

### FEATURES

- Wide Operating Voltage Range
- High Limiting Sensitivity
- Low Current Consumption
- 60 MHz IF Input
- 4 to 10 Volt Operation

### DESCRIPTION

The TK10420 integrated circuit has been developed for the FM IF system in communications equipment. The circuit operates on 4 to 10 volts and has low current consumption. The IC is most suited for receivers using double conversion. The IF input can be as high as 60 MHz and the second IF is 455 kHz.

The TK10420 is available in DIP16 dual in-line and surface mount MFP20 packages.

### ORDERING INFORMATION

**TK10420** □ □ □

— Tape/Reel Code

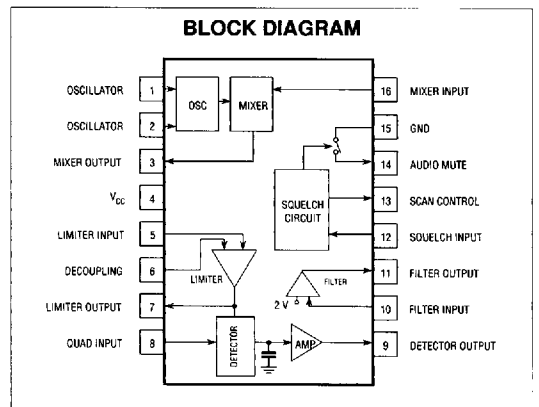
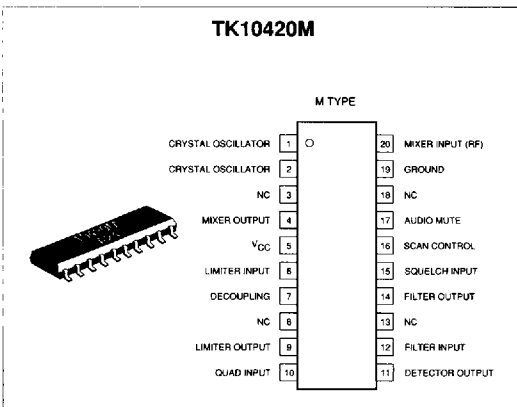
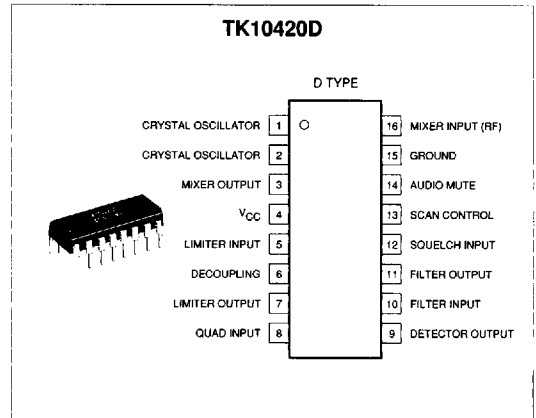
— Temp. Range

— Package Code

| PACKAGE CODE      | TEMP. RANGE       | TAPE/REEL CODE  |
|-------------------|-------------------|-----------------|
| M : Surface Mount | C : -20 to +70 °C | BX : Bulk/Bag   |
| D : Plastic Dip   |                   | TX : Paper Tape |
|                   |                   | TR : Tape Right |
|                   |                   | TL : Tape Left  |
|                   |                   | MG : Magazine   |

### APPLICATIONS

- Communications Equipment
- HAM Radio Transceivers
- VHF/UHF Handy Talkies
- Scanners
- Data Transponders
- Cordless Phones
- Cellular Phones



# TK10420

## ABSOLUTE MAXIMUM RATINGS

Input Voltage  $V_{CCMAX}$  ..... 12 V  
 Power Dissipation TK10420D (Note 1) ..... 700 mW  
 Power Dissipation TK10420M (Note 2) ..... 410 mW  
 Junction Temperature ..... 150 °C

Storage Temperature Range ..... -55 to +125 °C  
 Operating Temperature Range ..... -30 to +70 °C  
 Lead Soldering Temp. (10 sec.) ..... 300 °C

## ELECTRICAL CHARACTERISTICS

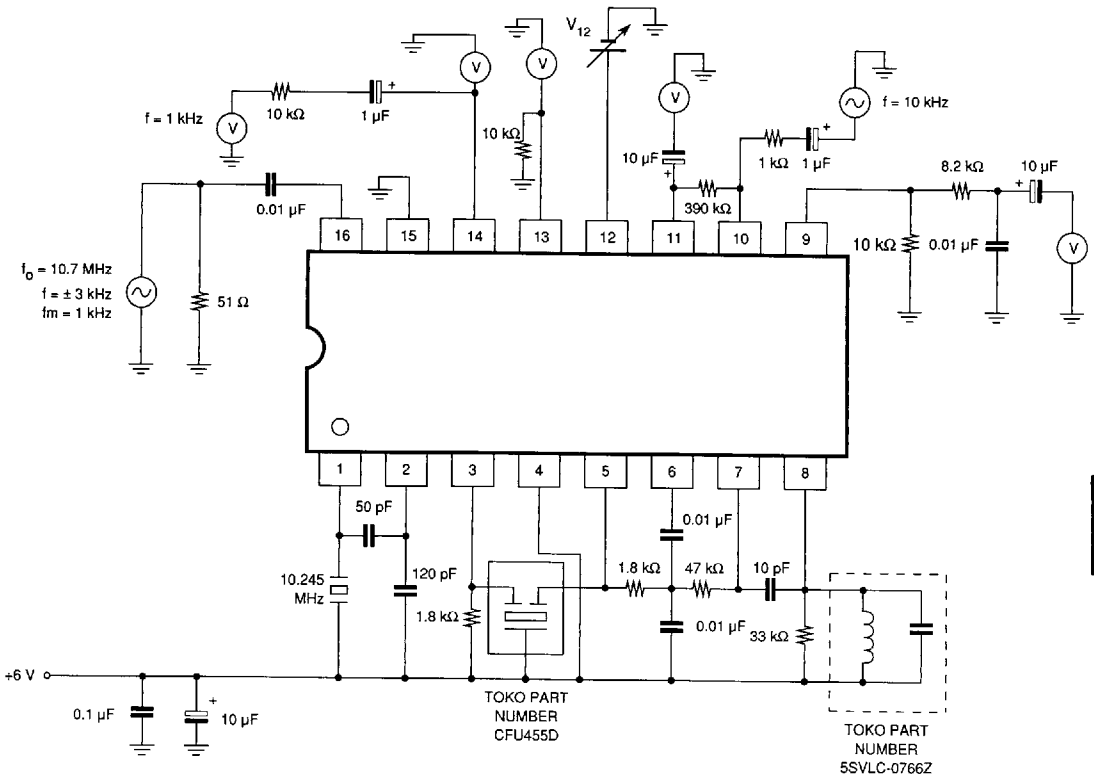
Test conditions:  $V_{CC} = 6.0$  V,  $f_O = 10.7$  MHz,  $\Delta f = \pm 3.0$  kHz,  $f_{MOD} = 1$  kHz,  $T_A = 25^\circ\text{C}$

| SYMBOL     | PARAMETER                     | TEST CONDITIONS                | MIN  | TYP   | MAX  | UNITS         |
|------------|-------------------------------|--------------------------------|------|-------|------|---------------|
| $I_{CC1}$  | Current Consumption           | $V_{12} = 2 V_{DC}$            |      | 2.5   | 3.5  | mA            |
| $I_{CC2}$  | Current Consumption           | $V_{12} = 0 V_{DC}$            |      | 4.0   | 5.5  | mA            |
| Limit      | Limiting Sensitivity          | -3 dB $V_{OUT}$                |      | 3.0   | 10.0 | $\mu\text{V}$ |
| $V_{DC}$   | Detector Output Term. Voltage | $V_{IN} = 10$ mV (RF); no mod. |      | 3.0   |      | mV            |
| $Z_{OUT}$  | Detector Output Impedance     | $V_{IN} = 10$ mV (RF)          |      | 400   | 990  | $\Omega$      |
| $V_{OUT}$  | Detector Output Voltage       | $V_{IN} = 10$ mV (RF)          | 300  | 550.0 |      | mV(rms)       |
| $F_{GAIN}$ | Filter Gain                   | $f = 10$ kHz, $V_{IN} = 3$ mV  | 40.0 | 46.0  |      | dB            |
| $F_{DC}$   | Filter Terminal Voltage       | At no input                    | 1.8  | 2.0   | 2.5  | $V_{DC}$      |
| HYS        | Trigger Hysteresis            |                                | 50   | 100   |      | mV            |
| $M_L$      | Mute Switch Resistance        | $V_{12} = 0 V_{DC}$            |      | 15    | 50   | $\Omega$      |
| $M_H$      | Mute Switch Resistance        | $V_{12} = 2 V_{DC}$            | 1    | 10    |      | M $\Omega$    |
| $S_L$      | Scan Control Voltage          | $V_{12} = 2 V_{DC}$            |      | 0     | 0.5  | $V_{DC}$      |
| $S_H$      | Scan Control Voltage          | $V_{12} = 0 V_{DC}$            | 5    |       |      | $V_{DC}$      |
| $M_G$      | Mixer Conversion Gain         |                                |      | 20    |      | dB            |
| $M_{INR}$  | Mixer Input Resistance        |                                |      | 3.3   |      | k $\Omega$    |
| $M_{INC}$  | Mixer Input Capacitance       |                                |      | 2.2   |      | pF            |
| $F_{OP}$   | Operating Frequency Range     |                                |      | 60    |      | MHz           |

Note 1: Power dissipation must be derated at the rate of 5.6 mW/ °C for operation at  $T_A = 25^\circ\text{C}$  and above.

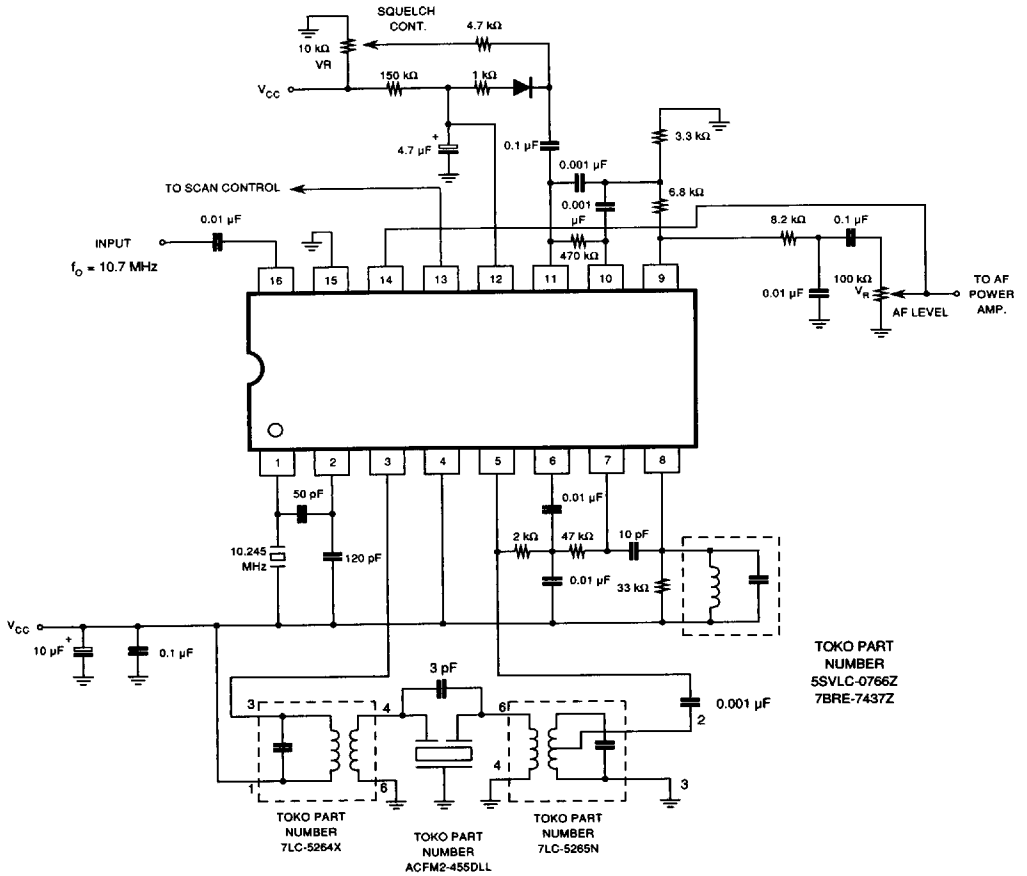
Note 2: Power dissipation must be derated at the rate of 3.3 mW/ °C for operation at  $T_A = 25^\circ\text{C}$  and above.

## TEST CIRCUIT



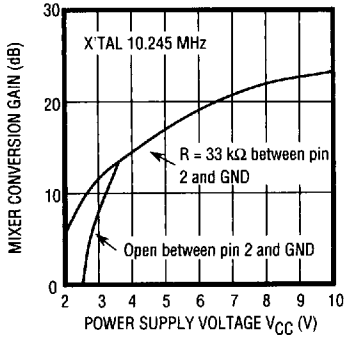
Note: The input impedance of the audio voltmeter and harmonic distortion meter should be higher than 100 k $\Omega$ .

TYPICAL APPLICATION

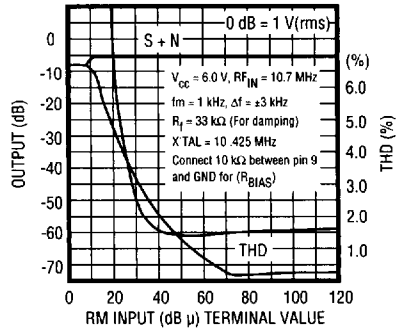


TYPICAL PERFORMANCE CHARACTERISTICS

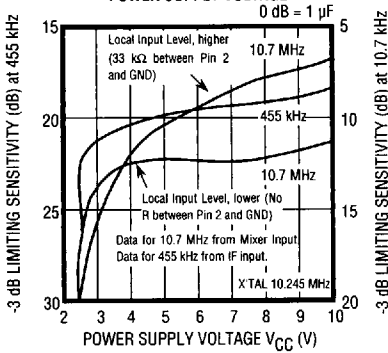
MIXER CONVERSION GAIN vs. POWER SUPPLY VOLTAGE



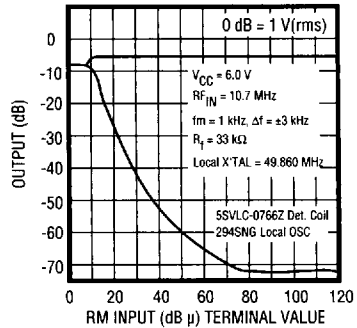
MIXER AND IF CHARACTERISTICS (10.7 MHz)



-3 dB LIMITING SENSITIVITY vs. POWER SUPPLY VOLTAGE



MIXER AND IF CHARACTERISTICS (50 MHz)



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