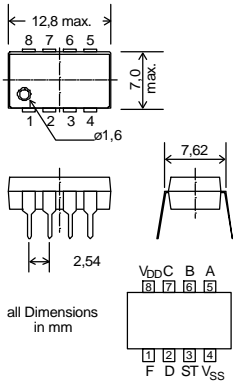


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EXO-3

CRYSTAL OSCILLATOR FOR μ P'S WITH PROGRAMMABLE OUTPUT



| | | |
|-----------------------------|----------------------------------|--------------------------|
| Frequency Range | 12 - 24,576 MHz | 30 - 32 MHz |
| Standard Frequency | Table 1 | |
| Divider Select | Table 2 | |
| Frequency Stability | $\pm 100 \times 10^{-6}$ | $\pm 150 \times 10^{-6}$ |
| Operating Temperature Range | -10 ... +70°C | |
| Supply Voltage | +5 \pm 0,5 V | |
| Supply Current | 20 mA max. (8 mA typ. at 16 MHz) | |
| Output Waveform | CMOS | |
| Output Symmetry | 40 / 60% | |
| Output Rise-/Fall Time | 15 ns max. (10 ns typ.) | |
| Load | 50 pF | 15 pF |

Table 1

| f_0 (MHz) | $f_0 / 2^1$ (MHz) | $f_0 / 2^2$ (MHz) | $f_0 / 2^3$ (MHz) | $f_0 / 2^4$ (kHz) | $f_0 / 2^5$ (kHz) | $f_0 / 2^6$ (kHz) | $f_0 / 2^7$ (kHz) | $f_0 / 2^8$ (kHz) |
|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 12,00000 | 6,000000 | 3,000000 | 1,500000 | 750,000 | 375,000 | 187,500 | 93,750 | 46,875 |
| 12,28800 | 6,144000 | 3,072000 | 1,536000 | 768,000 | 384,000 | 192,000 | 96,000 | 48,000 |
| 12,80000 | 6,400000 | 3,200000 | 1,600000 | 800,000 | 400,000 | 200,000 | 100,000 | 50,000 |
| 14,31818 | 7,159090 | 3,579545 | 1,789772 | 894,886 | 447,443 | 223,722 | 111,861 | 55,930 |
| 14,50000 | 7,250000 | 3,625000 | 1,812500 | 906,250 | 453,125 | 226,563 | 113,281 | 56,641 |
| 14,74560 | 7,372800 | 3,686400 | 1,843200 | 921,600 | 460,800 | 230,400 | 115,200 | 57,600 |
| 14,91050 | 7,455250 | 3,727625 | 1,863813 | 931,906 | 465,953 | 232,977 | 116,488 | 58,244 |
| 15,00000 | 7,500000 | 3,750000 | 1,875000 | 937,500 | 468,750 | 234,375 | 117,188 | 58,594 |
| 15,36000 | 7,680000 | 3,840000 | 1,920000 | 960,000 | 480,000 | 240,000 | 120,000 | 60,000 |
| 15,97440 | 7,987200 | 3,993600 | 1,996800 | 998,400 | 499,200 | 249,600 | 124,800 | 62,400 |
| 16,00000 | 8,000000 | 4,000000 | 2,000000 | 1000,000 | 500,000 | 250,000 | 125,000 | 62,500 |
| 16,12800 | 8,064000 | 4,032000 | 2,016000 | 1008,000 | 504,000 | 252,000 | 126,000 | 63,000 |
| 16,25700 | 8,128500 | 4,064250 | 2,032125 | 1016,063 | 508,031 | 254,016 | 127,008 | 63,504 |
| 16,38400 | 8,192000 | 4,096000 | 2,048000 | 1024,000 | 512,000 | 256,000 | 128,000 | 64,000 |
| 17,73447 | 8,867238 | 4,433619 | 2,216809 | 1108,400 | 554,200 | 277,100 | 138,550 | 69,275 |
| 18,43200 | 9,216000 | 4,608000 | 2,304000 | 1152,000 | 576,000 | 288,000 | 144,000 | 72,000 |
| 19,09090 | 9,545455 | 4,772727 | 2,386364 | 1193,182 | 596,591 | 298,295 | 149,148 | 74,574 |
| 19,20000 | 9,600000 | 4,800000 | 2,400000 | 1200,000 | 600,000 | 300,000 | 150,000 | 75,000 |
| 19,66080 | 9,830400 | 4,915200 | 2,457600 | 1228,800 | 614,400 | 307,200 | 153,600 | 76,800 |
| 20,00000 | 10,000000 | 5,000000 | 2,500000 | 1250,000 | 625,000 | 312,500 | 156,250 | 78,125 |
| 20,48000 | 10,240000 | 5,120000 | 2,560000 | 1280,000 | 640,000 | 320,000 | 160,000 | 80,000 |
| 21,47727 | 10,738635 | 5,369318 | 2,684659 | 1342,329 | 671,165 | 335,582 | 167,791 | 83,896 |
| 22,00000 | 11,000000 | 5,500000 | 2,750000 | 1375,000 | 687,500 | 343,750 | 171,875 | 85,938 |
| 22,11840 | 11,059200 | 5,529600 | 2,764800 | 1382,400 | 691,200 | 345,600 | 172,800 | 86,400 |
| 24,00000 | 12,000000 | 6,000000 | 3,000000 | 1500,000 | 750,000 | 375,000 | 187,500 | 93,750 |
| 24,57600 | 12,288000 | 6,144000 | 3,072000 | 1536,000 | 768,000 | 384,000 | 192,000 | 96,000 |
| 30,00000 | 15,000000 | 7,500000 | 3,750000 | 1875,000 | 937,500 | 468,750 | 234,375 | 117,188 |
| 32,00000 | 16,000000 | 8,000000 | 4,000000 | 2000,000 | 1000,000 | 500,000 | 250,000 | 125,000 |

Table 2

| INPUT | | | OUTPUT | | |
|--------|---|---|--------|--------------------|-------------------|
| Select | | | ST | original frequency | divided frequency |
| C | B | A | | F (OUT #1) | D (OUT #2) |
| L | L | L | H | f_0 clock | $f_0 / 2^1$ clock |
| L | L | H | H | f_0 clock | $f_0 / 2^2$ clock |
| L | H | L | H | f_0 clock | $f_0 / 2^3$ clock |
| L | H | H | H | f_0 clock | $f_0 / 2^4$ clock |
| H | L | L | H | f_0 clock | $f_0 / 2^5$ clock |
| H | L | H | H | f_0 clock | $f_0 / 2^6$ clock |
| H | H | L | H | f_0 clock | $f_0 / 2^7$ clock |
| H | H | H | H | f_0 clock | $f_0 / 2^8$ clock |
| - | - | - | L | L | L |