

## CQP860

## TECHNICAL SPECIFICATIONS

## TRANSMITTER MODULES

The following detailed specifications are all typical values measured at 20°C ambient temperature, unless otherwise stated.

## CRYSTAL OSCILLATOR XO862

## Supply Voltage

7.5 V

## Current Drain

< 3 mA

## Frequency Range

52.50 to 58.75 MHz

## Output Power

> 1 mW,  $R_L = 50 \text{ ohm}$

## MODULATION AMPLIFIER AA802

## Supply Voltage

7.5 V

## Current Drain

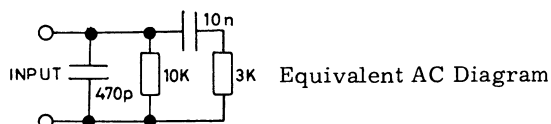
2.5 mA normal condition

3.0 mA amplifier blocked

## Microphone Signal Input Impedance

12 k ohm

## Tone Signal Input Impedance



## Maximum DC Blocking Voltage

1.2 V

## Blocking Gate Current

100  $\mu$ A

## Microphone Signal Input Sensitivity (1000 Hz)

Signal clipping begins to occur with an input signal of:

5 mV with amplifier set for min. gain.

0.2 mV with amplifier set for max. gain.

## Limiting

Output signal observed at output of AA802 when clipping occurs: 6.0 V p.p.

## Distortion (at 1000 Hz Microphone Signal)

measured at output of AA802.

$V_{IN}$  = Signal clipping level -1 dB

0.4% Gain set to minimum

3.0% Gain set to maximum

## Distortion (at 1000 Hz Tone signal)

0.2% measured at output of AA802

Microphone amplifier blocked

$V_{IN}$  = Signal clipping level -1 dB

## Frequency Response

300 Hz : -10.5 dB

1000 Hz: 0 dB

3000 Hz: +8.5 dB

Measured at constant input voltage and the level kept just below that at which clipping occurs at 3000 Hz.

**PHASE MODULATOR PM861**

**Supply Voltage**

7.5 V

**Current Drain**

9 mA

**Frequency Range**

52.5 - 58.75 MHz

**RF Input Impedance**

80 ohm // 60 pF

**RF Drive**

1 mW

**AF Input Impedance**

1 k ohm

**Modulation sensitivity**

200 mV for  $\Delta f = \frac{5}{8}$  kHz,  $f_{mod} = 1000$  Hz

**Modulation Distortion**

2% at  $\Delta f = \frac{5}{8}$  kHz,  $f_{mod} = 1000$  Hz

Z generator = 600 ohm

**FREQUENCY DOUBLER FD861**

**Supply Voltage**

7.5 V

**Current Drain**

5.5 mA

**Frequency Range**

Input: 52.50 MHz to 58.75 MHz

Output: 105.0 MHz to 117.5 MHz

**Input Impedance**

approx 135 ohm

**Drive**

approx 0.4 mW

**RF Bandwidth (1 dB)**

1.75 MHz

**Output Power**

0.75 mW,  $R_{load} = 1$  k ohm

**FREQUENCY DOUBLER FD862**

**Supply Voltage**

7.5 V

**Current Drain**

6 mA

**Frequency Range**

Input: 105.0 MHz to 117.5 MHz

Output: 210 to 235 MHz

**RF Input Impedance**

approx. 80 ohm

**Drive**

approx. 2 mW

**RF Bandwidth (1 dB)**

5 MHz

**RF Output Power**

6 mW,  $R_{load} = 100$  ohm

**FREQUENCY DOUBLER FD863**

**Supply Voltage**

7.5 V

**Current Drain**

29 mA

**Frequency Range**

Input: 210 to 235 MHz

Output: 420 to 470 MHz

**RF Bandwidth (1 dB)**

20 MHz

**Input Impedance**

approx. 100 ohm

**Drive**

approx. 6 mW

**RF Output**20 mW,  $R_{load} = 50 \text{ ohm}$ **BAND-PASS FILTER BP861****Frequency Range**

420 to 470 MHz

**Input and Output Impedance**

50 ohm

**Bandwidth (0.5 dB)**

40 MHz

**Insertion Loss**

1.0 dB

**Attenuation at  $\frac{1}{2}xfo$** 

45 dB

**Attenuation at  $1.5xfo$** 

37 dB

**POWER AMPLIFIER PA861****Supply Voltage**

9.5 V

**Current Drain**

95 mA

 $V_B = 10 \text{ V}$ ,  $V_{ADC} = 7.5 \text{ V}$ **Frequency Range**

420 to 470 MHz

**Bandwidth**

20 MHz

**Drive**

15 mW

**RF Output Power**

400 mW

**ADC Input Voltage**

4 to 9 V

**POWER AMPLIFIER PA862****Supply Voltage**

11 V

**Current Drain**

300 mA at 11 V

**Input Impedance**

approx. 30 ohm

**Output Impedance**

50 ohm

**Drive**

300 mW

**Maximum RF Output Power**

1.2 W at 11 V supply voltage

**Bandwidth (1 dB)**

20 MHz

**Insertion Loss (Ant - RX)**

0.5 dB

**ADC Output**

1.0 V/A

## ANTENNA FILTER FN861

## Input and Output Impedance

50 ohm

## Insertion Loss

0.5 dB

## ADC CIRCUIT AD801

## Supply Voltage

11 V and 7.5 V

## Current Drain

2 mA from 11 V

~0 mA from 7.5 V

## Input Voltage

0 - 300 mV

## Output Current

0 - 30 mA

 $R_{load} = 300 \text{ ohm}$ ,  $R_{Adj} = 3.9 \text{ k ohm}$ 

## RECEIVER

## RECEIVER CONVERTER RC861

## Supply Voltage

9 V to 15 V

## Current Drain

4.5 mA

## Frequency Range

420 to 470 MHz

## Injection Frequency Range

132.87 to 149.53 MHz

## Output Frequency

21.4 MHz

## RF Input Impedance

50 ohm

## Injection Frequency Impedance

50 ohm

## Output Impedance

1600 ohm

## Injection Frequency Input

1 mW

## RF Bandwidth

2.0 MHz

## CRYSTAL OSCILLATOR XO811

## Supply Voltage

7.5 V

## Current Drain

&lt; 3 mA

## Frequency Range

124 to 153 MHz

## RF Output

> 1 mW,  $R_{load} = 50 \text{ ohm}$ 

## CRYSTAL FILTER XF803

Type	XF803
Channel Spacing	20/25 kHz
Max. Frequency Dev.	$\pm 5 \text{ kHz}$
Generator Impedance	1600 ohm
Output Impedance	140 ohm//12 pF
Selectivity 3 dB	$\geq \pm 7.1 \text{ kHz}$
60 dB	$\leq \pm 15.4 \text{ kHz}$
80 dB	$\leq \pm 20.4 \text{ kHz}$
90 dB	$\leq \pm 25.4 \text{ kHz}$
Insertion loss	$\leq 6.1 \text{ dB}$
Band pass ripple	$\leq 2 \text{ dB}$

**IF CONVERTER IC801**

**Supply Voltage**

7.5 V

**Current Drain**

0.5 mA

**Input Frequency**

21.4 MHz

**Output Frequency**

103.5 kHz

**Input Impedance**

140 ohm // 12 pF

**Output Impedance**

1.2 k ohm

**Bandwidth (3 relative to 21.4 MHz)**

± 16 kHz

**Power Gain**

23 dB

**Crystal Oscillator Frequency**

21.2965 MHz

**IF AMPLIFIER IA801**

**Supply Voltage**

7.5 V

**Current Drain**

380 uA

**Gain**

44.5 dB ± 4 dB;  $R_{load} = 3.3 \text{ k ohm}$

**Maximum Output**

220 mV,  $R_{load} = 3.3 \text{ k ohm}$

**IF AMPLIFIER IA802**

**Supply Voltage**

7.5 V

**Current Drain**

≤ 1 mA

**Input Frequency**

103.5 kHz

**Bandwidth 3 dB**

≥ 18 kHz

**Maximum Frequency Deviation**

≥ ± 12 kHz

(measured at 5% distortion and BW = 25 kHz)

**Input Impedance**

3 k ohm

**Discriminator Conversion Efficiency**

38 mV/kHz at 25 kHz channel spacing

75 mV/kHz at 12.5 kHz channel spacing

**12 dB SINAD SENSITIVITY**

≤ 5 uV input to IC801 (pin 9). Output measured at output of IA802 (pin 7).  $\Delta f = 3.5 \text{ kHz}$ ,  $f_{mod} = 1 \text{ kHz}$

**Discriminator Linearity**

Pass-band 300 - 3000 Hz + 1 dB

**Minimum Load Resistance**

10 k ohm via capacitor

**Harmonic Distortion**

1%

**SQUELCH CIRCUIT SQ801a**

**Supply Voltage**

7.5 V

**Current Drain**

Squelched condition: < 800 uA

Un-squelched condition: < 900 uA

**Output Voltage**

Squelched condition:  $< 0.4 \text{ V}$

Un-squelched condition:  $> 5.5 \text{ V}$

Squelch disabled:  $> 7.0 \text{ V}$

**Input Impedance at 1 kHz**

40 k ohm

**Minimum Load Resistance**

10 k ohm

**Noise Filter Cut-off Frequency**

7 kHz

**Transition Time**

Turn-on delay  $< 20 \text{ ms}$

Turn-off delay  $< 8 \text{ ms}$

**AF AMPLIFIER AA801**

**Supply Voltage**

9.6 V to 15.0 V

7.5 V

**Current Drain at 11 V supply**

No signal condition:  $< 15 \text{ uA}$

Squelched condition:  $< 170 \text{ uA}$

at 0.25 W output:  $< 70 \text{ mA}$

**Input Impedance at 1 kHz**

120 k ohm

**Loudspeaker Impedance**

30 ohm

**Output Power at nominal supply voltage**

400 mW

measured at 1 kHz, distortion 7%

**Distortion**

$< 5\%$

measured at 1 kHz and 0.25 W output

**Frequency Responce relative to 1000 Hz.**

	100 Hz	300 Hz	3 kHz	6 kHz
25kHz	-4 dB -2/+4 dB	+9.6 dB -0.5/+1dB	-10dB -1.5/+2 dB	-19 dB -4/+1dB

**VOLTAGE REGULATOR VR801**

**Supply Voltage**

9.6 V to 15 V

**Current Drain**

$< 200 \text{ uA}$

**Regulated Output Voltage**

$7.5 \text{ V} \pm 2\%$

**Maximum Regulator Output Current**

60 mA

**Internal Resistance of Regulator**

$< 2 \text{ ohm}$

**Output Impedance at 1 kHz**

$< 2 \text{ ohm}$

**Transition Time**

$< 15 \text{ ms}$