CMC251-SERIES

- **Low Power Oscillator**
- **HCMOS/ LVCMOS output**
- **SMD package 2.5 x 2.0 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	Vs		1.8		3.3	V
Supply Current	Is	Vs = 1.8V, f_0=20MHz, no load Vs = 2.5V, f_0=20MHz, no load Vs = 2.8V, f_0=20MHz, no load Vs = 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}≥0.75Vs) (output signal active) Disable = GND or "0"(V_{IL}<0.25Vs) (output high impedance, oscillator operates) Standby = GND or "0" V_{IL}<0.25Vs) (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	$I_{E/D}$	Vs=1.8V, E/D =GND Vs=2.5V to 3.3V, E/D =GND Output in high impedance state			4.0 4.2	mA mA
Standby Current	Istby	STBY=GND,Vs=1.8V STBY=GND,Vs=2.5V STBY=GND,Vs=2.8V to 3.3V Output is weakly pulled down		0.2 1.1 2.1	1.3 2.5 4.3	µA µA µA
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,Vs=2.5 to 3.3V f_0=75MHz, Vs=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 mA (Vs=1.8V) I_{oh}= -3 mA (Vs= 2.5V or 2.8V) I_{oh}= -4 mA (Vs=3.0V or 3.3V)	0.9 Vs			V
		V_{OL}	I_{ol}=2 mA (Vs=1.8V) I_{ol}=3 mA (Vs= 2.5V or 2.8V) I_{ol}=4 mA (Vs=3.0V or 3.3V)			0.1Vs	V
	Duty Cycle	DC	50% Output level	45		55	%
	Output Load	O_{CL}	Ta=25 °C		15	60	pF

Table 1. Rise/Fall Time vs. CLoad (CL), Vs=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), Vs=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

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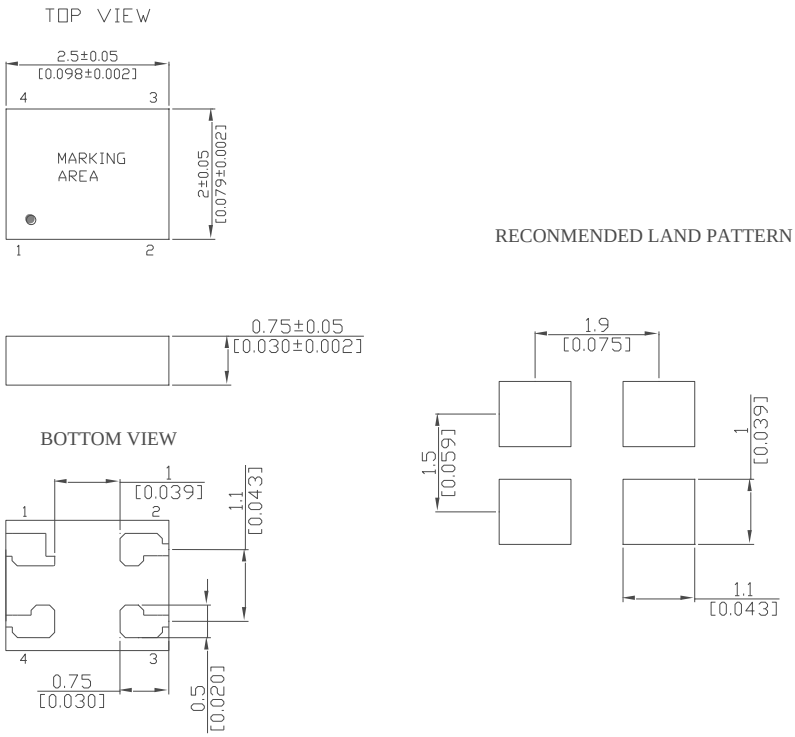
MECHANICAL DIMENSIONS AND PIN FUNCTIONING



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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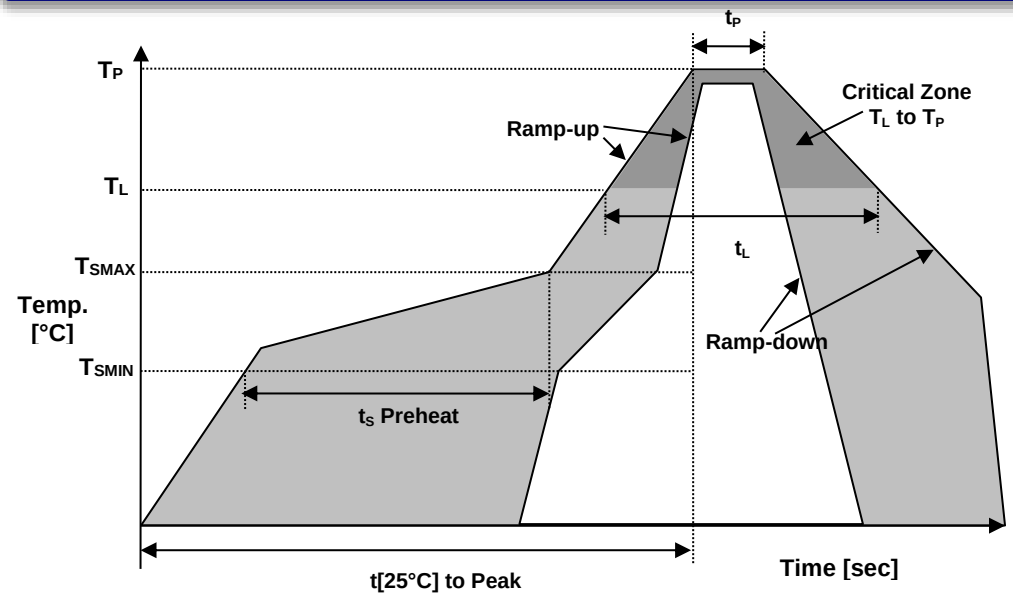
ENVIRONMENTAL

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)
CMC25	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	