

## **Investigation Report of Oscillation Circuit**

**[ 1 ] Customer : Messrs. ENDRICH**

**[ 2 ] Object** : Investigation a matching between your PWB s/n. ATmega64/128/169 and CFS-206 32.768kHz.  
(IC No. ATMEGA169)

**[ 3 ] Results** : See the data in the following Table-1.

Table-1.Circuit investigation

CFS-206 32.768kHz	Circuit Parameters		CL (Load capacitance) (pF)	Vdd (V)	Frequency Gap (ppm)	Negative Resistance (k ohm)	Safety factor (times)	DL (uW)	Startup Time (ms)
	Cin (pF)	Cout (pF)							
Our Investigating rameters	5	3	7	1.8	-53.4	1020	29.1	0.1	170
				2.7	-26.2	1280	36.6	0.1	170
				3.3	-19.1	1280	36.6	0.1	160
				4.5	-8.9	1820	52.0	0.1	160
				5.0	+2.1	1900	54.3	0.1	160
				5.5	+2.4	1940	55.4	0.1	160

\* Our Recommendable Negative Resistance Value : over 100 k ohm

**[ 4 ] Conclusion :**

1. At Our Investigated Parameters, Frequency Gap of the circuit is +2.1ppm,  
and its Negative Resistance satisfies Our Recommendable Negative Resistance Value.

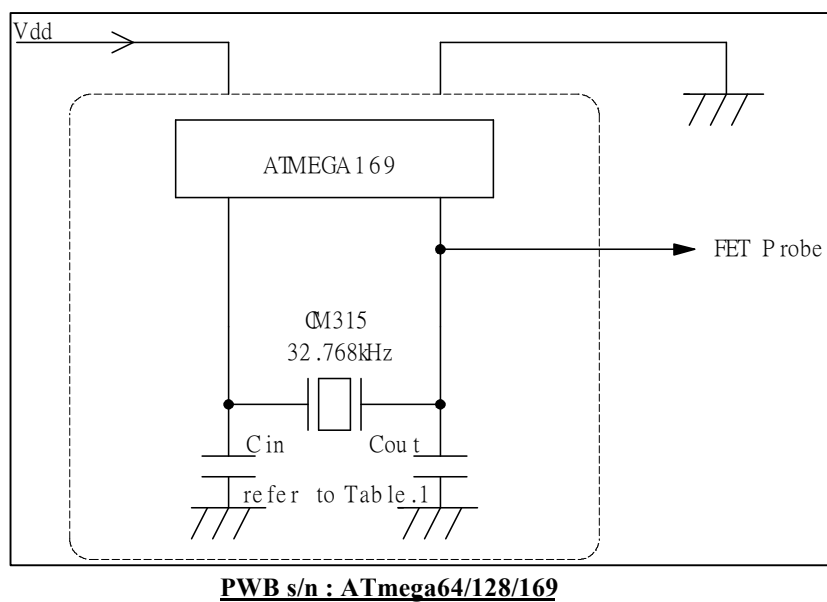
**[ 5 ] Caution :**

1. We would advise you to check a condition of performance with your whole sets for sure because the investigation was made the only condition of the oscillation circuit (Fig-1.)
2. The investigation report won't guarantee whole of your products and the results would be subject to change when the parameter of oscillation circuit was changed for some reason or other so that we advise you to re-investigate the oscillation circuit whenever it was changed .

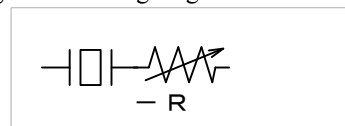
Please feel free to contact us if you have any question.

Yours faithfully.

Fig-1. Circuit parameters

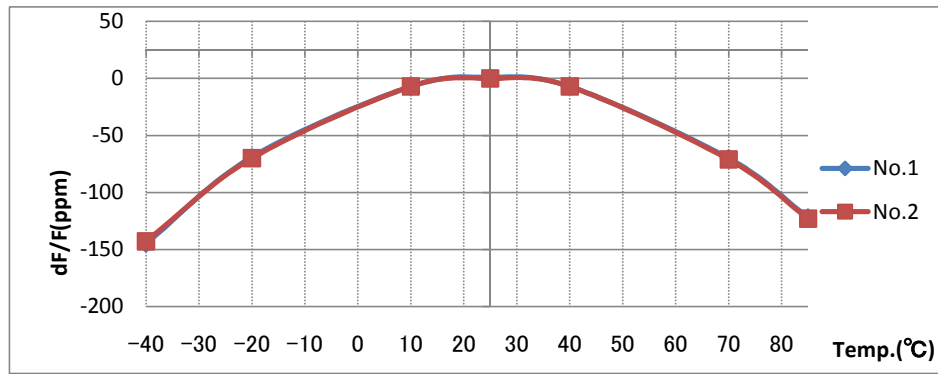


The way of measuring Negative Resistance (-R)

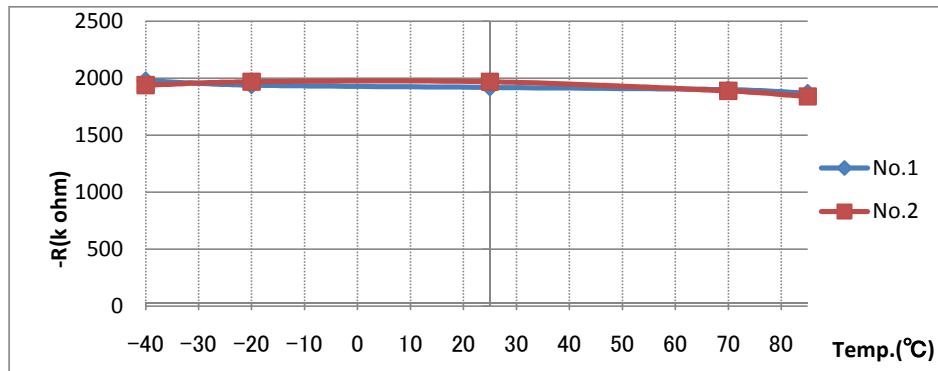


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 Toshiki Satoh

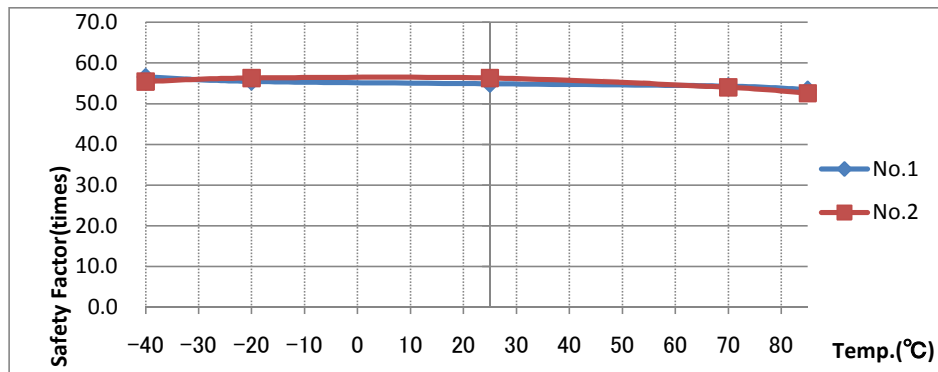
**Fig.2 Frequency-Temperature Characteristics**



**Fig.3 Negative Resistance – Temperature Characteristics**



**Fig.4 Safety Factor – Temperature Characteristics**



**Fig.5 Startup Time – Temperature Characteristics**

