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Edition 2.0a

FUJITSU

DATA SHEET

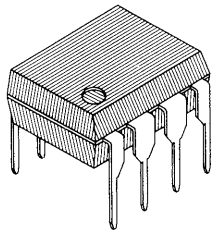
MB511

1GHz HIGH SPEED PRESCALER

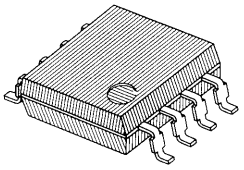
HIGH SPEED PRESCALER

The Fujitsu MB511 is a 1.0GHz high speed prescaler that forms a Phase Locked Loop (PLL) circuit when combined with a Fujitsu frequency synthesizer.Based on Fujitsu's advanced Bipolar processing, the MB511 maintains a consistent low power consumption of 23mA @ 5V. In addition, it can detect low amplitude input signals with a sensitivity of –20dBm min.

The MB511 will divide the input frequency a modulus of 1, 2, or 8, and is well suited for applications in CATV and electronically tuned TV.



PLASTIC PACKAGE
DIP-08P-M01

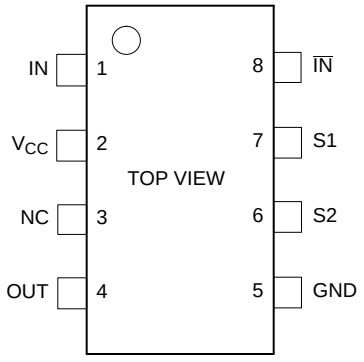


PLASTIC PACKAGE
FPT-08P-M01

FEATURES

- Wide operating frequency range:
  f_{in} = 50 to 1000MHz (v_{in} = –20dBm)
- Maximum operating frequency depends upon a divide ratio:
  1/1: 250MHz max. (Buffer through)
  1/2: 500MHz max.
  1/8: 1000MHz max.
- Low supply current: 23mA @5V
- High input sensitivity: –20dBm min.
- Stable Output Amplitude: 800mVp–p ($C_L \leq 5$pF)
- Wide temperature range: T_A = –40 to +85°C
- Plastic 8-pin Dual-In-Line package (Suffix: –P)
  Plastic 8-pin Flat package (Suffix: –PF)

PIN ASSIGNMENT



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} +0.5	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.

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.

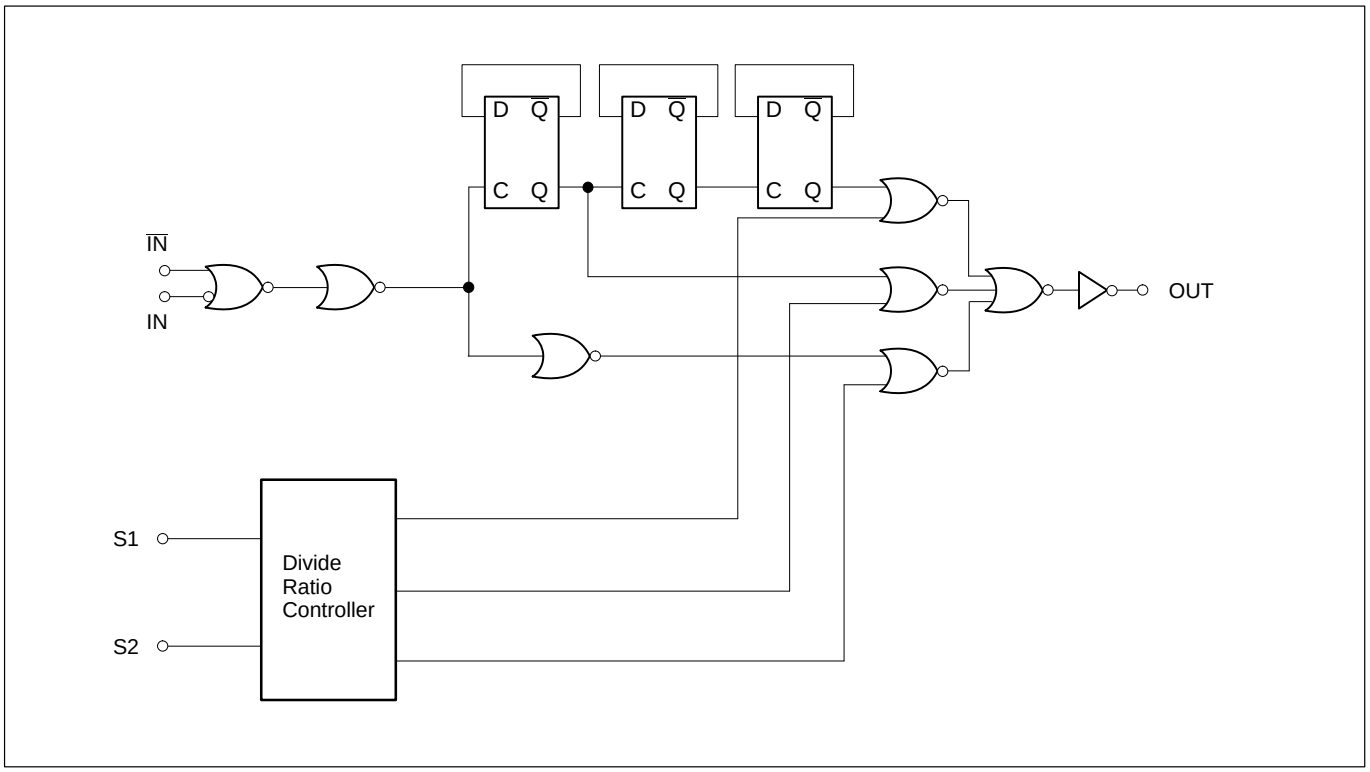


Figure 1. MB511 Block Diagram

FUNCTION TABLE

S1	S2	Divide Ratio	Operating Frequency
L	L	Not used	—
L	H	1	250MHz
H	L	2	500MHz
H	H	8	1000MHz

H = V_{CC}
L = OPEN

PIN DESCRIPTIONS

Pin Number	Symbol	I/O	Descriptions
1	IN	I	Input. The connection with VCO should be an AC connection.
2	V_{CC}	–	Power supply voltage input.
3	NC	–	No connection.
4	OUT	O	Output. Termination resistor is necessary due to emitter follower output.
5	GND	–	Ground.
6	S2	I	Divide ratio control input.
7	S1	I	Divide ratio control input.
8	$\overline{IN}$	I	Complementary Input.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	V_{CC}	4.5	5.0	5.5	V	
Operating Temperature	T_A	–40		+85	°C	
Load Capacitance	C_L			5	pF	Termination resistor 500Ω

ELECTRICAL CHARACTERISTICS

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Current		I_{CC}	15	23	32	mA	Except termination output current.
Output Amplitude		V_O	0.4	0.8	1.2	V_{p-p}	500Ω termination, C_L = 5pF max.
Input Frequency	1/1	f_1	50		250	MHz	Min. value is measured with coupling capacitor of 1000pF.
	1/2	f_2	50		500	MHz	
	1/8	f_3	50		1000	MHz	
Input Signal Amplitude		P_{IN}	–20		+10	dBm	50Ω
High Level Input Voltage	S1, S2	V_{IH}	V_{CC} –0.7	V_{CC}	V_{CC} +0.5	V	
Low Level Input Voltage		V_{IL}		OPEN		V	
Low Level Input Current	S1, S2	I_{IH}	40		160	μA	V_{CC} = 5V

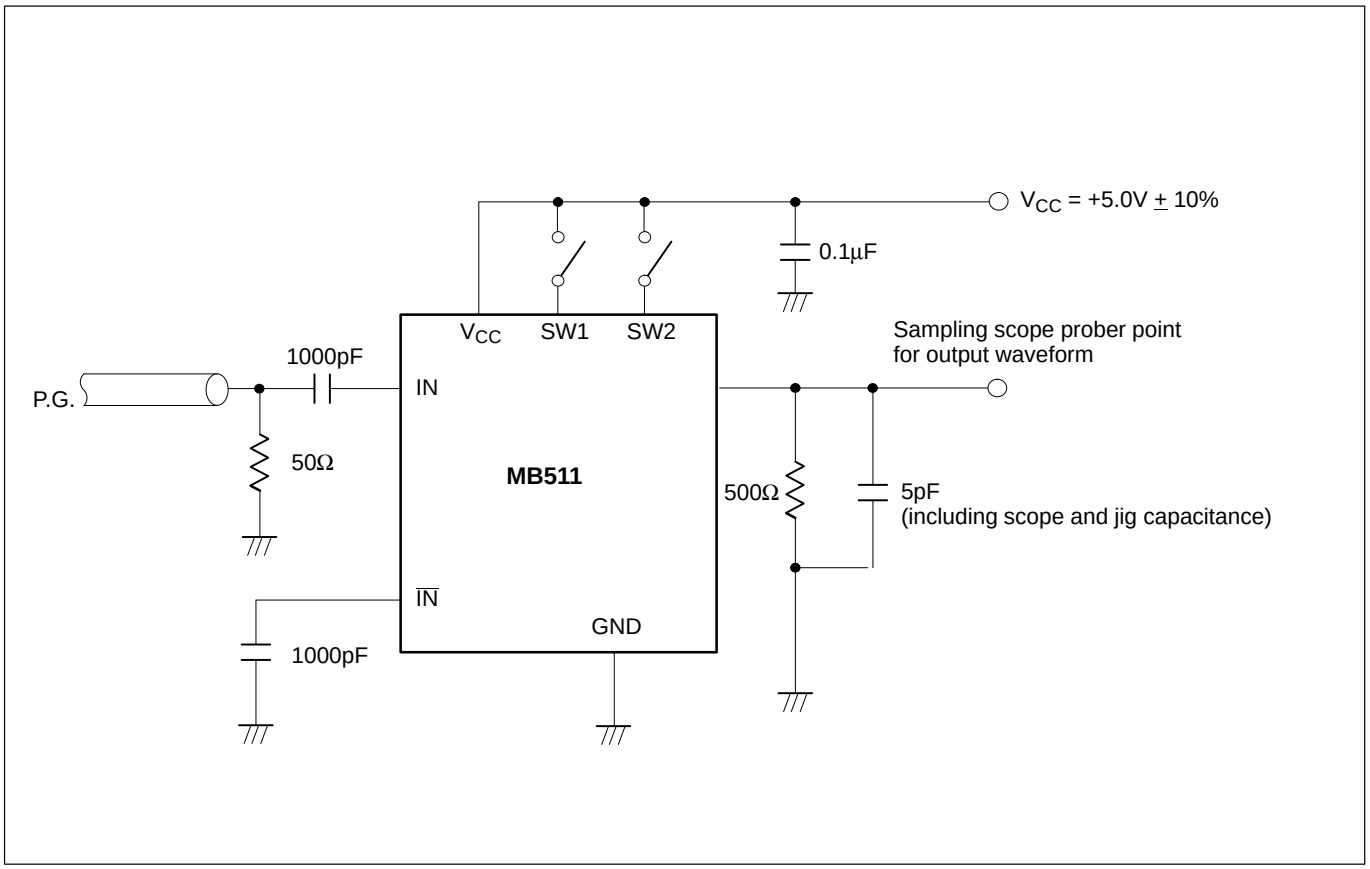


Figure 2. Test Circuit

TYPICAL CHARACTERISTICS CURVES

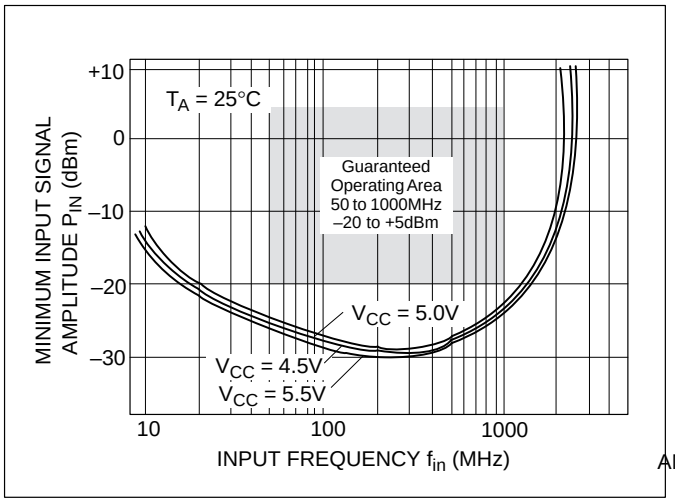
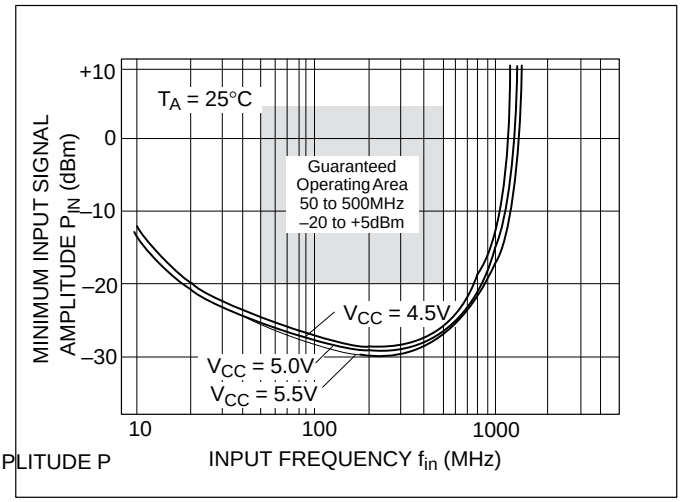


Figure 3. Input Sensitivity Curve (1/8 Divide Ratio) Power Supply Voltage Dependency



AMPLITUDE P

Figure 4. Input Sensitivity Curve (1/2 Divide Ratio) Power Supply Voltage Dependency

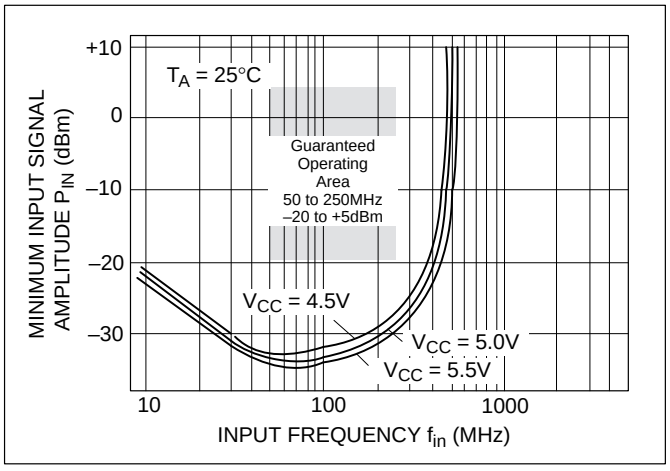


Figure 5. Input Sensitivity Curve (1/1 Divide Ratio) Power Supply Voltage Dependency

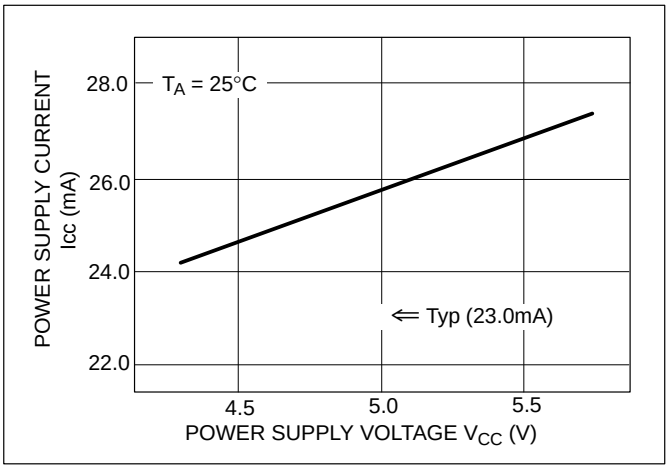


Figure 6. Power Supply Current vs. Power Supply Voltage

TYPICAL CHARACTERISTICS CURVES (Continued)

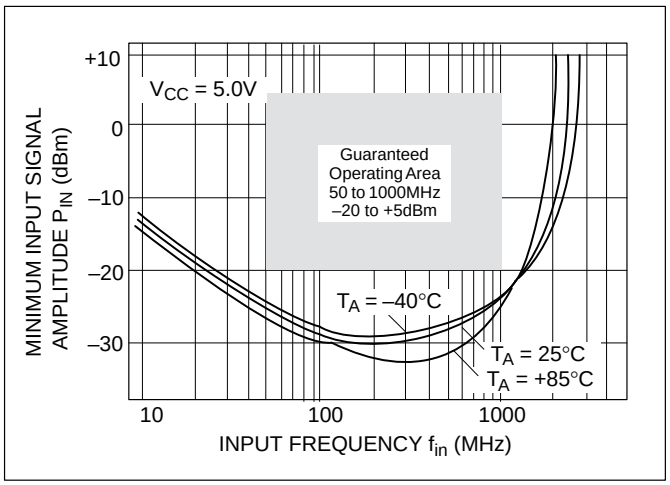


Figure 7. Input Sensitivity Curve (1/8 Divide Ratio) Temperature Dependency

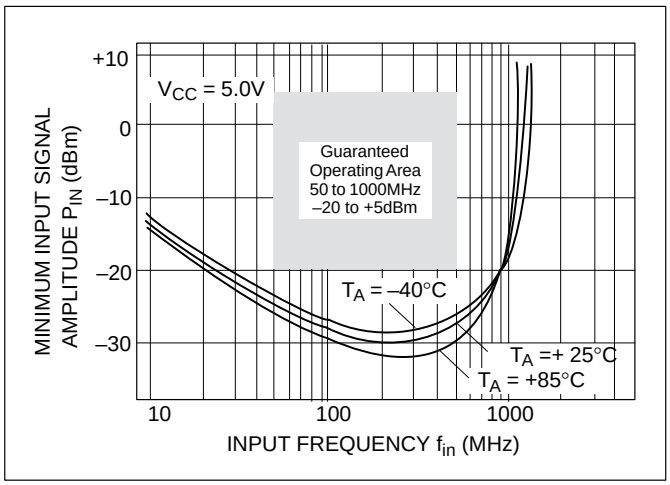


Figure 6. Input Sensitivity Curve (1/2 Divide Ratio) Temperature Dependency

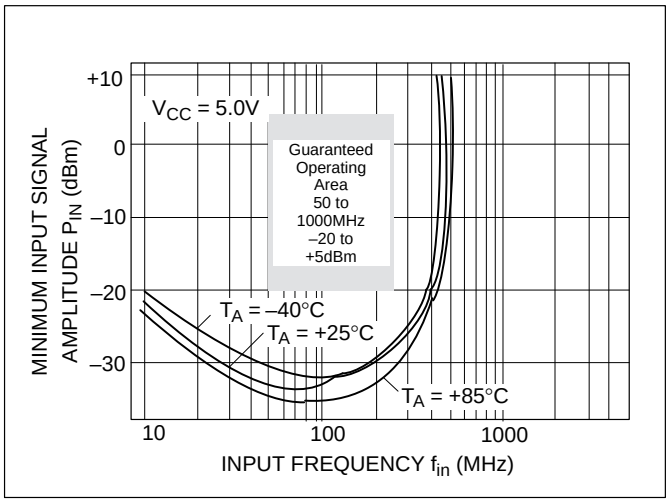


Figure 9. Input Sensitivity Curve (1/1 Divide Ratio) Temperature Dependency

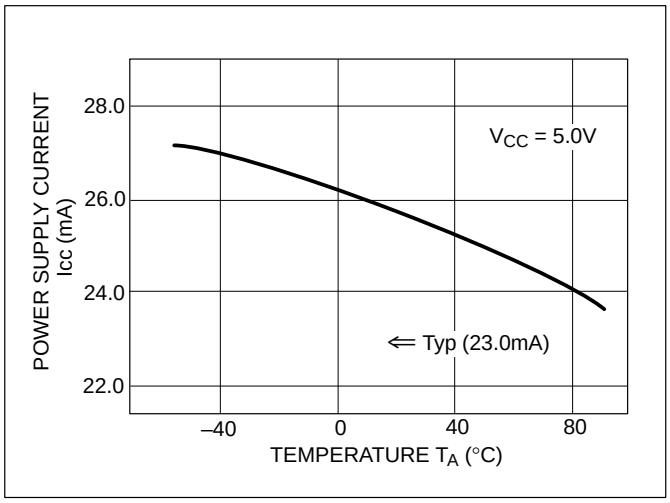
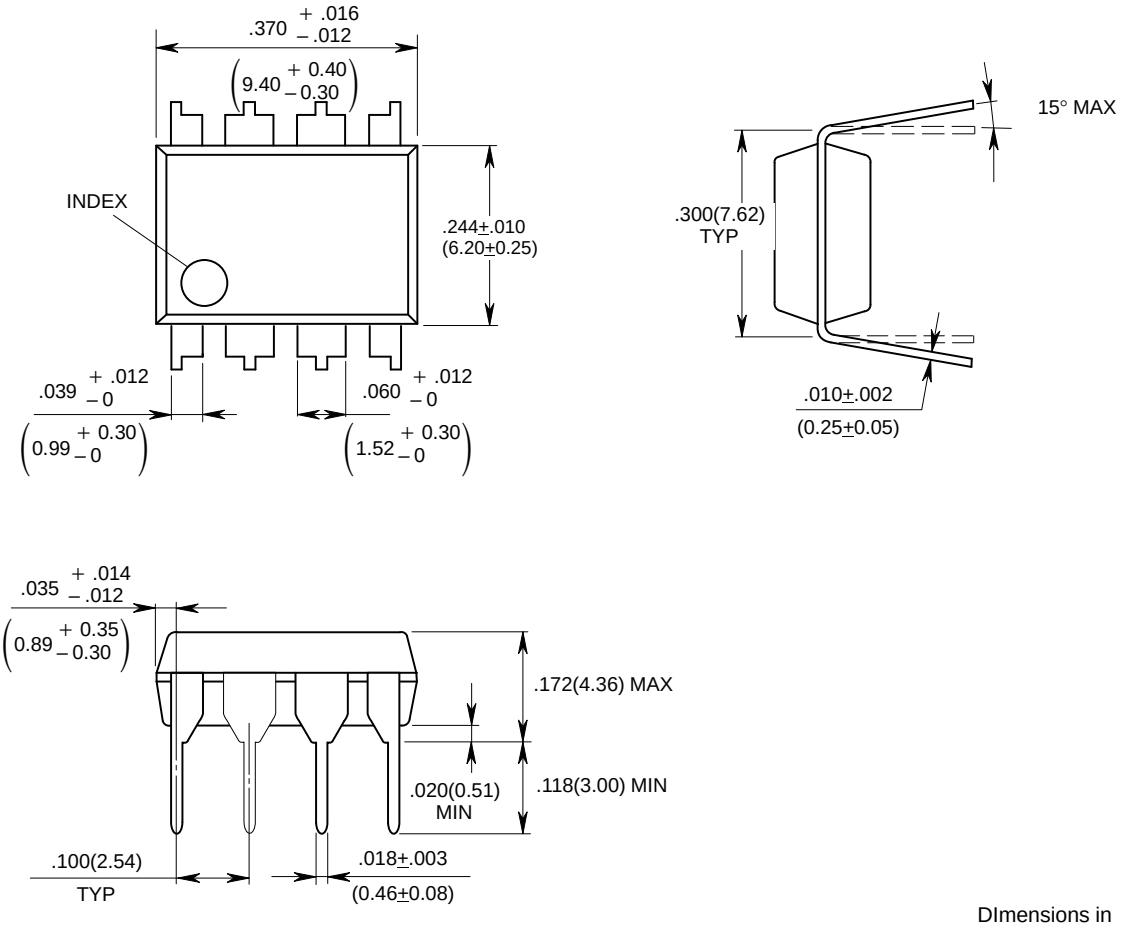


Figure 10. Power Supply Current vs. Temperature

PACKAGE DIMENSIONS

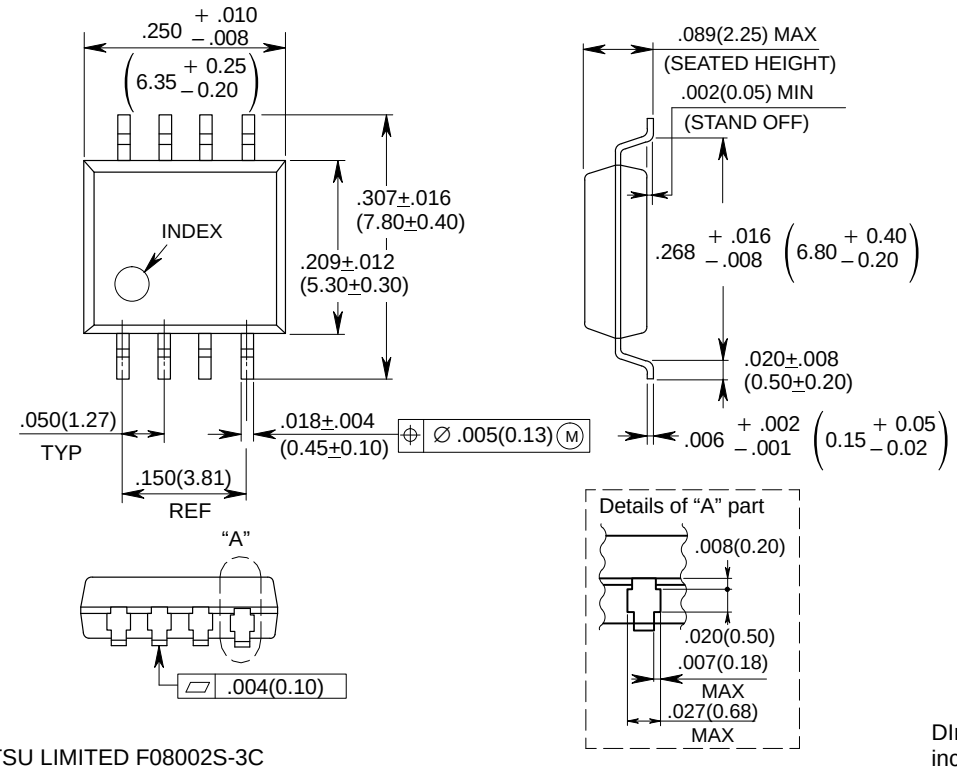
8-LEAD PLASTIC DUAL IN-LINE PACKAGE
(CASE No: DIP-08P-M01)



DImensions in
inches (millimeters)

PACKAGE DIMENSIONS (Continued)

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



DImensions in
inches (millimeters)

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