1. SPECIFICATION

1. GENERAL

Freqency Range Transmitter Receiver	 824.64 ~ 848.37 MHz 869.64 ~ 893.37 MHz
Channel Spacing	1.23 MHz
Number of Channels	20 FA
Duplex Spacing	45 MHz
Frequency Stability	300Hz
Operating Temperature	-20 ~ +50 (-4 ~ +122)
Operating Voltage HHP	3.6V DC (10%)
Size and Weight Including standard battery Including extended-life battery	108 x 46 x 25mm (standard) , 108 x 46 x 29mm (extended) 128g 143g
Operating Time Standby Time (Slot mode 2) Talk Time	 50 ~ 70 hours (with standard battery) 60 ~ 90 hours (with extended-life battery) 120 min (with standard battery) 150 min (with extended-life battery)

Waveform Quality	above 0.944
Time Reference	within 1us
Rx Sensitivity and Dynamic Range	-104dBm , FER=within 0.5% -104dBm ~ -25dBm, FER=within 0.5%
Tx Output Power	Maximum 430mW
Tx Frequency Deviation	within 300Hz
Occupied Band Width	1.32MHz
Tx Conducted Spurious Emission	900KHz : below -42dBc / 30KHz 1.98MHz: below -54dBc / 30KHz
Minimum Tx Power Control	below -50dBm
Open Loop Power Control	-25dBm : -57.0dBm ~ -38.5dBm -65dBm : -17.5dBm ~ + 1.5dBm -104dBm : +18.0dBm ~ +30.0dBm
Standby Output Power	below -61dBm
Colsed Loop Tx Power Control Range	Test1 : above 24dB Test2 : 0ms ~ 2.5ms Test3 : above 24dB Test4 : above 24dB Test5 : above 24dB

2. FREQENCY RANGE

Transmitter Frequency		
FA NO.	CH NO.	Center Frequency
1	1011	824.64MHz
2	29	825.87MHz
3	70	827.10MHz
4	111	828.33MHz
5	152	829.56MHz
6	193	830.79MHz
7	234	832.02MHz
8	275	833.25MHz
9	316	834.48MHz
10	363	835.89MHz
11	404	837.12MHz
12	445	838.35MHz
13	486	839.58MHz
14	527	840.81MHz
15	568	842.04MHz
16	609	843.27MHz
17	650	844.27MHz
18	697	845.91MHz
19	738	847.14MHz
20	779	848.37MHz

Receiver Frequency		
FA NO.	CH NO.	Center Frequency
1	1011	869.64MHz
2	29	870.87MHz
3	70	872.10MHz
4	111	873.33MHz
5	152	874.56MHz
6	193	875.79MHz
7	234	877.02MHz
8	275	878.25MHz
9	316	879.58MHz
10	363	880.89MHz
11	404	882.12MHz
12	445	883.35MHz
13	486	884.58MHz
14	527	885.81MHz
15	568	887.04MHz
16	609	888.27MHz
17	650	889.27MHz
18	697	890.91MHz
19	738	892.14MHz
20	779	893.37MHz

6. Description of Frequency Stabilization Circuit , Suppression of Spurious Radiation

Frequency Synthesizer Circuit

The Frequency synthesizer is an indirect frequency synthesizer PLL(Phased Locked Loop). It consists of a VCTCXO(U343), PLL IC(U342,U402), VCO(U341), and loop filter.

VCTCXO

The VCTCXO is a reference source of the frequency synthesizer. It provides 19.68MHz reference frequency to PLL. The VCTCXO is a Voltage Controlled Temperature Compensated Crystal Oscillator having 19.68MHz 2.5 ppm frequency stability over all useful temperature range. A correct frequency tuning is made by the control voltage.

VCO

The VCO(U341) generates the signal having 966 12.5MHz center frequency with the voltage control. PLL IC controls this signal.

PLL IC

The PLL IC(U342,U402) includes prescalers and charge pump. The reference divider in PLL IC divides the frequency of VCTCXO by 19.68MHz and makes reference frequency 10KHz. This reference frequency is supplied to one of the input of phase detector. The signal generated at VCO goes into another input stage of the phase detector through a prescaler and the main divider. At this point, the error proportional to the phase difference of two inputs is occurred. This error signal is supplied to the frequency control input stage of VCO through the loop filter consisted RC.

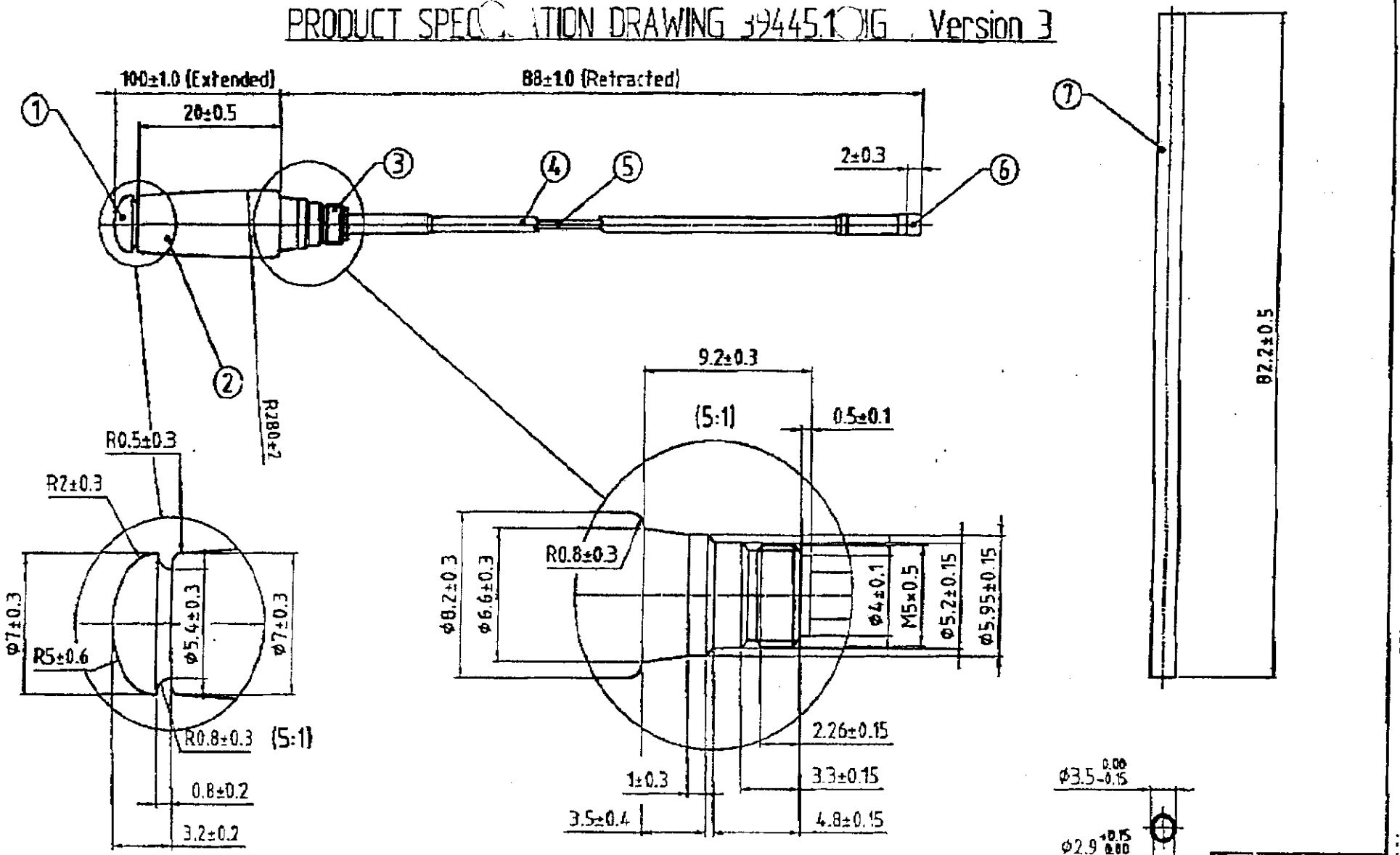
Spurious Radiation Suppression Circuit

The spurious signal from antenna is suppressed at the duplexer. The duplexer has a flat characteristics to the receive signal and a high attenuation characteristics to the harmonic signal of transmission. So it suppress the spurious radiation

Table: The characteristic of duplexer filter(F301)

Parameter	Value
T X	
Center Frequency	836.5 MHz (FT)
Bandwidth	FT 12.5 MHz
Insertion Loss at BW	+10 ~ +35 2.6dB Max -30 ~ +85 2.8dB Max
VSWR at BW	1.7 Max
Input power	2W Max
Attenuation absolute value relative value	869 ~ 894MHz 43dB Min 1648 ~ 1698 MHz 27dB Min 2472 ~ 2547 MHz 30dB Min
Ripple at BW	1.9dB Max
R X	
Center Frequency	881.5 MHz (FR)
Bandwidth	FR 12.5 MHz
Insertion Loss at BW	3.7dB Max
VSWR at BW	1.8 Max
Input power	1W Max
Attenuation absolute value relative value	824 ~ 849 MHz 50dB Min 914 ~ 939 MHz 10dB Min 959 ~ 984 MHz 30dB Min
Ripple at BW	1.3dB Max

PRODUCT SPEC[illegible]ATION DRAWING [illegible]IG Version 3



NO.	MATERIAL		SURFACE TREATMENT
	Plastic	Zytel 66 E101 L	Surface acc. to Charmilles VDI 3400 no. 30, Colour according to NCS 9500
	Plastic	Santoprene 103-40	Surface acc. to Charmilles VDI 3400 no. 33, Colour according to NCS 8500
	Brass	SS 5170-04	Cu/CuBNi2-4b acc. to SS ISO 1458
	Plastic	[illegible]	
	Ni-Ti-Cr	super elastic alloy	
	Brass	SS 5170-04	Cu/CuBNi10b acc. to SS ISO 1458

Scale: 2:1

Original: 98-02-24 HAS

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W-8-01

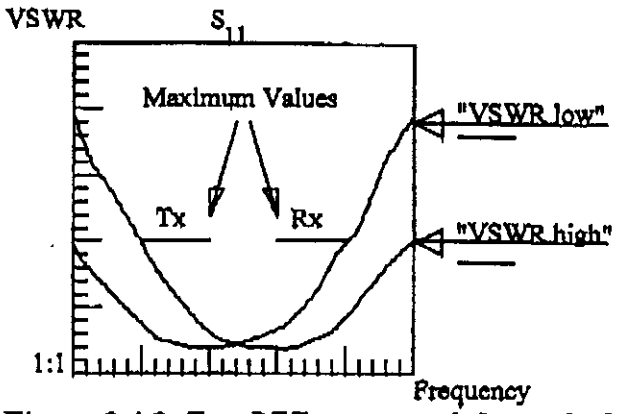

Figure 2.4.3. *Two REF antennas defining the low and high VSWR limits.*

2.5 GAIN[1]

2.5.1 Typical Minimum Values in Maximum Direction

Mode	Tx	Rx
Extended	-2 dBd	-2 dBd
Retracted	-3.5 dBd	-3.5 dBd

2.5.2 Maximum Lobe Tilt

Mode	Tx	Rx
Extended	45°	45°
Retracted	45°	45°

2.5.3 Measuring Method

The connection is done according to 2.4.2. Radiation patterns are measured at 6 different frequencies: Tx_{min}, Tx_{mid}, Tx_{max}; Rx_{min}, Rx_{mid}, and Rx_{max}. The specified values shall be found within ±45° from the horizontal plane according to figure 2.5.3 a) and b). The antenna is measured in 2 orthogonal E-planes, according to figure 2.5.3 c), in free space. The antenna is also measured in the H-plane as well as in talk position.

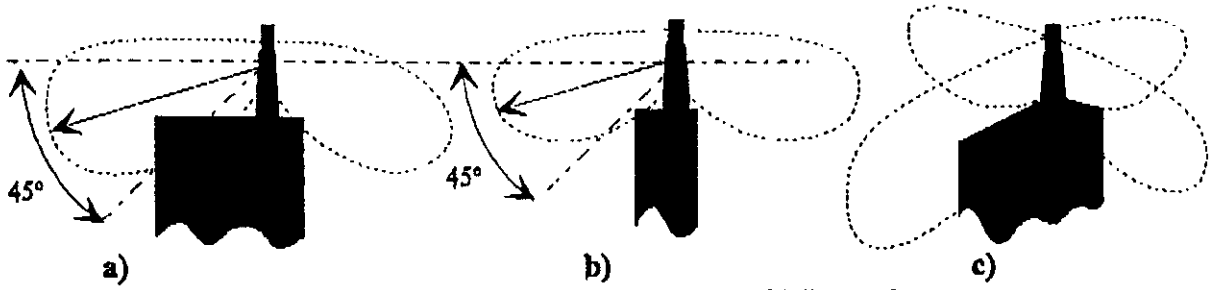

Figure 2.5.3. *Radiation patterns. a) Anterior view. b) Lateral view. c) 3-D view.*