

MB4072

1 CHANNEL 8-BIT D/A CONVERTER

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The Fujitsu MB4072 is a high-speed digital-to-analog converter IC. The MB4072 current outputs are high impedance open-collector that provide voltage output with a load, or current-to-voltage converter for various applications with operational amplifiers, microcomputers, etc.

The threshold level of digital inputs is variable with the level control input for various interface levels.

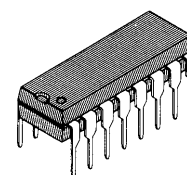
- Settling time: 85 ns
- Linearity error: .0.19% maximum
- Full-scale temperature coefficient: ± 10 ppm/ $^{\circ}\text{C}$ typical
- Output voltage compliance: -10V to $+18\text{V}$
- Multiplying operation
- True/complimentary current sink output
- Adjustable threshold level of digital inputs; interface directly with TTL, CMOS, ECL, etc.
- Wide supply voltage range: $\pm 4.5\text{V}$ to $\pm 18\text{V}$
- Low power consumption: .33 mW at $\pm 5\text{V}$ typical
- Operation temperature: -40°C to $+85^{\circ}\text{C}$
- Compatible with DAC-08
- Packaging: Plastic DIP package (suffix: -P)
Plastic FPT package (suffix: -PF)

ABSOLUTE MAXIMUM RATINGS (see Note)

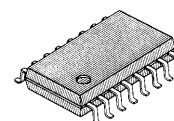
($T_A = 25^{\circ}\text{C}$)

Rating	Symbol	Value	Unit
Supply Voltage	V_+ to V_-	37	V
Digital Input Voltage	V_I	V_- to $V_+ + 37$	V
Threshold Control Voltage	V_{LC}	V_- to V_+	V
Reference Input Voltage	$V_{REF(+)}$	V_- to V_+	V
	$V_{REF(-)}$	V_- to V_+	
Differential Reference Input Voltage	$V_{REF(+)}$ to $V_{REF(-)}$	± 18.5	V
Storage Temperature	T_{STG}	-55 to $+125$	$^{\circ}\text{C}$

Note : Permanent device damage may occur if the above Absolute Maximum Ratings are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

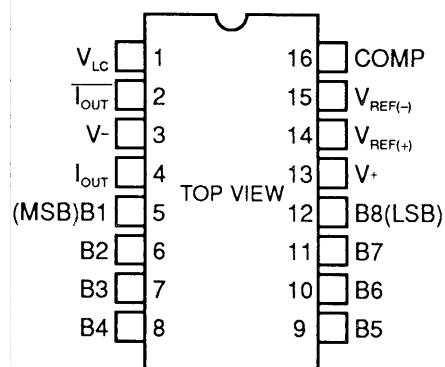


**PLASTIC PACKAGE
DIP-16P-M04**



**PLASTIC PACKAGE
FPT-16P-M06**

PIN ASSIGNMENT



This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit.

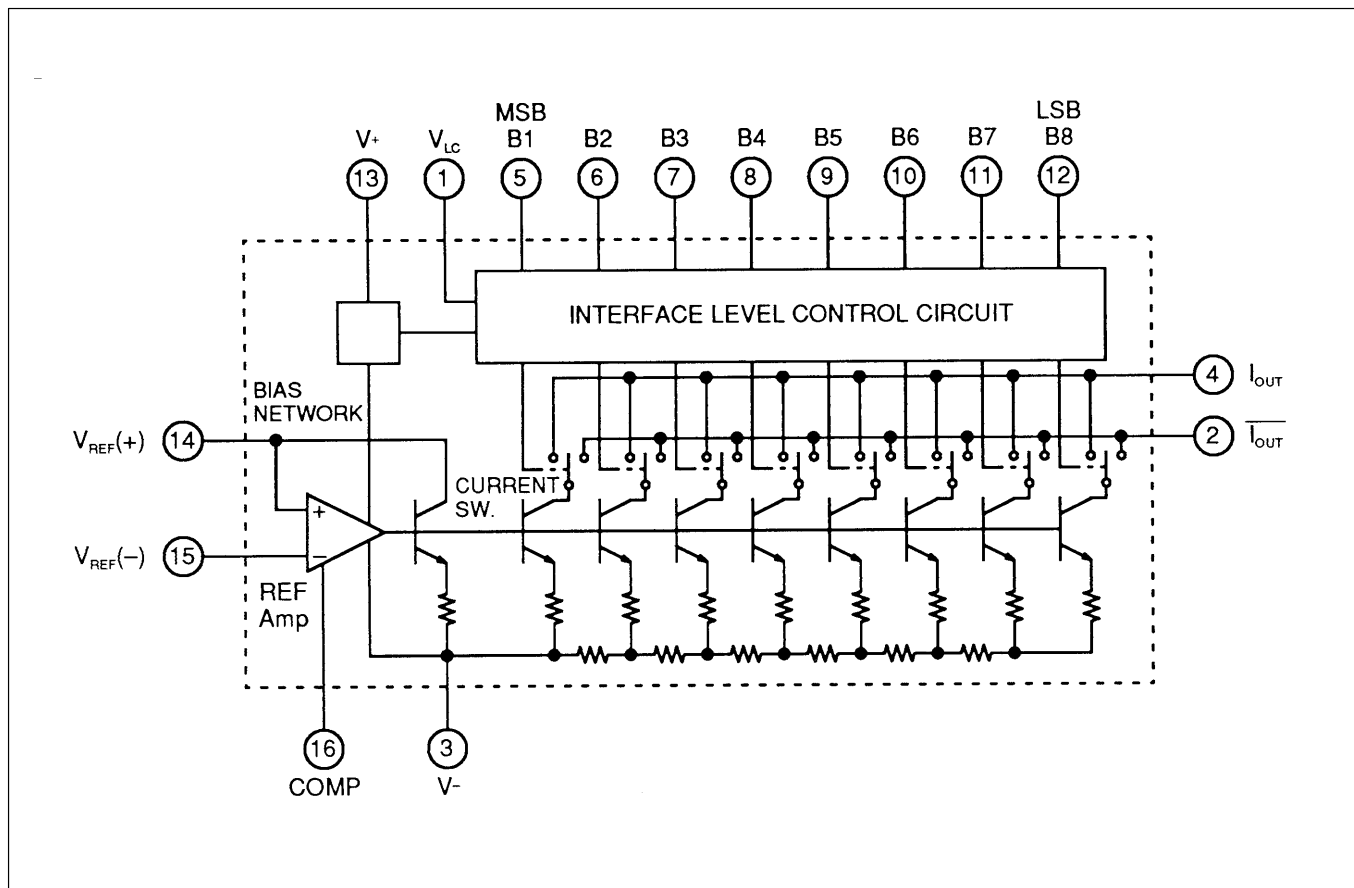


Figure 1. Block Diagram

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Power Supply Voltage	V ⁺	4.75		+18	V
	V ⁻	-18		-4.5	V
Operating Temperature	T _A	0		70	°C

ELECTRICAL CHARACTERISTICS

(Recommended Operating Conditions unless otherwise noted)

$V_+ = +1.5V$, $V_- = -15V$, $I_{REF} = 2.0\text{ mA}$, $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Resolution		8	8	8	bits
Monotonicity		8	8	8	bits
Linearity Error	LE			± 0.19	%(FSR)
Settling time (final value: $\pm 1/2$ LSB $T_A = -25^\circ\text{C}$, on/off switching for each bit/all bits)	t_s		85	150	ns
Propagation delay time ($T_A = 25^\circ\text{C}$, on/off switching for each bit/all bits)	t_{PLH} t_{PHL}		35	60	ns
Temperature coefficient at full-scale	TC_{IFS}		± 10	± 50	ppm/ $^\circ\text{C}$
Output voltage range (ΔI_{FS} 1/2 LSB, R_{OUT} 20M Ω typical)	V_{OC}	-10		+18	V
Output current at full-scale ($V_{REF} = -10.000V$, $R_{14} = 5.000\text{ k}\Omega$, $R_{15} = 5.000\text{ k}\Omega$, $T_A = 25^\circ\text{C}$)	I_{FS4}	1.94	1.99	2.04	mA
Symmetry at full-scale ($I_{FSS} = I_{FS4} - I_{FS2}$)	I_{FSS}		± 1.0	± 8.0	μA
Output current at zero scale	I_{ZS}		0.2	2.0	μA
Output current range ($R_{14} = 5.000\text{ k}\Omega$, $R_{15} = 5.000\text{ k}\Omega$, $V_{REF} = +1.50V$, $V_- = -10V$)	I_{OR1}	2.1			mA
Output current range ($R_{14} = 5.000\text{ k}\Omega$, $R_{15} = 5.000\text{ k}\Omega$, $V_{REF} = +25.0V$, $V_- = -12V$)	I_{OR2}	4.2			mA
Low-level input voltage ($V_{LC} = 0V$)	V_{IL}			0.8	V
High-level input voltage ($V_{LC} = 0V$)	V_{IH}	2.0			V
Low-level input current ($V_{LC} = 0V$, $V_{IN} = -0V$ to $+0.8V$)	I_{IL}		-2.0	-10	μA
High-level input current ($V_{LC} = 0V$, $V_{IN} = 2.0V$ to $18V$)	I_{IH}		0.002	10	μA

ELECTRICAL CHARACTERISTICS, continued

 $(V_S = \pm 15V, I_{REF} = 2.0 \text{ mA}, T_A = 40^\circ\text{C to } +85^\circ\text{C})$

Parameter		Symbol	Value			Unit
			Min	Typ	Max	
Logic input voltage range ($V_- = -15V$)		V_{IS}	-10		+18	V
Logic threshold voltage range ($V_+ = +15V, V_- = -15V$)		V_{THR}	-10		+13.5	V
Reference bias current		I_{15}		-1.0	-3.0	μA
Reference input through rate ($R_{EQ}=2000\Omega, R_L = 100\Omega, C_L = 0pF$)		$\frac{dI}{dt}$	4.0	8.0		$\text{mA}/\mu\text{s}$
Supply voltage sensitivity* ($V_+ = +4.5V$ to $+18V, I_{REF} = 1 \text{ mA}$)		$PSSI_{FS+}$		± 0.0003	± 0.01	%/%
Supply voltage sensitivity* ($V_- = -4.5V$ to $18V, I_{REF} = 1 \text{ mA}$)		$PSSI_{FS-}$		± 0.0002	± 0.01	%/%
Supply current	$(V_+ = +5V, V_- = -5V, I_{REF} = 1.0 \text{ mA})$	I^+		2.3	3.8	mA
		I^-		-4.3	-5.8	mA
	$(V_+ = +5V, V_- = -1.5V, I_{REF} = 2.0 \text{ mA})$	I^+		2.4	3.8	mA
		I^-		-6.4	-7.8	mA
	$(V_+ = +15V, V_- = -15V, I_{REF} = 2.0 \text{ mA})$	I^+		2.5	3.8	mA
		I^-		-6.5	-7.8	mA
Power dissipation	$(V_+ = +5V, V_- = -5V, I_{REF} = 1.0 \text{ mA})$	P_D		33	48	mW
	$(V_+ = +5V, V_- = -1.5V, I_{REF} = 2.0 \text{ mA})$	P_D		103	136	mW
	$(V_+ = +15V, V_- = -15V, I_{REF} = 2.0 \text{ mA})$	P_D		135	174	mW

*Note: $PSSI_{FS} = \left(\frac{\Delta I_{FS}}{I_{FS}} \times 100 \right) / \left(\frac{18-4.5}{15} \times 100 \right)$

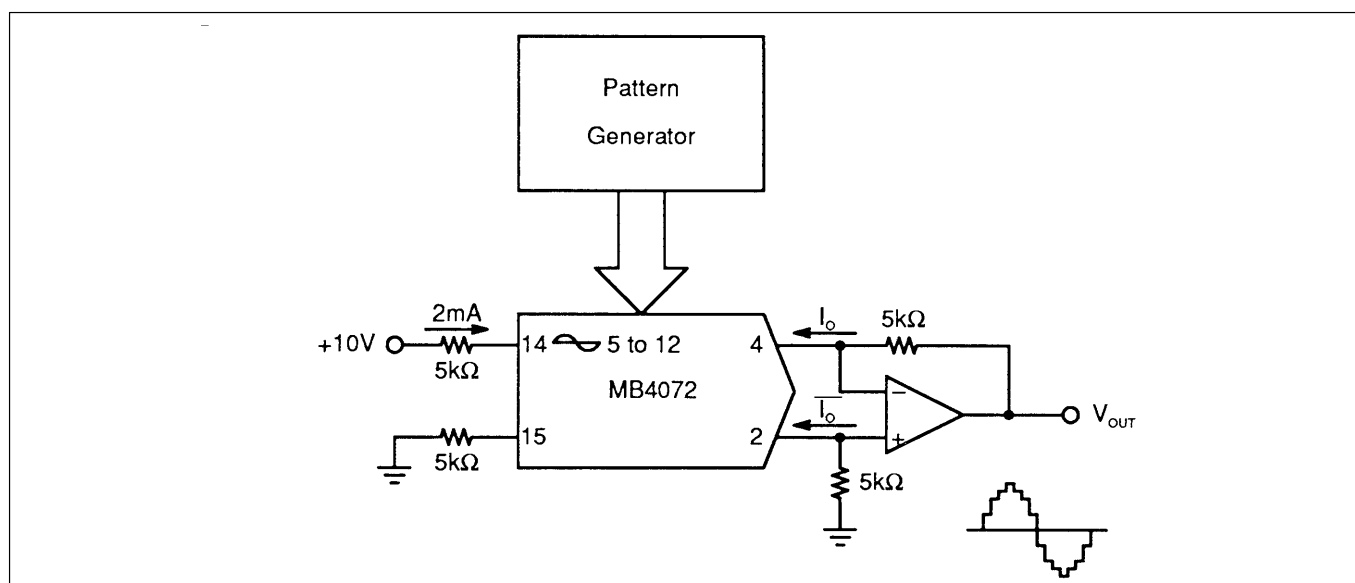
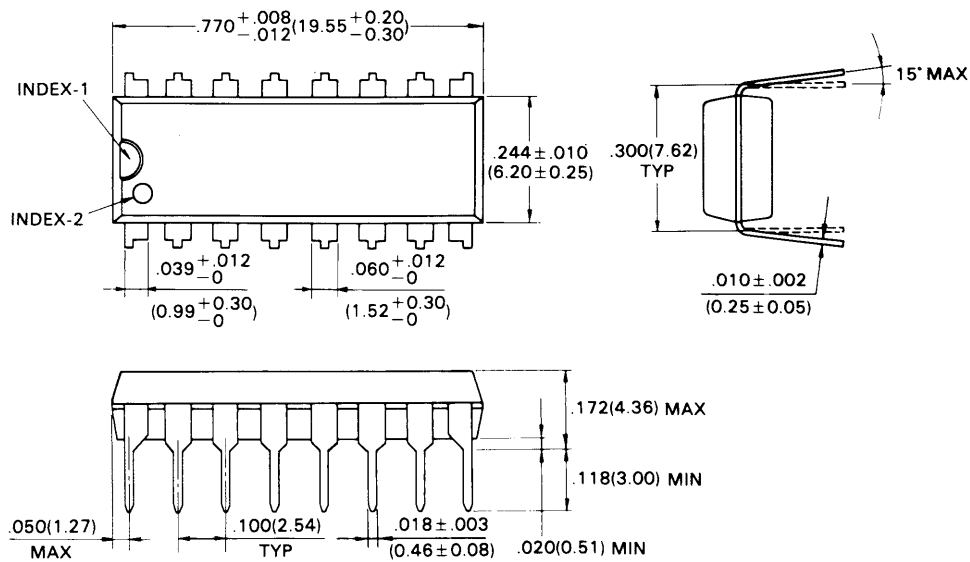


Figure 2. Waveform Synthesizer

PACKAGE DIMENSIONS

16-LEAD PLASTIC DUAL IN-LINE PACKAGE

(Case No. : DIP-16P-M04)



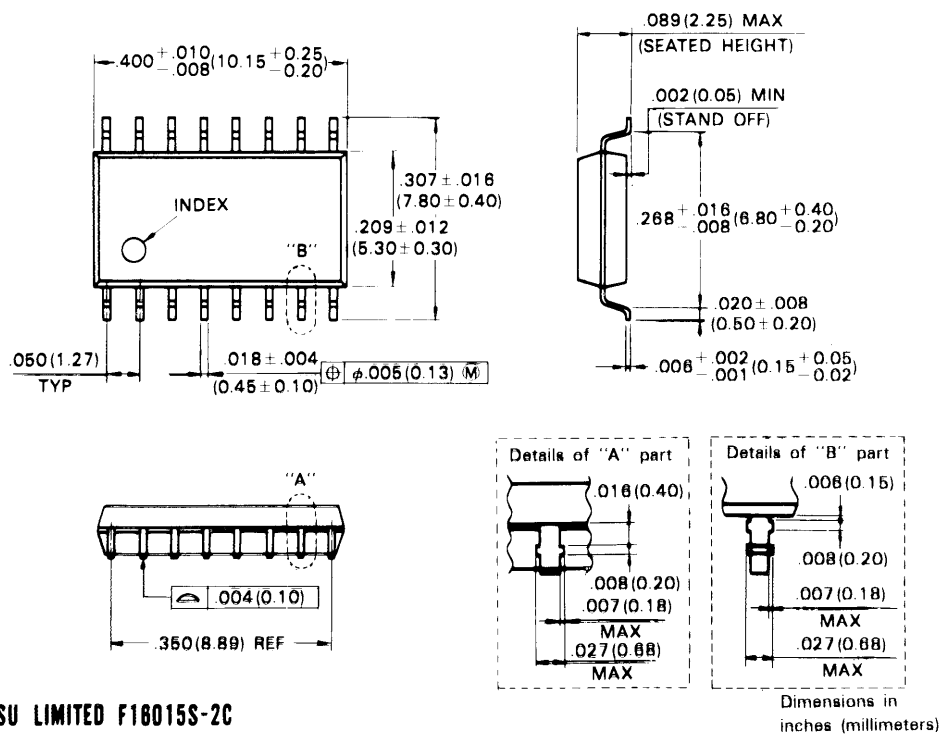
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Dimensions in
inches (millimeters)

PACKAGE DIMENSIONS, continued

16-LEAD PLASTIC FLAT PACKAGE

(Case No. : FPT-16P-M06)



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