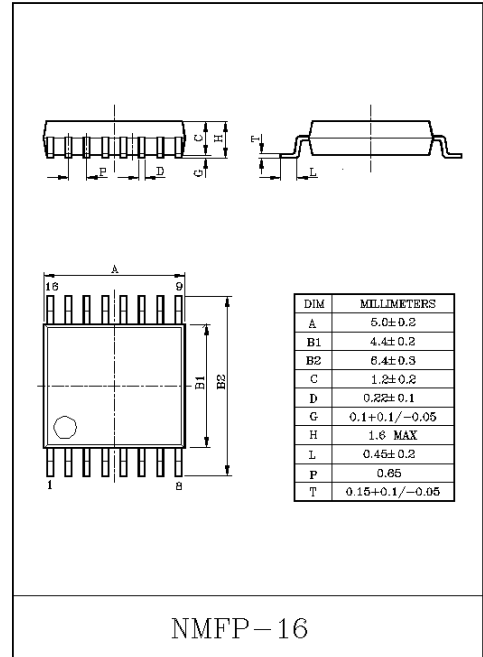


TV/FM SYSTEM FRONT END (1.5V USE)

The KIA8182FN is TV/FM Front End IC, which is designed for 1.5V headphone radio.

FEATURES

- Built-in VHF/FM band front end.
 - < FM Mode : 75~109MHz
 - < TV Mode : 175~225MHz
- Suitable for combination with Digital Tuning System.
- Built-in power ON/OFF switch.
- Built-in band switch.(FM/TV)
- Built-in IF amp.
- Built-in oscillator buffer circuit.
- Improved inter-Modulation characteristics by Double balanced type mixer circuit.
- Operating supply voltage range. (Ta=25°C)
 - : V_{CC(oper)}=0.95~4V.



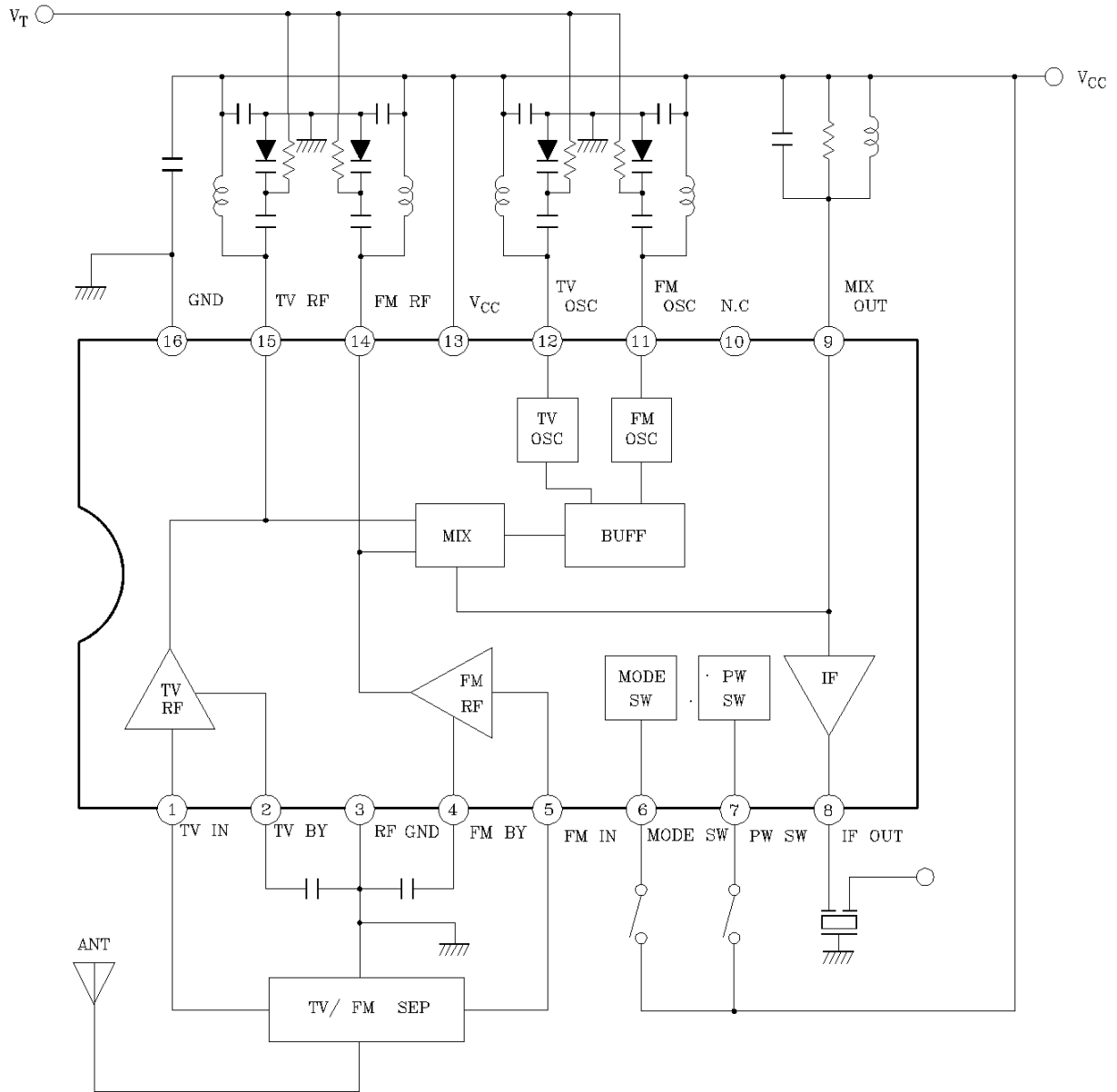
MAXIMUM RATINGS (Ta=25°C)

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

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BLOCK DIAGRAM



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ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, $V_{CC}=1.2V$, $f_{FM}=92MHz$, $f_{TV}=200MHz$, $\Delta f=\pm 22.5kHz$, $f=1kHz$, $T_a=25^\circ C$ SW2 : b)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	SW ₁	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Current		I_{CC1}	1	a	$V_{IN} < -20dB\mu V$ EMF	IC OFF SW2 : a	-	0.1	5	μA
		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	$V_{IN}=65dB\mu V$ EMF $f_{osc}=65MHz$	29	33	-	dB	
	Local OSC Voltage	V_{OSC1}	3			-	47	-	mV _{rms}	
	Local OSC Stop Voltage	V_{STP1}				-	0.85	0.95	V	
TV	Conversion Gain	G_{C2}	2	b	$V_{IN}=65dB\mu V$ EMF $f_{osc}=165MHz$	21	25	-	dB	
	Local OSC Voltage	V_{OSC2}	3			-	27	-	mV _{rms}	
	Local OSC 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	-	-	μA	
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	-	-	μA	
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	

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EXPLANATION OF TERMINALS (Terminal voltage $V_{CC}=1.2V$, $T_a=25^\circ C$)

PIN NO.	TERMINAL NAME	CONTENTS	INTERNAL EQUIVALENT CIRCUIT	DC VOLTAGE(V) (at No Signal)	
				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 Band 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
6	MODE SW	Mode Switch V_{CC} : TV Mode GND/OPEN : FM Mode		0	1.2
7	PW SW	Power ON/OFF Switch V_{CC} : Power ON GND/OPEN : 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	Mixer Coil is Connected		1.2	1.2

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PIN NO.	TERMINAL NAME	CONTENTS	INTERNAL EQUIVALENT CIRCUIT	DC VOLTAGE(V) (at No Signal)	
				FM	TV
10	NC	This terminal should be connected with V _{CC} line or open	-	-	-
11	FM OSC	FM OSC Tank Circuit is Connected (Collpitts type oscillator)		1.2	1.2
12	TV OSC	TV OSC Tank Circuit is Connected (Collpitts 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 (pin ⑦), 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 (pin ⑥), in case that this IC doesn't operate normally due to external noise etc.

2. RF GND

This IC has two GND terminals (pin ③ : RF GND, pin ⑩ : GND). External parts shown in below should be connected with RF GND (pin ③), and other parts should be connected with GND (pin ⑩).

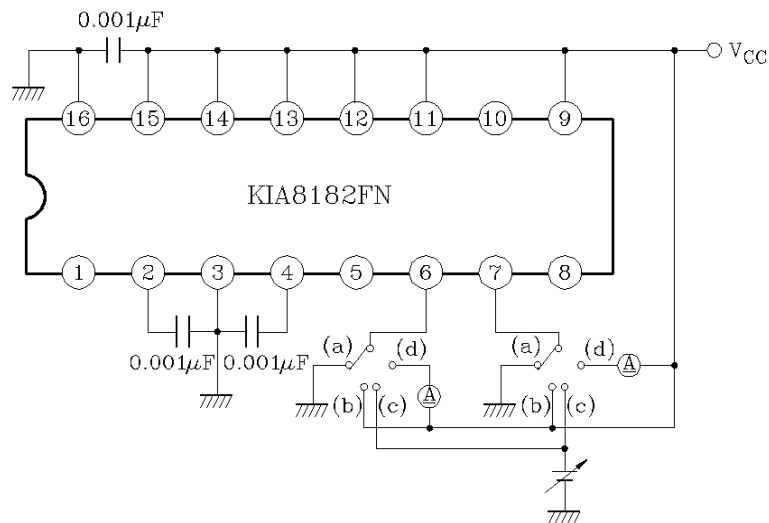
· By-pass capacitor at pin ⑭ (FM RF) and pin ⑮ (TV RF)

· By-pass capacitor at pin ④ (FM BY) and pin ② (TV BY)

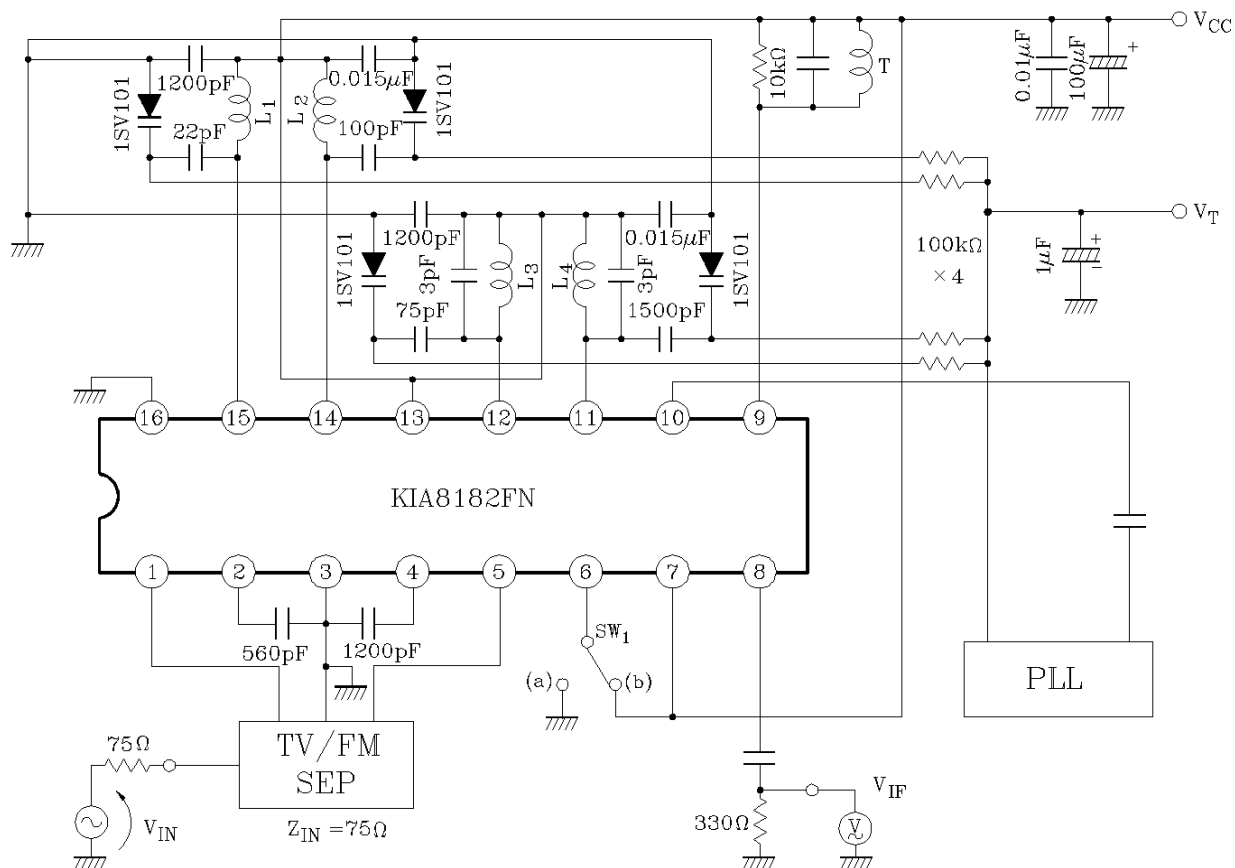
The pattern diagram of capacitor connected with pin ② and pin ④ should be shortly, because RF circuit and MIX circuit operate on the voltage of pin ② or pin ④.

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TEST CIRCUIT 1



TEST CIRCUIT 2

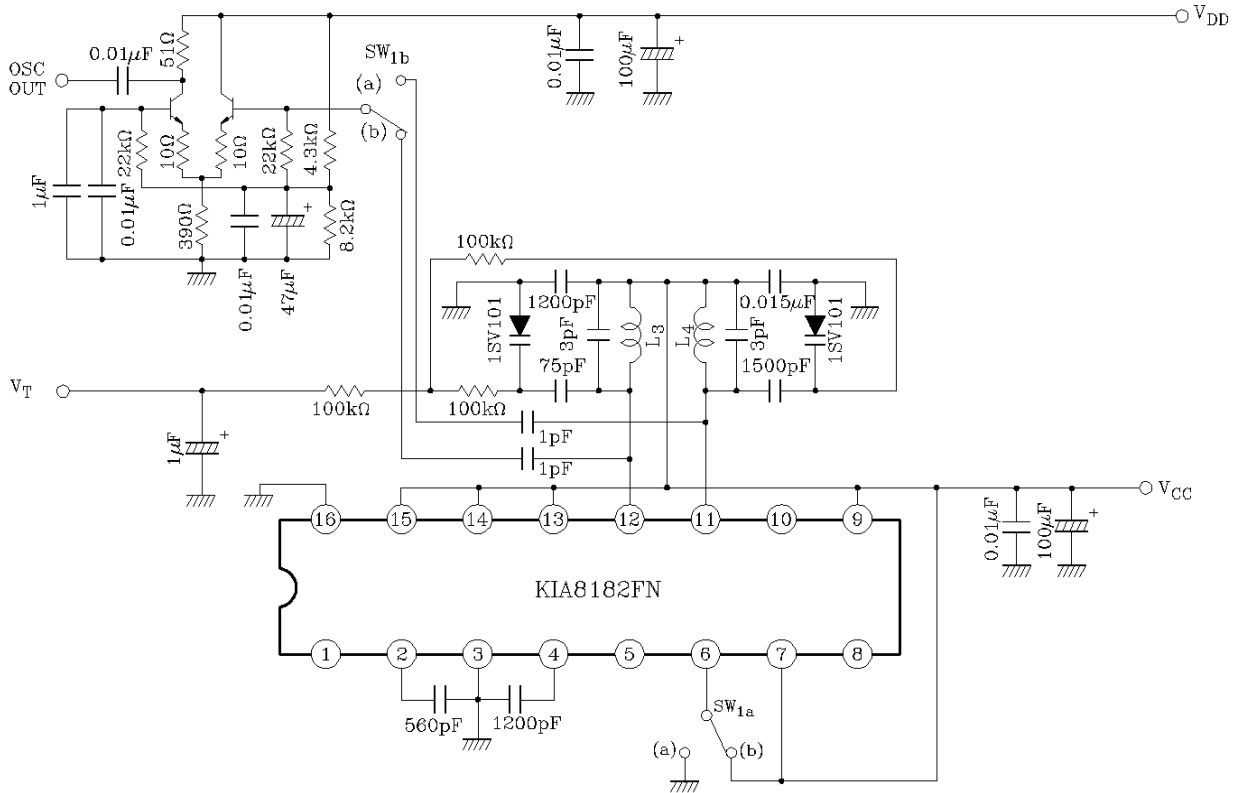


$$G_C(\text{dB}) = 20 \log V_{\text{IF}} (\mu\text{V}_{\text{rms}}) - (V_{\text{IN}} (\text{dB}\mu\text{V EMF}) - 6(\text{dB}))$$

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

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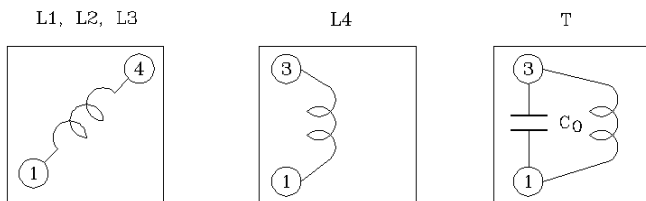
TEST CIRCUIT 3



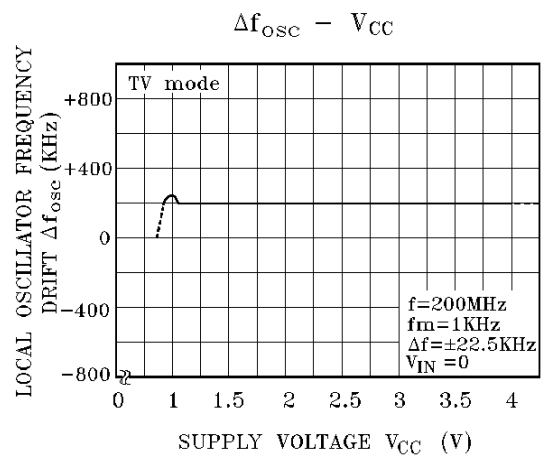
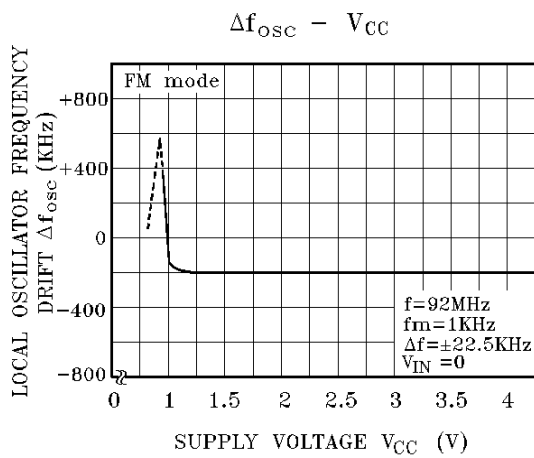
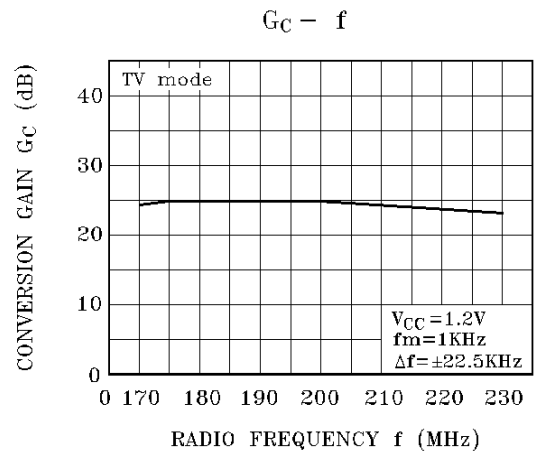
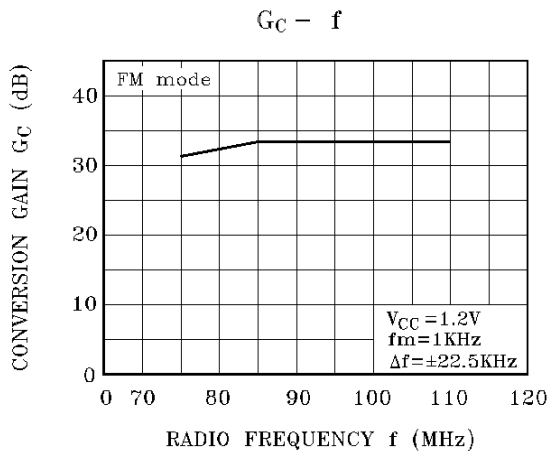
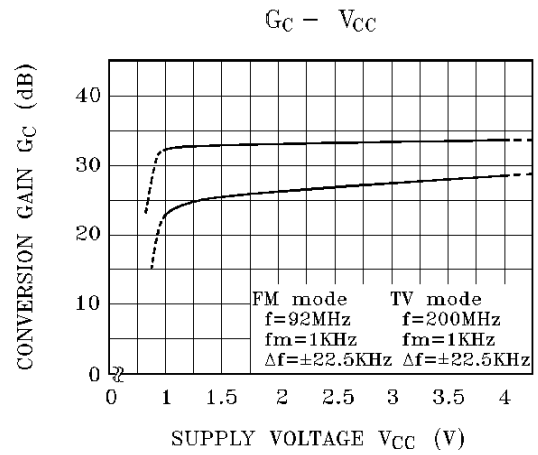
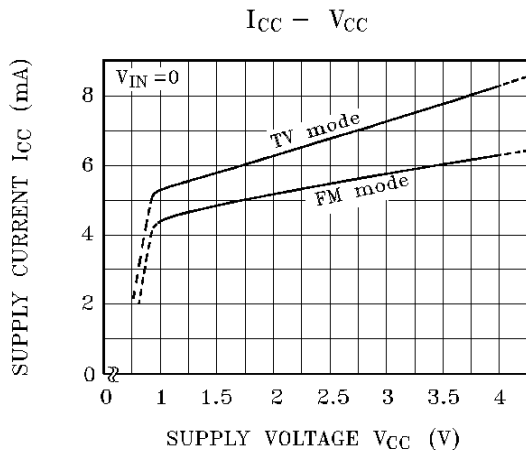
COIL DATA FOR TEST CIRCUIT

COIL SYMBOL	TEST FREQUENCY	C ₀ (pF)	Q ₀	TURNS		WIRE (mm ϕ)	REFERENCE
				1-3	1-4		
L ₁ TV RF	100MHz	-	55	-	1 1/2	0.5 UEW	Ⓢ 0258-236
L ₂ FM RF	100MHz	-	90	-	3 1/2	0.5 UEW	Ⓢ 0258-238
L ₃ TV OSC	100MHz	-	55	1 1/4	-	0.5 UEW	Ⓢ 0258-250
L ₄ FM OSC	100MHz	-	90	-	3 1/2	0.5 UEW	Ⓢ 0258-238
T FM IFT	10.7MHz	82	45	18	-	0.09 UEW	Ⓢ 4162-083A

Ⓢ : SUMIDA ELECTRIC Co., Ltd.



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