

**CMC701-SERIES**



- Low Power Oscillator
- HCMOS/ LVCMOS output
- SMD package 7.0 x 5.0 mm

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
			Min.	Typ.	Max.	
Frequency Range	$f_0$	Any Frequency between Frequency range, accurate to 6 decimal places	1.0		110.0	MHz
Supply Voltage	$V_s$		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	
LVCMOS	Output Levels	$V_{OH}$	$I_{oh} = -2 \text{ mA ( } V_s = 1.8\text{V )}$ $I_{oh} = -3 \text{ mA ( } V_s = 2.5\text{V or } 2.8\text{V )}$ $I_{oh} = -4 \text{ mA ( } V_s = 3.0\text{V or } 3.3\text{V )}$	0.9 $V_s$			V
		$V_{OL}$	$I_{ol} = 2 \text{ mA ( } V_s = 1.8\text{V )}$ $I_{ol} = 3 \text{ mA ( } V_s = 2.5\text{V or } 2.8\text{V )}$ $I_{ol} = 4 \text{ mA ( } V_s = 3.0\text{V or } 3.3\text{V )}$			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 ),  $V_s = 1.8\text{V}$**

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 ),  $V_s = 2.5\text{V}$**

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**

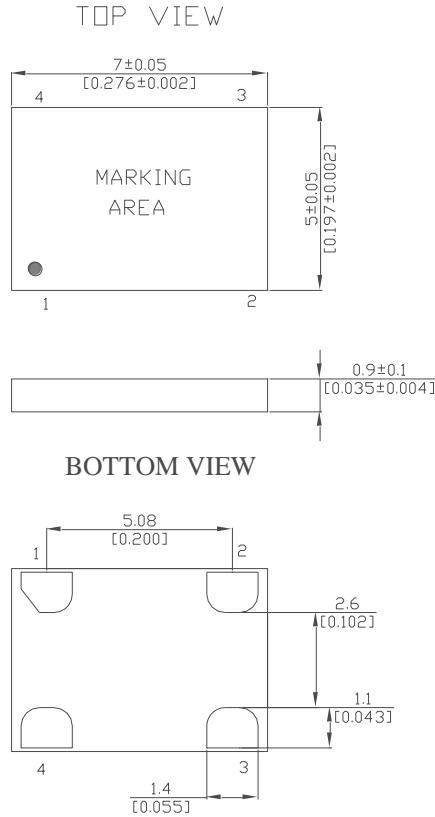
CL	5pF	15pF	30pF	45pF	60pF
Drive Strength	@20% to 80% (ns) typ.				
D0	0.27	0.76	1.39	2.16	2.85
D1	0.30	0.83	1.55	2.40	3.13
D2	0.38	0.92	1.72	2.71	3.51
D3, default	0.51	1.00	1.97	3.07	3.90
D4	0.89	1.92	3.39	5.20	6.64
D5	1.22	2.46	4.54	6.76	8.62
D6	1.84	3.71	6.72	9.86	12.68
D7	3.60	7.21	11.97	18.74	24.30

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

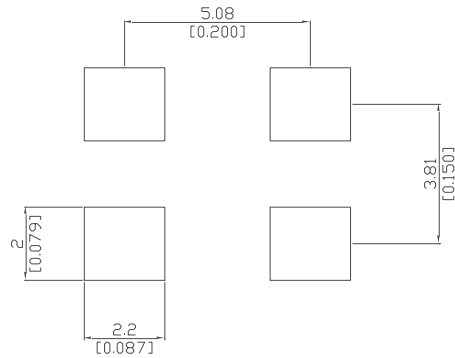
CL	5pF	15pF	30pF	45pF	60pF
Drive Strength	@20% to 80% (ns) typ.				
D0	0.25	0.72	1.31	1.83	2.61
D1	0.28	0.79	1.46	2.05	2.93
D2	0.33	0.87	1.64	2.30	3.35
D3, default	0.46	1.00	1.86	2.60	3.84
D4	0.81	1.82	3.22	4.52	6.33
D5	1.16	2.33	4.29	6.04	8.34
D6	1.74	3.50	6.38	8.98	12.19
D7	3.39	6.88	11.63	17.56	23.59

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**MECHANICAL DIMENSIONS AND PIN FUNCTIONING**



**RECONMENDED LAND PATTERN**



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

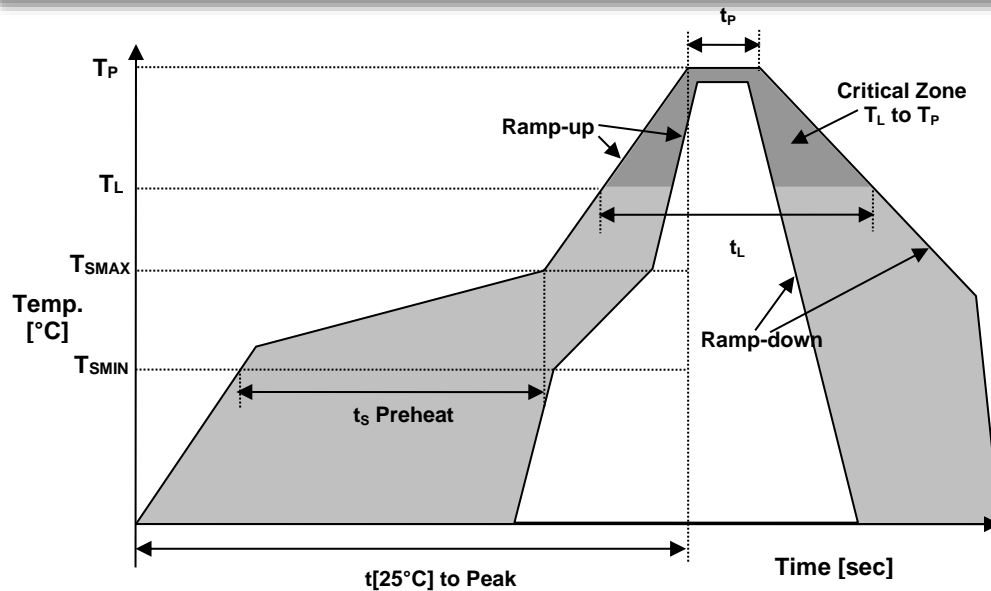
**Note:** Connect a capacitor of 0.1μF or higher value between Vs and GND

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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)
CMC701	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	-	

**APPROVALS**

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

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

Revision: A