

ASSP

CMOS

FRONT-END LSI

MB54501

■ DESCRIPTION

The Fujitsu MB54501 includes a low-noise amplifier and a mixer, which are used for front end of mobile telecommunication systems.

Using Fujitsu's advanced technology, MB54501 achieves an Icc of 6.0mA (typ.).

■ FEATURES

	Amplifier	Mixer
• Supply voltage	3V (typ.)	3V (typ.)
• Current consumption	3mA (typ.)	3mA (typ.)
• Input frequency	1.1GHz (max.)	1.1GHz (max.)
• Gain	14dB (typ.) ^{*1}	15dB (typ.) ^{*2}
• Noise figure	2.2dB (typ.) ^{*1}	5dB (SSB, typ.) ^{*2}
• 1dB compression point	-1dBm (typ.) ^{*1}	
• Input return loss	8dB (typ.) ^{*1}	
• Output return loss	10dB (typ.) ^{*1}	

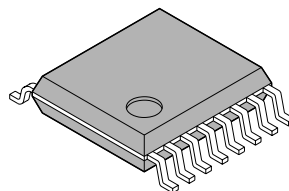
*1: Measured by the circuit of "measurement circuit example".
(fin = 878MHz)

*2: Measured by the circuit of "measurement circuit example".
(IF = 90MHz)

- 16-pin Plastic Shrink Small Outline Package (Suffix: -PFV)

■ PACKAGE

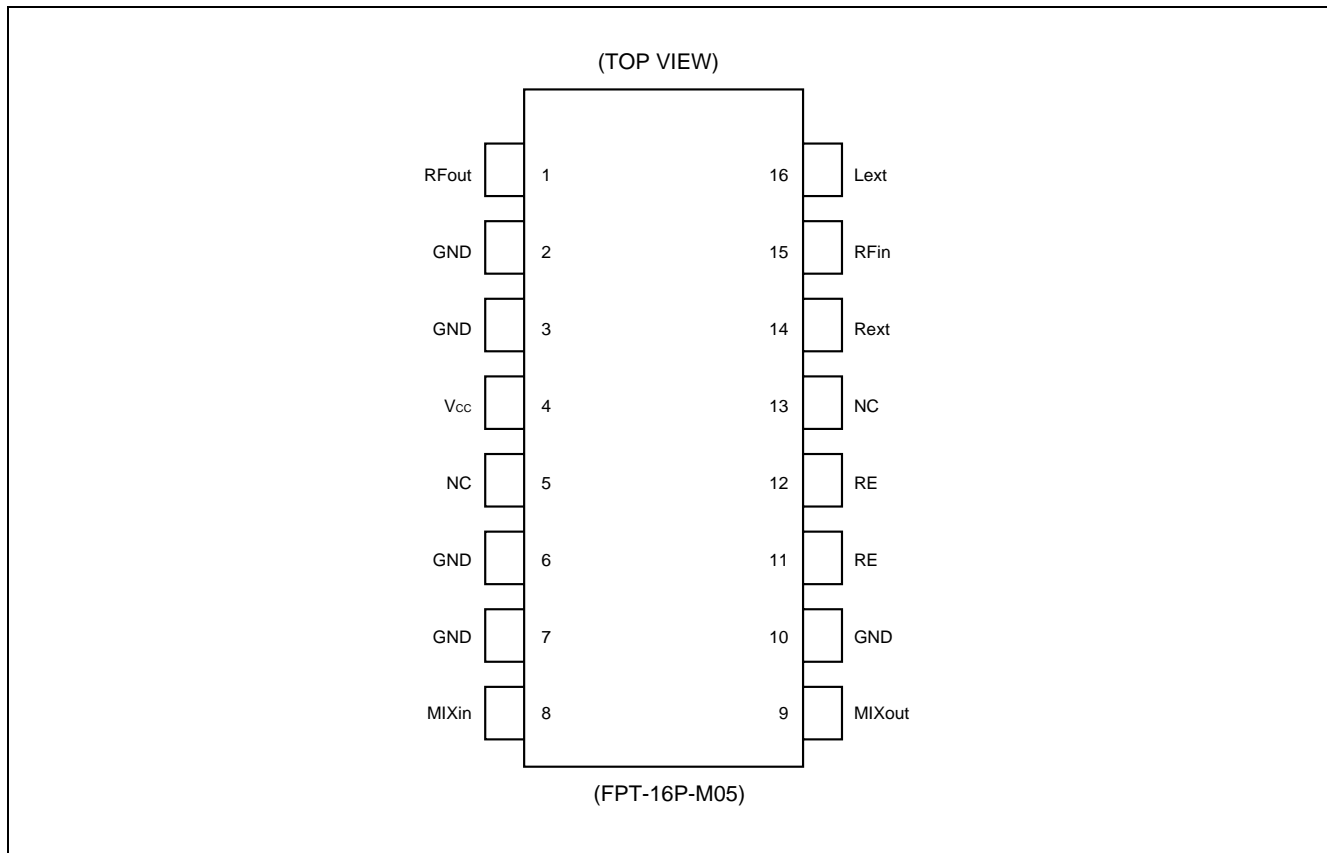
16-pin Plastic SSOP



(FPT-16P-M05)

MB54501

■ PIN ASSIGNMENT



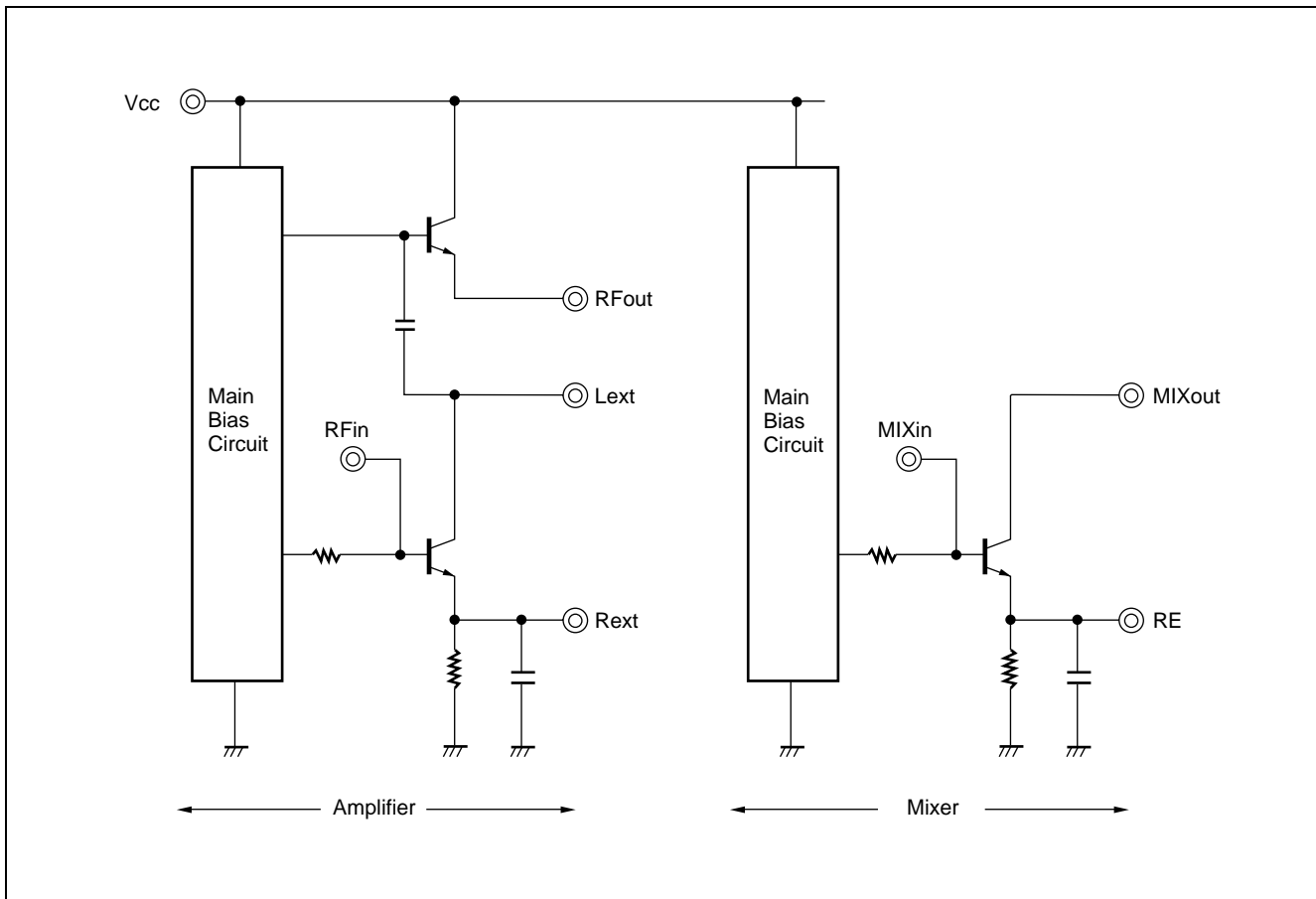
■ ABSOLUTE MAXIMUM RATINGS

Parameters	Symbol	Value	Unit
Supply Voltage	V_{CC}	-0.5 to 7.0	V
Output Voltage	V_O	-0.5 to $V_{CC} + 0.5$	V
Output Current	I_O	0 to 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.

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■ EQUIVALENT CIRCUIT



■ PIN DESCRIPTION

Pin No.	Pin Name	Description	Pin No.	Pin Name	Description
1	RFout	Amplifier output	9	MIXout	Mixer output
2	GND	Ground	10	GND	Ground
3	GND	Ground	11	RE	Emitter of a transistor for mixer
4	Vcc	Power supply	12		
5	NC	No connection	13	NC	No connection
6	GND	Ground	14	Rext	Emitter of a transistor for amplifier
7	GND	Ground	15	RFin	Amplifier input
8	MIXin	Mixer input	16	Lext	Amplifier load connection

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■ RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Supply Voltage	V _{CC}	2.7	3.0	5.5	V
Input Voltage	V _I	GND	–	V _{CC}	V
Operating Temperature	T _a	–40	–	+85	°C

Notes: To protect against damage by electrostatic discharge, note the following handling precautions:

- Store and transport devices in conductive containers.
- Use properly grounded workstations, tools, and equipment.
- Turn off power before inserting or removing this device into or from a socket.
- Protect leads with conductive sheet, when transporting a board mounted device.

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■ ELECTRICAL CHARACTERISTICS

AMPLIFIER

(V_{CC} = +3.0V, T_a = 25°C)

Parameter	Symbol	Conditions	Target Value			Unit
			Min.	Typ.	Max.	
Supply Voltage	V _{CC}	—	2.7	3.0	5.5	V
Supply Current	I _{CC}	—	—	3.0	—	mA
Operating Frequency	f _{in}	—	—	878	1100	MHz
Gain	Gain	—	—	14	—	dB
Noise Figure	NF	—	—	2.2	—	dB
1dB Compression Point	P _{1dB}	Output	—	-1	—	dBm
Input Return Loss	RL _{IN}	—	—	8	—	dB
Output Return Loss	RL _{OUT}	—	—	10	—	dB

Remark: Electrical characteristics depend on external circuits (elements) or status of mounting.
The above characteristics are measured by the test circuit in the next page.

MIXER

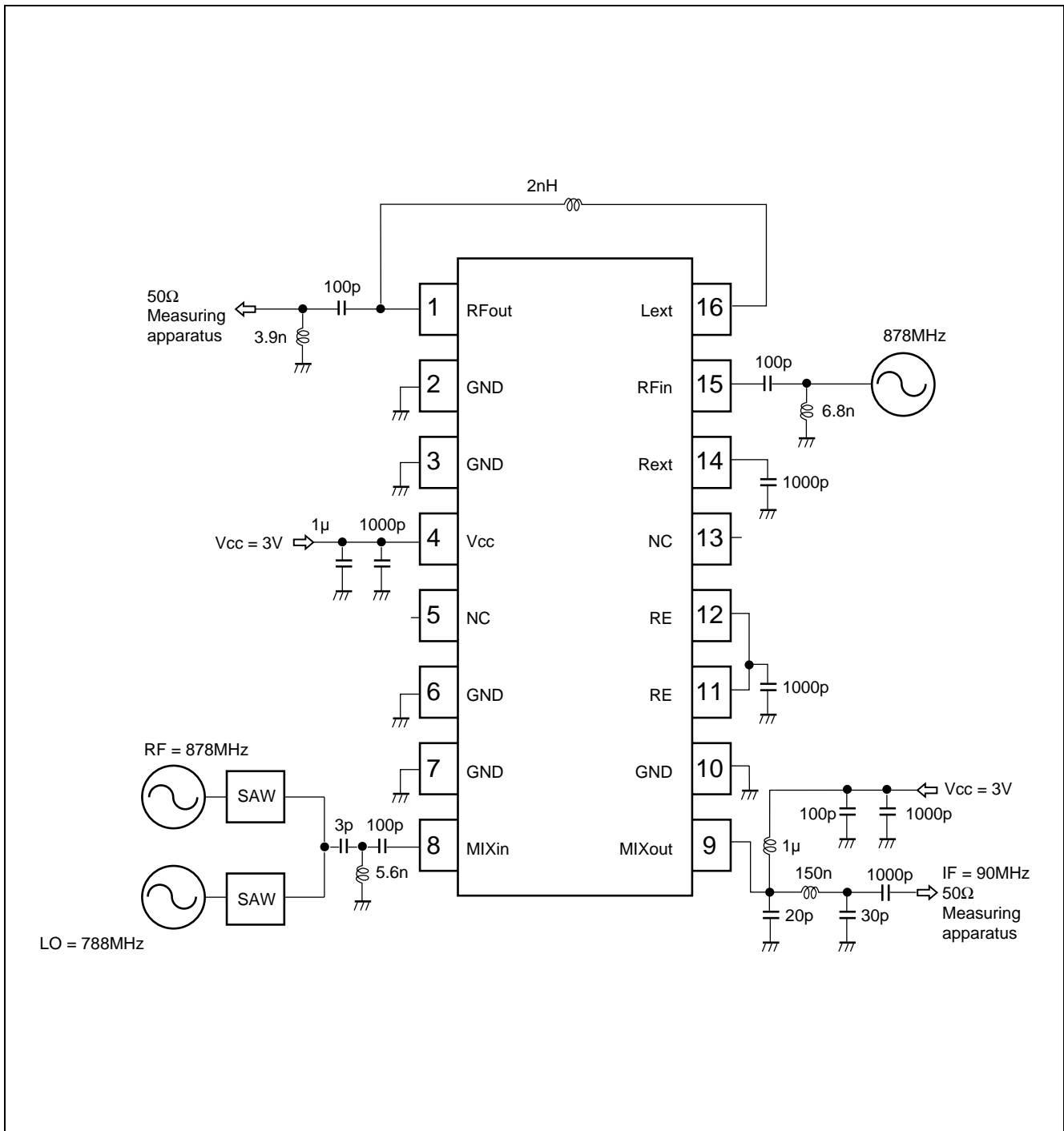
(V_{CC} = +3.0V, T_a = 25°C)

Parameter	Symbol	Conditions	Target Value			Unit
			Min.	Typ.	Max.	
Supply Voltage	V _{CC}	—	2.7	3.0	5.5	V
Current Consumption	I _{CC}	—	—	3.0	—	mA
Operating Frequency	f _{in}	—	—	878	1100	MHz
Gain	S ₂₁	Amplifier characteristics	—	9	—	dB
Conversion Gain	G _C	Mixer characteristics IF = 90MHz	—	15	—	dB
Noise Figure	NF		SSB	—	5	—

Remark: Electrical characteristics depend on external circuits (elements) or status of mounting.
The above characteristics are measured by the test circuit in the next page.

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MEASUREMENT CIRCUIT (EXAMPLE)

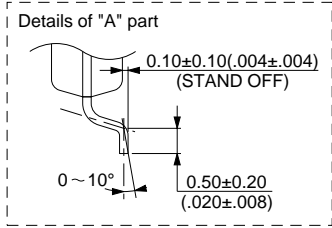
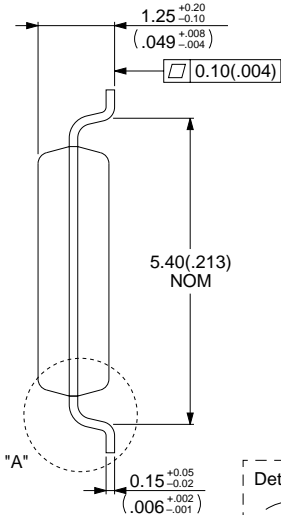
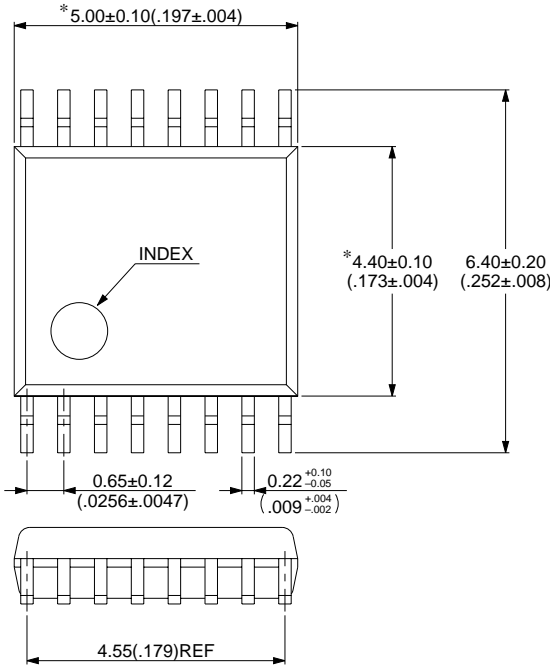


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■ PACKAGE DIMENSIONS

16pins, Plastic SSOP
(FPT-16P-M05)

*: This dimension does not include resin protrusion.



Dimensions in mm (inches).

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FUJITSU LIMITED

For further information please contact:

Japan

FUJITSU LIMITED
Corporate Global Business Support Division
Electronic Devices
KAWASAKI PLANT, 4-1-1, Kamikodanaka
Nakahara-ku, Kawasaki-shi
Kanagawa 211-8588, Japan
Tel: (044) 754-3763
Fax: (044) 754-3329

<http://www.fujitsu.co.jp/>

North and South America

FUJITSU MICROELECTRONICS, INC.
Semiconductor Division
3545 North First Street
San Jose, CA 95134-1804, USA
Tel: (408) 922-9000
Fax: (408) 922-9179

Customer Response Center
Mon. - Fri.: 7 am - 5 pm (PST)
Tel: (800) 866-8608
Fax: (408) 922-9179

<http://www.fujitsumicro.com/>

Europe

FUJITSU MIKROELEKTRONIK GmbH
Am Siebenstein 6-10
D-63303 Dreieich-Buchsschlag
Germany
Tel: (06103) 690-0
Fax: (06103) 690-122

<http://www.fujitsu-edc.com/>

Asia Pacific

FUJITSU MICROELECTRONICS ASIA PTE LTD
#05-08, 151 Lorong Chuan
New Tech Park
Singapore 556741
Tel: (65) 281-0770
Fax: (65) 281-0220

<http://www.fmap.com.sg/>

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