

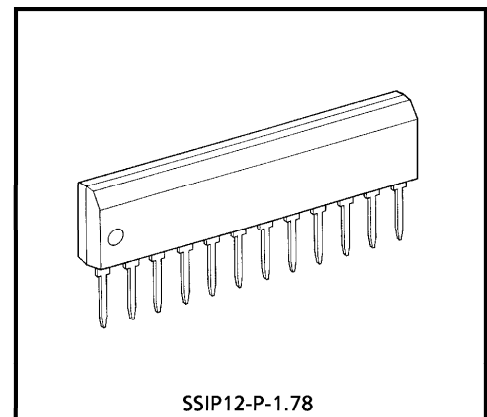
TA8168SN

FM FRONT END IC

The TA8168SN is a FM FRONT-END IC which is designed for radio cassette recorders and music centers. Comparing with conventional types, RF inter-modulation characteristics and overload characteristics are improved.

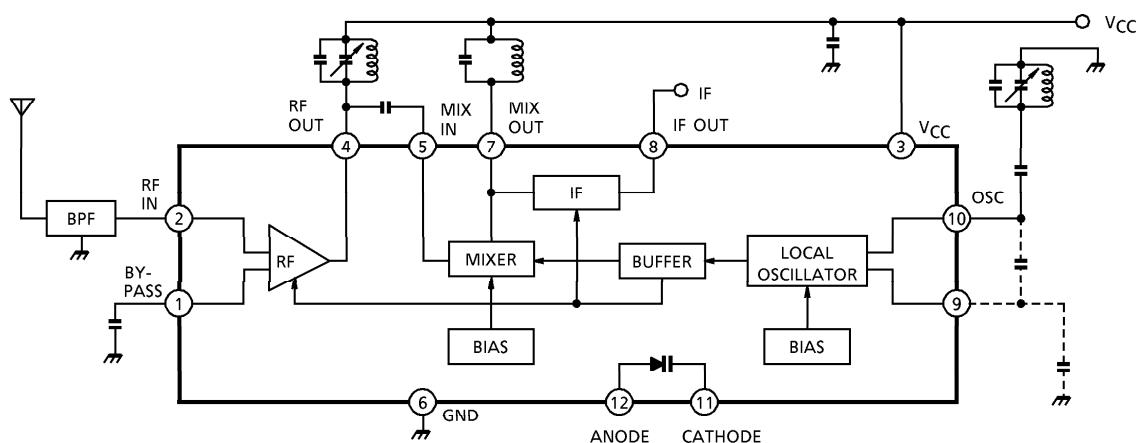
FEATURES

- Improved RF inter-modulation characteristics by double balanced type mixer circuit
- Low drift oscillation frequency for strong input
- It is available TV band frequency (up to 220MHz)
- Built-in IF amplifier
 $R_O = 330\Omega$ (Typ.), V_O (IF) = 70mV_{rms} (Typ.)
- Emitter output of local oscillation transistor
- Built-in varactordiode for AFC
 Cathode and anode are floating
- Operating supply voltage range
 $V_{CC} (opr) = 3.5 \sim 14V$ ($T_a = 25^\circ C$)



Weight : 0.65g (Typ.)

BLOCK DIAGRAM



961001EBA2

● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

EXPLANATION OF TERMINALS (Terminal voltage is DC voltage at Ta = 25°C, VCC = 5V, and no signal)

PIN No.	SYMBOL	CONTENTS	INTERNAL CIRCUIT	TERMINAL VOLTAGE (V)
1	BY-PASS	Bias Terminal for RF Amp. Capacitor is connected		2.0
2	RF IN	RF Input Terminal		1.3
3	VCC	Power supply terminal		5.0
4	RF OUT	RF Output Terminal RF Tank circuit is connected	Refer to Pin①, ②.	5.0
5	MIX IN	Mixer Input Terminal		2.0
6	GND	Ground Terminal	—	—
7	MIX OUT	Mixer Output Terminal Mixer Coil is connected		5.0
8	IF OUT	IF Output Terminal Output Impedance RO (IF) = 330Ω (Typ.)		4.85
9	MONITOR	Local OSC Monitor Terminal		4.25
10	LOCAL OSC	Local OSC Terminal OSC Tank circuit is connected		4.9
11	AFC (C)	AFC Diode Cathode Terminal		—
12	AFC (A)	AFC Diode Anode Terminal		—

961001EBA2'

- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	15	V
AFC Diode Reverse Voltage	V _R	4	V
Power Dissipation	P _D (Note)	750	mW
Operating Temperature	T _{opr}	-25~75	°C
Storage Temperature	T _{stg}	-55~150	°C

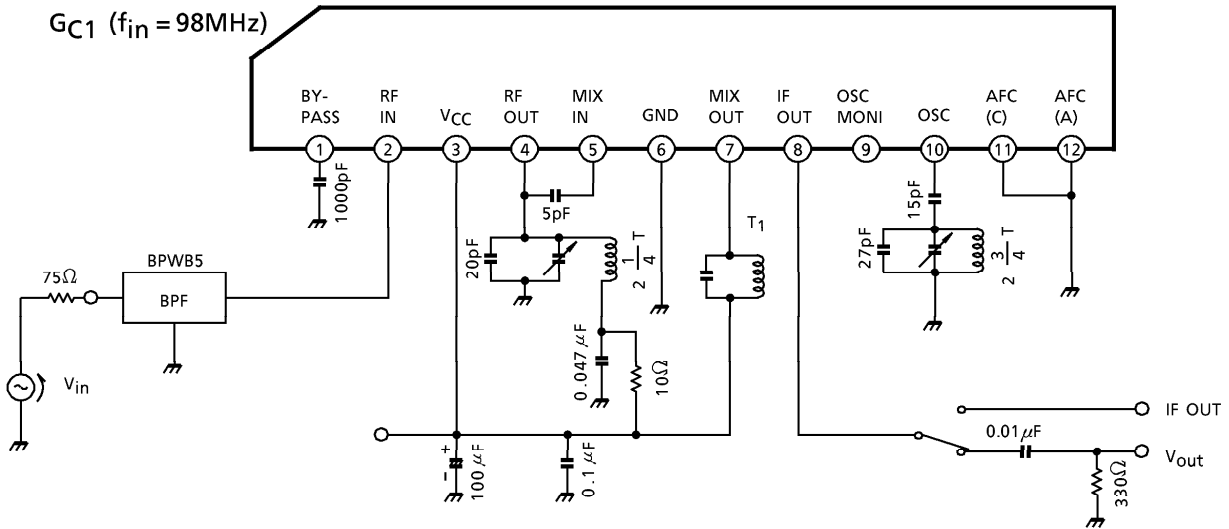
(Note) Derated linearly above Ta = 25°C in the proportion of 6mW/°C.

ELECTRICAL CHARACTERISTICS

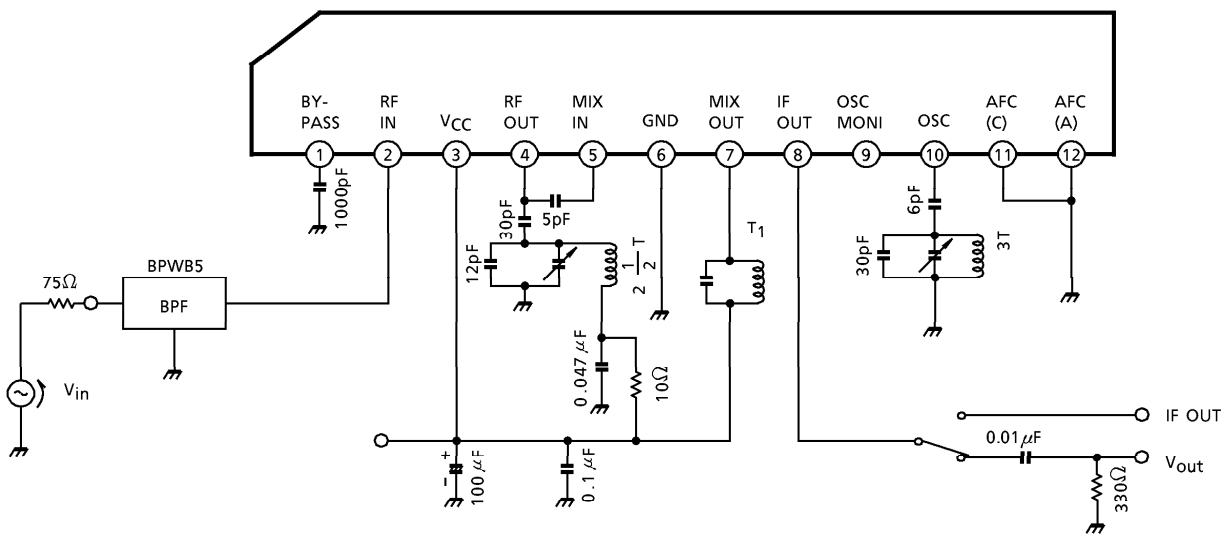
(Unless otherwise specified, Ta = 25°C, V_{CC} = 5V, f_m = 1kHz, f = 98MHz, Δf = ±22.5kHz dev.)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Current		I _{CC}	1	V _{in} = 0	—	10	15	mA	
Conversion Gain		G _{C1}	1	f _{in} = 98MHz, V _{in} = 50dB _μ V EMF	42	46	50	dB	
		G _{C2}	1	f _{in} = 220MHz, V _{in} = 50dB _μ V EMF	—	42	—		
Local Oscillation Voltage		V _{OSC1}	2	f _{OSC} = 108.7MHz	220	310	440	mV _{rms}	
		V _{OSC2}	2	f _{OSC} = 230MHz	—	100	—		
Pin② Input Impedance	Parallel Input Resistance	r _{ip2}	3	f = 98MHz	—	50	—	Ω	
	Parallel Input Capacitance	c _{ip2}			—	-15	—	pF	
Pin④ Output Impedance	Parallel Output Resistance	r _{op4}	3		—	70	—	kΩ	
	Parallel Output Capacitance	c _{op4}			—	1.5	—	pF	
Pin⑤ Input Impedance	Parallel Input Resistance	r _{ip5}	3		—	4.0	—	kΩ	
	Parallel Input Capacitance	c _{ip5}			—	2.0	—	pF	
Pin⑦ Output Impedance	Parallel Output Resistance	r _{op7}	3		f = 10.7MHz	—	80	—	kΩ
	Parallel Output Capacitance	c _{op7}				—	2.5	—	pF
Local OSC Stop Voltage		V _{stop}	2		f _{OSC} = 108.7MHz	—	1.5	1.8	V
AFC Diode Capacitance		C _{AFC}	3		f = 98MHz, V _{AFC} = 3V	—	13	—	pF

TEST CIRCUIT 1



G_{C2} ($f_{in} = 220\text{MHz}$)



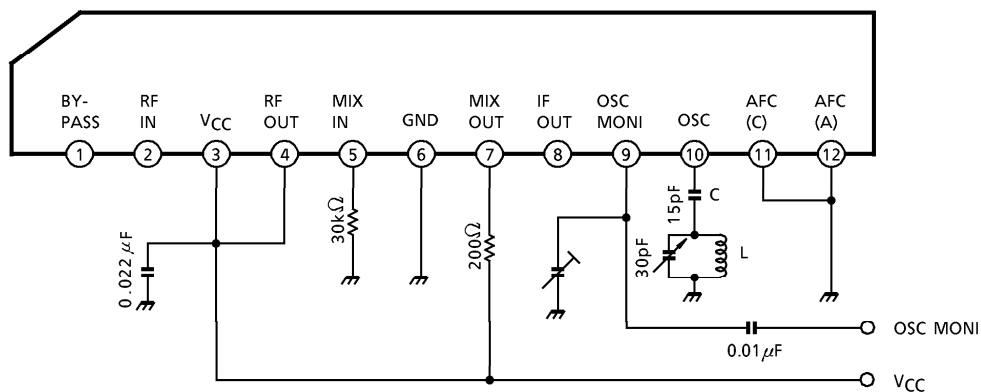
COIL DATA FOR TEST CIRCUIT

COIL No.	TEST FREQUENCY (Hz)	L (μH)	C_o (pF)	Q_o	TURNS					WIRE (mm ϕ)	NOTE
					1-2	2-3	1-3	1-4	4-6		
T ₁	10.7M	—	75	100	—	—	13	—	2	0.1UEW	© 2153-414-041A

© : SUMIDA ELECTRIC CO., LTD

TEST CIRCUIT 2

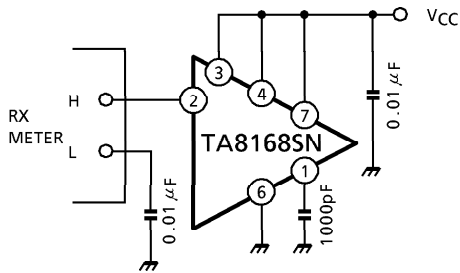
V_{OSC} , V_{stop}



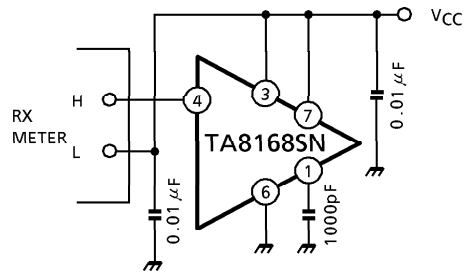
- (1) $f_{OSC} = 108.7\text{MHz}$
 L : 5mm ϕ , $2 \frac{1}{2}$ turn with ferrite core
 C : 15pF
- (2) $f_{OSC} = 230\text{MHz}$
 L : 5mm ϕ , 3 turn without ferrite core
 C : 6pF

TEST CIRCUIT 3

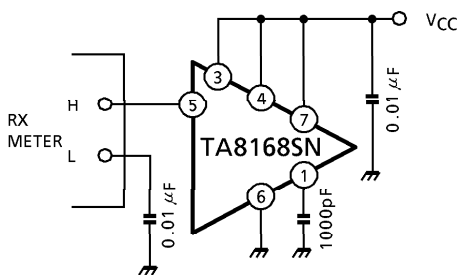
Pin② input resistance, input capacitance



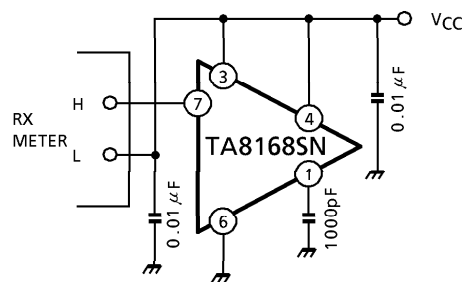
Pin④ output resistance, output capacitance



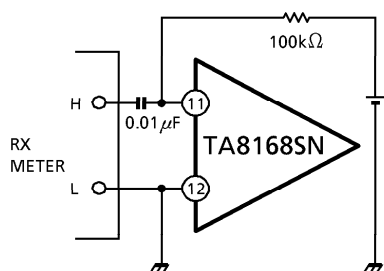
Pin⑤ input resistance, input capacitance

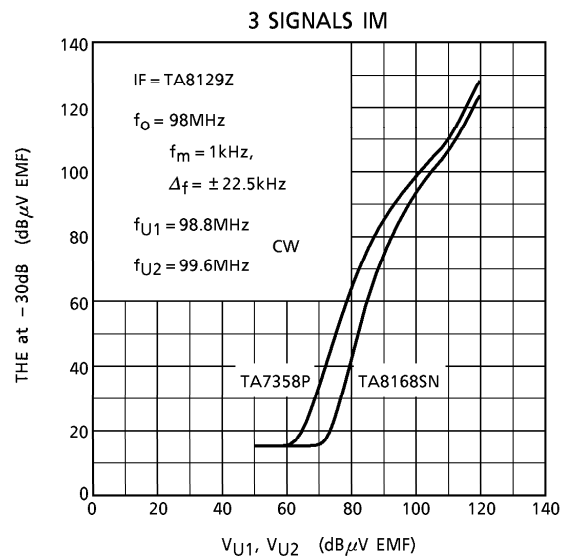
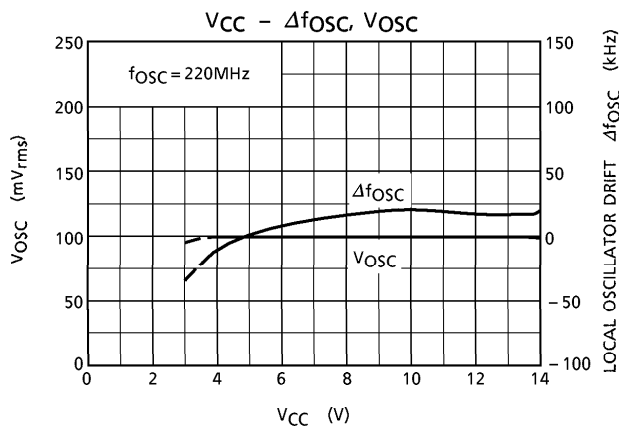
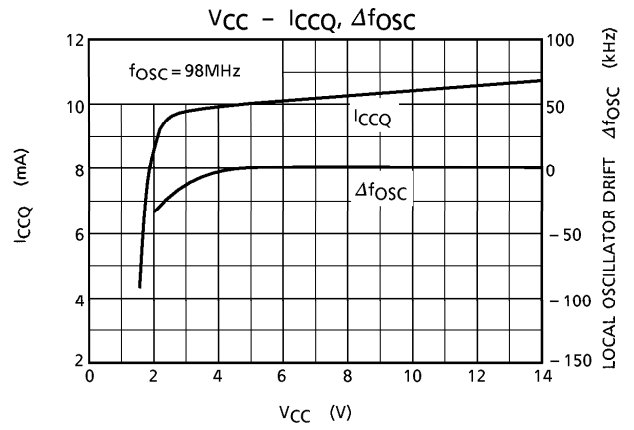
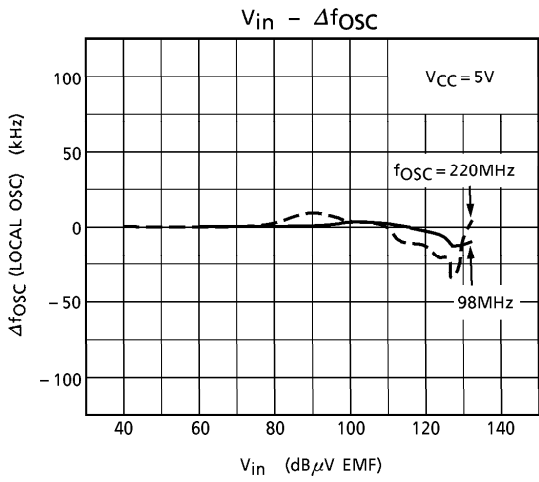
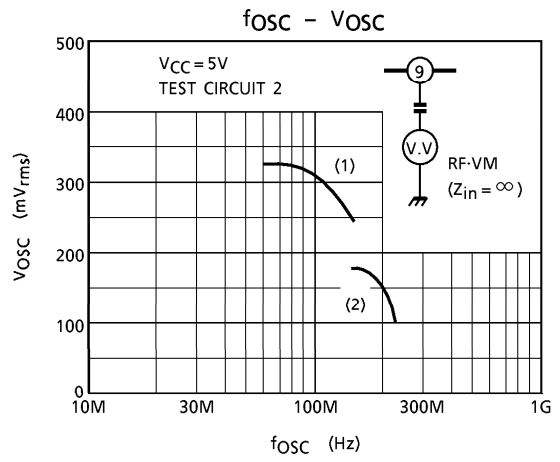
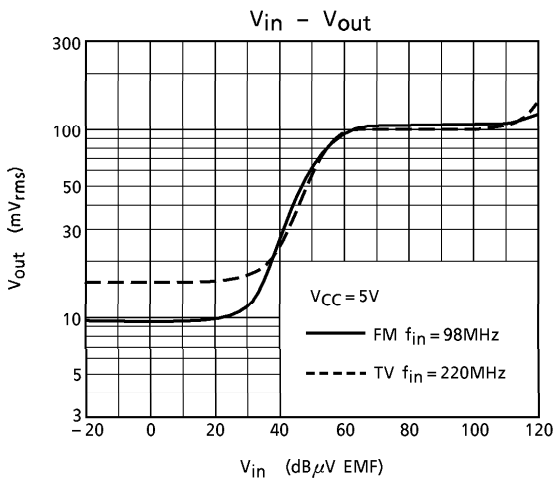


Pin⑦ output resistance, output capacitance

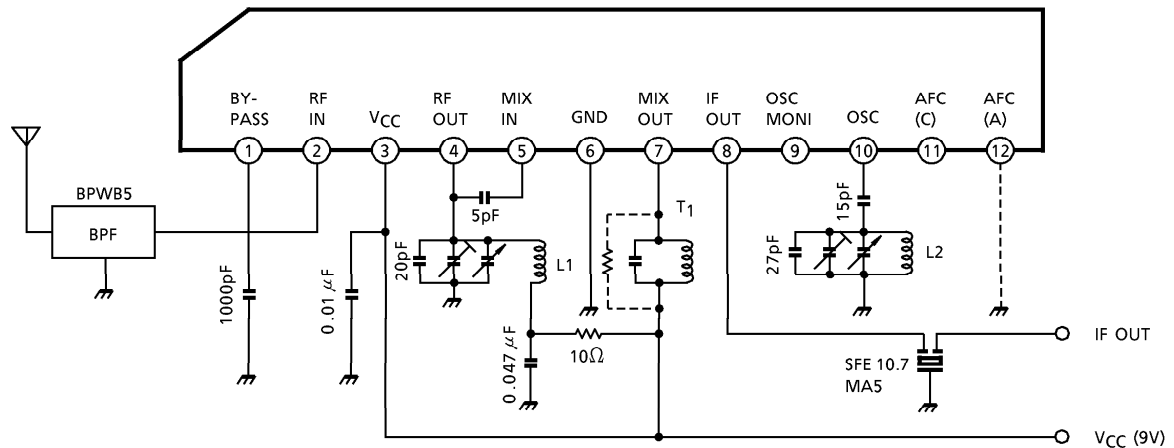


AFC diode capacitance





APPLICATION CIRCUIT

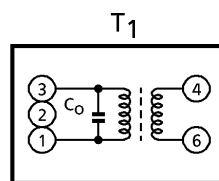
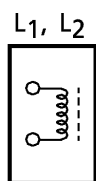


COIL DATA FOR APPLICATION CIRCUIT

COIL No.	STAGE	TEST PREQ	L (μH)	C ₀ (pF)	Q ₀	TURNS				WIRE (mm)	REMARKS
						1-2	2-3	1-3	4-6		
L ₁	FM RF	100M	0.06	—	100	—	—	2 $\frac{1}{4}$	—	φ0.5UEW	Within Core
L ₂	FM OSC	100M	0.045	—	100	—	—	1 $\frac{3}{4}$	—	φ0.5UEW	Within Core
T ₁	FM IFT	10.7M	—	75	100	—	—	13	2	φ0.16UEW	Ⓜ TY-20580 Ⓢ 2153-414-041A

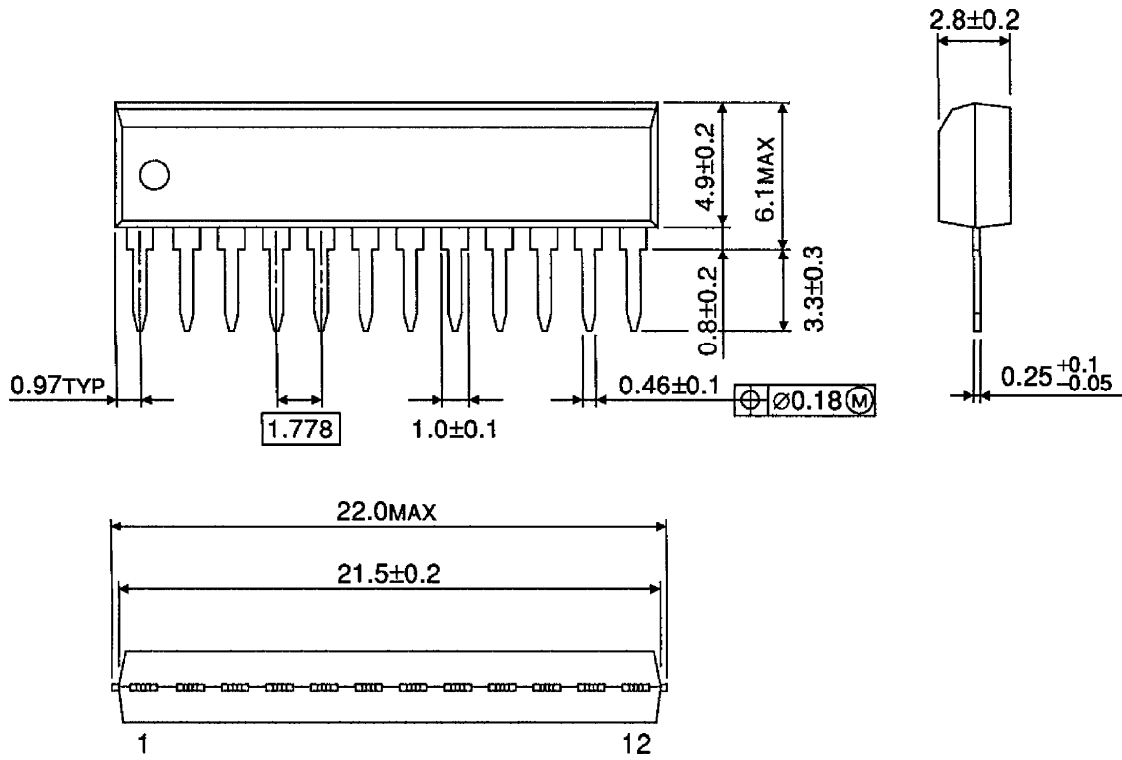
Ⓢ : SUMIDA ELECTRIC CO., LTD

Ⓜ : MITSUMI ELECTRIC CO., LTD



OUTLINE DRAWING
SSIP12-P-1.78

Unit : mm



Weight : 0.65g (Typ.)

Copyright Each Manufacturing Company.

All Datasheets cannot be modified without permission.

This datasheet has been download from :

www.AllDataSheet.com

100% Free DataSheet Search Site.

Free Download.

No Register.

Fast Search System.

www.AllDataSheet.com