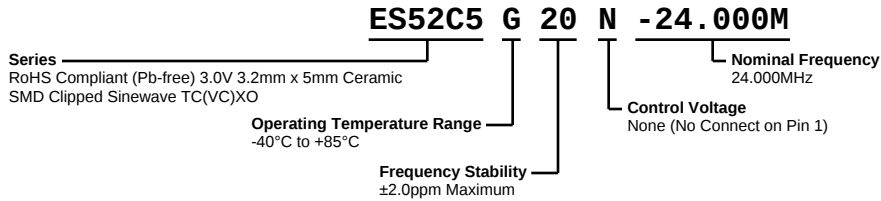


ES52C5G20N-24.000M



ELECTRICAL SPECIFICATIONS

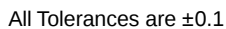
Nominal Frequency	24.000MHz
Frequency Stability vs. Frequency Tolerance	±1.0ppm Maximum (at 25°C ±2°C, at Vdd=3.0Vdc, and Vc=1.5Vdc)
Frequency Stability	±2.0ppm Maximum (Inclusive of Operating Temperature Range, at Vdd=3.0Vdc and Vc=1.5Vdc)
Frequency Stability vs. Input Voltage	±0.3ppm Maximum (±5%)
Frequency Stability vs. Aging	±1ppm/year Maximum (at 25°C)
Frequency Stability vs. Load	±0.2ppm Maximum (±1kOhm//±1pF)
Operating Temperature Range	-40°C to +85°C
Supply Voltage	+3.0Vdc ±5%
Input Current	2.0mA Maximum
Output Voltage	0.7Vp-p Clipped Sinewave Minimum (External DC-Cut capacitor required, 1000pF recommended)
Load Drive Capability	10kOhms//10pF
Output Logic Type	Clipped Sinewave
Control Voltage	None (No Connect on Pin 1)
Phase Noise	-80dBc/Hz at 10Hz Offset, -115dBc/Hz at 100Hz Offset, -135dBc/Hz at 1kHz Offset, and -148dBc/Hz at 10kHz Offset (Typical Values at 12.800MHz)
Start Up Time	5mSec Maximum
Storage Temperature Range	-40°C to +85°C

ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM: 1500V
Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Flammability	UL94-V0
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Moisture Resistance	MIL-STD-883, Method 1004
Moisture Sensitivity	J-STD-020, MSL 1
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Resistance to Solvents	MIL-STD-202, Method 215
Solderability	MIL-STD-883, Method 2003
Temperature Cycling	MIL-STD-883, Method 1010, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A

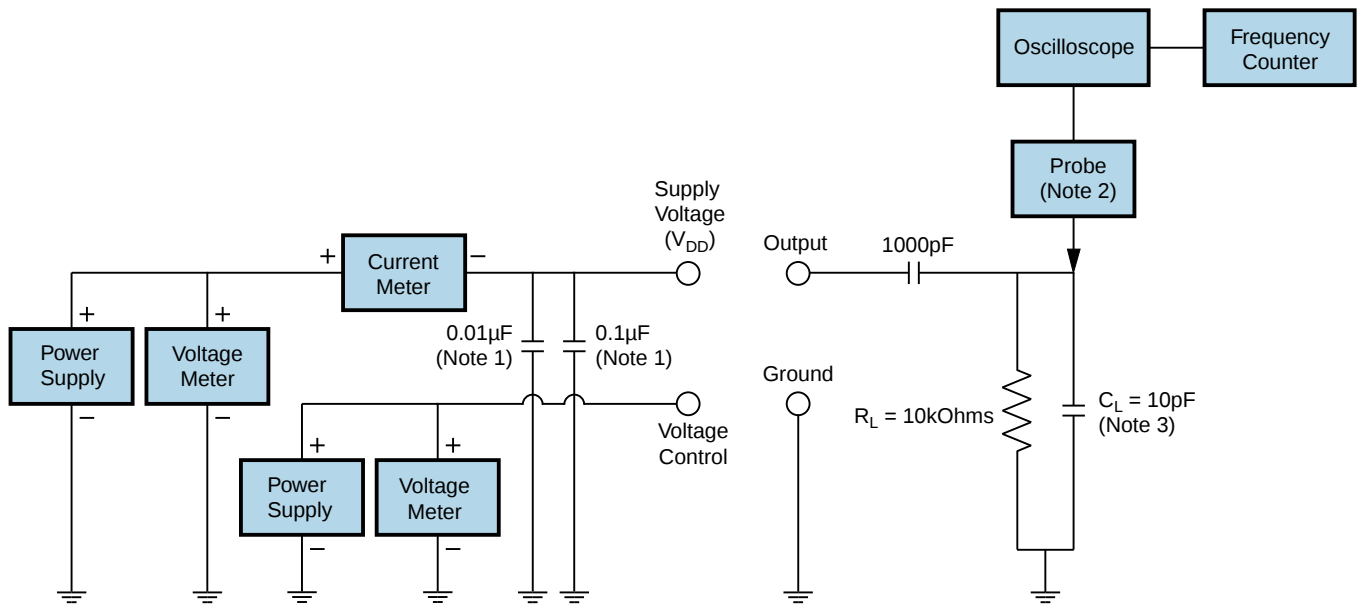
PIN	CONNECTION
1	No Connect
2	Ground
3	Output
4	Supply Voltage

LINE	MARKING
1	E24.000 <i>E=Ecliptek Designator</i>
2	XXYYZZ <i>XX=Ecliptek Manufacturing Code</i> <i>Y=Last Digit of the Year</i> <i>ZZ=Week of the Year</i>



ES52C5G20N-24.000M

Test Circuit for Voltage Control Option



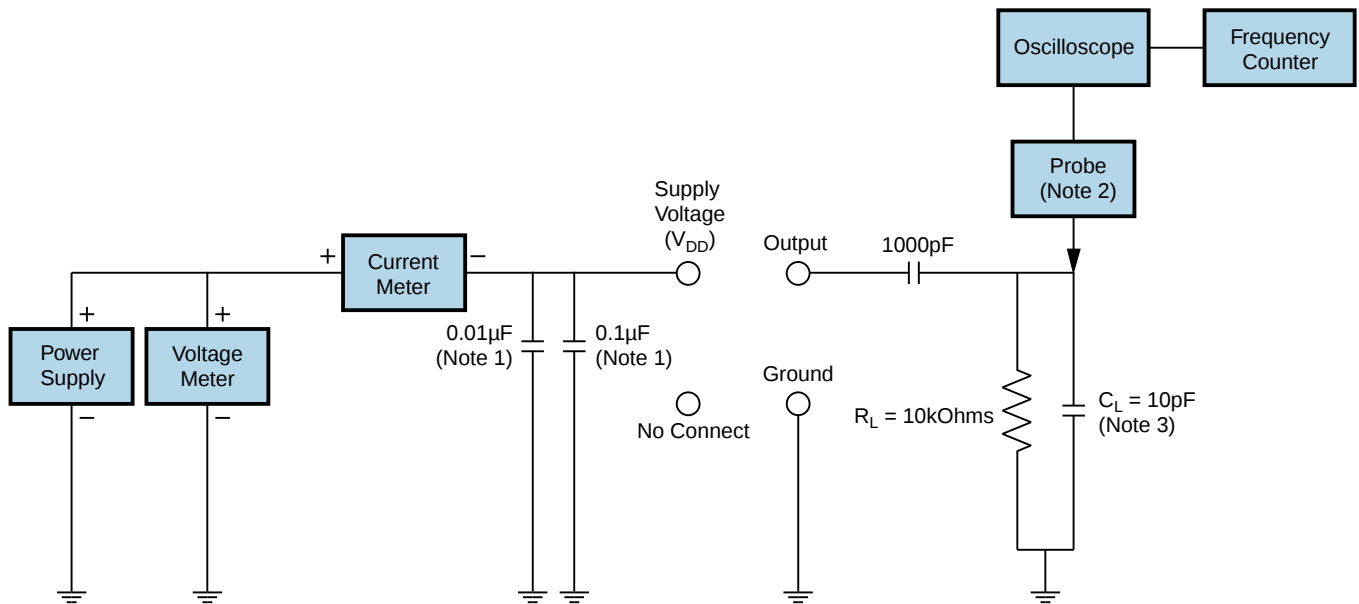
Note 1: An external $0.1\mu\text{F}$ low frequency tantalum bypass capacitor in parallel with a $0.01\mu\text{F}$ high frequency ceramic bypass capacitor close to the package ground and V_{DD} pin is required.

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.

ES52C5G20N-24.000M

Test Circuit for No Connect Option



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.

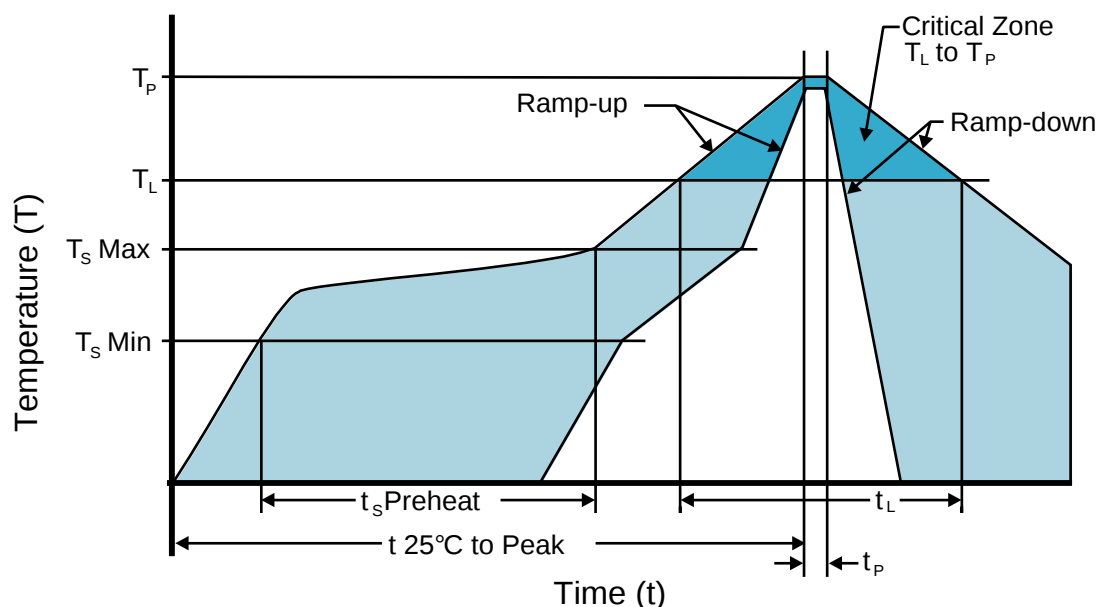
Recommended Solder Reflow Methods



High Temperature Infrared/Convection

$T_s \text{ MAX to } T_L$ (Ramp-up Rate)	3°C/second Maximum
Preheat	
- Temperature Minimum ($T_s \text{ MIN}$)	150°C
- Temperature Typical ($T_s \text{ TYP}$)	175°C
- Temperature Maximum ($T_s \text{ MAX}$)	200°C
- Time ($t_s \text{ MIN}$)	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 ($T_p \text{ Target}$)	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

Recommended Solder Reflow Methods



Low Temperature Infrared/Convection 240°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) 240°C Maximum

Target Peak Temperature (Tp Target) 240°C Maximum 2 Times / 230°C Maximum 1 Time

Time within 5°C of actual peak (tp) 10 seconds Maximum 2 Times / 80 seconds Maximum 1 Time

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.