

MB501SL

SUPER LOW POWER TWO MODULUS PRESCALER

SUPER LOW POWER TWO MODULUS PRESCALER

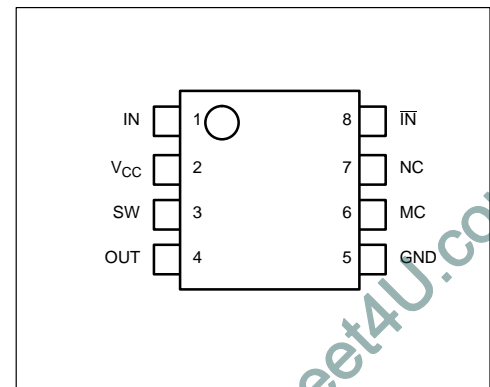
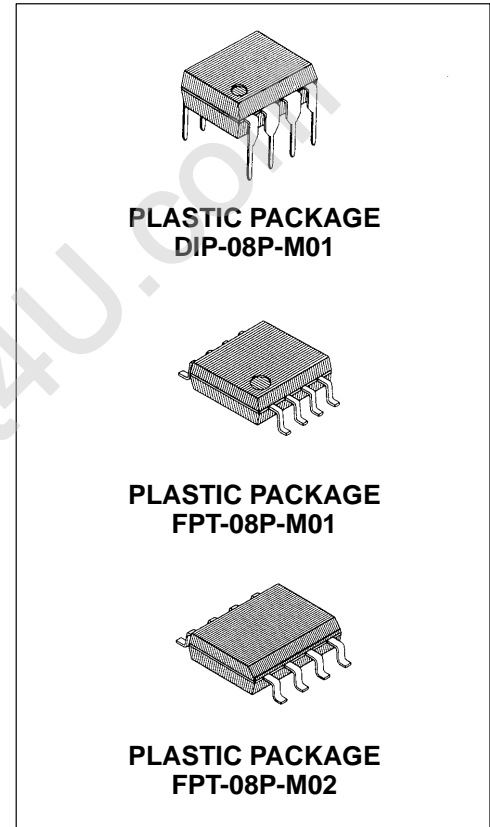
The Fujitsu MB501SL is a super low power version of the MB501 two modulus prescaler used with a frequency synthesizer to make a Phase Locked Loop (PLL). It divides the input frequency by the modulus of 64/65 or 128/129, respectively. The MB501SL achieves extremely small stray capacitance by the use of Fujitsu's Advanced Process Technology. High speed operation is achieved with low power supply current of 5mA which is about half of the current value of the MB501L.

- High Frequency Operation: $f_{max} = 1.1\text{GHz max. (P}_{IN} = -14\text{dBm})$
- Pulse Swallow Function: 64/65, 128/129
- Low Power Supply Current: 5.0mA typ.
- Stable Output Amplitude: $V_O = 1.6\text{Vp-p typ.}$
- Complete PLL synthesizer circuit with the Fujitsu MB87001A, PLL synthesizer IC
- Plastic 8-pin Dual-In-Line Package
- Plastic 8-pin Mini Flat Package
- Built-in Termination Resistor
- Stable output amplitude is obtained up to output load capacitance of 8pF.

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 Voltage	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.



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.

MB501SL

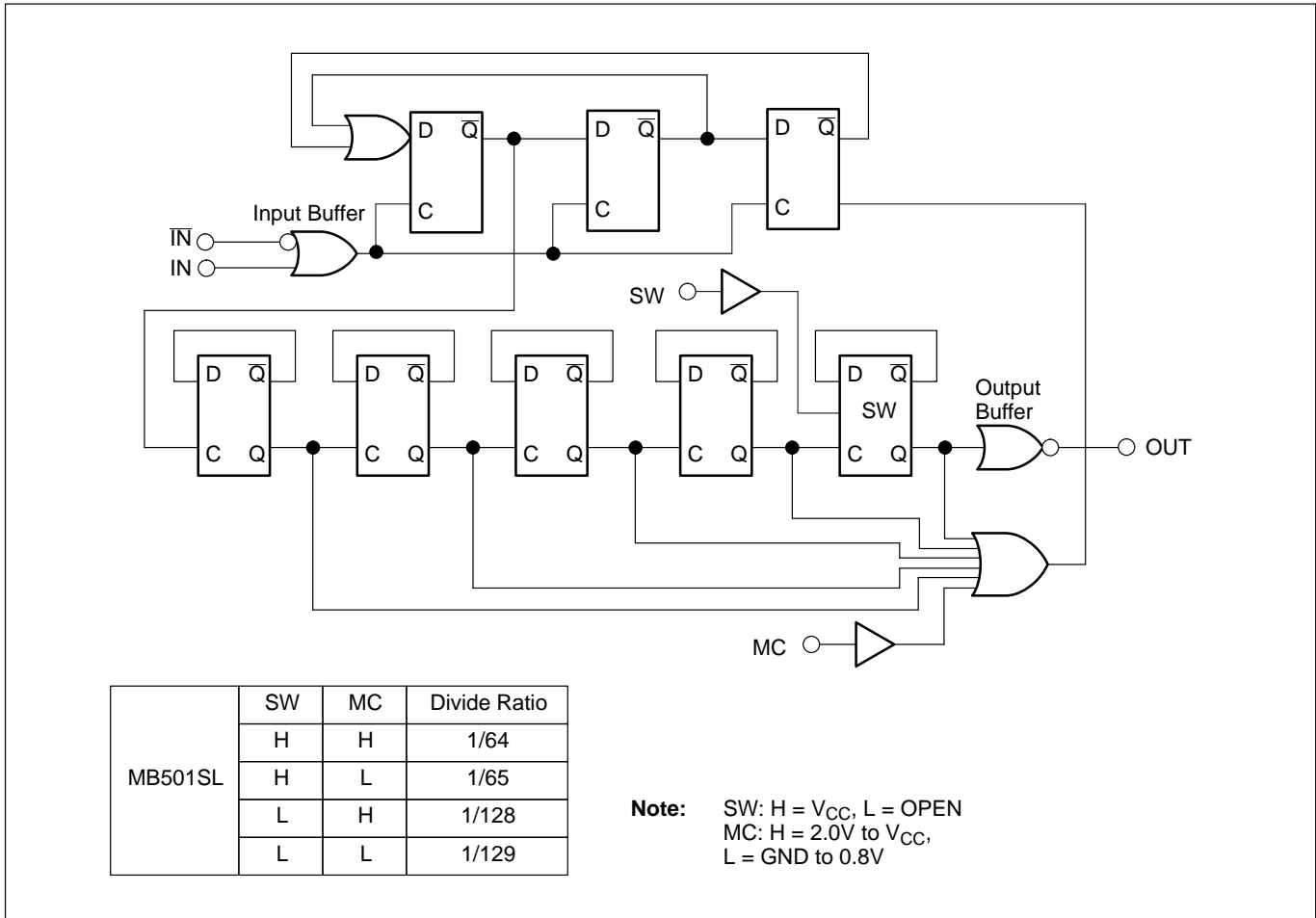


Figure 1. MB501SL Block Diagram

PIN DESCRIPTION

Pin Number	Symbol	Description
1	IN	Input
2	V _{CC}	Power Supply, +5V
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	Values			Unit
		Min.	Typ.	Max.	
Power Supply Voltage	V_{CC}	4.5	5.0	5.5	V
Operating Temperature	T_A	-40	—	+85	°C
Load Capacitance	CL	—	—	8	pF

ELECTRICAL CHARACTERISTICS

(Recommended Operating Conditions unless otherwise noted)

Parameter	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Power Supply Current	I_{CC}	—	—	5.0	7.0	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	—	1100	MNz
Input Signal Amplitude	P_{IN}	—	-14	—	0	dBm
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
Modulus Set-up Time MC to Output	t_{SET}	—	—	16	26	ns

Note: * Design Guarantee

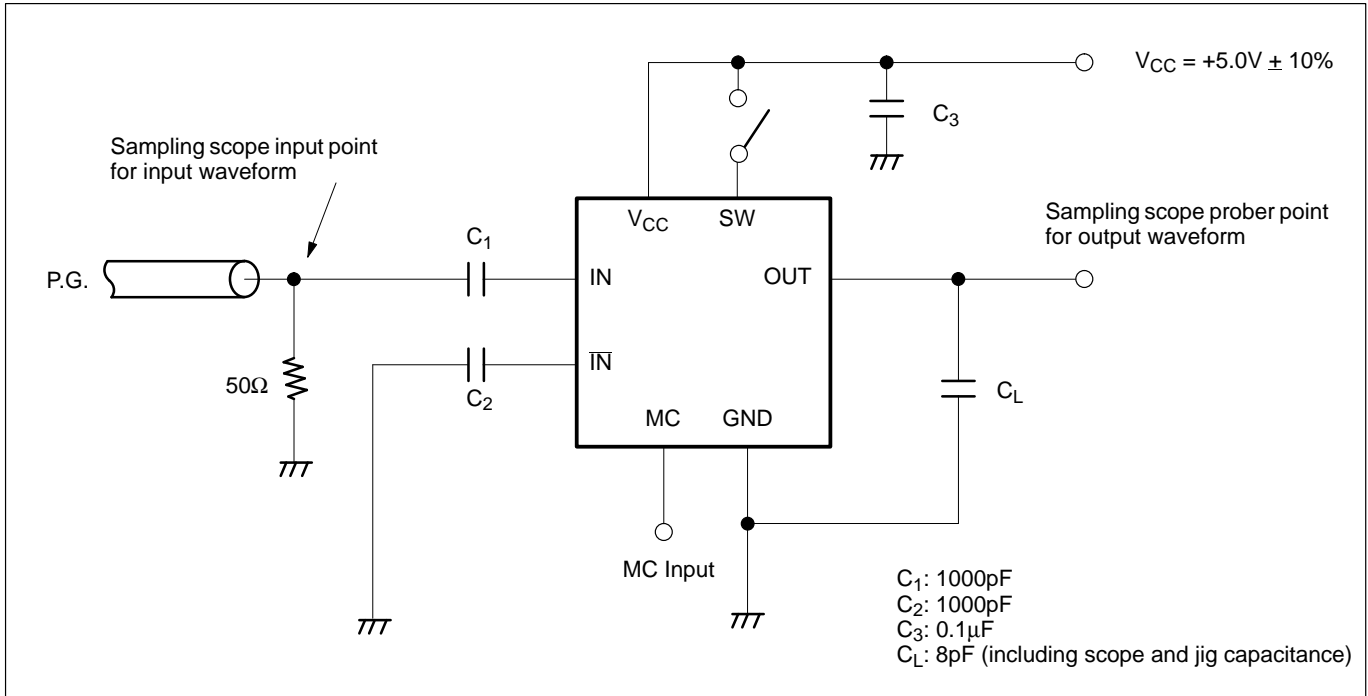
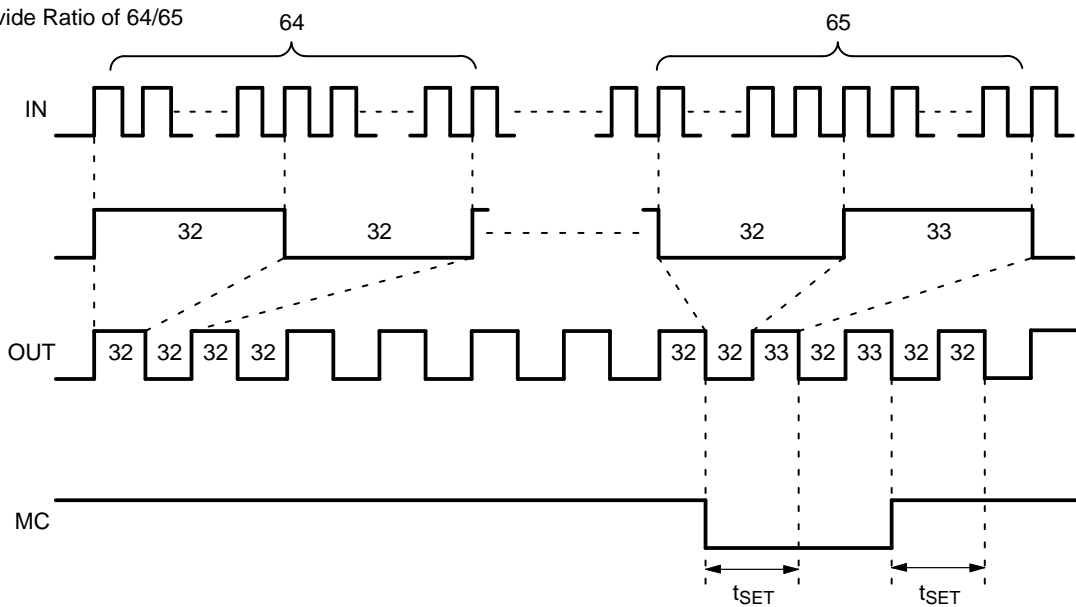


Figure 2. Test Circuit

TWO MODULUS OPERATING TIMING CHART

Example: Divide Ratio of 64/65



Notes:

When divide ratio of 129 is selected, positive pulse is added by one to 65.
 The typical set up time (t_{SET}) is 16ns from MC signal input to the timing of change of prescaler divide ratio.

TYPICAL CHARACTERISTICS CURVES

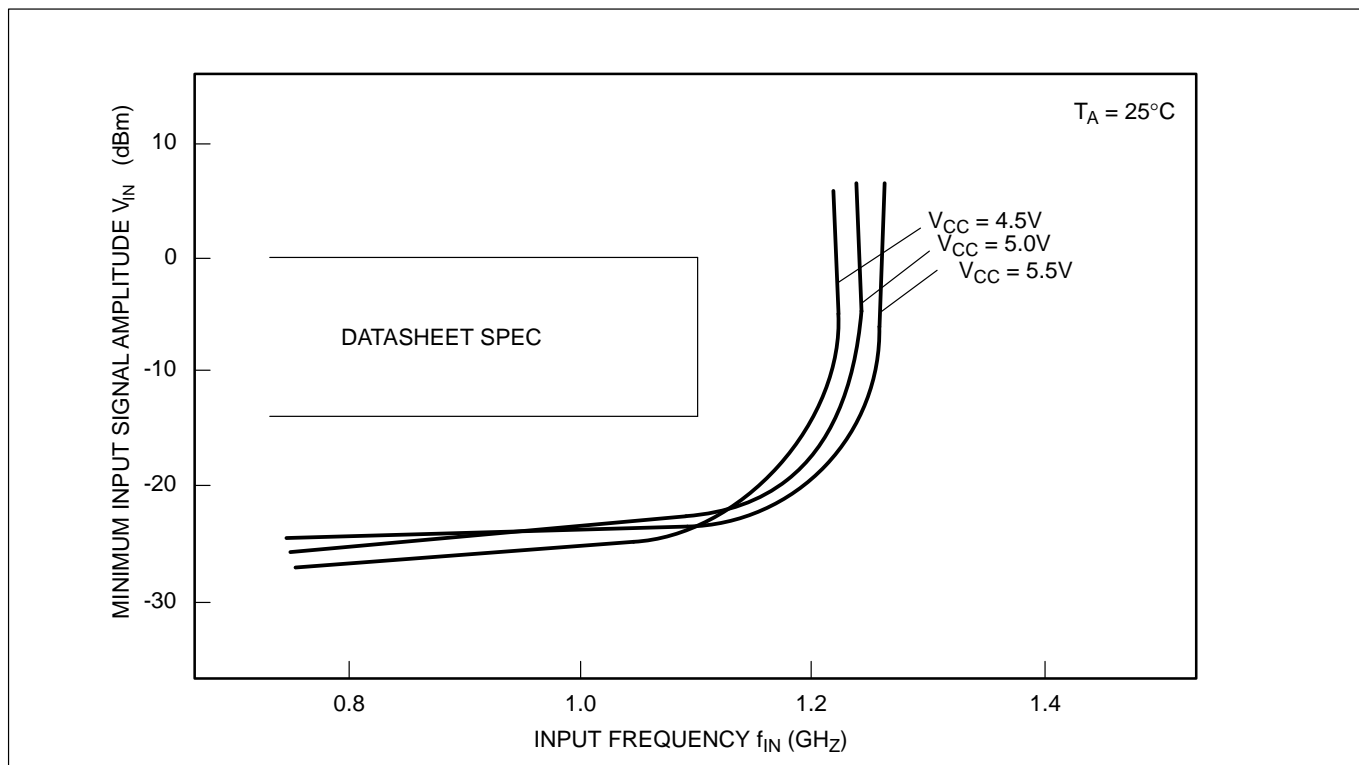


Figure 3. Input Signal Amplitude vs. Input Frequency

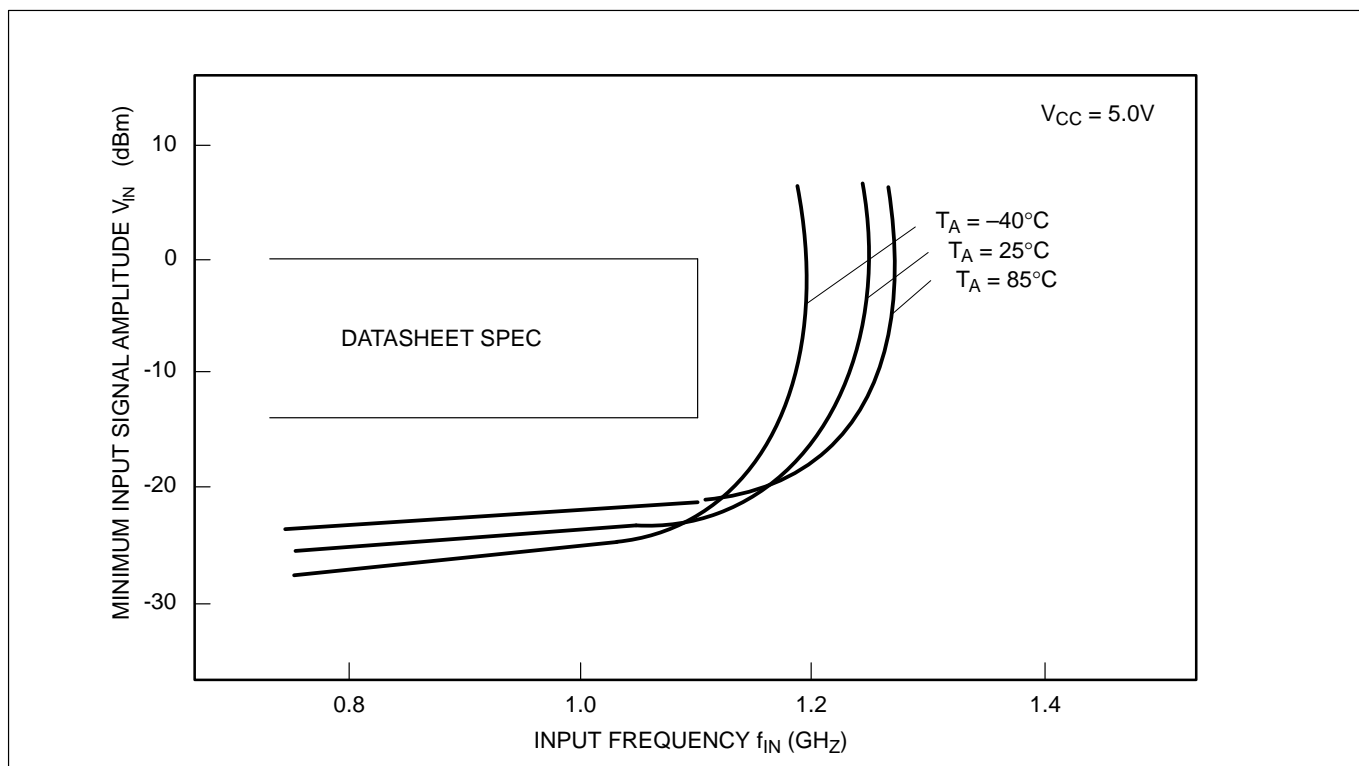


Figure 4. Input Signal Amplitude vs. Input Frequency

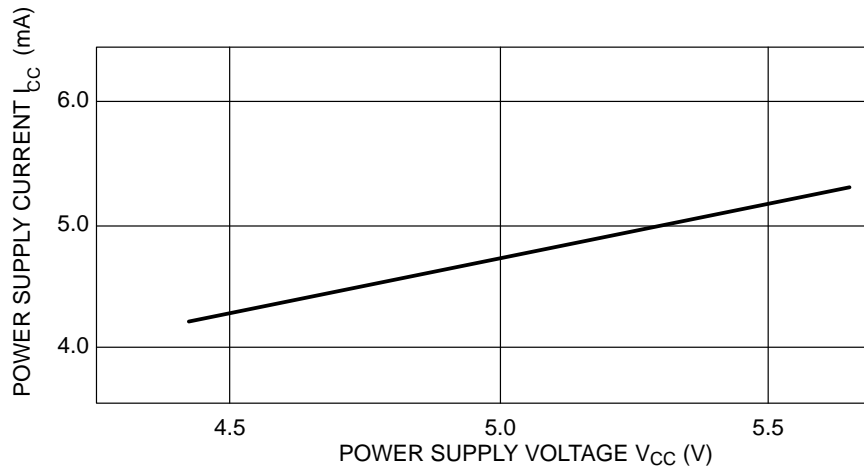


Figure 5. Power Supply Current vs. Power Supply Voltage

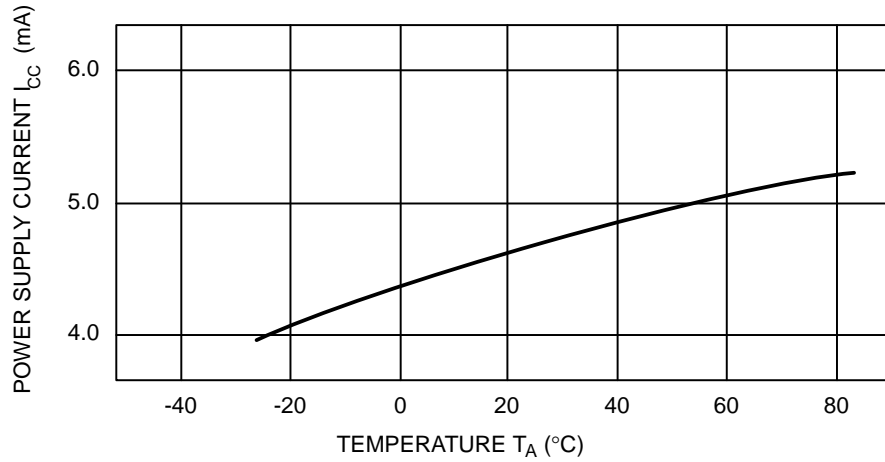


Figure 6. Power Supply Current vs. Temperature

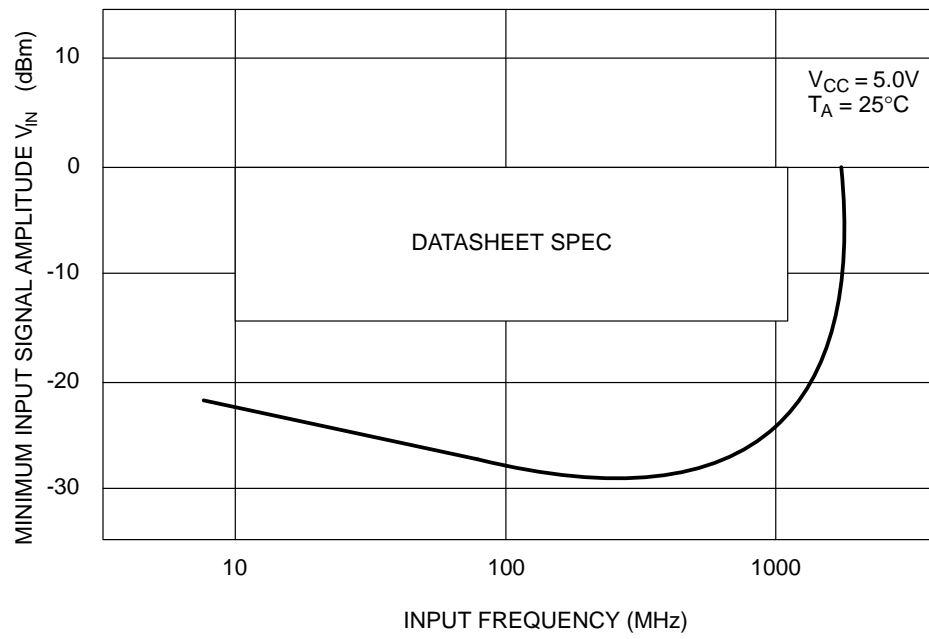


Figure 7. Input Signal vs. Input Frequency

MB501SL

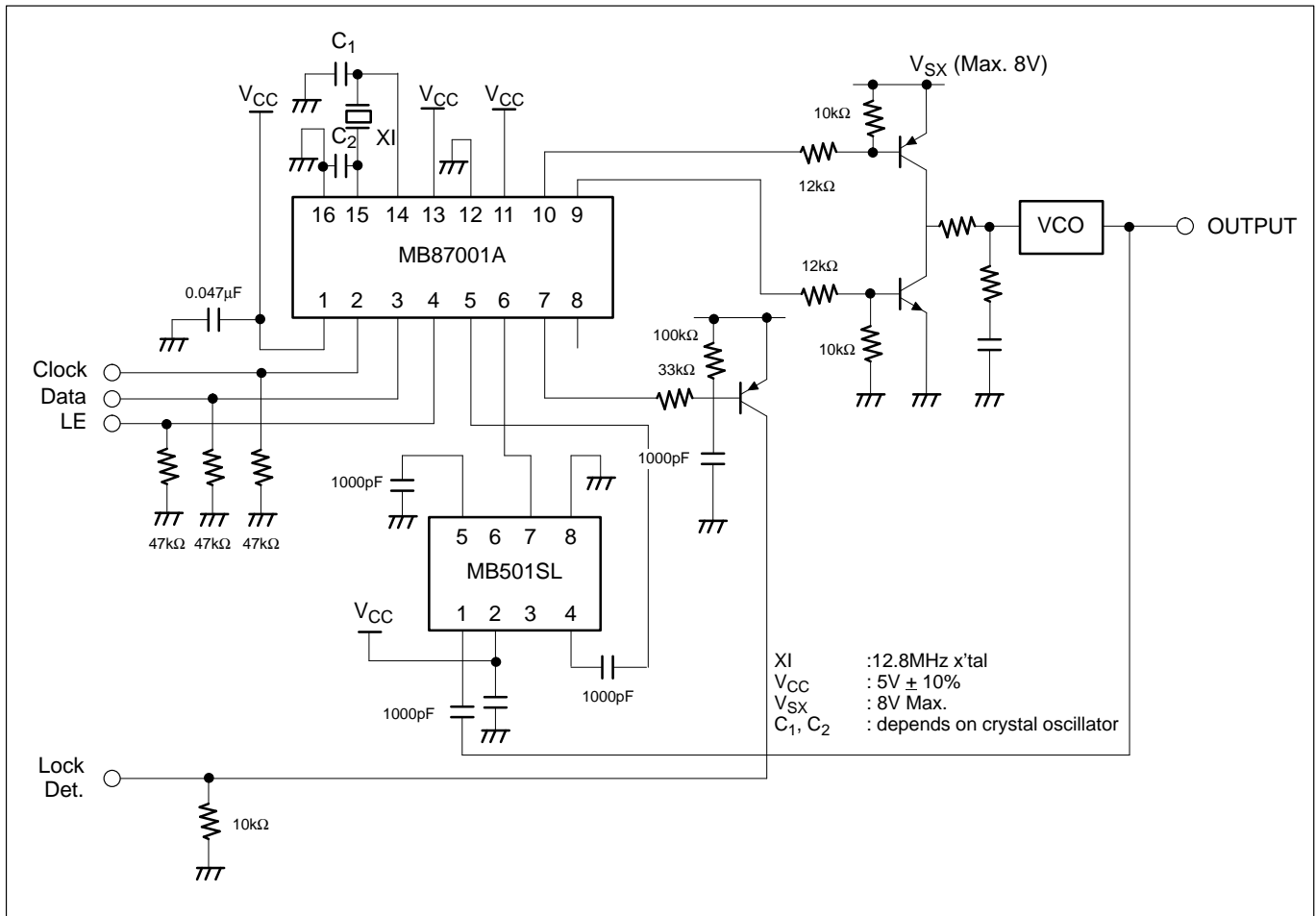
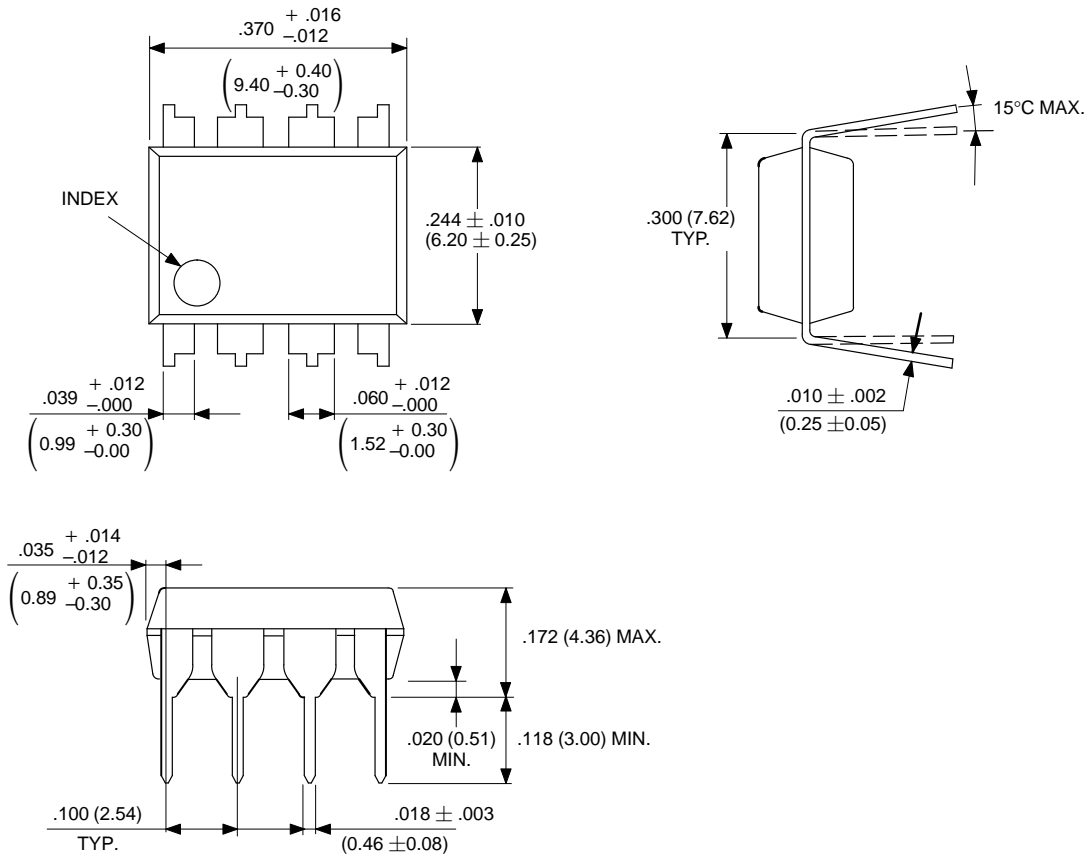


Figure 8. Typical Application Example

PACKAGE DIMENSIONS

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

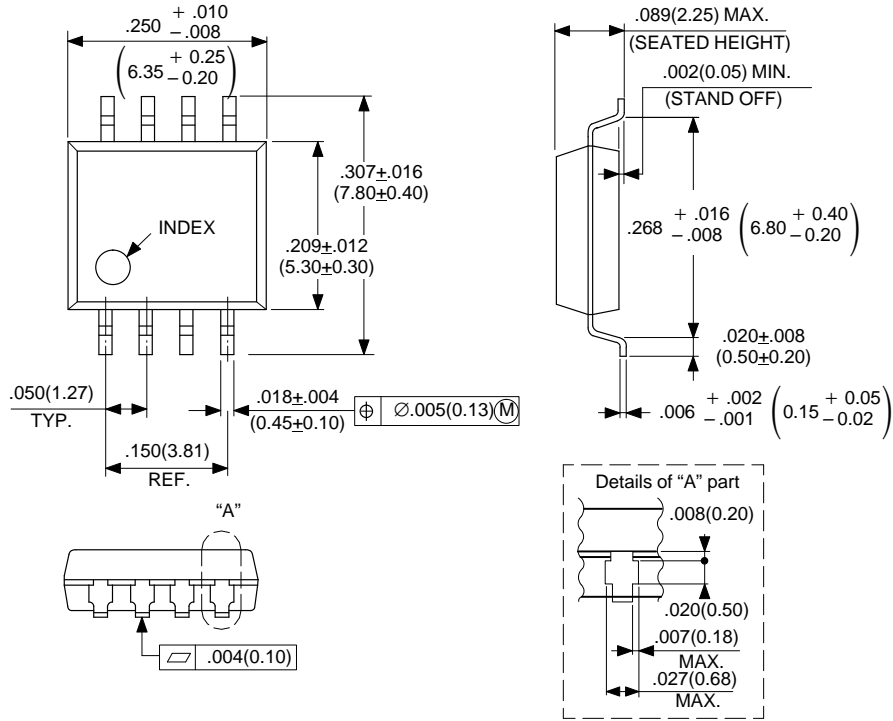


Dimensions in inches (millimeters).

©1988 FUJITSU LIMITED D08006S-2C

PACKAGE DIMENSIONS (Continued)

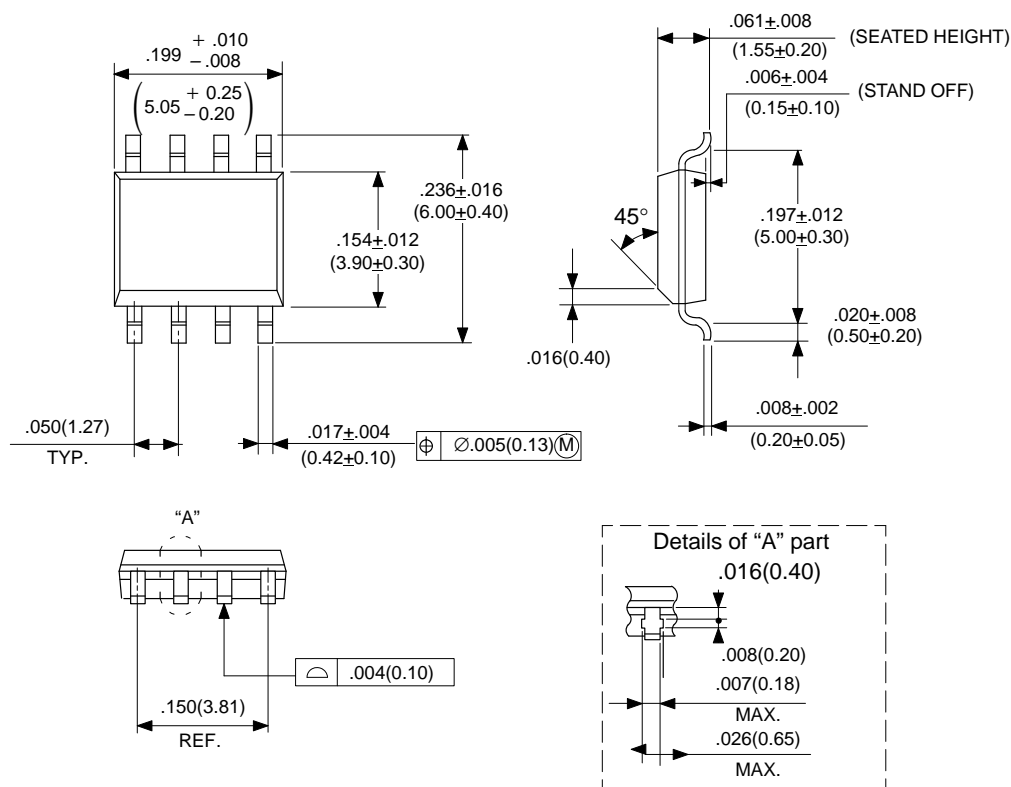
8-LEAD PLASTIC FLAT PACKAGE
(CASE No.: FPT-08P-M01)



Dimensions in inches (millimeters).

PACKAGE DIMENSIONS (Continued)

8-LEAD PLASTIC FLAT PACKAGE
(CASE No.: FPT-08P-M02)



Dimensions in inches (millimeters).

©1988 FUJITSU LIMITED F08004S-2C

All Rights Reserved.

Circuit diagrams utilizing Fujitsu products are included as a means of illustrating typical semiconductor applications. Complete information sufficient for construction purposes is not necessarily given.

The information contained in this document has been carefully checked and is believed to be reliable. However, Fujitsu assumes no responsibility for inaccuracies.

The information contained in this document does not convey any license under the copyrights, patent rights or trademarks claimed and owned by Fujitsu.

Fujitsu reserves the right to change products or specifications without notice.

No part of this publication may be copied or reproduced in any form or by any means, or transferred to any third party without prior written consent of Fujitsu.

FUJITSU LIMITED

For further information please contact:

Japan

FUJITSU LIMITED
International Marketing Div.
Furukawa Sogo Bldg., 6-1, Marunouchi 2-chome
Chiyoda-ku, Tokyo 100, Japan
Tel: (03) 3216-3211
Telex: 781-2224361
FAX: (03) 3215-0662

North and South America

FUJITSU MICROELECTRONICS, INC.
Integrated Circuits Division
3545 North First Street
San Jose, CA 95134-1804, USA
Tel: 408-922-9000
FAX: 408-432-9044

Europe

FUJITSU MIKROELEKTRONIK GmbH
Am Siebenstein 6-10,
6072 Dreieich-Buchsschlag,
Germany
Tel: (06103) 690-0
Telex: 411963
FAX: (06103) 690-122

Asia

FUJITSU MICROELECTRONICS ASIA PTE LIMITED
51 Bras Basah Road,
Plaza By The Park,
#06-04 to #06-07
Singapore 0719
Tel: 336-1600
Telex: 55573
FAX: 336-1609