DATA SHEET

Part No.	AN6591BFJM
Package Code No.	*QFP044-P-0606A

SEMICONDUCTOR COMPANY
MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.

Contents

AN6591BFJM

Sending and receiving PLL single-chip IC for PHS

■ Function

- PLL: Prescaler, Counter, Phase comparator, Charge pump (for two systems)
- Reception: 2nd-MIX, LIM-AMP, RSSI
- Transmission: Quadrature modulator, Phase shifter, UP-MIX, APC

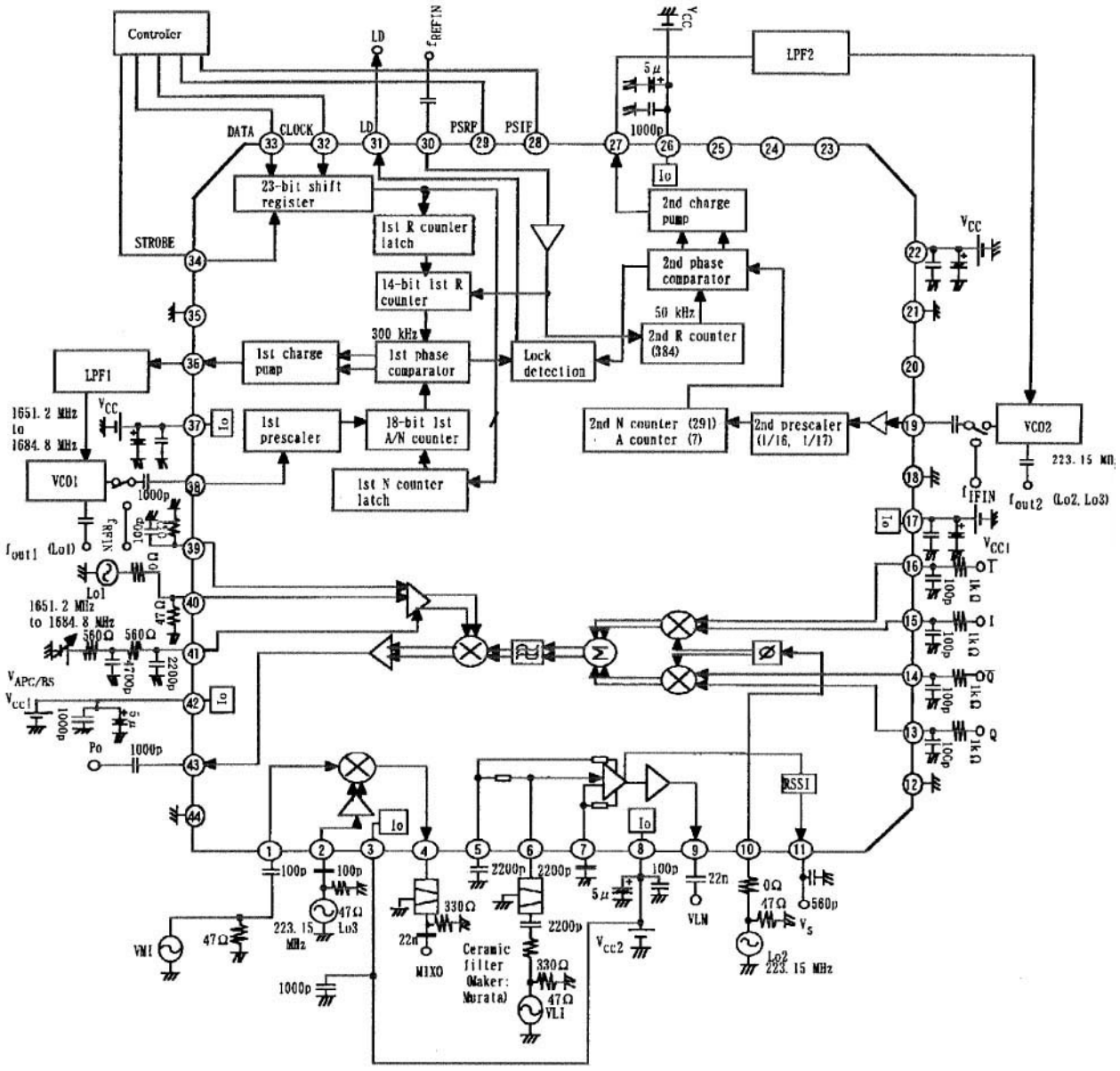
■ Applications

- PHS

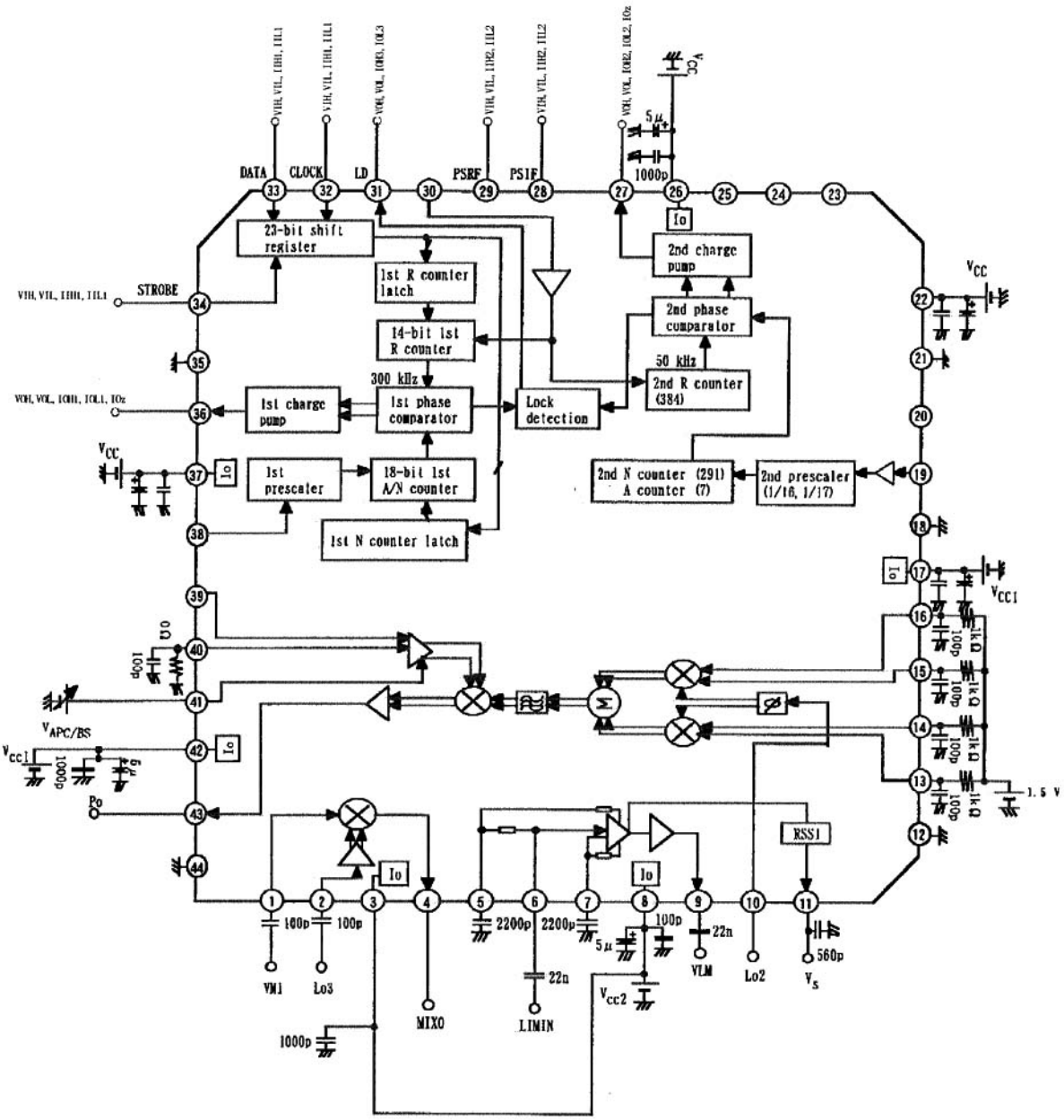
■ Package

- 4Directions - 44Pin Plastic Quad Flat Non-leaded Package (QFP Type)

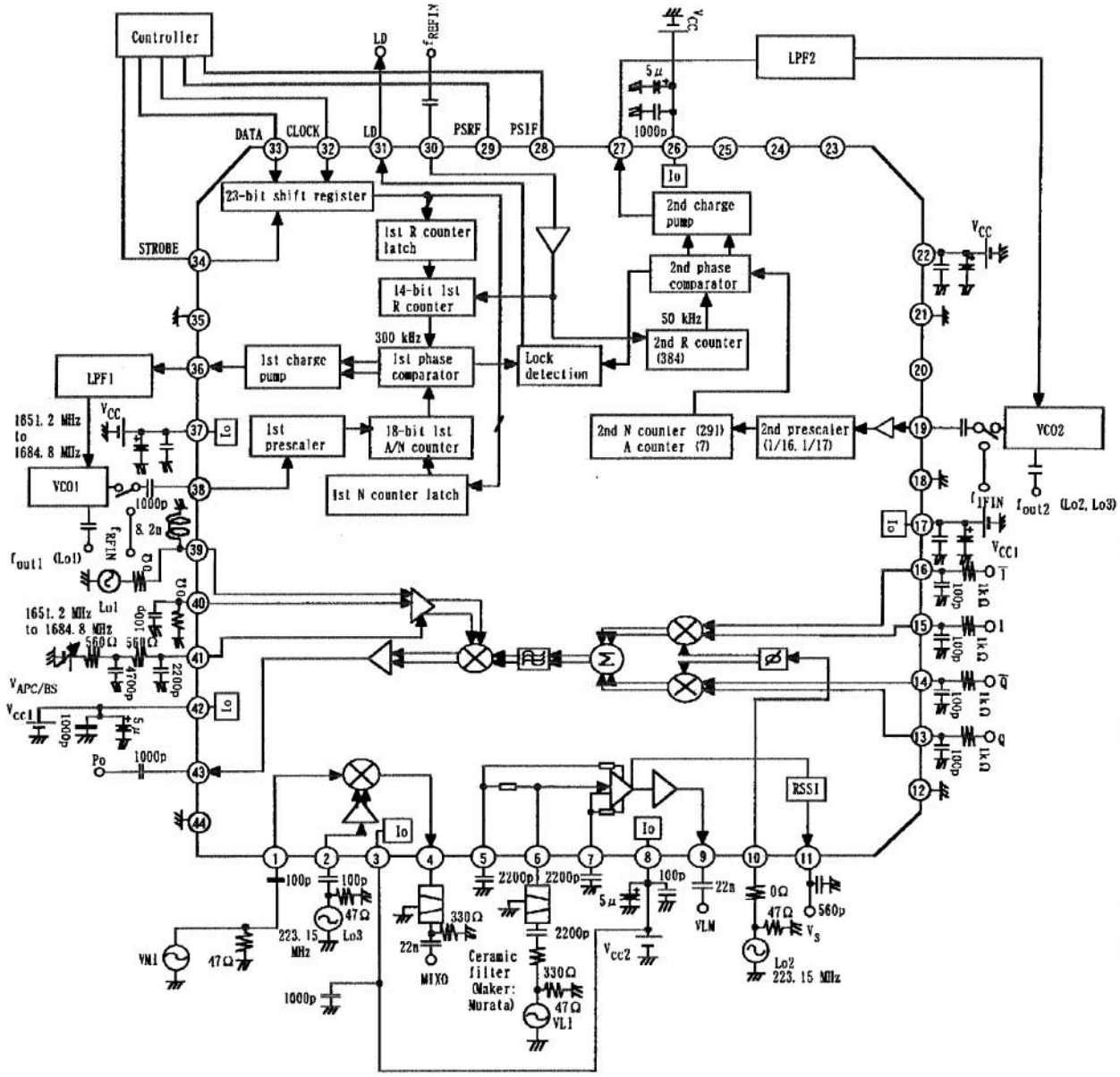
■ Test Circuit Diagram



■ Test Circuit Diagram (continued)



■ Block Diagram



■Pin Descriptions

Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	RXMXIN	RX-MIX-IN	23	N.C.	
2	RXLOIN	RX-LOCAL-IN	24	N.C.	
3	V_{CC2}	V_{CC}-MIX	25	N.C.	
4	MXO	MIX-OUT	26	V_{CC}	V_{CC}-2nd CMOS
5	LMDEC1	LIM-DECOUPLE1	27	CP2	2nd-CHARGEPUMP-OUT
6	LMIN	LIM-IN	28	PSIF	2nd-POWERSAVE-IN
7	LMDEC2	LIM-DECOUPLE2	29	PSRF	1st-POWERSAVE-IN
8	V_{CC2}	V_{CC}-LIN	30	REF	REFERENCE-IN
9	LMO	LIM-OUT	31	LD	LOCK-DETECT-OUT
10	TXLO2	TX-LOCAL2-IN	32	CLOCK	CLOCK-IN
11	RSO	RSSI-OUT	33	DATA	SERIAL-DATA-IN
12	GND	GND	34	STROBE	STROBE-IN
13	Q_IN	Q_INPUT	35	GND	GND-1st / 2nd CMOS
14	Q_IN	$\overline{Q}$_INPUT	36	CP1	1st-PRESCALER-IN
15	I_IN	I_INPUT	37	V_{CC}	V_{CC}-1st CMOS
16	I_IN	$\overline{I}$_INPUT	38	RFIN	1st-PRESCALER-IN
17	V_{CC1}	V_{CC}-TX-MOD	39	TXLO1	TX-LOCAL1
18	GNDM	GND-TX-MOD	40	TXLO1R	TX-LOCAL 1REF
19	IFIN	2nd-PRESCALER-IN	41	APC/BS	APC / BS
20	N.C.		42	V_{CC1}	V_{CC}-TX-OUT
21	GND2	GND-2nd CMOS	43	TXO	TX-OUTPUT
22	V_{CC}	V_{CC}-1st / 2nd BIP	44	GNDO	GND-TX-OUT

■ Absolute Maximum Ratings

No.	Parameter	Symbol	Rating		Unit
1	Storage temperature	T_{stg}	–55 to +125	°C	*1
2	Operating ambient temperature	T_{opr}	–20 to +70	°C	*1
3	Operating ambient atmospheric pressure	P_{opr}	$1.013 \times 10^5 \pm 0.61 \times 10^5$	Pa	
4	Operating constant gravity	G_{opr}	9 810	m/s^2	
5	Operating shock	S_{opr}	4 900	m/s^2	
6	Supply voltage	V_{CC} , V_{CC1} , V_{CC2}	3.5	V	*2
7	Supply current	I_{CC}	54	mA	
8	Power dissipation	P_D	194	mW	*2

Note) *1: Expect for the operating ambient temperature and storage temperature , all ratings are for T_a = 25°C
*2: The range under absolute maximum ratings, power dissipation.

■ Operating Supply Voltage Range

Operating supply voltage range	V_{CC} , V_{CC1} , V_{CC2}	2.7 to 3.3	V	

Request for your special attention and precautions in using the technical information and semiconductors described in this book

(1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.

(2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products, and no license is granted under any intellectual property right or other right owned by our company or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.

(3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
- Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
- Any applications other than the standard applications intended.

(4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.

(5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.

(6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.