

GSM and DCS Band RF Unit

Product Description

GSM and DCS band RF Unit will be used to convert the GSM (900 MHz) and DCS (1800 MHz) uplink and downlink bands to an intermediate frequency (IF) of 76.8 MHz (6 downconversion chains used to cover the full band of GSM & DCS bands), each IF chain has 40MHz bandwidth.

The unit will also include the RF chains for the functionality of upconverting 6 intermediate frequencies at 76.8 MHz to GSM & DCS bands. The upconversion and downconversion chains will be controlled by Microcontroller and this MIC acts as a slave for External Microcontroller. The unit generates its own LO's through reference generation circuit and PLL's. All the sub-modules (Tx_distribution and reference generation circuits, PLL's, Microcontroller, up-converters and down converters) except the receiver distribution module will be housed in 19 Inch Rack mount unit and the Rx distribution circuits will have separate mechanical enclosure called Tower Mount unit.

Technical Specifications

Down Conversion Chain with Rx Distribution Module:

No. of Inputs	8 Inputs : (RF_IN1, RF_IN2, RF_IN3, RF_IN4, RF_IN5, RF_IN6, RF_IN7, RF_IN8).
Frequency Range	RF_IN1 – RF_IN4 : 880–960 MHz RF_IN5 – RF_IN8 : 1710-1880 MHz
RF Input Level	-110 dBm to 0 dBm
Max Non Destructive Input Level	+10 dBm
VSWR	< 2:1
Number of IFs	6 IF's: (IF_OUT1, IF_OUT2, IF_OUT3,IF_OUT4, IF_OUT5, IF_OUT6,)
IF Frequency	76.8 MHz
1 dB BW of IF Outputs	40 MHz (76.8 ± 20 MHz)
3 dB BW of IF Outputs	44 MHz
40 dB BW of IF Outputs	50 MHz
RF to IF Mapping	
880-915 MHz	IF_OUT1
925-960 MHz	IF_OUT2
1710-1748.75 MHz	IF_OUT3
1746.25-1785 MHz	IF_OUT4
1805-1843.75 MHz	IF_OUT5
1841.25-1880 MHz	IF_OUT6
Linear Gain Range from RF_IN to IF_OUT (For all 6 chains)	37 dB ± 2 dB for RF Input Level of -110 to -40 dBm

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Max Level at IF Outputs	+5 dBm
VSWR at IF Output	< 3:1
Two tone Spurious free dynamic Range	≥ 70 dB
Noise Figure	≤ 15 dB
LO frequency for IF_OUT1 (LO1)	974.3 MHz
LO frequency for IF_OUT2 (LO2)	1019.3 MHz
LO frequency for IF_OUT3 (LO3)	1805.55 MHz
LO frequency for IF_OUT4 (LO4)	1843.05 MHz
LO frequency for IF_OUT5 (LO5)	1900.55 MHz
LO frequency for IF_OUT6 (LO6)	1938.05 MHz
Phase Noise for LO1 to LO6	≤ -95 dBc/Hz @ 10kHz Offset
Frequency Stability of all LOs	Better than 1 in 10 ⁻⁷
LO Re-radiation	≥ 90 dB
IF Rejection	≥ 90 dB
Image Rejection	≥ 90 dB
Switchable RF Attenuation	Manual; 30 dB in 5 dB steps
LO frequency for IF_OUT1 (LO1)	974.3 MHz
LO frequency for IF_OUT2 (LO2)	1019.3 MHz
LO frequency for IF_OUT3 (LO3)	1805.55 MHz
LO frequency for IF_OUT4 (LO4)	1843.05 MHz
LO frequency for IF_OUT5 (LO5)	1900.55 MHz
LO frequency for IF_OUT6 (LO6)	1938.05 MHz

Up Conversion Chain with Tx Distribution Module

Number of Inputs	Six: (IF_IN1, IF_IN2, IF_IN3, IF_IN4, IF_IN5, IF_IN6)
IF Frequency Range	76.8 ± 20MHz
IF Input level	-20dBm
VSWR	<2:1
Number of RF Outputs	Eight: (RF_OUT1, RF_OUT2, RF_OUT3, RF_OUT4, RF_OUT5, RF_OUT6, RF_OUT7, RF_OUT8)
RF_OUT1 to RF_OUT4	880-960MHz
RF_OUT5 to RF_OUT8	1710-1880MHz
RF Output level	-12dBm to +12dBm
RF Output adjustability	In 1dB steps
VSWR at RF Output	<3:1

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LO Frequencies	
LO frequency for RF_OUT1(LO7)	974.3MHz
LO frequency for RF_OUT2(LO8)	1019.3MHz
LO frequency for RF_OUT3(LO9)	1805.55MHz
LO frequency for RF_OUT4(LO10)	1823.05MHz
LO frequency for RF_OUT5(LO11)	1880.05MHz
LO frequency for RF_OUT6(LO12)	1918.05MHz
Phase Noise for LO7 to LO12	≤-95dBc/Hz @10kHz offset
Frequency Stability of LO's	Better than 1 in 10 ⁻⁷
LO Re-radiation	≥90dB
IF rejection	≥90dB
Image Rejection	≥90dB
Reference Generation Module Ref_IN1 to Ref_IN12 Baseband Reference	104MHz for synthesizers 104MHz with +13dBm
BITE	At Module level
RSSI Measurement	At RF input level
Remote Controllability, Module fault status and RSSI measurement report	Via 8 Pairs of RS422 Lines(8 Rx+8 Tx),8 Pairs of TTL Lines (8 Rx+8 Tx)
Power Supply	230V AC, single phase 50Hz ± 5Hz;
Mechanical	Standard 19" width rack mountable unit with 560 mm depth and 3U height.

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Environmental and EMI/EMC Specifications:

Low Temperature	
a. Operational	-10°C
b. Storage	-20°C
High Temperature	
a. Dry Heat Operational	+55°C
b. Storage	+70°C
Damp Heat	40°C @ Humidity without condensation
Temperature Cycling	-10°C to +55°C @ 5°C/mt, 4 cycles
Altitude	-10°C Height = 4km (60kpa)
Vibration (Sinusoidal)	MIL STD – 810C
Resonance Search and Endurance	Method 516.2, Proc.1, 15G, 11msec, ½ sine
Bump	15 G max
Toppling	100mm height six faces on each edge
EMI/EMC	Compliance with MIL-STD461C

Product Photo:

Rack Mount Unit



Tower Mount Unit

