

# MB510

## 2.7GHz TWO MODULUS PRESCALER

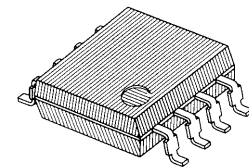
### 2.7GHz TWO MODULUS PRESCALER

The Fujitsu MB510 is an ultra high speed, two modulus prescaler that forms a Phase Locked Loop (PLL) when combined with a frequency synthesizer such as the Fujitsu MB87001A. It divides the input frequency by the modulus of 128/144 or 256/272, and operates at a low power supply current of 10mA at 5.0V.

Through the use of Fujitsu's Advanced Process Technology, the MB510 achieves extremely small stray capacitance from its internal elements.

### FEATURES

- High Frequency Operation: 2.7GHz max.
- Power Dissipation: 50mW typ.
- Pulse Swallow Function: 128/144, 256/272
- Wide Operation Temperature: -40°C to +85°C
- Stable Output Amplitude:  $V_{OUT} = 1.6V_{p-p}$  typ.
- Built-in Termination Resistor
- Complete PLL synthesizer circuit with the Fujitsu MB87001A PLL synthesizer IC
- Package  
Standard 8-pin Flat Package (Suffix: -PF)



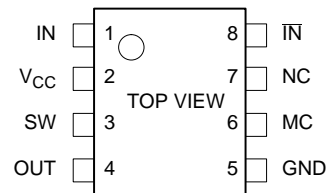
PLASTIC PACKAGE  
FPT-08P-M01

### ABSOLUTE MAXIMUM RATINGS (See Note)

Rating	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	-0.5 to +7.0	V
Input Voltage	$V_{IN}$	-0.5 to $V_{CC}$	V
Output Current	$I_O$	10	mA
Storage Temperature	$T_{STG}$	-55 to +125	°C

**Note:** Permanent device damage may occur if the above **Absolute Maximum Ratings** are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

### PIN ASSIGNMENT



This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit.

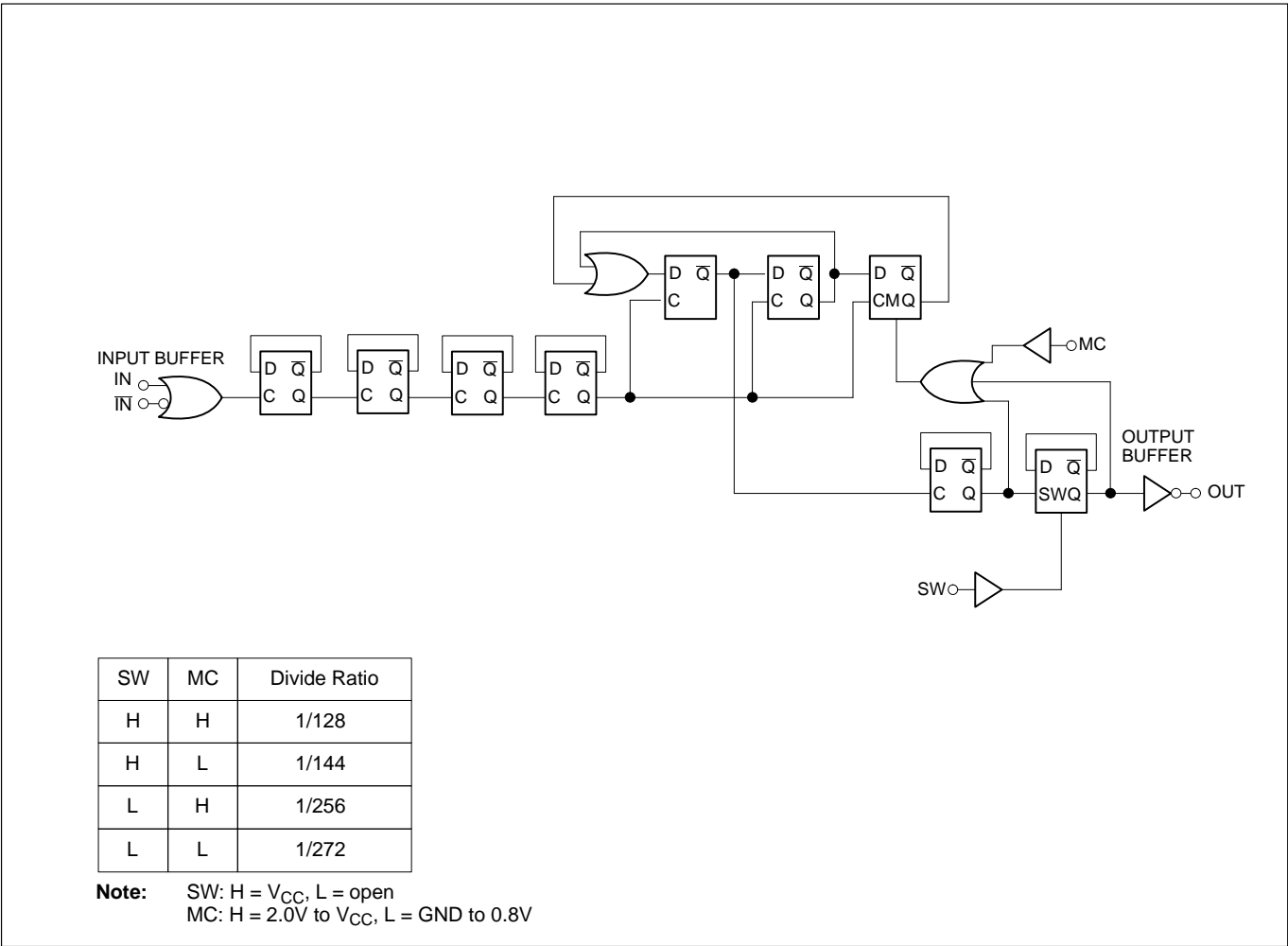


Figure 1. MB510 Block Diagram

**PIN DESCRIPTION**

Pin Number	Symbol	Function
1	IN	Input
2	V <sub>CC</sub>	DC Supply Voltage
3	SW	Divide Ratio Control Input (See Divide Ratio Table)
4	OUT	Output
5	GND	Ground
6	MC	Modulus Control Input (See Divide Ratio Table)
7	NC	Non Connection
8	IN̄	Complementary Input

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Supply Voltage	$V_{CC}$	4.5	5.0	5.5	V
Output Current	$I_O$		1.2		mA
Ambient Temperature	$T_A$	-40		+85	°C
Load Capacitance	$C_L$			8	pF

## ELECTRICAL CHARACTERISTICS

(Recommended Operating Conditions unless otherwise noted)

Parameter	Symbol	Condition	Value			Unit
			Min.	Typ.	Max.	
Supply Current	$I_{CC}$			10.0	15.0	mA
Output Amplitude	$V_O$	Built-in a termination resistor. Load capacitance = 8pF	1.0	1.6		$V_{p-p}$
Input Frequency	$f_{IN}$	With input coupling capacitor 1000pF	10		2700	MHz
Input Signal Amplitude	$P_{IN}$	$f_{IN} = 10$ to 2200MHz	-10		10	dBm
		$f_{IN} = 2200$ to 2700MHz	-4		10	
High Level Input Voltage for MC Input	$V_{IHM}$		2.0			V
Low Level Input Voltage for MC Input	$V_{ILM}$				0.8	V
High Level Input Voltage for SW Input	$V_{IHS}^*$		$V_{CC} - 0.1$	$V_{CC}$	$V_{CC} + 0.1$	V
Low Level Input Voltage for SW Input	$V_{ILS}$		Open			V
High Level Input Current for MC Input	$I_{IHM}$	$V_{IH} = 2.0V$			0.4	mA
Low Level Input Current for MC Input	$I_{ILM}$	$V_{IL} = 0.8V$	-0.2			mA
Modulus Set-up Time MC to OUT	$t_{SET}$			16	26	ns

**Note:** \*Design Guarantee

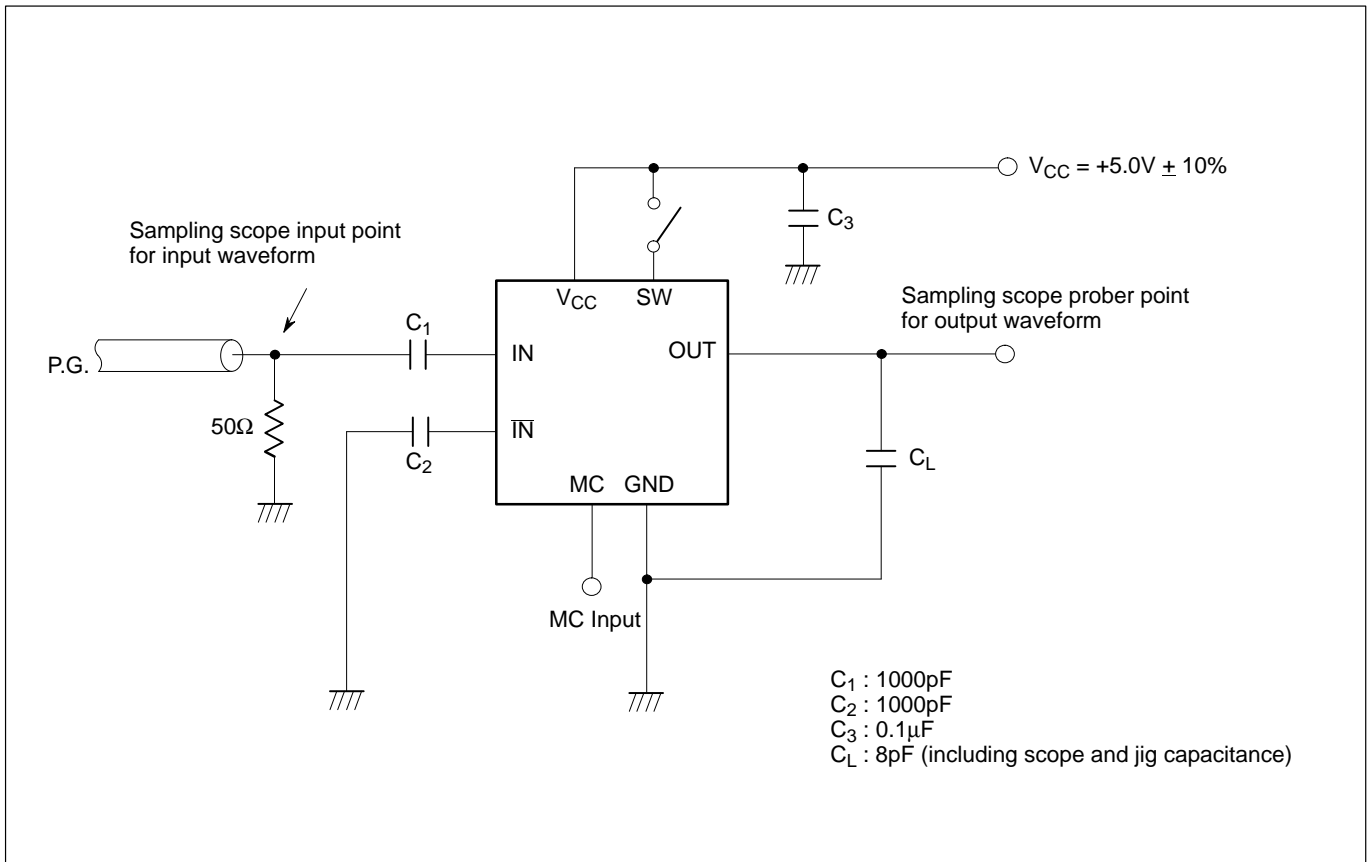


Figure 2. Test Circuit

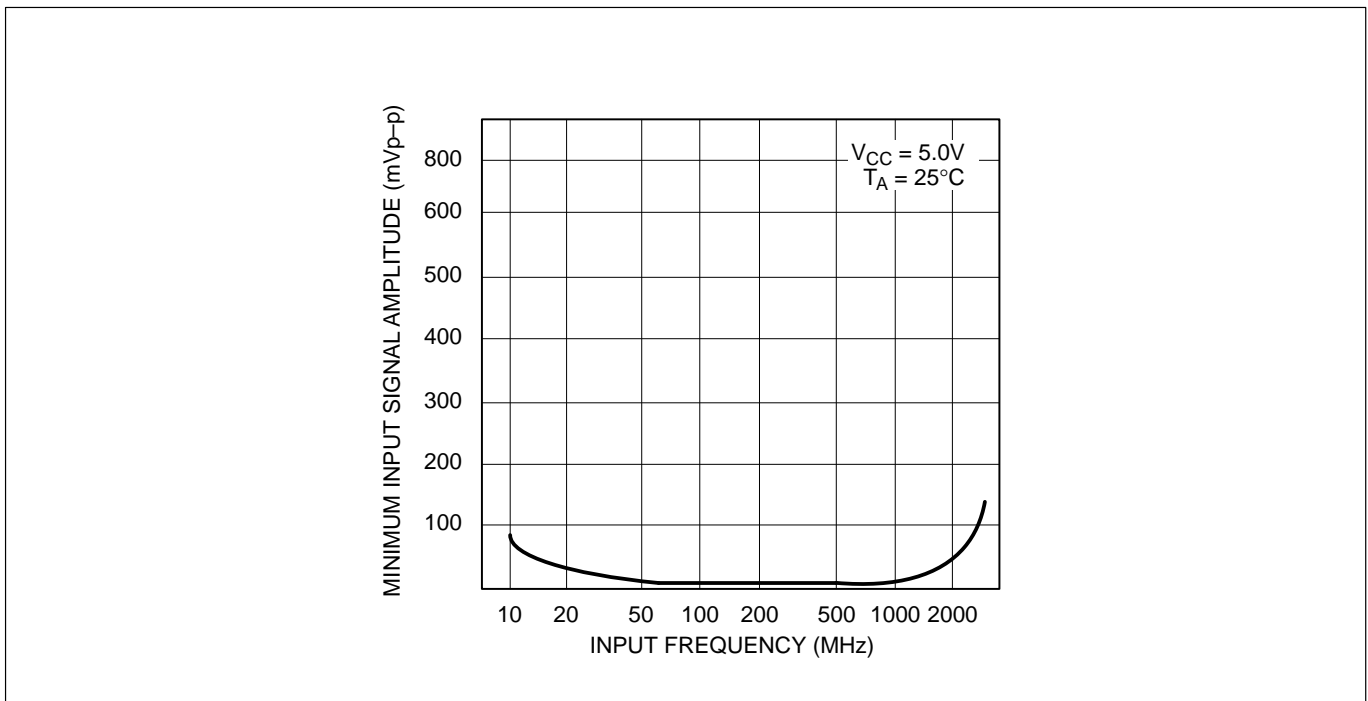
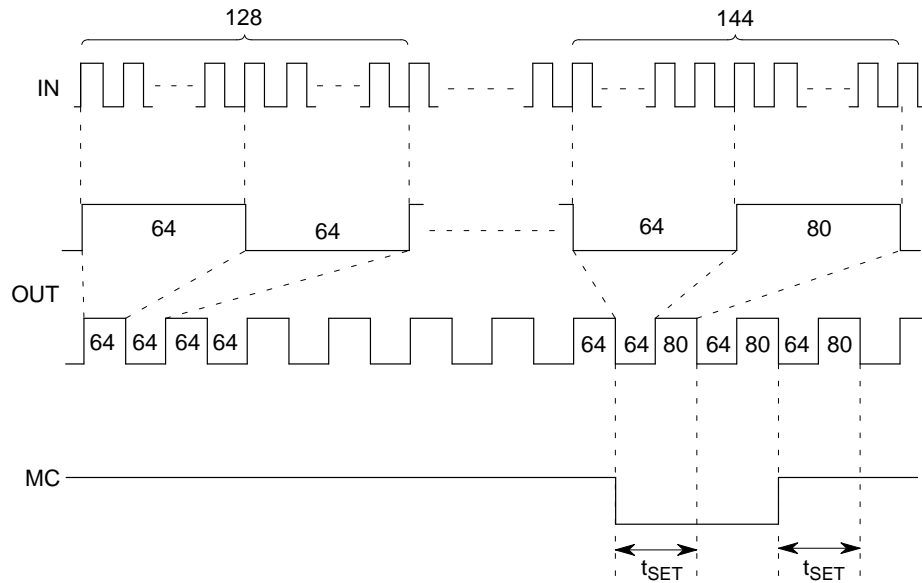


Figure 3. Input Signal Amplitude vs. Input Frequency

**TIMING CHART (2 MODULUS)**

Example: Divide ratio = 128/144



**Note:** When divide of 144 is selected, positive pulse is applied by 16 to 80.  
The typical set up time is 16 ns from the MC signal input to the timing of change of prescaler divide ratio.

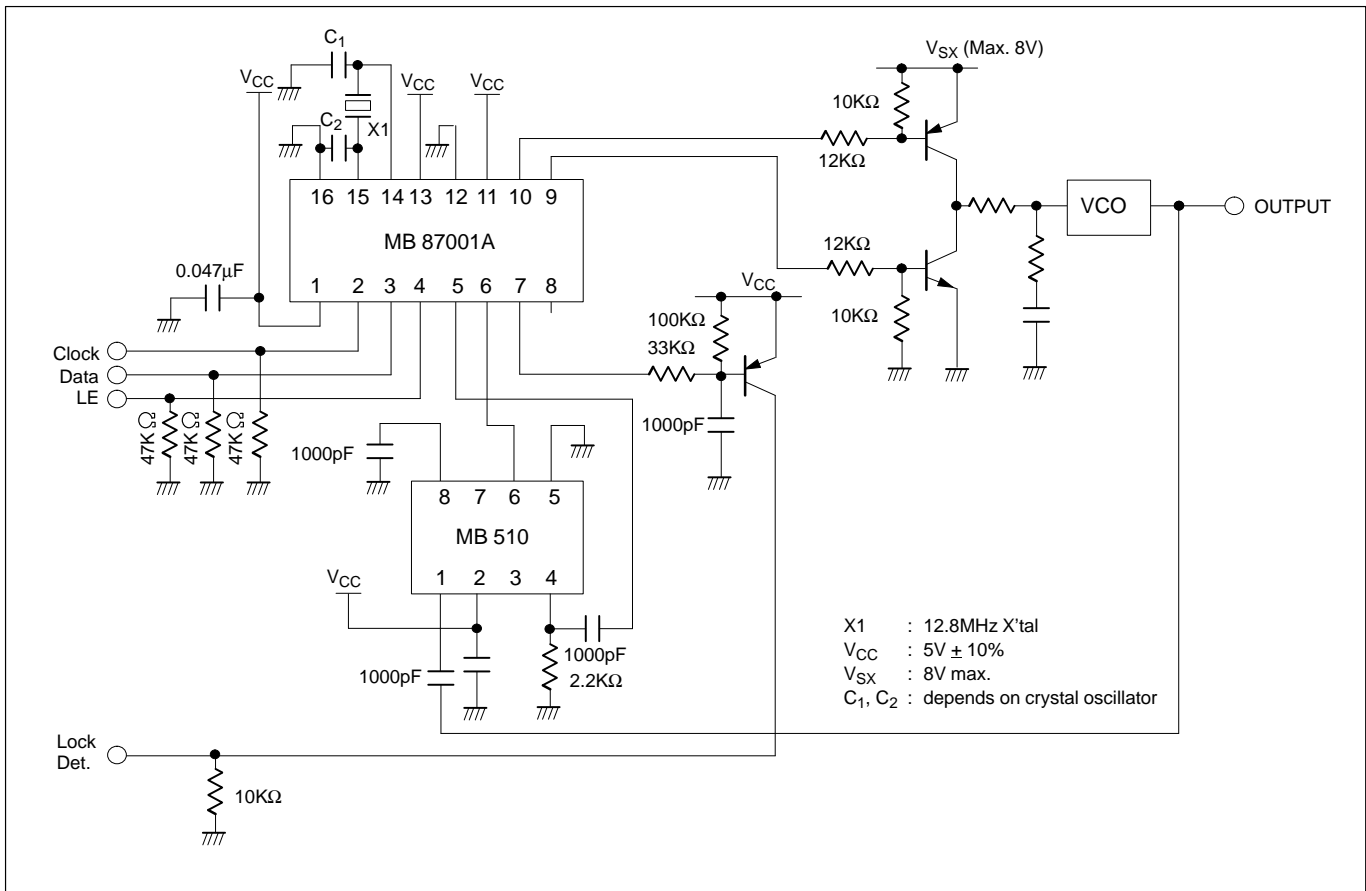
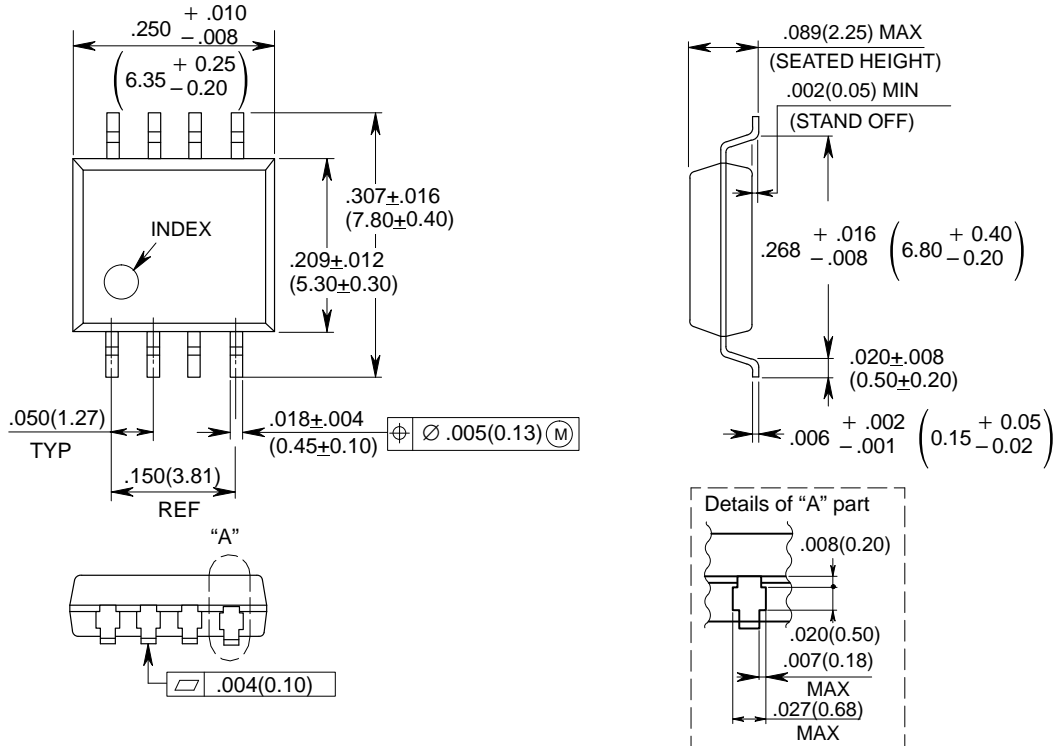


Figure 4. Typical Application Example

# PACKAGE DIMENSIONS

(Suffix: -PF)

## 8-LEAD PLASTIC FLAT PACKAGE (CASE No: FPT-08P-M01)



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Dimensions in inches (millimeters)

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