FUJITSU

═══ *DATA SHEET* ═══

MB508
2.3GHz TWO MODULUS PRESCALER

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The Fujitsu MB508 is a 2.3GHz two modulus prescaler used with a frequency synthesizer to form a Phase Locked Loop (PLL) and divides the input frequency by a modulus of 128/130, 256/258 or 512/514. The output level is 1.6V peak to peak ECL level. The ultra high frequency operation provides wide application, such as Direct Broadcasting Satellite System, CATV system, UHF Transceiver, etc.

FEATURES

- High Frequency Operation: $f = 2.3GHz$ max. (P_{IN} = –4dBm min.)

- Input Signal Amplitude: $V_{IN} = 100mV_{p-p}$ (f_{IN} = 100MHz to 1.8GHz)

- Pulse Swallow Function: 128/130, 256/258, 512/514

- Power Dissipation: 120mW typ.

- Wide Operation Temperature: -40°C to +85°C

- Stable Output Amplitude: $V_{OUT} = 1.6V_{p-p}$ typ.

- Complete PLL synthesizer circuit with the Fujitsu MB87001A, PLL synthesizer system block IC

- Standard Plastic 8-pin Dual-In-Line Package or Flat Package

**PLASTIC PACKAGE
DIP-08P-M01**

**PLASTIC PACKAGE
FPT-08P-M01**

PIN ASSIGNMENT

IN	1	8	$\overline{IN}$
V_{CC}	2	7	SW2
SW1	3 TOP VIEW	6	MC
OUT	4	5	GND

ABSOLUTE MAXIMUM RATINGS (See Note)

Rating	Symbol	Value	Unit
Power 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
Operating Temperature	T_A	–40 to +85	°C
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.
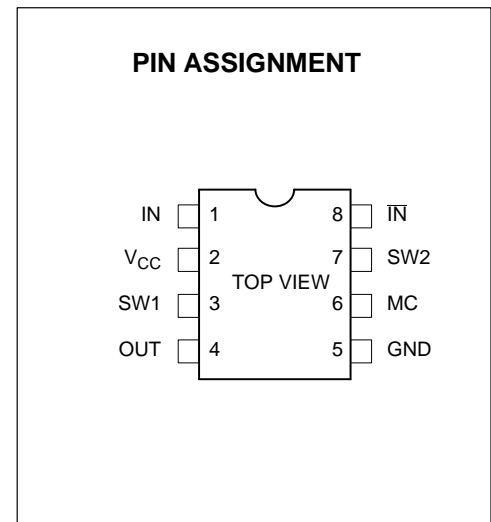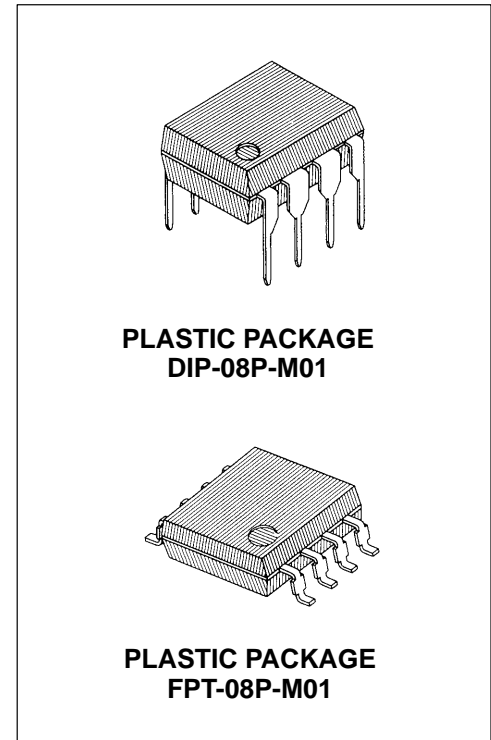
This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit.
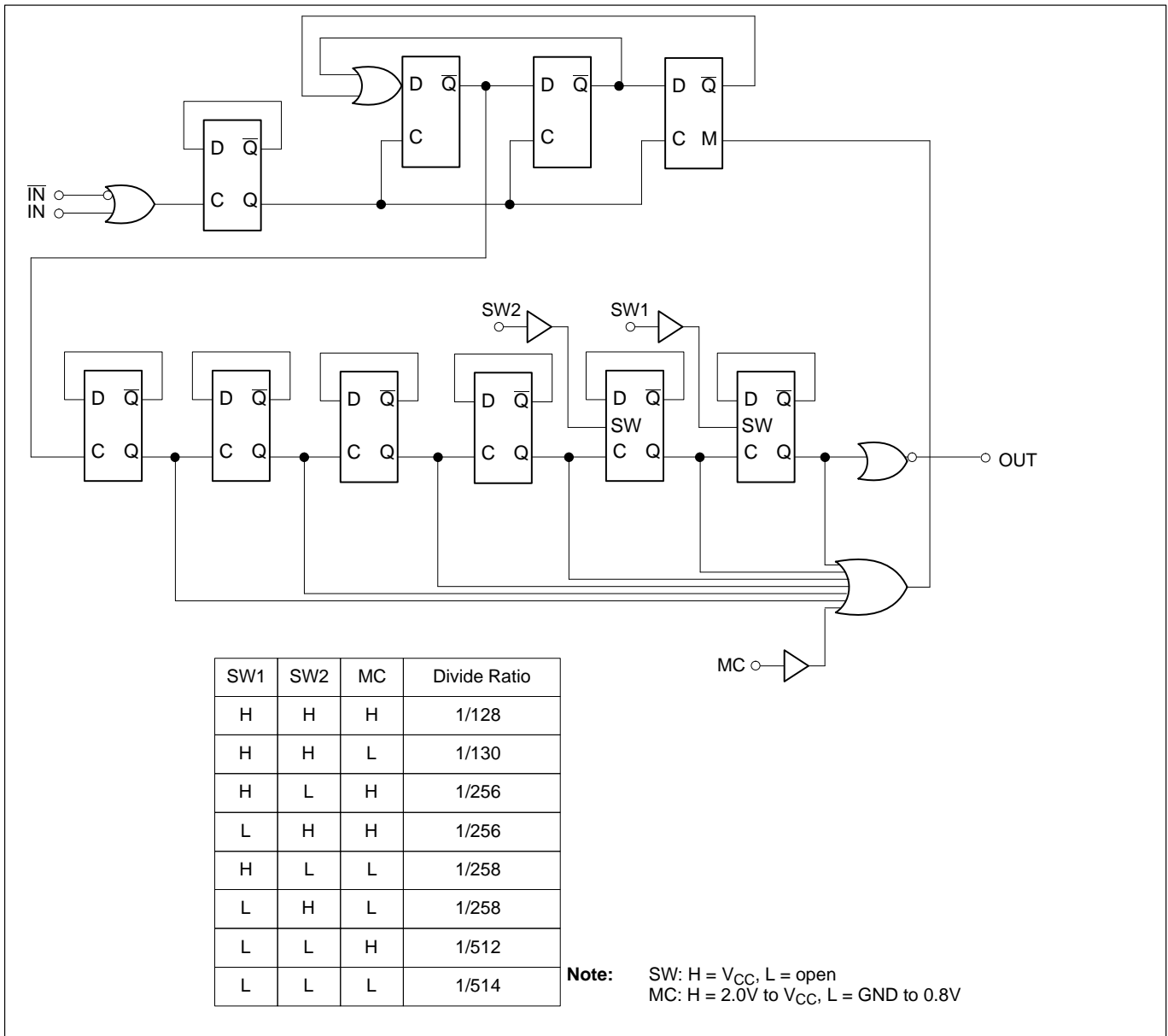
Figure 1. MB508 Block Diagram

SW1	SW2	MC	Divide Ratio
H	H	H	1/128
H	H	L	1/130
H	L	H	1/256
L	H	H	1/256
H	L	L	1/258
L	H	L	1/258
L	L	H	1/512
L	L	L	1/514

Note: SW: H = V_{CC}, L = open
MC: H = 2.0V to V_{CC}, L = GND to 0.8V

PIN DESCRIPTION

Pin Number	Symbol	Descriptions
1	IN	Input
2	V_{CC}	Power Supply, +5V
3	SW1	Divide Ratio Control Input (See Divide Ratio Table)
4	OUT	Output
5	GND	Ground
6	MC	Modulus Control Input (See Divide Ratio Table)
7	SW2	Divide Ratio Control Input (See Divide Ratio Table)
8	$\overline{IN}$	Complementary Input

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Power Supply Voltage	V_{CC}	4.5	5.0	5.5	V
Output Current	I_O		1.2		mA
Operating Temperature	T_A	−40		+85	°C
Load Capacitance	C_L			12	pF

ELECTRICAL CHARACTERISTICS
(Recommended Operating Conditions unless otherwise noted.)

Parameter	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Power Supply Current	I_{CC}			24		mA
Output Amplitude	V_O		1.0	1.6		V_{p-p}
Input Frequency	f_{IN}	with input coupling capacitor 1000pF	100		2300	MHz
Input Signal Amplitude	P_{INA}	f_{IN} = 1800MHz to 2300MHz	−4		5.5	dBm
	P_{INB}	f_{IN} = 100MHz to 1800MHz	−16		10	
High Level Input Voltage for MC	V_{IHM}		2.0			V
Low Level Input Voltage for MC	V_{ILM}				0.8	V
High Level Input Voltage for SW	V_{IHS}*		V_{CC} −0.1	V_{CC}	V_{CC} +0.1	V
Low Level Input Voltage for SW	V_{ILS}			Open		V
High Level Input Current for MC	I_{IHM}	V_{IH} = 2.0V			0.4	mA
Low Level Input Current for MC	I_{ILM}	V_{IL} = 0.8V	−0.2			mA
High Level Input Current for SW	I_{IHS}	V_{IH} = V_{CC}			250	μA
Modulus Set-up Time MC to Output at 2.3GHz Operation	t_{SET}			18	28	ns

Note: *Design Guarantee

Figure 2. Test Circuit

TIMING CHART (2 MODULUS)
Example: Divide ratio = 128/130

Note: When divide of 130 is selected, positive pulse is applied by two to 66.
The typical set up time is 18 ns from the MC signal input to the timing of change of prescaler divide ratio.

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Figure 3. Input Signal Amplitude vs. Input Frequency

Figure 4. Typical Application Example

PACKAGE DIMENSIONS

(Suffix: –P)

8-LEAD PLASTIC DUAL IN-LINE PACKAGE
(CASE No: DIP-08P-M01)

.370 $^{+.016}_{-.012}$

$\left(9.40 ^{+0.40}_{-0.30}\right)$

INDEX

.244±.010
(6.20±0.25)

.039 $^{+.012}_{-0}$

$\left(0.99 ^{+0.30}_{-0}\right)$

.060 $^{+.012}_{-0}$

$\left(1.52 ^{+0.30}_{-0}\right)$

15° MAX

.300(7.62)
TYP

.010±.002
(0.25±0.05)

.035 $^{+.014}_{-.012}$

$\left(0.89 ^{+0.35}_{-0.30}\right)$

.172(4.36) MAX

.020(0.51)
MIN

.118(3.00) MIN

.100(2.54)
TYP

.018±.003
(0.46±0.08)
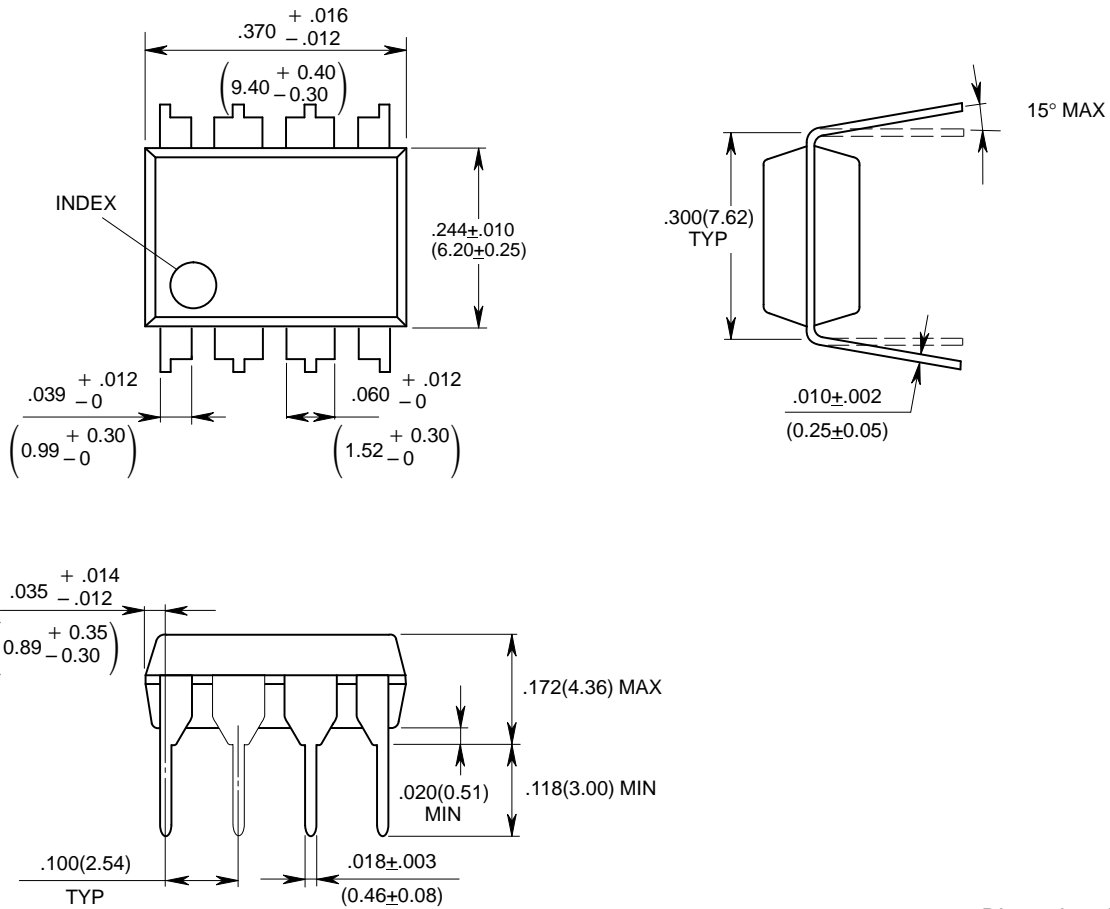
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DImensions in
inches (millimeters)

PACKAGE DIMENSIONS (Continued)
(Suffix: –PF)

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

.250 $^{+ .010}_{- .008}$

$\left(6.35\ ^{+ 0.25}_{- 0.20}\right)$

.089(2.25) MAX
(SEATED HEIGHT)

.002(0.05) MIN
(STAND OFF)

.307±.016
(7.80±0.40)

INDEX

.209±.012
(5.30±0.30)

.268 $^{+ .016}_{- .008}$ $\left(6.80\ ^{+ 0.40}_{- 0.20}\right)$

.020±.008
(0.50±0.20)

.050(1.27)
TYP

.018±.004
(0.45±0.10)

⊕ ∅ .005(0.13) Ⓜ

.006 $^{+ .002}_{- .001}$ $\left(0.15\ ^{+ 0.05}_{- 0.02}\right)$

.150(3.81)
REF

"A"

Details of "A" part

.008(0.20)

.020(0.50)
.007(0.18)
MAX
.027(0.68)
MAX

▱ .004(0.10)

DImensions in
inches (millimeters)

FUJITSU LIMITED

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