

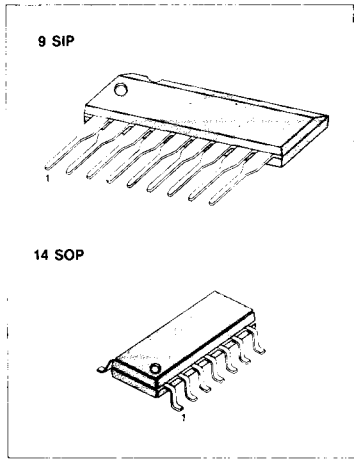
**FM FRONT END**

The KA22495 is a monolithic integrated circuit designed for the front end of portable radio cassettes or music centers. It consists of RF AMP, local OSC, OSC buffer and mixer. etc. 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.



**ORDERING INFORMATION**

Device	Package	Operating Temperature
KA22495	9 SIP	-25°C ~ +75°C
KA22495D	14 SOP	

**BLOCK DIAGRAM**

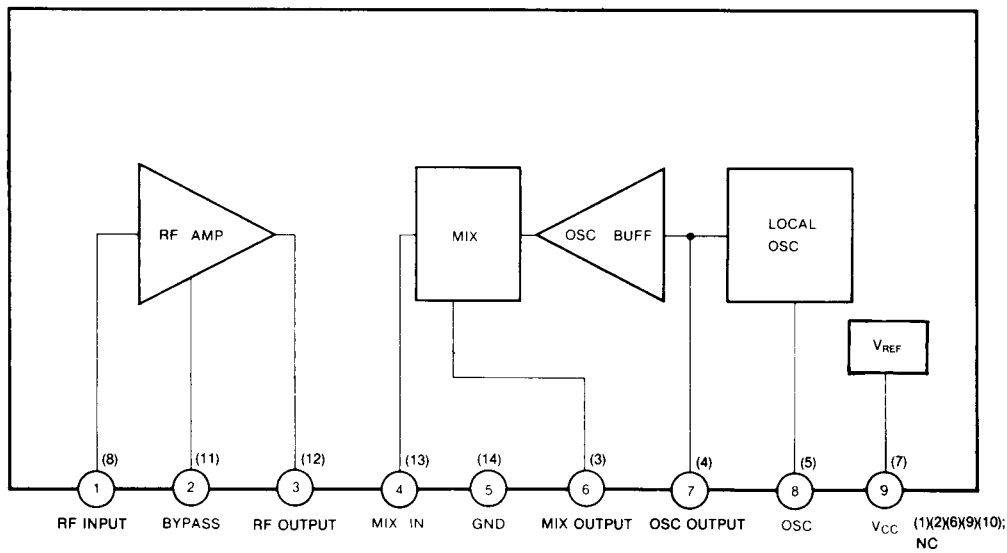


Fig. 1

( ) : 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	$T_{OPR}$	$-25 \sim +75$	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	$-55 \sim +150$	$^\circ\text{C}$

\*: 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	$V_{I(LIM)}$	$V_o (V_i = 60\text{dB}\mu) - 3\text{dB Down}$		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 1

( $I_{CCQ}$ ,  $V_{I(LIM)}$ ,  $S_{USA}$ ,  $G_V$ ,  $V_{OSC}$ ,  $V_{STOP}$ )

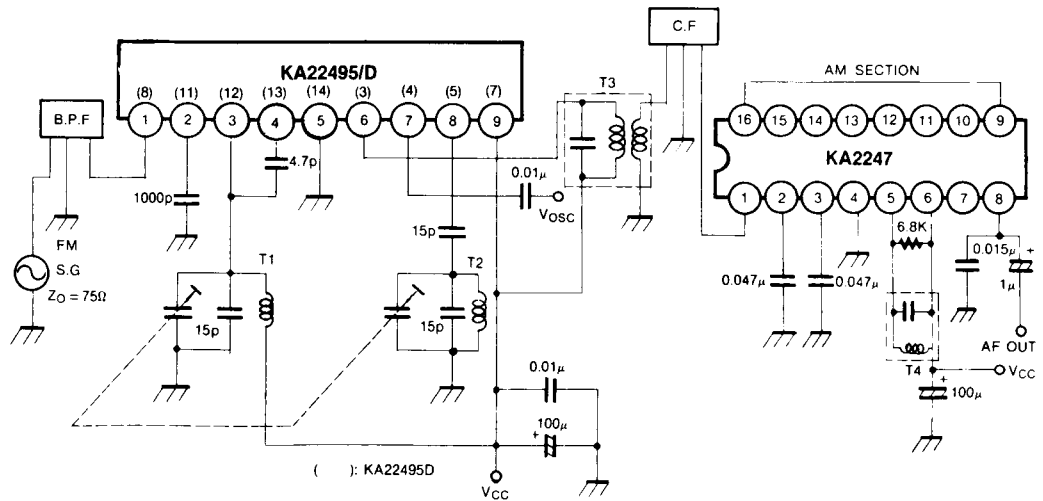


Fig. 2

When using the KA22471 for the IF stage.

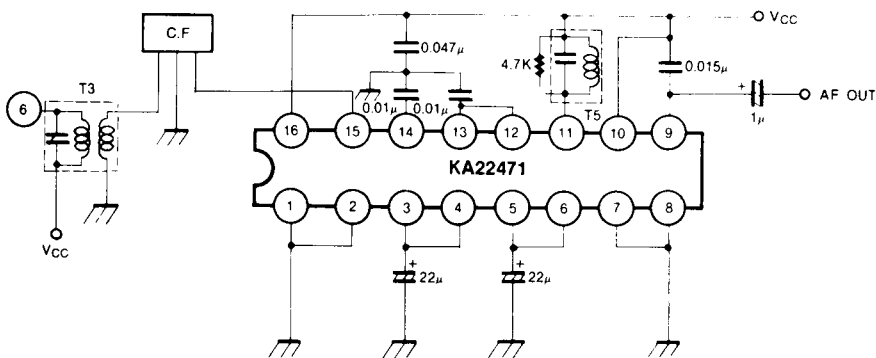
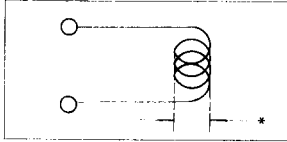


Fig. 3

COIL SPECIFICATIONS (BOTTOM VIEW)

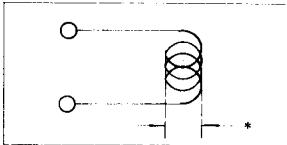
T1 FM RF



$f$ (MHz)	$Q_o$	Turns
98	100	4

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

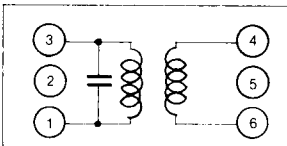
T2 FM OSC



$f$ (MHz)	$Q_o$	Turns
98	100	3

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

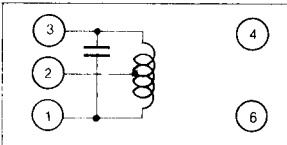
T3 FM IFT



$C_o$ (pF) 1-3	$f$ (MHz)	$Q_o$ 1-3	Turns 1-3 4-6	
75	10.7	115	12	1

KOREA TOKO  
0.12mm  $\varnothing$  UEW

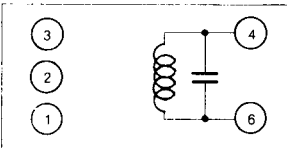
T4 FM IFT (DET)



$C_o$ (pF) 1-3	$f$ (MHz)	$Q_o$ 1-3	Turns 1-3
56	10.7	95	12

KOREA TOKO  
0.12mm  $\varnothing$  UEW

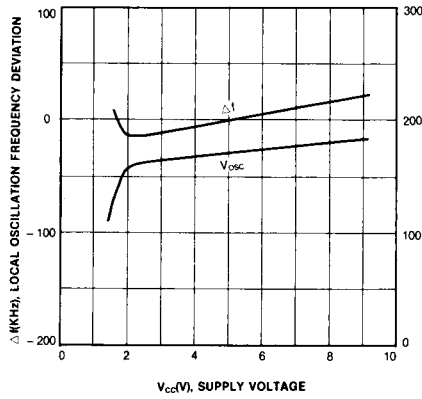
T5 FM IFT (DET)



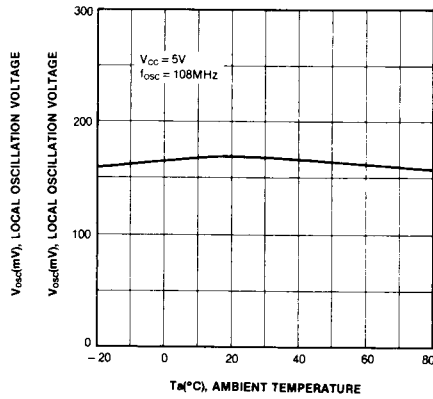
$C_o$ (pF) 4-6	$f$ (MHz)	$Q_o$ 4-6	Turns 4-6
47	10.7	115	14

KOREA TOKO  
0.12mm  $\varnothing$  UEW

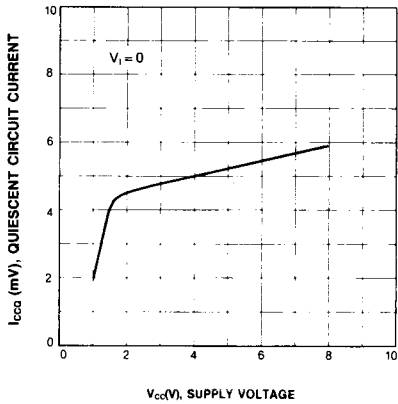
LOCAL OSCILLATION FREQUENCY DEVIATION,  
LOCAL OSCILLATION VOLTAGE-SUPPLY VOLTAGE



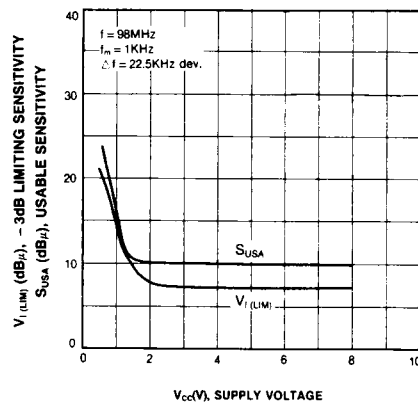
LOCAL OSCILLATION VOLTAGE  
-AMBIENT TEMPERATURE



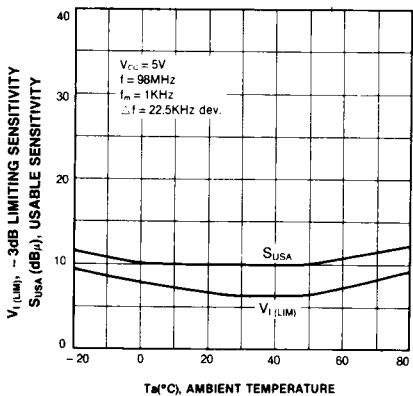
QUIESCENT CIRCUIT CURRENT-SUPPLY VOLTAGE



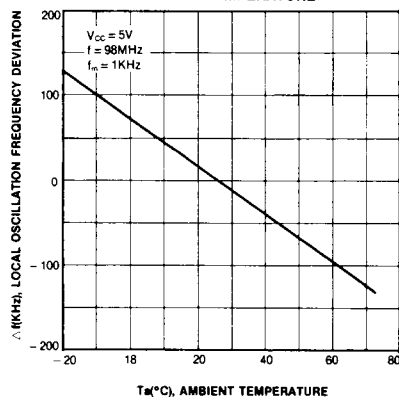
SENSITIVITY-SUPPLY VOLTAGE



SENSITIVITY-AMBIENT TEMPERATURE



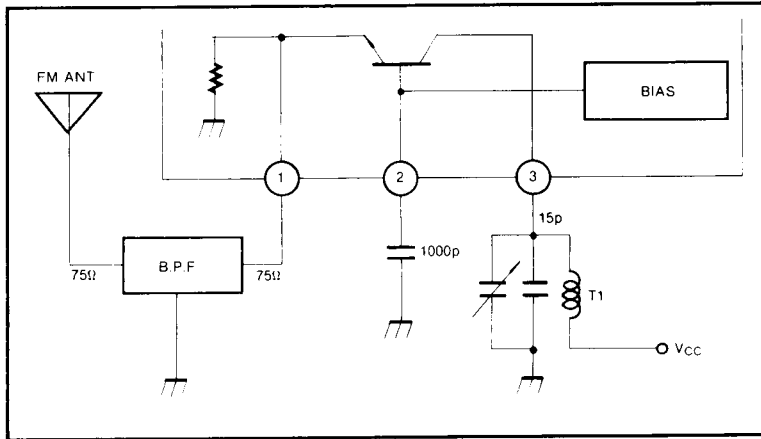
LOCAL OSCILLATION FREQUENCY DEVIATION  
-AMBIENT TEMPERATURE



## APPLICATION INFORMATION

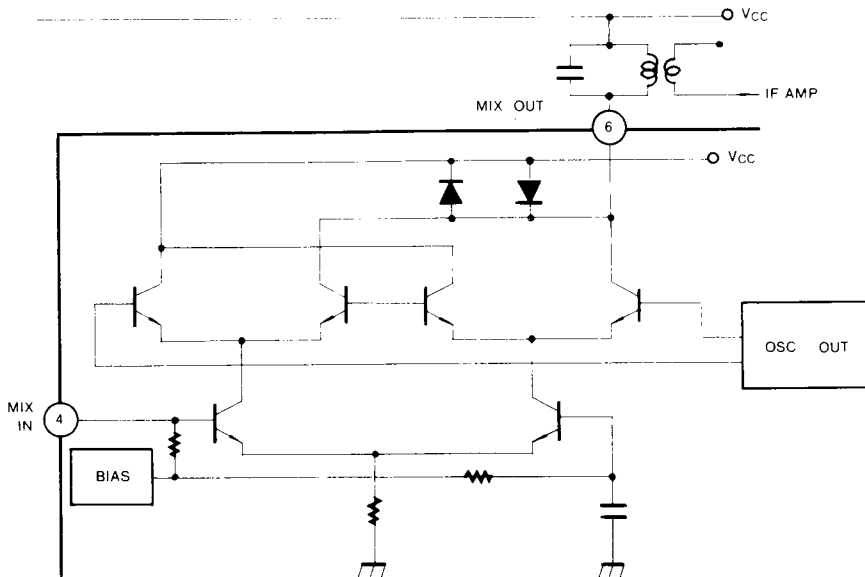
## 1. RF AMP

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.



## 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.



**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.

