

M51722P,FP

F-V CONVERTER WITH MULTIPLEXER

80C 08982 DT-73-13-03

6249826 MITSUBISHI ELEK (LINEAR)

DESCRIPTION

The M51722P,FP are semiconductor integrated circuits developed for frequency-voltage (F-V) converter.

In combination with predriver ICs, the devices constitute high-accuracy 2-phase, 3-phase, F-servo motor control system.

FEATURES

- Built-in frequency multiplexer controls motors with high accuracy.
- Operates at a low supply voltage (supply voltage range 4.5~10V)
- Built-in FG amplifier circuit enables operation by weak signals
- Large final stage output current (current source and current sink)

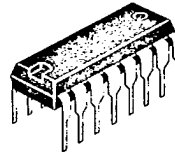
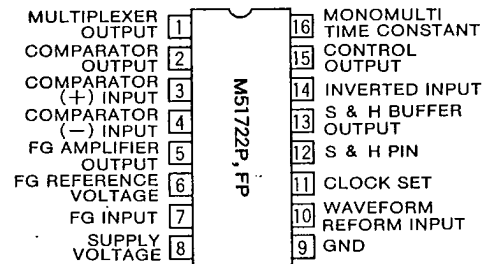
APPLICATION

VTRs, floppy-disk drive, etc.

RECOMMENDED OPERATING CONDITIONS

Supply voltage range 4.5~10V
 Rated supply voltage 9V

PIN CONFIGURATION (TOP VIEW)

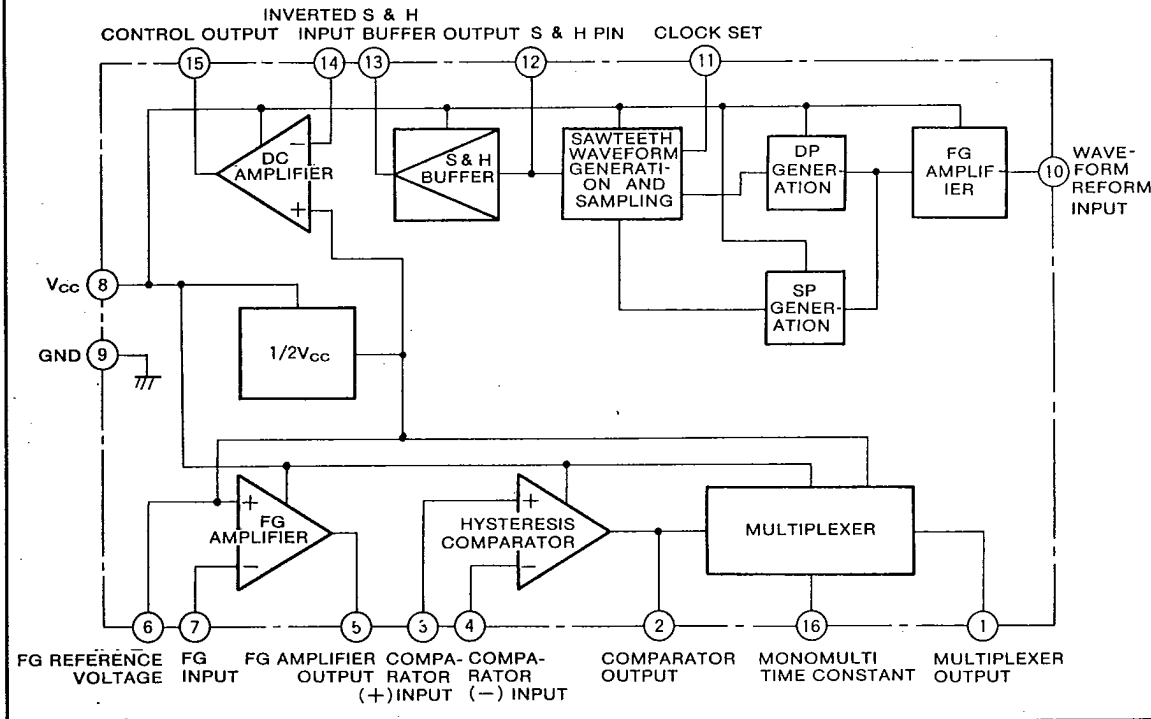


16-pin molded plastic DIP



16-pin molded plastic FLAT (C type)

BLOCK DIAGRAM



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

| Symbol | Parameter | Conditions | Rated | Unit |
|--------------|-----------------------|------------|-------------------|-------|
| V_{CC} | Supply voltage | | 10 | V |
| I_{O2} | Pin ② output current | | 8 | mA |
| I_{O5} | Pin ⑤ output current | | 2 | mA |
| I_{O1} | Pin ① source current | | 8 | mA |
| I_{O5} | Pin ⑤ sink current | | 12 | mA |
| I_{O13} | Pin ⑬ output current | | 1 | mA |
| V_{O7} | Pin ⑦ input voltage | | $1.5 \sim V_{CC}$ | V |
| V_{O10} | Pin ⑩ input voltage | | $0 \sim V_{CC}$ | V |
| P_{DF} | Power dissipation | | 770(430) | mW |
| K_{θ} | Thermal derating | | 7.7(4.3) | mW/°C |
| T_{opr} | Operating temperature | | $-20 \sim +75$ | °C |
| T_{stg} | Storage temperature | | $-40 \sim +125$ | °C |

Note: () = M51722FP

ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$, $V_{CC}=9\text{V}$, unless otherwise noted)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|-------------------|---|---|--------|-----|---------|---------------|
| | | | Min | Typ | Max | |
| $I_{CC(1)}$ | Circuit current (1) | $V_{CC}=4.5\text{V}$ | | 4.5 | 9 | mA |
| $I_{CC(2)}$ | Circuit current (2) | $V_{CC}=10\text{V}$ | | 4.5 | 9 | mA |
| $V_{ref(1)}$ | Reference voltage of output voltage (1) | Pin ⑥ Open | 4.4 | 4.5 | 4.6 | V |
| $V_{ref(2)}$ | Reference voltage of output voltage (2) | 10k Ω between pin ⑥ and GND | 4.4 | 4.5 | 4.6 | V |
| V_{OH5} | Pin ⑤ high-level output | 3.9k Ω between pin ⑤ and GND | 6.0 | 6.8 | | V |
| V_{OL5} | Pin ⑤ low-level output | 3.9k Ω between V_{CC} and pin ⑤ | | 1.0 | 1.5 | V |
| V_{OH2} | Pin ② high-level output | 2k Ω between pin ② and GND | 7.5 | 8.0 | | V |
| V_{OL2} | Pin ② low-level output | 2k Ω between V_{CC} and pin ② | | 1.0 | 1.5 | V |
| V_{OH13} | Pin ⑬ high-level output | 1.5k Ω between pin ⑬ and GND | 6.6 | 7.5 | | V |
| V_{OL13} | Pin ⑬ low-level output | 1.5k Ω between V_{CC} and pin ⑬ | | 1.0 | 1.5 | V |
| $V_{offset6-7}$ | Pin ⑥ - pin ⑦ offset voltage | | | | ± 6 | mV |
| $V_{offset3-4}$ | Pin ③ - pin ④ offset voltage | | | | ± 6 | mV |
| $V_{offset12-13}$ | Pin ⑫ - pin ⑬ offset voltage | | | | ± 6 | mV |
| T_{O1} | Pin ① pulse width | Pin ⑬ time constant 100k Ω + 820pF | 45 | 55 | 65 | μs |

M51722P,FP

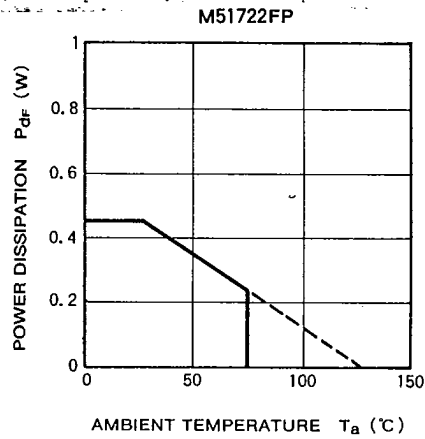
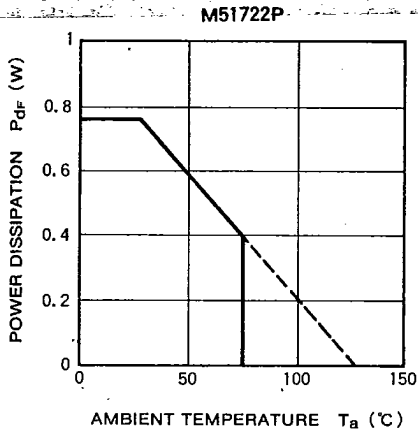
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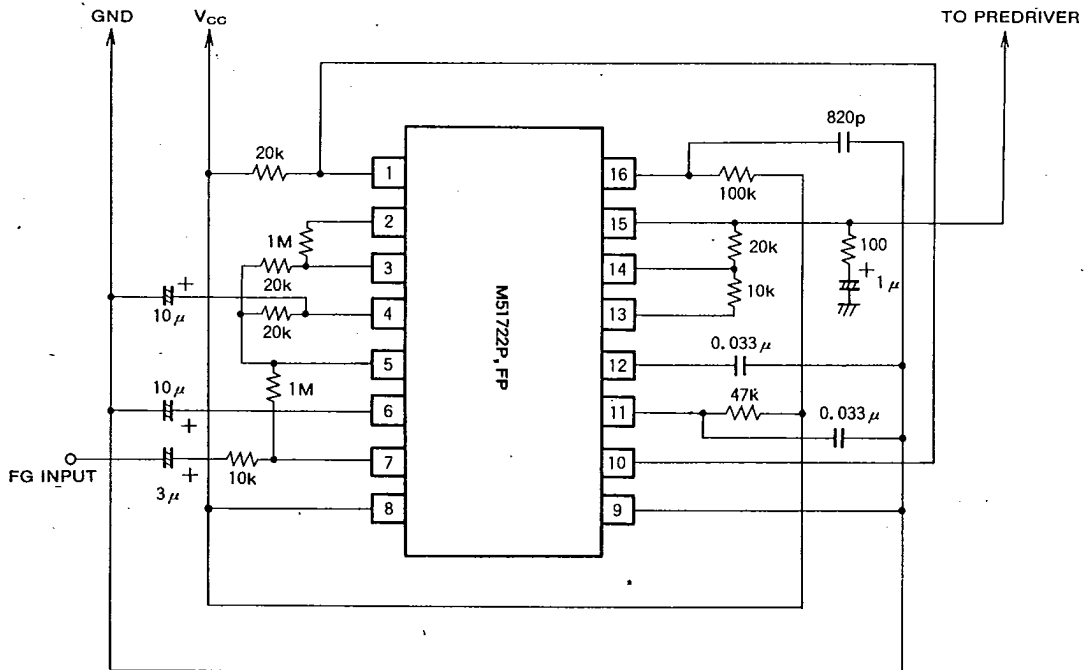
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THERMAL DERATING (MAXIMUM RATING) ($T_a=25^\circ\text{C}$, unless otherwise noted)



APPLICATION EXAMPLE



Unit Resistance : Ω
Capacitance : F

F-V CONVERTER WITH MULTIPLEXER

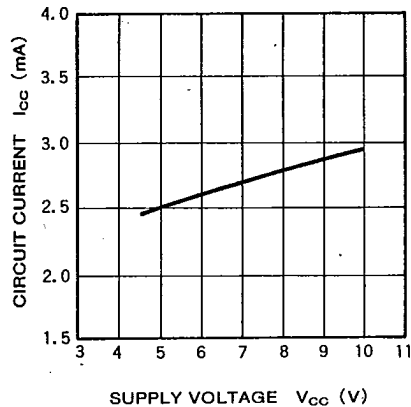
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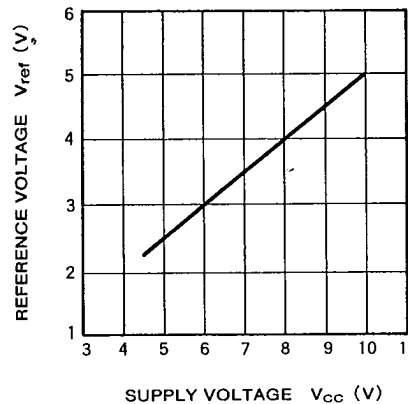
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TYPICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, unless otherwise noted)

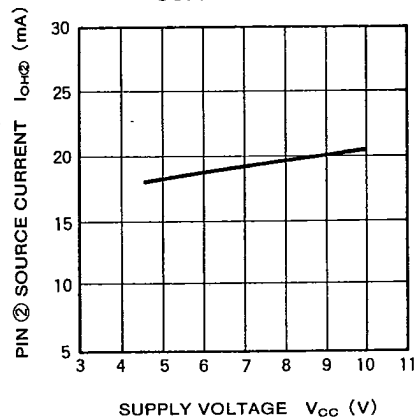
CIRCUIT CURRENT VS. SUPPLY VOLTAGE



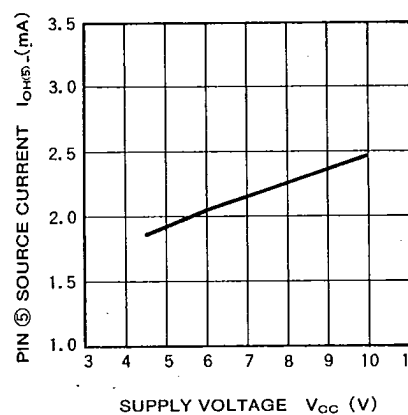
REFERENCE VOLTAGE VS. SUPPLY VOLTAGE



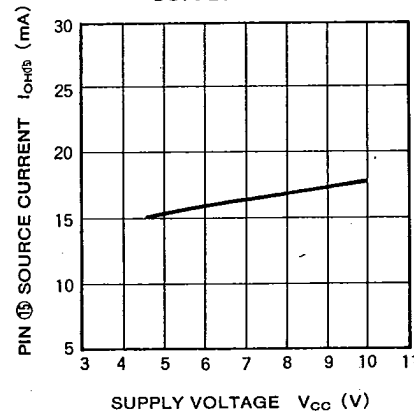
PIN ② SOURCE CURRENT VS. SUPPLY VOLTAGE



PIN ⑤ SOURCE CURRENT VS. SUPPLY VOLTAGE



PIN ⑬ SOURCE CURRENT VS. SUPPLY VOLTAGE

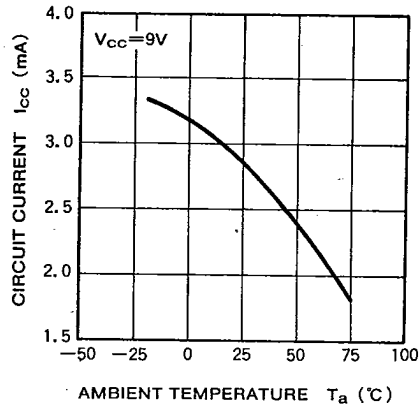


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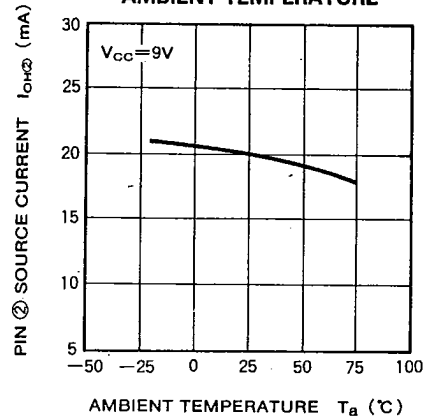
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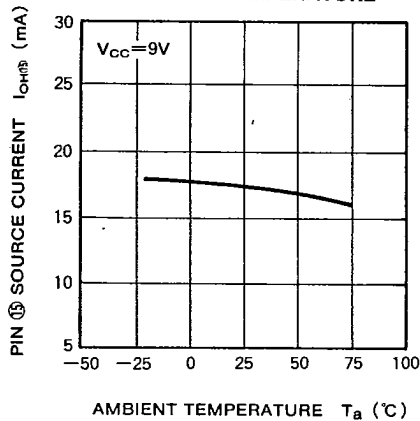
CIRCUIT CURRENT VS. AMBIENT TEMPERATURE



PIN ② SOURCE CURRENT VS. AMBIENT TEMPERATURE



PIN ⑤ SOURCE CURRENT VS. AMBIENT TEMPERATURE



REFERENCE VOLTAGE VS. AMBIENT TEMPERATURE

