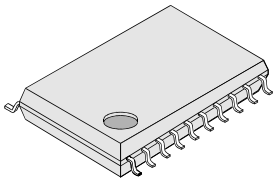
MB15F8xUL Series

Fractional-N / Integer dual PLL Frequency Synthesizers

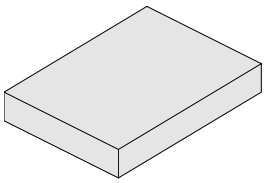
■ DESCRIPTION

The Fujitsu MB15F8xUL series dual PLLs are serial input Frequency synthesizers. The Fractional-N PLL operates up to 2.6 GHz and the integer PLL operates up to 1200 MHz. They have built-in dual-modulus prescalers enabling pulse swallow operation and fixed or selectable fractional modulo. The latest advanced BiCMOS technology is used resulting in a super low supply current. A refined charge pump design (Fujitsu's Super Charger) provides fast tuning along with low spurious noise and phase noise characteristics. The MB15F8xUL series is ideally suited for digital mobile communications, including GSM, DCS1800, PCS1900, IS-136, IS-95 and ISM applications.

Packages



20-pin, Plastic TSSOP
FPT-20P-M06



20-pad, Plastic BCC
LCC-20P-M05

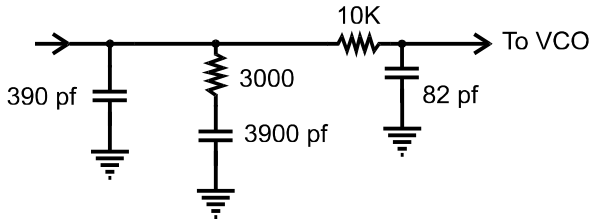
■ FEATURES

- Fractional-N RF PLL and Integer IF PLL
- Very low spurious and phase noise characteristics
- Low operating voltage: 2.4 to 3.6 volts
- Low operating current: 5.8 to 6 mA (typical)
- Power-saving current: 0.1µA (typical)
- Wide operating temperature: –40 to +85°C
- New 30% smaller BCC 20 package
- Plastic 20-pin TSSOP
- Selectable charge pump current (±1.5 or ±6.0 mA)
- Evaluation Kits available

Parameter	MB15F83UL	MB15F86UL	MB15F88UL
RF/RX Frequency - max.	2 GHz	2.5 GHz	2.6 GHz
IF/TX Frequency - max	600 MHz	600 MHz	1.2 GHz
Low Power Supply Voltage	2.7V	2.7V	2.7V
Low Power Supply Current	5.8 Ma	5.8 mA	6.0 mA
Prescaler Divide Ratios	RF = 16/17 IF = 8/9 OR 16/17	RF = 16/17 or 32/33 IF = 8/9 or 16/17	Rx = 32/33 Tx = 16/17 or 32/33
Reference Divider	RF = 3 to 127 IF = 3 to 16383	RF = 3 to 255 IF = 3 to 16383	RF = 8 to 16383 IF = 8 to 16383
Fractional Function	RF = modulo 13 fixed	RF = modulo 3 to 16	RF = modulo 5 or 8
Fractional Counter	RF = 0 to 15	RF = 0 to 15	RF = 0 to 15
Swallow Counter	RF = 0 to 31 IF = 0 to 15	RF = 0 to 31 IF = 0 to 31	RX = 0 to 31 TX = 0 to 31
Programmable Counter	RF = 18 to 1,023 IF = 3 to 2.027	RF = 18 to 1,023 IF = 3 to 2.027	RF = 34 to 1,023 TX = 3 to 2.027
Power Saving Function		0.1µA typ.	

Reference Information: MB15F83UL

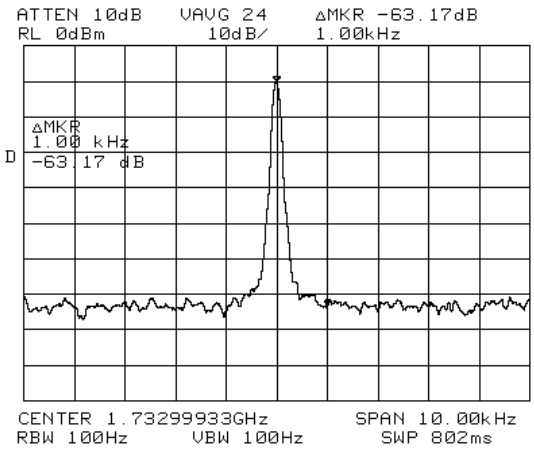
Frequencies: 1733 to 1803 MHz
Step Size: 200 kHz
Hop Time: Less than 2 µs
Charge Pump: 6.0 mA
VCO Sens: 44 MHz/V



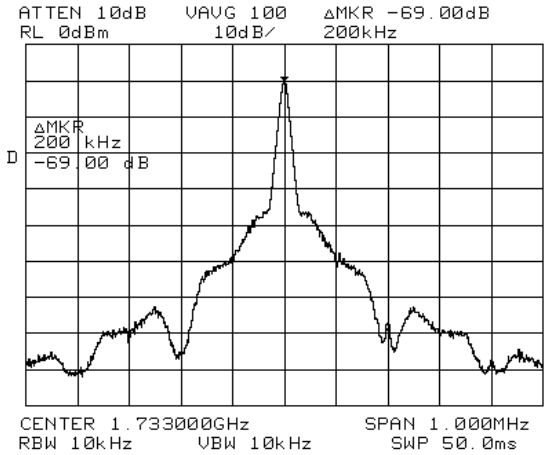
Loop Filter Values

Test Results

Phase Noise = -83.2 dBc/Hz

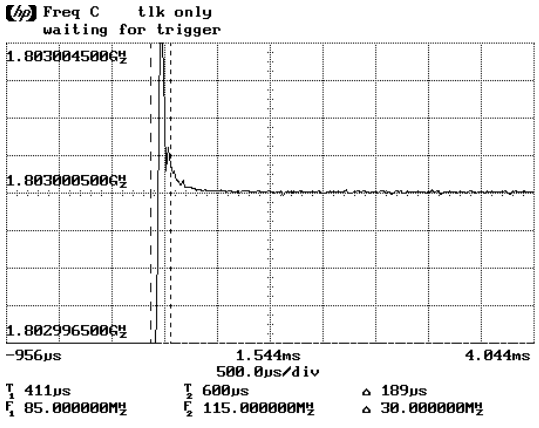


Spurious = -69.0 dBc

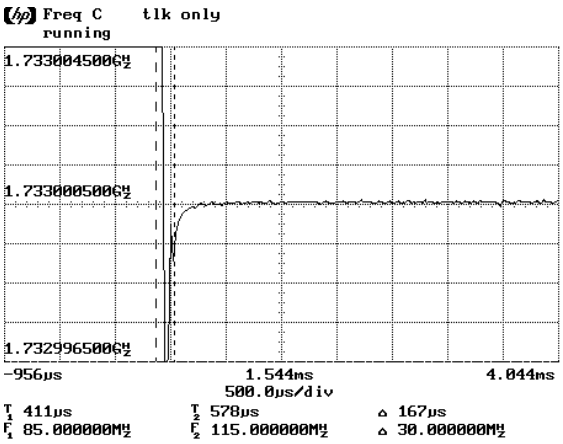


Switching Times

1733 to 1803 =189 µs

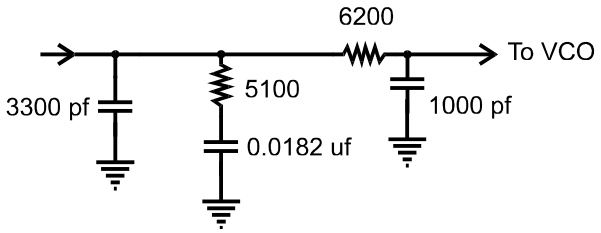


1803 to 1733 = 167 µs



Reference Information: MB15F86UL

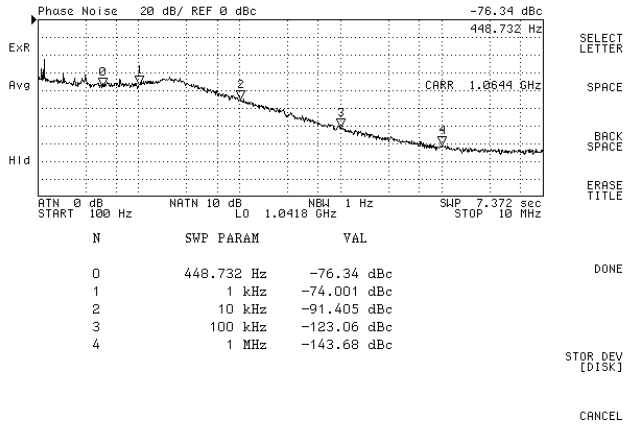
Frequencies: 1051.98 to 1078.17
Step Size: 30 kHz
Hop Time: Less than 2 Ms
Charge Pump: 1.5 mA
VCO Sens: 25 MHz/V



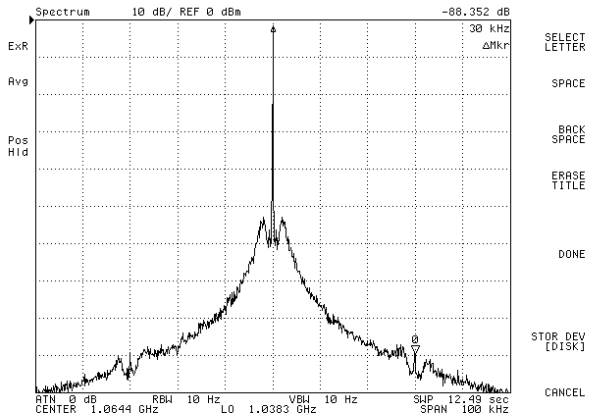
Loop Filter Values

Test Results

Phase Noise = -76.34 dBc/Hz

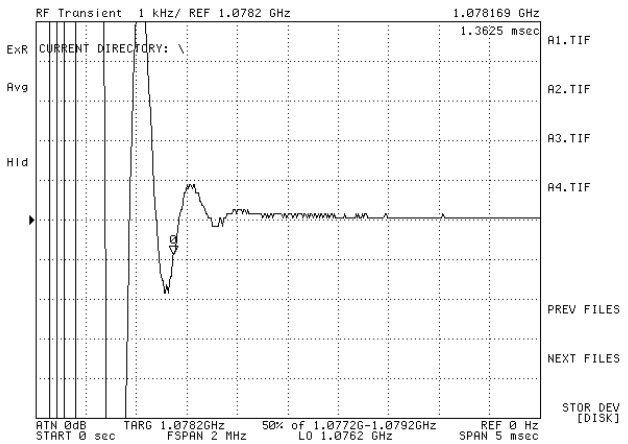


Spurious = -88.35 dBc

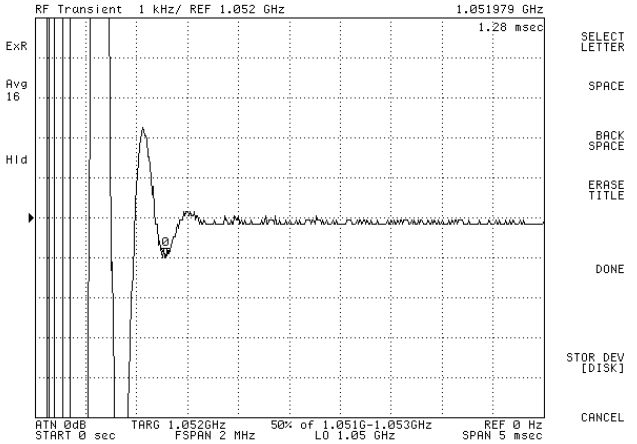


Switching Times

1051.98 to 1078.17 =1.36 ms

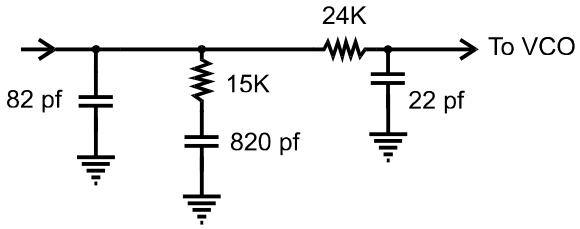


1078.17 to 1051.98 = 1.28 ms



Reference Information: MB15F88UL

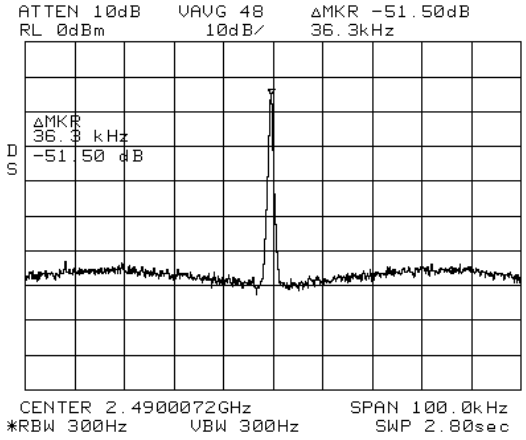
Frequencies: 2490 to 2550 MHz
Step Size: 200 kHz
Hop Time: Less than 2 µs
Charge Pump: 6.0 mA
VCO Sens: 52 MHz/V



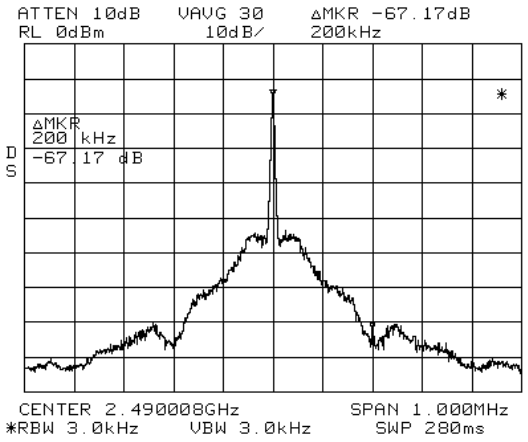
Loop Filter values

Test Results

Phase Noise = -76.3 dBc/Hz

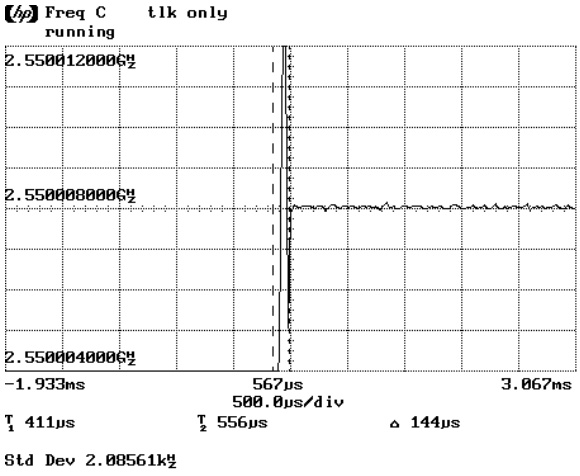


Spurious = -67.2 dBc

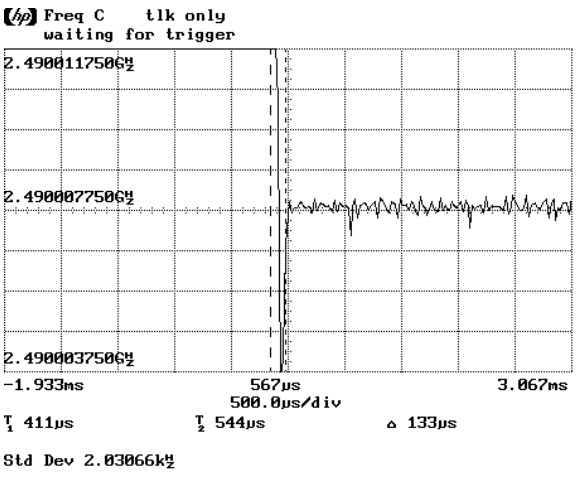


Switching Times

2490 to 2550 MHz = 144 µs

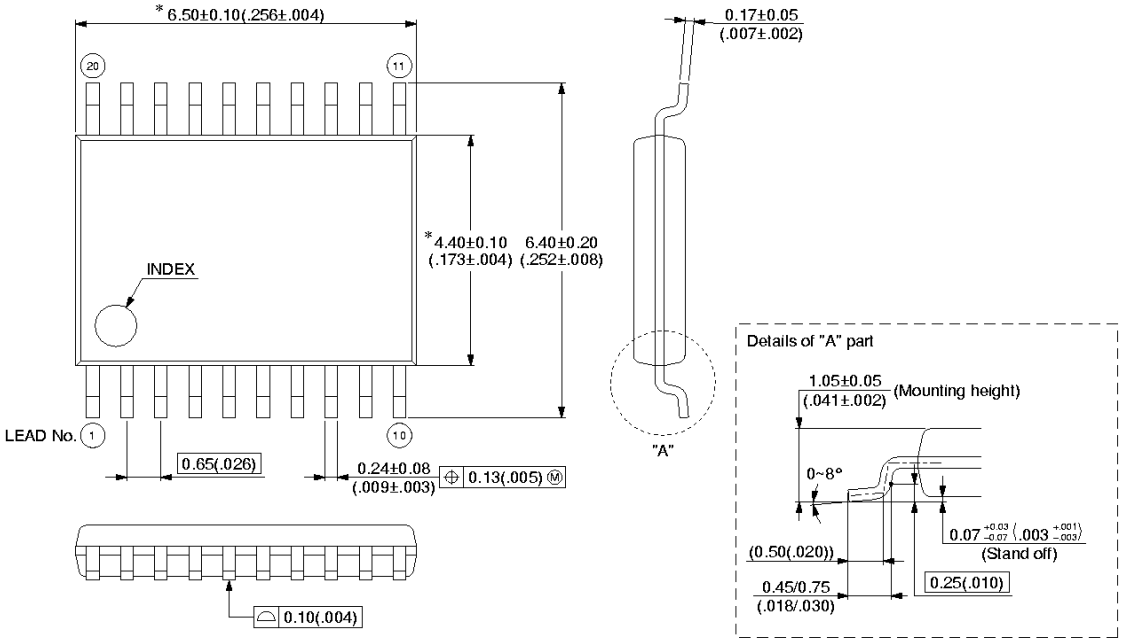


2550 to 2490 MHz = 133 µs

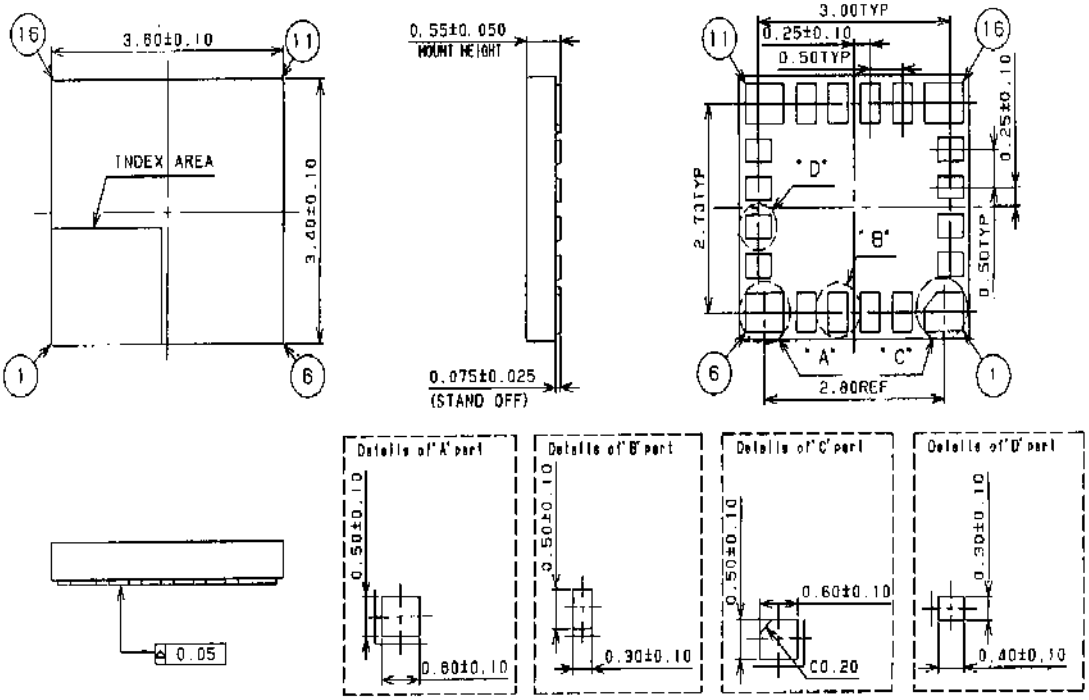


Package Dimensions

MB15F8xULPFT - 20 pin, Plastic SSOP (FPT-20P-M06)



MB15F8xULPVA - 20 pin, Plastic BCC (LCC-20P-M05)



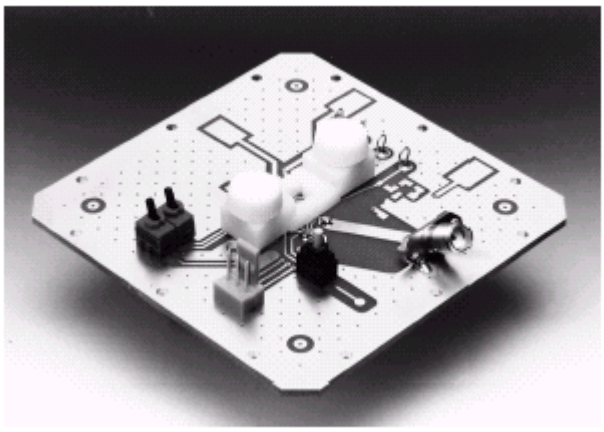
Evaluation Systems

Designing a complex subsystem, such as a PLL, is no easy task. Therefore, Fujitsu has made available an evaluation system to aid in the development of reliable frequency synthesizers. Each evaluation system consists of two PCBs, controlling software, and instructions.

The RF PCB is laid out to allow the target MB158xUL to be optimized for the chosen application. The RF board is only semi-populated, which allows the user to configure it to fit the application.

Evaluation Board P/N's

MB1500EB16 for the TSSOP Package
MB1500EB16B for the BCC Package



Typical Evaluation Board

PLL-DS-20933-5/2002

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