MHO+ Series
14 pin DIP, 5.0 Volt, HCMOS/TTL, Clock Oscillator

RoHS Compliant

Features:
- Standard 14 DIP Package
- RoHS Compliant Version Available (-R)
- Tristate Option
- Wide Operating Temperature Range

Ordering Information

MHO+ 1 3 F A D -R 00.0000 MHz

Product Series

Temperature Range
- 1: 0°C to +70°C
- 2: -40°C to +85°C
- 3: -55°C to +105°C
- 4: -55°C to +125°C
- 5: -10°C to +85°C
- 6: -20°C to +70°C
- 7: 0°C to +85°C

Stability
- 1: ±1000 ppm
- 2: ±500 ppm
- 3: ±100 ppm
- 4: ±50 ppm
- 5: ±35 ppm
- 6: ±25 ppm
- 7: +0/-200 ppm
- *8: ±20 ppm

Output Type
- F: Fixed
- T: Tristate (1.000 to 80.000 MHz)

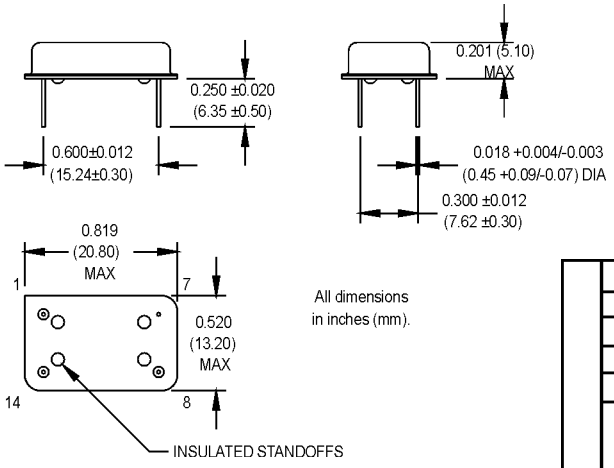
Symmetry/Logic Compatibility (See Table Below)
- A: 40/60 HCMOS/TTL
- B: 45/55 TTL
- C: 45/55 HCMOS
- D: 45/55 HCMOS/TTL
- F: 40/60 TTL
- G: 40/60 HCMOS

Package/Lead Configurations
- D: DIP; Nickel Header
- G: Gull Wing; Nickel Header

RoHS Compliance
- Blank: non-RoHS compliant part
- -R: RoHS compliant part

Frequency (customer specified)

*Contact factory for availability



All dimensions in inches (mm).

Pin Connections

PIN	FUNCTION
1	N/C or Tristate
7	Circuit/Case Ground
8	Output
14	+Vdd

Available Symmetry

FREQUENCY RANGE	STD.	OPTIONS
0.732 kHz to 50 MHz	A	B, C, D
50.001 to 60 MHz	A	B, C
60.001 to 67 MHz	A	C
67.001 to 80 MHz	F,G	C

Electrical Specifications

PARAMETER	Symbol	Min.	Typ.	Max.	Units	Condition/Notes
Frequency Range	F	.732 kHz		80	Mhz	See Note 1
Operating Temperature	TA	(See Ordering Information)				
Storage Temperature	Ts	-55		+125	°C	
Frequency Stability	ΔF/F	(See Ordering Information)				
Aging						
1st Year			±3		ppm	
Thereafter (per year)			±2		ppm	
Input Voltage	Vdd	4.5	5.0	5.5	V	
Input Current	Idd			15	mA	.732 kHz to 2.999 MHz
				25	mA	3.000 to 25.999 MHz
				60	mA	26.000 to 80.000 MHz
Output Type						HCMOS/TTL
Load						See Note 2
		5 TTL or 50 pF				.732 kHz to 2.999 MHz
		10 TTL or 50 pF				3.000 to 67.000 MHz
		10 TTL or 15 pF				67.001 to 80.000 MHz
Symmetry (Duty Cycle)		(See Ordering Information)				See Note 3
Logic "1" Level	Voh	90% Vdd			V	HCMOS Load
		Vdd -0.5			V	TTL Load
Logic "0" Level	Vol			10% Vdd	V	HCMOS Load
				0.5	V	TTL Load
Output Current				±8	mA	0.732 kHz to 2.999 MHz
				±16	mA	3.000 to 80.000 MHz
Rise/Fall Time	Tr/Tf					See Note 4
				20	ns	.732 kHz to 2.999 MHz
				10	ns	3.000 to 80.000 MHz
Tristate Function		Input Logic "1" or floating; output active Input Logic "0"; output to high-Z				
Start up Time			5		ms	
Random Jitter	Rj		5	12	ps RMS	1-Sigma

1. Consult factory for availability of higher frequencies.
2. TTL load - See load circuit diagram #1. HCMOS load - See load circuit diagram #2.
3. Symmetry is measured at 1.4 V with TTL load, and at 50% Vdd with HCMOS load.
4. Rise/Fall times are measured between 0.5 V and 2.4 V with TTL load, and between 10% Vdd and 90% Vdd with HCMOS load.