

TTA Standard  
TTAS.KO -06.0028/R2

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# Standard on I/O Connection Interface of Digital Cellular Phone



Telecommunications  
Technology Association

# Preface

## 1. Purpose

This standard aims to enhance the facilitation of recharging batteries and connecting between digital cellular phone(800MHz or 1.8GHz) and other auxiliary equipments, and recommends the specification on input/output connection interface of cellular phone

## 2. References

2.1 International : None

2.2. Domestic : TTAS.KO-06.0028/R1, TTAS.KO-06.0029, TTAS.KO-06.0030

3. The relation of International recommendation or standard : None

4. The statement of Intellectual Property Rights : None

5. The statement of Conference Testing and Certification :

- We apply this standard currently and are doing the certification of a charger.
- The examination standard has TTAS.KO-06.0029, TTAS.KO-06.0030/R1.

## 6. History

Version	Issued Date	Contents
1.0	2001. 3. 7.	Published
2.0	2001. 12. 3.	Revised
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# CONTENTS

1. Introduction	1
2. Functions of I/O Interface for Digital Cellular Phone	1
2.1 Function of Battery Recharging	1
2.2 Functions of Hands Free	2
2.3 Functions of Data Communication	2
2.4 Other Functions	3
3. Functional Pin Allocation of I/O Interface for Digital Cellular Phone	3
4. Mechanical Specifications of I/O Connector for Digital Cellular Phone	5
4.1 Specifications of Outer Part for Connection Socket	5
4.2. Specifications of Keys for Connection Socket	6
4.3 Specifications of Locking Part for Connection Socket	6
4.4 Specifications of Pin Arranging Part for Connection Socket	7
4.5 Specifications of Detail Part for Connection Plug	7
4.6 Shape of Connection Socket	8
5. Acronyms	9

## 1. Introduction

This standard recommends connection standard of input & output terminal of mobile phone for the purpose of maximizing availability of mobile terminal by make it easy to charge the battery of digital mobile phone terminal(800MHz and 1.8GHz) and interface with other external peripheral devices.

## 2. Functions of I/O Interface for Digital Cellular Phone

The following <Table 2-1>, <Table 2-2>, <Table 2-3>, <Table 2-4> and <Table 2-5> are signal names of input & output terminal pin by functions of mobile phone terminals used for this standard.

### 2.1 Function of Battery Recharging

<Table 2-1> Signal names of input and output terminal pins for charging functions

Pin No.	Signal Name	Description
1	BATTERY ID	<ul style="list-style-type: none"><li>* 27k<math>\Omega</math>:450mA and 4.7k<math>\Omega</math>:750mA(1.5k<math>\Omega</math>:900mA is optional)</li><li>* ID resistance value error : <math>\pm 10\%</math></li><li>* Charging current Tolerance : <math>\pm 50\text{mA}</math></li><li>* All of 3 battery ID resistance values (27k<math>\Omega</math>, 4.7k<math>\Omega</math>, 1.5k<math>\Omega</math>) should be able to detected.</li><li>* If 900mA is not output, 1.5k<math>\Omega</math> is perceived, but 750mA should be output.</li></ul>
21, 22	POWER (+4.2V)	Charging circuit external terminal supply power
4, 5	POWER (+5.0 -5.5V)	Charging circuit internal terminal supply power
12, 19	POWER GROUND	Negative ground

## 2.2 Functions of Hands Free

<Table 2-2> Signal names and descriptions of I/O pins for hands-free functions

Pin No.	Signal Name	Description
7	AUDIO IN	Analogue hands-free voice signal input
11	AUDIO OUT	Analogue hands-free voice signal output
7	PCM RX	Digital hands-free voice signal input
11	PCM TX	Digital hands-free voice signal output
8	PCM CLOCK	PCM clock for Digital hands-free
9	PCM SYNC	PCM synchronization signal for Digital hands-free
2	H A N D S - F R E E MODE	High signal : hands-free mode/ Low signal : phone mode

## 2.3 Functions of Data Communication

<Table 2-3> Signal names and descriptions of I/O pins for data communication functions

Pin No,	Signal Name	Description
3	DSR	Data Set Ready
13	RXD	Received Data
14	TXD	Transmitted Data
18	RI	Ring Indicator
17	DCD	Data Carrier Detect
20	RFR : RTS	Ready For Receiving : Request To Send
23	CTS	Clear To Send
24	DTR	Data terminal Ready

## 2.4 Other Functions

<Table 2-4> Signal Names and Descriptions of I/O pins for other functions

Pin No.	Signal Name	Description
6	ON SWITCH	Limited for the test in PCB manufacturing process
10	USB D-	USB data signal
15	USB D+	USB data signal
16	USB POWER	USB power input(T/R built-in type: +5V)
21, 22	SWITCHED BATTERY(+)	Phone battery can supply power to peripheral devices through these pins.

## 3. Functional Pin Allocation of I/O Interface for Digital Cellular Phone

The input and output connector of digital cellular phone should have 24 pins, and all of the functional pin allocations for their signal names are designated as shown in <Table 3-1>.

<Table 3-1> Signal Names and Functional Allocations for 24 pins of I/O connector

Pin No.	Signal Name	Input & output	Remarks
1	BATTERY ID	Input signal	For external charging circuit
2	HANDS-FREE MODE	Input signal	Signals below 3.3V
3	DSR	Output signal	For data communication
4	POWER (+5.0 -5.5V)	Power	For internal charging circuit
5	POWER (+5.0 -5.5V)	Power	For internal charging circuit
6	ON SWITCH	Input signal	Limited for the PCB manufacturing test
7	AUDIO IN / PCM PX	Input signal	100mV/1kHz/PCM reception in average
8	OPTION / PCM CLOCK	Output signal	For Optional use / digital hands-free
9	OPTION / PCM SYNC	Output signal	For Optional use / digital hands-free
10	OPTION / USB D-	Input signal	For Optional use / USB data
11	AUDIO OUT / PCM TX	Output signal	100mV/1kHz/PCM transmission in average
12	POWER GROUND	Power	For charging
13	RXD	Input signal	For data communication
14	TXD	Output signal	For data communication
15	OPTION / USB D+	Output signal	For Optional use / USB data
16	USB Power (+5.0V)	Power	For USB power input (T/R built-in)
17	DCD	Output signal	For data communication
18	RI	Output signal	For data communication
19	POWER GROUND	Power	For charging
20	RFR : RTS	Output signal	For data communication
21	POWER (+4.2V) / SWB+	Power	For external charging circuit / supplying power from cellular phone
22	POWER (+4.2V) / SWB+	Power	For external charging circuit / supplying power from cellular phone
23	CTS	Input signal	For data communication
24	DTR	Input signal	For data communication



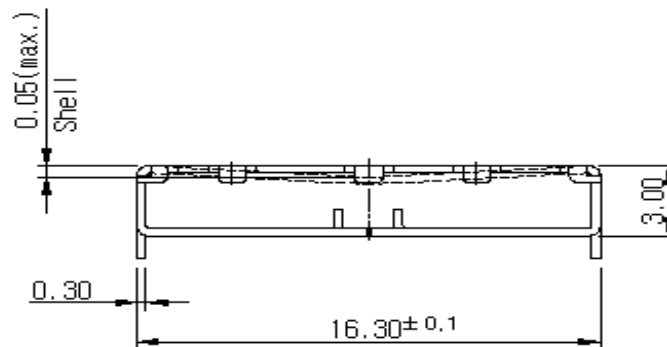
#### 4. Mechanical Specifications of I/O Connector for Digital Cellular Phone

The input and output interface of this standard means a 24 pin connector which is divided into two parts on the whole, i.e. a socket of digital cellular phone and a plug of battery charger cable. This connection plug has 3 concave keys, as shown in (Figure 4-2), to prevent standard I/O socket from being connected wrong with other non-standard I/O plug.

When the part of selective insertion devices (3 convex keys) in I/O socket faces upward and we look into the front side of the socket of digital cellular phone, as shown in (Figure 4-4), 24 pin allocation is increasing in numerical order from left to right. This pin number is a reference of arranging each pin's connection function.

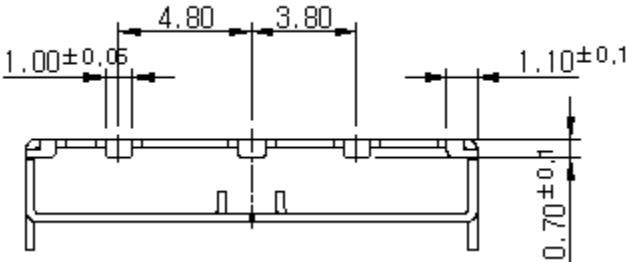
Several specifications of I/O socket and plug are shown at (Figure 4-1), (Figure 4-2), (Figure 4-3), (Figure 4-4) and (Figure 4-5). Outer view of I/O socket is shown at (Figure 4-6a) and (Figure 4-6b).

##### 4.1 Specifications of Outer Part for Connection Socket



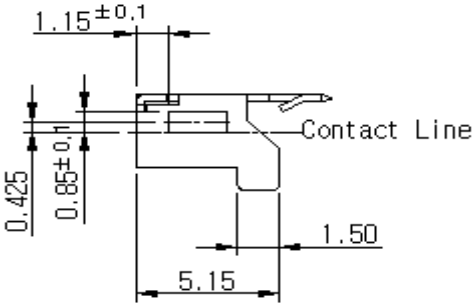
(Fig. 4-1) Specifications of Outer Part for I/O Connection Socket

4.2 Specifications of Keys for Connection Socket



(Fig. 4-2) Specifications of Selective Insertion Device for I/O Connection Socket

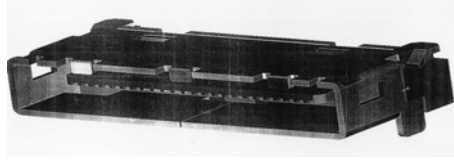
4.3 Specifications of Locking Part for Connection Socket



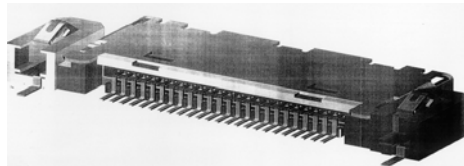
(Fig. 4-3) Specifications of Locking Part for I/O Connection Socket



#### 4.6 Shape of Connection Socket



(Fig. 4-6a) Front side view of I/O connection socket



(Fig. 4-6b) Rear side view of I/O connection socket

## 5. Acronyms

CTS	: Clear To Send
DCD	: Data Carrier Detect
DSR	: Data Set Ready
DTR	: Data Terminal Ready
I/O	: Input and Output
PCB	: Printed Circuit Board
PCM	: Pulse Code Modulation
RFR	: Ready For Receiving
RI	: Ring Indicator
RTS	: Request To Send
RXD	: Received Data
SWB	: Switched Battery
SYNC	: Synchronization
T/R	: Transceiver
TXD	: Transmitted Data
USB	: Universal Serial Bus

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