

# Dynamic Engineers Inc.

2550 Gray Falls Dr., Suite#128, Houston, TX, 77077 USA TEL: 1-281-870-8822 EMAIL: Sales@DynamicEng.com

### XO2520BM-50MHz-A

50MHz Ultra-low Power Crystal Oscillator

#### **Features and Benefits**

Frequency range: 50MHz Supply voltage: 3.3V Current: 15mA Max.

Frequency stability vs. temperature: ±25PPM

Aging: ±3PPM per year

Operating temperature: -40°C to +85°C

Size: 2.5x2.0x0.81 mm

#### Typical Applications

loT Smartphone Digital Camera Game Console Wearable Device **Digital Consumer Electronics** 

#### **Description**

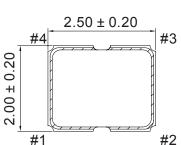
XO2520BM-50MHz-A is the low power crystal oscillator. The power consumption can be less than 15mA. It can be widely used in the low power consumption applications.

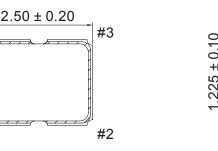
## **Mechanical Drawing & Pin Connections**

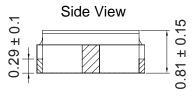
Top View

**Drawing No:** 

MD220022-1

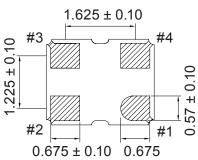






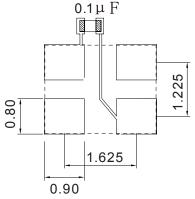
Pin#	Function				
1	Tri-state				
2	GND				
3	Output				
4	Vcc				

Unit in mm 1mm = 0.0394 inches



**Bottom View** 

#### Recommended Soldering Pattern



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1uF as close to the part as possible between Vcc and GND PAD



# Dynamic Engineers Inc.

2550 Gray Falls Dr., Suite#128, Houston, TX, 77077 USA TEL: 1-281-870-8822 EMAIL: Sales@DynamicEng.com

# XO2520BM-50MHz-A 50MHz Ultra-low Power Crystal Oscillator

# **Specifications**

Specification   Miles   Specification   Miles   Specification   Specificatio	Oscillator	Sy	Condition		Value		Unit	Note
CMOS			Condition	Min.		Max.		
Output Waveform		f <sub>0</sub>			50		MHz	
Load				T				T
Output High(Logic "1")		Waveform			CMOS			
Output Low(Logic "0")						15		
Duty Cycle				0.9Vcc				
Note								
Output enable				45	50	55	%	
Output enable	Rise & Fall Time					3	ns	
Startup Time	Tri-State		Output enable	0.7 V <sub>cc</sub>			V	floating (*Note1): Enable frequency output
Power Supply     Voltage     Voc     2.97     3.3     3.63     V       Current     At maximum supply voltage     15     mA       Stand by Current     OE pin Low and disable frequency output     10     uA       Frequency Stability       Frequency stability includes frequency tolerance @25°C and frequency stability vs. operating temperature range and voltage variance.     -25     +25     ppm       Aging     Frequency drift in first year @ 25°C     -3.0     +3.0     ppm       Environmental Conditions       Operating temperature range     -40°C to +85°C; The operating temperature range over which the frequency stability is measured.       Storage Temperature range     -55°C to +125°C       Thermal Shock     MIL-STD-883H 1010.8 Condition B; -55°C, 125°C; soak time is 10 mins, with total 200 cycles       Damp Heat     JESD22-A101; 85°C /85% RH for 500 hrs       Low Temp Storage     IEC 60068-2-1; -55°C for 500 hrs       Drop Test     IEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboard       Mechanical Shock     MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.						0.3 V <sub>cc</sub>	V	frequency
Power Supply         Voltage       V <sub>cc</sub> 2.97       3.3       3.63       V         Current       DE pin Low and disable frequency output       15       mA         Stand by Current       Frequency stability         Frequency Stability         Frequency Stability vs. operating temperature range and voltage variance.         Frequency drift in first year @ 25°C       -25       +25       ppm         Environmental Conditions         Operating temperature range         -40°C to +85°C; The operating temperature range over which the frequency stability is measured.         Storage Temperature range         -55°C to +125°C         Thermal Shock       MIL-STD-883H 1010.8 Condition B; -55°C, 125°C; soak time is 10 mins, with total 200 cycles         Damp Heat       JESD22-A101; 85°C /85% RH for 500 hrs         Low Temp Storage       IEC 60068-2-1; -55°C for 500 hrs         Low Temp Storage       IEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboard         Mechanical Shock       MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.	Startup Time					2	ms	
Current At maximum supply voltage  Stand by Current DE pin Low and disable frequency output  Frequency Stability  Frequency Stability  Frequency Stability  Frequency Stability  Frequency stability vs. operating temperature range and voltage variance.  Aging Frequency drift in first year @ 25°C -3.0 +3.0 ppm  Environmental Conditions  Operating temperature range  Storage Temperature range  Storage Temperature range  MIL-STD-883H 1010.8 Condition B; -55°C, 125°C; soak time is 10 mins, with total 200 cycles  Damp Heat JESD22-A101; 85°C /85% RH for 500 hrs  Low Temp Storage IEC 60068-2-13; -55°C for 500 hrs  Drop Test IEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboard  Mechanical Shock MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.	Power Supply							
Stand by Current  OE pin Low and disable frequency output  Frequency Stability  Frequency Stability  Overall  Frequency Stability  Frequency stability  Frequency stability includes frequency tolerance@25°C and frequency stability vs. operating temperature range and voltage variance.  Aging  Frequency drift in first year @ 25°C  Frequency stability is measured.  Storage Temperature range  -55°C to +125°C  Thermal Shock  MIL-STD-883H 1010.8 Condition B; -55°C, 125°C; soak time is 10 mins, with total 200 cycles  Damp Heat  JESD22-A101; 85°C /85% RH for 500 hrs  Low Temp Storage  IEC 60068-2-1; -55°C for 500 hrs  Drop Test  IEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboard  Mechanical Shock  MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.	Voltage	$V_{cc}$		2.97	3.3	3.63	V	
Stand by Current    OE pin Low and disable frequency output	Current					15	mA	
Prequency Stability  Frequency stability includes frequency tolerance@25°C and frequency stability vs. operating temperature range and voltage variance.  Aging  Frequency drift in first year @ 25°C -3.0  Frequency drift in first year @ 25°C	Stand by Current		OE pin Low and disable			10	uA	
Frequency stability includes frequency tolerance@25°C and frequency stability vs. operating temperature range and voltage variance.  Aging  Frequency drift in first year @ 25°C -3.0 +3.0 ppm  Frequency drift in first year @ 25°C -3.0 ppm  Frequency drift in fi	Frequency Stability		modulinoy output					
Provisor Pro			includes frequency tolerance@25°C and frequency stability vs. operating temperature range and voltage variance.	-25		+25	ppm	
Environmental ConditionsOperating temperature range-40°C to +85°C; The operating temperature range over which the frequency stability is measured.Storage Temperature range-55°C to +125°CThermal ShockMIL-STD-883H 1010.8 Condition B; -55°C, 125°C; soak time is 10 mins, with total 200 cyclesDamp HeatJESD22-A101; 85°C /85% RH for 500 hrsLow Temp StorageIEC 60068-2-1; -55°C for 500 hrsDrop TestIEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboardMechanical ShockMIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.	Aging			-3.0		+3.0	ppm	
Operating temperature range  -40°C to +85°C; The operating temperature range over which the frequency stability is measured.  Storage Temperature range  -55°C to +125°C  Thermal Shock  MIL-STD-883H 1010.8 Condition B; -55°C, 125°C; soak time is 10 mins, with total 200 cycles  Damp Heat  JESD22-A101; 85°C /85% RH for 500 hrs  Low Temp Storage  IEC 60068-2-1; -55°C for 500 hrs  Drop Test  IEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboard  Mechanical Shock  MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.	<b>Environmental Condition</b>	ns	, , , , , , , , , , , , , , , , , , , ,					
Thermal Shock  MIL-STD-883H 1010.8 Condition B; -55°C, 125°C; soak time is 10 mins, with total 200 cycles  Damp Heat  JESD22-A101; 85°C /85% RH for 500 hrs  Low Temp Storage  IEC 60068-2-1; -55°C for 500 hrs  Drop Test  IEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboard  Mechanical Shock  MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.			-40°C to +85°C; The operating temperature range over which the frequency stability is					
Thermal Shock  MIL-STD-883H 1010.8 Condition B; -55°C, 125°C; soak time is 10 mins, with total 200 cycles  Damp Heat  JESD22-A101; 85°C /85% RH for 500 hrs  Low Temp Storage  IEC 60068-2-1; -55°C for 500 hrs  Drop Test  IEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboard  Mechanical Shock  MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.								
Damp Heat  JESD22-A101; 85°C /85% RH for 500 hrs  Low Temp Storage  IEC 60068-2-1; -55°C for 500 hrs  Drop Test  IEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboard  Mechanical Shock  MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.		MIL-STD-883H 1010.8 Condition B; -55°C, 125°C; soak time is 10 mins, with total				s, with total 200		
Low Temp StorageIEC 60068-2-1; -55°C for 500 hrsDrop TestIEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboardMechanical ShockMIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.								
Drop Test IEC 60068-2-32; 70, 80, 100cm, each height for 3 times on hardboard Mechanical Shock MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.		·						
Mechanical Shock MIL-STD-883H 2002.5 Condition B; 1500g, half-sine, 0.5ms, each axis for 3 times.			·		height for 3	times on h	ardboard	
								for 3 times
Vibration Test MIL-STD-883H 2007.3 Condition A; 10~2000Hz, 1.52mm, 20g, each axis for 4 hrs	Vibration Test							

<sup>\*</sup>Note 1: A pull-up resistor of  $<30k\Omega$  between the OE pin and Vcc is recommended in a high noise environment.