

M51722P,FP

F-V CONVERTER WITH MULTIPLEXER

80C 08982 D T-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

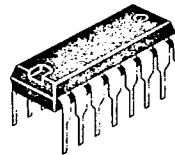
VTRs, floppy-disk drive, etc.

RECOMMENDED OPERATING CONDITIONS

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

PIN CONFIGURATION (TOP VIEW)

MULTIPLEXER OUTPUT	1	16	MONOMULTI TIME CONSTANT
COMPARATOR OUTPUT	2	15	CONTROL OUTPUT
COMPARATOR (+) INPUT	3	14	INVERTED INPUT
COMPARATOR (-) INPUT	4	13	S & H BUFFER OUTPUT
FG AMPLIFIER OUTPUT	5	12	S & H PIN
FG REFERENCE VOLTAGE	6	11	CLOCK SET
FG INPUT	7	10	WAVEFORM REFORM INPUT
SUPPLY VOLTAGE	8	9	GND

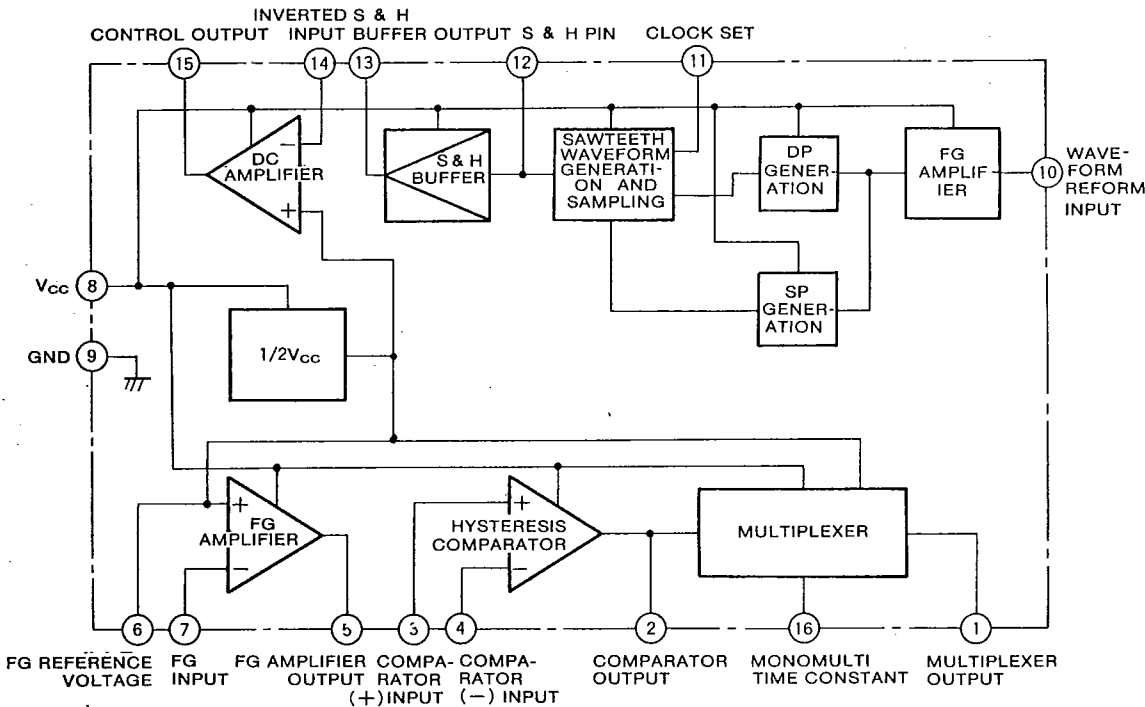


16-pin molded plastic DIP



16-pin molded plastic FLAT (C type)

BLOCK DIAGRAM



F-V CONVERTER WITH MULTIPLEXER

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

Symbol	Parameter	Conditions	Ratings	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/ $^{\circ}\text{C}$
T_{opr}	Operating temperature		$-20 \sim +75$	$^{\circ}\text{C}$
T_{stg}	Storage temperature		$-40 \sim +125$	$^{\circ}\text{C}$

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_{OH15}	Pin ⑮ high-level output	1.5k Ω between pin ⑮ and GND	6.6	7.5		V
V_{OL15}	Pin ⑮ low-level output	1.5k Ω between V_{CC} and pin ⑮		1.0	1.5	V
$V_{offset(6-7)}$	Pin ⑥ - pin ⑦ offset voltage				± 6	mV
$V_{offset(3-4)}$	Pin ③ - pin ④ offset voltage				± 6	mV
$V_{offset(12-13)}$	Pin ⑫ - pin ⑬ offset voltage				± 6	mV
T_{O1}	Pin ① pulse width	Pin ⑮ time constant 100k Ω + 820pF	45	55	65	μs

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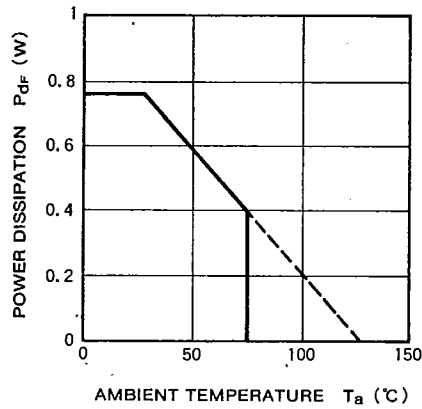
F-V CONVERTER WITH MULTIPLEXER

80C 08984

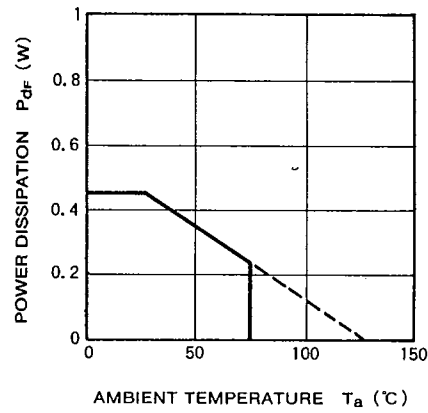
D T-73-13-03

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

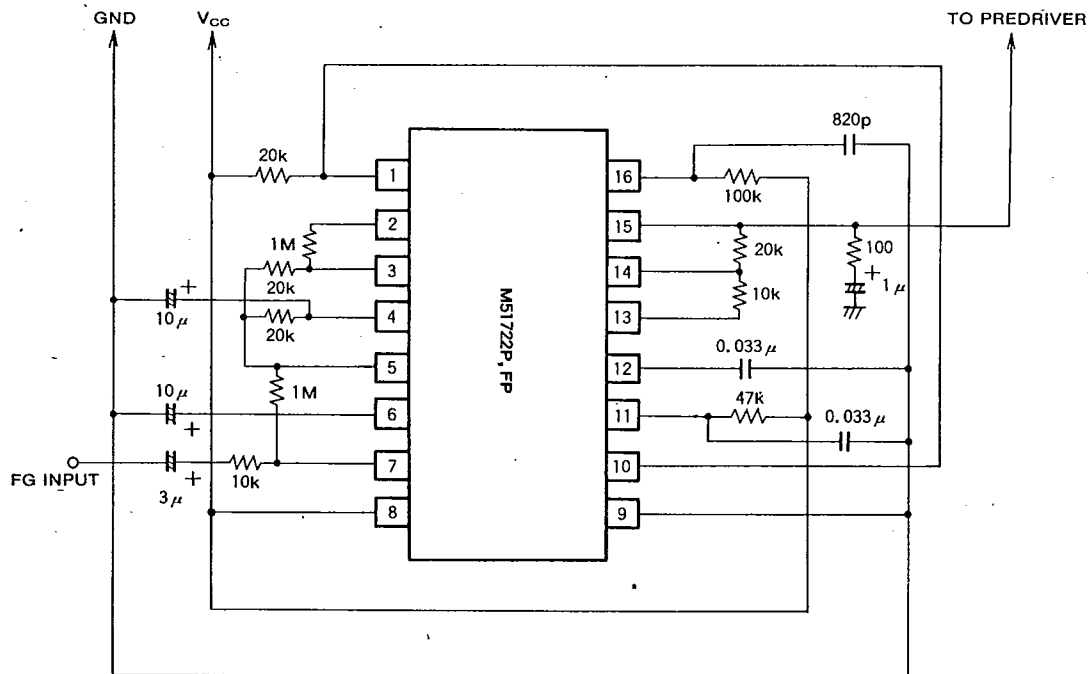
M51722P



M51722FP



APPLICATION EXAMPLE


Unit Resistance : Ω
Capacitance : F

F-V CONVERTER WITH MULTIPLEXER

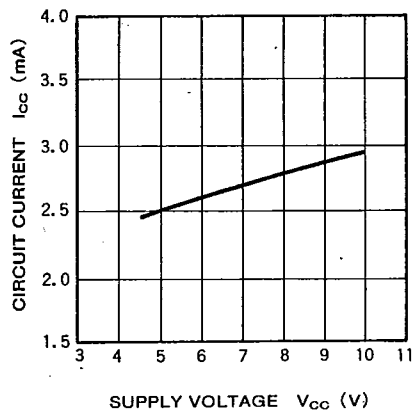
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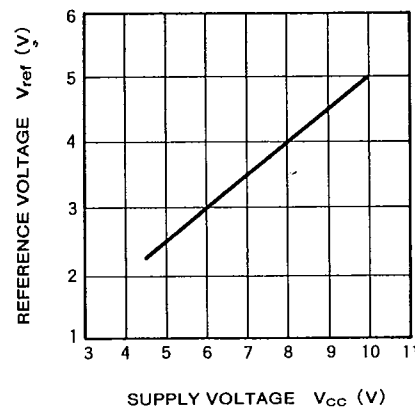
D7-73-13-03

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

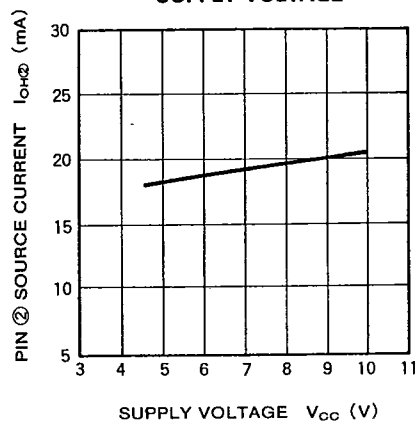
CIRCUIT CURRENT VS. SUPPLY VOLTAGE



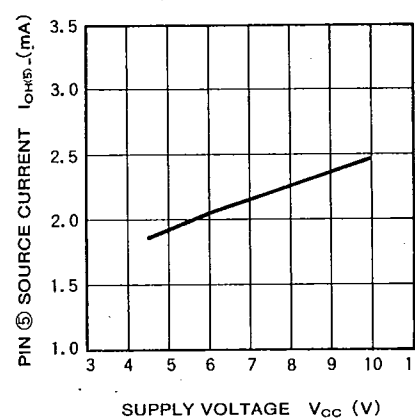
REFERENCE VOLTAGE VS. SUPPLY VOLTAGE



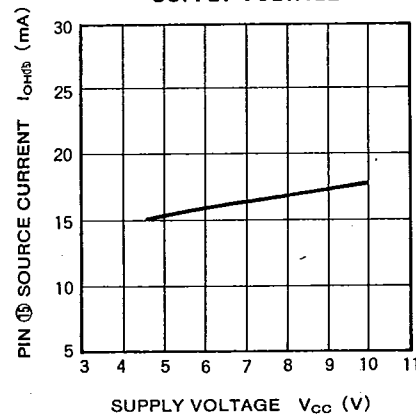
PIN ② SOURCE CURRENT VS. SUPPLY VOLTAGE



PIN ⑤ SOURCE CURRENT VS. SUPPLY VOLTAGE



PIN ⑬ SOURCE CURRENT VS. SUPPLY VOLTAGE

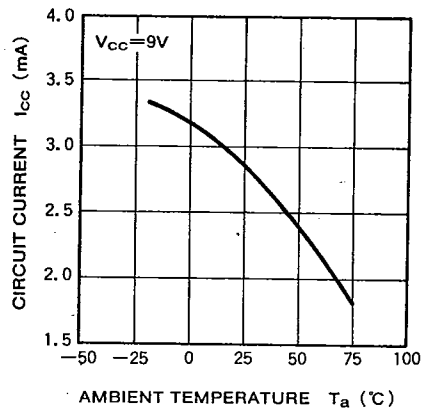
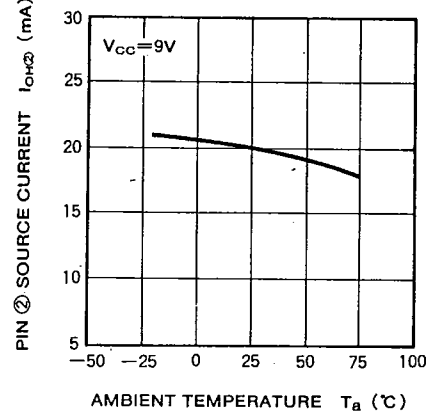
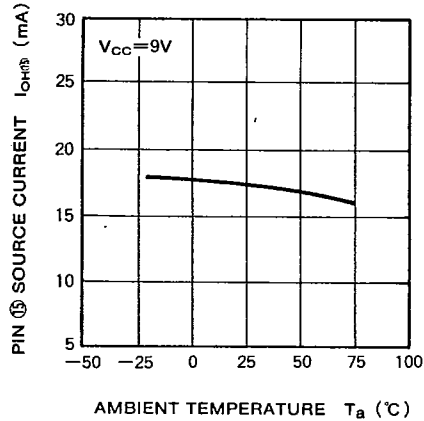


F-V CONVERTER WITH MULTIPLEXER

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CIRCUIT CURRENT VS.
AMBIENT TEMPERATURE

PIN ② SOURCE CURRENT VS.
AMBIENT TEMPERATURE

PIN ③ SOURCE CURRENT VS.
AMBIENT TEMPERATURE

REFERENCE VOLTAGE VS.
AMBIENT TEMPERATURE
