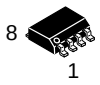
1.1 GHz Dual Modulus Prescaler

MC12026A



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Description

The MC12026A is a high frequency, low voltage dual modulus prescaler used in phase-locked loop (PLL) applications.

The MC12026A can be used with CMOS synthesizers requiring positive edges to trigger internal counters in a PLL to provide tuning signals up to 1.1 GHz in programmable frequency steps.

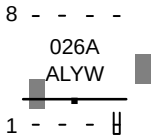
A Divide Ratio Control (SW) permits selection of an 8/9 or 16/17 divide ratio as desired.

The Modulus Control (MC) selects the proper divide number after SW has been biased to select the desired divide ratio.

Features

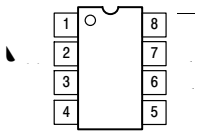
- 1.1 GHz Toggle Frequency
- Supply Voltage 4.5 to 5.5 V
- Low Power 4.0 mA Typical
- Operating Temperature Range of −40 to 85 C
- The MC12026 is Pin Compatible with the MC12022
- Short Setup Time (t_{set}) 6.0 ns Typical @ 1.1 GHz
- Modulus Control Input Level is Compatible with Standard CMOS and TTL
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

MARKING DIAGRAM



A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb-Free Package

PIN CONNECTIONS



(Top View)

Table 1. FUNCTIONAL TABLE

SW	MC	Divide Ratio
H	H	8
H	L	9
L	H	16
L	L	17

1. SW: H = V_{CC}, L = Open. A logic L can also be applied by grounding this pin, but this is not recommended due to increased power consumption.
2. MC: H = 2.0 V to V_{CC}, L = GND to 0.8 V.

Table 2. MAXIMUM RATINGS

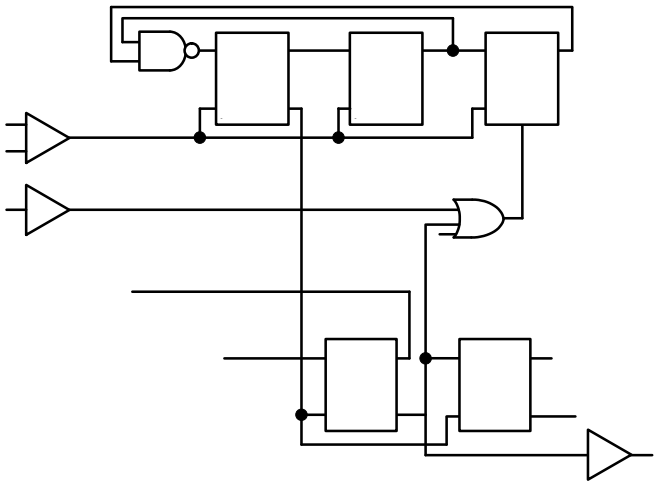
Characteristics	Symbol	Value	Unit
Power Supply Voltage, Pin 2	V_{CC}	−0.5 to 7.0	Vdc
Operating Temperature Range	T_A	−40 to 85	C
Storage Temperature Range	T_{stg}	−65 to 150	C
Modulus Control Input, Pin 6	MC	−0.5 to 6.5	Vdc
Maximum Output Current, Pin 4	I_O	10.0	mA

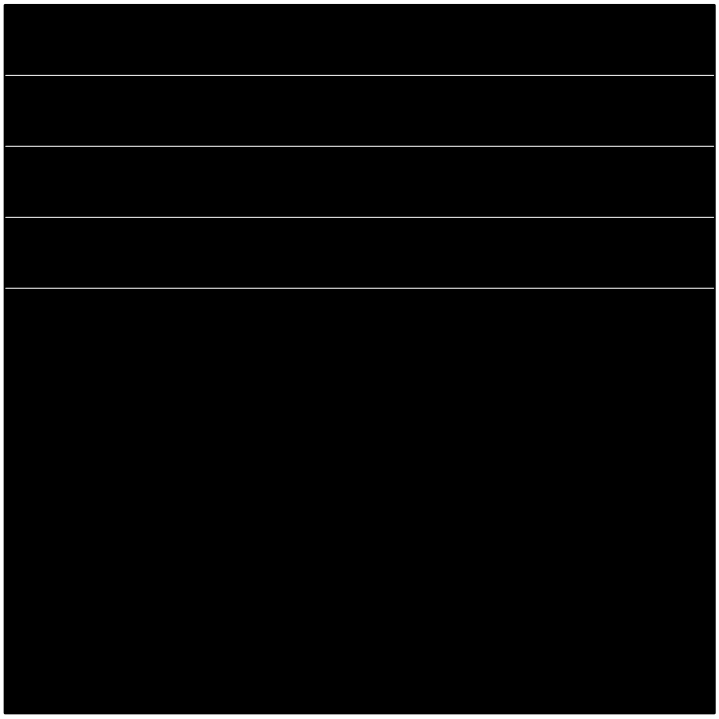
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
NOTE: ESD data available upon request.

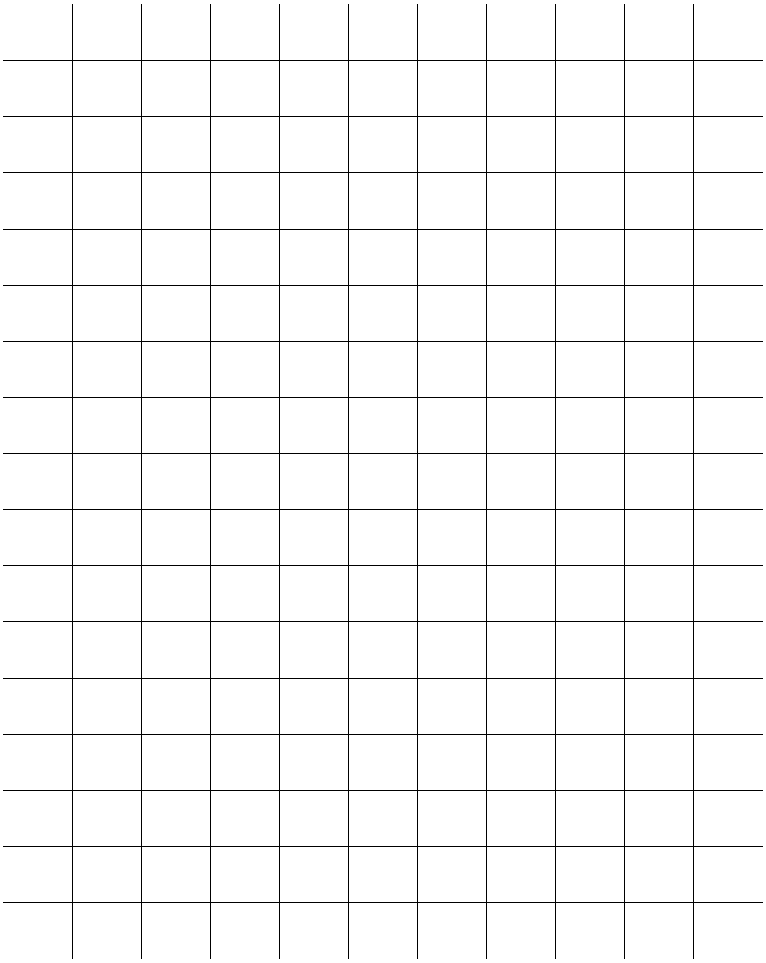
Table 3. ELECTRICAL CHARACTERISTICS (V_{CC} = 4.5 to 5.5; T_A = −40 to 85 C, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Toggle Frequency (Sin Wave)	f_t	0.1	1.4	1.1	GHz
Supply Current Output Unloaded (Pin 2)	I_{CC}	−	4.0	5.3	mA
Modulus Control Input High (MC)	V_{IH1}	2.0	−	V_{CC}	V
Modulus Control Input Low (MC)	V_{IL1}	GND	−	0.8	V
Divide Ratio Control Input High (SW)	V_{IH2}	V_{CC} − 0.5 V	V_{CC}	V_{CC} + 0.5 V	V
Divide Ratio Control Input Low (SW)	V_{IL2}	OPEN	OPEN	OPEN	−
Output Voltage Swing (R_L = 560 Ω; I_O = 5.5 mA) (Note 1) (R_L = 1.1 kΩ; I_O = 2.9 mA) (Note 2)	V_{out}	1.0	1.6	−	V_{pp}
Modulus Setup Time MC to Out (Note 3)	t_{SET}	−	6.0	9.0	ns
Input Voltage Sensitivity 100−250 MHz 250−1100 MHz	V_{in}	 400 100	 − −	 1000 1000	mVpp

1. Divide Ratio of 8/9 at 1.1 GHz, C_L = 8.0 pF.
2. Divide Ratio of 16/17 at 1.1 GHz, C_L = 8.0 pF.
3. Assuming R_L = 560 Ω at 1.1 GHz.







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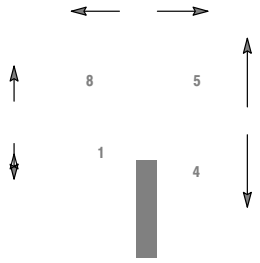

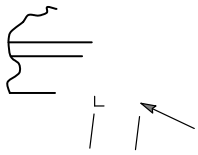

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