

## 1. GENERAL

Frequency Range	PCS Mode	Analog Mode
Transmitter	1850 ~ 1910 MHz	824 ~ 849 MHz
Receiver	1930 ~ 1990 MHz	869 ~ 894 MHz
Channel Spacing	50 KHz	30KHz
Number of Channels	1200 CHs	832 CHs
Duplex Spacing	80 MHz	45 MHz
Frequency Stability	(Frx-80MHz) $\pm 150\text{Hz}$	$\pm 2.5 \text{ ppm}$
Operating Temperature	-30°C ~ +60 °C (-22°F ~ +140 °F)	
Operating Voltage HHP	3.6V DC ( $\pm 10\%$ )	
Size and Weight	112 X 52 X 25 mm (with standard battery)	
Including standard battery	146g	
Including extended-life battery	166g	
Operating Time	PCS Mode	Analog Mode
Standby Time (slot mode 2)	130 ~ 150 hours (with standard battery) 210 ~ 240 hours (with extended-life battery)	14 ~ 17 hours (with standard battery) 23 ~ 26 hours (with extended-life battery)
Talk Time	about 170 min (with standard battery) about 280 min (with extended-life battery)	about 55 min (with standard battery) about 90 min (with extended-life battery)

## 2. ANALOG MODE

### TRANSMITTER

RF output power	0.5W (+2/-4dB)
Carrier ON/OFF conditions "ON" Condition "OFF" Condition	within 3dB of specification output (in 2mS) below -60dBm (in 2mS)
Compressor Compression Rate Attack Time Recovery Time Reference Input	2:1 3mS 13.5mS Input level for producing a nominal 2.9KHz peak frequency deviation of transmitted carrier
Preamphasis	6dB/OCT within 0.3 ~ 3KHz
Maximum Frequency Deviation F3 of G3 Supervisory Audio Tone Signaling Tone Wideband Data	12KHz 2KHz ( 10%) 8KHz ( 10%) 8KHz ( 10%)
Post Deviation Limiter Filter 3.0 ~ 5.9KHz 5.9 ~ 6.1KHz 6.1 ~ 15KHz Over 15KHz	above 40 LOG (F/3000) dB above 35 dB above 40 LOG (F/3000) dB above 28 dB
Spectrum Noise Suppression  For all modulation $f_0 + 20\text{KHz} \sim f_0 + 45\text{KHz}$  For modulation by voice and SAT $f_0 + 45\text{KHz}$  For modulation by WBD(without SAT) and ST (with SAT) $f_0 + 45\text{KHz} \sim f_0 + 60\text{KHz}$ $f_0 + 60\text{KHz} \sim f_0 + 90\text{KHz}$ $f_0 + 90\text{KHz} \sim 2f_0$	above 26 dB  above 63 +10 LOG (PY) dB  above 45 dB above 65 dB above 63 +10 LOG (PY) dB (where $f_0$ =carrier frequency PY=mean output power in watts)
Harmonic and conducted Spurious Emissions	below 43 + 10 LOG (PY) dB

**RECEIVER**

De-Emphasis	-6dB / OCT within 0.3 ~3KHz
Expander Expander Rate Attack Time Recovery Time Reference Input	1:2 within 3mS within 13.5mS output level to a 1000Hz tone from a carrier within 2.9KHz peak frequency deviation
Sensitivity	12dB SINAD / -116dBm
Intermodulation Spurious Response Attenuation	above 65dB
RSSI Range	above 60dB
Protection Against Spurious Response Interference	above 60dB
In Band Conducted Spurious Emission Transmit Band Receive Band	below -60dBm below -80dBm
Out of Band Conducted Spurious Emissions	below -47dBm
Radiated Spurious Emission	
Frequency Range 25 ~ 70 MHz 70 ~ 130MHz 130 ~ 174MHz 174 ~ 260 MHz 260 ~ 470 MHz 470 ~ 1GHz	Maximum Allowable EIRP -45dBm -41dBm -41 ~ -32dBm -32dBm -32 ~ -26dBm -21dBm

### 3. PCS MODE

Waveform Quality	0.944 or more
Time Reference	1uS or less
Tx Output Power	Maximum 200mW (23dBm)
Occupied Band Width	1.23MHz
Tx Conducted Spurious Emission	1.25MHz : -42dBc / 30KHz below
Minimum Tx Power Control	-50dBm below
Open Loop Power Control	-25dBm: -60.5dBm ~ -41.5dBm -65dBm: -20.5dBm ~ + 1.5dBm -104dBm: +15.0dBm ~ +30.0dBm
Closed Loop Powe Control Range	24dB
Single Tone Desensitization Rx Power = -101dBm Tone Power = -30dBm Tone offset from carrier = 1.25MHz	lower than 1%
Conducted Spurious Emission 1930 1990MHz 1850 1910MHz All Other Frequencies	< -81dBm < -61dBm < -47dBm
Rx Sensitivity and Dynamic Range	-104dBm, FER=0.5% or less -25dBm, FER=0.5% or less
Intermodulation Spurious Response Attenuation Rx power = -101dBm Tone Power 1 = -43dBm Tone Power 2 = -43dBm Tone 1 offset from carrier = 1.25MHz Tone 2 offset from carrier = 2.05MHz	lower than 1%

The PLL(Phased Locked Loop) block consists of VC-TCXO(U205), PLL-IC(U204), VCO(U201,U202), and loop filter.

#### VC-TCXO

The VC-TCXO is a reference source of the frequency synthesizer. It provides 19.68MHz reference frequency to PLL-IC. It is a voltage controlled temperature compensated crystal oscillator having 19.68MHz 2.5ppm frequency stability over all useful temperature range. A correct frequency tuning is made by the control voltage.

#### VCO(for PCS)

The VCO(U201) generates the RF local signal having 1750 30 MHz frequency range with the voltage control.

#### VCO(for AMPS)

The VCO(U202) generates the signal having 954 980 MHz frequency range with the voltage control.

#### PLL IC

The PLL IC(U204) includes prescalers, dividers and charge pump. The reference divider in the PLL IC divides the frequency of VC-TCXO into 10kHz and 40kHz . This reference frequency is supplied to one of the inputs of phase detector. The signal generated at VCO goes into another input stage of the phase detector through a prescaler and a programmable divider. At this point the error proportional to the phase difference of the two inputs occurs. This phase error is applied to the frequency control input stage of VCO through the loop filter which consists of resistors and capacitors.

## **Spurious Radiation Suppression Circuit**

The spurious signal from antenna is suppressed at the duplexer. The duplexer has flat characteristics to the receiving signal and high attenuation characteristics to the harmonic signals of transmission.

So it suppresses the spurious radiation.

Table 1. The characteristics of duplexer filter(for PCS)

Parameter	Specification	Typical Variation
<b>TX</b>		
Center Frequency	1880MHz	
Passband	1850 1910MHz	
Insertion Loss	3.6dB(max)	0.25dB
Return Foss	10.0dB(min)	1.0dB
Attenuation	37.0dB(min)	2.0dB
<b>RX</b>		
Center Frequency	1960MHz	
Passband	1930 1990MHz	
Insertion Loss	4.4dB(max)	0.35dB
Return Loss	10.0dB(max)	1.0dB
Attenuation	55.0dB(min)	2.0dB
Power Rating	3W	
Input/Output Impedance	50 (typ.)	
Operating Temperature	-40 to 85	

Table 2. The characteristics of duplexer filter(for AMPS)

Parameter	Specification	Typical Variation
<b>TX</b>		
Center Frequency	836.5MHz(FT)	
Passband	824 - 849 MHz	
Insertion Loss at Passband	+10 +35 2.6dB(max) -30 +85 2.8 dB(max)	0.25dB
VSWR at Passband	1.7(max)	1.0dB
Input Power	2W(max)	
Attenuation Absolute Value Relative Value	869 894MHz 43dB(Min.) 1648 1698MHz 27dB(Min.) 2472 2547MHz 30dB(Min.)	3.0dB
Ripple at Passband	1.9dB(Max.)	
<b>RX</b>		
Center Frequency	881.5MHz (FR)	
Passband	FR 12.5MHz	
Insertion Loss at Passband	3.7dB(max)	0.35dB
VSWR at Passband	1.8dB(max)	1.0dB
Input Power	1W	
Attenuation Absolute Value Relative Value	824 849MHz 50dB(Min.) 914 939MHz 10dB(Min.) 959 984MHz 30dB(Min.)	2.5dB
Ripple at Passband	1.3dB(Max.)	