Default Frequency and VCXO Pull Range Order Information for Ceramic 5x7 Devices

Ordering Information for FemtoClock® NG Ceramic-Package XO and VCXO Products

The programmable VCXO and XO devices support a variety of devices options such as the output type, number of default frequencies, internal crystal frequency, power supply voltage, ambient temperature range and the frequency accuracy. The device options, default frequencies and VCXO pull range must be specified at the time of order and are programmed by IDT before the shipment. Table 1 specifies the available order codes including the device options. Table 2 to Table 4 specify the default frequency configurations. Example part number: order code 8N3QV01FD-0001CDI specifies a programmable, quad default-frequency VCXO with a voltage supply of 2.5V, a LVPECL output, a ±50ppm crystal frequency accuracy, contains a 114.285MHz internal crystal as frequency source, industrial temperature range, a lead-free (6/6 RoHS) 10-lead ceramic 5mm x 7mm x 1.55mm package and is factory-programmed to the default frequencies of 100MHz, 122.88MHz, 125MHz and 156.25MHz and to the VCXO pull range of min. ±100ppm. The default frequency configuration is found in table 1.

Other default frequencies and order codes are available from IDT on request.

Look up default frequencies from Tables 2, 3 and 4 by using the left-most frequency column for single-frequency devices, the two left-most columns for dual and all four columns for quad-frequency devices, respectively.

Table 1. Order Codes

8N X X XXX X X - dddd XX X X

FemtoClock NG

I/O Identifier
0: LVCMOS
3: LVPECL
4: LVDS

Number of Default Frequencies
S: 1: Single
D: 2: Dual
Q: 4: Quad

Part Number

	Function	#Pins	OE fct. at pin
001	XO	10	OE@2
003	XO	10	OE@1
V01	VCXO	10	OE@2
V03	VCXO	10	OE@1
V75	VCXO	6	OE@2
V76	VCXO	6	nOE@2
V85	VCXO	6	—
085	XO	6	OE@1
270	XO	6	OE@1
271	XO	6	OE@2
272	XO	6	nOE@2
273	XO	6	nOE@1

Option Code (Supply Voltage and Frequency-Stability)
A: V_{CC} = 3.3V±5%, ±100ppm
B: V_{CC} = 2.5V±5%, ±100ppm
E: V_{CC} = 3.3V±5%, ±50ppm
F: V_{CC} = 2.5V±5%, ±50ppm
K: V_{CC} = 3.3V±5%, ±20ppm
L: V_{CC} = 2.5V±5%, ±20ppm

Die Revision
H

Default-Frequency and VCXO Pull Range
See document *FemtoClock NG Ceramic-Package XO and VCXO Ordering Product Information.*

dddd	f_{XTAL} (MHz)	PLL feedback	Use for	**Table**
0000 to **0999**	114.285	Fractional	VCXO, XO	**2**
1000 to **1999**	100.000	Integer	XO	**3**
2000 to **2999**		Fractional	XO	**4**

Last digit = **L**: configuration pre-programmed and not changeable

Package Code
CD: Lead-Free, 6/10-lead ceramic 5mm x 7mm x 1.55mm

Ambient Temperature Range
"**I**": Industrial: (T_A = -40°C to 85°C)
(no letter): (T_A = 0°C to 70°C)

Shipping Package
8: Tape & Reel
(no letter): Tray

©2014 Integrated Device Technology, Inc.

Table 2. Default Frequencies and Ordering Information for f_{XTAL}= 114.285MHz

Code (dddd)	Default Frequencies (MHz)				
	Single Frequency Devices				
	Dual Frequency Devices				
	FSEL = 0	FSEL = 1			
	Quad Frequency Devices				
	FSEL[1:0] = 00	FSEL[1:0] = 01	FSEL[1:0] = 10	FSEL[1:0] = 11	Pull Range (ppm)
0001	125	100	122.88	156.25	±100
0002	1228.8	983.04	614.14	491.52	±100
0003	622.08	625	666.5143	669.3266	±100
0004	622.08	625	161.1328	167.3365	±100
0005	622.08	625	644.5313	693.4830	±100
0006	622.08	625	657.4219	707.3527	±100
0007	622.08	666.5143	669.3266	672.1627	±100
0008	644.5313	669.3266	657.4219	707.3527	±100
0009	148.5	148.35165	74.25	74.175824	±100
0010	622.08	644.5313	669.3266	672.16	±100
0011	622.08	644.5313	669.3266	693.483	±100
0012	672.1627	696.4215	672.1627	696.4215	±100
0013	622.08	672.1627	696.4217	715.5389	±200
0014	625	312.5	156.25	125	±100
0015	156.25	187.5	200	250	±100
0016	100	125	155.52	156.25	±100
0017	622.08	669.3266	644.5313	693.483	±200
0018	212.5	250	300	312.5	±100
0019	155.52	161.132	669.3266	693.483	±100
0020	106.25	125	156.25	212.5	±100
0021	164.3555	164.3555	164.3555	164.3555	±500
0022	176.8382	176.8382	176.8382	176.8382	±500
0023	707.3527	707.3527	707.3527	707.3527	±500
0024	100	125	156.25	250	±100
0025	25	25	19.44	19.44	±100
0026	311.04	311.04	311.04	311.04	±100
0027	400	400	400	400	±100
0028	156.25	156.25	156.25	156.25	±100
0029	155.52	155.52	155.52	155.52	±300
0030	312.5	312.5	312.5	312.5	±100
0031	80	100	125	156.25	±100
0032	76.8	19.2	19.2	76.8	±100
0033	100	125	156.25	250	±100
0034	155.52	167.3316	669.3266	172.5607	±100
0035	155.52	156.25	128.78788	159.375	±100
0036	100	125	250	312.5	±100
0037	500	125	250	1000	±100
0038	155.52	166.62857	627.32962	649.97033	±50
0039	148.5	125	200	100	±100
0040	622.08	669.3266	622.08	669.3266	±200
0041	693.483	707.3527	693.483	707.3527	±350
0042	644.5313	657.42	644.5313	657.42	±350
0043	496	496	496	496	±50
0044	125	100	155.52	166.628571	±100
0045	100	125	100	125	±100
0046	200	50	100	125	±50
0047	24.576	125	148.5	143.35164	±100

 ©2014 Integrated Device Technology, Inc.

Table 2. Default Frequencies and Ordering Information for f_{XTAL}= 114.285MHz

Code (dddd)	Default Frequencies (MHz)				
	Single Frequency Devices				
	Dual Frequency Devices				
	FSEL = 0	FSEL = 1			
	Quad Frequency Devices				
	FSEL[1:0] = 00	FSEL[1:0] = 01	FSEL[1:0] = 10	FSEL[1:0] = 11	Pull Range (ppm)
0048	159.375	155.52	106.25	133.33	±100
0049	150	75	300	150	±100
0050	622.08	155.52	644.5313	669.3266	±100
0051	672.1562	696.4375	710.3125	710.3125	±100
0052	425	212.5	106.25	159.375	±100
0053	160	160	160	160	±125
0054	25	33.33	50	62.5	±100
0055	156.25	125	100	25.175	±100
0056	125	66.66	30.72	50	±100
0057	155.52	77.76	38.88	156.25	±100
0058	669.3266	669.3266	669.3266	669.3266	±100
0059	644.5313	644.5313	644.5313	644.5313	±100
0060	622.08	622.08	622.08	622.08	±100
0061	693.483	693.483	693.483	693.483	±100
0062	150	125	155.52	311.04	±100
0063	24	39.4	48	64	±100
0064	106.25	100	106.25	100	±100
0065	212.5	212.5	212.5	212.5	±100
0066	122.88	122.88	122.88	122.88	±100
0067	192	192	192	192	±175
0068	161.1328	161.1328	161.1328	161.1328	±100
0069	250	250	250	250	±100
0070	24.576	200	225	250	±100
0071	622.08	672.1627	644.5313	696.6149	±87.5
0072	622.08	666.514286	627.32962	649.970332	±100
0073	312.5	156.25	125	100	±100
0074	100	106.25	100	106.25	±100
0075	150	75	150	75	±100
0076	200	200	200	200	±100
0077	125	156.25	322.265625	125	±100
0078	100	200	300	400	±100
0079	328.125	322.265625	125	162.5 (TBD)	±100
0080	125	125	125	125	±100
0081	125	156.25	250	312.5	±100
0082	622.08	156.25	155.52	125	±100
0083	160	160	160	160	±300
0084	622.08	669.3266	622.08	669.3266	±300
0085	160	160	160	160	±225
0086	350	350	350	350	±100
0087	161.1328	155.52	156.25	156.25	±150
0088	156.25	156.25	156.25	156.25	±100
0089	155.52	155.52	155.52	155.52	±100
0090	159.375	133.33	106.25	187.5	±100
0091	70.656	35.328	70.656	35.328	±100
0092	148.5	148.351648	74.25	74.175824	±100
0093	737.28	737.28	737.28	737.28	±300
0094	20	44.736	51.84	125	±100
0095	100	125	133	156.25	±100

 ©2014 Integrated Device Technology, Inc.

Table 2. Default Frequencies and Ordering Information for f_{XTAL}= 114.285MHz

Code (dddd)	Default Frequencies (MHz)				
	Single Frequency Devices				
	Dual Frequency Devices				
	FSEL = 0	FSEL = 1			
	Quad Frequency Devices				
	FSEL[1:0] = 00	FSEL[1:0] = 01	FSEL[1:0] = 10	FSEL[1:0] = 11	Pull Range (ppm)
0096	100	100.3	100	100.3	±100
0097	38.88	38.88	38.88	38.88	±100
0098	130	100	80	25	±100
0099	187.5	250	287.5	312.5	±100
0100	100	195.3125	200.717	203.768	±100
0101	125	156.25	192	225	±150
0102	25	50	100	125	±100
0103	240	240	240	240	±100
0104	425	425	425	425	±100
0105	110	110	110	110	±100
0106	125.009375	150	312.25	156.25	±100
0107	187.5	150	300	300	±100
0108	100	100	100	100	±100
0109	156.25	155.52	100	150	±100
0110	25	38.88	44.736	100	±100
0111	500	500	500	500	±100
0112	156.25	161.1328	156.25	161.1328	±100
0113	156.25	175	200	312.5	±100
0114	300	350	400	533	±100
0115	175	175	175	175	±100
0116	70.656	35.328	70.656	35.328	±50
0117	156.25	100	125	312.5	±100
0118	100	100	100	100	±100
0119	533	400	350	200	±100
0120	166.6667	166.6667	166.6667	166.6667	±100
0121	180	180	180	180	±100
0122	320	320	320	320	±100
0123	669.326582	693.482991	669.326582	693.482991	±100
0124	75	75	75	75	±100
0125	622.08	672.16271	622.08	672.16271	±295
0126	19.2	38.4	26	52	±100
0127	25	33.3333	50	125	±100
0128	25	33.3333	62.5	125	±100
0129	187.5	187.5	187.5	187.5	±100
0130	174.8	174.8	174.8	174.8	±100
0131	114.285	114.285	114.285	114.285	±100
0132	496	496	496	496	±100
0133	480	480	480	480	±100
0134	100	156.25	250	312.5	±100
0135	25	40	50	100	±100
0136	100	312.5	100	312.5	±100
0137	155.52	155.52	155.52	155.52	±237
0138	148.5	148.351	27	74.1758	±100
0139	170	200	220	250	±100
0140	133.333333	140	146.666666	153.333333	±100
0141	156.25	133.3333	137.5	156.25	±100
0142	120	120	120	120	±100
0143	81	135	270	108	±100

 ©2014 Integrated Device Technology, Inc.

Table 2. Default Frequencies and Ordering Information for f_{XTAL}= 114.285MHz

Code (dddd)	Default Frequencies (MHz)				
	Single Frequency Devices ↓				
	Dual Frequency Devices ↓				
	FSEL = 0	FSEL = 1			
	Quad Frequency Devices ↓				
	FSEL[1:0] = 00	FSEL[1:0] = 01	FSEL[1:0] = 10	FSEL[1:0] = 11	Pull Range (ppm)
0144	100	125	156.25	200	±250
0145	100	200	333	400	±100
0146	100	95	105	125	±100
0147	100	400	1000	1000	±100
0148	231.25	231.25	231.25	231.25	±100
0149	350	312.5	175	156.25	±100
0150	100	400	1000	250	±100
0151	150	156.25	212.5	150	±100
0152	328.125	322.265625	125	265.625	±100
0153	100	40.5	67.5	135	±100
0154	50	50	50	50	±100
0155	100	83.33	100	83.33	±100
0156	121.109	121.109	121.109	121.109	±100
0157	100	100.011	99.989	100.022	±100
0158	166.62875	166.62875	166.62875	166.62875	±100
0159	100	156.25	212.5	106.25	±100
0160	155.52	155.52	155.52	155.52	±75
0161	212	212	212	212	±137.5
0162	100	98	102	99	±100
0163	81	135	270	108	±100
0164	156.25	312.5	125	250	±100
0165	100	110	125	130	±100
0166	100	95	105	125	±100
0167	98	99	102	100	±100
0168	74.25	74.174	74.25	74.174	±100
0169	148.5	148.35	148.5	148.35	±100
0170	100	106.25	125	300	±100
0171	622.08	644.5313	622.08	644.5313	±587.5
0172	287.5	287.5	287.5	287.5	±100
0173	156.2523	156.25	156.2328	156.2281	±100
0174	136	155	400	450	±100
0175	100	125	122.88	153.6	±100
0176	345	172.5	100	125	±100
0177	1124	1152	1128	1130	±100
0178	800	800	800	800	±87.5
0179	62.5	200	62.5	200	±100
0180	78.125	78.125	78.125	78.125	±100
0181	66.00	66.00	66.00	66.00	±100
0182	644.5313	698.8123	672.1627	696.6149	±20
0183	644.5313	698.3266	693.4830	438.2813	±20
0184	156.25	156.25	156.25	156.25	±350
0185	156.25	156.25	156.25	156.25	±750
0186	622.08	622.08	622.08	622.08	±350
0187	622.08	622.08	622.08	622.08	±750
0188	533.33333	450	400	200	±100
0189	26.9865	26.9865	27	26.973	±750
0190	245.76	245.76	245.76	245.76	±100
0191	148.35165	148.5	148.351648	148.5	±100

 ©2014 Integrated Device Technology, Inc.

Table 2. Default Frequencies and Ordering Information for f_{XTAL}= 114.285MHz

Code (dddd)	Default Frequencies (MHz)				
	Single Frequency Devices				
	Dual Frequency Devices				
	FSEL = 0	FSEL = 1			
	Quad Frequency Devices				
	FSEL[1:0] = 00	FSEL[1:0] = 01	FSEL[1:0] = 10	FSEL[1:0] = 11	Pull Range (ppm)
0192	540	828	1242	1278	±350
0193	133.0000	133.0000	133.0000	133.0000	133.0000
0195	50.0000	200.0000	156.2500	390.6250	±100
0196	102.4000	50.0000	100.0000	125.0000	±100
0197	200.0000	200.0000	200.0000	200.0000	±137.5
0198	156.2500	135.0000	156.2500	135.0000	±200
0199	25.0000	25.0000	25.0000	25.0000	±125
0200	156.2500	156.2500	156.2500	156.2500	±125
0201	153.6000	125.0000	153.6000	125.0000	±90
0202	156.2500	125.0000	156.2500	125.0000	±90
0203	698.8120	706.1806	698.8120	706.1806	±500
0204	191.1250	125.0000	191.1250	125.0000	±90
0205	155.5200	153.6000	155.5200	153.6000	±90
0206	100.8000	100.0000	125.0000	156.2500	±100
0207	100.0000	125.0000	156.2500	300.0000	±100

NOTE: Other default frequencies can be obtained from IDT on request.
NOTE: Pull range is only applicable to VCXO devices. When ordering a XO device, the pull range can be ignored.
NOTE: Default pull range is: ±100ppm.

 ©2014 Integrated Device Technology, Inc.

Table 3. Default Frequency Ordering Information for f_{XTAL}= 100.000MHz, Integer Feedback PLL

Code (dddd)	Default Frequencies (MHz)			
	Single Frequency Devices ↓			
	Dual Frequency Devices ↓			
	FSEL = 0	FSEL = 1		
	Quad Frequency Devices ↓			
	FSEL[1:0] = 00	FSEL[1:0] = 01	FSEL[1:0] = 10	FSEL[1:0] = 11
1014	625	312.5	156.25	125
1015	156.25	187.5	200	250
1018	212.5	250	300	312.5
1020	106.25	125	156.25	212.5
1024	100	125	156.25	250
1027	400	400	400	400
1028	156.25	156.25	156.25	156.25
1030	312.5	312.5	312.5	312.5
1031	80	100	125	156.25
1033	100	125	156.25	250
1034	16	75	166	300
1036	100	125	250	312.5
1037	500	125	250	1000
1043	496	496	496	496
1045	100	125	100	125
1046	200	50	100	125
1049	150	75	300	150
1052	425	212.5	106.25	159.375
1053	160	160	160	160
1054	25	33.33	50	62.5
1064	106.25	100	106.25	100
1065	212.5	212.5	212.5	212.5
1069	250	250	250	250
1073	312.5	156.25	125	100
1074	100	106.25	100	106.25
1075	150	75	150	75
1076	200	200	200	200
1077	135	135	135	135
1078	100	200	300	400
1079	148.5	148.5	148.5	148.5
1080	125	125	125	125
1086	350	350	350	350
1088	156.25	156.25	156.25	156.25
1095	100	125	133	156.25
1098	130	100	80	25
1099	187.5	250	287.5	312.5
1102	25	50	100	125
1103	240	240	240	240
1104	425	425	425	425
1105	110	110	110	110
1107	187.5	150	300	300
1108	100	100	100	100
1111	500	500	500	500
1113	156.25	175	200	312.5
1114	300	350	400	533
1115	175	175	175	175

 ©2014 Integrated Device Technology, Inc.

Table 3. Default Frequency Ordering Information for f_{XTAL}= 100.000MHz, Integer Feedback PLL

Code (dddd)	Default Frequencies (MHz)			
	Single Frequency Devices ↓			
	Dual Frequency Devices ↓			
	FSEL = 0	FSEL = 1		
	Quad Frequency Devices ↓			
	FSEL[1:0] = 00	FSEL[1:0] = 01	FSEL[1:0] = 10	FSEL[1:0] = 11
1118	100	100	100	100
1120	166.6667	166.6667	166.6667	166.6667
1121	180	180	180	180
1122	320	320	320	320
1124	75	75	75	75
1127	25	33.3333	50	125
1128	25	33.3333	62.5	125
1129	187.5	187.5	187.5	187.5
1133	480	480	480	480
1134	100	156.25	250	312.5
1135	25	40	50	100
1136	100	312.5	100	312.5
1141	156.25	133.3333	137.5	156.25
1142	120	120	120	120
1145	100	200	333	400
1146	100	95	105	125
1147	100	400	1000	1000
1149	350	312.5	175	156.25
1150	100	400	1000	250
1151	150	156.25	212.5	150
1153	100	40.5	67.5	135
1154	50	50	50	50
1155	100	83.33	100	83.33
1164	156.25	312.5	125	250
1165	100	110	125	130
1166	100	95	105	125
1172	287.5	287.5	287.5	287.5
1178	156.25	156.25	156.25	156.25
1179	62.5	200	62.5	200
1180	78.125	78.125	78.125	78.125
1181	66.00	66.00	66.00	66.00
1189	26.9865	26.9865	27	26.973
1196	102.4000	50.0000	100.0000	125.0000
1197	100.0000	125.0000	156.2500	212.5000
1198	125.0000	150.0000	250.0000	300.0000
1199	206.2500	206.2500	206.2500	206.2500
1207	100.0000	125.0000	156.2500	300.0000

NOTE: Other default frequencies can be obtained from IDT on request.
NOTE: The default frequency codes 1000 to 1999 are implemented with integer-only PLL dividers and are only applicable to XO devices.

 ©2014 Integrated Device Technology, Inc.

Table 4. Default Frequency Ordering Information for f_{XTAL}= 100.000MHz, Fractional Feedback PLL

Code (dddd)	Default Frequencies (MHz)			
	Single Frequency Devices ↓			
	Dual Frequency Devices ↓			
	FSEL = 0	FSEL = 1		
	Quad Frequency Devices ↓			
	FSEL[1:0] = 00	FSEL[1:0] = 01	FSEL[1:0] = 10	FSEL[1:0] = 11
2002	1228.8	983.04	614.14	491.52
2060	622.08	622.08	622.08	622.08
2066	122.88	122.88	122.88	122.88
2148	231.25	231.25	231.25	231.25
2163	81	135	270	108
2174	136	155	400	450
2175	100	125	122.88	153.6
2176	345	172.5	100	125
2177	1124	1152	1128	1130
2180	78.125	78.125	78.125	78.125
2181	66.00	66.00	66.00	66.00
2182	644.5313	698.8123	672.1627	696.6149
2183	644.5313	669.3266	693.4830	438.2813
2188	533.33333	450	400	200
2189	26.9865	26.9865	27	26.973
2190	245.76	245.76	245.76	245.76
2191	148.35165	148.5	148.351648	148.5
2193	133.0000	133.0000	133.0000	133.0000
2194	174.703084	174.703084	174.703084	174.703084
2195	50.0000	200.0000	156.2500	390.6250
2197	257.8125	250.0000	312.5000	175.000
2199	25.0000	26.6000	27.0000	32.0000
2200	25.0000	37.0560	78.0000	104.0000
2201	100.0000	156.2500	161.1330	174.7030

NOTE: Other default frequencies can be obtained from IDT on request.

NOTE: The default frequency codes 2000 to 2999 are implemented with fractional PLL dividers and are only applicable to XO devices with f_{XTAL}=100.000MHz.

 ©2014 Integrated Device Technology, Inc.

Table 5. Default Frequency Ordering Information for f_{XTAL}= 100.000MHz, Non-Changeable XO Configurations

Code (dddd)	Default Frequencies (MHz)			
	Single Frequency Devices			
	Dual Frequency Devices			
	FSEL = 0	FSEL = 1		
	Quad Frequency Devices			
	FSEL[1:0] = 00	FSEL[1:0] = 01	FSEL[1:0] = 10	FSEL[1:0] = 11
101L	625	312.5	156.25	125
102L	106.25	212.5	75	150
105L	100	125	150	156.25
203L	622.08	155.52	644.5313	669.3266
204L	156.25	161.1328125	187.5	155.52

We've Got Your Timing Solution

www.IDT.com

6024 Silver Creek Valley Road
San Jose, California 95138

Sales
800-345-7015 (inside USA)
+408-284-8200 (outside USA)
Fax: 408-284-2775
www.IDT.com/go/contactIDT

Technical Support
netcom@idt.com
+480-763-2056

DISCLAIMER Integrated Device Technology, Inc. (IDT) and its subsidiaries reserve the right to modify the products and/or specifications described herein at any time and at IDT's sole discretion. All information in this document, including descriptions of product features and performance, is subject to change without notice. Performance specifications and the operating parameters of the described products are determined in the independent state and are not guaranteed to perform the same way when installed in customer products. The information contained herein is provided without representation or warranty of any kind, whether express or implied, including, but not limited to, the suitability of IDT's products for any particular purpose, an implied warranty of merchantability, or non-infringement of the intellectual property rights of others. This document is presented only as a guide and does not convey any license under intellectual property rights of IDT or any third parties.

IDT's products are not intended for use in applications involving extreme environmental conditions or in life support systems or similar devices where the failure or malfunction of an IDT product can be reasonably expected to significantly affect the health or safety of users. Anyone using an IDT product in such a manner does so at their own risk, absent an express, written agreement by IDT.

Integrated Device Technology, IDT and the IDT logo are registered trademarks of IDT. Other trademarks and service marks used herein, including protected names, logos and designs, are the property of IDT or their respective third party owners.

Copyright 2014. All rights reserved.