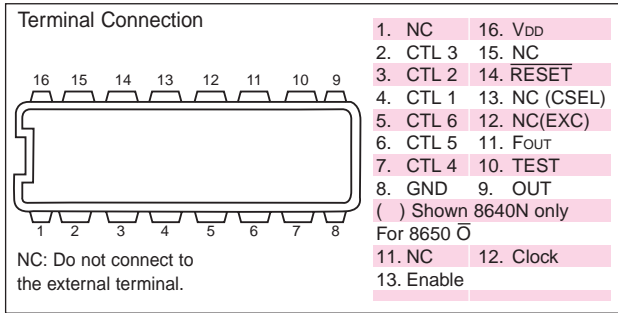




# Crystal Oscillators - Programmable - Seiko Epson

## SPG Series



## Explanation of Terminals

Terminal Name	Function
CTL1 to 6	Programs dividing ratio. (pull-down resistor incorporated)
OUT	Output frequency preset by CTL1-6. (Refer to the setting procedure of output frequency)
FOUT	Constantly outputs the oscillation source frequency of built-in quartz crystal.
RESET	Stops output at RESET="L". (Pull up resistor incorporated)
TEST	Used for the input terminal for testing. When CTL4 is H, output will be 1000 times larger than the preset value at TEST="H". (Pull-down resistor incorporated)
EXC (8640N only)	Serves as input terminal when using an external clock by changing to the built-in oscillator. Effective only when CSEL is H.
CSEL (8640N only)	When this terminal is made H, the external clock is selected (Pull down resistor incorporated).

Note: treatment of empty terminals. When RESET terminal is not used, this should be connected to VDD, when TEST terminal, CSEL terminal, and CTL1 to 6 terminals are not used, to GND.

Additional explanation of terminals for 8650D series	
Clock	Clock input (max. 1MHz)
ENABLE	Be sure to connect to V <sub>DD</sub>

## Setting of Divider Output

CTL1	CTL2	CTL3	Dividing ratio	CTL4	CTL5	CTL6	Dividing ratio
0	0	0	1/1	0	0	0	1/1 (1 <sup>0</sup> )
0	0	1	1/10	0	0	1	1/10 (1 <sup>1</sup> )
0	1	0	1/2	0	1	0	1/10 <sup>2</sup> (1/2 <sup>2</sup> )
0	1	1	1/3	0	1	1	1/10 <sup>3</sup> (1/2 <sup>3</sup> )
1	0	0	1/4	1	0	0	1/10 <sup>4</sup> (1/2 <sup>4</sup> )
1	0	1	1/5	1	0	1	1/10 <sup>5</sup> (1/2 <sup>5</sup> )
1	1	0	1/6	1	1	0	1/10 <sup>6</sup> (1/2 <sup>6</sup> )
1	1	1	1/12	1	1	1	1/10 <sup>7</sup> (1/2 <sup>7</sup> )

\*0 = L 1 = H

(8650D)

## Setting of Output Frequency

### 8640AN

Set terminal	CTL4	CTL5	CTL3	CTL2	CTL1	Output frequency (kHz)	Baud rate (fo/16)(bits/sec)	output example (fo/16)(bits/sec)					
0	0	0	0	0	0	600K	60K	6K	600	6	0.6	0.06	
0	0	1	0	0	0	60K	6K	600	60	6	0.6	0.06	0.006
0	1	0	0	0	0	300K	30K	3K	300	30	3	0.3	0.03
0	1	1	0	0	0	200K	20K	2K	200	20	2	0.2	0.02
1	0	0	0	0	0	150K	15K	1.5K	150	15	1.5	0.15	0.015
1	0	1	0	0	0	120K	12K	1.2K	120	12	1.2	0.12	0.012
1	1	0	0	0	0	100K	10K	1K	100	10	1	0.1	0.01
1	1	1	0	0	0	50K	5K	500	50	5	0.5	0.05	0.005

### 8640BN

Set terminal	CTL4	CTL5	CTL3	CTL2	CTL1	Output frequency (kHz)	Baud rate (fo/16)(bits/sec)	output example (fo/16)(bits/sec)						
0	0	0	0	0	0	1M	100K	10K	1K	100	10	1	1/10	1/100
0	0	1	0	0	0	100K	10K	1K	100	10	1	1/10	1/100	1/100
0	1	0	0	0	0	500K	50K	5K	500	50	5	1/2	1/2	1/20
0	1	1	0	0	0	333.3K	33.3K	3.3K	333.3	33.3	3.33	1/3	1/3	1/30
1	0	0	0	0	0	250K	25K	2.5K	250	25	2.5	1/4	1/4	1/40
1	0	1	0	0	0	200K	20K	2K	200	20	2	1/5	1/5	1/50
1	1	0	0	0	0	166.6K	16.6K	1.6K	166.6	16.6	1.6	1/6	1/6	1/60
1	1	1	0	0	0	83.3K	8.3K	833.3	83.3	8.3	0.83	1/12	1/120	1/120

### 8650A 8651A

Set terminal	CTL4	CTL5	CTL3	CTL2	CTL1	Output frequency (kHz)	Baud rate (fo/16)(bits/sec)	output example (fo/16)(bits/sec)						
0	0	0	0	0	0	60K	6K	600	60	6	0.6	0.06	0.006	0.0006
0	0	1	0	0	0	6K	600	600	60	0.6	0.06	0.006	0.006	0.0006
0	1	0	0	0	0	30K	3K	300	30	3	0.3	0.03	0.03	0.003
0	1	1	0	0	0	20K	2K	200	20	2	0.2	0.02	0.02	0.002
1	0	0	0	0	0	15K	1.5K	150	15	1.5	0.15	0.015	0.015	0.0015
1	0	1	0	0	0	12K	1.2K	120	12	1.2	0.12	0.012	0.012	0.0012
1	1	0	0	0	0	10K	1K	100	10	1	0.1	0.01	0.01	0.001
1	1	1	0	0	0	5K	500	50	5	0.5	0.05	0.005	0.005	0.0005

### 8650B 8651B

Set terminal	CTL4	CTL5	CTL3	CTL2	CTL1	Output frequency (kHz)	Baud rate (fo/16)(bits/sec)	output example (fo/16)(bits/sec)						
0	0	0	0	0	0	100K	10K	1K	100	10	1	1/10	1/100	1/1000
0	0	1	0	0	0	10K	1K	100	10	1	1/10	1/100	1/100	1/1000
0	1	0	0	0	0	50K	5K	500	50	5	1/20	1/10	1/10	1/200
0	1	1	0	0	0	33.3K	3.3K	333.3K	33.3	3.33	1/3	1/30	1/30	1/300
1	0	0	0	0	0	25K	2.5K	250	25	2.5	1/4	1/40	1/40	1/400
1	0	1	0	0	0	20K	2K	200	20	2	1/5	1/50	1/50	1/500
1	1	0	0	0	0	16.6K	1.6K	166.6	16.6	1.6	1/6	1/60	1/60	1/600
1	1	1	0	0	0	8.3K	833.3	83.3	8.3	0.83	1/12	1/120	1/120	1/200

### 8650E 8651E

Set terminal	CTL4	CTL5	CTL3	CTL2	CTL1	Output frequency (kHz)	Baud rate (fo/16)(bits/sec)	output example (fo/16)(bits/sec)						
0	0	0	0	0	0	32768	3276.8	327.68	32.768	3.2768	0.32768	0.03276	0.00327	0.000327
0	0	1	0	0	0	3276.8	327.68	32.768	3.276	0.327	0.0327	0.00327	0.000327	0.0000327
0	1	0	0	0	0	16384	1638.4	163.84	16.384	1.638	0.1638	0.01638	0.001638	0.0001638
0	1	1	0	0	0	10922.6	1092.26	109.226	10.922	1.092	0.1092	0.01092	0.001092	0.0001092
1	0	0	0	0	0	8192	819.2	81.92	8.192	0.819	0.0819	0.00819	0.000819	0.0000819
1	0	1	0	0	0	6553.6	655.36	65.536	6.553	0.655	0.0655	0.00655	0.000655	0.0000655
1	1	0	0	0	0	5461.3	546.13	54.613	5.461	0.546	0.0546	0.00546	0.000546	0.0000546
1	1	1	0	0	0	2730.6	273.06	27.306	2.730	0.273	0.0273	0.00273	0.000273	0.0000273

## Baud Rate Generator

### 8640CN

CTL1	CTL2	CTL3	CTL4	CTL5	CTL6	Output frequency (kHz)	Baud rate output example (fo/16)(bits/sec)
0	0	0	0	0	0	768k	48000
1	0	1	0	0	0	153.6	9600
0	0	1	0	0	0	76.8	4800
0	1	0	0	0	1	38.4	2400
1	0	0	0	0	1	19.2	1200

### 8650C

CTL1	CTL2	CTL3	CTL4	CTL5	CTL6	Output frequency (kHz)	Baud rate output example (fo/16)(bits/sec)
0	0	0	0	0	0	96.0	6000
1	0	1	0	0	0	19.2	1200
0	0	1	0	0	0	9.6	600
0	1	0	0	0	1	4.8	300
0	1	1	0	0	1	3.2	200
1	0	0	0	0	1	2.4	150
1	1	0	0	0	1	1.6	100
1	1	1	0	0	1	0.8	50

### 8650D

CTL1	CTL2	CTL3	CTL4	CTL5	CTL6	Output frequency (kHz)	Baud rate output example (fo/16)(bits/sec)
0	0	0	0	0	0	153.6	9600
0	0	0	0	0	1	76.8	4800
0	0	0	0	1	0	38.4	2400
0	0	0	0	1	1	19.2	1200
0	0	0	1	0	1	4.8	300
0	1	1	1	0	0	3.2	200
0	0	0	1	1	0	2.4	150
1	1	0	1	0	0	1.6	100
0	0	0	1	1	1	1.2	75
1	1	1	1	0	0	0.8	50

Note: Lower digits are omitted



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