VECTRON INTERNATIONAL
A DOVER COMPANY

HT-MM900A

Military Temperature Oscillator

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: 2.5 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	-25	–	+25	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

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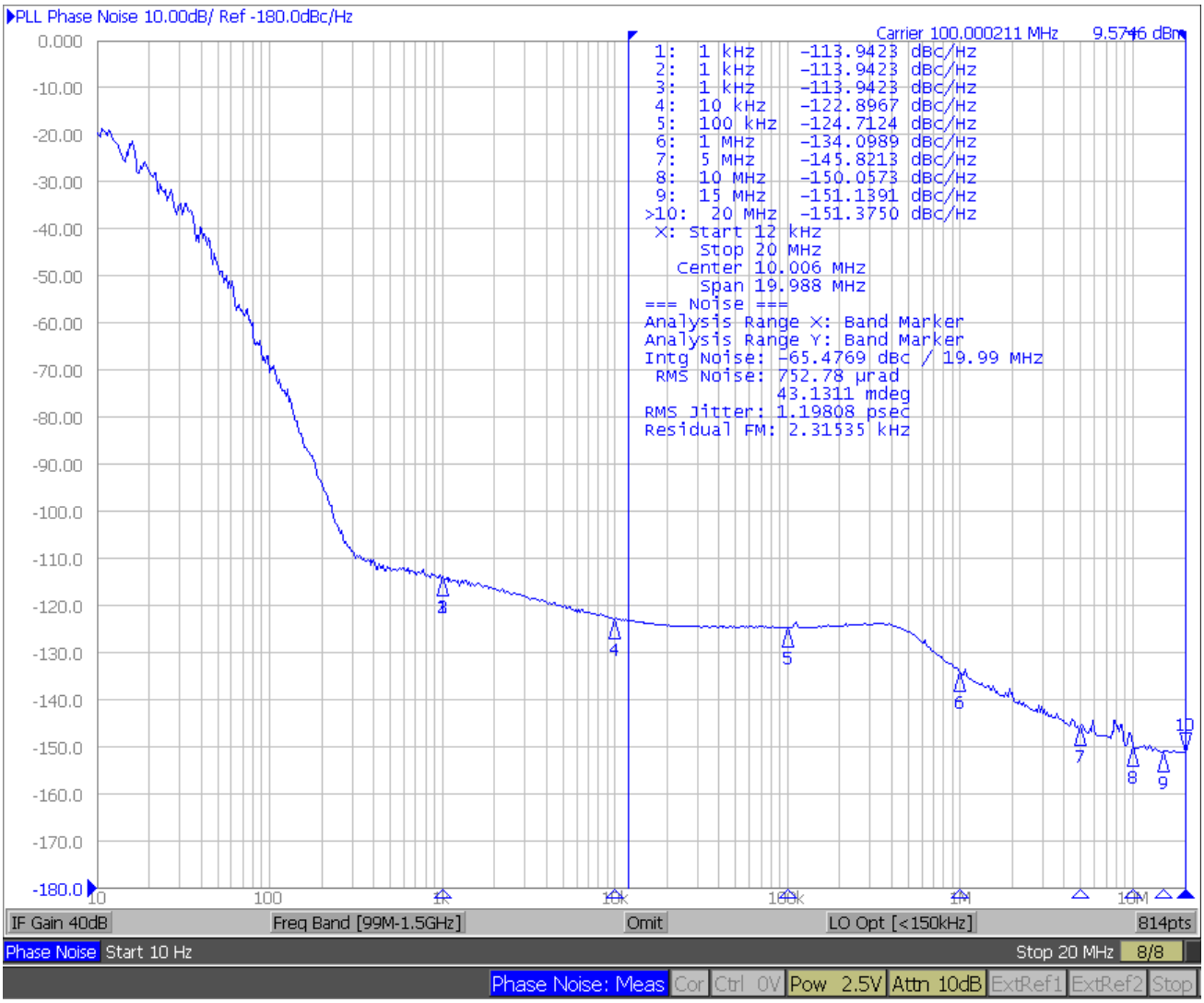
Typical Phase Noise

100MHz output, Phase Jitter <1.2 ps rms, 12kHz - 20MHz



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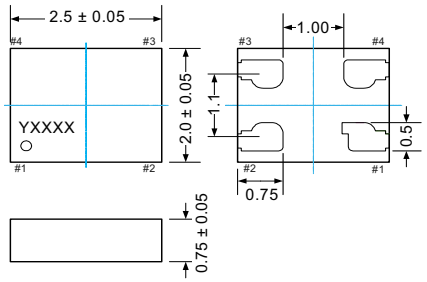
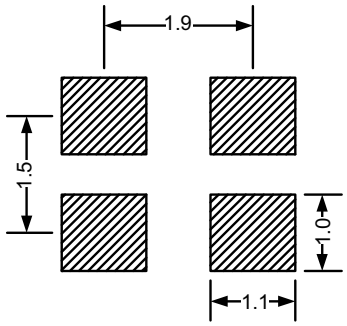
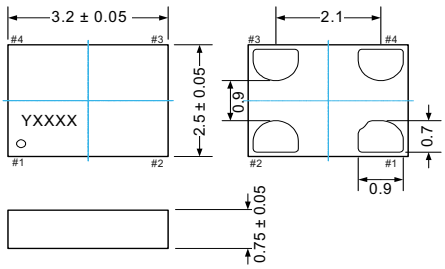
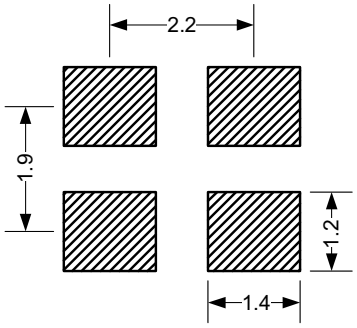
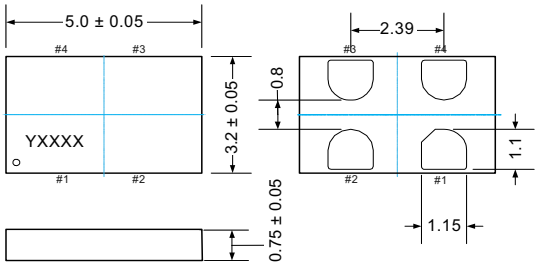
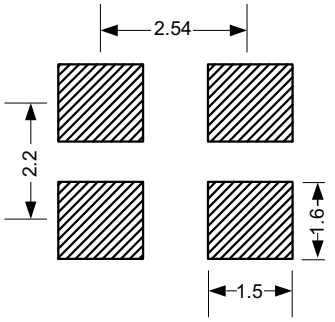
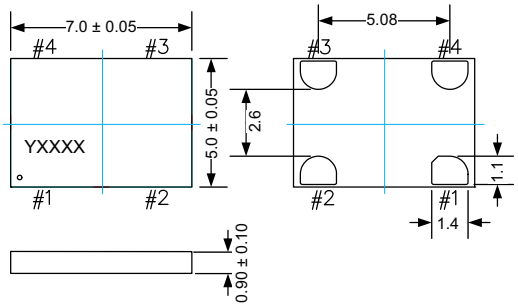
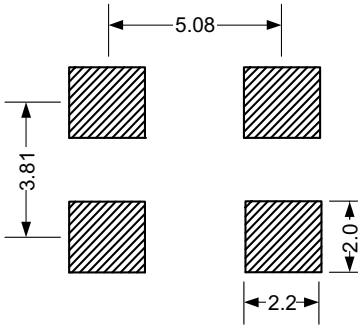
Packaging Options

Package Outline & Dimensions (Unit: mm)	Recommended Land Pattern (Unit: 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	
	

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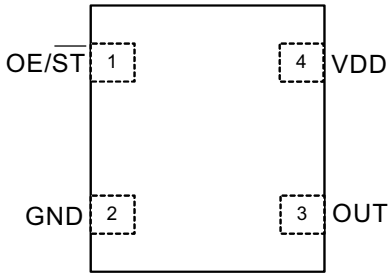
Pin Functionality

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]

Top View



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

Environmental

Environmental Compliance	
Parameter	Conditions
Mechanical Shock	MIL-STD-883 Method 2002; (50,000g)
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

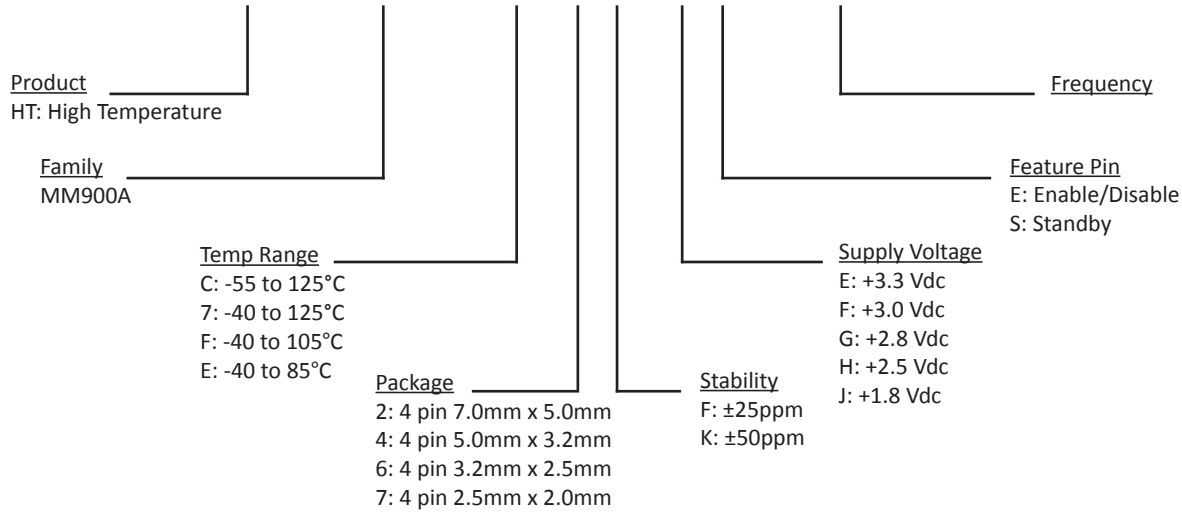
Maximum Ratings			
Parameter	Min.	Max.	Unit
Storage Temperature	-65	150	°C
VDD	-0.5	4	V
Electrostatic Discharge	–	2000	V
Soldering Temperature (follow standard Pb free soldering guidelines)	–	260	°C
Junction Temperature	–	150	°C

Thermal Data

Thermal Considerations			
Package	θJA, 4 Layer Board (°C/W)	θJA, 2 Layer Board (°C/W)	θJC, Bottom (°C/W)
7.0x5.0mm	191	263	30
5.0x3.2mm	97	199	24
3.2x2.5mm	109	212	27
2.5x2.0mm	117	222	26

Ordering Information

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



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.

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:
Vectron International
1589 Century Avenue, the 19th Floor
Chamtime International Financial Center
Shanghai, China
Tel: 86.21.6081.2888
Fax: 86.21.6163.3598