MEMS Standard Frequency Differential Oscillator

CMP302-SERIES

- **0.6 ps RMS Phase Jitter over 12 kHz to 20 MHz bandwidth**
- **31 Standard frequencies from 25 MHz to 212.5 MHz**
- **LVPECL and LVDS Output types**
- **SMD package 3.2 x 2.5 mm**

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
			Min.	Typ.	Max.	
Frequency Range	f_0	31 standard frequencies, see table 1	25		212.5	MHz
Supply Voltage	Vs	Vs ±5% Vs ±5% Vs ±5%	2.25 2.25 2.97	- 2.5 3.3	3.63 2.75 3.63	V V V
Operating Temperature	T_a		-20 -40		+70 +85	°C °C
Frequency Stability	$\Delta f/f_0$	Including First Year aging, initial frequency tolerance at 25°C, Frequency stability over temperature range, supply variation, load variation	-10 -20 -25 -50		+10 +20 +25 +50	ppm ppm ppm ppm
Long Term stability (Aging)	$\Delta f/\Delta t_y$ $\Delta f/\Delta t_y$	First Year @ 25°C 10 Years @ 25°C	-2 -5		+2 +5	ppm ppm
Input Voltage High	VIH	Pin 1 , E/D or STBY	70%Vs			V
Input Voltage Low	VIL	Pin 1 , E/D or STBY			30%Vs	V
Input Pull-up Impedance	Zin	Pin 1 , E/D=High or Low or STBY=High Pin 1, STBY = Low	 2	100	250	kΩ MΩ
Start-up Time	T st	Measured from the time Vs reaches its rated minimum value		6	10	ms
Resume Time	T res	Measured from the time STBY pin crosses 50% threshold		6	10	ms
Duty Cycle	DC		45		55	%

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OUTPUT CHARACTERISTICS

	PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
				Min	Typ.	Max	
LVPECL	Output Levels	V_{OH}	Output termination load 50Ω connected to V_S -2.0V, Vs ±5%	Vs -1.1		Vs -0.7	V
		V_{OL}	Output termination load 50Ω connected to V_S -2.0V, Vs ±5%	Vs -1.9		Vs -1.5	V
	Output differential voltage swing	V SWING		1.2	1.6	2.0	V
	Current consumption	Is	Excluding Load termination, Vs=2.5 V or 3.3V		61	69	mA
	E/D current consumption	I E/D	E/D = Low			35	mA
	Output Disable Supply leakage	I LEAK	E/D = Low			1	µA
	STBY current	I STBY	STBY= Low, for all Vs			100	µA
	Maximum Output Current	I driver	Maximum average current drawn from Out + or Out -			30	mA
	Rise / Fall Time	Tr / Tf	20% to 80%		300	500	ps
	E/D time	T E/D	f_0=212.5 MHz, for other frequencies T E/D=100 ns + 3 period			115	ns
	RMS Period Jitter	J P	f_0=100 MHz, Vs= 3.3v or 2.5V f_0=156.25 MHz, Vs= 3.3v or 2.5V f_0=212.5 MHz, Vs= 3.3v or 2.5V		1.2 1.2 1.2	1.7 1.7 1.7	ps ps ps
	RMS Phase Jitter	J PH	f_0=156.25 MHz, integrated bandwidth, 12 KHz to 20 MHz, all Vs		0.6	0.85	ps

	PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
				Min	Typ.	Max	
LVDS	Output differential voltage	V OD	Output termination load 100Ω connected between OUT+ and OUT- , Vs ±5%	250	350	450	mV
	Output differential voltage Magnitude change	ΔV OD				50	mV
	Offset Output Voltage	V OOFF	Output termination load 100Ω connected between OUT+ and OUT- , Vs ±5%	1.125	1.2	1.375	V
	Offset Output Voltage Magnitude change	ΔV OOFF				50	mV
	Current consumption	Is	Excluding Load termination, Vs=2.5 V or 3.3V		47	55	mA
	E/D current consumption	I E/D	E/D = Low			35	mA
	Output Disable Supply leakage	I LEAK	E/D = Low			1	µA
	STBY current	I STBY	STBY= Low, for all Vs			100	µA
	Rise / Fall Time	Tr / Tf	20% to 80%		495	600	ps
	E/D time	T E/D	f_0=212.5 MHz, for other frequencies T E/D=100 ns + 3 period			115	ns
	RMS Period Jitter	J P	f_0=100 MHz, Vs= 3.3v or 2.5V f_0=156.25 MHz, Vs= 3.3v or 2.5V f_0=212.5 MHz, Vs= 3.3v or 2.5V		1.2 1.2 1.2	1.7 1.7 1.7	ps ps ps
	RMS Phase Jitter	J PH	f_0=156.25 MHz, integrated bandwidth, 12 KHz to 20 MHz, all Vs		0.6	0.85	ps

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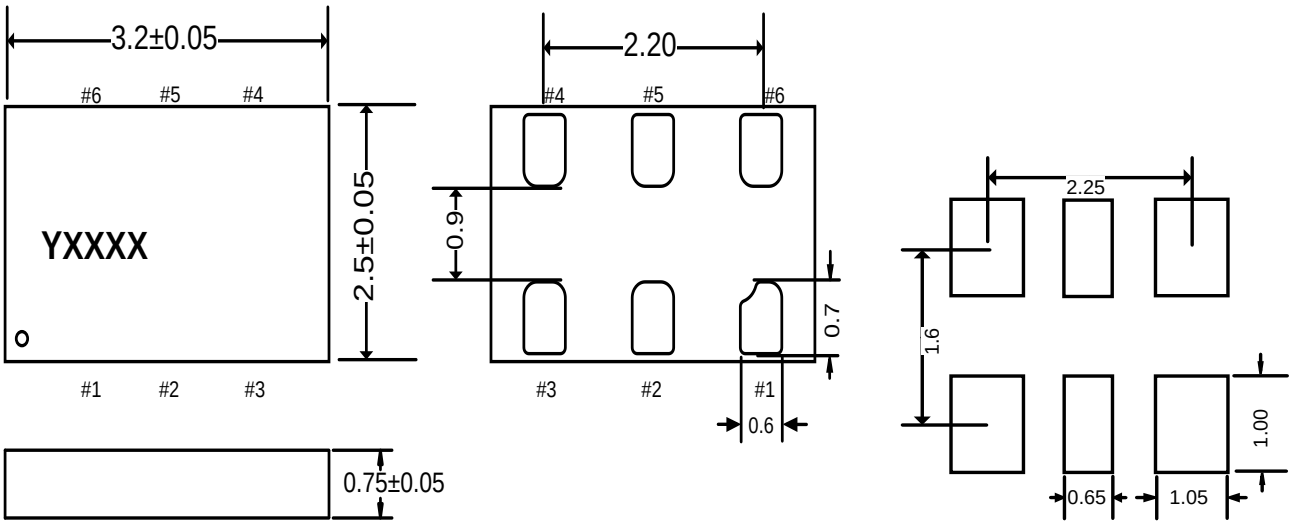
Table 1. List of Supported Frequencies

25 MHz	50 MHz	74.175824 MHz	74.250 MHz	75 MHz	98.304 MHz	100 MHz	106.250MHz
125 MHz	133 MHz	133.3 MHz	133.33 MHz	133.333 MHz	133.3333 MHz	133.33333MHz	133.333333 MHz
148.351648 MHz	148.5 MHz	150 MHz	155.520 MHz	156.250 MHz	161.13280 MHz	166 MHz	166.6 MHz
166.66 MHz	166.666 MHz	166.6666 MHz	166.66666 MHz	166.666666MHz	200 MHz	212.5MHz	

MECHANICAL DIMENSIONS AND PIN FUNCTIONING

Recommended land pattern



PIN	SYMBOL	FUNCTION
1	E/D	H or Open: Oscillator frequency output L: Output is high impedance
	STBY	H or Open: Oscillator frequency output L: Device goes to sleep mode. Supply current reduces to I_{STBY}
2	GND	Electrical Ground
3	NC	No connect, leave it floating or connect to GND for better heat dissipation
4	OUT+	Oscillator Output Signal
5	OUT-	Complementary Oscillator Output signal
6	Vs	Supply Voltage

Note: Connect a capacitor of 0.1µF or higher value between Vs and GND

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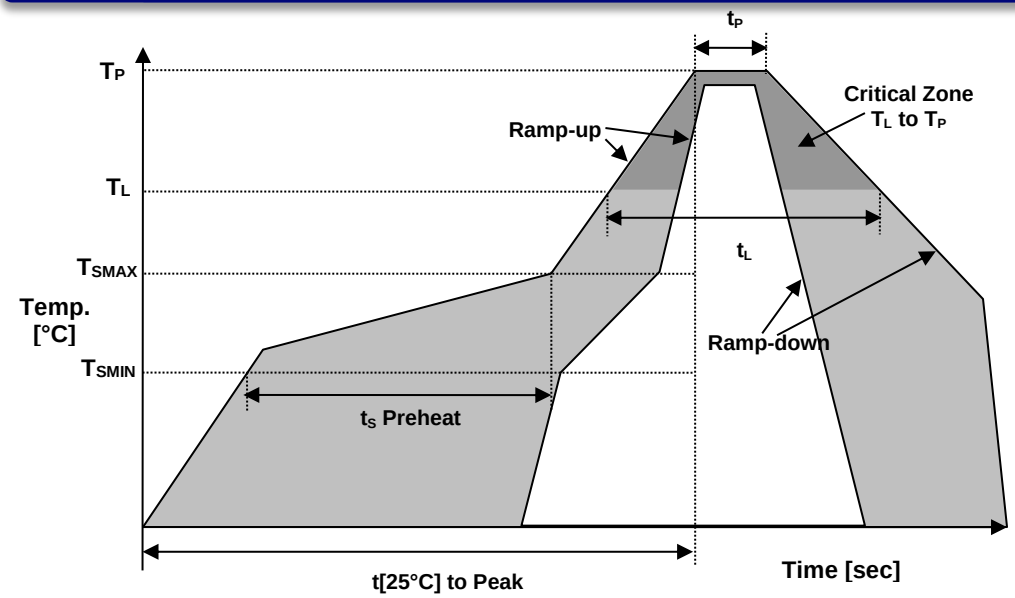
ENVIRONMENTAL

Soldering	MIL-STD-883F, Method 2003
Moisture Sensitivity Level	MSL 1 at 260°C
Temperature Cycle	JESD22, Method A104
Vibration	MIL-STD-883F, Method 2007
Mechanical Shock	MIL-STD-883F, Method 2002
Storage Temperature	-65° ..... +150°C

REFLOW PROFILE



Recommended Solder Reflow Profile		
Temperature Min Preheat	T_{SMIN}	150°C
Temperature Max Preheat	T_{SMAX}	200°C
Time (T_{SMIN} to T_{SMAX})	t_S	60-180 sec.
Temperature	T_L	217°C
Peak Temperature	T_P	260°C
Ramp-up rate	R_{UP}	3°C/sec max.
Ramp-down rate	R_{DOWN}	6°C/sec max.
Time within 5°C of Peak Temperature	t_P	10 sec.
Time t[25°C] to Peak Temperature	t[25°C] to Peak	480 sec.
Time	t_L	60-150 sec.

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ORDERING INFORMATION

SERIES	SUPPLY VOLTAGE (V)	Frequency Stability	TEMP RANGE (°C)	Output Type	Enable/ Disable Function	-	OUTPUT FREQUENCY (MHz)
CMP302	25: Vs=2.5V 33: Vs=3.3V XX: Vs=2.25V to 3.63V	A:±10ppm B:±20ppm C:±25ppm D:±50ppm	U: -20~70 V: -40~85	1:LVPECL 2:LVDS	E: E/D output S:Standby	-	See table 1

APPROVALS	
Eng. approval, date:	SP, 07/19/2016
Created by, date:	SP, 07/19/2016
Revision: A	