

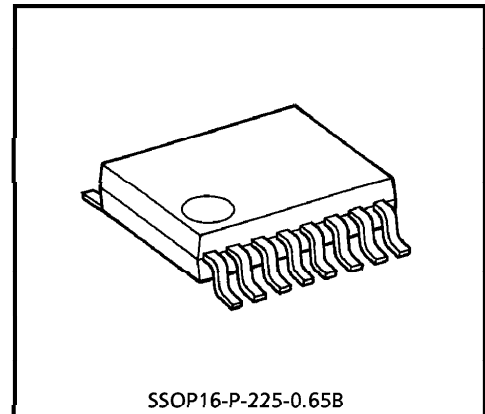
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8182FN**TV/FM SYSTEM F/E (1.5V USE)**

The TA8182FN is a TV/FM SYSTEM FRONT END IC, which is developed for headphone radio in 1.5V use. It is built in FM F/E and TV F/E (Japanese VHF band).

FEATURES

- Built-in FM F/E and TV F/E
FM mode : 75~109MHz
TV mode : 175~225MHz
- Suitable for combination with Digital Tuning System.
- Built-in power switch
- Built-in FM/TV switch
- Built-in IF amplifier
- Improved Inter-Modulation characteristics by Double Balanced Type Mixer circuit.
- Supply current ($V_{CC} = 1.2V$, $T_a = 25^\circ C$)
FM mode : $I_{CC} = 4.6mA$ (Typ.)
TV mode : $I_{CC} = 5.5mA$ (Typ.)
- Operating supply voltage range ($T_a = 25^\circ C$)
 $V_{CC} (opr) = 0.95 \sim 4V$



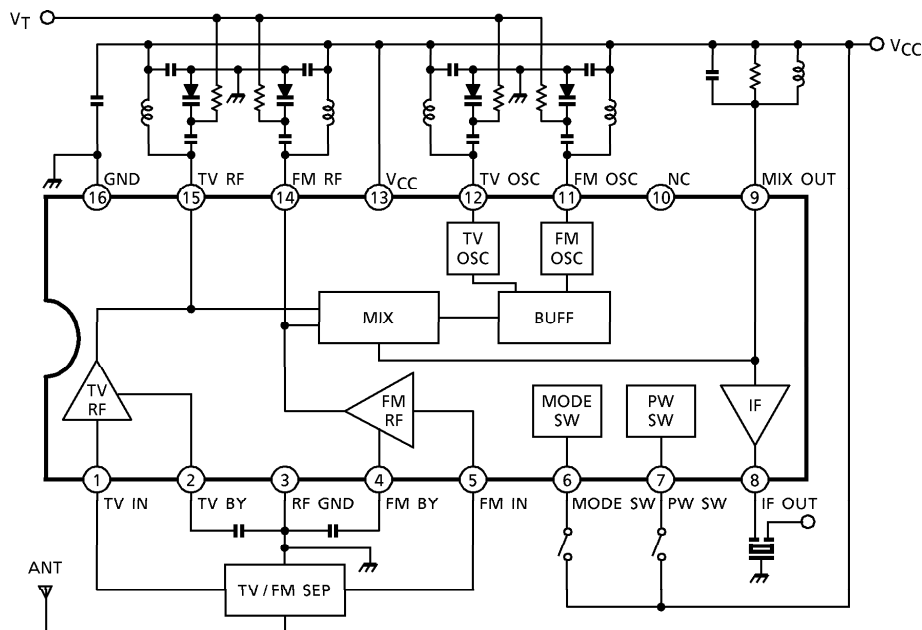
SSOP16-P-225-0.65B

Weight : 0.09g (Typ.)

980508EBA2

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BLOCK DIAGRAM



TERMINAL EXPLANATION

Terminal voltage : Typ. terminal voltage at no signal with test circuit. ($V_{CC} = 1.2V$, $T_a = 25^\circ C$)

TERMI- NAL No.	TERMINAL NAME	FUNCTION	INTERNAL CIRCUIT	TERMINAL VOLTAGE (V)	
				FM	TV
1	TV IN	Input of TV RF signal. (Common-base type)		0	0.1
2	TV BY	By-pass terminal of TV RF and MIX. (Radiation is lightened by connected capacitor.)		—	0.7
15	TV RF	TV RF tuning circuit is connected.		1.2	1.2
3	RF GND	—	—	0	0
4	FM BY	By-pass terminal of FM RF and MIX. (Radiation is lightened by connected capacitor.)		0.7	—
5	FM IN	Input of FM RF signal. (Common-base type)		0.1	—
14	FM RF	FM RF tuning circuit is connected.		1.2	1.2

TERMI- NAL No.	TERMINAL NAME	FUNCTION	INTERNAL CIRCUIT	TERMINAL VOLTAGE (V)	
				FM	TV
6	MODE SW	Mode switch. (V_{CC} : TV mode) (Open / GND : FM mode)		0	1.2
7	PW SW	Power switch. (V_{CC} : Power on) (Open / GND : Power off)		1.2	1.2
8	IF OUT	Output of TV / FM IF signal. Output impedance : 330Ω (Typ.)		0.5	0.5
9	MIX OUT	MIX Coil is connected.		1.2	1.2
10	NC	This terminal should be connected with V_{CC} line or open.	—	—	
11	FM OSC	FM OSC tank circuit is connected. (Colpitts type oscillator)		1.2	1.2
12	TV OSC	TV OSC tank circuit is connected. (Colpitts type oscillator)		1.2	1.2
13	V_{CC}	V_{CC}	—	1.2	1.2
16	GND	GND (Except RF part)	—	0	0

APPLICATION NOTE

1. PW SW

It is necessary to connect an external pull-down resistor with the terminal PW SW (pin⑦), in case that this IC is turned on due to external noise etc.

2. MODE SW

It is necessary to connect an external pull-down resistor with the terminal MODE SW (pin⑥), in case that this IC doesn't operate normally due to external noise etc.

3. RF GND

This IC has two GND terminals (pin③ : RF GND, pin⑩ : GND). External parts shown in below should be connected with RF GND (pin③), and other parts should be connected with GND (pin⑩).

- By-pass capacitor at pin⑭ (FM RF) and pin⑮ (TV RF)
- By-pass capacitor at pin④ (FM BY) and pin② (TV BY)

The pattern diagram of capacitor connected with pin② and pin④ should be shortly, because RF circuit and MIX circuit operate on the voltage of pin② or pin④.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	4.5	V
Power Dissipation (Note)	P _D	400	mW
Operating Temperature	T _{opr}	-25~75	°C
Storage Temperature	T _{stg}	-55~150	

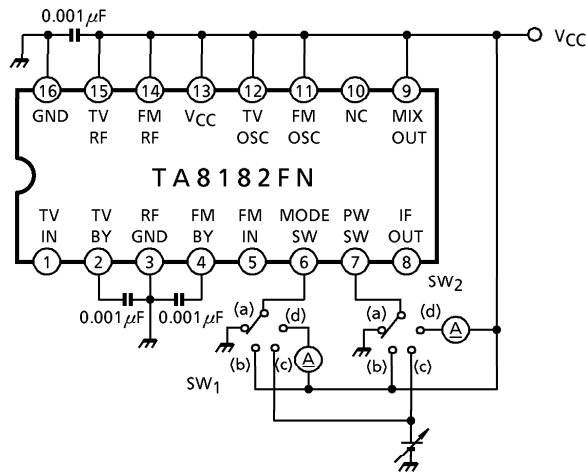
(Note) Derated above Ta = 25°C in the proportion of 3.2mW/°C.

ELECTRICAL CHARACTERISTICS

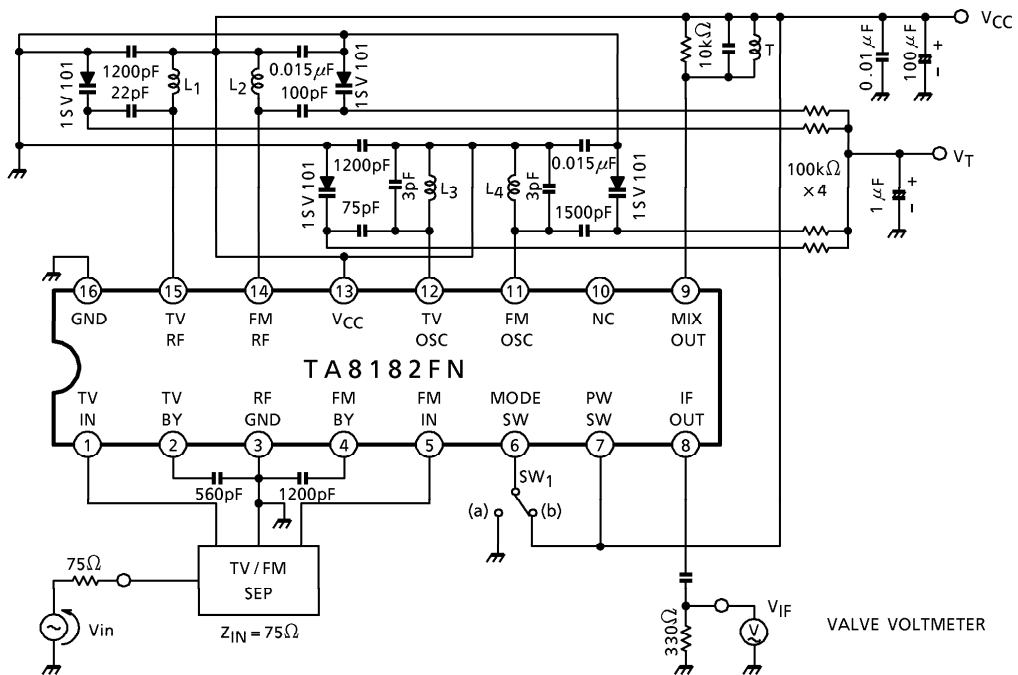
Unless otherwise specified, $V_{CC} = 1.2V$, $T_a = 25^\circ C$, $f_{FM} = 92MHz$, $f_{TV} = 200MHz$
 $\Delta f = \pm 22.5kHz$, $f_m = 1kHz$, $SW_2 : b$

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	SW ₁	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Current		I _{CC1}	1	a	V _{in} < -20dB μ V EMF	IC OFF, SW ₂ : a	—	0.1	5	μ A
		I _{CC2}				FM mode	—	4.6	6.0	mA
		I _{CC3}		b	TV mode	—	5.5	7.0		
FM	Conversion Gain	G _{c1}	2	a	V _{in} = 65dB μ V EMF	29	33	—	dB	
	Local Oscillator Voltage	V _{osc1}	3		f _{osc} = 65MHz	—	47	—	mV _{rms}	
	Local Oscillator Stop Voltage	V _{STP1}				—	0.85	0.95	V	
TV	Conversion Gain	G _{c2}	2	b	V _{in} = 65dB μ V EMF	21	25	—	dB	
	Local Oscillator Voltage	V _{osc2}	3		f _{osc} = 165MHz	—	27	—	mV _{rms}	
	Local Oscillator Stop Voltage	V _{STP2}				—	0.88	0.95	V	
Power On Current		I ₇	1	a	V _{CC} = 0.95V, V ₂ \leq 0.2V SW ₂ : d V ₄ \geq 0.4V	5	—	—	μ A	
Power Off Voltage		V ₇		a	V _{CC} = 0.95V, V ₂ \leq 0.2V SW ₂ : c V ₄ \leq 0.2V	0	—	0.3	V	
TV Mode On Current		I ₆		d	V _{CC} = 0.95V, V ₂ \geq 0.4V V ₄ \leq 0.2V	5	—	—	μ A	
FM Mode On Voltage		V ₆		c	V _{CC} = 0.95V, V ₂ \leq 0.2V V ₄ \geq 0.4V	0	—	0.3	V	

TEST CIRCUIT 1



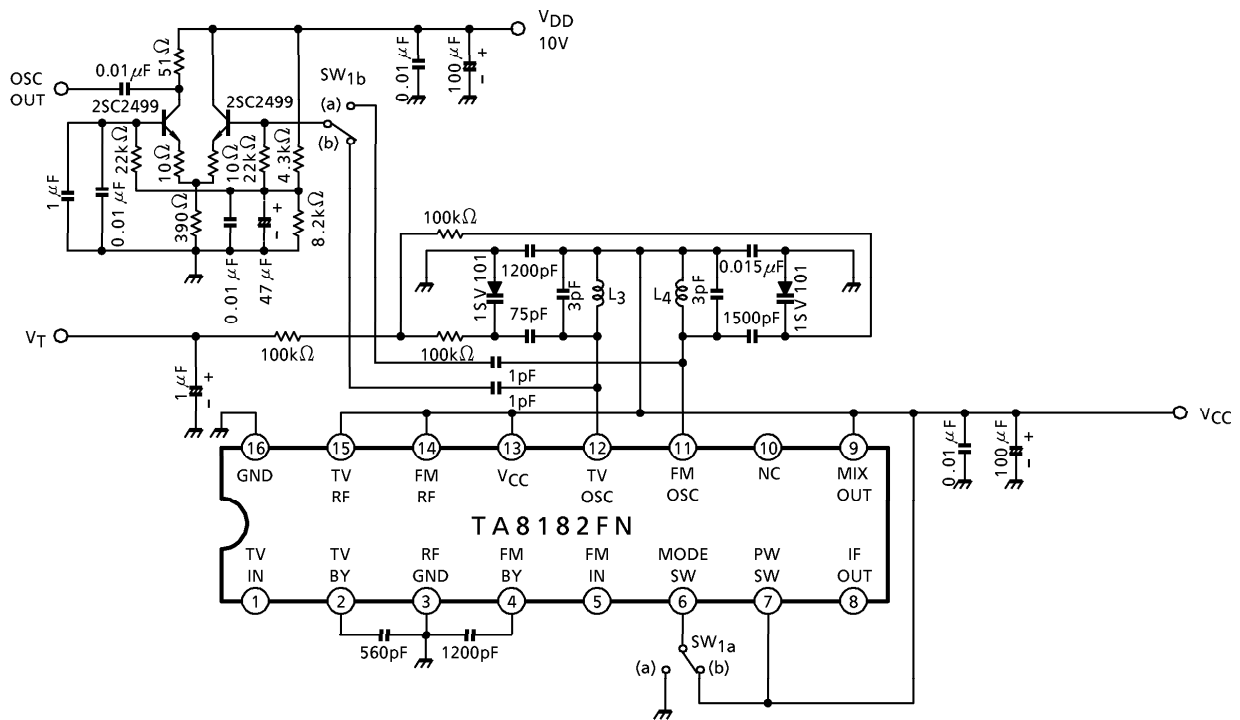
TEST CIRCUIT 2



$$G_C \text{ (dB)} = 20 \log V_{IF} (\mu\text{V}_{\text{rms}}) - (V_{in} \text{ (dB}\mu\text{V EMF)} - 6\text{dB})$$

TV / FM Separator : GTVS03 (SOSHIN ELECTRIC CO., LTD.)

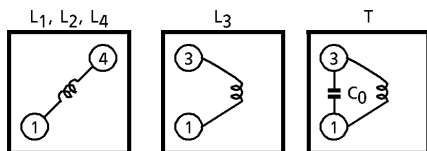
TEST CIRCUIT 3

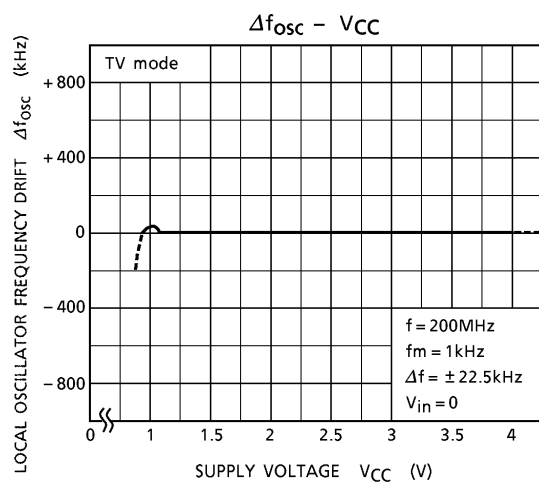
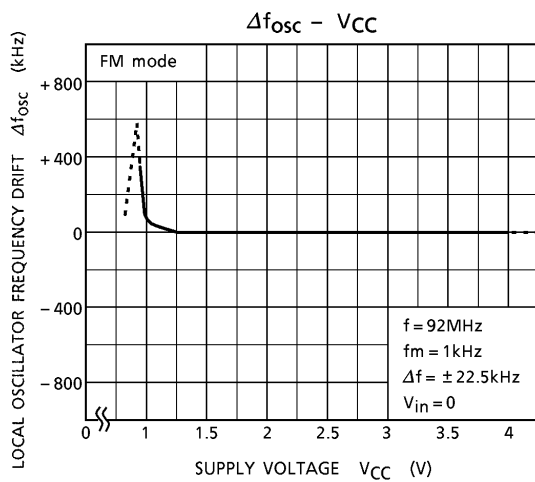
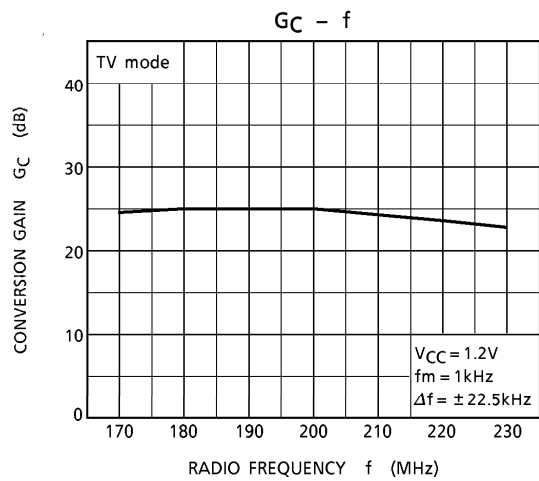
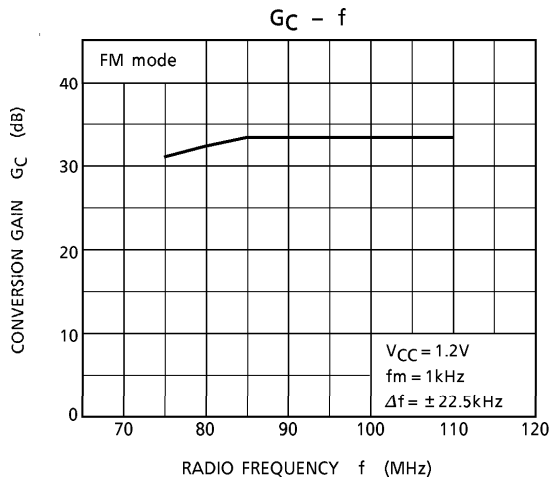
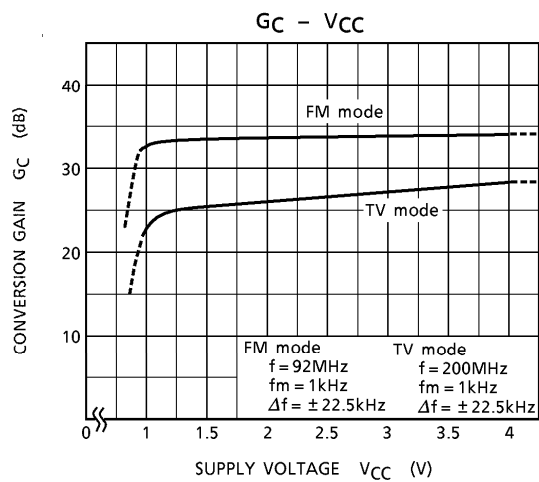
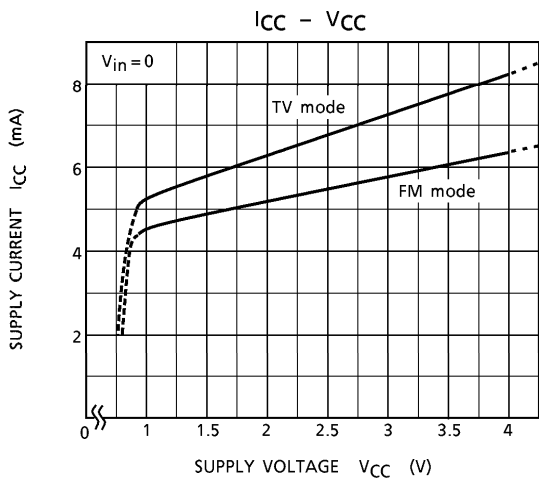


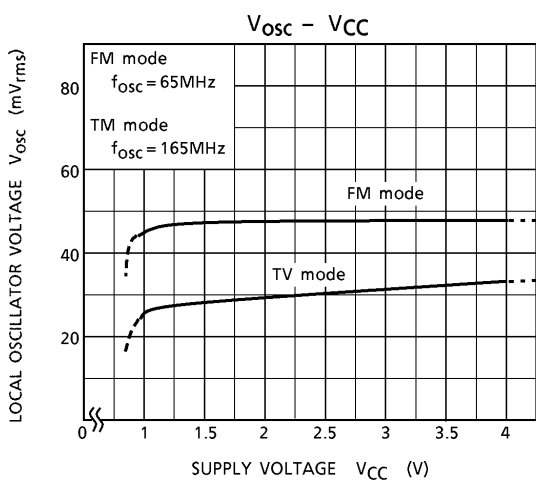
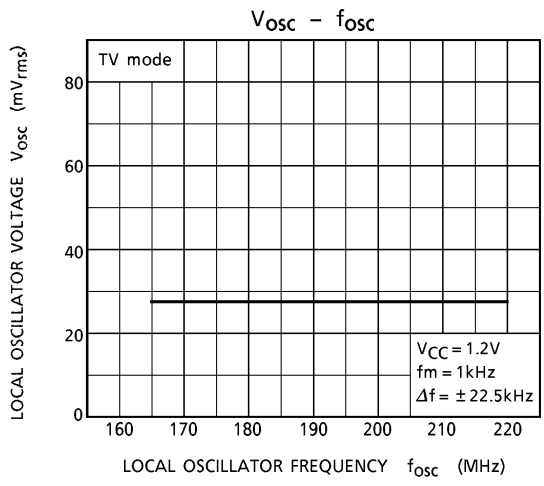
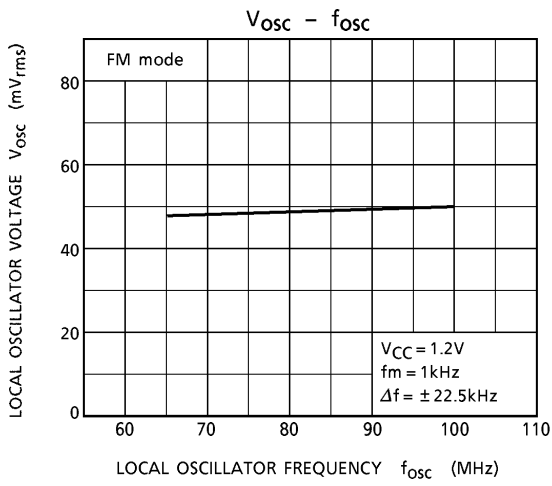
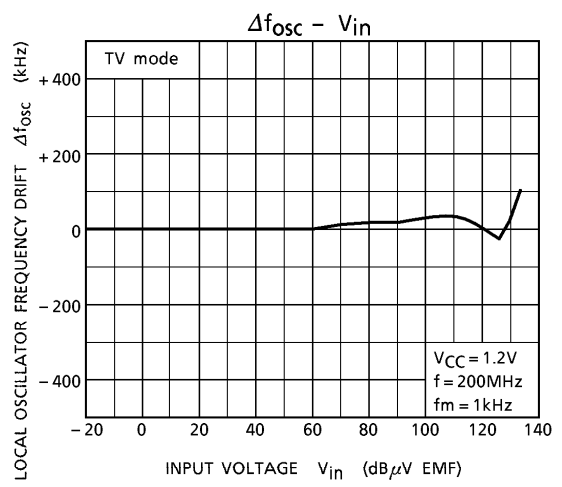
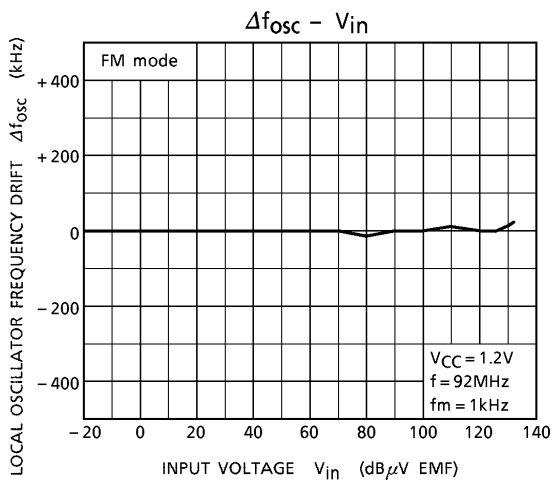
COIL DATA (Test circuit)

COIL No.	TEST FREQ.	C ₀ (pF)	Q ₀	TURNS		WIRE (mm φ)	REFERENCE
				1-3	1-4		
L ₁ TV RF	100MHz	—	55	—	1 1/2	0.5UEW	Ⓢ 0258-236
L ₂ FM RF	100MHz	—	90	—	3 1/2	0.5UEW	Ⓢ 0258-238
L ₃ TV OSC	100MHz	—	55	1 1/4	—	0.5UEW	Ⓢ 0258-250
L ₄ FM OSC	100MHz	—	90	—	3 1/2	0.5UEW	Ⓢ 0258-238
T FM IFT	10.7MHz	82	45	18	—	0.09UEW	Ⓢ 4162-083A

Ⓢ : SUMIDA ELECTRIC CO., LTD.

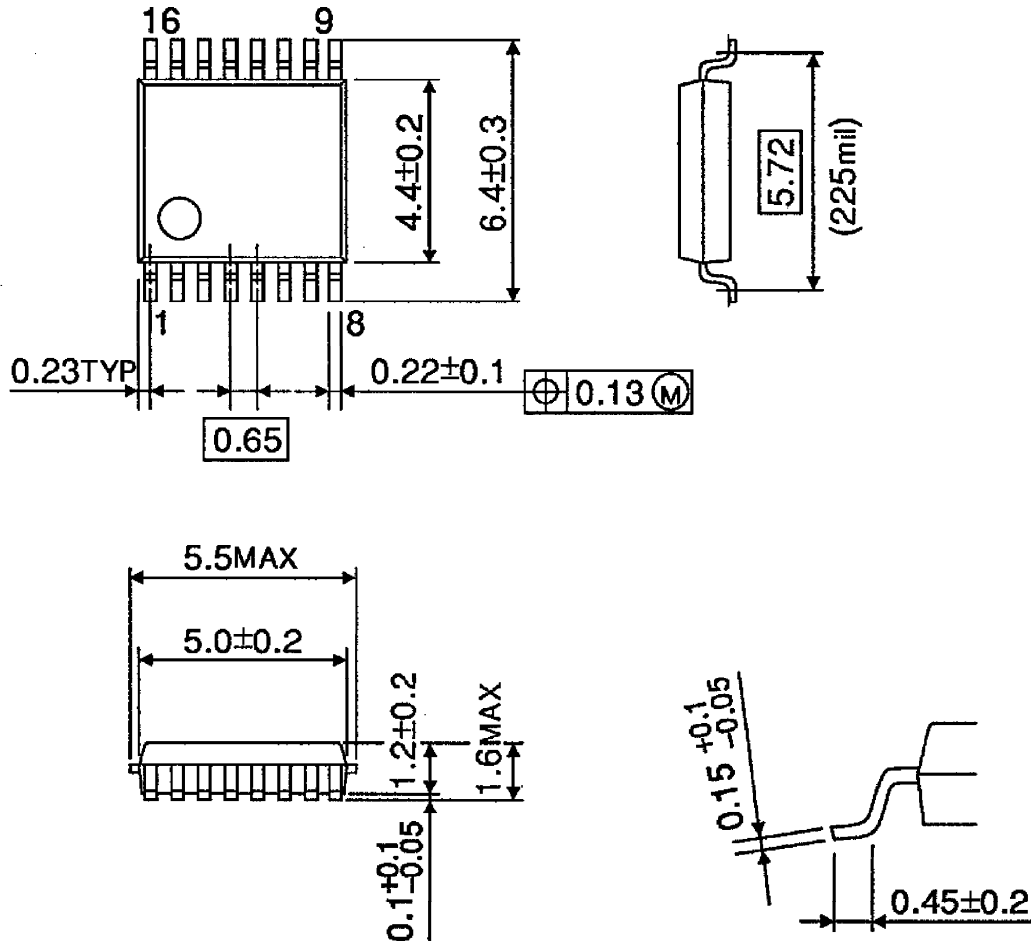






OUTLINE DRAWING
SSOP16-P-225-0.65B

Unit : mm



Weight : 0.09g (Typ.)