

TA8168SN

FM FRONT END IC

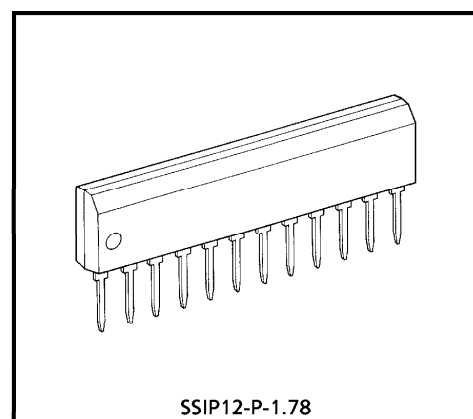
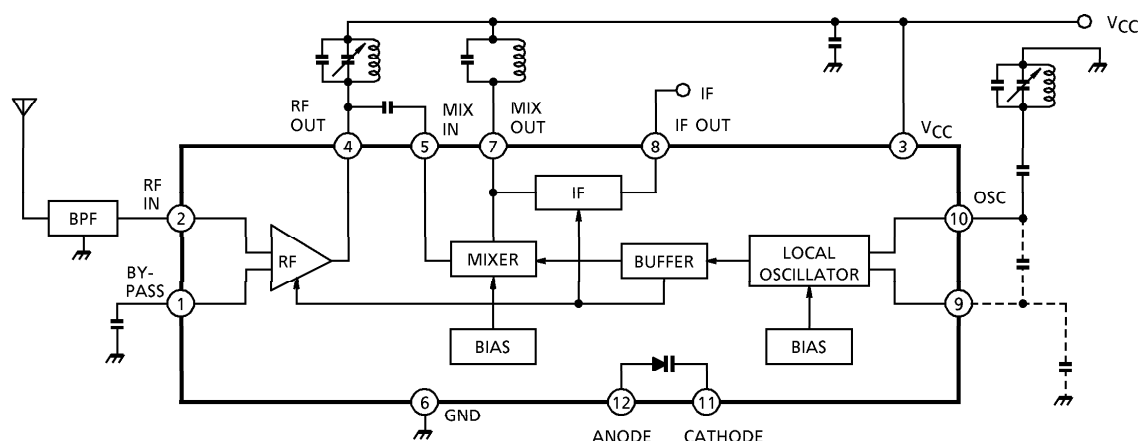
The TA8168SN is a FM FRONT-END IC which is designed for radio cassette recorders and music centers.

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
 $V_{CC}(\text{opr}) = 3.5 \sim 14V$ ($T_a = 25^\circ\text{C}$)

BLOCK DIAGRAM



Weight : 0.65g (Typ.)

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EXPLANATION OF TERMINALS (Terminal voltage is DC voltage at Ta = 25°C, V_{CC} = 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	V _{CC}	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 R _O (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		—

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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

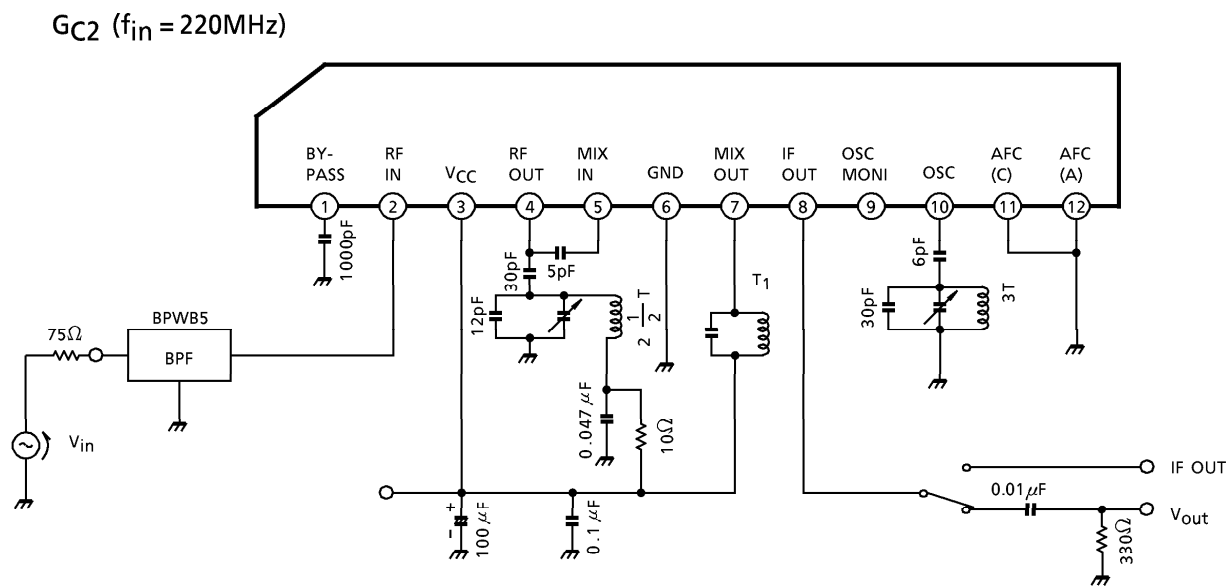
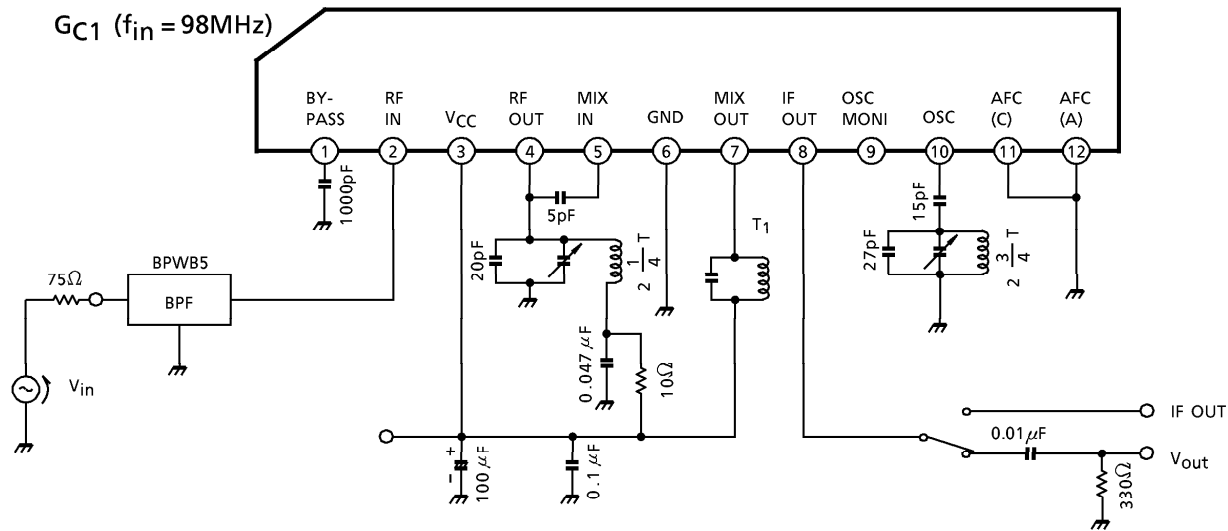
(Note) Derated linearly above Ta = 25°C in the proportion of 6mW/°C.

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



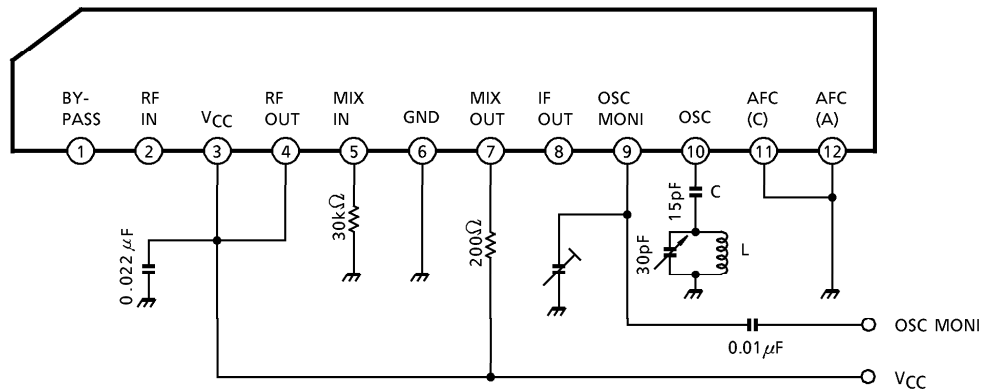
COIL DATA FOR TEST CIRCUIT

COIL No.	TEST FREQUENCY (Hz)	L (μH)	C ₀ (pF)	Q ₀	TURNS					WIRE (mmφ)	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

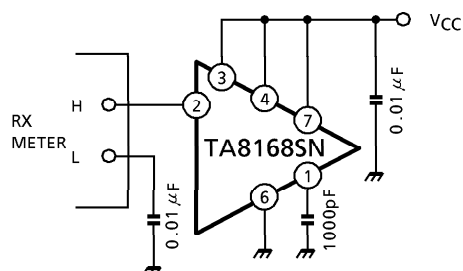
V_{OSC} , V_{stop}



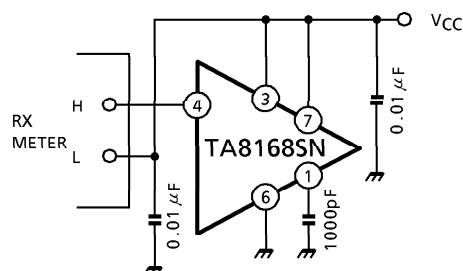
- (1) $f_{OSC} = 108.7\text{MHz}$
 $L : 5\text{mm}\phi, 2 \frac{1}{2} \text{ turn with ferrite core}$
 $C : 15\text{pF}$
- (2) $f_{OSC} = 230\text{MHz}$
 $L : 5\text{mm}\phi, 3 \text{ turn without ferrite core}$
 $C : 6\text{pF}$

TEST CIRCUIT 3

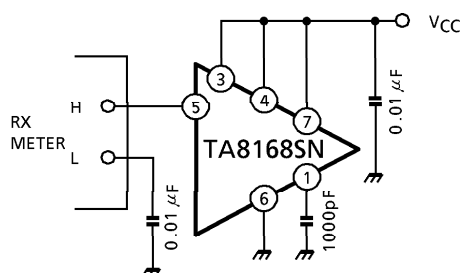
Pin② input resistance, input capacitance



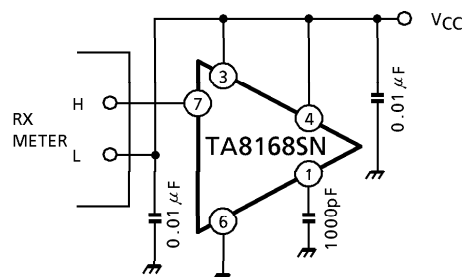
Pin④ output resistance, output capacitance



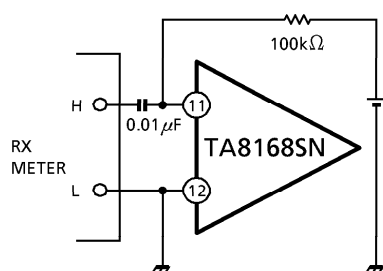
Pin⑤ input resistance, input capacitance

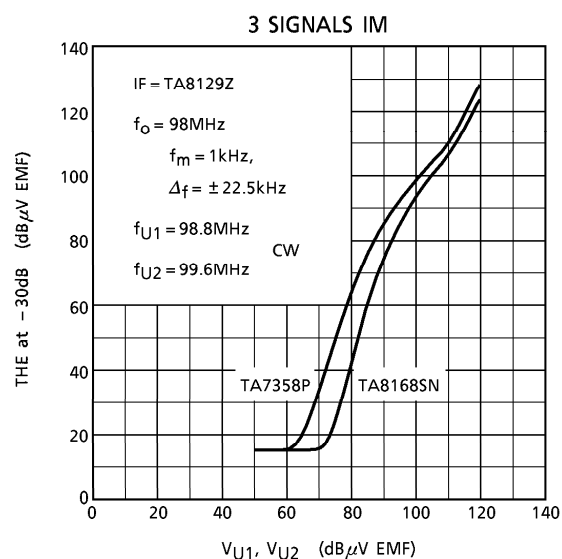
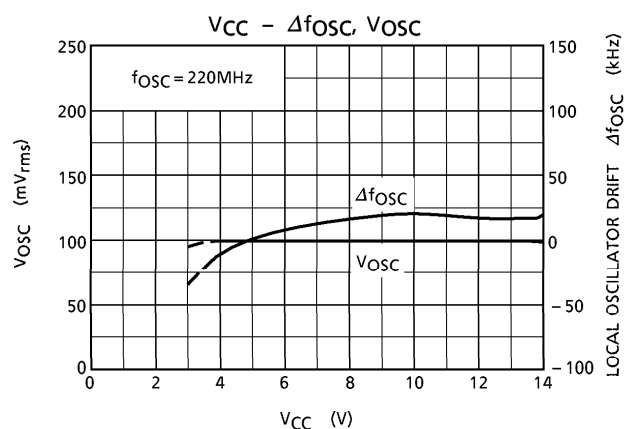
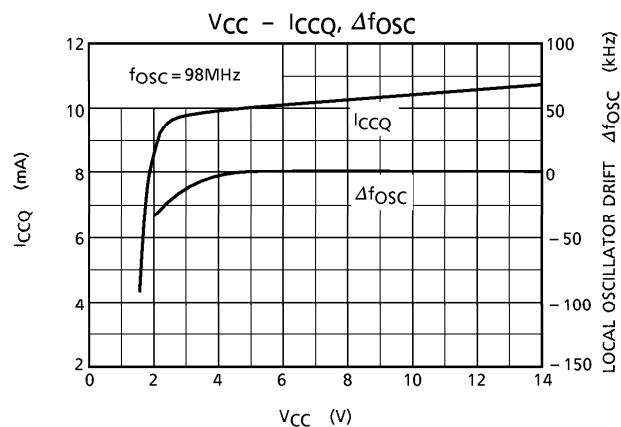
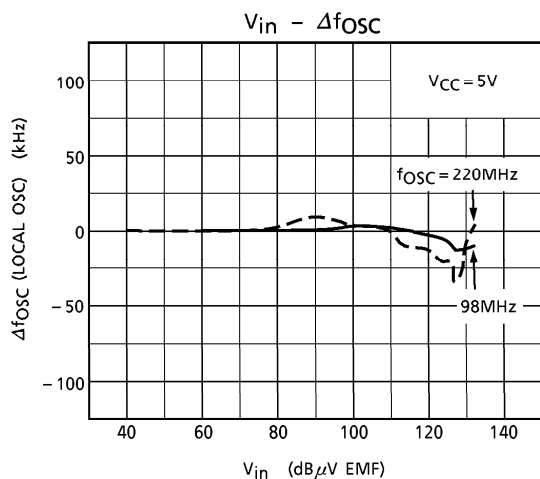
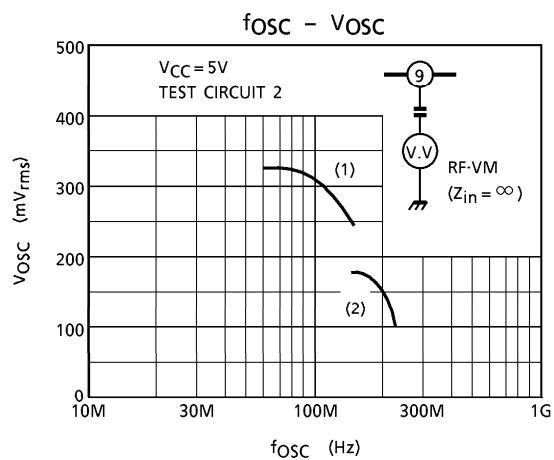
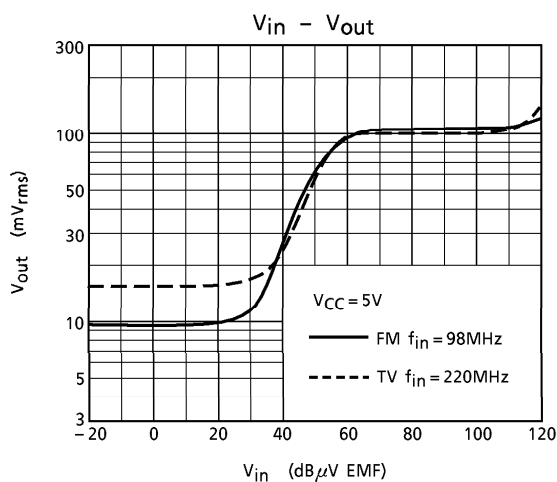


Pin⑦ output resistance, output capacitance

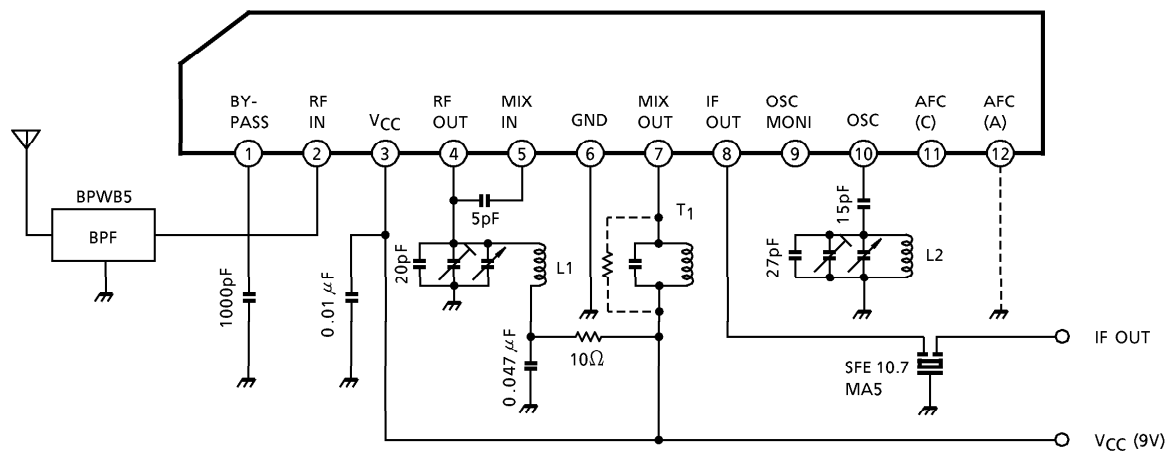


AFC diode capacitance





APPLICATION CIRCUIT



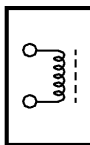
COIL DATA FOR APPLICATION CIRCUIT

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

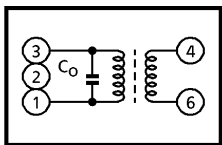
Ⓢ : SUMIDA ELECTRIC CO., LTD

Ⓜ : MITSUMI ELECTRIC CO., LTD

L₁, L₂

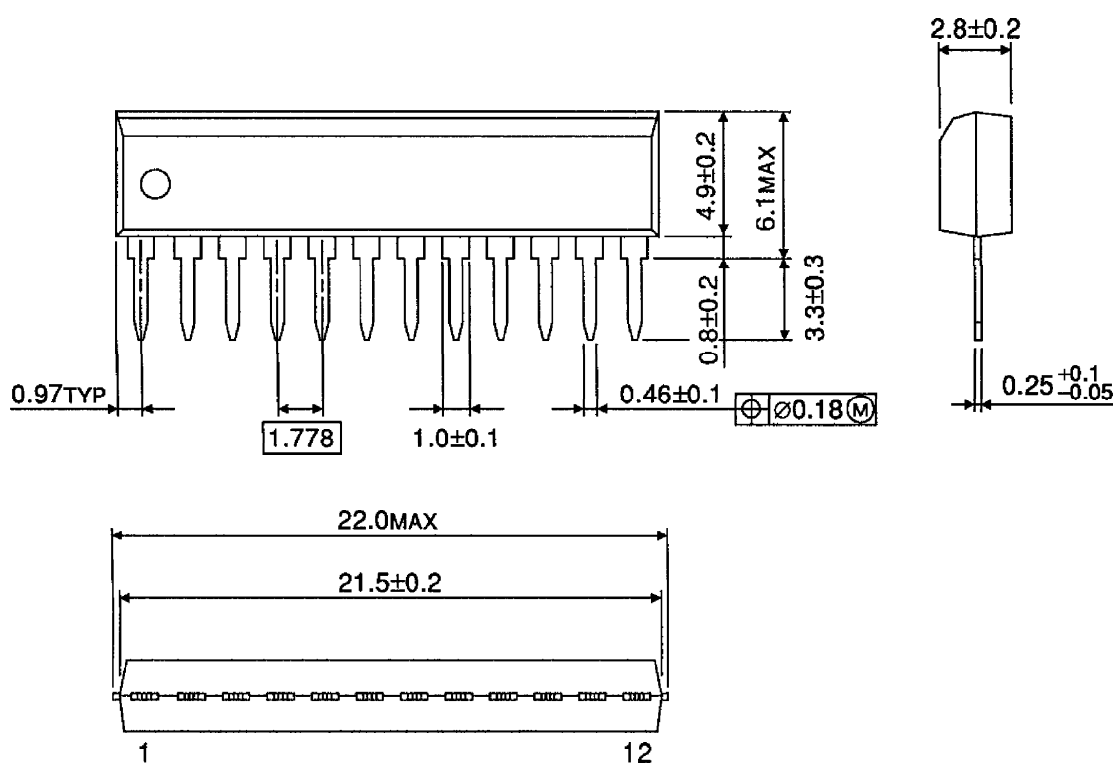


T₁



OUTLINE DRAWING
SSIP12-P-1.78

Unit : mm



Weight : 0.65g (Typ.)