

## CMC202-SERIES



- Low Power Consumption of 3.5mA typical at 1.8V
- 52 Standard frequencies between 3.57MHz and 77.760 MHz
- HCMOS/ LVC MOS compatible output
- SMD package 2.0 x 1.6 mm

### ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
			Min.	Typ.	Max.	
Frequency Range	$f_0$	52 standard frequencies between 3.57MHz and 77.760MHz	3.57		77.760	MHz
Supply Voltage	$V_s$	$V_s \pm 5\%$	1.8		3.3	V
Supply Current	$I_s$	$V_s = 1.8V, f_0=20MHz, no load$ $V_s = 2.5V, f_0=20MHz, no load$ $V_s = 2.8V, f_0=20MHz, no load$ $V_s = 3.3V, f_0=20MHz, no load$		3.5 3.7 3.8 3.8	4.1 4.2 4.5 4.5	mA mA mA mA
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	-20 -25 -50		+20 +25 +50	ppm ppm ppm
Enable / Disable/ Standby Function	E/D/St	Enable = Open or "1" ( $V_{IH} \geq 0.75V_s$ ) ( output signal active ) Disable = GND or "0" ( $V_{IL} < 0.25V_s$ ) ( output high impedance, oscillator operates ) Standby = GND or "0" ( $V_{IL} < 0.25V_s$ ) ( output weakly pulled down, oscillator sleep mode )	0.75Vs		0.25Vs 0.25Vs	V V V
Enable / Disable Time	$T_{E/D}$	$f_0=110MHz$			130	ms
Enable / Disable Current	$I_{E/D}$	$V_s=1.8V, E/D = GND$ $V_s=2.5V$ to 3.3V, E/D =GND Output in high impedance state			4.0 4.2	mA mA
Standby Current	$I_{stby}$	STBY=GND, $V_s=1.8V$ STBY=GND, $V_s=2.5V$ STBY=GND, $V_s=2.8V$ to 3.3V Output is weakly pulled down		0.2 1.1 2.1	1.3 2.5 4.3	$\mu A$ $\mu A$ $\mu A$
Startup Time	$T_{ST}$				5	ms
RMS Phase Jitter	$J_{PH}$	$f_0=75MHz, BW 900KHz$ to 7.5MHz $f_0=75MHz, BW 12KHz$ to 20MHz		0.5 1.3	0.9 2.0	ps ps
RMS Period Jitter	$J_P$	$f_0=75MHz$		1.8	3	ps
Peak to Peak Period Jitter	$J_{PK-PK}$	$f_0=75MHz, V_s=2.5$ to 3.3V $f_0=75MHz, V_s=1.8V$		12 14	25 30	ps ps

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**OUTPUT CHARACTERISTICS**

	PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
				Min	Typ.	Max	
LVC MOS	Output Levels	$V_{OH}$	$I_{oh} = -2 \text{ mA ( } V_s = 1.8V \text{ )}$ $I_{oh} = -3 \text{ mA ( } V_s = 2.5V \text{ or } 2.8V \text{ )}$ $I_{oh} = -4 \text{ mA ( } V_s = 3.0V \text{ or } 3.3V \text{ )}$	0.9 $V_s$			V
		$V_{OL}$	$I_{ol} = 2 \text{ mA ( } V_s = 1.8V \text{ )}$ $I_{ol} = 3 \text{ mA ( } V_s = 2.5V \text{ or } 2.8V \text{ )}$ $I_{ol} = 4 \text{ mA ( } V_s = 3.0V \text{ or } 3.3V \text{ )}$			0.1 $V_s$	V
	Duty Cycle	DC	50% Output level	45		55	%
	Output Load	$O_{CL}$	$T_a = 25^\circ \text{C}$		15	60	pF

**Table 1. Rise/Fall Time vs. CLoad ( CL ),  $V_s = 1.8V$**

CL	5pF	15pF	30pF	45pF	60pF
Drive Strength	@20% to 80% (ns) typ.				
D0, default	0.65	1.30	2.40	3.35	4.56
D1	0.70	1.48	2.64	3.68	5.09
D2	0.78	1.66	2.94	4.09	5.74
D3	0.93	1.91	3.32	4.66	6.48
D4	1.65	3.23	5.79	8.18	11.08
D5	2.11	4.31	7.65	10.77	14.47
D6	3.19	6.35	11.00	16.01	21.52
D7	6.16	11.61	22.00	31.27	39.91

**Table 2. Rise/Fall Time vs. CLoad ( CL ),  $V_s = 2.5V$**

CL	5pF	15pF	30pF	45pF	60pF
Drive Strength	@20% to 80% (ns) typ.				
D0	0.34	0.88	1.64	2.54	3.32
D1	0.43	0.96	1.81	2.79	3.65
D2, default	0.54	1.00	2.01	3.10	4.01
D3	0.62	1.28	2.27	3.51	4.45
D4	1.09	2.20	3.88	5.86	7.57
D5	1.45	2.81	5.16	7.65	9.88
D6	2.11	4.27	7.64	11.20	14.49
D7	4.13	8.25	12.82	21.45	27.79

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**Table 3. Rise/Fall Time vs. CLoad ( CL ), Vs=2.8V**

CL	5pF	15pF	30pF	45pF	60pF
Drive Strength	@20% to 80% (ns) typ.				
D0	0.29	0.81	1.48	2.29	2.99
D1	0.34	0.88	1.64	2.52	3.30
D2, default	0.44	1.00	1.83	2.82	3.67
D3	0.55	1.12	2.08	3.22	4.08
D4	0.97	2.00	3.54	5.43	6.93
D5	1.29	2.57	4.72	7.01	9.06
D6	1.94	3.90	7.03	10.24	13.34
D7	3.77	7.54	12.28	19.57	25.27

**Table 4. Rise/Fall Time vs. CLoad ( CL ), Vs=3.0V**

CL	5pF	15pF	30pF	45pF	60pF
Drive Strength	@20% to 80% (ns) typ.				
D0	0.27	0.76	1.39	2.16	2.85
D1	0.30	0.83	1.55	2.40	3.13
D2	0.38	0.92	1.72	2.71	3.51
D3, default	0.51	1.00	1.97	3.07	3.90
D4	0.89	1.92	3.39	5.20	6.64
D5	1.22	2.46	4.54	6.76	8.62
D6	1.84	3.71	6.72	9.86	12.68
D7	3.60	7.21	11.97	18.74	24.30

**Table 5. Rise/Fall Time vs. CLoad ( CL ), Vs=3.3V**

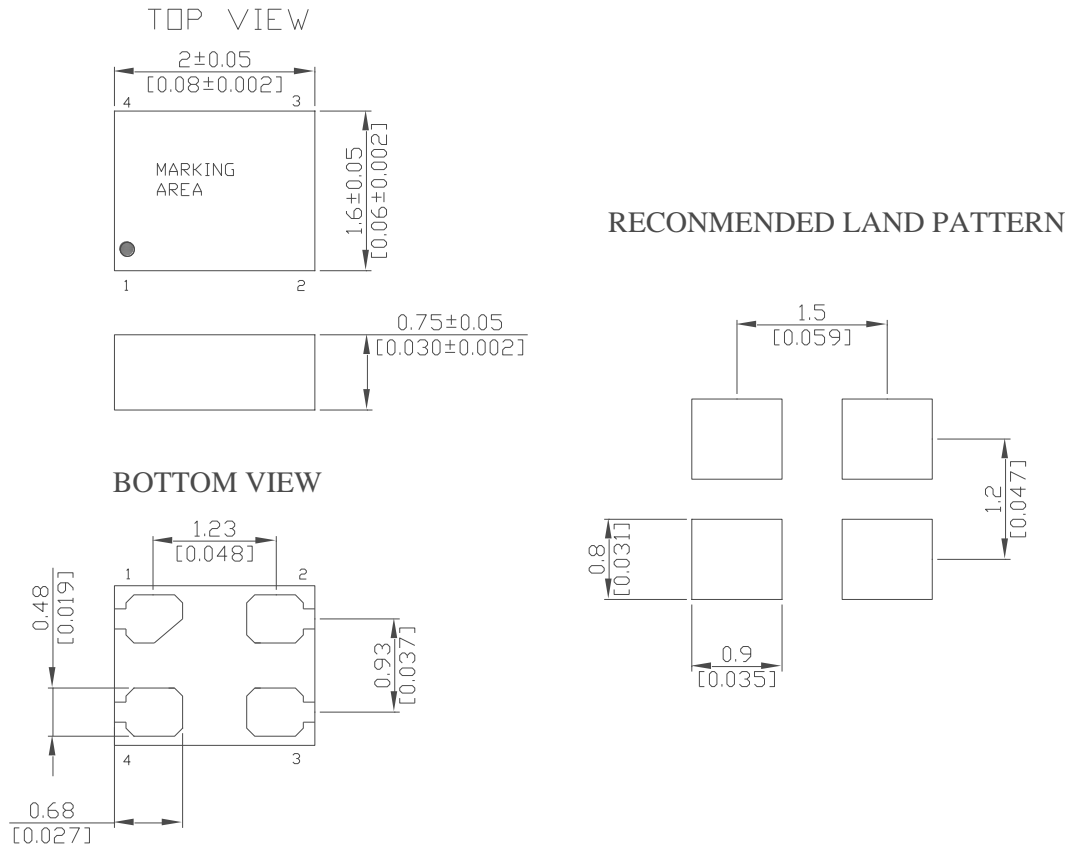
CL	5pF	15pF	30pF	45pF	60pF
Drive Strength	@20% to 80% (ns) typ.				
D0	0.25	0.72	1.31	1.83	2.61
D1	0.28	0.79	1.46	2.05	2.93
D2	0.33	0.87	1.64	2.30	3.35
D3, default	0.46	1.00	1.86	2.60	3.84
D4	0.81	1.82	3.22	4.52	6.33
D5	1.16	2.33	4.29	6.04	8.34
D6	1.74	3.50	6.38	8.98	12.19
D7	3.39	6.88	11.63	17.56	23.59

**Table 6. List of Supported Frequencies**

3.57 MHz	4 MHz	4.096 MHz	6 MHz	7.3728 MHz	8.192 MHz	10 MHz	12 MHz	14 MHz
18.432MHz	19.2 MHz	20 MHz	24 MHz	24.576MHz	25 MHz	25.000625MHz	26 MHz	27 MHz
28.6363 MHz	30 MHz	31.25 MHz	32.768 MHz	33 MHz	33.3 MHz	33.33MHz	33.333 MHz	33.3333MHz
33.33333MHz	35.84MHz	37.5 MHz	38 MHz	38.4 MHz	40 MHz	40.5MHz	48 MHz	50 MHz
54 MHz	60 MHz	62.5 MHz	65 MHz	66 MHz	66.6 MHz	66.66 MHz	66.666MHz	66.6666MHz
66.66666MHz	72 MHz	74.175824MHz	74.176 MHz	74.25 MHz	75 MHz	77.760 MHz		

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**MECHANICAL DIMENSIONS AND PIN FUNCTIONING**



PIN	SYMBOL	FUNCTION
1	E/D/STBY/N	H :Enable output frequency L:Disable output frequency , high impedance In E/D or STBY mode connect a pull-up resistor of 10kΩ to pin 1, in case not externally driven. In case pin1 is left floating, use N option
2	GND	Electrical Ground
3	OUTPUT	Output Signal
4	Vs	Supply Voltage

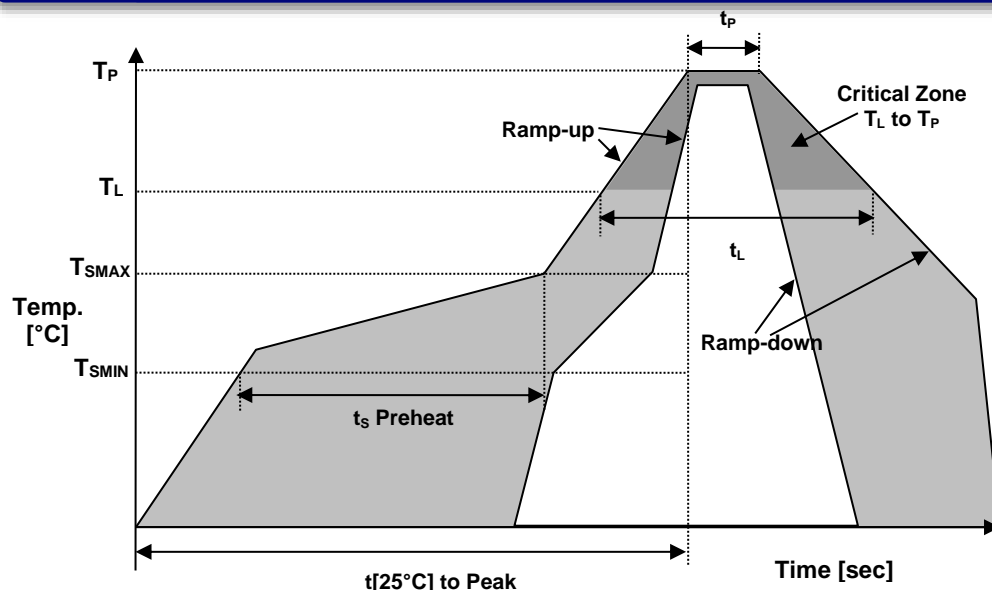
**Note:** Connect a capacitor of 0.1µF or higher value between Vs and GND

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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 Drive	Enable/Disable Function	-	OUTPUT FREQUENCY (MHz)
CMC202	18: Vs=1.8V 25: Vs=2.5V 28: Vs=2.8V 30: Vs=3.0V 33: Vs=3.3V XX: Vs=2.5V-10% to 3.3V+10%	A: ±20ppm B: ±25ppm C: ±50ppm	U: -20~70 V: -40~85	1:D0 2:D1 3:D2 4:D3 5:D4 6:D5 7:D6 8:D7 See table 1 to 5	E: E/D output S: Standby N: No connect	-	See table 6

**APPROVALS**

Eng. approval, date: SP, 07/05/2016

Created by, date: SP, 07/05/2016

Revision: A