

CY386 Circuit Description

The description for model CY386 is base on the circuit diagram and the block diagram.

A. CY386 Handset

1. RF Link and Audio Path

When the handset linked up to the Base station in Offhook mode, the RF and the Audio Path will be turned on as below:

Receive path

(DLH36107, DH24RF17B)

2.4GHz FSK Modulated signal will be received by a simple monopole antenna (permanently mounted) through Pin diode T/R switch to the RFIC Transceiver DH24RF17B. In RFIC, the signal will be first Amplified, then it will down converted by the image-rejected mixer and 2401.808203-2479.398926GHz LO (PLL referenced at 13.824MHz). The output of the receive image-reject mixer is at an IF frequency of 2 MHz. This choice of low IF allows integration of the high-Q channel-selection filters. The down-converted IF Signal will then feed to an 900 kHz nominal 3 dB bandwidth filter, limiter, FM discriminator and finally a data slicer to give out the digital data to DSP for Process.

After the base band DSP IC203 DLH36107 received the data. It will process the data received back to an analog audio by its internal ADPCM codec. The audio received will then be amplified. It will output to the earpiece when it is in Talk mode and to the 8-ohm speaker when it is in Speakerphone mode.

Transmit Path

(DLH36107, DH24RF17B)

Voice from microphone will be changed to an analogy audio. It will then feed to the Base band DSP IC203 DLH36107. The analog audio signal will be digitalized to packetized ADPCM format and will then feed to the RFIC DH24RF17B.

In the RFIC, the digital data will directly modulate with the two PLL referenced LO (129.6MHz & 2401.808203-2479.398926GHz). The internal

power amplifier will then amplify the 2.4GHz-modulated signal. The RF signal will finally reach the Antenna through the T/R switch and the 2.4GHz band-pass filter for transmitting.

2. Display, Keyboard, LEDs, memory and Alert Tone

(DSP DLH36107, EEPROM 24C32, SID15206)

The DSP DLH36107 will drive the LCD Display by the LCD driver IC301 SID15206. The DSP DLH36107 will also scan for the keyboard; generate beep and ring alert tone; and control the LED On/OFF. The DSP DLH36107 will also detect the charging and control the charging circuit.

The EEPROM will store all message needed for phonebook and some other system parameters.

3. RESET & Power Down Circuit, Power Supply and charging circuit

(Q201, 214,215, Q203, 204, IC202, IC205 3.3V Regulator XC6203P332)

Q201, Q214&Q215 with c253 give a small delay when power on the handset to ensure the DSP working normally. The Q203 & Q204 will give out a signal to inform the DSP before the Reset circuit reset the DSP to avoid losing some important data when battery voltage dropped to an very low level.

Zener diode Z201 will clamp the voltage below 5.1V. The Q202 and Q205 will control the charging current.

The 3.6V battery voltage will be regulator to 3.3V by the DC regulator XC6203P332.

B. CY386 Base:

1. Handset offhook mode and handset base intercom

Receive Path

(DLH36567, DH24RF17B & Q506)

One of the two inverted-L antennas (Both are permanently mounted) will be selected by larger LSSI voltage to receive 2.4GHz FSK Modulated signal through Pin diode antenna switch & T/R switch to the RFIC Transceiver DH24RF17B. In RFIC, the signal will be first Amplified, then it will down converted by the image-rejected mixer and 2401.808203-2479.398926GHz LO (PLL referenced at 13.824MHz). The output of the receive image-reject mixer is at an IF frequency of 2 MHz. This choice of low IF allows integration of the high-Q channel-selection filters. The down-converted IF

Signal will then feed to an 900 kHz nominal 3 dB bandwidth filter, limiter, FM discriminator and finally a data slicer to give out the digital data to DSP for Process.

After the base band DSP IC504 DLH36567 received the data. It will process the data received back to an analog audio by its internal ADPCM codec.

The audio received will then be amplified. When it is in Handset OFF hook mode, the audio will feed to side tone Cancellation Bridge to reduce the side tone by Q506. The voice audio will then go to the line through the hook switch controlled by DSP (Q502, Q503 & Q504) and the diode bridge (D1-4)

Transmit Path

(DLH36567, DH24RF17B)

Analog voice audio signal from line will go through the diode bridge (D1-4) & Hook switch (Q502, Q503, Q504) to the Base band DSP IC504 DLH36567. The analog audio signal will be digitalized to packetized ADPCM format and will then feed to the RFIC DH24RF17B.

In the RFIC, the digital data will directly modulate with the two PLL referenced LO (129.6MHz & 2401.808203-2479.398926GHz). The internal power amplifier will then amplify the 2.4GHz-modulated signal. The RF signal will finally reach the Antenna, which is selected with a larger RSSI, through the T/R switch and the 2.4GHz band-pass filter for transmitting.

2. Speakerphone Off hook

Analog voice audio signal from line will go through the diode bridge (D501-504/507-510) & Hook switch (Q502, Q503, Q504) to the Base band DSP IC504 DLH36567; On the other hand, voice from microphone will be changed to an analogy audio. It will then feed to the Base band DSP IC504 DLH36567. The analog audio to the DSP will be digitalized and being the echo cancellation process. The audio will then be output to the Speaker and the line.

NOTE : RF doesn't turn on in this mode.

3. Conference mode & Intercom mode

In Conference mode, Both Handset Offhook mode and Speaker phone mode are turned on. The Internal mixer in DSP DLH36567 will mix two audio together.

In Intercom mode, it's similar to the Conference mode but the line audio is not turned on.

4. Display, Keyboard, LEDs, memory and Alert Tone
(DSP DLH36567, EEPROM 24C32, SID15206)

The DSP DLH36567 will drive the LCD Display by the LCD driver IC401 SID15206. The DSP DLH36567 will also scan for the keyboard; generate beep and ring alert tone; and control the LED On/OFF. The DSP DLH36567 will also detect the charging and control the charging circuit.
The EEPROM will store all message needed for phonebook and some other system parameters.

5. TELEPHONE LINE INTERFACE

I) PROTECT CIRCUIT

(L501, L506, F501 0.5A/350V, VA501 P3100EB)

L501, L506, F501 0.5A/350V, VA501 P3100EB are some safety protect circuits in case of suddenly large voltage presented in line.

II) RING DETECT AND LINE DC DETECT CIRCUIT

(Q519, DSP DLH36567, Q503 & Q502)

A Ring signal is obtained by Q519, then DSP will process the ring signal and generate ring.

DSP DLH36567 will also check LINE DC voltage and control the Line-in-use LED indicator or parallel phone in use indicator.

Q503 & Q502 is the switch for the hook; it is controlled by the DLH36567.

III) CID DETECT CIRCUIT (ON-HOOK)

DSP DLH36567 also detects FSK signal and CAS tone.

6. RESET & Power Down Circuit, Power Supply and charging circuit
(Q512, 520,521, IC508, IC503 3.3V Regulator XC6203P332,
IC501 MC34063A)

Q512, Q520&Q521 with C546 give a small delay when power on the handset to ensure the DSP working normally.

The IC501 MC34063A regulator will regulate the input 7.5V voltage to 5V.
IC508, IC503 3.3V Regulator XC6203P332 will regulate the voltage to 3.3V for RF and DSP power supply.

APPENDIX A – CHANNEL CENTRE FREQUENCIES

Physical Channel Number	Test mode Channel Number	Centre Frequency (MHz)	Physical Channel Number	Test mode Channel Number	Centre Frequency (MHz)	Physical Channel Number	Test mode Channel Number	Centre Frequency (MHz)
1	12	2401.808203	31	42	2428.564307	61	72	2455.32041
2	13	2402.698096	32	43	2429.454199	62	73	2456.210303
3	14	2403.591943	33	44	2430.348047	63	74	2457.10415
4	15	2404.481836	34	45	2431.237939	64	75	2457.994043
5	16	2405.375684	35	46	2432.131787	65	76	2458.887891
6	17	2406.265576	36	47	2433.02168	66	77	2459.777783
7	18	2407.159424	37	48	2433.915527	67	78	2460.671631
8	19	2408.05	38	49	2434.80542	68	79	2461.561523
9	20	2408.943164	39	50	2435.699268	69	80	2462.455371
10	21	2409.833057	40	51	2436.58916	70	81	2463.345264
11	22	2410.726904	41	52	2437.483008	71	82	2464.239111
12	23	2411.616797	42	53	2438.3729	72	83	2465.129004
13	24	2412.510645	43	54	2439.266748	73	84	2466.022852
14	25	2413.400537	44	55	2440.156641	74	85	2466.912744
15	26	2414.294385	45	56	2441.050488	75	86	2467.806592
16	27	2415.184277	46	57	2441.940381	76	87	2468.696484
17	28	2416.078125	47	58	2442.834229	77	88	2469.590332
18	29	2416.968018	48	59	2443.724121	78	89	2470.480225
19	30	2417.861865	49	60	2444.617969	79	90	2471.374072
20	31	2418.751758	50	61	2445.507861	80	91	2472.263965
21	32	2419.645605	51	62	2446.401709	81	92	2473.157813
22	33	2420.535498	52	63	2447.291602	82	93	2474.047705
23	34	2421.429346	53	64	2448.185449	83	94	2474.941553
24	35	2422.319238	54	65	2449.075342	84	95	2475.831445
25	36	2423.213086	55	66	2449.969189	85	96	2476.725293
26	37	2424.102979	56	67	2450.859082	86	97	2477.615186
27	38	2424.996826	57	68	2451.75293	87	98	2478.509033
28	39	2425.886719	58	69	2452.642822	88	99	2479.398926
29	40	2426.780566	59	70	2453.53667			
30	41	2427.670459	60	71	2454.426563			