

**FREQUENCY ELECTRONICS, INC.**  
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**MODEL FE-189A**

- High stability vs. temperature-up to  $\pm 2 \times 10^{-10}$
- Low aging
- Low phase noise
- Ideal for GPS, CDMA, 3G applications

**HIGH STABILITY, LOW AGING, DOUBLE OVEN CRYSTAL OSCILLATOR  
 MODEL FE-189A SPECIFICATIONS**

MODEL NUMBER	FE-189A			UNITS
STANDARD FREQUENCY*	10.0			MHz
Frequency Range	4.096 to 20.0			MHz
Output Signal Into 50 ohms (HCMOS also available)	>0.0			dBm
ORDER DESIGNATOR <b>X</b> Operating Temperature Range E(-10°C to +70°C)	Frequency stability over temperature ORDER DESIGNATOR <b>XX</b>			
	<b>02</b> $\pm 2 \times 10^{-10}$	<b>03</b> $\pm 3 \times 10^{-10}$	<b>04</b> $\pm 4 \times 10^{-10}$	
<b>H</b> (-40°C +70°C)	<b>02</b> $\pm 2 \times 10^{-10}$	<b>03</b> $\pm 3 \times 10^{-10}$	<b>04</b> $\pm 4 \times 10^{-10}$	
Frequency stability versus supply voltage 12V $\pm$ 5%	$< \pm 0.5 \times 10^{-10}$			
Frequency stability versus Load 50 Ohm $\pm$ 10%	$< \pm 1 \times 10^{-10}$			
Long term stability	$< \pm 0.3 \times 10^{-9}$		per day after 7 days	
	$< \pm 0.15 \times 10^{-9}$		per day after 30 days	
	$< \pm 30 \times 10^{-9}$		per year	
	$< \pm 100 \times 10^{-9}$		per 10year	

Phase Noise (for 10 MHz) typical:		
1Hz	$< -101$	dBc/Hz
10Hz	$< -129$	dBc/Hz
100Hz	$< -145$	dBc/Hz
1000Hz	$< -149$	dBc/Hz
10000Hz	$< -150$	dBc/Hz
Harmonic suppression	$> 40$	dB
Short term stability (Allan Variance) for 1s	$< 3 \times 10^{-12}$ typical	
Warm-up time:	$< 15$ within $\pm 5 \times 10^{-8}$	min
Frequency control range	$> \pm 1.5 \times 10^{-7}$	
Voltage control range	0 to +5(+ slope)	V
Supply voltage $\pm 5\%$	12	V
Peak current consumption after switch on	$< 1.5$	A
Current consumption at steady state	$< 350$	mA
Package outline	<b>Z38</b>	
	2"X2"X1.5"	in
	50.8X50.8X38	mm
Shock	50	g
Vibration	10-200Hz,5g	

2002-07-26-Rev2-FEI

**Ordering Information**

**FORMAT:** Model number, operating temperature, temperature coefficient, package, output format, and frequency.

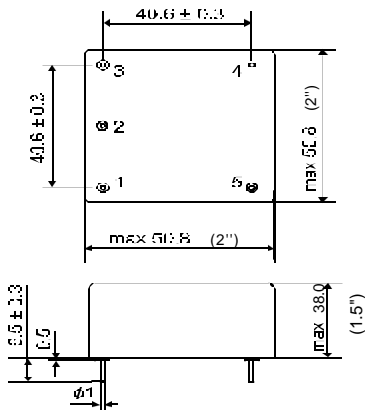
**EXAMPLE:** FE-189A-E-03-Z38-[Sine]-10.0 MHz

E (-10°C +70°C), 03 (frequency stability over temperature of  $\pm 3 \times 10^{-10}$ ), Z38 (package), Sine (output format) 10.0 MHz (frequency)

**EXAMPLE:** FE-189A-E-03-Z38-[HCMOS]-10.0 MHz

[HCMOS] – for oscillators with HCMOS output

Consult factory for minimum order requirements  
 \*Special Frequencies have minimum orders



FE-189A Package Outline

**PIN FUNCTION**  
 1 Freq. Adj.  
 2 V Reference  
 3 RF Output  
 4 GND  
 5 Supply Voltage

