

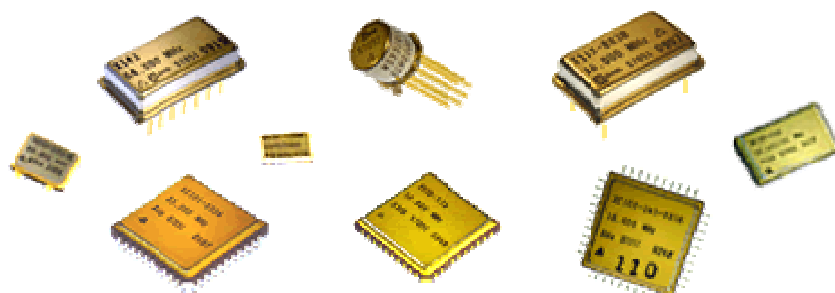
# Kamaka Electronic GmbH

73431 Aalen - Ulmer Strasse 130 – Phone: +49-7361-9662-0 – Fax: +49-7361-9662-29






## WELCOME TO X SIS ELECTRONICS

Manufacturer of Hybrid Microcircuit Crystal Oscillators  
For Military, Space, and High Reliability Industrial  
and Telecommunications Applications

Over 33 Years of Delivering Outstanding Quality  
Hybrid Microcircuit Crystal Oscillators



### NEW PRODUCTS

Type Number	Supply Voltage	Output Type	Output Enable	Frequency Range	Package Outline
<b>XC5A</b>	5.0 VDC	HCMOS/TTL	Yes	1.0 MHz - 105.0 MHz	5x7 mm  Lead Less
<b>XC5L</b>	3.3 VDC	HCMOS/TTL	Yes	1.0 MHz - 200.0 MHz	
<b>XC5N</b>	2.5 VDC	HCMOS	Yes	1.0 MHz - 190.0 MHz	
<b>XC5R</b>	1.8 VDC	HCMOS	Yes	1.0 MHz - 160.0 MHz	
<b>XE40-100</b>	5 VDC	TTL	Yes	400 KHz to 90 MHz	7x9 mm  "J" Leads
<b>XE40-200A</b>	5 VDC	HC/ACMOS	Yes	400 K Hz to 90 MHz	
<b>XE40-L00A</b>	3.3 VDC	HC/ACMOS/TTL	Yes	400 KHz to 100 MHz	
<b>XE30-100</b>	5 VDC	TTL	Yes	400 KHz to 90 MHz	9x14 mm  "J" Leads
<b>XE30-200A</b>	5 VDC	HC/ACMOS	Yes	400 K Hz to 90 MHz	
<b>XE30-L00A</b>	3.3 VDC	HC/ACMOS/TTL	Yes	400 KHz to 100 MHz	
<b>M55310/09</b>	5.0 VDC	TTL	No	400.0 KHz - 60.0 MHz	8 Pin (Round) 
<b>M55310/27</b>	5.0 VDC	HCMOS	Yes	1.0 MHz - 85.0 MHz	9x14 mm  "J" Leads
<b>M55310/30</b>	3.3 VDC	HCMOS	Yes	450.0 KHz - 85.0 MHz	

## **PRODUCT HIGHLIGHTS**

- **QPL TO MIL-PRF-55310**
  - **883B SCREENING**
- **CUSTOM HI-REL SCREENING**
- **TTL - CMOS - AC/HCMOS - GATED - ECL**
  - **COMPLEMENTARY OUTPUTS**
  - **MULTIPLE FREQUENCY OUTPUTS**
  - **WIDE FREQUENCY RANGES**
- **VARIETY OF FREQUENCY STABILITIES**
- **MULTIPLE TEMPERATURE RANGES**
  - **DUAL IN-LINE PACKAGE**
  - **TO (Round) PACKAGE**
- **LEADLESS CHIP CARRIER ( Surface Mount )**
  - **"J" LEAD PACKAGE (Surface Mount )**
- **"GULL WING" LEADS PACKAGE ( Surface Mount )**
- **RESISTANCE - WELDED, HERMETICALLY SEALED**
  - **HIGH SHOCK & VIBRATION DESIGNS**

## STANDARD PRODUCTS

Type No.	Supply Voltage	Output Type	Output Enable	Frequency Range	Package Outline
<b>XC5A</b>	5.0 VDC	HCMOS/TTL	YES	1.0 MHz - 105.0 MHz	5 x 7 mm  Lead Less
<b>XC5L</b>	3.3 VDC	HCMOS/TTL	YES	1.0 MHz - 200.0 MHz	
<b>XC5N</b>	2.5 VDC	HCMOS	YES	1.0 MHz - 190.0 MHz	
<b>XC5R</b>	1.8 VDC	HCMOS	YES	1.0 MHz - 160.0 MHz	
<b>XE40-100</b>	5 VDC	TTL	Yes	400 KHz to 90 MHz	9 x 7 mm  "J" Leads
<b>XE40-200A</b>	5 VDC	HC/ACMOS	Yes	400 KHz to 90 MHz	
<b>XE40-L00A</b>	3.3 VDC	HC/ACMOS/TTL	Yes	400 KHz to 100 MHz	
<b>XE30-100</b>	5 VDC	TTL	Yes	400 KHz to 90 MHz	9 x 14 mm  "J" Leads
<b>XE30-200A</b>	5 VDC	HC/ACMOS	Yes	400 KHz to 90 MHz	
<b>XE30-L00A</b>	3.3 VDC	HC/ACMOS/TTL	Yes	400 KHz to 100 MHz	
<b>X100</b>	5 VDC	TTL	Yes	60 Hz to 90 MHz	14 Pin DIP 
<b>M100</b>	5 VDC	TTL	No	60 Hz to 90 MHz	
<b>E100</b>	5 VDC	TTL	No	60 Hz to 90 MHz	
<b>X200A</b>	5 VDC	HC/ACMOS	Yes	5 Hz to 90 MHz	
<b>X3200</b>	3.3 VDC	HC/ACMOS/TTL	Yes	100 KHz to 100 MHz	
<b>XL00</b>	3.3 VDC	HC/ACMOS/TTL	Yes	100 KHz to 100 MHz	
<b>X200</b>	5 to 15 VDC	CMOS	No	1.5Hz to 12 MHz	14 Pin DIP 
<b>M200</b>	5 to 15 VDC	CMOS	No	1.5Hz to 12 MHz	
<b>E200</b>	5 to 15 VDC	CMOS	No	1.5Hz to 12 MHz	
<b>T100</b>	5 VDC	TTL	Yes	60 Hz to 90 MHz	4 Pin DIP 
<b>T200</b>	5 to 15 VDC	CMOS	No	1.5 Hz to 12 MHz	
<b>T200A</b>	5 VDC	HC/ACMOS	Yes	5 Hz to 90 MHz	
<b>T3200</b>	3.3 VDC	HC/ACMOS/ TTL	Yes	100 KHz to 100 MHz	

<b>XE20-100</b>	5 VDC	TTL	Yes	400 KHz to 90 MHz	TO (Round) 
<b>XE20-200A</b>	5 VDC	HC/ACMOS	Yes	400 K Hz to 90 MHz	
<b>XE20-L00A</b>	3.3 VDC	HC/ACMOS/TTL	Yes	400 KHz to 100 MHz	
<b>XE10-100</b>	5 VDC	TTL	Yes	400 KHz to 90 MHz	LCC  Surface Mount
<b>XE10-200A</b>	5 VDC	HC/ACMOS	Yes	400 KHz to 90 MHz	
<b>XE10-3200</b>	3.3 VDC	HC/ACMOS	Yes	400 KHz to 100 MHz	
<b>XE101-100</b>	5 VDC	TTL	Yes	400 KHz to 90 MHz	"J" Leads  Surface Mount
<b>XE101-200A</b>	5 VDC	HC/ACMOS	Yes	400 KHz to 90 MHz	
<b>XE101-3200</b>	3.3 VDC	HC/ACMOS	Yes	400 KHz to 100 MHz	
<b>XE102-100</b>	5 VDC	TTL	Yes	400 KHz to 90 MHz	Gull Wing Leads  Surface Mount
<b>XE102-200A</b>	5 VDC	HC/ACMOS	Yes	400 KHz to 90 MHz	
<b>XE102-3200</b>	3.3 VDC	HC/ACMOS	Yes	400 KHz to 100 MHz	
<b>X300</b>	-5.2 VDC	ECL	No	10.0 to 240 MHz	14 Pin DIP 
<b>X300A</b>	-4.5 VDC	ECL	No	10.0 to 240 MHz	
<b>T300</b>	-5.2 VDC	ECL	No	10.0 to 240 MHz	4 Pin DIP 
<b>T300A</b>	-4.5 VDC	ECL	No	10.0 to 240 MHz	

## QPL ( M55310 ) OSCILLATORS

Type Number	Supply Voltage	Output Type	Output Enable	Frequency Range	Package Outline
<b>M55310/08</b>	5.0 VDC	TTL	No	100.0 Hz - 50.0 MHz	14 Pin  DIP
<b>M55310/09</b>	5.0 VDC	TTL	No	400.0 KHz - 60.0 MHz	8 Pin  Round
<b>M55310/11</b>	5 to 15 VDC	CMOS	No	50 KHz - 10.0 MHz	14 Pin  DIP
<b>M55310/14</b>	5.0 VDC	TTL	No	100.0 Hz - 25.0 MHz	14 Pin  DIP
<b>M55310/15</b>	5 to 15 VDC	CMOS	No	5.25 Hz - 10.0 MHz	14 Pin  DIP
<b>M55310/16</b>	5.0 VDC	TTL	No	100.0 Hz - 80.0 MHz	14 Pin  DIP
<b>M55310/17</b>	5.0 VDC	TTL (GATED)	Yes	250.0 KHz - 50.0 MHz	14 Pin  DIP
<b>M55310/18</b>	5 to 15 VDC	CMOS	No	5.25 Hz - 15.0 MHz	14 Pin  DIP
<b>M55310/19</b>	5.0 VDC	TTL	No	1.0 MHz - 60.0 MHz	.485" Sq.  LCC
<b>M55310/26</b>	5.0 VDC	HCMOS	No	10.0 KHz - 65.0 MHz	14 Pin  DIP
<b>M55310/26</b>	5.0 VDC	HCMOS	No	10.0 KHz - 65.0 MHz	4 Pin  DIP
<b>M55310/27</b>	5.0 VDC	HCMOS	Yes	1.0 MHz - 85.0 MHz	9x14mm  "J" Leads
<b>M55310/30</b>	3.3 VDC	HCMOS	Yes	450.0 KHz - 85.0 MHz	

# CRYSTAL OSCILLATORS FOR SPACE APPLICATIONS

Xsis Electronics is a leading supplier of Advance Design Rad-Hard Hybrid Crystal Oscillators for space applications. The following is a list of some of the space programs where Xsis oscillators have been used in flight hardware.

<b>Program Name</b>	<b>Description</b>
<b>Spacebuss 3000B</b>	<b>Alcatel Telecommunication Satellite Program</b>
<b>Amos 3</b>	<b>Israel Telecommunication Satellite</b>
<b>Cryosat</b>	<b>ESA Earth Observation Satellite</b>
<b>HTV</b>	<b>Japanese Space Vehicle to Space Station</b>
<b>TerraSar-X</b>	<b>German Earth Observation Satellite</b>
<b>Tandem-X</b>	<b>Second TerraSar-X</b>
<b>SMOS</b>	<b>ESA Earth Observation Satellite</b>
<b>Rapid Eye</b>	<b>ESA Earth Observation Satellite</b>
<b>Lisa Pathfinder</b>	<b>ESA/NASA Earth Observation Satellite</b>
<b>ISSR Mass Memory</b>	<b>Japanese Project</b>
<b>Express AM33, AM44</b>	<b>Russian Telecommunication Satellite</b>

# STANDARD ENVIRONMENTAL SPECIFICATIONS

Environmental Specifications are derived from MIL-PRF-55310 and are generally performed on a sampling basis for qualification to insure that all units in production meet or exceed the required specifications. This sampling method, coupled with Workmanship Standards to

MIL-PRF-38534, a Product Assurance Plan in accordance with MIL-STD-790 and a Quality System certified to ISO-9001, insures a superior product.

<b>VIBRATION</b>	<b>0.06" DA, 30G Peak, 10 - 2000 Hz, MIL-STD-202, Method 204, Cond. G</b>
<b>SHOCK</b>	<b>1/2 Sine, 1500G Peak, MIL-STD-883, Method 2002, Cond. B</b>
<b>THERMAL SHOCK</b>	<b>MIL-STD-202, Method 107, Cond. B</b>
<b>ALTITUDE</b>	<b>MIL-STD-202, Method 105, Cond. C</b>
<b>MOISTURE RESISTANCE</b>	<b>MIL-STD-202, Method 106, Vibration Sub cycle Omitted</b>
<b>SALT SPRAY</b>	<b>MIL-STD-883, Method 1009, Cond. A</b>
<b>CONSTANT ACCELERATION</b>	<b>MIL-STD-883, Method 2001, 5000G</b>
<b>SOLDERABILITY</b>	<b>MIL-STD-202, Method 208</b>
<b>RESISTANCE TO SOLDERING HEAT</b>	<b>MIL-STD-202, Method 210, Cond. C or B as Applicable</b>
<b>RESISTANCE TO SOLVENTS</b>	<b>MIL-STD-202, Method 215</b>
<b>INTERNAL WATER VAPOR CONTENT</b>	<b>MIL-STD-883, Method 1018</b>

# 883B SCREENING

( Same as MIL-PRF-55310, Class B Screening )

When 883B Screening is specified, Xsis oscillators are subjected to the following tests on a 100% basis. PDA for burn-in is in accordance with the requirements of MIL-PRF-55310 for Class B products.

<b>Internal Visual</b>	<b>MIL-STD-883, Method 2017, Class B</b>
<b>Stabilization Bake</b>	<b>MIL-STD-883, Method 1008, Cond. C, 24 Hours Minimum</b>
<b>Temperature Cycling</b>	<b>MIL-STD-883, Method 1010, Cond. B</b>
<b>Constant Acceleration</b>	<b>MIL-STD-883, Method 2001, Cond. A, Y<sub>1</sub> only,( 5000 G )</b>
<b>Seal ( fine &amp; gross leak )</b>	<b>MIL-STD-883, Method 1014</b>
<b>Electrical Tests</b>	<b>MIL-PRF-55310, Class B</b>
<b>Burn-in</b>	<b>+125 °C, Nominal Supply Voltage &amp; Burn-in Load, 160 Hours Min.</b>
<b>Electrical Tests</b>	<b>MIL-PRF-55310, Class B</b>



# CUSTOM HI-REL SCREENING

( Similar to MIL-PRF-55310, "Class S" Screening )

When required by the customer, Xsis oscillators can be subjected to the following screening tests on a 100% basis. PDA for burn-in & Non-Destruct Bond Pull are in accordance with the requirements of MIL-PRF-55310 for "class S" products.

<b>Non-Destruct Bond Pull</b>	<b>MIL-STD-883, Method 2023 ( PDA=2% or 1 wire whichever is greater )</b>
<b>Internal Visual</b>	<b>MIL-STD-883, Method 2017, Class "S", Except Class "B" for Elements</b>
<b>Stabilization Bake</b>	<b>MIL-STD-883, Method 1008, Cond. C, 48 Hours Minimum</b>
<b>Thermal Shock</b>	<b>MIL-STD-883, Method 1011, Cond. A</b>
<b>Temperature Cycling</b>	<b>MIL-STD-883, Method 1010, Cond. B</b>
<b>Constant Acceleration</b>	<b>MIL-STD-883, Method 2001, Cond. A, Y<sub>1</sub> only, ( 5000 G )</b>
<b>Seal - fine &amp; gross leak</b>	<b>MIL-STD-883, Method 1014</b>
<b>PIND</b>	<b>MIL-STD-883, Method 2020, Cond. A</b>
<b>Radiographic Insp.</b>	<b>MIL-STD-883, Method 2012</b>
<b>Electrical Tests</b>	<b>MIL-PRF-55310, Class B</b>
<b>Burn-in</b>	<b>+125 °C, Nominal Supply Voltage &amp; Burn-in Load, 320 Hours Min.</b>
<b>Electrical Tests</b>	<b>MIL-PRF-55310, Class B</b>

# MICROCIRCUIT CRYSTAL OSCILLATOR

## TERMINOLOGY

<b>Nominal Frequency</b>	<b>Customer specified frequency</b>
<b>Frequency Accuracy @ +25 °C (Setting and/or Calibration Tolerance)</b>	<b>How close to the specified frequency the output frequency is factory adjusted at +25 °C.</b>
<b>Frequency Stability Vs. Temperature</b>	<b>The maximum frequency deviation over a specified temperature range with respect to the frequency measured at +25 °C <math>\pm</math> 1 °C. This can be expressed as a percentage, PPM, or in scientific notation, e.g. <math>\pm</math> 0.005%, or <math>\pm</math> 50PPM, or <math>50(10)^{-6}</math>.</b>
<b>Operating Temperature Range</b>	<b>The operating temperatures range over which the frequency stability and other electrical parameters must remain within their specified limits.</b>
<b>Aging</b>	<b>Long term frequency changes which are due primarily to variations in the crystal and other oscillator components.</b>
<b>Input Current</b>	<b>The current drawn by the device from the power source at a specified supply voltage.</b>
<b>Rise Time (TTL)</b>	<b>The time required for output voltage to rise from 0.6 VDC to 2.2 VDC.</b>
<b>Rise Time (CMOS &amp; ECL)</b>	<b>The time required for output voltage to rise from 10% to 90% of the peak to peak output.</b>
<b>Fall Time (TTL)</b>	<b>The time required for output voltage to drop from 2.2 VDC to 0.6 VDC.</b>
<b>Fall Time (CMOS &amp; ECL)</b>	<b>The time required for output voltage to drop from 90% to 10% of the peak to peak output amplitude.</b>
<b>Symmetry (TTL)</b>	<b>The percentage of time the output voltage is above the TTL threshold (1.4VDC @ +25 °C).</b>
<b>Symmetry (CMOS &amp; ECL)</b>	<b>The percentage of time the output voltage is above the 50% of the peak to peak output amplitude</b>

## **QUALITY MANAGEMENT SYSTEM**

Xsis Electronics Quality Management System is designed to meet or exceed the requirements of ISO-9001, MIL-STD-790, and MIL-PRF-55310.

Xsis Electronics has been surveyed and approved by virtually every defense contractor in the United States, and worldwide. Xsis Electronics is currently certified for ISO-9001-2000, MIL-PRF-55310 and MIL-STD-790.