviation) | 1.0% typical (at AF 1 kHz 60% Deviation) | 1.0% typical (at AF 1 kHz 60% Deviation) |
| **Limiting characteristics of the modulator** | 70%~100% of maximum deviation | 60%~100% of maximum deviation | 60%~100% of maximum deviation |
| **RECEIVER** | | | |
| **Sensitivity (20 dB SINAD)** | −118 dBm typical | −117 dBm | −117 dBm |
| **Audio power output Internal SP** | 0.6 W typical at 5 % distortion into the 4 Ω load | 0.8 W typical at 5 % distortion into the 12 Ω load | 1.5 W typical at 5 % distortion into the 8 Ω load |
| **External SP** | 0.15 W typical at 5% distortion into an 8 Ω load | 0.4 W typical at 5 % distortion into an 8 Ω load | • 0.4 W typical at 5 % distortion into an 8 Ω load • 1.5 W typical at 5 % distortion into the HM-222HLWP |
| **Adjacent channel selectivity** | 55 dB minimum, 65 dB typical | 81.29 dBµV/m | 81.29 dBµV/m |
| **Intermodulation** | 50 dB minimum, 54 dB typical | 86.29 dBµV/m | 86.29 dBµV/m |
| **Hum and Noise (with a CCITT filter)** | 40 dB minimum, 48 dB typical | 47 dB typical | 47 dB typical |
| **Squelch sensitivity (Threshold)** | −123 dBm typical | −117 dBm typical | −121 dBm typical |

Specifications: Measurements made in accordance with EN300 296 procedures.

# SECTION 4    COMPARISON TO COMPETITORS

## 4-1    FUNCTION COMPARISON

| | IC-U20SR | PKT-23E/T | XT420 |
|---|---|---|---|
| **SIGNALING** | | | |
| CTCSS | YES | YES | YES |
| DTCS | YES | YES | YES |
| **EMERGENCY AND SECURITY FUNCTIONS** | | | |
| Emergency call | YES (TX only)* | NONE | NONE |
| Lone Worker function | YES (TX only)* | NONE | NONE |
| Surveillance function | YES | NONE | NONE |
| **CHANNEL ANNOUNCEMENT AND VOX FUNCTIONS** | | | |
| Channel Announcement function | YES | YES | YES |
| VOX function | YES | YES | YES |
| **SCAN FUNCTION** | | | |
| SCAN function | YES | YES | YES |
| **HARDWARE** | | | |
| Channel number display | YES | NONE | NONE |
| Number of programmable keys | 2 keys | 2 keys | 2 keys |
| Compatible IP rating | IP54 | IP54 | IP55 |

*An MDC 1200 compatible transceiver is necessary for receiving.

## 4-2    SPECIFICATION COMPARISON

| | IC-U20SR | PKT-23E/T | XT420 |
|---|---|---|---|
| **GENERAL** | | | |
| **Frequency coverage (MHz)** | 446.00625~446.19375 | 446.00625~446.19375 | 446.00625~446.19375 |
| **Number of channels** | 16 | 8 | 16 |
| **Operating temperature range** | −30ºC to +60ºC | −10ºC to +60ºC | −30ºC to +60ºC |
| **Dimensions (projections not included: H×W×D)** | 94.0 × 50.0 × 26.7 mm | 85.0 × 46.0 × 21.0 mm | 116.0 × 58.0 × 40.0 mm |
| **Weight** | 157 g | 110 g | 244.0 g |
| **TRANSMITTER** | | | |
| **Rated output power** | 0.5 W ERP | 0.5 W ERP | 0.5 W |
| **Spurious emissions** **≤1 GHz** | 0.25 µW maximum, 0.01 µW typical | 0.25 µW | 0.25 µW |
| **Spurious emissions** **>1 GHz** | 1.00 µW maximum, 0.01 µW typical | 1.00 µW | 1.00 µW |
| **Audio harmonic distortion (at AF 1 kHz 40% Deviation)** | 5.0% maximum | 5.0% or less | 2.0% or less |
| **FM Hum and Noise (without a CCITT filter)** | 40 dB minimum, 56 dB typical | 50 dB | −45 dB or less |
| **RECEIVER** | | | |
| **Sensitivity** | 0.28 µV typical (20 dB SINAD) | 0.45 µV (20 dB SINAD) | 0.18 µV (12 dB SINAD) |
| **Audio power output** | 0.6 W typical at 5 % distortion into the 4 Ω load | 0.3 W at 5% distortion into the 4 Ω load | 1.5 W with 5% distortion into the 8 Ω load |
| **Adjacent channel selectivity** | 55 dB minimum, 65 dB typical | 60 dB | 70 dB |
| **Intermodulation** | 50 dB minimum, 54 dB typical | 60 dB | 70 dB |

Specifications: Measurements made in accordance with EN300 296 procedures.

# SECTION 5    MAJOR FUNCTION INTRODUCTION

The major functions of the IC-U20SR transceiver based on the main firmware Rev. 1.0 are described as follows.
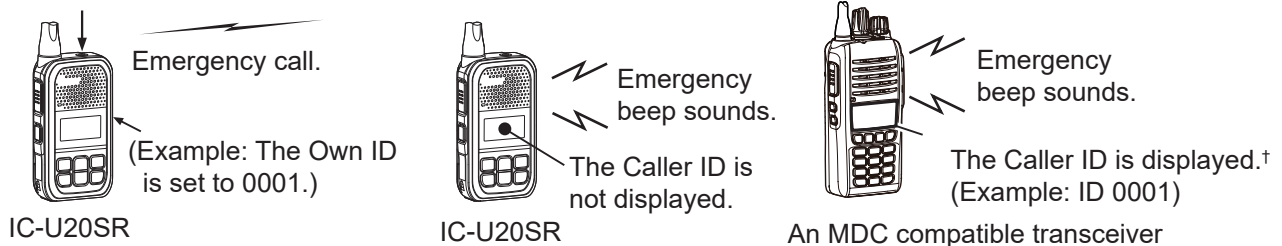
## 5-1    EMERGENCY CALL

The IC-U20SR can make an Emergency call by the following two methods.

**• Using [Emergency]**
Hold down **[Emergency]** on the top panel for 2 seconds* (default setting), and the IC-U20SR enters the Emergency mode.
When the Reminder Timer* (default setting is 0 seconds) time has passed, the IC-U20SR makes an Emergency call.
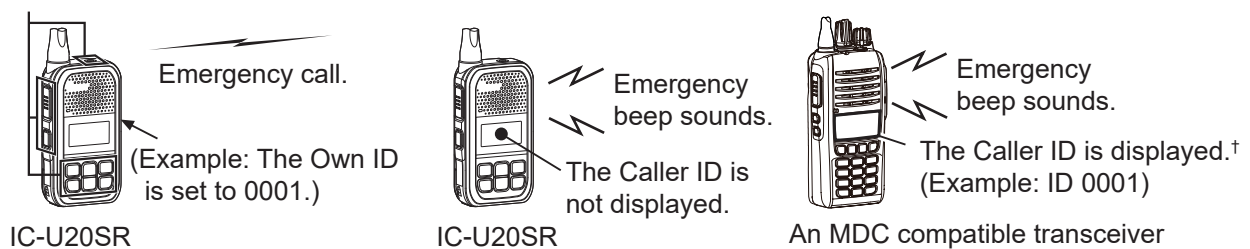
Hold down **[Emergency]** to make an Emergency call.

Emergency call.

(Example: The Own ID is set to 0001.)

IC-U20SR

Emergency beep sounds.

The Caller ID is not displayed.

IC-U20SR

Emergency beep sounds.

The Caller ID is displayed.[†] (Example: ID 0001)

An MDC compatible transceiver

**• Lone Worker**
When no key operation is performed for the ON Timer preset time (default setting: 60 minutes*),
the IC-U20SR enters the Emergency mode, and the countdown starts. When the countdown time set in the Reminder Timer (default setting: 60 seconds*) has passed, the IC-U20SR makes an Emergency call.

No key operation is performed.

Emergency call.

(Example: The Own ID is set to 0001.)

IC-U20SR

Emergency beep sounds.

The Caller ID is not displayed.

IC-U20SR

Emergency beep sounds.

The Caller ID is displayed.[†] (Example: ID 0001)

An MDC compatible transceiver

The MDC 1200 signal is used for the IC-U20SR Emergency call. However, the IC-U20SR does not have an MDC 1200 decoder, so another transceiver with an MDC 1200 decoder, such as the IC-F2000T, is necessary to know who is in an emergency state.

*The setting period can be changed using the CS-U20SR.
[†]The Caller ID can only be displayed on an MDC 1200 compatible transceiver.

## 5-2　　CALL-RING FUNCTION

The Call-Ring function calls the same group's transceiver operators by sounding the preset ringer.

This function is useful when the Caller operator wants to notice to start communication for the same group members, or when a voice call is difficult during events such as concerts.
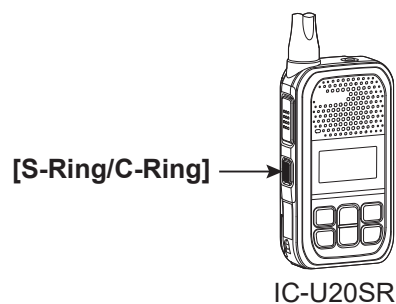
It is recommended to use a different ringtone for each group. Users can identify the group by the ringtone. The ringer can be set in the Call-Ring Pattern item in the User Set mode.
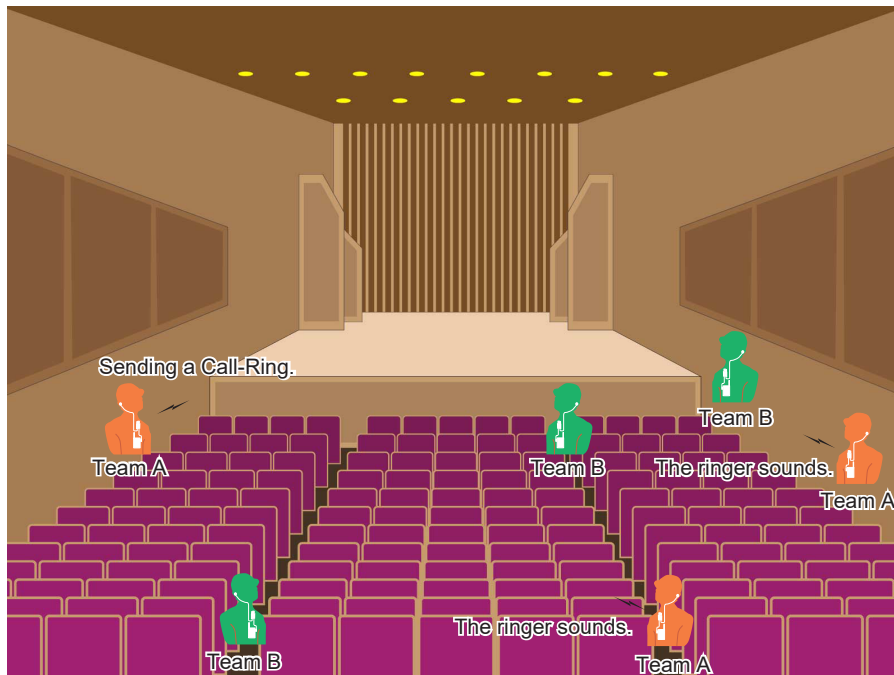


**Call-Ring Operation**
Keep holding down **[S-Ring/C-Ring]** for at least 1 second to send the preset ringer.
• The same ringer sounds from your group member's speaker.



IC-U20SR

**NOTE:** To use this function, the operating channel and CTCSS tone or DTCS code must be the same on all of the operator group's transceivers.
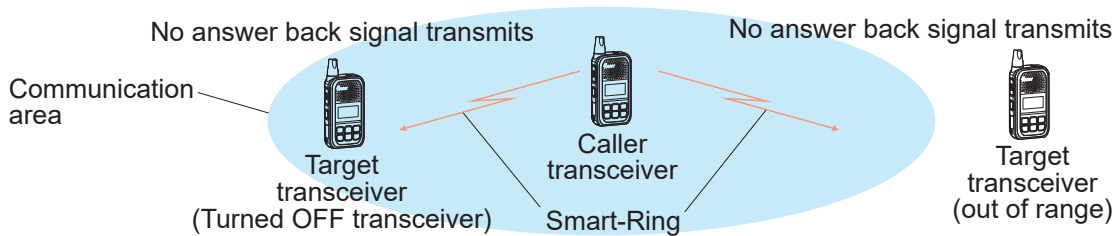
## 5-3    SMART-RING FUNCTION

The Smart-Ring function notifies whether some transceivers are within range or out of range. Target transceivers that receive a Smart-Ring call sound the Ringer melody.
The Target transceivers automatically send an answer back signal to the Caller transceiver.

This function is helpful to know whether the target transceivers are in an operable area/state before making a call.
The Target transceivers are in an operable area/state when an answer back signal is received.

Answer back signal    Answer back signal

Communication area

Caller transceiver

Target transceiver        Target transceiver
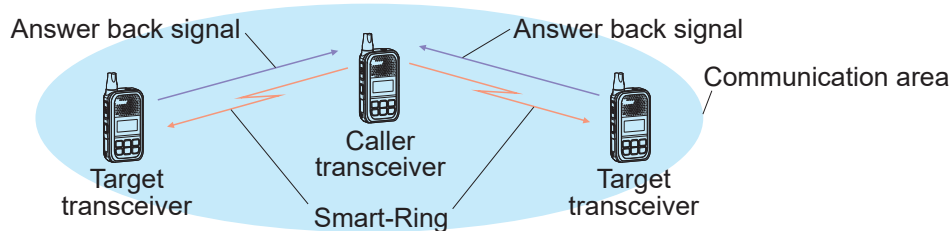
Smart-Ring

When no answer back signal is received, the transceivers are out-of-range or inoperable.

No answer back signal transmits        No answer back signal transmits

Communication area

Caller transceiver

Target transceiver (Turned OFF transceiver)        Target transceiver (out of range)

Smart-Ring

**Smart-Ring Operation**
Push **[S-Ring/C-Ring]** to make a Smart-Ring call.
• The "**TX**" icon is displayed.
• When an answer back signal is received, the Caller transceiver sounds the Ringer melody and displays "SR OK."
  Push any key to stop the Ringer melody.
  When the Target transceivers receive the Smart-Ring call, the transceivers also sound the Ringer melody and display "SR OK."
• When no answer back signal is received, the Caller transceiver sounds three short failure beeps and displays "SR NG."

**[S-Ring/C-Ring]** →

IC-U20SR (Caller transceiver)

When an anwer back signal is received, "SR OK" is displayed.

When no anwer back signal is received, "SR NG" is displayed.
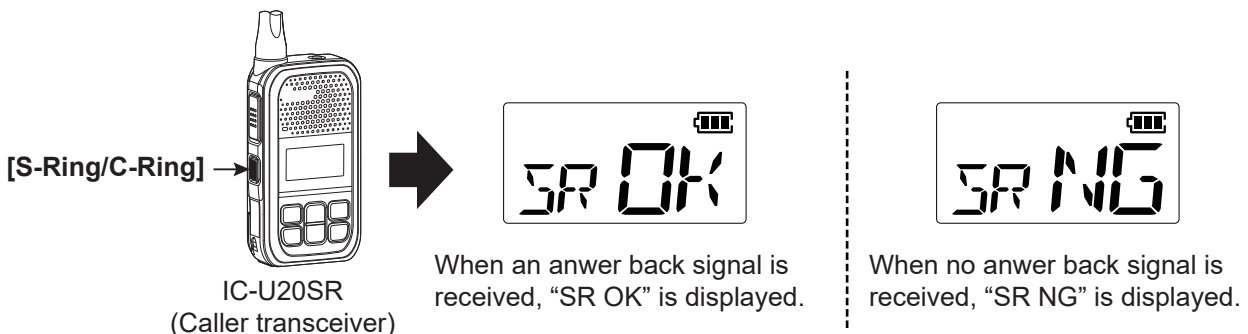
**NOTE:**
• To use this function, the operating channel and CTCSS tone must be the same on all of the operator group's transceivers.
• This function can be operated for channels which CTCSS tone is set for.

# SECTION 6    OPTIONAL ACCESSORIES

Current (as of July 2023) optional accessories available for the IC-U20SR transceiver are shown below.

**CHARGER**

• **BC-262**
  (Same as the supplied chager)



**Specification**

| | |
|---|---|
| Input voltage | 5.0 V±0.25 V DC |
| Output voltage | 4.9 V±0.25 V DC (500 mA load) |
| Operating temperature range | 0°C~+45°C |
| Dimentions | 75 (W) × 38 (H) × 50 (D) mm (Projections not included) |
| Weight | Approximately 46 g |
| USB connector type | USB Type-C™ |

**BATTERY PACK**

• **BP-304A** (3.6 V DC, Minimum: 2270 mAh, Typical: 2350 mAh)
      (Same as the supplied battery pack)



**BELT CLIP**

• **MB-127**

## MICROPHONES

| | |
|---|---|
| • **HM-183LS** | • **HM-186LS** |
| Speaker-microphone | Speaker-microphone |
| (Water and dust proof: IP67, | (An ear phone connectable microphone) |
| Cable length: Approximately 0.52 m*) | (Water and dust proof: IP54, |
| | Cable length: Approximately 0.52 m*) |



| | |
|---|---|
| • **HM-166LS** | • **HM-153LS** |
| Tie-pin microphone with earphone | Tie-pin microphone with earphone |
| (Cable length: Approximately 1.00 m, | (Cable length: Approximately 1.00 m, |
| Ear phone cable length: Approximately 0.45 m) | Ear phone cable length: Approximately 0.5 m) |



*When curled.

## HEADSETS AND ADAPTER CABLES

- **HS-94**
  Earhook type with boom microphone
  (Cable length: Approximately 0.8 m,
   Boom length: Approximately 0.1 m)

- **HS-95**
  Behind head type
  (Cable length: Approximately 1.00 m,
   Boom length: Approximately 0.12 m)

- **HS-97**
  Throat Microphone type
  (Cable length: Approximately 0.8 m,
   Microphone cable length: Approximately 0.23 m)

- **OPC-2006LS**
  Adapter cable for HS-94, HS-95, and HS-97
  (Cable length: Approximately 0.13 m)

- **OPC-2328**
  Adapter cable with the PTT switch for HS-94,
  HS-95, and HS-97
  (Cable length for transceiver:
   Approximately 0.77 m,
   Cable length for headset:
   Approximately 0.14 m)

Revision record

| Version | Month/Year | The revised contents |
|---------|------------|----------------------|
| Version 1.0 | July 2023 | First issue. |

How the World Communicates