

AM/FM TUNER + MPX

The KA2292 is a monolithic integrated circuit which consists of a 3V one chip tuner and FM multiplex for AM/FM radios and head-phone radios.

FUNCTIONS

- * FM Stage : RF/IF/AF amp, Quadrature Detector, MIX, OSC, Tuning Indicator.
- * AM Stage : RF/IF/AF amp, Detector, MIX, OSC, AGC, Tuning Indicator.
- * MPX Stage : PLL amp, Decoder, Flip Flop, VCO Stop, Phase Detector, Stereo Indicator.

FEATURES

- 3V one chip tuner with built-in FM Multiplex
- No AM detect coil, IF coupling capacitor, FM IF by-pass capacitor needed.
- Built-in tuning indicator function.
- Built-in AM/FM selection switch.
- Minimum number of external parts required.
- Wide operating voltage range: $V_{CC} = 1.8V \sim 7V$
- Low distortion (FM IF: 0.4%, AM IF: 1%, 0.2% (Typ)).

BLOCK DIAGRAM

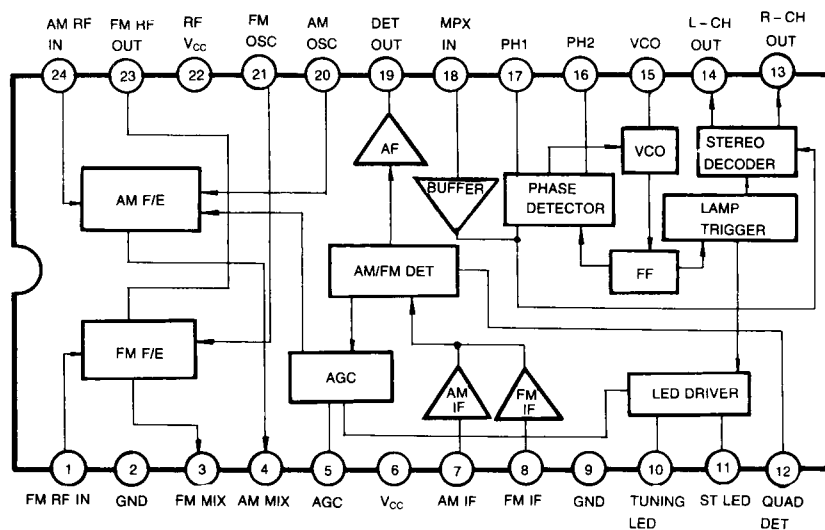
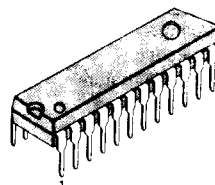
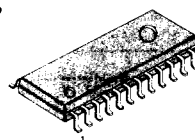


Fig. 1

24 SDIP



24 SOP



ORDERING INFORMATION

| Device | Package | Operating Temperature |
|---------|---------|-----------------------|
| KA2292 | 24 SDIP | - 20°C ~ + 75°C |
| KA2292D | 24 SOP | |

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

| Characteristic | Symbol | Value | Unit |
|-----------------------|------------------|------------|------|
| Supply Voltage | V _{CC} | 8 | V |
| Power Dissipation | P _D | 1200 | mW |
| Operating Temperature | T _{OPR} | -20 ~ +75 | °C |
| Storage Temperature | T _{STG} | -55 ~ +150 | °C |
| LED Drive Voltage | V _{DR} | 10 | V |
| LED Drive Current | I _{DR} | 10 | mA |

ELECTRICAL CHARACTERISTICS

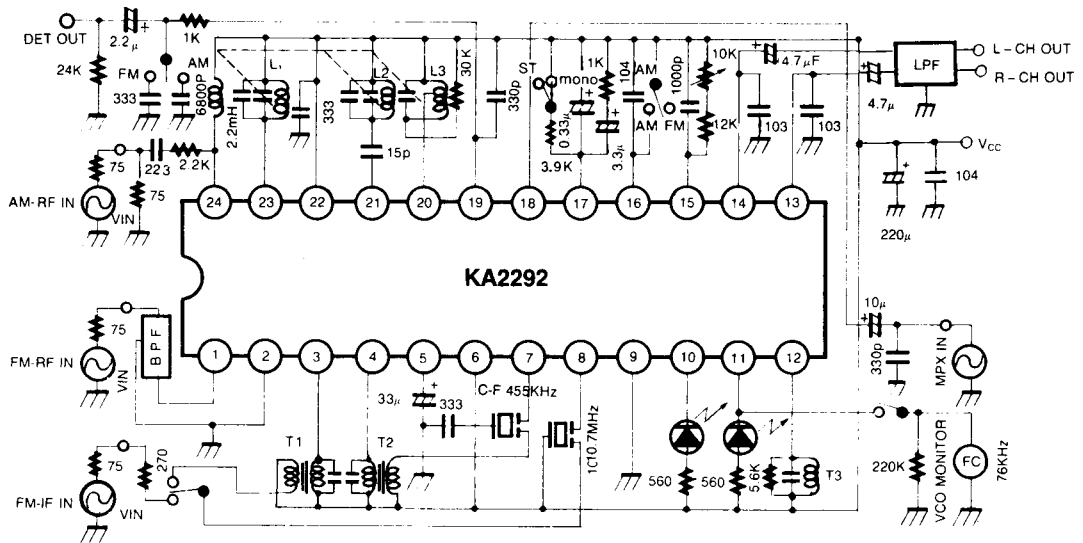
(T_a = 25°C, V_{CC} = 3V, unless otherwise specified)

FM F/E : f = 98MHz, fm = 1KHz, Δf = 22.5KHz AM : f = 1MHz, fm = 1KHz, 30% Mod

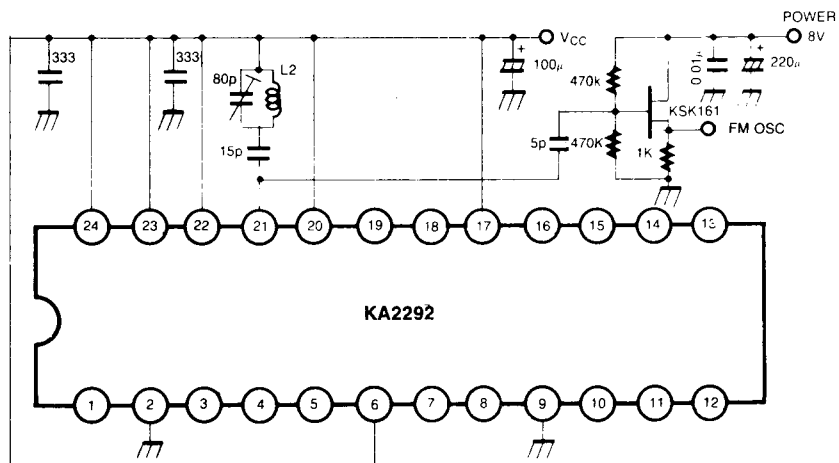
FM IF : f = 10, 7MHz, fm = 1KHz, Δf = 22.5KHz MPX : f = 1KHz, L + R = 90%, P = 10%, V_i = 150mV

| Characteristic | | Symbol | Test Conditions | Min | Typ | Max | Unit | Test Circuit |
|---------------------------|---------------------------|----------------------|------------------------|-----|------|------|------|--------------|
| Quiescent Circuit Current | | I _{CCQ1} | FM, V _i = 0 | 8.4 | 13.2 | 20.0 | mA | 1 |
| | | I _{CCQ2} | AM, V _i = 0 | 4.4 | 8.4 | 13.4 | mA | 1 |
| F/E | -3dB Limiting Sensitivity | V _{I(LIM)1} | V _O = -3dB | | 10 | | dBμ | 1 |
| | Oscillation Voltage | V _{OSC} | fosc = 98MHz | 40 | 70 | 110 | mV | 2 |
| FM IF | -3dB Limiting Sensitivity | V _{I(LIM)2} | V _O = -3dB | 40 | 46 | 53 | dBμ | 1 |
| | Detector Output Voltage | V _{O(DET)1} | V _i = 80dBμ | 55 | 80 | 110 | mV | 1 |
| | Signal to Noise Ratio | S/N ₁ | V _i = 80dBμ | 60 | 70 | | dB | 1 |
| | Total Harmonic Distortion | THD ₁ | V _i = 80dBμ | | 0.4 | 1 | % | 1 |
| | AM Rejection Ratio | AMR | V _i = 80dBμ | 22 | 32 | | dB | 1 |
| | Tuning Indication Voltage | V _{L1} | I _{LED} = 1mA | 45 | 51 | 56 | dBμ | 1 |
| | | | | | | | | |
| AM IF | Voltage Gain | G _{V1} | V _i = 26dBμ | 40 | 70 | 110 | mV | 1 |
| | Detector Output Voltage | V _{O(DET)2} | V _i = 60dBμ | 55 | 80 | 110 | mV | 1 |
| | Signal to Noise Ratio | S/N ₂ | V _i = 60dBμ | 32 | 42 | | dB | 1 |
| | Total Harmonic Distortion | THD ₂ | V _i = 60dBμ | | 1 | 2 | % | 1 |
| | Tuning Indication Voltage | V _{L2} | I _{LED} = 1mA | 20 | 25 | 30 | dBμ | 1 |
| MPX | Maximum Input Voltage | V _{I(MAX)} | Stereo, THD = 3% | 250 | 350 | | mV | 1 |
| | Channel Separation | CS ₁ | Stereo, f = 100Hz | 32 | 42 | | dB | 1 |
| | | CS ₂ | Stereo, f = 1KHz | 32 | 42 | | dB | 1 |
| | | CS ₃ | Stereo, f = 10KHz | 32 | 42 | | dB | 1 |
| | Total Harmonic Distortion | THD ₃ | Mono | | 0.2 | 1 | % | 1 |
| | | THD ₄ | Stereo | | 0.2 | 1 | % | 1 |
| | Voltage Gain | G _{V2} | Mono | -5 | -3 | -1 | dB | 1 |
| | Channel Balance | CB | Mono | -2 | 0 | 2 | dB | 1 |
| | Lamp on Level | V _{L(ON)} | Pilot only | | 8 | 16 | mV | 1 |
| | | V _{L(OFF)} | Pilot only | 2 | 6 | | mV | 1 |
| | Lamp Hysteresis | HY | | | 2 | | mV | 1 |
| | Capture Range | CR | Pilot only | ±1 | ±3 | ±5 | % | 1 |
| | Signal to Noise Ratio | S/N ₃ | Mono | 60 | 70 | | dB | 1 |

TEST CIRCUIT 1

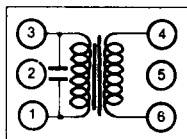


TEST CIRCUIT 2



COIL SPECIFICATION

T1 FM IFT (MIX OUT)

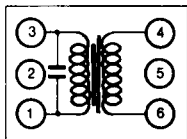


| C ₀ (pF) | f (MHz) | Q ₀ | TURNS | | |
|---------------------|------------|----------------|-------|-----|--|
| | | | 1-3 | 4-6 | |
| 75 | 10.7 | 70(min) | 11 | 2 | |

KOREA TOKO

0.1mmφ

T2 AM IFT (MIX OUT)

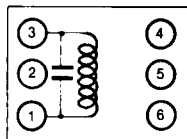


| C ₀ (pF) | f (MHz) | Q ₀ | TURNS | | |
|---------------------|------------|----------------|-------|-----|--|
| | | | 1-3 | 4-6 | |
| 180 | 455 | 70(min) | 180 | 15 | |

KOREA TOKO

0.08mmφ

T3 FM IFT (DET)

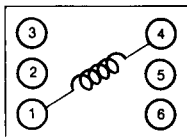


| C ₀ (pF) | f (MHz) | Q ₀ | TURNS | | |
|---------------------|------------|----------------|-------|--|--|
| | | | 1-3 | | |
| 47 | 10.7 | 80(min) | 14 | | |

KOREA TOKO

0.1mmφ

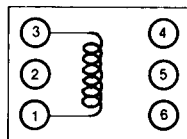
L1 FM RF



| f (MHz) | Q ₀ | TURNS | | |
|------------|----------------|-------|--|--|
| | | 1-4 | | |
| 100 | 100 | 2½ | | |

0.5mmφ

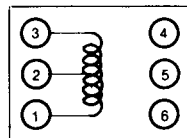
L2 FM OSC



| f (MHz) | Q ₀ | TURNS | | |
|------------|----------------|-------|--|--|
| | | 1-3 | | |
| 100 | 100 | 2¾ | | |

0.5mmφ

L3 AM OSC

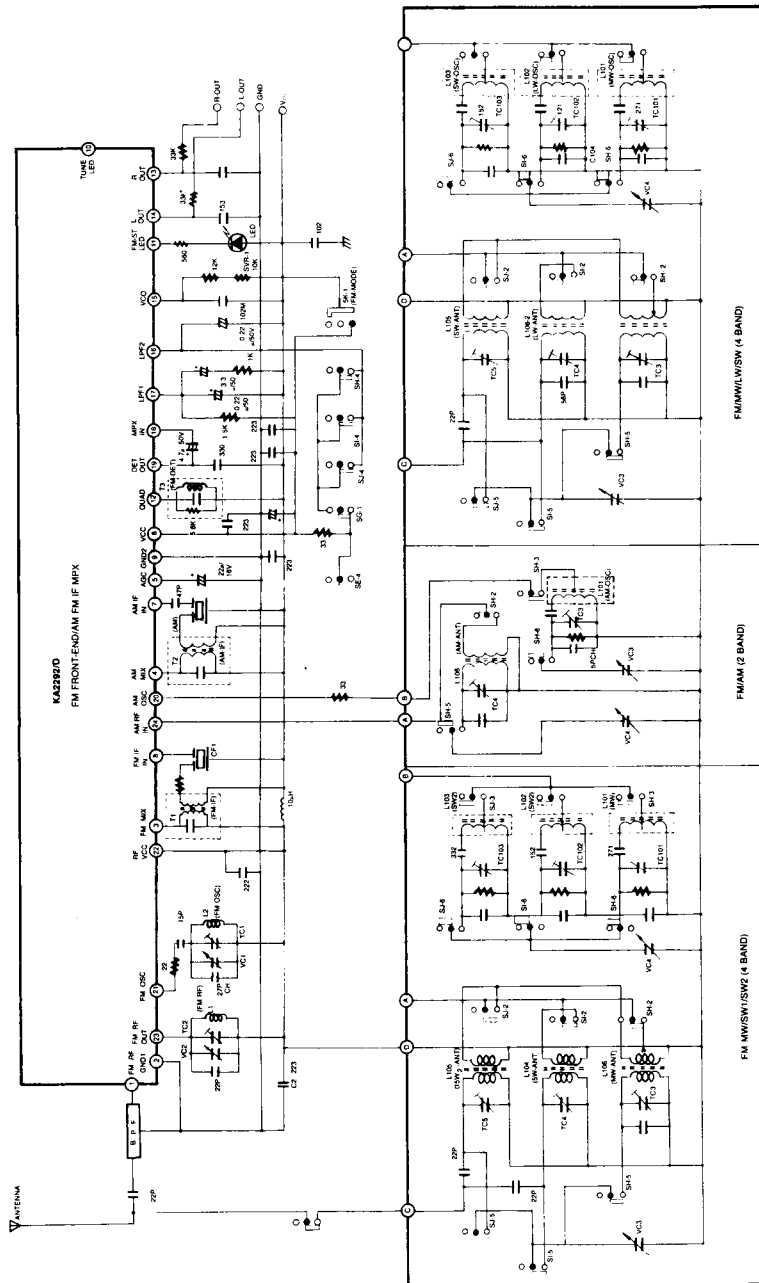


| f (KHz) | Q ₀ | TURNS | | | L (μH) |
|------------|----------------|-------|-----|--|-----------|
| | | 1-2 | 2-3 | | |
| 796 | 80(min) | 13 | 73 | | 288 |

KOREA TOKO

0.08mmφ

APPLICATION CIRCUIT



This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.