

FM FRONT END

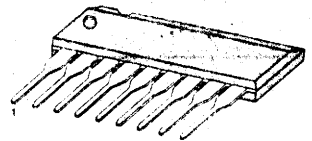
The KA22495 is a monolithic integrated circuit designed for the FM front end of portable radio cassettes or music centers. It consists of RF AMP, local OSC, OSC buffer and mixer. Compared with conventional types, it is improved in the following characteristics:

- 1) Low supply voltage.
- 2) Strong input.
- 3) Spurious radiation.

FEATURES

- Wide supply voltage range: $V_{CC} = 1.6V \sim 6.0V$
- Low local oscillation stop voltage: $V_{STOP} = 0.9V$ (Typ)
- Improved inter-modulation characteristics by double balanced type mixer circuit.
- Low spurious radiation.
- Built-in clamping diode in the mixer output stage.

9-SIP



8-SOP-225



ORDERING INFORMATION

Device	Package	Operating Temperature
KA22495	9-SIP	-25°C~+75°C
KA22495D	8-SOP-225	

BLOCK DIAGRAM

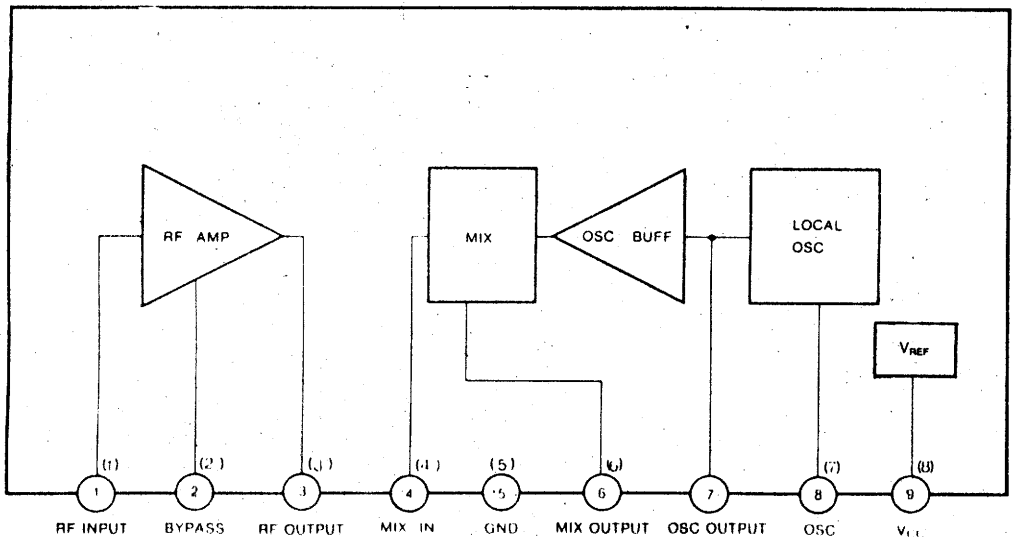


Fig. 1

() : KA22495D

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	8	V
Power Dissipation	P_D	KA22495	600
		KA22495D	300
Operating Temperature	T_{OPR}	-25 ~ +75	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

*: Derated above $T_a = 25^\circ\text{C}$ in the proportion of $4\text{mW}/^\circ\text{C}$.

ELECTRICAL CHARACTERISTICS

($T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, $f = 98\text{MHz}$, $f_m = 1\text{KHz}$, $\Delta f = \pm 22.5\text{KHz}$, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Circuit Current	I_{CCQ}	$V_I = 0$		5.0	8.0	mA
-3dB Limiting Sensitivity	$V_{I(LIM)}$	$V_D (V_I = 60\text{dB}\mu) - 3\text{dB Down}$		3.0	7.0	$\text{dB}\mu$
Conversion Gain	G_V	$V_I = 60\text{dB}\mu$	25	31		dB
Usable Sensitivity	S_{USA}	$S/N = 30\text{dB}$		11		$\text{dB}\mu$
Oscillation Voltage	V_{OSC}	$f_{osc} = 108\text{MHz}$	90	165	250	mV
Oscillation Stop Voltage	V_{STOP}			0.9	1.3	V

TEST CIRCUIT

(I_{CCO} , $V_{I(LIM)}$, S_{USA} , G_v , V_{OSC} , V_{STOP})

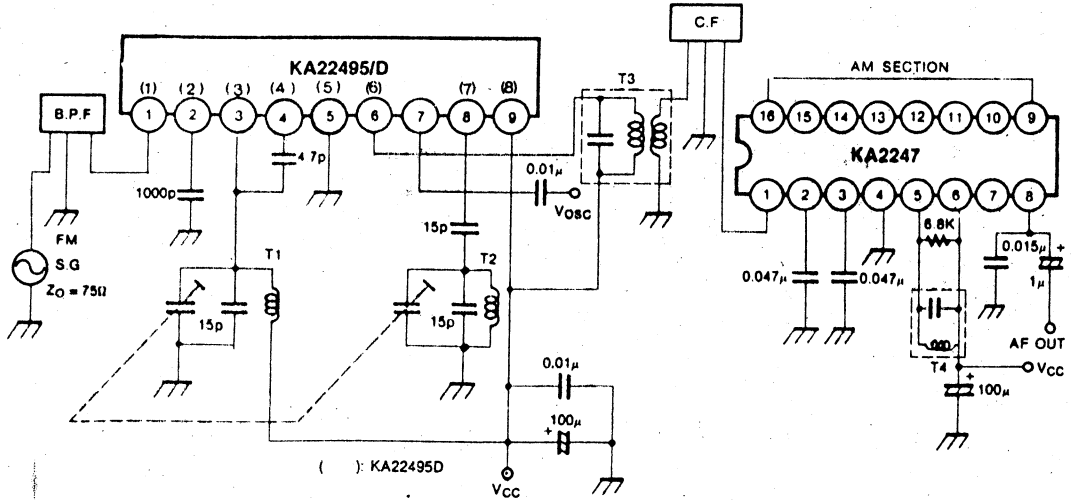


Fig. 2

When using the KA22471 for the IF stage.

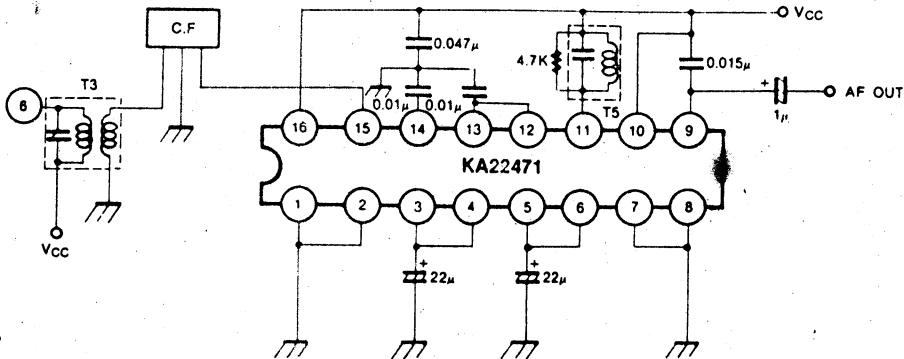
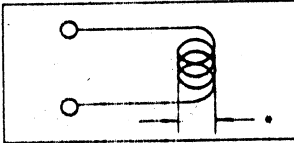


Fig. 3

COIL SPECIFICATIONS (BOTTOM VIEW)

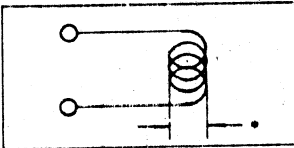
T1 FM RF



f (MHz)	Q_0	Turns
98	100	4

* In a Diameter of 5.5mm
0.8mm \varnothing UEW

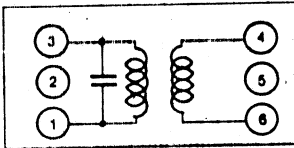
T2 FM OSC



f (MHz)	Q_0	Turns
98	100	3

* In a Diameter of 5.5mm
0.8mm \varnothing UEW

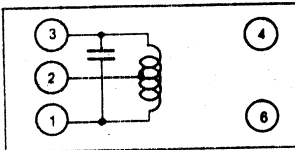
T3 FM IFT



C_0 (pF)	f (MHz)	Turns		
		Q_0	1-3	4-6
75	10.7	115	12	1

KOREA TOKO
0.12mm \varnothing UEW

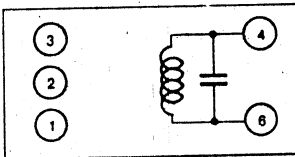
T4 FM IFT (DET)



C_0 (pF)	f (MHz)	Turns	
		Q_0	1-3
56	10.7	95	12

KOREA TOKO
0.12mm \varnothing UEW

T5 FM IFT (DET)

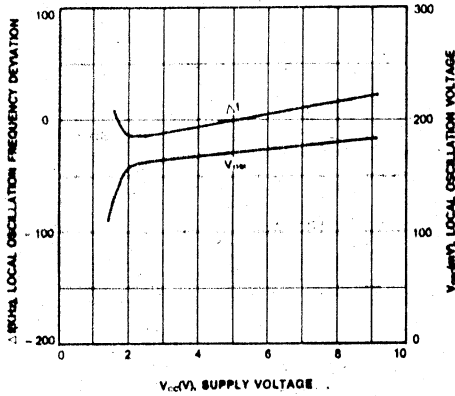


C_0 (pF)	f (MHz)	Turns	
		Q_0	4-6
47	10.7	115	14

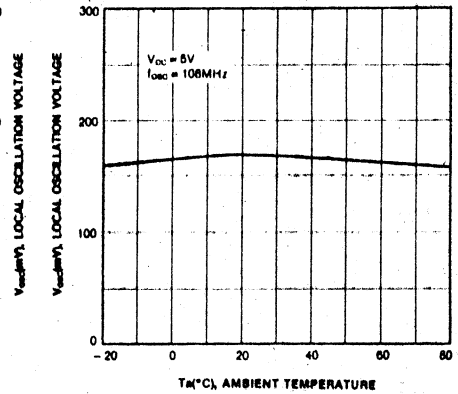
KOREA TOKO
0.12mm \varnothing UEW

3

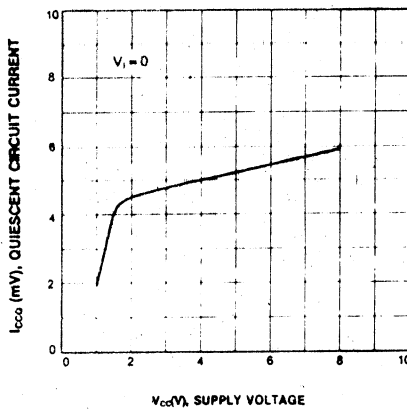
LOCAL OSCILLATION FREQUENCY DEVIATION,
LOCAL OSCILLATION VOLTAGE-SUPPLY VOLTAGE



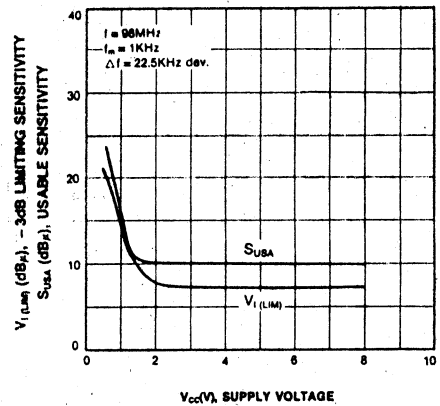
LOCAL OSCILLATION VOLTAGE
-AMBIENT TEMPERATURE



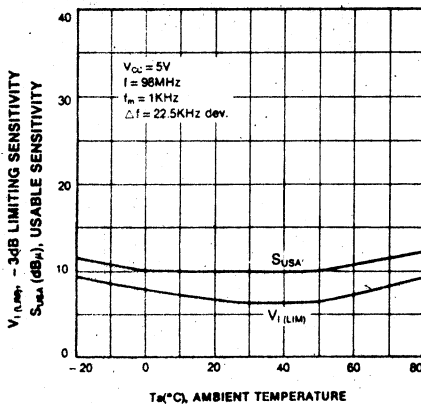
QUIESCENT CIRCUIT CURRENT-SUPPLY VOLTAGE



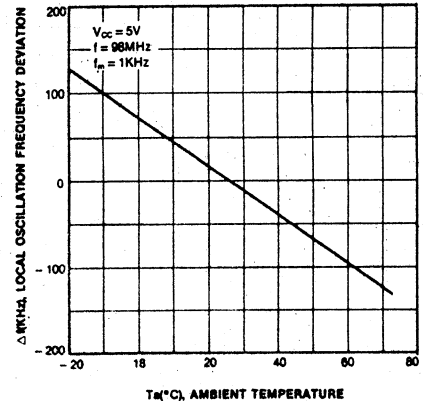
SENSITIVITY-SUPPLY VOLTAGE



SENSITIVITY-AMBIENT TEMPERATURE



LOCAL OSCILLATION FREQUENCY DEVIATION
-AMBIENT TEMPERATURE



APPLICATION INFORMATION

1. RF AMP

The RF AMP is a common base type, so the operating frequency range is improved. The GND of the bypass capacitor (Pin2) should be located closely at Pin 5 (GND). When using the bypass capacitor at V_{CC} -line of Pin 3, we can expect an improvement of the S/N ratio.

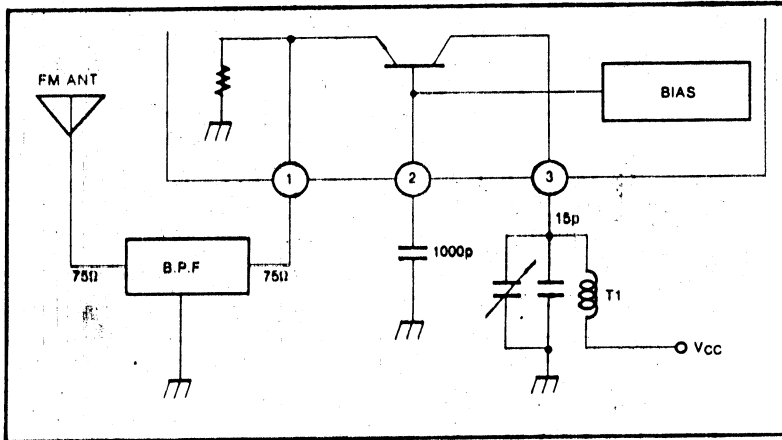


Fig. 4.

2. MIXER

The mixer stage uses a double balanced type in order to protect the leakage of OSC, spurious radiation. Also, this is built into the limiter in order to improve the strong input characteristic.

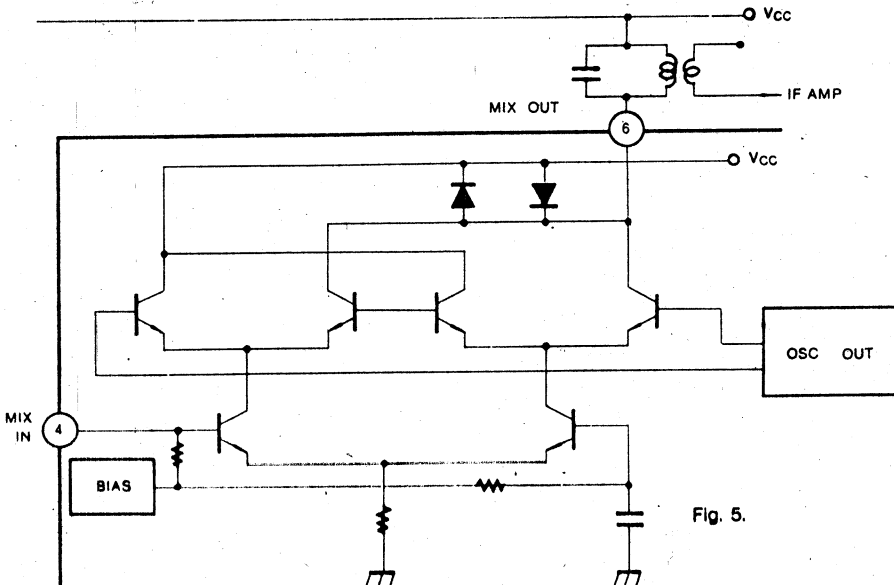


Fig. 5.

LOCAL OSCILLATION

The local oscillator uses a colpitts oscillator for stable oscillation at high frequency. This is built into the OSC buffer in order to stably operate the OSC frequency and OSC voltage at strong input.

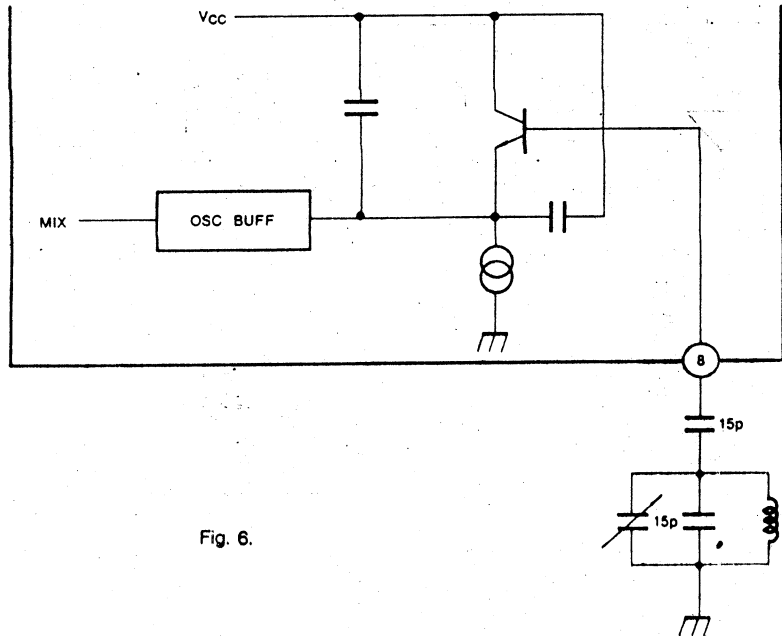


Fig. 6.