MOTOROLA Semiconductors

MFC6020

Advance Information

DUAL TOGGLE FLIP-FLOP

- Wide Operating Voltage Range — 4.0 to 16 Volts
- Regulated Supply Not Required
- Compatible with TTL and DTL
- Economical 6-Lead Plastic Package

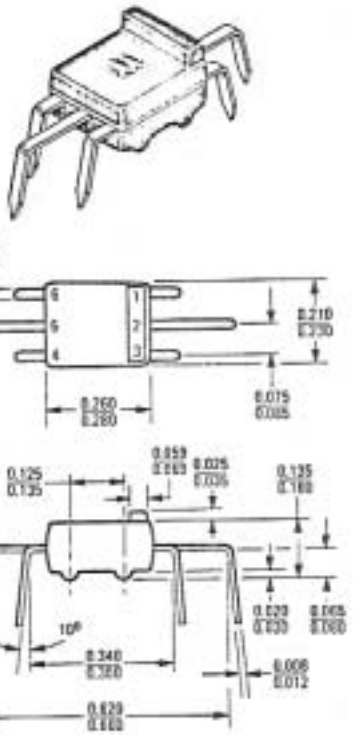
DUAL TOGGLE FLIP-FLOP

Silicon Monolithic Functional Circuit

DECEMBER 1970 — ADI-59 R1

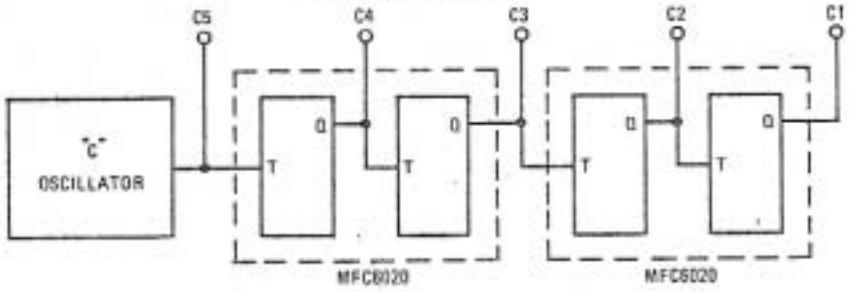
MAXIMUM RATINGS

Rating	Symbol	Value	Volts
Power Supply Voltage	V_{CC}	19	Vdc
Output Sinking Current	I_{sink}	10	mA
Negative Input Voltage	V_{in}	0.5	Vdc
Power Dissipation @ $T_A = 25^oC$ Derate above 25^oC	P_D $1/\theta_{JA}$	1.0 10	Watt $mW/^oC$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-40 to +125	^oC
Operating Temperature Range	T_A	-10 to +75	^oC



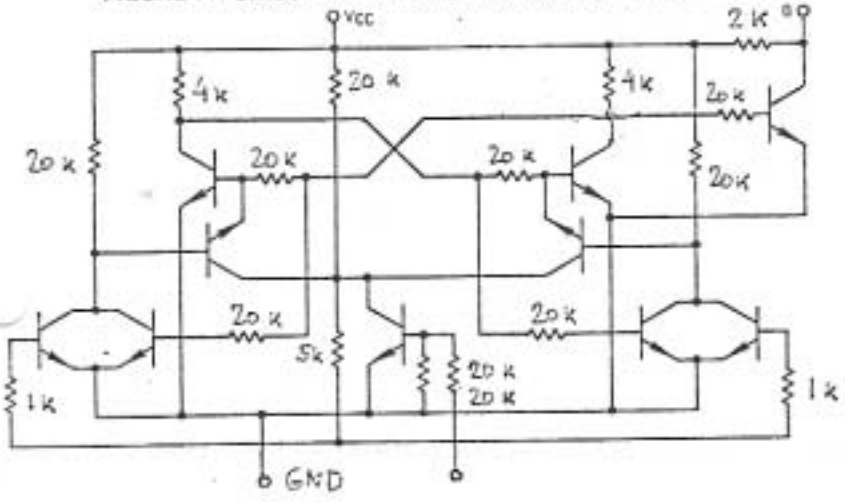
CASE 643A
PLASTIC PACKAGE

TYPICAL APPLICATION — ELECTRONIC ORGAN DIVIDER

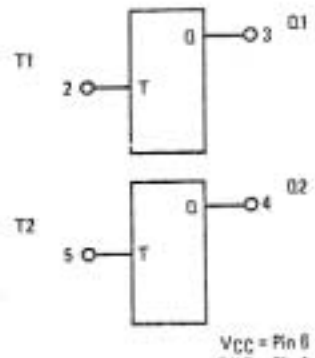


C4 = 261 Hz

FIGURE 1 — CIRCUIT SCHEMATIC (One Half of Circuit Shown)



BLOCK DIAGRAM

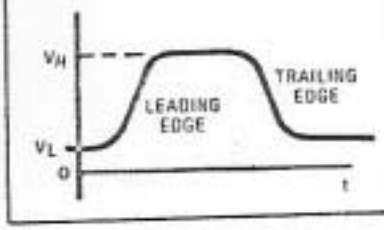


V_{CC} = Pin 6
GND = Pin 1

CTRICAL CHARACTERISTICS (V_{CC} = 12 Vdc, V_{in} = 4.0 V, Square Pulse, f = 10 kHz, 50% Duty Cycle, t_f = 1.0 V/μs (Min), T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Operating Power Supply Voltage	V_{CC}	4.0	–	16	Vdc
Toggle Frequency	f_{Tog}	–	3.0	–	MHz
Output Voltage (High) (V_{CC} = 4.0 Vdc) (V_{CC} = 16 Vdc)	V_{OH}	 3.5 15.5	 – –	 – –	Vdc
Output Voltage (Low) (V_{CC} = 4.0 Vdc) (V_{CC} = 16 Vdc)	V_{OL}	 – –	 – –	 0.5 1.0	Vdc
Operating Drain Current	I_D	–	–	32	mAdc
Output Sinking Current ($V_o \leq 1.0$ Vdc)	I_{sink}	–	2.0	–	mAdc
Rise Time	t_r	–	250	–	ns
Storage Time	t_s	–	350	–	ns
Fall Time	t_f	–	60	–	ns
Cross Talk (V_{in} = 15 V, Square Pulse, V_{CC} = 16 Vdc) T1 to Q2 T2 to Q1	V_o	 –	 –	 15 15	mV
Input Resistance	R_{in}	10	–	–	kΩ
Output Resistance (Output High)	R_{OH}	–	–	2.8	kΩ

INPUT PULSE REQUIREMENTS



Characteristic	Symbol	Min	Max	Unit
Pulse Magnitude	V_H	+4.0	–	Volts
Zero Level	V_L	–	+1.0	Volts
Leading Edge	No Requirement			
Trailing Edge	$\frac{dv}{dt}$	-1.0	–	$\frac{Volts}{\mu s}$

FIGURE 2 – RMS CURRENT DRAIN versus SUPPLY VOLTAGE