

EC3220HS-24.576M

Lead Free



COMPLIANT



ITEM DESCRIPTION

24.576MHz ± 20 ppm 0°C to +70°C

ELECTRICAL SPECIFICATIONS

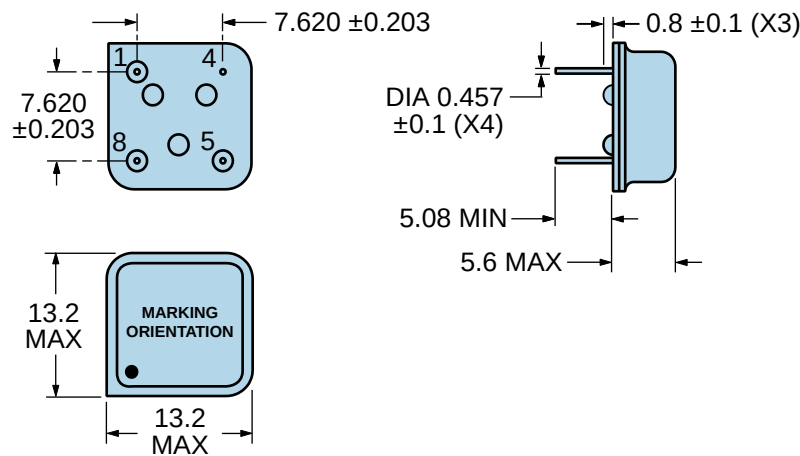
Nominal Frequency	24.576MHz
Frequency Tolerance/Stability	± 20 ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration)
Aging at 25°C	± 5 ppm/year Maximum
Operating Temperature Range	0°C to +70°C
Supply Voltage	3.3Vdc $\pm 10\%$
Input Current	20mA Maximum
Output Voltage Logic High (Voh)	2.4Vdc Minimum with TTL Load, 2.7Vdc Minimum with LVCMOS Load
Output Voltage Logic Low (Vol)	0.4Vdc Maximum with TTL Load or with LVCMOS Load
Rise/Fall Time	5nSec Maximum (Measured at 0.4Vdc to 2.4Vdc w/TTL Load, 20% to 80% of waveform w/LVCMOS Load)
Duty Cycle	50 ± 10 (%) (Measured at 50% of waveform w/LVCMOS Load)
Load Drive Capability	2TTL Load or 15pF LVCMOS Load Maximum
Output Logic Type	CMOS
Control Voltage	1.65Vdc ± 1.65 Vdc
Frequency Deviation	± 50 ppm Minimum
Linearity	$\pm 20\%$ Maximum
Transfer Function	Positive Transfer Characteristic
Absolute Clock Jitter	± 100 pSec Maximum
One Sigma Clock Period Jitter	± 25 pSec Maximum
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Lead Integrity	MIL-STD-883, Method 2004
Mechanical Shock	MIL-STD-202, Method 213, Condition C
Resistance to Soldering Heat	MIL-STD-202, Method 210
Resistance to Solvents	MIL-STD-202, Method 215
Solderability	MIL-STD-883, Method 2003
Temperature Cycling	MIL-STD-883, Method 1010
Vibration	MIL-STD-883, Method 2007, Condition A

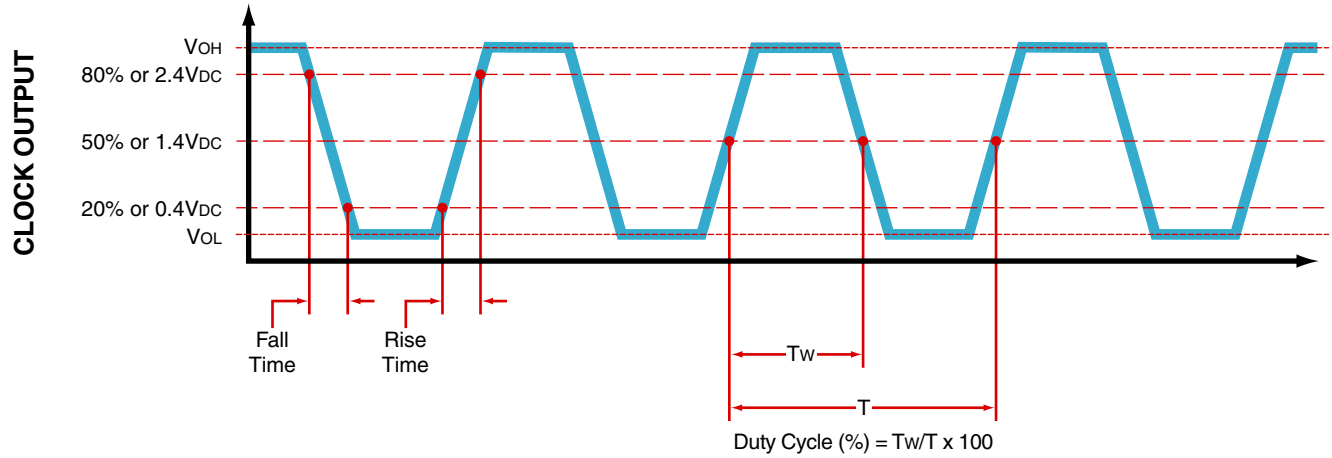
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MECHANICAL DIMENSIONS (all dimensions in millimeters)



PIN	CONNECTION
1	Control Voltage
4	Ground/Case Ground
5	Output
8	Supply Voltage

LINE	MARKING
1	ECLIPTEK
2	EC32 EC32=Product Series
3	24.576M
4	XXYYZZ XX=Ecliptek Manufacturing Code Y=Last Digit of the Year ZZ=Week of the Year

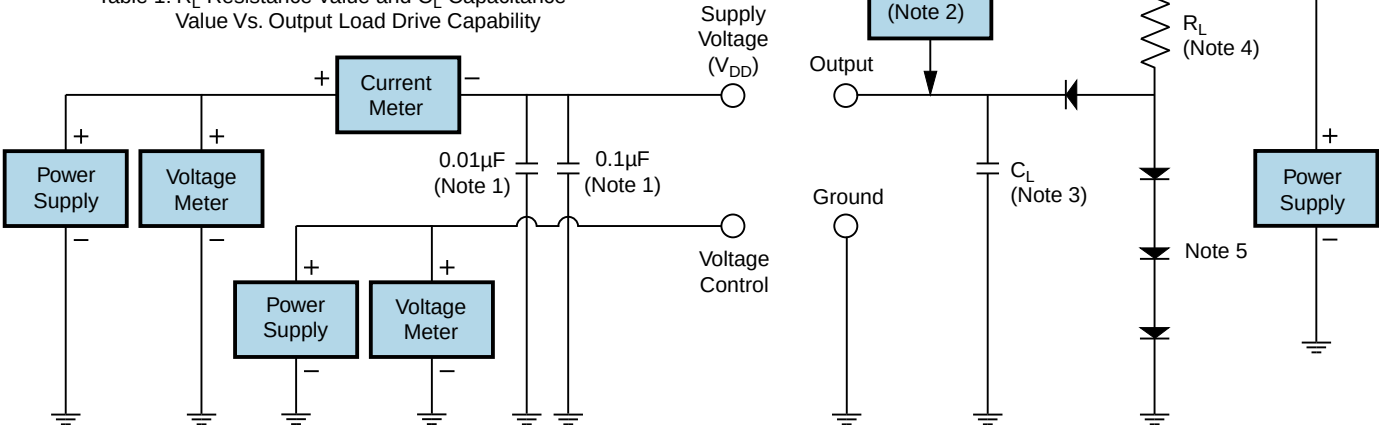
EC3220HS-24.576M **OUTPUT WAVEFORM**

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Test Circuit for TTL Output

Output Load Drive Capability	R _L Value (Ohms)	C _L Value (pF)
10TTL	390	15
5TTL	780	15
2TTL	1100	6
10LSTTL	2000	15
1TTL	2200	3

Table 1: R_L Resistance Value and C_L Capacitance Value Vs. Output Load Drive Capability



Note 1: An external 0.1μF low frequency tantalum bypass capacitor in parallel with a 0.01μF high frequency ceramic bypass capacitor close to the package ground and V_{DD} pin is required.

Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

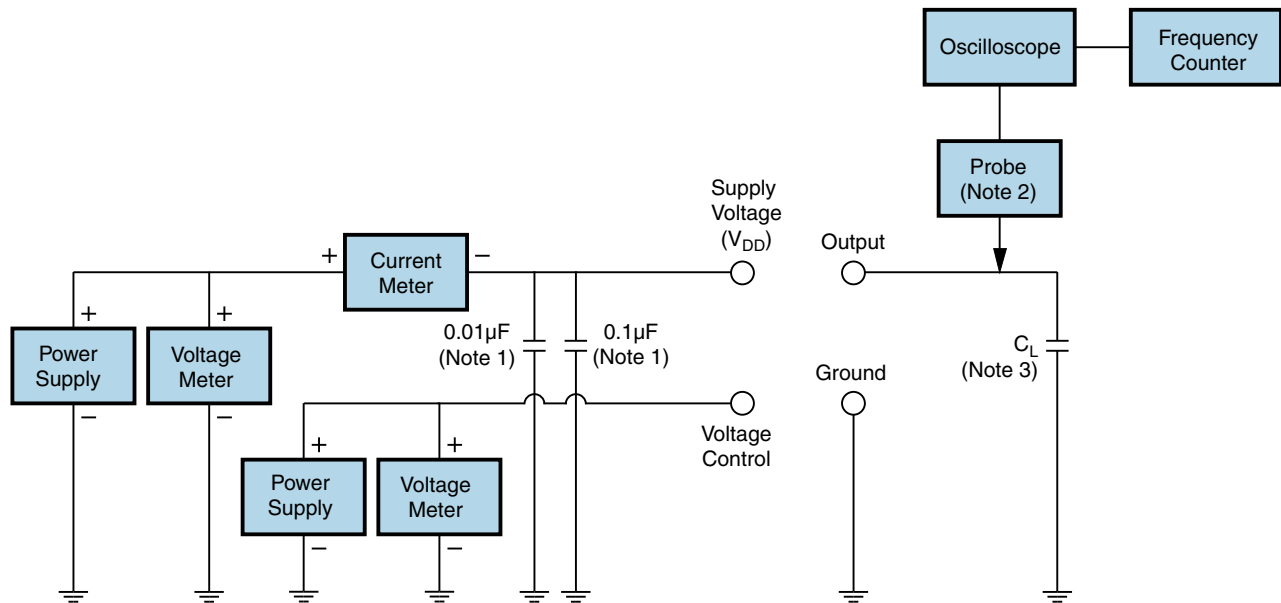
Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance.

Note 4: Resistance value R_L is shown in Table 1. See applicable specification sheet for 'Load Drive Capability'.

Note 5: All diodes are MMBD7000, MMBD914, or equivalent.

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Test Circuit for CMOS Output



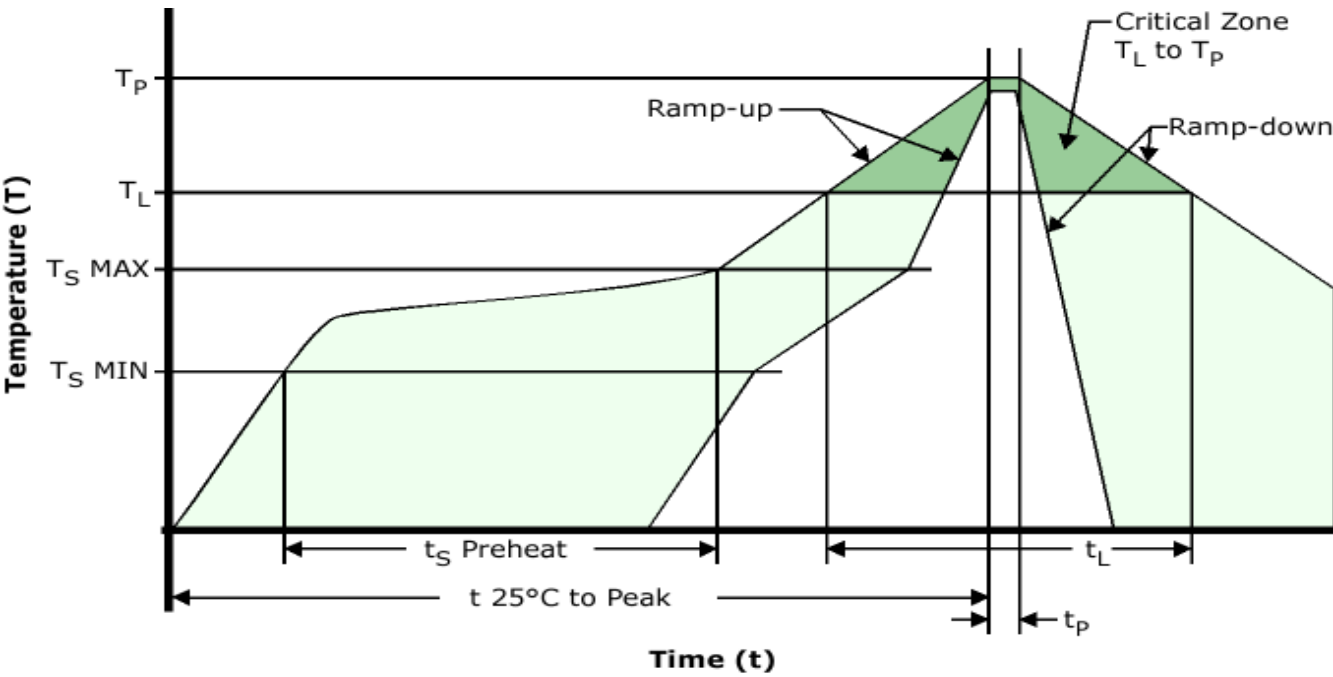
Note 1: An external $0.01\mu\text{F}$ ceramic bypass capacitor in parallel with a $0.1\mu\text{F}$ high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low capacitance ($<12\text{pF}$), 10X attenuation factor, high impedance ($>10\text{Mohms}$), and high bandwidth ($>300\text{MHz}$) passive probe is recommended.

Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance.

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Recommended Solder Reflow Methods

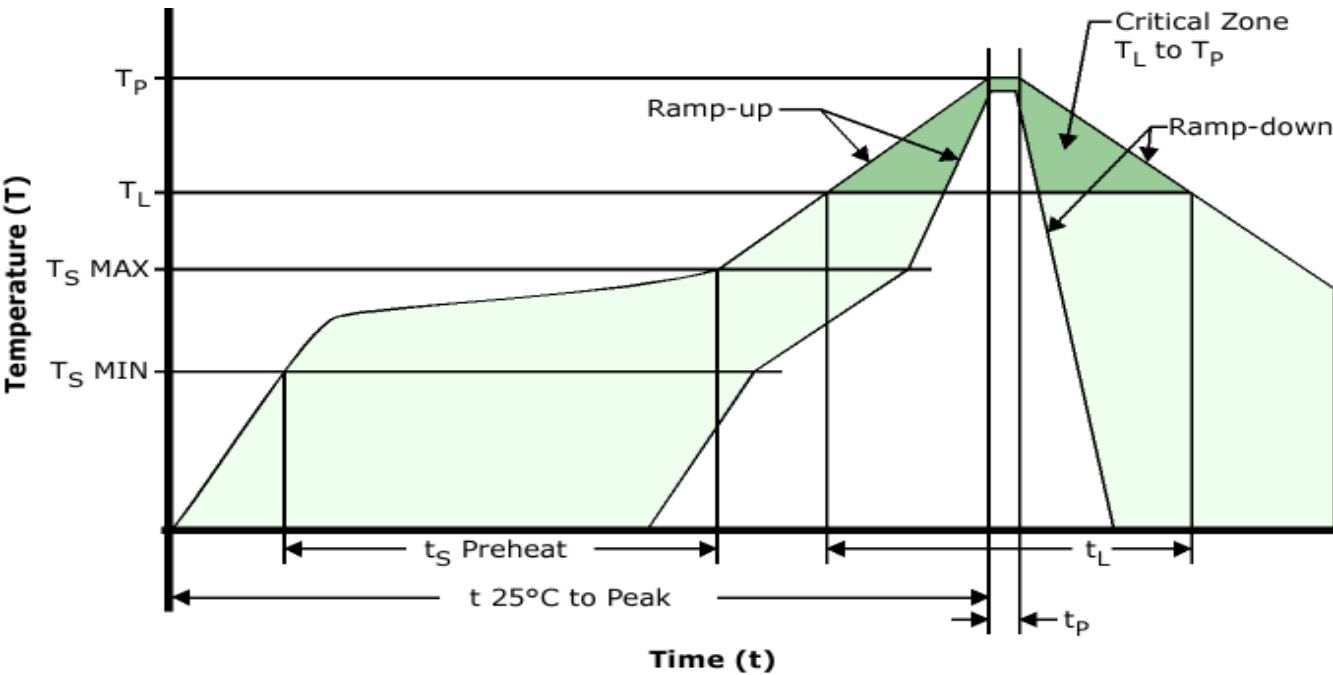


High Temperature Solder Bath (Wave Solder)

Ts MAX to T _L (Ramp-up Rate)	3°C/Second Maximum
Preheat	
- Temperature Minimum (T _s MIN)	150°C
- Temperature Typical (T _s TYP)	175°C
- Temperature Maximum (T _s MAX)	200°C
- Time (t _s MIN)	60 - 180 Seconds
Ramp-up Rate (T _L to T _P)	3°C/Second Maximum
Time Maintained Above:	
- Temperature (T _L)	217°C
- Time (t _L)	60 - 150 Seconds
Peak Temperature (T _P)	260°C Maximum for 10 Seconds Maximum
Target Peak Temperature (T _P Target)	250°C +0/-5°C
Time within 5°C of actual peak (t _P)	20 - 40 Seconds
Ramp-down Rate	6°C/Second Maximum
Time 25°C to Peak Temperature (t)	8 Minutes Maximum
Moisture Sensitivity Level	Level 1

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Recommended Solder Reflow Methods

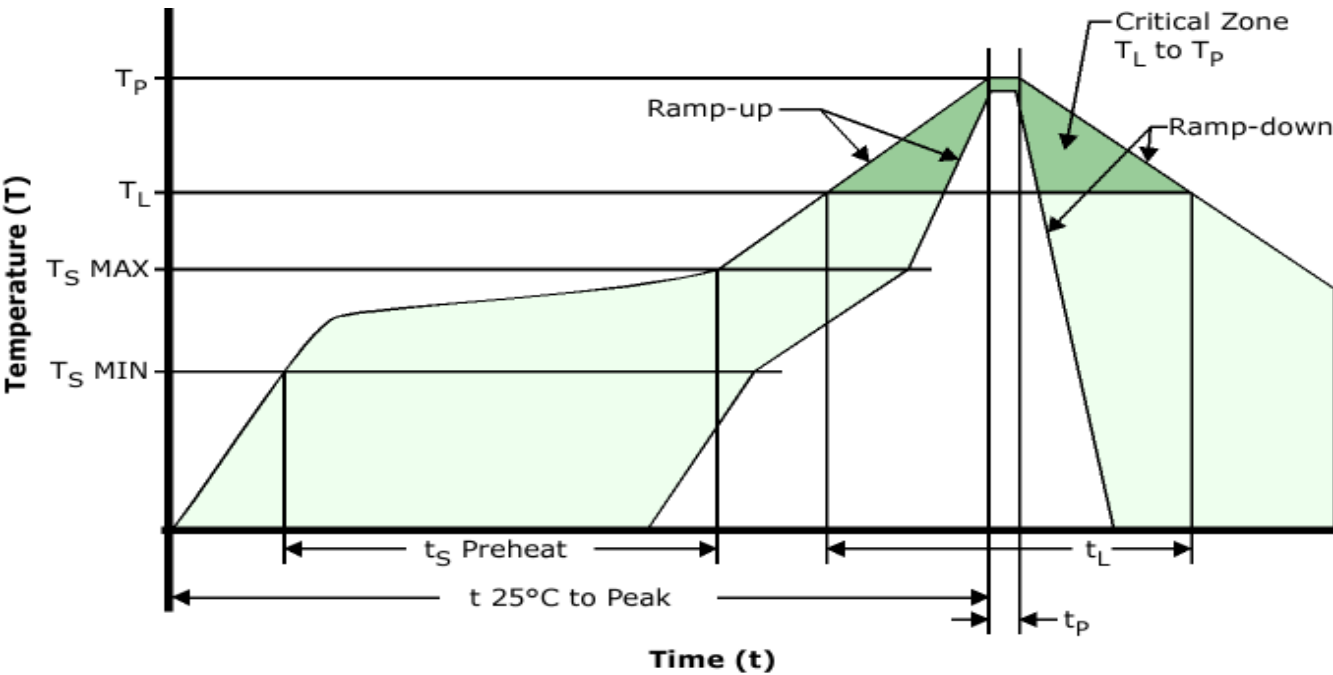


Low Temperature Infrared/Convection 185°C

Ts MAX to Tl (Ramp-up Rate)	5°C/Second Maximum
Preheat	
- Temperature Minimum (Ts MIN)	N/A
- Temperature Typical (Ts TYP)	150°C
- Temperature Maximum (Ts MAX)	N/A
- Time (ts MIN)	60 - 120 Seconds
Ramp-up Rate (Tl to Tp)	5°C/Second Maximum
Time Maintained Above:	
- Temperature (Tl)	150°C
- Time (tL)	200 Seconds Maximum
Peak Temperature (Tp)	185°C Maximum
Target Peak Temperature (Tp Target)	185°C Maximum 2 Times
Time within 5°C of actual peak (tp)	10 Seconds Maximum 2 Times
Ramp-down Rate	5°C/Second Maximum
Time 25°C to Peak Temperature (t)	N/A
Moisture Sensitivity Level	Level 1

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Recommended Solder Reflow Methods



Low Temperature Solder Bath (Wave Solder)

Ts MAX to Tl (Ramp-up Rate)	5°C/Second Maximum
Preheat	
- Temperature Minimum (Ts MIN)	N/A
- Temperature Typical (Ts TYP)	150°C
- Temperature Maximum (Ts MAX)	N/A
- Time (ts MIN)	30 - 60 Seconds
Ramp-up Rate (Tl to Tp)	5°C/Second Maximum
Time Maintained Above:	
- Temperature (Tl)	150°C
- Time (tL)	200 Seconds Maximum
Peak Temperature (Tp)	245°C Maximum
Target Peak Temperature (Tp Target)	245°C Maximum 1 Time / 235°C Maximum 2 Times
Time within 5°C of actual peak (tp)	5 Seconds Maximum 1 Time / 15 Seconds Maximum 2 Times
Ramp-down Rate	5°C/Second Maximum
Time 25°C to Peak Temperature (t)	N/A
Moisture Sensitivity Level	Level 1

Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum.

High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum.