VECTRON INTERNATIONAL
A DOVER COMPANY

MV-9350A

80-220 MHz High Performance VCXO

Helping Customers Innovate, Improve & Grow

Features

- Any frequency between 80 MHz and 220 MHz with 6 decimal places of accuracy
- CMOS compatible output
- Industrial and extended commercial temperature ranges
- Industry-standard packages: 3.2 mm x2.5 mm (4-pin), 5.0 mm x 3.2 mm (6-pin), 7.0 mm x 5.0 mm (6-pin)

Applications

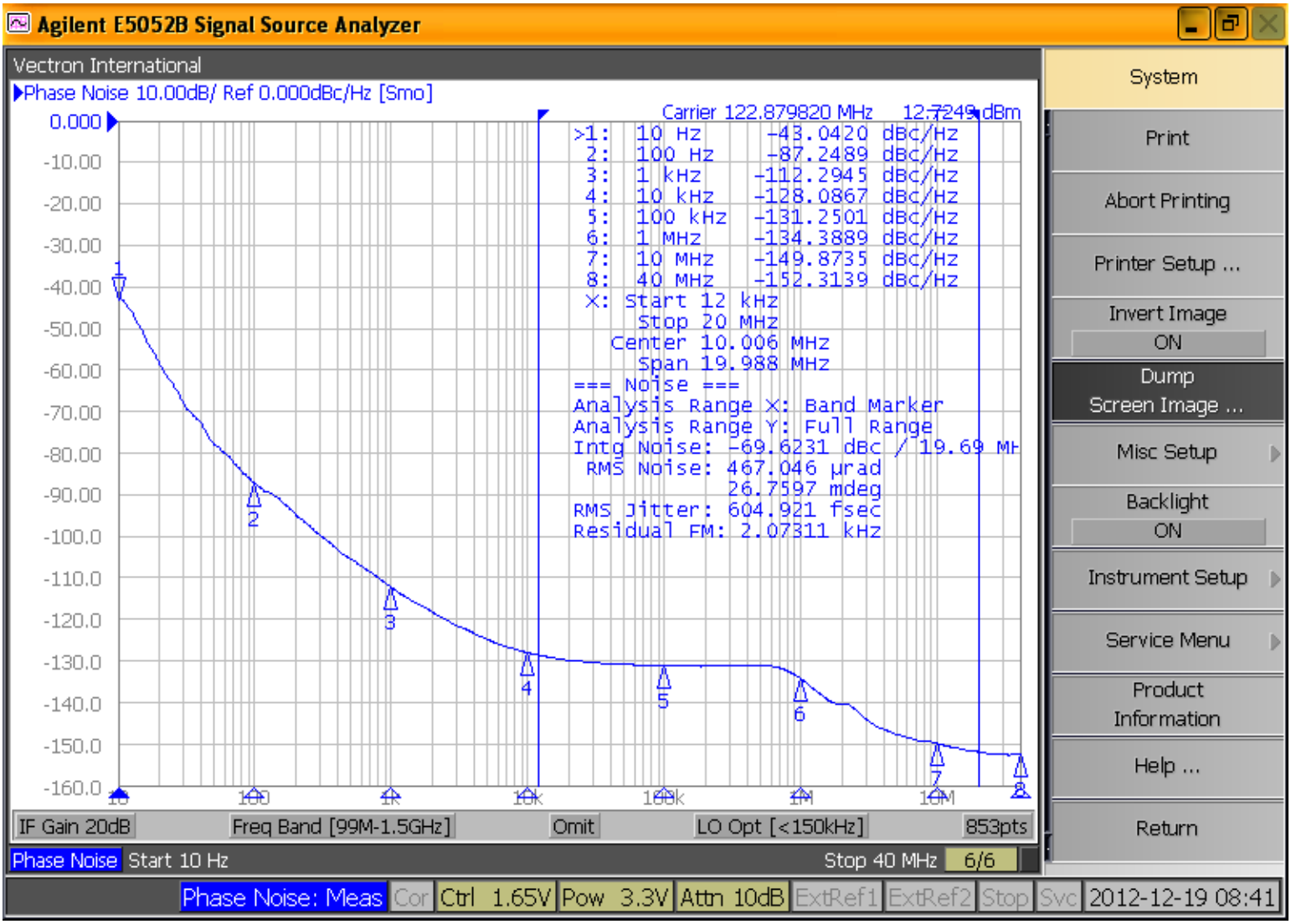
- Ideal for telecom clock synchronization, low bandwidth analog PLL, jitter cleaning, clock recovery, audio, video, FPGA, broadband and networking

Performance Specifications

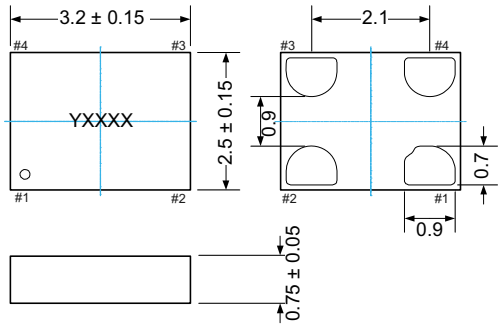
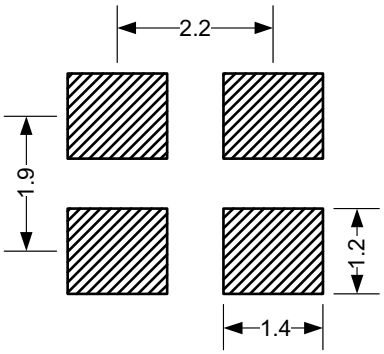
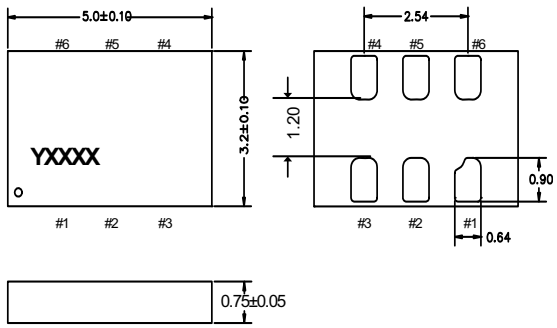
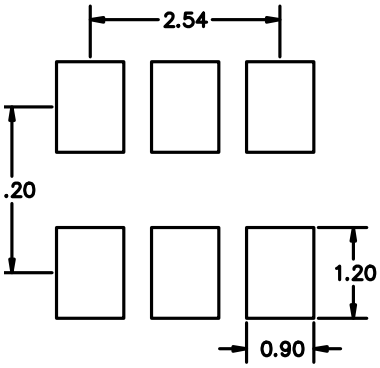
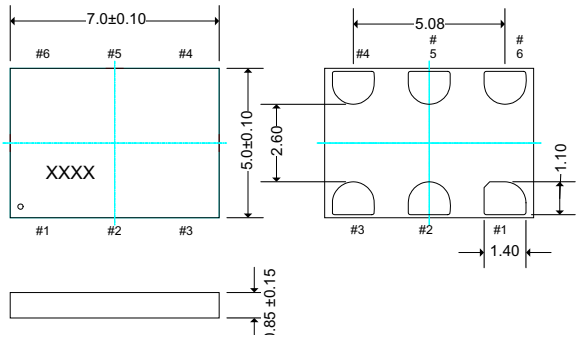
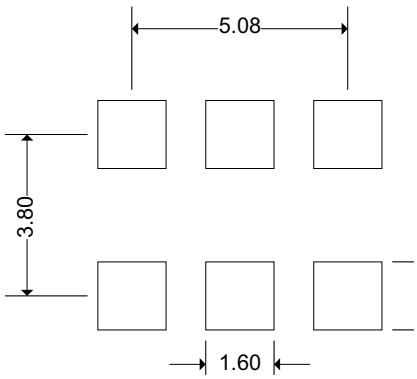
Parameter and Conditions	Symbol	Min.	Typ.	Max.	Unit	Condition
Output Frequency Range	f	80	–	220	MHz	
Frequency Stability	F_stab	-25	–	+25	PPM	Inclusive of Initial tolerance at 25 °C, and variations over operating temperature, aging, supply voltage and load
		-50	–	+50	PPM	
Aging	F_aging	–	–	±5	PPM	10 years
Operating Temperature Range	T_use	-20	–	+70	°C	Extended Commercial
		-40	–	+85	°C	Industrial
Supply Voltage	Vdd	2.97	3.3	3.63	V	Contact Vectron for any other voltage support between 2.5V and 3.3V
		2.52	2.8	3.08	V	
		2.25	2.5	2.75	V	
		1.71	1.8	1.89	V	
Pull Range	PR	±50, ±80, ±100			PPM	
Upper Control Voltage	VC_U	1.7	–	–	V	Vdd = 1.8 V, Voltage at which maximum deviation is guaranteed.
		2.4	–	–	V	Vdd = 2.5 V, Voltage at which maximum deviation is guaranteed.
		2.7	–	–	V	Vdd = 2.8 V, Voltage at which maximum deviation is guaranteed.
		3.2	–	–	V	Vdd = 3.3 V, Voltage at which maximum deviation is guaranteed.
Lower Control Voltage	VC_L	–	–	0.1	V	Voltage at which miminum deviation is guaranteed.
Control Voltage Input Impedence	Z_vin	100	–	–	kΩ	For the voltage control pin
Linearity	Lin	–	0.1	1	%	
Frequency Change Polarity		Positive slope				
Control Voltage Bandwidth (-3dB)	V_BW	–	8	–	kHz	Contact Vectron for 16 kHz and other high bandwidth options
Current Consumption	Idd	–	34	36	mA	No load condition, f = 100 MHz, Vdd = 2.5 V, 2.8 V or 3.3 V
		–	30	33	mA	No load condition, f = 100 MHz, Vdd = 1.8 V
Standby Current	I_std	–	–	70	µA	All Vdds, ST = GND, output is Weakly Pulled Down
Duty Cycle	DC	45	–	55	%	f <= 165 MHz, all Vdds.
		40	–	60	%	f > 165 MHz, all Vdds.
Rise/Fall Time	Tr, Tf	–	1.5	2	ns	Vdd = 1.8, 2.5, 2.8 or 3.3 V, 10% - 90% Vdd level
Output Voltage High	VOH	90%	–	–	Vdd	OH = -7 mA, IOL = 7 mA, (Vdd = 3.3 V) IOH = -4 mA, IOL = 4 mA, (Vdd = 2.8 V and Vdd = 2.5 V) IOH = -2 mA, IOL = 2 mA, (Vdd = 1.8 V)
Output Voltage Low	VOL	–	–	10%	Vdd	
Input Pull-up Impedance	Z_in	–	100	250	kΩ	For the OE/ST pin if available
Start-up Time	T_start	–	6	10	ms	
OE Enable/Disable Time	T_oe	–	–	150	ns	f=100 MHz, all Vdds. For other freq, T_oe = 100 ns + 3 cycles
Resume Time	T_resume	–	–	10	ms	Measured from the time ST pin crosses 50% threshold
RMS Period Jitter	T_jitt	–	1.5	2	ps	f = 156.25 MHz, Vdd = 2.5 V, 2.8 V or 3.3 V
		–	2	3	ps	f = 156.25 MHz, Vdd = 1.8 V
RMS Phase Jitter (random)	T_phj	–	0.6	1	ps	f = 156.25 MHz, Integration bandwidth=12kHz to 20MHz, All Vdds

Vectron International • 267 Lowell Road, Hudson, NH 03051 • Tel: 1-88-VECTRON-1 • http://www.vectron.com
Rev 6: October 2013

Typical Phase Noise



Packaging and Pinout

Package Outline & Dimensions (Unit: mm)	Recommended Land Pattern (Unit: mm)
3.2 x 2.5 x 0.75 mm	
	
5.0 x 3.2 x 0.75 mm	
	
7.0 x 5.0 x 0.90 mm	
	

4 pin package: Pin Connections		
Pin	Symbol	Functionality
1	VIN	0-Vdd: Produces voltage dependent frequency change
2	GND	VDD Power Supply Ground
3	CLK	Oscillator output
4	Vdd	Power supply voltage

6 pin package: Pin Connections		
Pin	Symbol	Functionality
1	VIN	0-Vdd: Produces voltage dependent frequency change
2 (options)	NC	H or L or Open: No effect on output frequency or other device functions
	OE	H or Open: specified frequency output, L: output is high impedance
	ST	H or Open: specified frequency output, L: output is low level (weak pull down). Oscillation stops
3	GND	VDD Power Supply Ground
4	CLK	Oscillator output
5	NC	Do Not Connect; Leave it floating
6	Vdd	Power supply voltage

Absolute Maximum Ratings and Test Compliance

Maximum Ratings			
Parameter	Min.	Max.	Unit
Storage Temperature	-65	150	°C
VDD	-0.5	4	V
Electrostatic Discharge	–	6000	V
Soldering Temperature (follow standard Pb free soldering guidelines)	–	260	°C
Program Retention over -40 to 125°C, Process, Vdd (0 to 3.65 V)	1,000+	-	Years

Environmental Compliance	
Parameter	Condition/Test Method
Mechanical Shock	MIL-STD-883F, Method 2002
Mechanical Vibration	MIL-STD-883F, Method 2007
Temperature Cycle	JESD22, Method A104
Solderability	MIL-STD-883F, Method 2003
Moisture Sensitivity Level	MSL1 @ 260°C

Ordering Information

MV - 9350A E - 1 F - E E K 156M250000

Product
MV: MEMS VCXO

Family
9350A: VCXO, 80-220MHz

Temp Range
J: -20/70°C
E: -40/85°C

Package
1: 6 pin 7.0mm x 5.0mm
3: 6 pin 5.0mm x 3.2mm
6: 4 pin 3.2mm x 2.5mm

Stability
F: ±25ppm
K: ±50ppm

Supply Voltage
E: +3.3 Vdc
G: +2.8 Vdc
H: +2.5 Vdc
J: +1.8 Vdc

Feature Pin
N: No Connect
(6 pin option, default for 4 pin)
E: Ouput Enable
S: Standby

Pull Range (APR)
K: 50ppm
P: 80ppm
S: 100ppm

Frequency

Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Unless otherwise stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
3. Subject to technical modification.
4. Contact factory for availability.

For Additional Information, Please Contact

USA:
Vectron International
267 Lowell Road
Hudson, NH 03051
Tel: 1.888.328.7661
Fax: 1.888.329.8328

Europe:
Vectron International
Landstrasse, D-74924
Neckarbischofsheim, Germany
Tel: +49 (0) 7268.801.100
Fax: +49 (0) 7268.801.282

Asia:
68 Yin Cheng Road(C), 22nd Floor
One Lu Jia Zui
Pudong, Shanghai 200120, China
Tel: +86 21 6194 6886
Fax: +86 21 6194 6699