Data Sheet

Miniature crystal oscillator EXO-3

RS stock numbers 296-879, 296-885, 296-891, 296-908

The EXO-3 is a small size CMOS crystal clock oscillator equipped with a programmable frequency divider. Division from $^1/_2$ to $^1/_{2^8}$ of the original frequency may be achieved simultaneously. Composed of an AT-cut oscillator and a specially designed CMOS IC divider and can operate from a wide range of power supply voltages. Low power consumption, high speed operation and stand-by function make the EXO-3 suitable in a variety of applications.

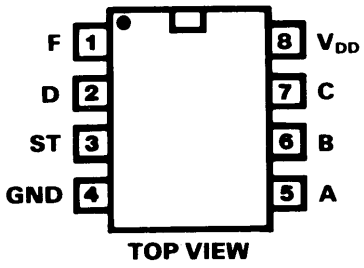
Absolute maximum ratings

Power supply voltage ——— –0.5V to +7V
Input voltage ——— –0.3 to V_{DD} + 0.3
Output current ——— ±25mA
Storage temperature range ——— –55°C to +125°C
Operating temperature range ——— –10°C to 70°C

Features

- Standard 8-pin DIL package.
- Low current consumption CMOS IC
- Wide range operating supply voltage +3V to +6V
- Short starting time - less than 1.5msec
- High noise margin
- Standby function
- No adjustment required

Pin connections



Handling notes

ATTENTION

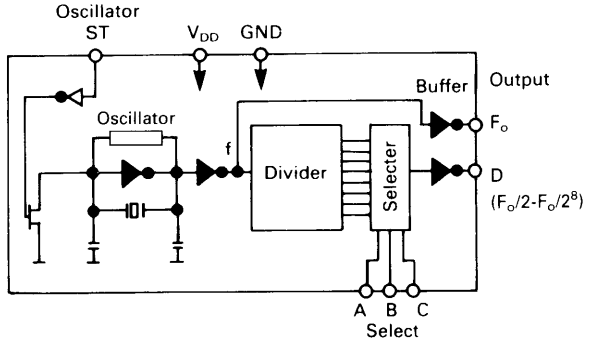
OBSERVE PRECAUTIONS FOR HANDLING

ELECTROSTATIC SENSITIVE DEVICES

No by-pass capacitor is inserted between power supply stage (V_{DD}-GND). To protect from overvoltage and overcurrent applied to this device due to power supply noise, use a capacitor (above 0.01μF) at a place as close as possible to the V_{DD}-GND pin.

Reversal of the power supply connections should be avoided as this will cause internal device destruction.

Figure 1 Block diagram



Pin functions

1. Outputs the original frequency (f_o) of the internal quartz crystal.
2. Outputs the frequency of programmed dividing ratio ($f_o/2^n$).
3. Possible to be oscillated when set to HIGH level and oscillation stopped when set to LOW level. When this function is not needed ensure the standby pin is set to a HIGH level.
4. Ground.
5. }
6. } Used to programme the dividing ratio for the original frequency.
7. }
8. Supply voltage.

Operating conditions

Item	Symbol	Rating			Unit
		min	typ	max	
Supply voltage	V_{DD}	3.0	5.0	6.0	V
Operating temperature range	T_{OPR}	–10	25	70	°C

Electrical characteristics

V_{DD}=5.0V C_L=50pF Ta=25°C

Item		Symbol	Condition	min	typ	max	Unit
'H' input voltage		V_{IH}		3.6			V
'L' input voltage		V_{IL}				0.8	V
'H' output voltage		V_{OH}	I_{OUT}=-20μA	4.75			V
			I_{OUT}=–4mA	4.5			V
'L' output voltage		V_{OL}	I_{OUT}=+20μA			0.25	V
			I_{OUT} =+4mA			0.5	V
Output rise time		T_{TLH}			10	15	ns
Output fall time		T_{THL}			10	15	ns
Input leakage current		I_I	V_{IN}=V_{DD} or GND			±1.0	μA
Set up time	V_{DD}	T_{VU}				1.5	ms
	ST	T_{STU}				1.5	ms
Duty ratio		T1/T2		40/60		60/40	%
Power supply current		I_{DD}				20.0	mA
Stand-by current		I_{ST}				10	μA

Figure 2 Frequency supply current (typical

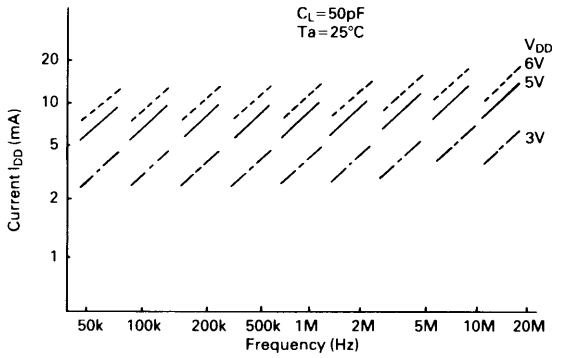


Figure 3 Supply voltage as a function of supply current (typical)

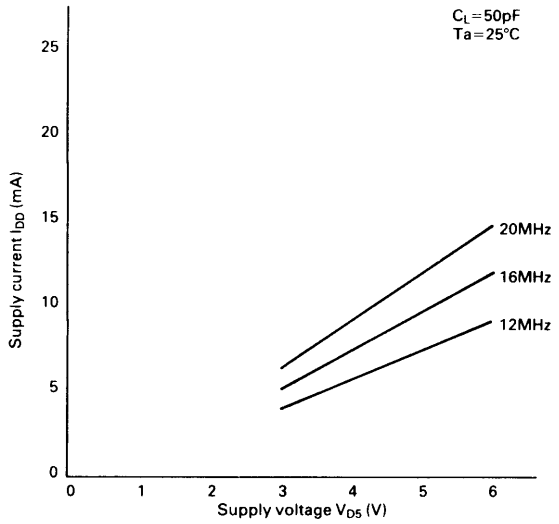


Figure 4 Load capacitance as a function of supply current (typical)

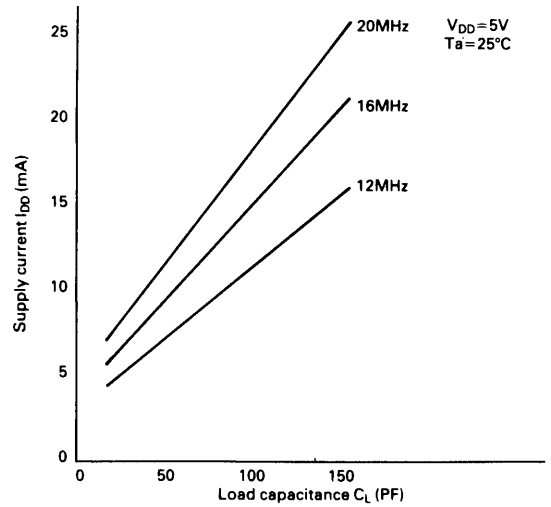


Figure 5 Supply voltage as a function of output rise and fall time (typical)

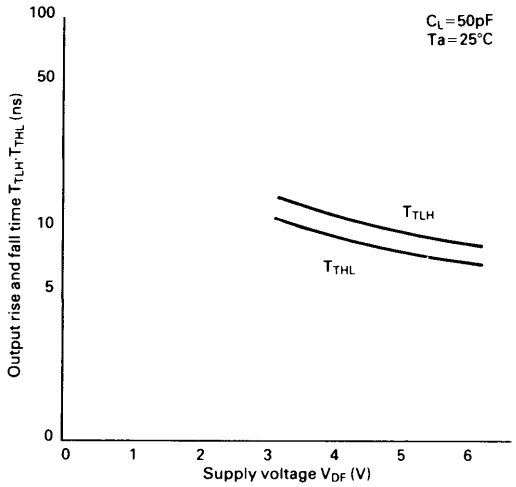
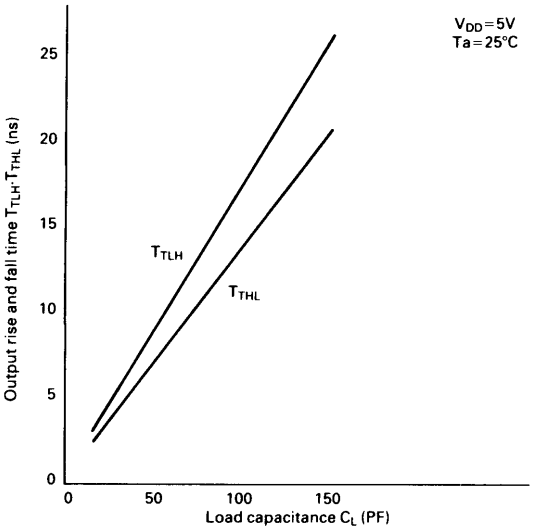


Figure 6 Load capacitance as a function of output rise and fall time (typical)



Standard frequencies

RS stock no	fo (original frequency)	Divided waveform							
	$1/2^0$	$1/2$	$1/2^2$	$1/2^3$	$1/2^4$	$1/2^5$	$1/2^6$	$1/2^7$	$1/2^8$
296-879	12MHz	6MHz	3MHz	1.5MHz	750kHz	375kHz	187.5kHz	93.75kHz	46.875kHz
296-885	14.31818MHz	7.15909MHz	3.579545MHz	1.789772MHz	894.88kHz	447.44kHz	223.72kHz	111.875kHz	55.937kHz
296-891	16MHz	8MHz	4MHz	2MHz	1MHz	500kHz	250kHz	125kHz	62.6kHz
296-908	19.6608MHz	9.8304MHz	4.9152MHz	2.4576MHz	1.2288MHz	614.4kHz	307.2kHz	153.6kHz	76.8kHz

Setting of divider output

Input				Output	
	Select		ST	F	D
C	B	A		Base frequency	Divider output
X	X	X	L	L	L
L	L	L	H	F_O	$F_O/2$
L	L	H	H	F_O	$F_O/4$
L	H	L	H	F_O	$F_O/8$
L	H	H	H	F_O	$F_O/16$
H	L	L	H	F_O	$F_O/32$
H	L	H	H	F_O	$F_O/64$
H	H	L	H	F_O	$F_O/128$
H	H	H	H	F_O	$F_O/256$