Helping Customers Innovate, Improve & Grow

Features

- Any frequency between 1 MHz and 110 MHz accurate to 6 decimal places
- Low power consumption of 4.5 mA typical
- CMOS compatible output
- Industry-standard packages: 2.0 x 1.6, 2.5 x 2.0, 3.2 x 2.5, 5.0 x 3.2, 7.0 x 5.0 mm
- Operating temperature to 125°C
- Capable of surviving 50,000 g shock, with 70 g vibration resistance and 0.1ppb/g g-sensitivity

Applications

- Military Applications
- Environmentally Demanding Applications
- Ruggedized Equipment

Performance Specifications

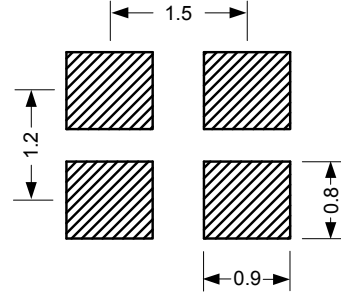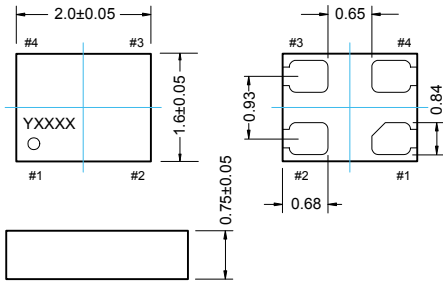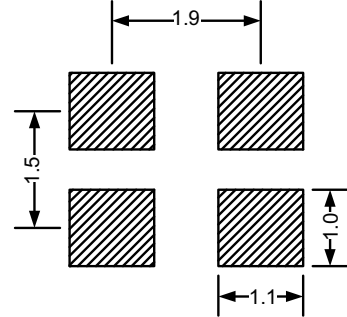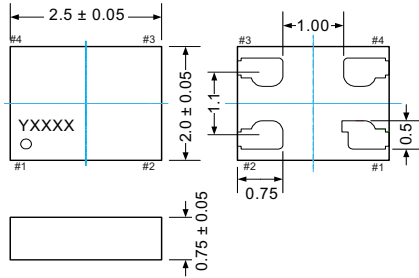| Parameter and Conditions	Symbol	Min.	Typ.	Max.	Unit	Condition
Output Frequency Range	f	1	–	110	MHz	
Frequency Stability	F_stab	-20	–	+20	ppm	Inclusive of Initial tolerance at 25°C, and variations over operating temperature, rated power supply voltage and load.
		-50	–	+50	ppm	
Aging	Ag	−1.5	–	1.5	ppm	1st year at 25°C
Operating Temperature Range	T_use	-55	–	+125	°C	
		-40	–	+125	°C	
		-40	–	+105	°C	
		-40	–	+85	°C	
Supply Voltage	Vdd	1.62	1.8	1.98	V	Other supply voltages between 2.5V and 3.3V can be supported. Contact Vectron for additional information.
		2.25	2.5	2.75	V	
		2.52	2.8	3.08	V	
		2.7	3.0	3.3	V	
		2.97	3.3	3.63	V	
Current Consumption	Idd	–	3.9	5	mA	No load condition, f = 20 MHz, Vdd = 2.5V, 2.8V, 3.0V or 3.3V
		–	3.6	4.5	mA	No load condition, f = 20 MHz, Vdd = 1.8V
Standby Current	I_std	–	2.5	10	μA	ST = GND, Vdd = 3.0V or 3.3V, Output is Weakly Pulled Down
		–	2.5	10	μA	ST = GND, Vdd = 2.5V or 2.8V, Output is Weakly Pulled Down
		–	1	5	μA	ST = GND, Vdd = 1.8V, Output is Weakly Pulled Down
Duty Cycle	DC	45	–	55	%	All supply voltage options
Rise/Fall Time	Tr, Tf	–	1.2	2.5	ns	20% - 80% Vdd = 2.5V, 2.8V, 3.0V or 3.3V
		–	1.5	3.5	ns	20% - 80% Vdd = 1.8V
		-	1.5	3	ns	20% - 80% Vdd = 2.25V - 3.63V
Output High Voltage	VOH	90%	–	–	Vdd	IOH = -4 mA (Vdd = 3.0V or 3.3V) IOH = -3 mA (Vdd = 2.8V and Vdd = 2.5V) IOH = -2 mA (Vdd = 1.8V)
Output Low Voltage	VOL	–	–	10%	Vdd	IOL = 4 mA (Vdd = 3.0V or 3.3V) IOL = 3 mA (Vdd = 2.8V and Vdd = 2.5V) IOL = 2 mA (Vdd = 1.8V)
Input High Voltage	VIH	70%	–	–	Vdd	Pin 1, OE or ST
Input Low Voltage	VIL	–	–	30%	Vdd	Pin 1, OE or ST
Input Pull-up Impedence	Z_in	–	100	250	kΩ	Pin 1, OE logic high or logic low, or ST logic high
		2	–	–	MΩ	Pin 1, ST logic low
Startup Time	T_start	–	–	5	ms	Measured from the time Vdd reaches its rated minimum value
Enable/Disable Time	T_oe			150	ns	
Resume Time	T_resume	–	–	5	ms	Measured from the time ST pin crosses 50% threshold
RMS Period Jitter	T_jitt	–	2	4	ps	f = 20 MHz, Vdd = 2.5V, 2.8V, 3.0V or 3.3V
		–	2	4.5	ps	f = 20 MHz, Vdd = 1.8V
RMS Phase Jitter (random)	T_phj	–	1.5	3	ps	Integration bandwidth = 12 kHz to 20 MHz, -40 to +125°C
			2.5	3	ps	Integration bandwidth = 12 kHz to 20 MHz, -55 to +125°C

100MHz output, Phase Jitter <1.2 ps rms, 12kHz - 20MHz
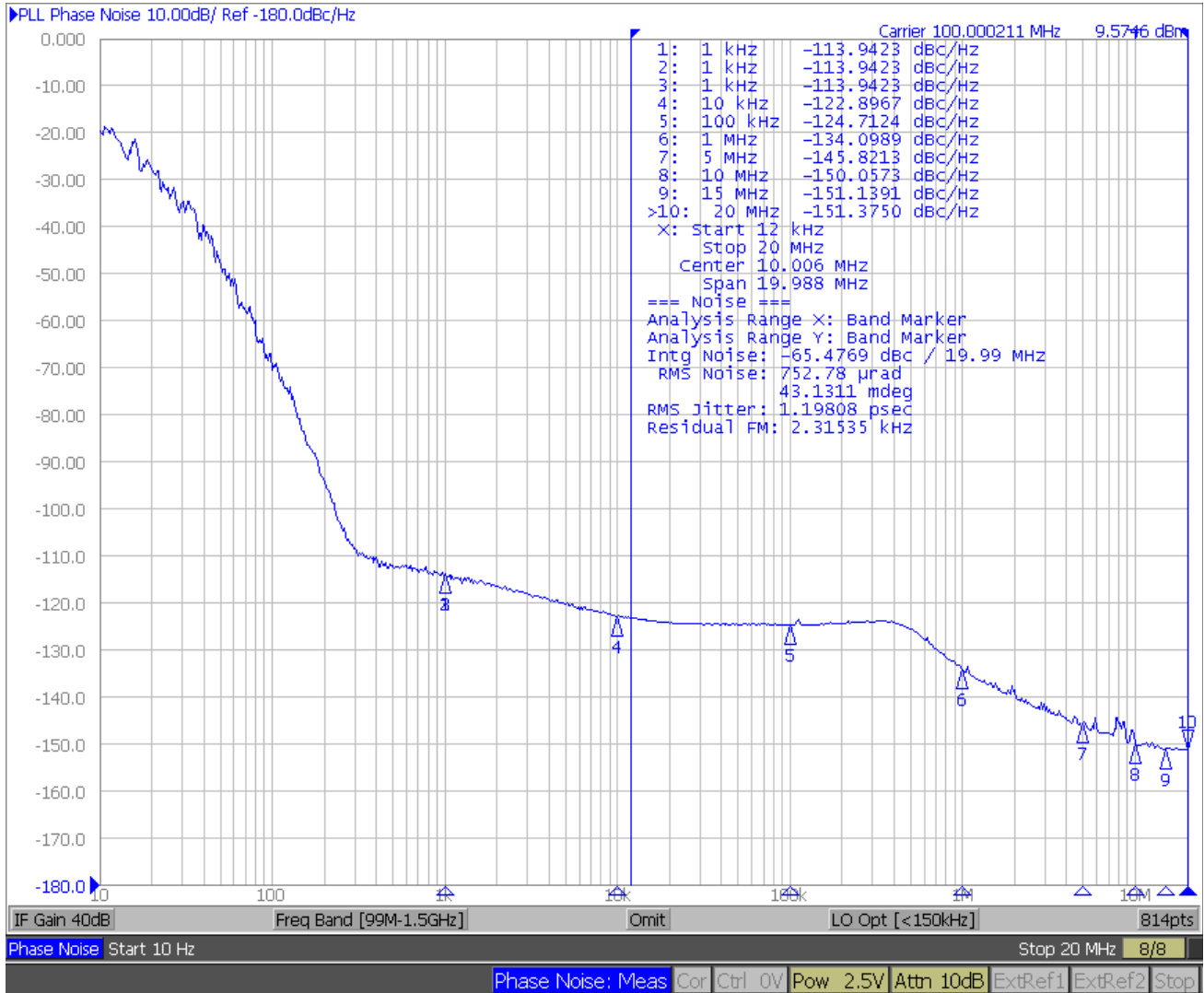
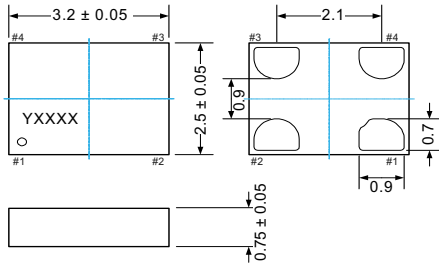| Package Outline & Dimensions (Unit: mm)	Recommended Land Pattern (Unit: mm)
2.0 x 1.6 x 0.75 mm	
2.5 x 2.0 x 0.75 mm	
3.2 x 2.5 x 0.75 mm	
5.0 x 3.2 x 0.75 mm	
7.0 x 5.0 x 0.90 mm	
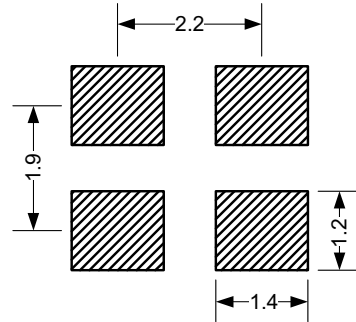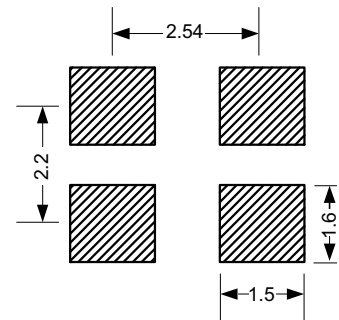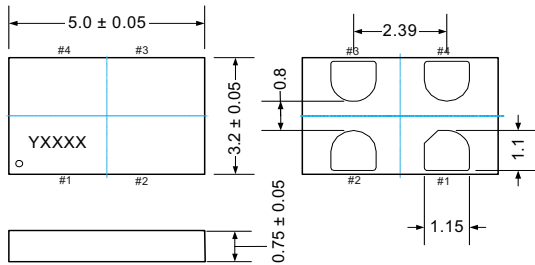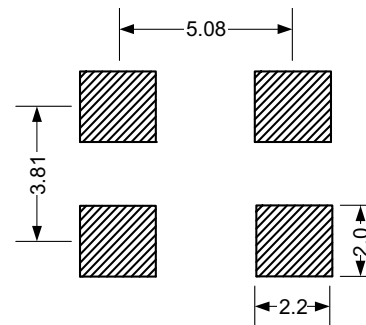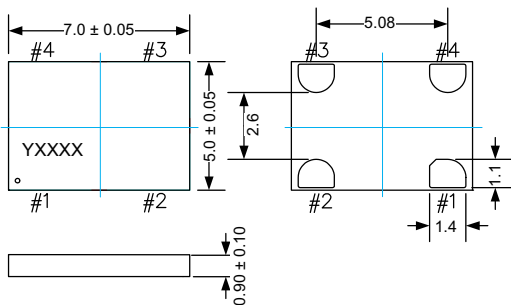
Pin Functionality

Pin Connections			
Pin	Symbol		Functionality
1	OE/ ST	Output Enable	H or Open[1]: specified frequency output L: output is high impedance. Only output driver is disabled.
		Standby	H or Open[1]: specified frequency output L: output is low (weak pull down). Device goes to sleep mode. Supply current reduces to I_std.
2	GND	Power	Electrical ground[2]
3	OUT	Output	Oscillator output
4	VDD	Power	Power supply voltage[2]
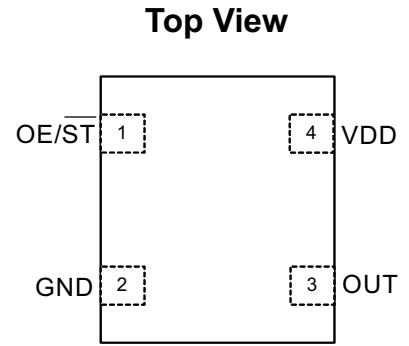
H = 'High', L = 'Low'
1) A pull-up resistor of <10 kΩ between OE/ ST pin and Vdd is recommended in high noise environment
2) A Capacitor value of 0.1uF between Vdd and GND is recommended

Top View

```
        _____
OE/ST  | [1]            [4] |  VDD
       |                    |
       |                    |
GND    | [2]            [3] |  OUT
       |_____|
```

Environmental

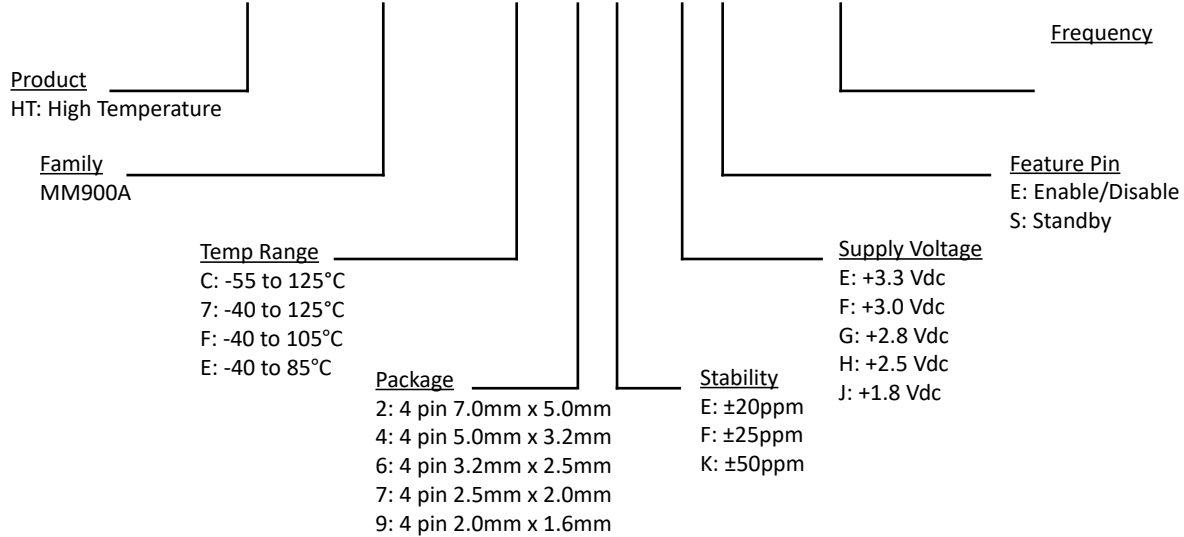| Environmental Compliance	
Parameter	Conditions
Mechanical Shock	MIL-STD-883 Method 2002; (10,000g)
Mechanical Vibration	MIL-STD-883 Method 2007; Condition C 70g
Moisture Resistance	JESD22-A113; MSL-1 conditions (125°C 24 hours bake, 85%RH/85°C 168 hours, 3 Reflows 260°C)
Temperature Cycle	JESD22, Method A104
Solderability	MIL-STD-883F, Method 2003

Absolute Maximum Ratings

Attempted operation outside the absolute maximum ratings of the part may cause permanent damage to the part. Actual performance of the IC is only guaranteed within the operational specifications, not at absolute maximum ratings

Maximum Ratings			
Parameter	Min.	Max.	Unit
Storage Temperature	-65	150	°C
VDD	-0.5	4	V
Electrostatic Discharge	–	2000	V
Soldering Temperature (follow standard Pb free soldering guidelines)	–	260	°C
Junction Temperature	–	150	°C

Thermal Data

Thermal Considerations			
Package	θJA, 4 Layer Board (°C/W)	θJA, 2 Layer Board (°C/W)	θJC, Bottom (°C/W)
7050	191	263	30
5032	97	199	24
3225	109	212	27
2520	117	222	26
2016	124	227	26

HT - MM900A C - 7 F - E E - 25M0000000

Frequency

Product
HT: High Temperature

Family
MM900A

Temp Range
C: -55 to 125°C
7: -40 to 125°C
F: -40 to 105°C
E: -40 to 85°C

Package
2: 4 pin 7.0mm x 5.0mm
4: 4 pin 5.0mm x 3.2mm
6: 4 pin 3.2mm x 2.5mm
7: 4 pin 2.5mm x 2.0mm
9: 4 pin 2.0mm x 1.6mm

Stability
E: ±20ppm
F: ±25ppm
K: ±50ppm

Supply Voltage
E: +3.3 Vdc
F: +3.0 Vdc
G: +2.8 Vdc
H: +2.5 Vdc
J: +1.8 Vdc

Feature Pin
E: Enable/Disable
S: Standby

* Add **_SNPBDIP** for tin lead solder dip
Example: HT-MM900AC-6K-EE-125M000000_SNPBDIP

Notes:
1. Unless otherwise stated all values are valid after warm-up time and refer to typical conditions for supply voltage, load, temperature (25°C).
2. Subject to technical modification.
3. Contact factory for availability.
4. Outside standard frequency ranges (see table at right) check with factory for availability

Standard Frequency Ranges: Outside this check with Vectron	
For -40 to 125 ºC or -40 to 105ºC	For -55 to 125ºC
1.000000 to 61.222999	1.000000 to 61.222999
61.674001 to 69.795999	61.674001 to 69.239999
70.485001 to 79.062999	70.827001 to 78.714999
79.162001 to 81.427999	79.561001 to 80.159999
82.232001 to 91.833999	80.174001 to 80.779999
92.155001 to 94.248999	82.632001 to 91.833999
94.430001 to 94.874999	95.474001 to 96.191999
94.994001 to 97.713999	96.209001 to 96.935999
98.679001 to 110.00000	99.158001 to 110.000000
115.194001 to 117.810999	119.342001 to 120.238999
118.038001 to 118.593999	120.262001 to 121.169999
118.743001 to 122.141999	121.243001 to 121.600999
122.705001 to 123.021999	123.948001 to 137.000000
123.348001 to 137.000000	

Revision	Change Summary	Date
1.0	Product Release	June 2013
1.1	Knowles logo and address change	Feb 2014
1.2	Expanded frequency range to 137MHz	March 2014
1.3	Add ±20ppm temperature stability	Aug 2014
1.4	Update logo and contact information, add "SNPBDIP" odering option	Aug 2018

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