



PCS Development Engineering

V600/V500

Bluetooth Troubleshooting Guide

Revision 0.2

15 August 2003

Deven Patel and Russ Nelson

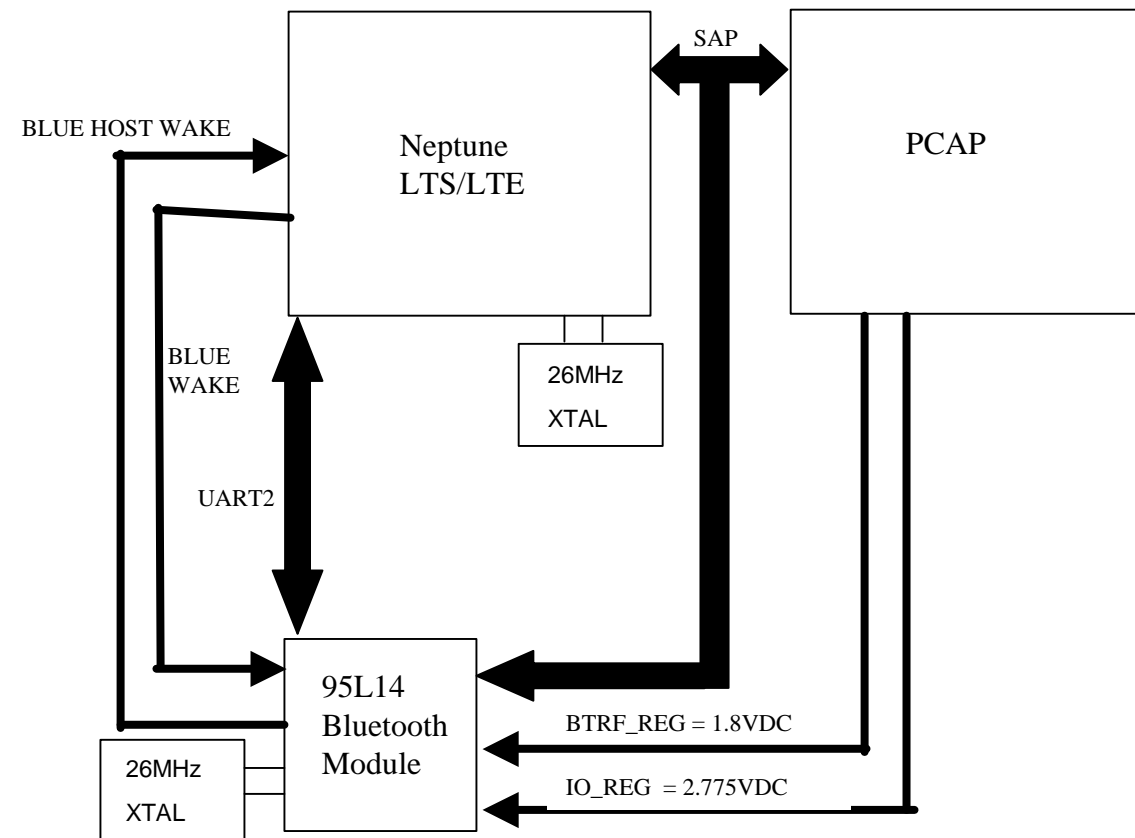


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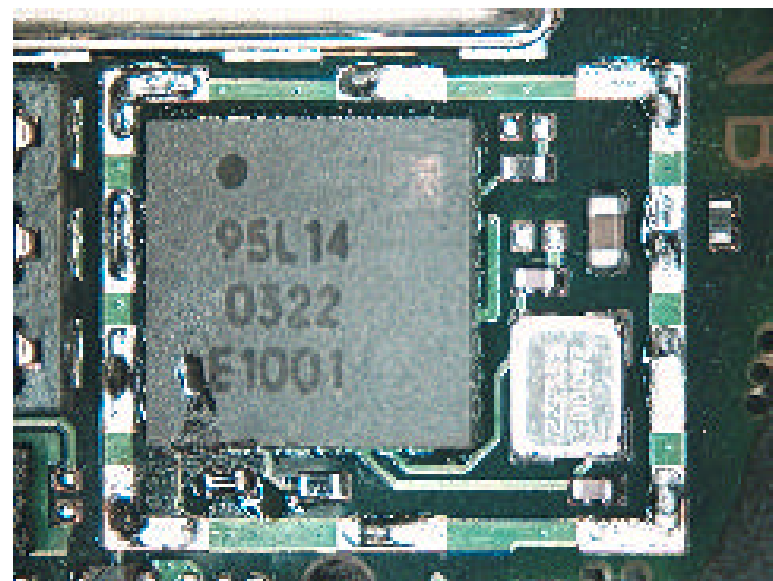
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System Block Diagram

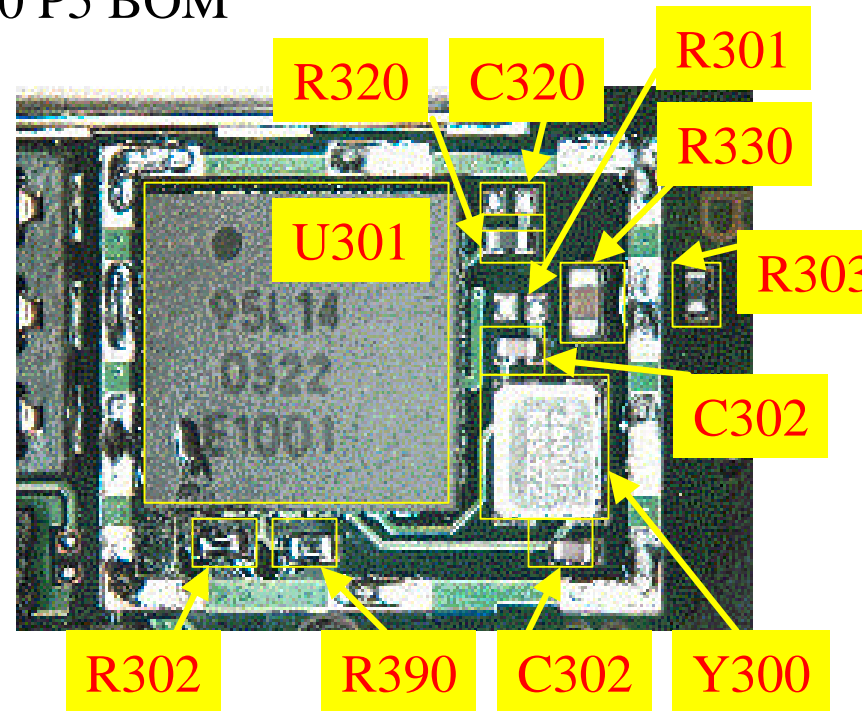


Picture of V600/V500 Bluetooth Block



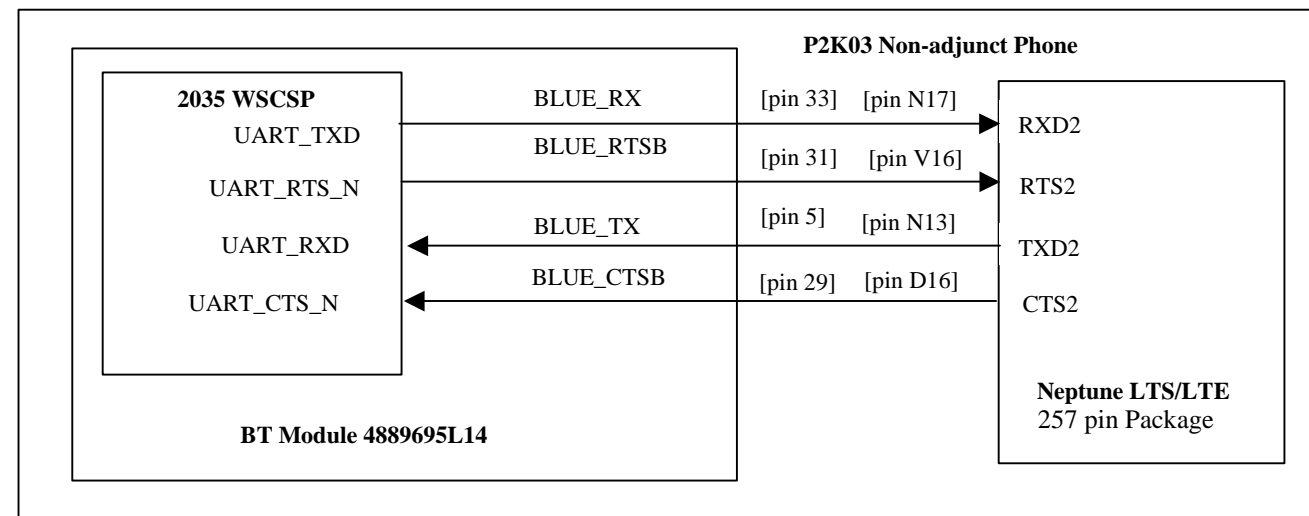
V600/V500 P5 BOM

Reference		
<u>Designator</u>	<u>MOT P/N</u>	<u>Nominal Value</u>
U301	4889596L14	N/A
Y300	4809612J50	26MHz
R301	0662057M01	DNP†
R302	0662057M98	10k Ohms
R303	0662057M98	10kOhms†
R320	0662057M01	0 Ohm
R390	0662057N37	390k Ohms
C320	DNP	
C360	2187906N01	4.7u Farad

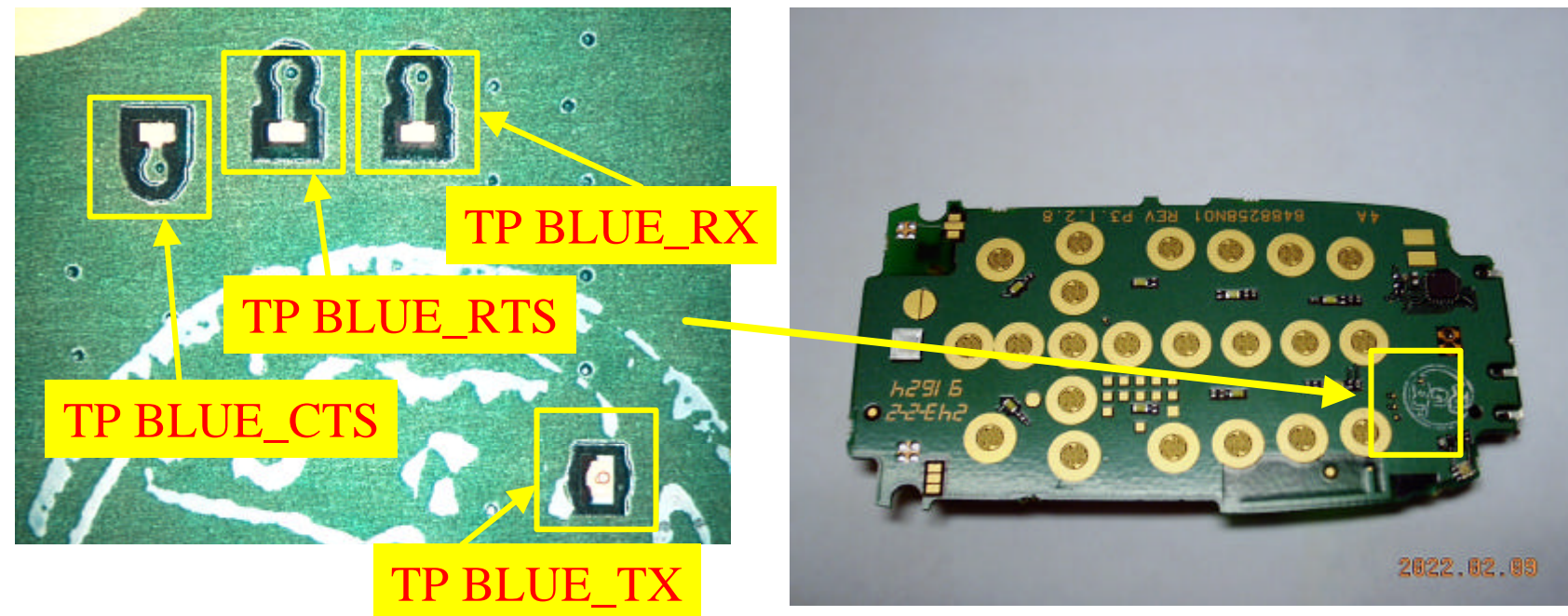


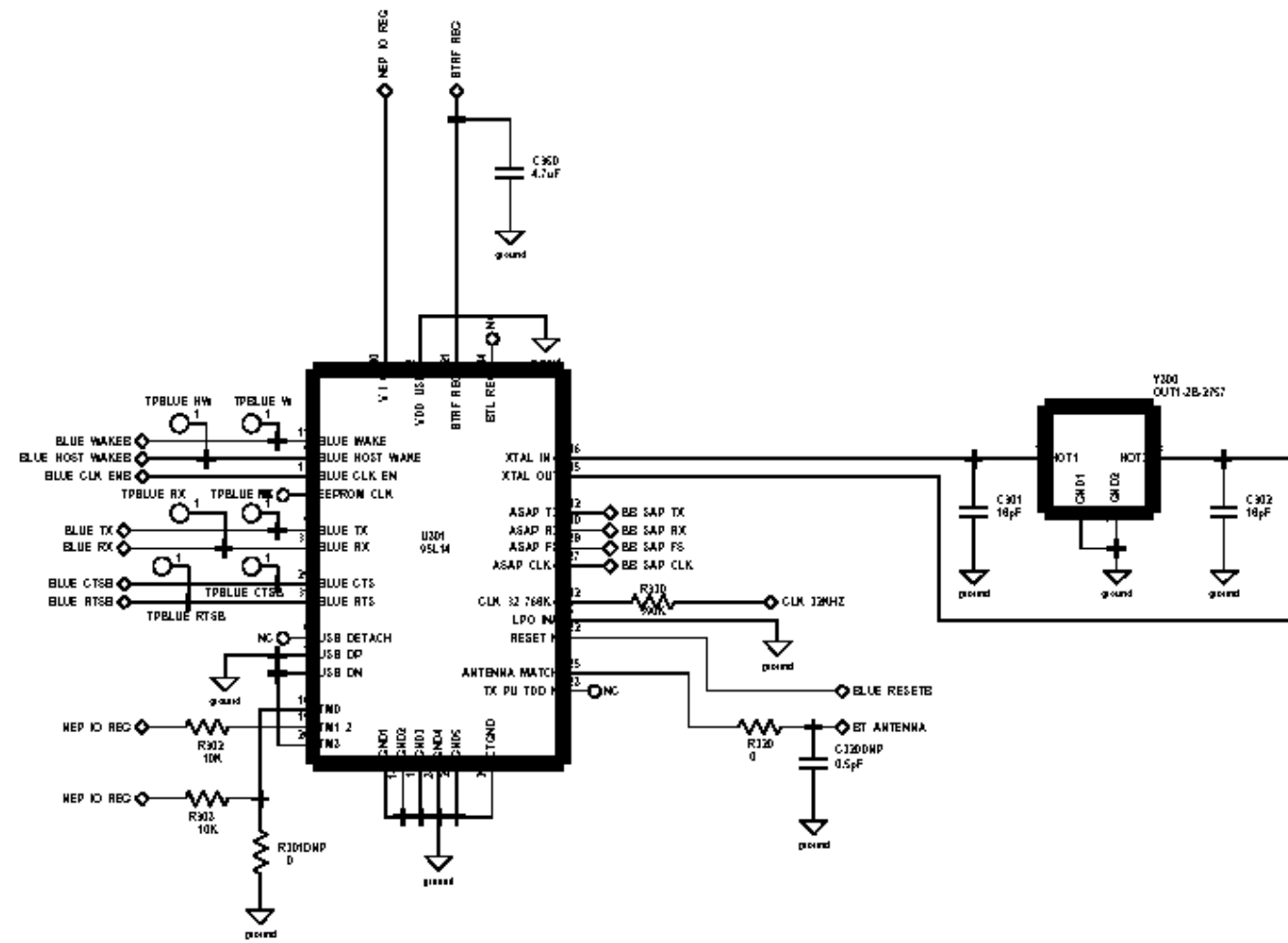
† P4.0 and P4.2 R301 = 0Ohm and R303 = DNP; P4.1 and P5.0 and beyond as defined in table.

UART2 Block Diagram

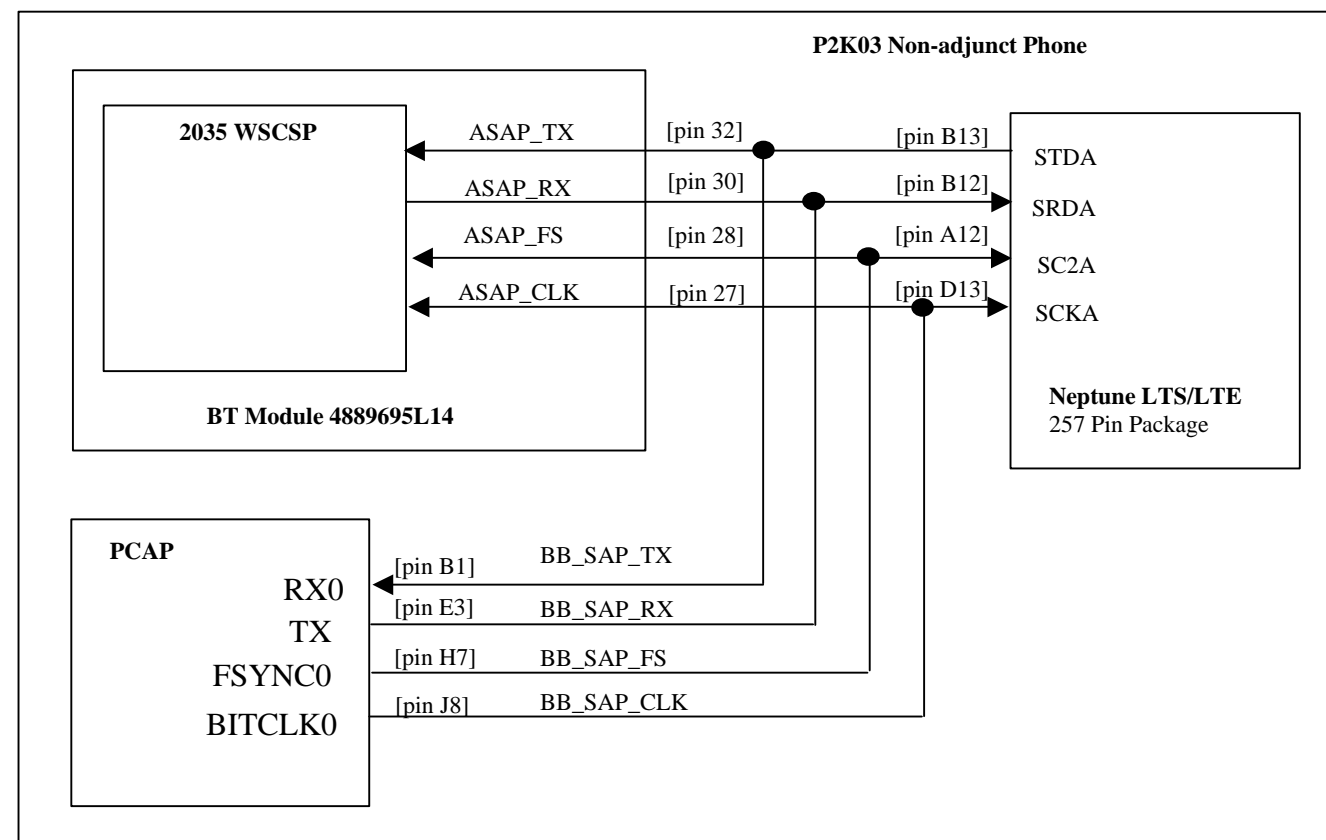


Picture of V600/V500 Bluetooth UART2 Testpoints

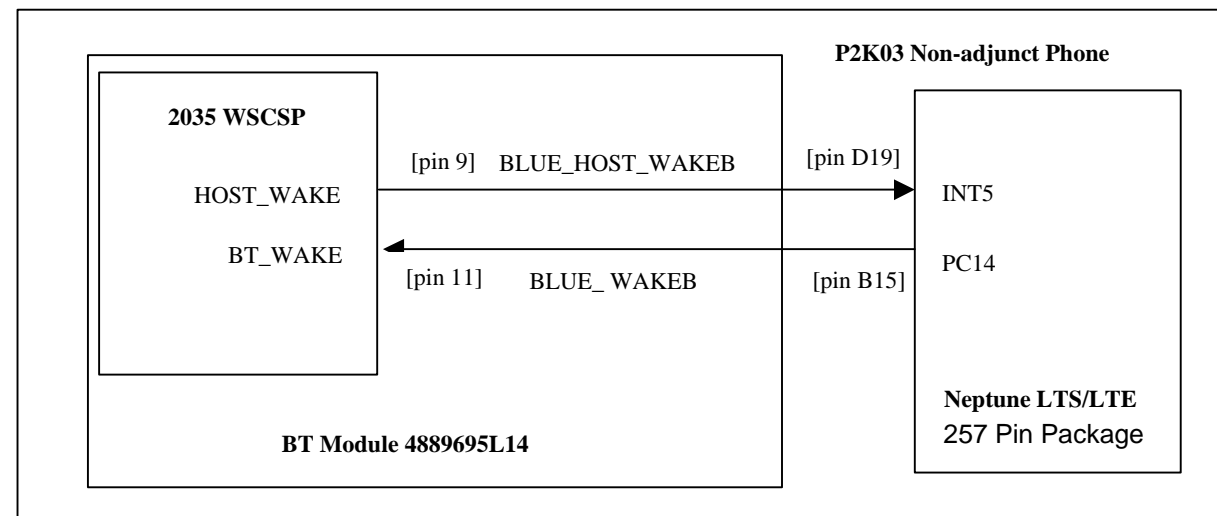




SAP Block Diagram



Control Signaling Block Diagram



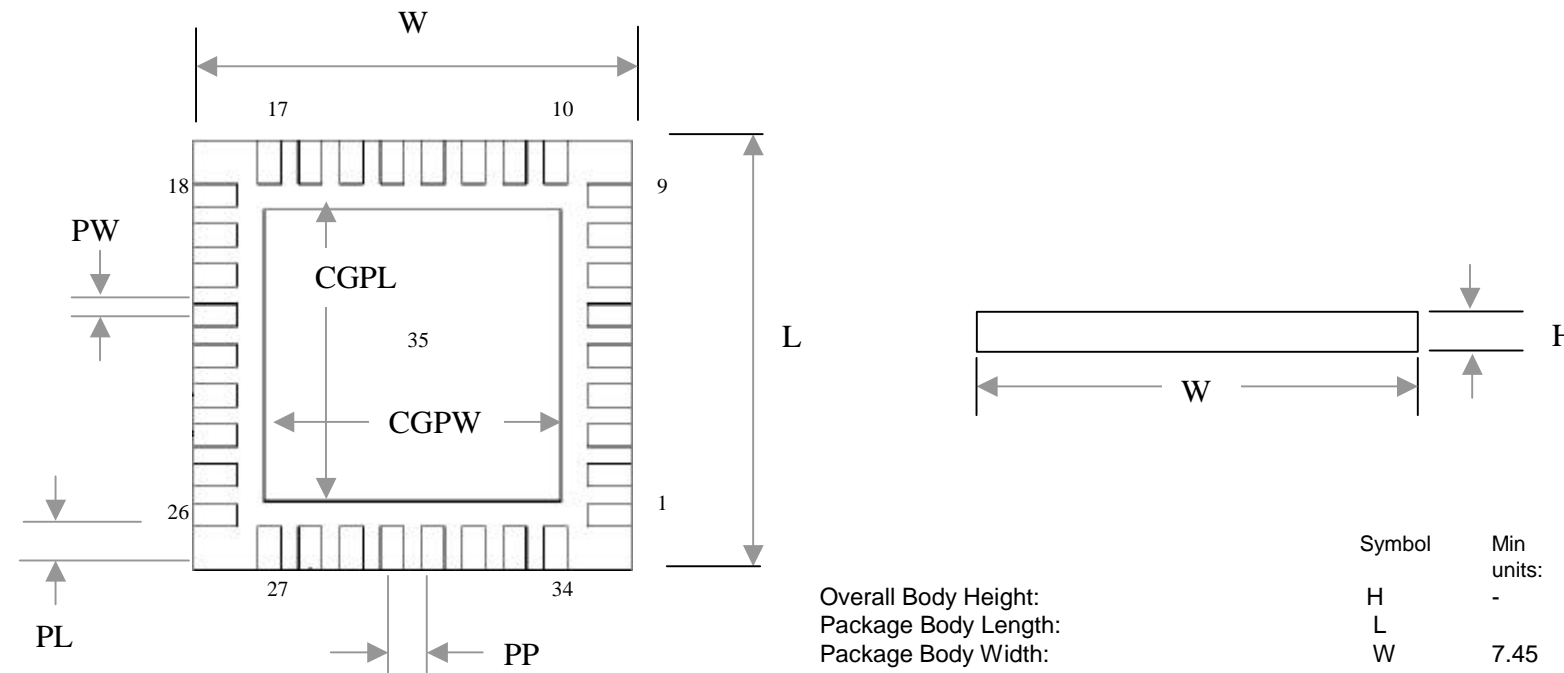


4889695L14 IO Definitions

Pin Number	Pin Description
1	GROUND
2	VDD_USB
3	USB_DN
4	USB_DP
5	BLUE_TX
6	REG_CTRL
7	EEPROM_CLK
8	USB_DETACH
9	BLUE_HOST_WAKE
10	V_I_O
11	BLUE_WAKE
12	LPO_IN
13	BLUE_CLK_EN
14	GROUND
15	XTAL_OUT

Pin Number	Pin Description
16	XTAL_IN
17	GROUND
18	TM0
19	TM1_2
20	TM3
21	BTRF_REG
22	RESET_N
23	TX_PU_TDD_N
24	GROUND
25	ANTENNA_MATCH
26	GROUND
27	ASAP_CLK
28	ASAP_FS
29	BLUE_CTS
30	ASAP_RX
31	BLUE_RTS
32	ASAP_TX
33	BLUE_RX
34	BTL_REG
35	GROUND

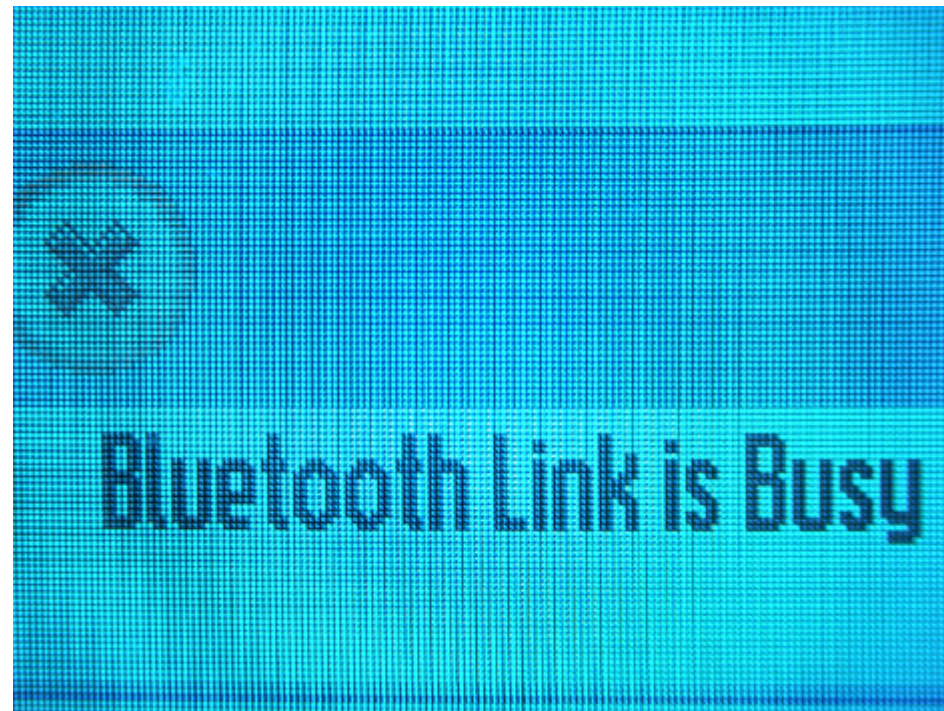
4889695L14 REV O Pinout and Dimensions



Overall Body Height:
 Package Body Length:
 Package Body Width:
 I/O Pad Width:
 I/O Pad Pitch:
 I/O Pad Length
 Center Gnd Pad Width
 Center Gnd Pad Length

Symbol	Min units:	Nominal millimeters	Max
H	-	1.38	1.40
L	-	7.45	7.5
W	7.45	7.5	7.55
PW	0.3	0.4	0.5
PP	0.6	0.7	0.8
PL	0.65	0.75	0.85
CGPW	4.8	4.9	5.0
CGPL	4.8	4.9	5.0

“Bluetooth Link is Busy”

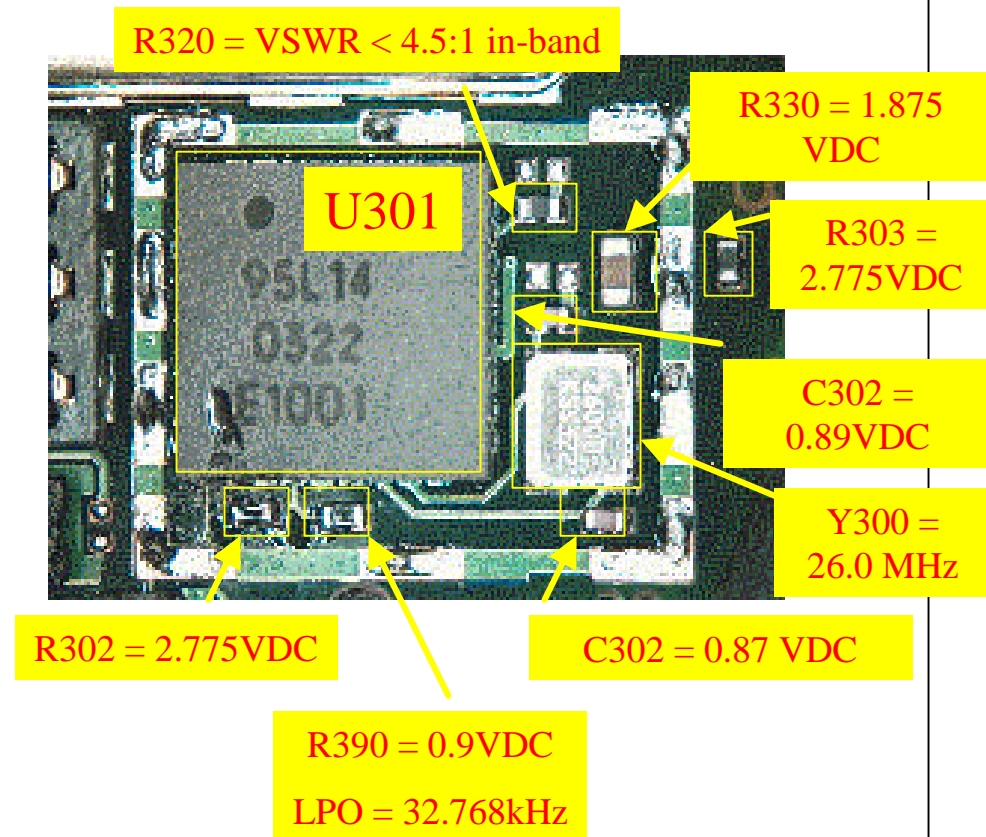


- check Flex info
- check DC voltages
- generate CW tone in test mode
- sniff 26MHz xtal (w/ sleep mode disabled)
- most likely process issue but can be flexed incorrectly and result in same message

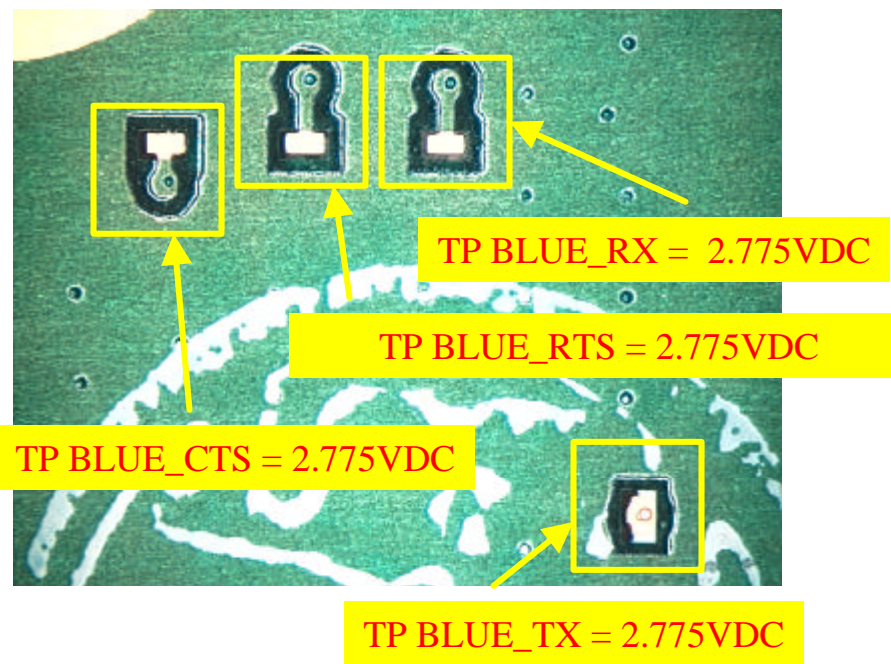
BT DC Voltages and Clock Frequencies

Reference		
<u>Designator</u>	<u>MOT P/N</u>	<u>Nominal Value</u>
U301	4889596L14	N/A
Y300	4809612J50	26MHz
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C320	DNP	
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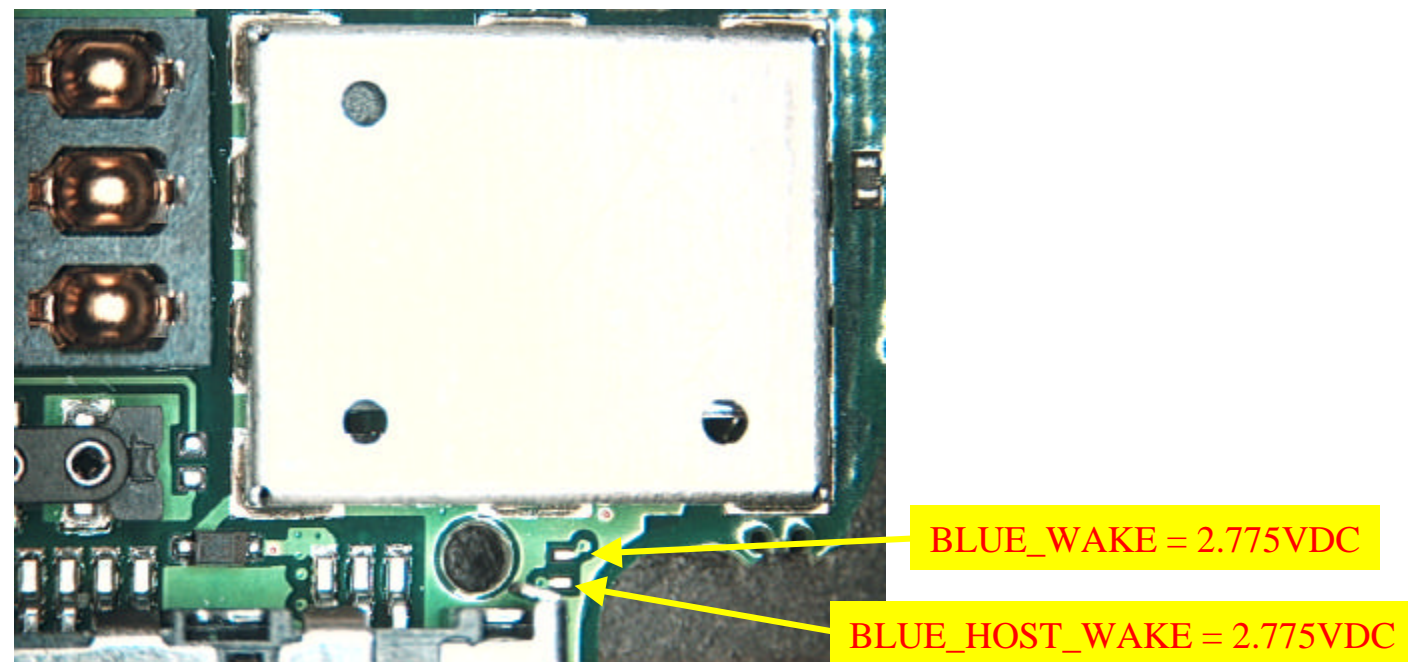
† P4.0 and P4.2 R301 = 0Ohm and R303 = DNP; P4.1 and P5.0 and beyond as defined in table.



Bluetooth UART2 Testpoint Voltages after Phone Power-up
and BT in Sleep Mode (see logic state table)



Blue_Wake and Bluetooth_Wake Testpoint Voltages after Phone Power-up
and BT in Sleep Mode (see logic state table)





Blue_Wake and Bluetooth_Wake Testpoint Logic States
(for Customer flex only)

Signal_Name	Config_by_HAPI (Initial Phone Power Up with BT Feature Disabled)	BT_Idle_State (After 5 seconds)	Connection_State
BLUE_TX	1	1	1
BLUE_RX	1	1	1
BLUE_CTSB	1	1	0
BLUE_RTSB	1	1	normally high – occasionally low
BLUE_HOST_WAKEB	1	1	0
BLUE_WAKEB	0	1	normally high – occasionally low



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Blue_Wake and Bluetooth_Wake Testpoint Logic States
(for Manufacturing flex only)

Signal_Name	Config_by_HAPI (Initial Phone Power Up with BT Feature Disabled)	BT_Idle_State (After executing x84)	BT_Idle_State (After executing x86)
BLUE_TX	1	1	1
BLUE_RX	1	1	1
BLUE_CTSB	1	0	0
BLUE_RTSB	1	0	1
BLUE_HOST_WAKEB	1	normally low - with some activity	1
BLUE_WAKEB	0	normally high - with some activity	1

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BT SEEM ELEMENTS

(all element ID numbers are subject to change between software releases,
however, SEEM element names will remain the same)

Item: CN_SAM_LD_FID_DEVICE_ADDRESS
Size: 6 Bytes
48 Bit BD_Address Programmed at Distribution Center

Item: CN_SAM_LD_FID_CRYSTAL_TRIM
Size: 10 Bytes

Byte 0: use ifTrim and rfTrim (**x00**)
Byte 1: integer part of ref frequency (**x1A**)
Byte 2: fractional part of ref frequency (**x00**)
Byte 3: measured PPM deviation (**programmed in factory**)
Byte 4: ifTrim (**not used**)
Byte 5 and 6: rfTrim (**not used**)
Byte 7: factory commit (**not used**)
Byte 8 and 9: not used (**future use**)

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BT SEEM ELEMENTS (continued)

(all element ID numbers are subject to change between software releases,
however, SEEM element names will remain the same)

Item: CN_SAM_LDI_FID_PWR_BIAS

Size: 10 Bytes

This SEEM element stores parameter information that will be sent to the 4889695L14 during download configuration to set the Temperature Compensation Algorithm thresholds.

The TCA will attenuate power as the ambient temperature gets colder at two predefined temperature thresholds.

The purpose of the TCA is to avoid transmitting more power than the Bluetooth standard allows versus temperature.

Byte 0 - Cold threshold memory location high address byte

Byte 1 - Cold threshold memory location low address byte

Byte 2 - Cold threshold value

Byte 3 - Warm threshold memory location high address byte

Byte 4 - Warm threshold memory location low address byte

Byte 5 - Warm threshold value

Byte 6 - Hot threshold memory location high address byte

Byte 7 - Hot threshold memory location low address byte

Byte 8 - Hot threshold value

Byte 9 - Future use



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BT SEEM ELEMENTS (continued)

(all element ID numbers are subject to change between software releases,
however, SEEM element names will remain the same)

Item: CN_SAM_LDI_FID_DOWNLOAD_BAUD

Size: 6 Bytes

byte1-4 - Host UART rate

Baud Rate	Value (hex - 4 bytes)
9600	x00002580
19200	x00004B00
38400	x00009600
57600	x0000E100
115200	x 0001C200
230400	x 00038400
460800	x 00070800
750000	x 000B71B0
921600	x000E1000

byte5-6 - Host Controller UART rate

Baud Rate	Value (hex)
9600	x 2264
19200	x11B2
38400	x 01D9
57600	x00E6
115200	x 00F3
230400	x44FA
460800	x22FD
750000	x00FD
921600	x55FF

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Bluetooth FAQ

Question: The “Handsfree” submenu does not appear when traversing to the Bluetooth menu? How can this menu be turned on?

```
DL_DB_FEATURE_ID_BLUETOOTH_HEADSET_AVAILABLE * |
```

```
SEEM ID      : 0x0032
```

```
Record #     : 1
```

```
Record Offset : 0x001E
```

```
Bit Offset   : 2
```

If the value is x87 this bit is on, x85 would turn it off.

The Handsfree menu is turned off in Manufacturing flex files.



Bluetooth FAQ

Question: The Bluetooth menu does not appear when traversing the menu Settings => Connections => Bluetooth. How can this menu be turned on?

DL_DB_FEATURE_ID_BLUETOOTH_AVAILABLE

SEEM ID : 0x0032

Record # : 1

Record Offset : 0x000D

Bit Offset : 7

If the value is F0 this bit is on, 70 would turn it off.



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Bluetooth FAQ

Question: Why does Audio Loopback Test not work?

Software with CRs LIBdd30030 and LIBdd27663 included will have a fix for broken Audio Loopback Test.

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Bluetooth FAQ

Question: What is the maximum frequency offset without correction for the J50 crystal oscillator?

+/- 20ppm (or +/- 20 * 2441Hz at BT channel 39)

Question: What is the maximum frequency offset after correction for the J50 crystal oscillator?

+/- 4ppm (or +/- 4 * 2441Hz at BT channel 39)

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Bluetooth FAQ

Question: What is the difference between Customer Flex (CF) and Manufacturing Flex (MF)?

SEEM Element Name: DL_DB_FEATURE_ID_BLUETOOTH_AVAILABLE

	SEEM ID	Record #	Offset	Length	Value
CF	0x0032	0x0001	0x000D	0x0001	0xF0
MF	0x0032	0x0001	0x000D	0x0001	0x70

SEEM Element Name: DL_DB_FEATURE_ID_BLUETOOTH_HEADSET_AVAILABLE

	SEEM ID	Record #	Offset	Length	Value
CF	0x0032	0x0001	0x001E	0x0001	0x87
MF	0x0032	0x0001	0x001E	0x0001	0x85



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Radiocom CW Test Script
Generates CW Signal at $f = 2441\text{MHz}$

RAW_DATA,000000420001000081,000000420001000081

WAIT,1000,

RAW_DATA,0000004200050000012DFC0129,0000004200050000012DFC0129

WAIT,1000,

RAW_DATA,0000004200050000012DFC0129,0000004200050000012DFC0129

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Radiocom CW Test Script
Make BT Device Discoverable for CMU200/E1852B/Anritsu Test Set

```
RAW_DATA,000000420001000081,000000420001000081
WAIT,1000,
RAW_DATA,000000420004000001030C00,000000420004000001030C00
WAIT,1000,
RAW_DATA,00000042000A00000101FC06060504030201,00000042000A00000101FC06060504030201
WAIT,1000,
RAW_DATA,000000420004000001031800,000000420004000001031800
WAIT,1000,
RAW_DATA,0000004200050000011BFC0101,0000004200050000011BFC0101
WAIT,1000,
RAW_DATA,0000004200050000011A0C0103,0000004200050000011A0C0103
WAIT,1000,
RAW_DATA,000000420007000001050C03020002,000000420007000001050C03020002
```



Radiocom Audio Loopback Test Script

For this test it is required to use a parsing program to strip out the audio sample data in order to plot the 1kHz analog signal.
(More info to be added for parsing program and plotting analog data reconstructed from sample data.)

```
RAW_DATA,000000420001000084,  
WAIT,1000,  
RAW_DATA,000000420001000081,  
WAIT,1000,  
RAW_DATA,00000042000500000124FC0101,  
WAIT,1000,  
AUD_PATH,7B00,  
WAIT,5000,  
RAW_DATA,00000044000D0000015A830500000000000000000000,  
WAIT,1000,  
AUD_SAMP,0814
```