

**FLEXIBLE DISK DRIVE (FDD) READ/WRITE AND LOGIC IC**

6249826 MITSUBISHI ELEK (LINEAR)

B0C 09351 DT-52-33-11

**DESCRIPTION**

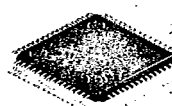
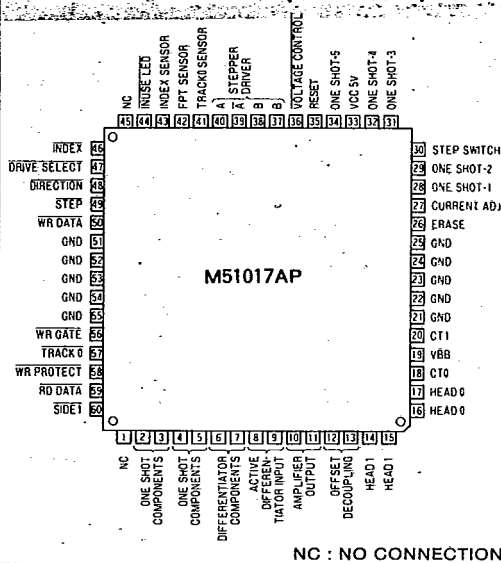
The M51017AP is a semiconductor integrated circuit designed for use in flexible disk drives. It consists of read, write, and stepping motor drive pulse generator circuit sections, as well as a wide variety of control logic circuits.

The M51017AP can be used for double-sided recording. The magnetic head is selected by side select signal.

**FEATURES**

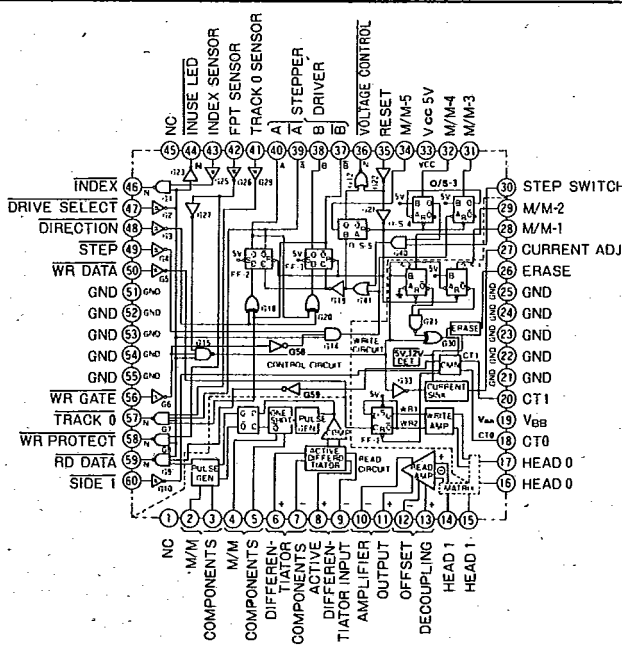
- Read circuit section  
Amplifies the signals from the magnetic head and outputs the required read data.
- Write circuit section  
Drives the write switching circuit according to the write data and the recording current is made to flow in the magnetic head. The recording current is set externally. Also drives the erasing circuit (tunnel erase system) according to the on/off switching of the write gate. The erase timing can be set by an external constant.
- Stepping motor drive pulse generator section  
Generates a drive pulse corresponding to the two-phase excitation system according to the step input signal. A switching terminal for selecting one step/one pulse or one step/two pulses has been provided. The output is TTL level.
- Control logic circuit sections  
(functions of each section are described later)  
The input circuit section provides hysteresis operation and LSTTL level, while the output circuit section has open collector output.
- Housed in a 60-pin molded plastic quad flat package (with a lead pitch of 0.8mm)

**PIN CONFIGURATION (TOP VIEW)**



60-pin molded plastic quad flat package

**BLOCK DIAGRAM**



# ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Rating	Unit
$V_{CC}/V_{WW}$	Supply voltage	COM	7.0	V
$V_{BB}$	Supply voltage		15.0	V
$T_{opr}$	Operating temperature range		0~+60	°C
$T_{stg}$	Storage temperature range		-40~+125	°C
$V_{hd}$	Voltage applied to head input pins (pins ⑩, ⑪, ⑫, ⑬)	Pulse applied for 2 $\mu$ s	25	V
$V_{\text{Ⓣ}}$	Voltage applied to erase-current pin (pin ⑭)	Pulse applied for 2 $\mu$ s	20	V
$I_{\text{Ⓣ}}$	Erase-current pin output current (pin ⑭)	Erase mode	100	mA
$I_{\text{Ⓢ}}$	Center-tap pin output current (pin ⑬, ⑭)	Write/erase mode	110	mA

## ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ , $V_{CC}=5\text{V}$ , $V_{BB}=12\text{V}$ , unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$G_v$	Voltage gain	$f=125\text{kHz}$	47	49	51	dB
$B_w$	Preamplifier high range gain attenuation	$f=5\text{MHz}$		-3		dB
$V_O$	Differential output voltage width	Pins ⑩-⑪		6		$V_{P-P}$
$I_{OS}$	Differential output current width	Pins ⑩-⑪		8		$\text{mA}_{P-P}$
$r_i$	Differential input resistance	Pins ⑩-⑪/⑫-⑬	20	25		k $\Omega$
$r_O$	Differential output resistance	Pins ⑩-⑪		30		$\Omega$
$N_i$	Input conversion noise voltage	$B_w=10\text{kHz}\sim 1\text{MHz}$		8		$\mu\text{V}_{rms}$
$V_{OFF}$	Output offset voltage	Pins ⑩-⑪	-0.6		+0.6	V
CMRR	In-phase signal suppression ratio	$V_i=5\text{mV}_{rms}$ , $f=10\text{kHz}$		50		dB
SVRR	Supply fluctuation suppression ratio	$\Delta V_{BB}=100\text{mV}_{rms}$ , $f=10\text{kHz}$		60		dB
$r_{id}$	Differential input resistance	Pins ⑥-⑦	22	30		k $\Omega$
$I_{OS}$	Output sink current	Pins ⑥, ⑦		1.5		mA
$P_s$	Peak shift		-2		+2	%
-	Monostable one-pulse width setting range		500	2000	2400	ns
-	Monostable two-pulse width setting range		150	1000	1200	ns
-	Monostable one-pulse width precision	$R_1=5.6\text{k}\Omega$ , $C_1=560\text{pF}$ , $t_w=2000\text{ns}$	-15		+15	%
-	Monostable two-pulse width precision	$R_2=5.6\text{k}\Omega$ , $C_2=300\text{pF}$ , $t_w=1200\text{ns}$	-20		+20	%
$I_{WR}$	Write current	$R_{IWR}=5.6\text{k}\Omega$		6		mA
-	Write current precision		-10		+10	%
-	Write current supply dependency	$V_{CC}=5\text{V}$ , $V_{BB}=10.8\sim 13.2\text{V}$		$\pm 0.1$		%/V
-	Write current temperature dependency	$T_a=0\sim 60^\circ\text{C}$		$\pm 0.05$		%/°C
$\Delta I_{WR}$	Write current pair quality	$t_{WR1}-t_{WR2}$	-1		+1	%
-	Write current setting range			10		mA
$V_{sat}$	Output saturation voltage	$I_{OL}=7.5\text{mA}$		4		V
$I_{OH1}$	Off-state leakage current	Head on non-selected side		250		$\mu\text{A}$
$I_{OH2}$	Off-state leakage current	Head on selected side		100		$\mu\text{A}$
$V_{OL}$	Output saturation voltage	$I_{OL}=70\text{mA}$		0.6		V
$I_{OH}$	Output leakage current	$V_{OH}=20\text{V}$		250		$\mu\text{A}$
$I_{er}$	Erase current range			100		mA
$V_{OH}$	Output voltage at time of write selection		10.2	11.3		V
$V_{OL}$	Output voltage at time of read selection			2		V
-	Output current range				110	mA
$t_{w1}$	M/M-1 output pulse width	$R_1=100\text{k}\Omega$ , $C_1=0.01\mu\text{F}$ , $k\approx 0.28$		285		$\mu\text{s}$
$t_{w2}$	M/M-2 output pulse width	$R_2=82\text{k}\Omega$ , $C_2=0.033\mu\text{F}$ , $k\approx 0.27$		730		$\mu\text{s}$
$t_{w3}$	M/M-3 output pulse width	$R_3=100\text{k}\Omega$ , $C_3=0.12\mu\text{F}$ , $k\approx 0.29$		3.7		ms
$t_{w5}$	M/M-5 output pulse width	$R_5=100\text{k}\Omega$ , $C_5=2.2\mu\text{F}$ , $k\approx 0.31$		68		ms

**ELECTRICAL CHARACTERISTICS (CONTINUED)** ( $T_a=25^\circ\text{C}$ ,  $V_{CC}=5\text{V}$ ,  $V_{BB}=12\text{V}$ , unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{OL}$	Open-collector output	"L" output voltage	$I_{OL}=48\text{mA}$			V
$I_{OH}$		"H" output current	$V_{OH}=12\text{V}$			$\mu\text{A}$
—		Applicable pins: ④, ⑥, ⑦, ⑧, ⑨				
$V_{OL}$	Open-collector output	"L" output voltage	$I_{OL}=12\text{mA}$			V
$I_{OH}$		"H" output current	$V_{OH}=12\text{V}$			$\mu\text{A}$
—		Applicable pins: ⑫				
$V_{OH}$	Output circuit	"H" output voltage	2.7	3.4		V
$V_{OL}$		"L" output voltage			0.4	V
—		Applicable pins: ①, ③, ⑤, ⑩ Totem-pole output				
$V_{th+}$	Schmitt trigger input	Positive-going threshold voltage	1.2	1.6	1.9	V
$V_{th-}$		Negative-going threshold voltage	0.5	0.8	1.1	V
Hys		Hysteresis	0.4	0.8		V
$I_{IH}$	Schmitt trigger input	"H" input current	$V_I=2.7\text{V}$			$\mu\text{A}$
$I_{IL}$		"L" input current	$V_I=0.4\text{V}$			$\text{mA}$
—		Applicable pins: ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, ⑪, ⑫				
$V_{IH}$	Input	"H" input voltage	2.0			V
$V_{IL}$		"L" input voltage			0.8	V
$I_{IH}$		"H" input current	$V_I=2.4\text{V}$			$\mu\text{A}$
$I_{IL}$		"L" input current	$V_I=0.4\text{V}$			$\text{mA}$
—	Applicable pins: ⑩, ⑫					
$V_{th5}$	Supply current detection	5V-system detection voltage	3.4	3.9	4.4	V
$V_{th12}$		12V-system detection voltage	7.6	8.6	-9.6	V
$I_{CC}$	Circuit current	5V-system circuit current	Read mode		68	$\text{mA}$
$I_{BB}$		12V-system circuit current	Read mode			$\text{mA}$