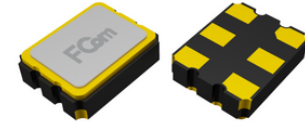


FCom Differential Output OSC

Series FCO-3L



SMD Differential Output Crystal Oscillator 3.2×2.5 mm

Feature

- Output Frequency up to 220MHz
- Very low phase jitter: 0.15 pS, typ. RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

- 10Gbit Ethernet, Fiber Channel
- Storage Area Network, SONET
- Enterprise Servers, Telecom
- Reference Clocks for ADC and DAC

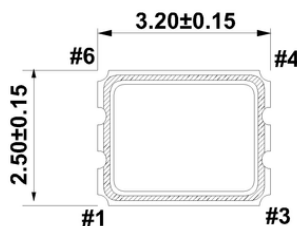
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	13.5~220				MHz		Test condition Ambient temperature : 25 ± 5°C Relative humidity : 40% ~ 70%
Standard Frequency		F(ST)	100, 125, 156.25				MHz		
Supply Current		Icc	-	55	-	55	mA		
Transition Time	Rise Time	Tr	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	0.6	-	0.6			
Output Level		VoH	2.215	2.42	1.415	1.64	V	Output High	
		VoL	1.49	1.68	0.69	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz			-143		-145				
100 kHz			-151	-	-154				
1 MHz			-155	-	-155				
RMS Phase Jitter	13.5MHz~80MHz	PJ	-	1	-	1	pSec	Integrated 12 kHz~20MHz @ 3.3V	
	80MHz~220MHz		-	0.3	-	0.3			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	30	-	30	μA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

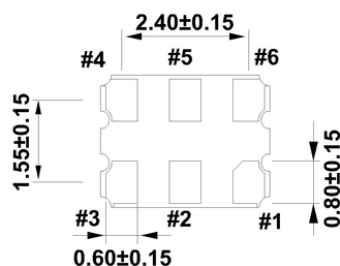
⚠ Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

TOP VIEW



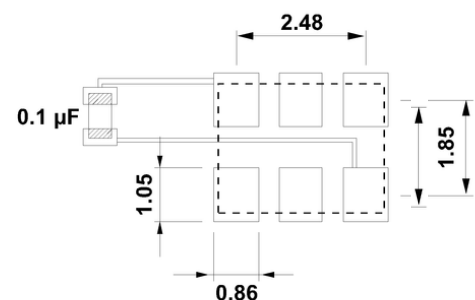
BOTTOM VIEW



SIDE VIEW



Solder Pad Layout(mm)



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between V_{dd} and GND pads.

Parameters	Symbol	LVDS						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	13.5~220						MHz		Test condition Ambient temperature : 25 ± 5°C Relative humidity : 40% ~ 70%
Standard Frequency	F(ST)	100, 125, 156.25						MHz		
Supply Current	Icc	-	35	-	30	-	20	mA		
Transition Time	Tr	-	0.3	-	0.3	-	0.5	nSec	Measured from 20% ~ 80%	
	Tf	-	0.3	-	0.3	-	0.5			
Output Level	Vdiff	0.24	0.45	0.24	0.45	0.24	0.45		VOD, OUT-OUTN	
	VoH	-	1.6	-	1.6	-	1.6	V		
	VoL	0.9	-	0.9	-	0.9	-	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						μA	Max	
Output Load	RL	100Ω (Between OUT & OUTN)						Ω		
Start-up Time	Tosc	-	5	-	5	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

⚠ Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

Parameters	Symbol	HCSL						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~135						MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	100, 125						MHz		
Supply Current	Icc	-	42	-	42	-	30	mA		
Transition Time	Tr	-	0.6	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Tf	-	0.6	-	0.6	-	0.6			
Output Level	VoH	0.6	0.9	0.6	0.9	0.55	1.0	V		
	VoL	-0.15	0.15	-0.15	0.15	-0.15	0.15	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, f _{out} =156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						μA	Max	
Output Load	RL	50 to GND						Ω		
Start-up Time	Tosc	-	10	-	10	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

⚠ Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 25	± 50
@-20~70°C	○	○
@-40~85°C	○	○
@-40~105°C	×	○
@-40~125°C	×	△

○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.