Technical Data of Ceramic Resonator

Type CSB1000J

Applied to μPD780032A

TOYAMA MURATA MANUFACTURING CO., LTD.

Product Engineering Service Section I

Engineering Service Department

Piezoelectric Components Group

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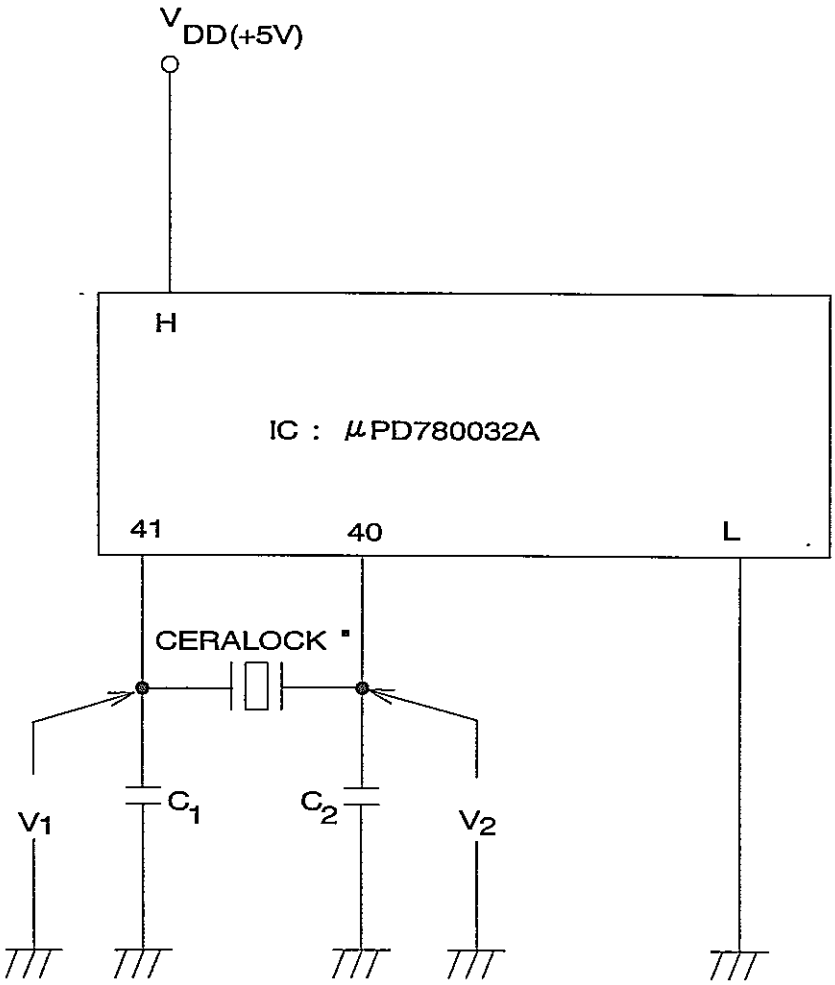
Contents

Test Circuit



H:10,24,35,36,38

L:9,25 ~34,39,42

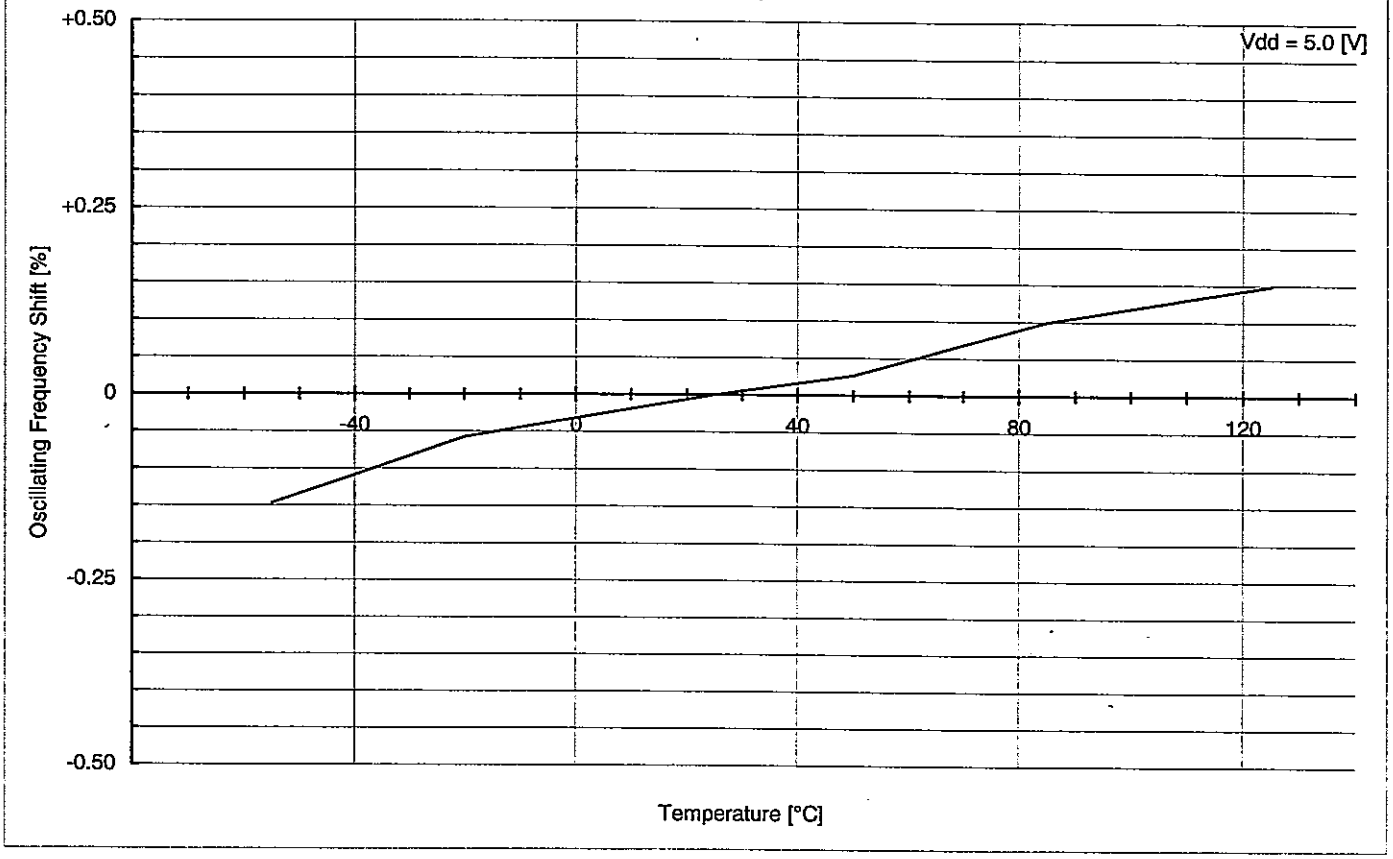
Recommendable Value

CERALOCK® : CSB1000J

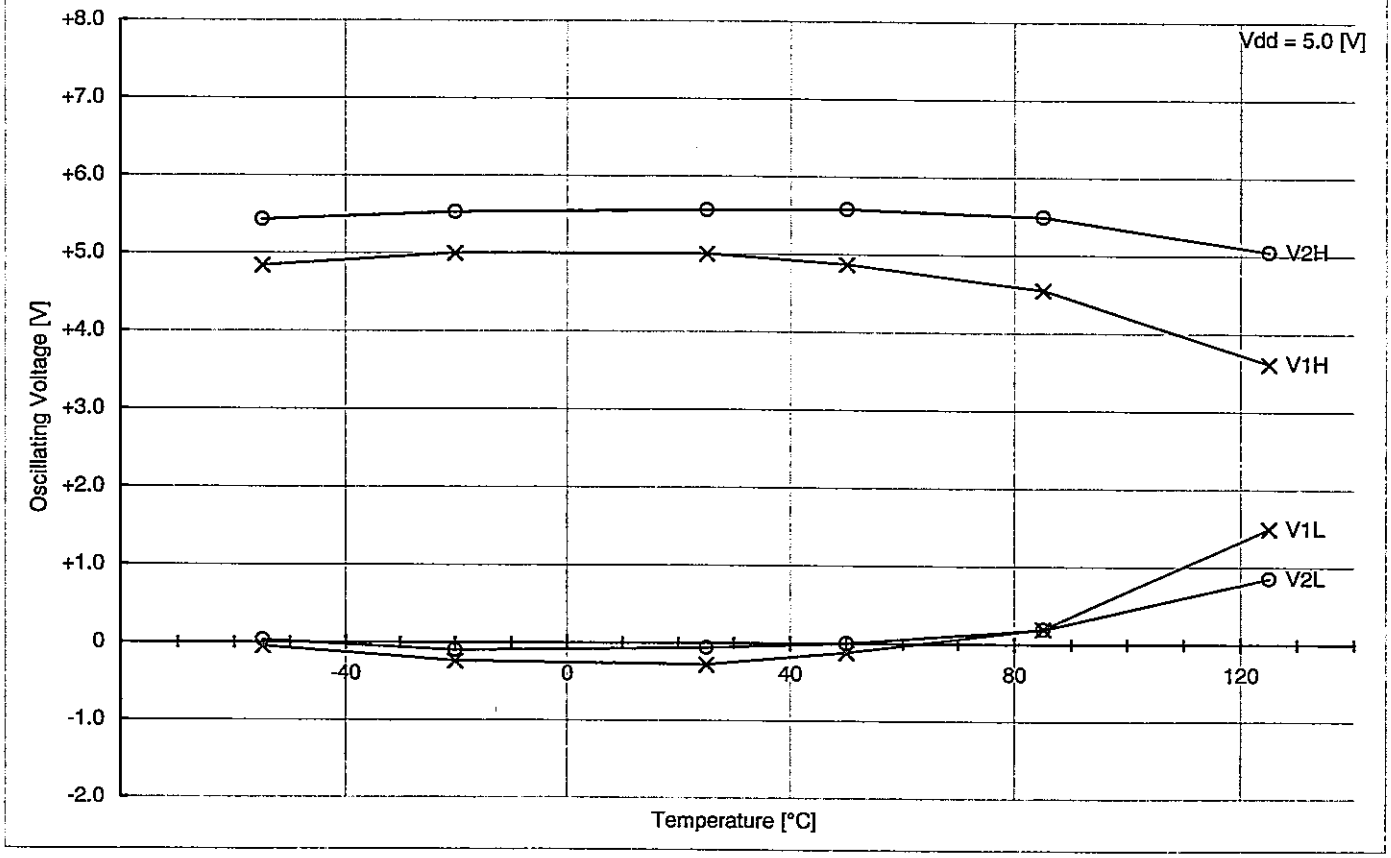
C1 = 100 [pF]

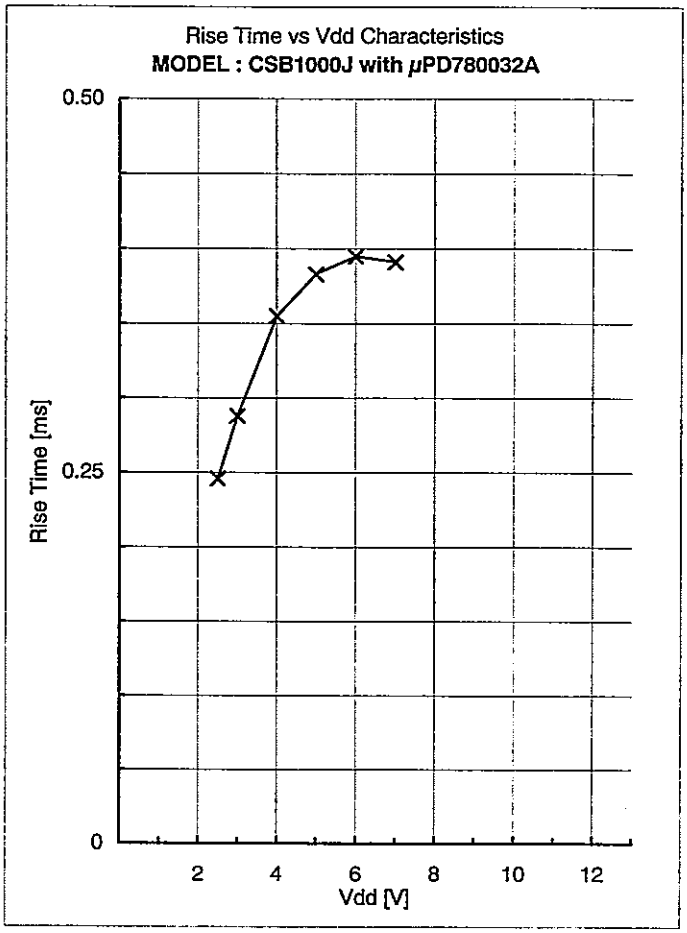
C2 = 100 [pF]

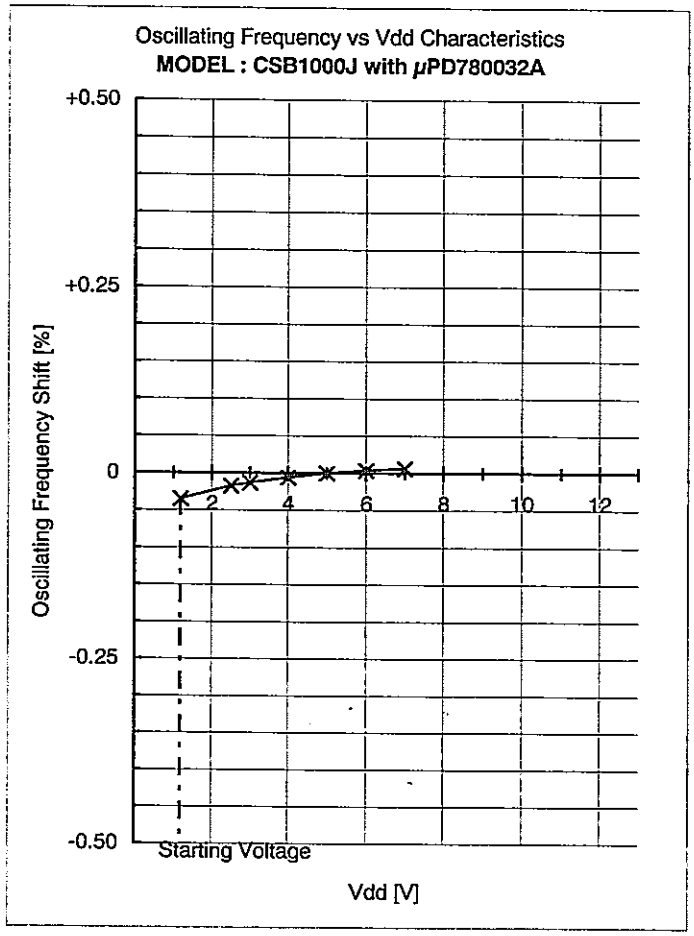
Temperature Characteristics of Oscillating Frequency
MODEL : CSB1000J with μPD780032A

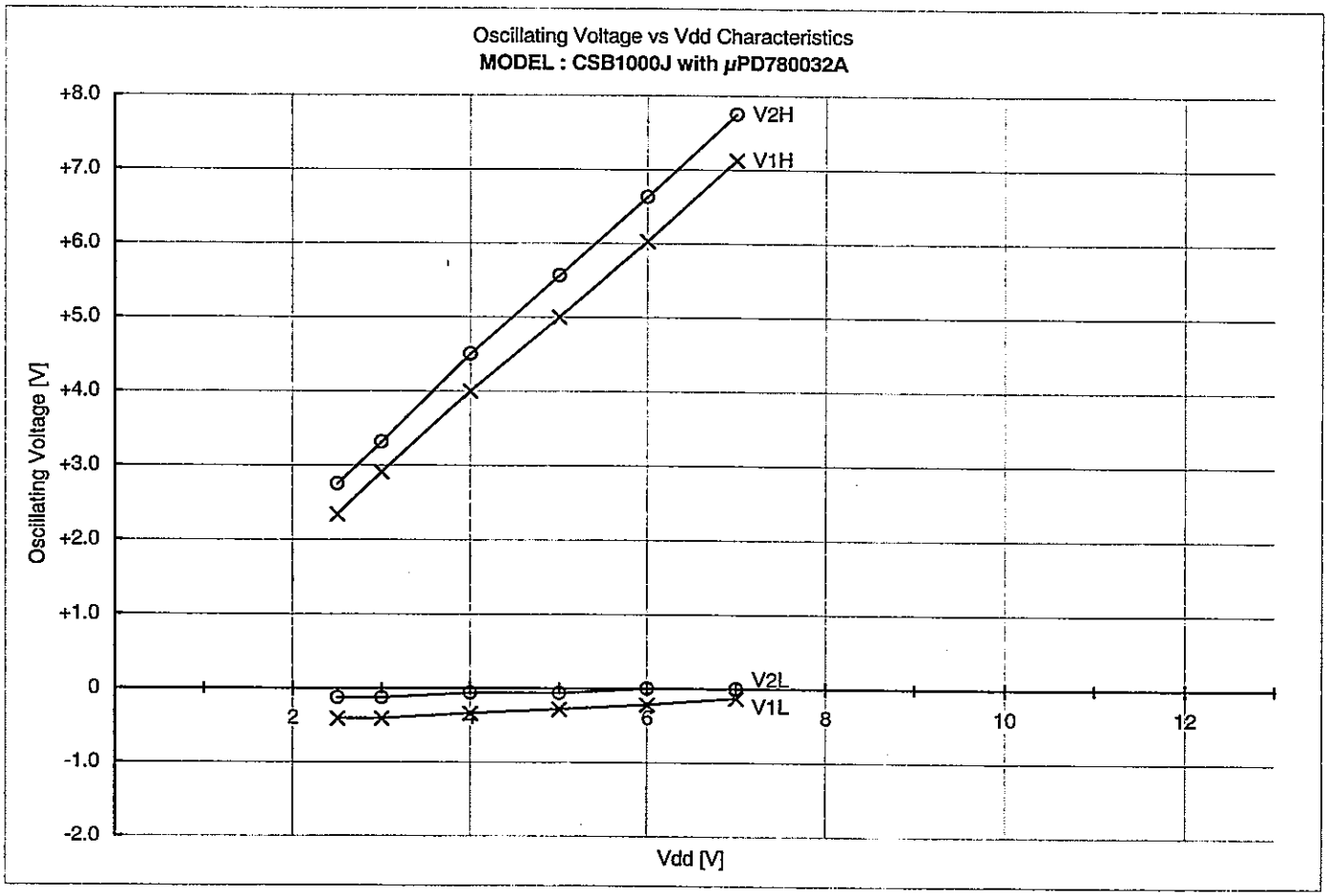


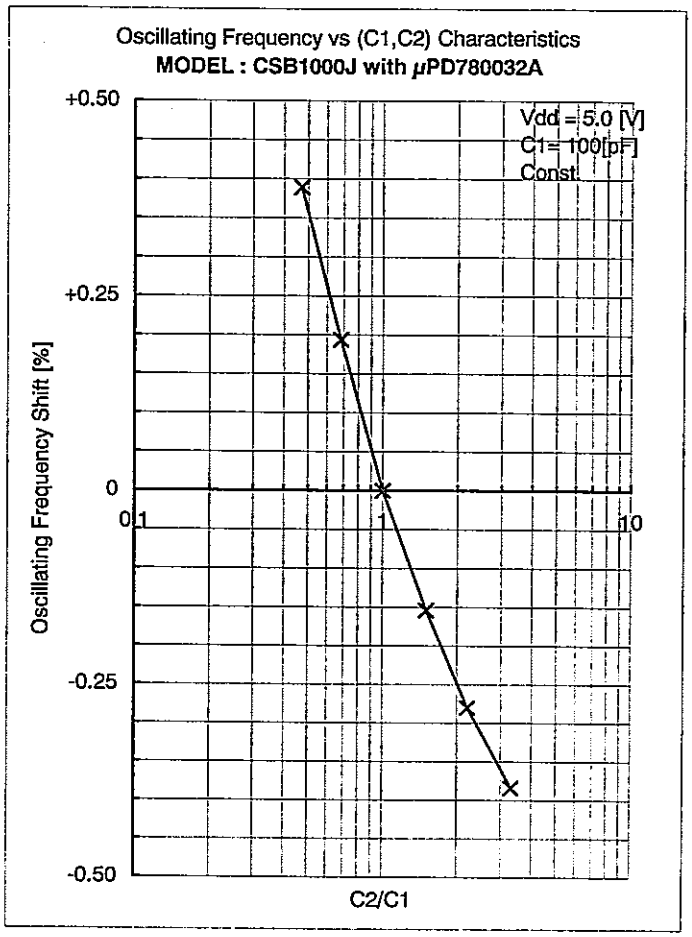
Temperature Characteristics of Oscillating Voltage
MODEL : CSB1000J with μPD780032A

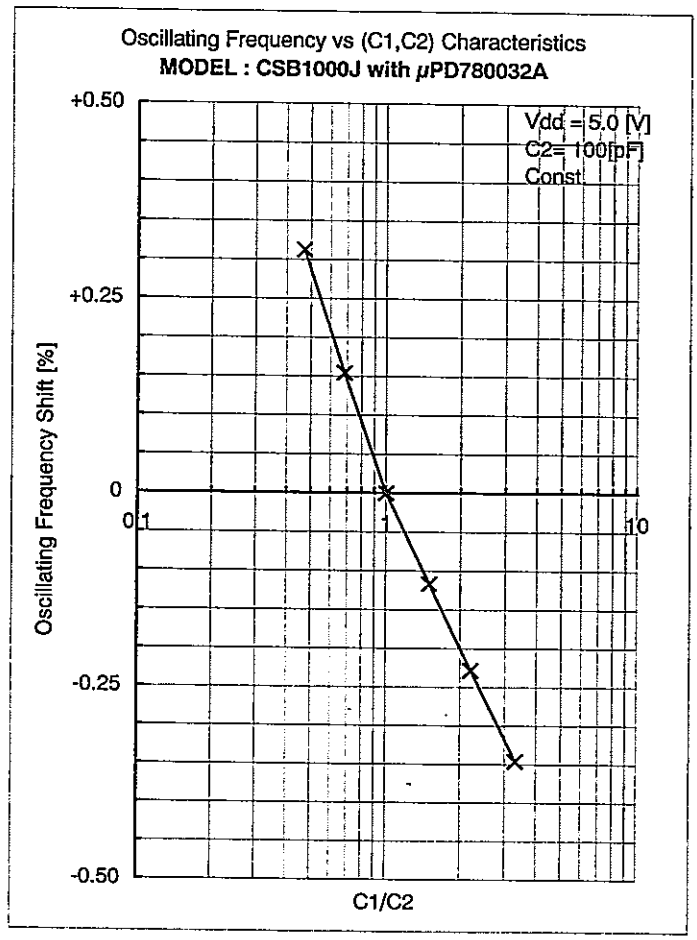


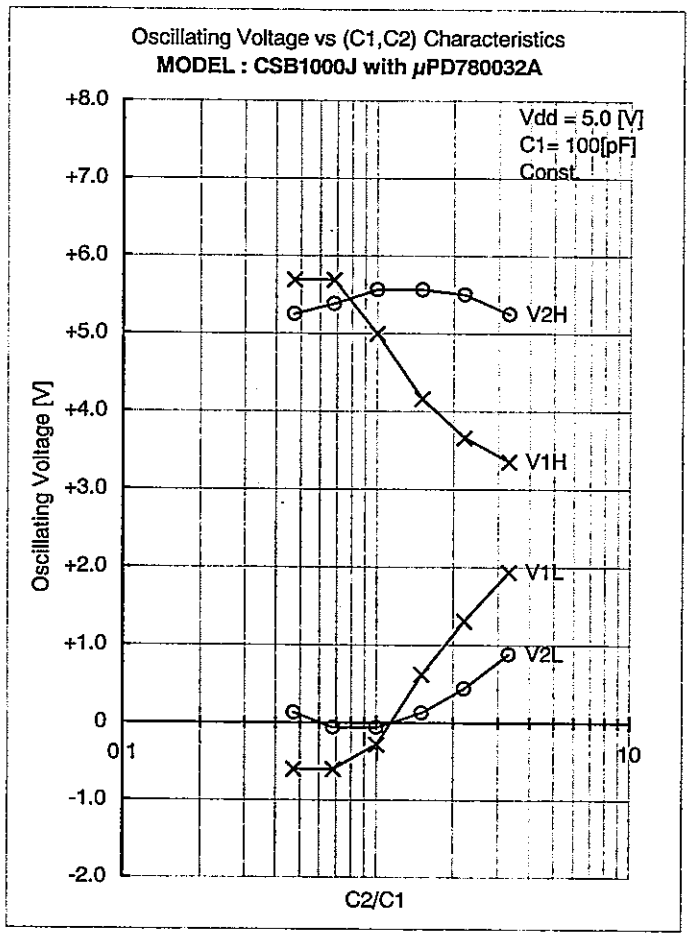

Rise Time vs Vdd Characteristics
MODEL : CSB1000J with μPD780032A
Rise Time [ms]
0.50
0.25
0
2
4
6
8
10
12
Vdd [V]

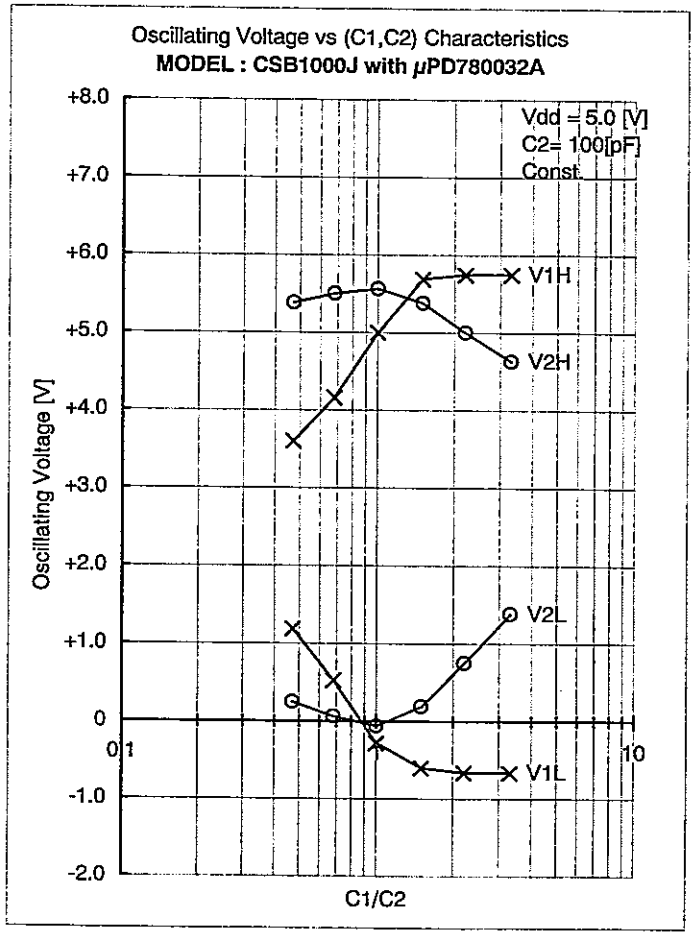

Oscillating Frequency vs Vdd Characteristics
MODEL : CSB1000J with μPD780032A
Oscillating Frequency Shift [%]
+0.50
+0.25
0
-0.25
-0.50
2
4
6
8
10
12
Starting Voltage
Vdd [V]

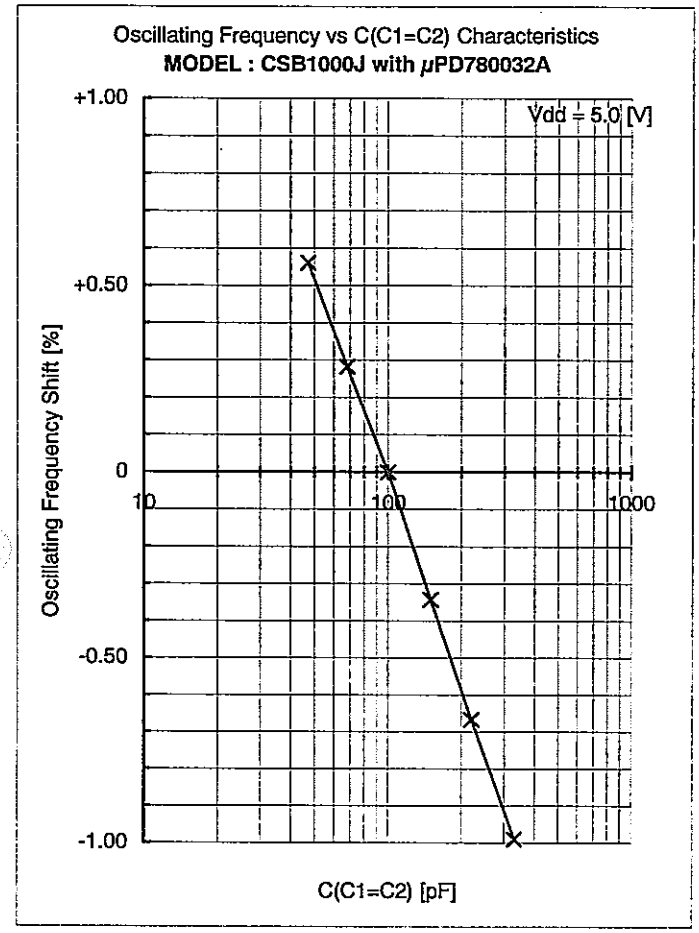

Oscillating Voltage vs Vdd Characteristics
MODEL : CSB1000J with μPD780032A
Oscillating Voltage [V]
+8.0
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
0
-1.0
-2.0
V2H
V1H
V2L
V1L
2
6
8
10
12
Vdd [V]

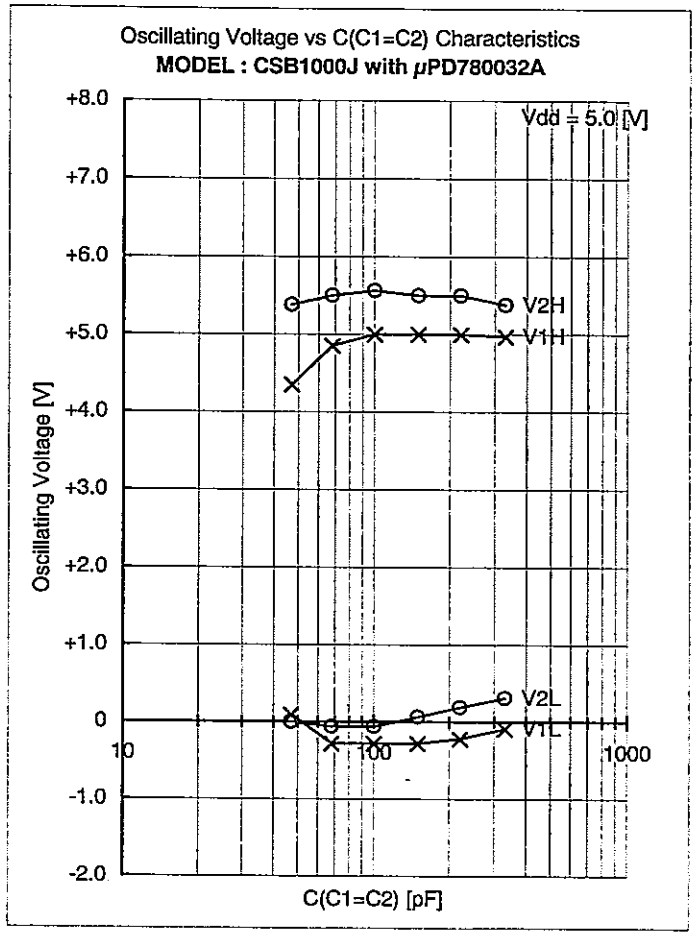

Oscillating Frequency vs (C1,C2) Characteristics
MODEL : CSB1000J with μPD780032A
Vdd = 5.0 [V]
C1= 100[pF]
Const.
+0.50
+0.25
0
-0.25
-0.50
0.1
1
10
Oscillating Frequency Shift [%]
C2/C1

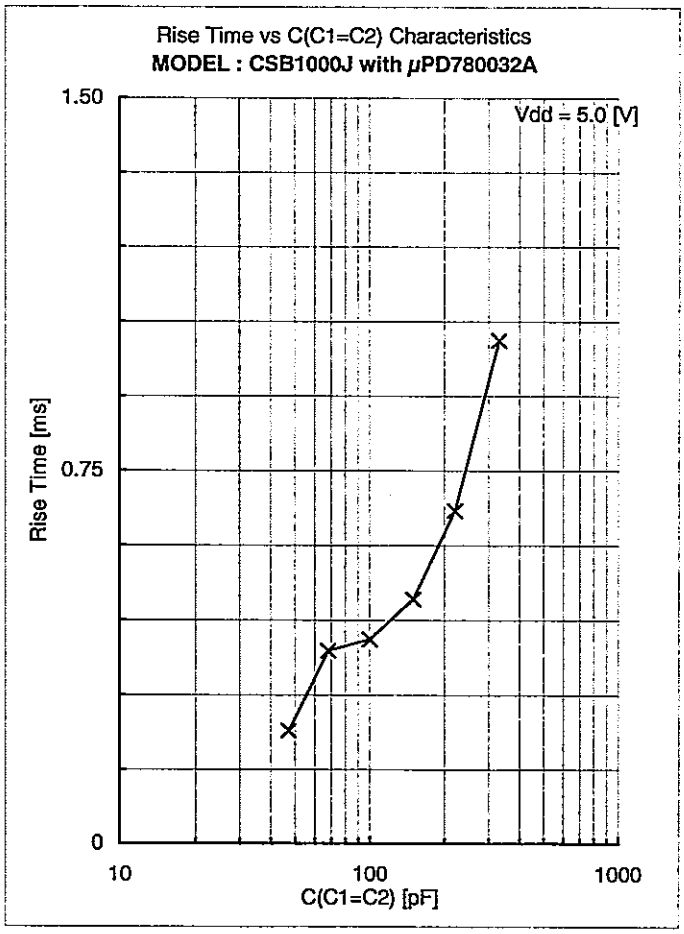

Oscillating Frequency vs (C1,C2) Characteristics
MODEL : CSB1000J with μPD780032A
Vdd = 5.0 [V]
C2= 100[pF]
Const.
+0.50
+0.25
0
-0.25
-0.50
0.1
1
10
Oscillating Frequency Shift [%]
C1/C2

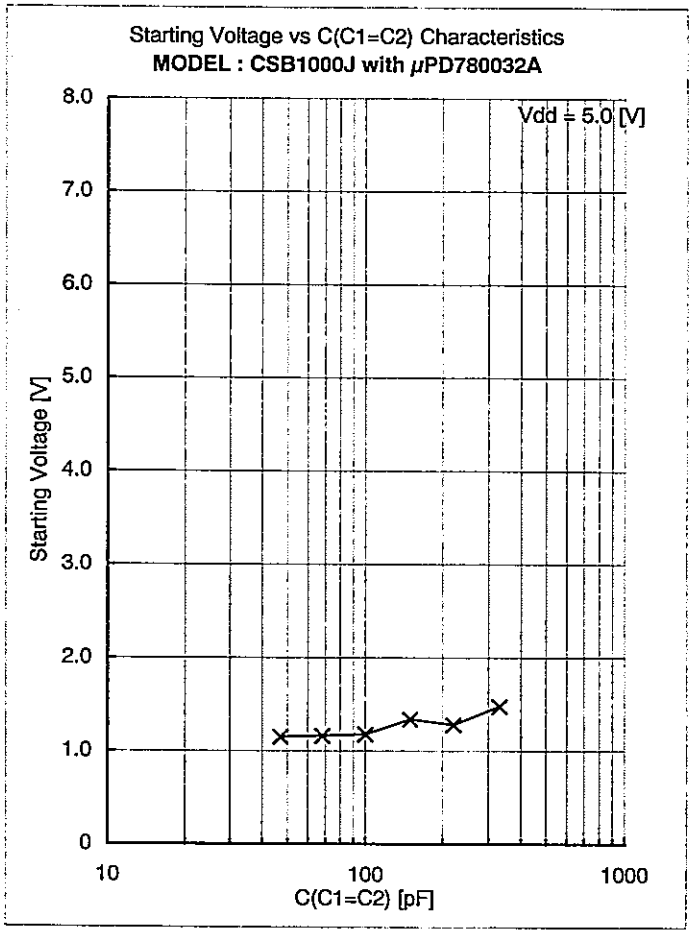

Oscillating Voltage vs (C1,C2) Characteristics
MODEL : CSB1000J with μPD780032A
Vdd = 5.0 [V]
C1= 100[pF]
Const.
+8.0
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
0
-1.0
-2.0
0.1
1
10
V2H
V1H
V1L
V2L
Oscillating Voltage [V]
C2/C1


Oscillating Voltage vs (C1,C2) Characteristics
MODEL : CSB1000J with μPD780032A
Vdd = 5.0 [V]
C2= 100[pF]
Const.
+8.0
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
0
-1.0
-2.0
0.1
1
10
V1H
V2H
V2L
V1L
Oscillating Voltage [V]
C1/C2


Oscillating Frequency vs C(C1=C2) Characteristics
MODEL : CSB1000J with μPD780032A
Vdd = 5.0 [V]
+1.00
+0.50
0
-0.50
-1.00
Oscillating Frequency Shift [%]
10
100
1000
C(C1=C2) [pF]


Oscillating Voltage vs C(C1=C2) Characteristics
MODEL : CSB1000J with μPD780032A
Vdd = 5.0 [V]
+8.0
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
0
-1.0
-2.0
Oscillating Voltage [V]
V2H
V1H
V2L
V1L
10
100
1000
C(C1=C2) [pF]


Rise Time vs C(C1=C2) Characteristics
MODEL : CSB1000J with μPD780032A
Vdd = 5.0 [V]
1.50
0.75
0
Rise Time [ms]
10
100
1000
C(C1=C2) [pF]


Starting Voltage vs C(C1=C2) Characteristics
MODEL : CSB1000J with μPD780032A
Vdd = 5.0 [V]
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
Starting Voltage [V]
10
100
1000
C(C1=C2) [pF]

Comparison Table

IC : No	V1H [V]	V1L [V]	V1p-p [V]	V2H [V]	V2L [V]	V2p-p [V]	Fosc [kHz]	Trise [ms]	Vstart [V]
W03	4.97	-0.35	5.32	5.56	-0.13	5.69	1000.162	0.378	1.28
W05	5.00	-0.22	5.22	5.56	0.00	5.56	1000.184	0.426	1.08
W07	4.97	-0.35	5.32	5.56	-0.13	5.69	1000.176	0.382	1.29
W09	5.00	-0.16	5.16	5.56	0.00	5.56	1000.186	0.432	1.06
W15	5.00	-0.28	5.28	5.56	-0.06	5.62	1000.163	0.404	1.18

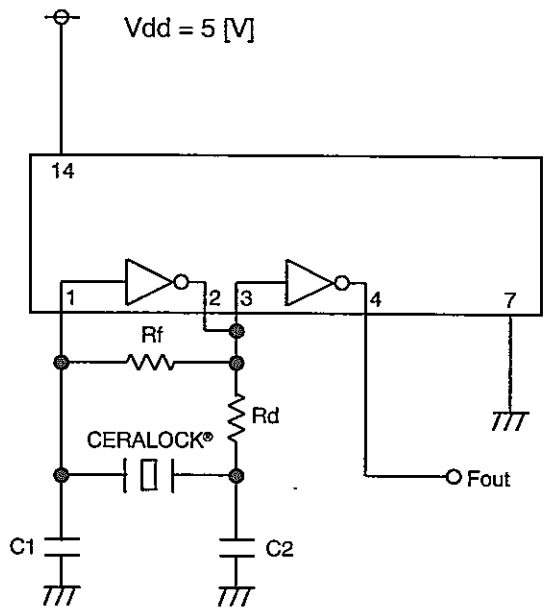
Ref.

Performance described page 2 to 5 were measured with IC No. W15

Frequency Correlation Data

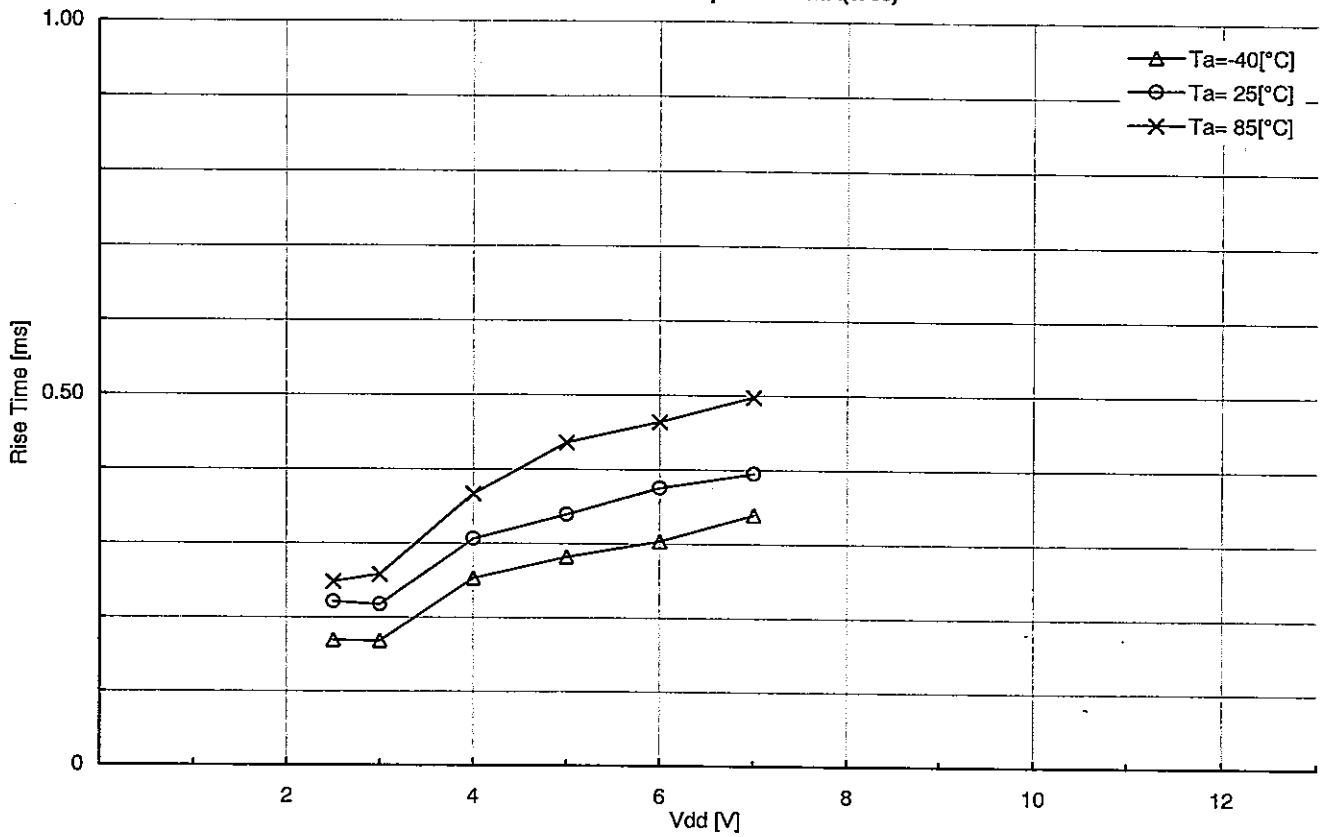
Sample No.	μPD780032A Fosc [kHz]	CD4069UBE Fosc [kHz]	Shift [%]
1	1000.218	999.784	0.0434
2	999.232	998.928	0.0304
3	999.444	999.133	0.0311
4	1001.510	1001.186	0.0324
5	1000.163	999.742	0.0422
$\bar{X}$	1000.113	999.755	0.0359

muRata Standard Circuit

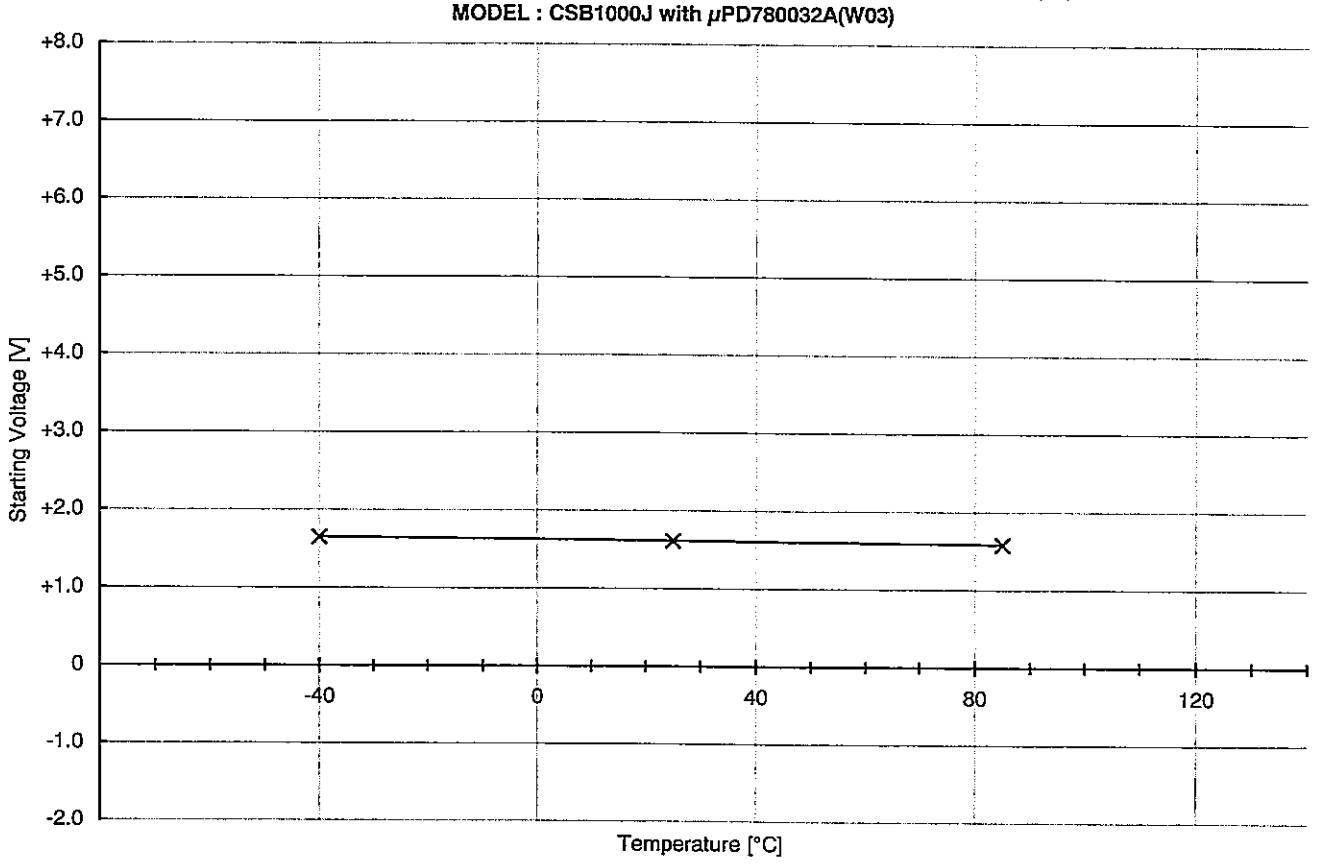


CERALOCK® : CSB1000J
C1 = 100 [pF]
C2 = 100 [pF]
Rf = 1 [Mohm]
Rd = 5.6 [kohm]

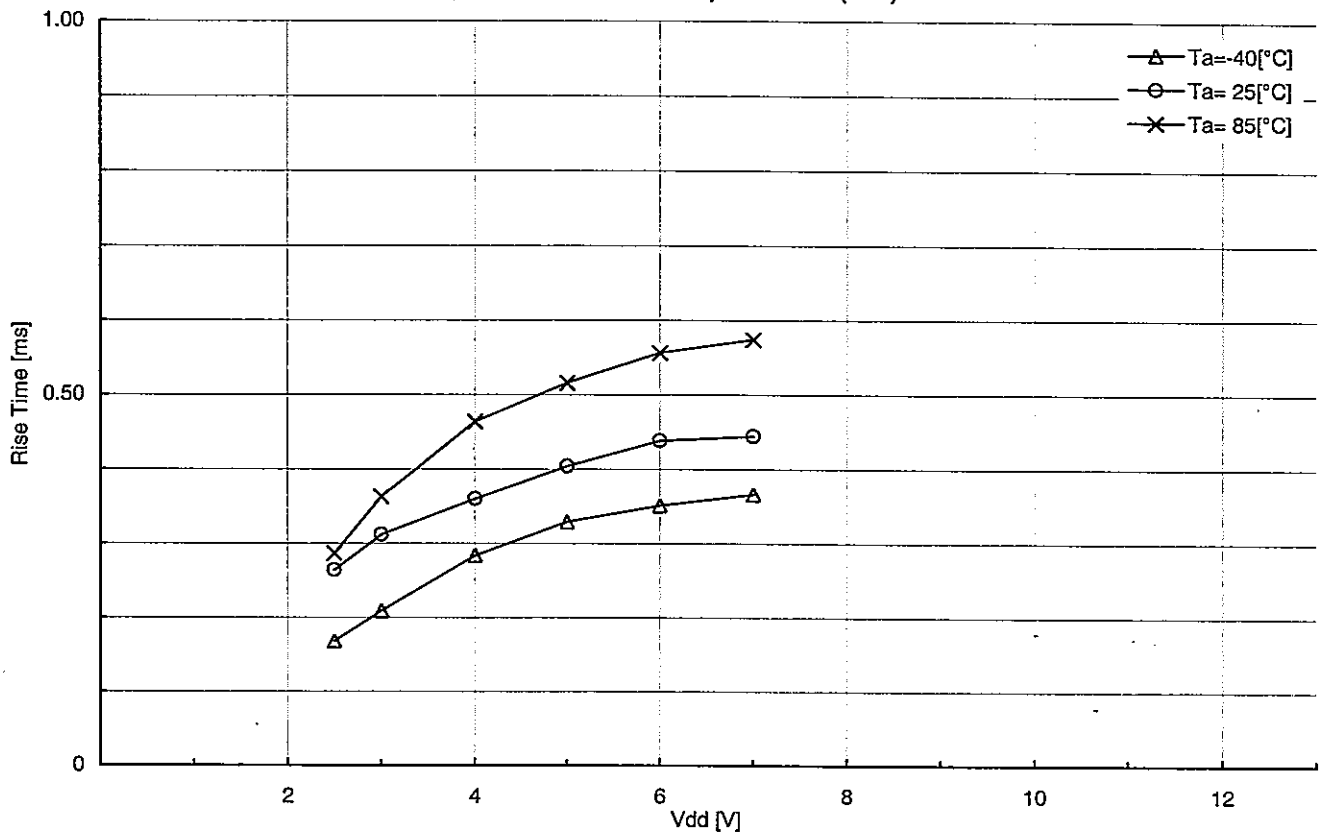
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSB1000J with μPD780032A(W03)



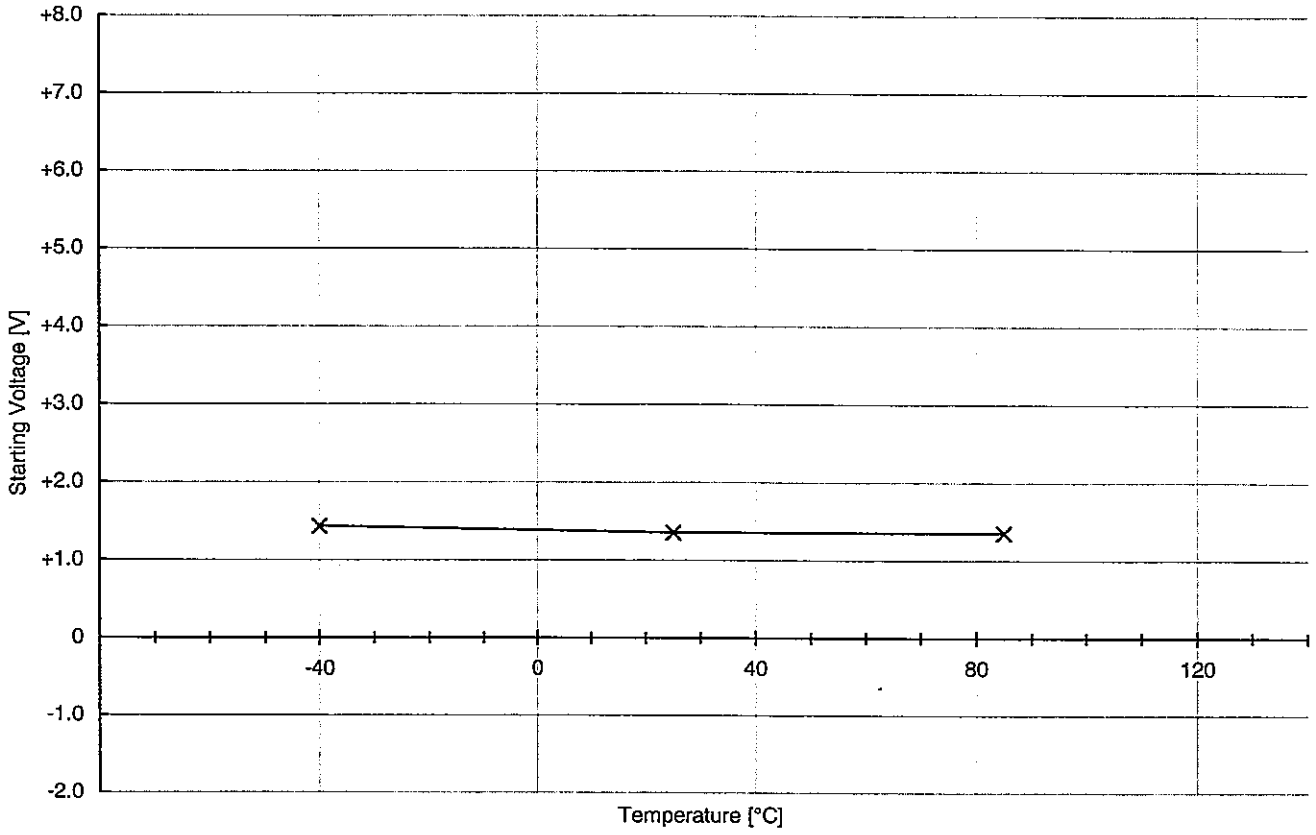
Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSB1000J with μPD780032A(W03)



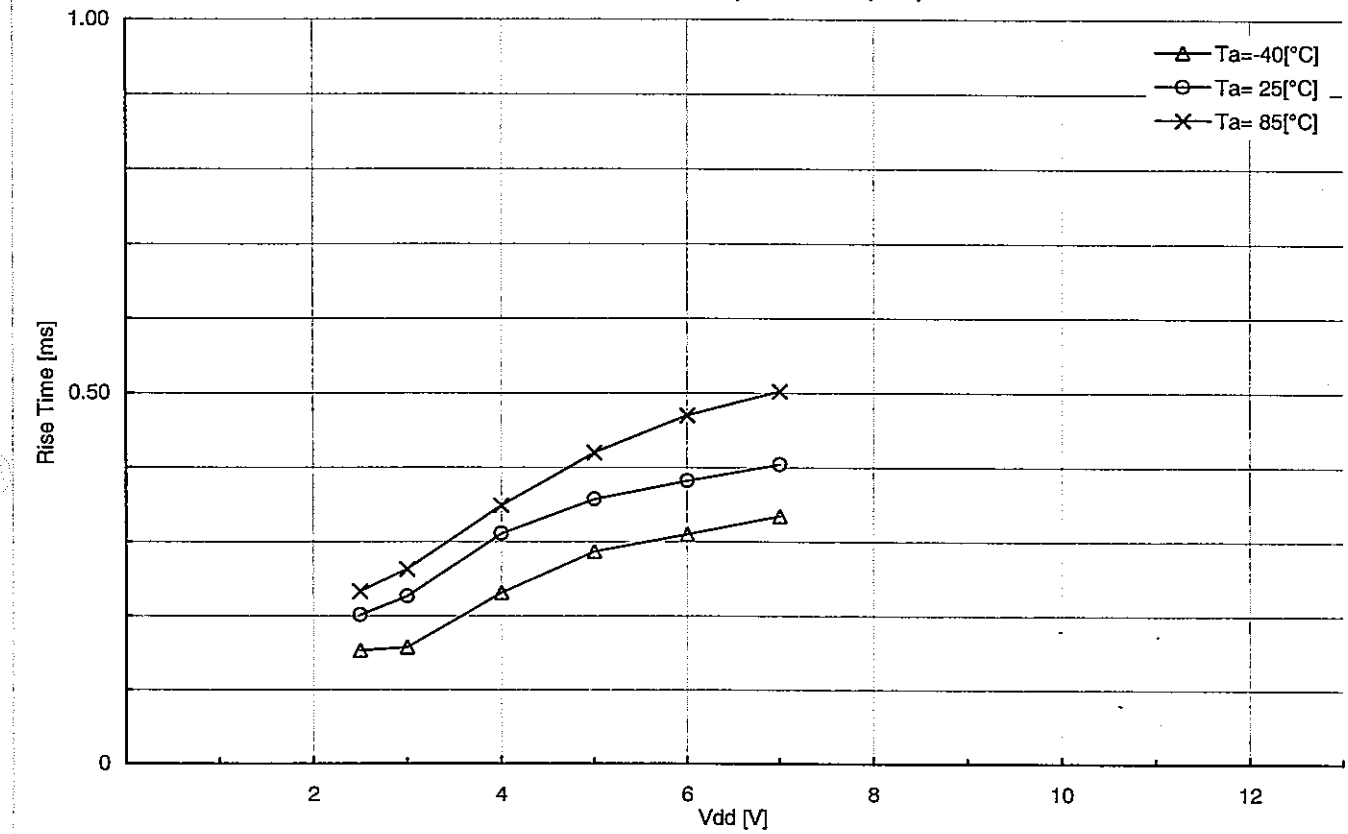
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSB1000J with μPD780032A(W05)



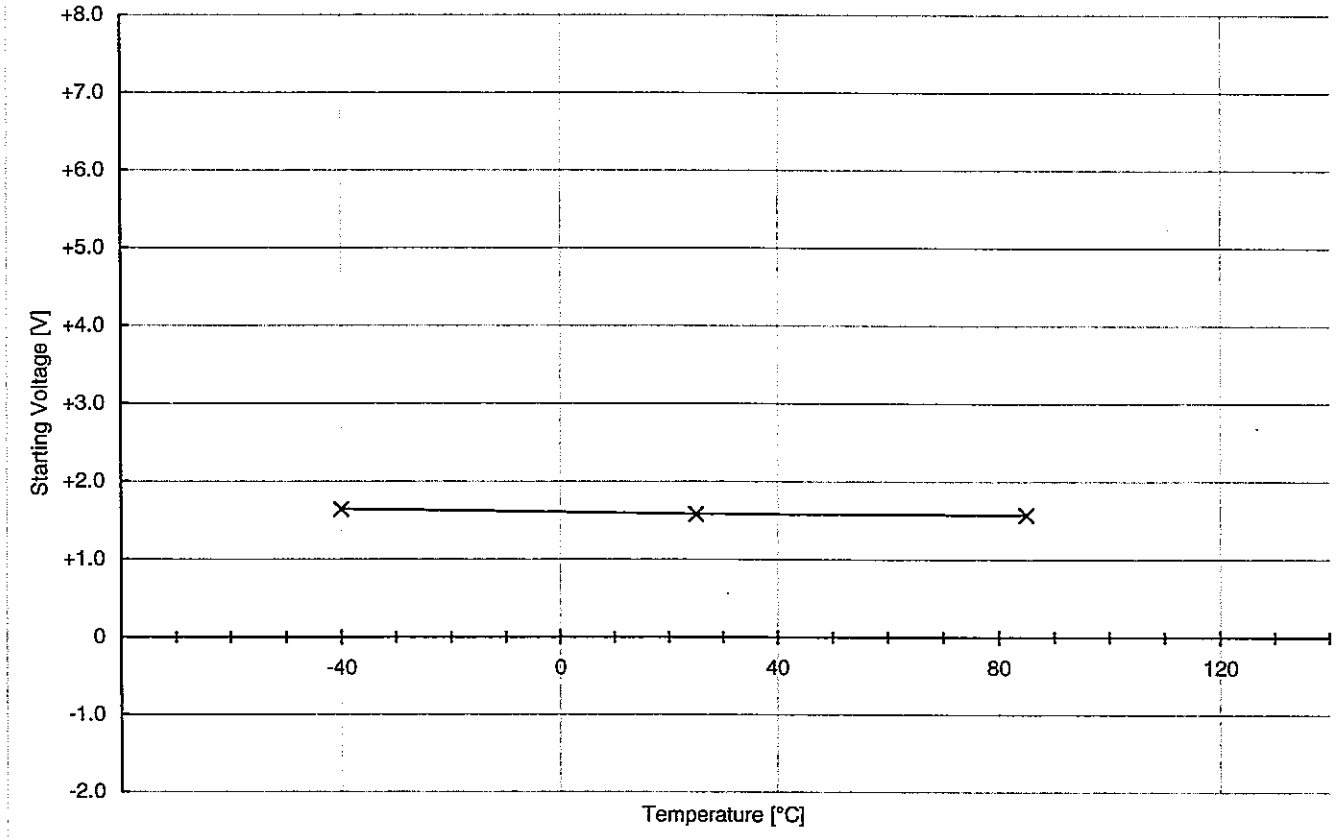
Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSB1000J with μPD780032A(W05)



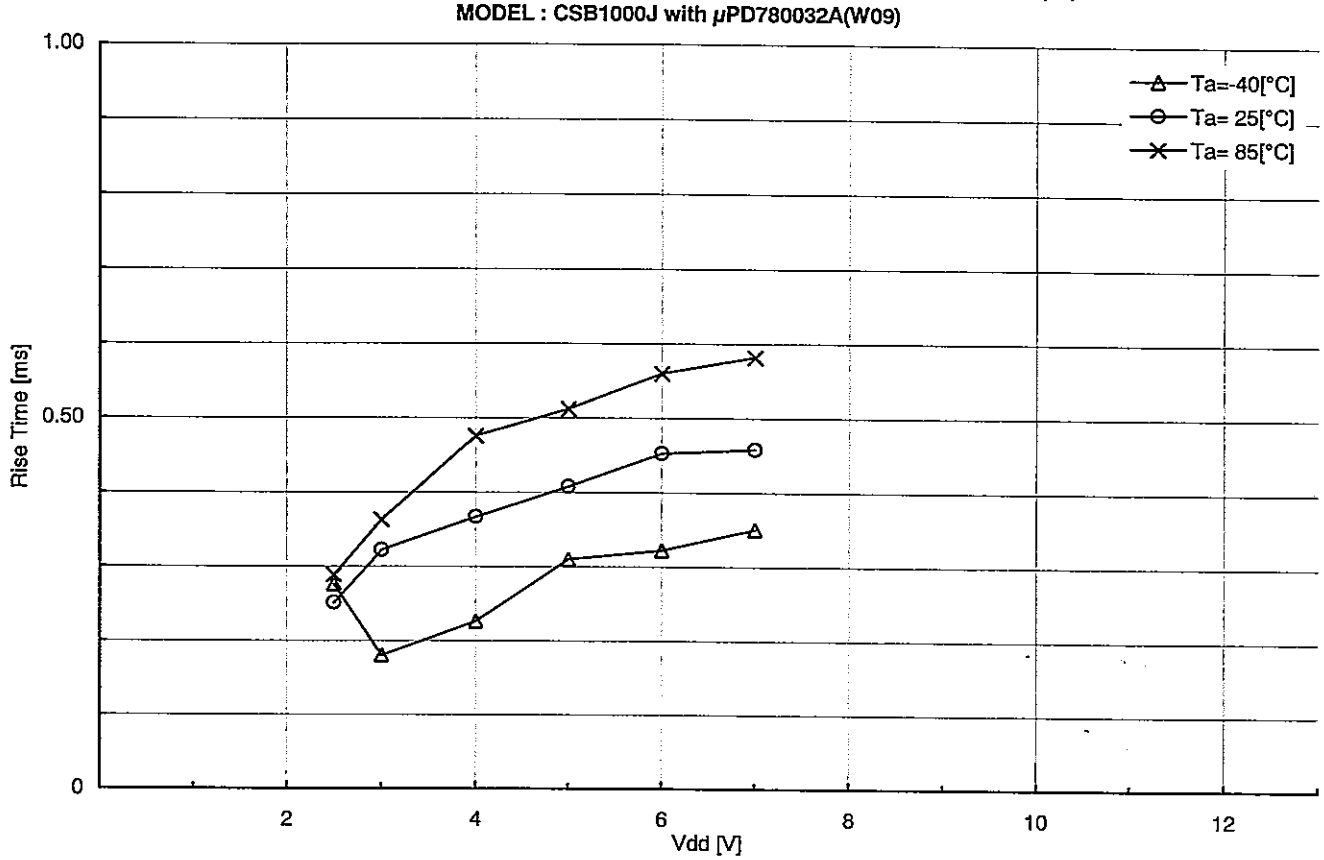
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSB1000J with μPD780032A(W07)



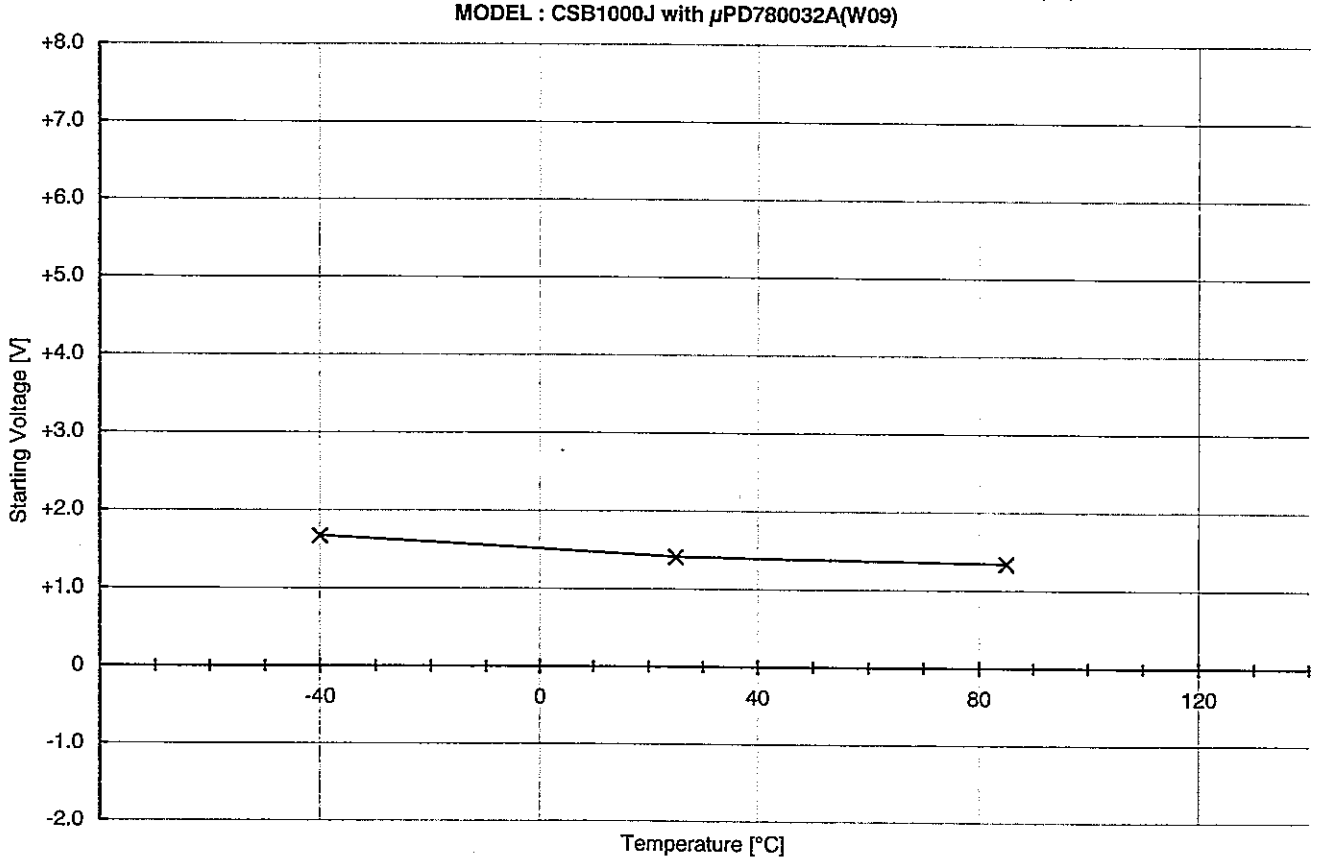
Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSB1000J with μPD780032A(W07)



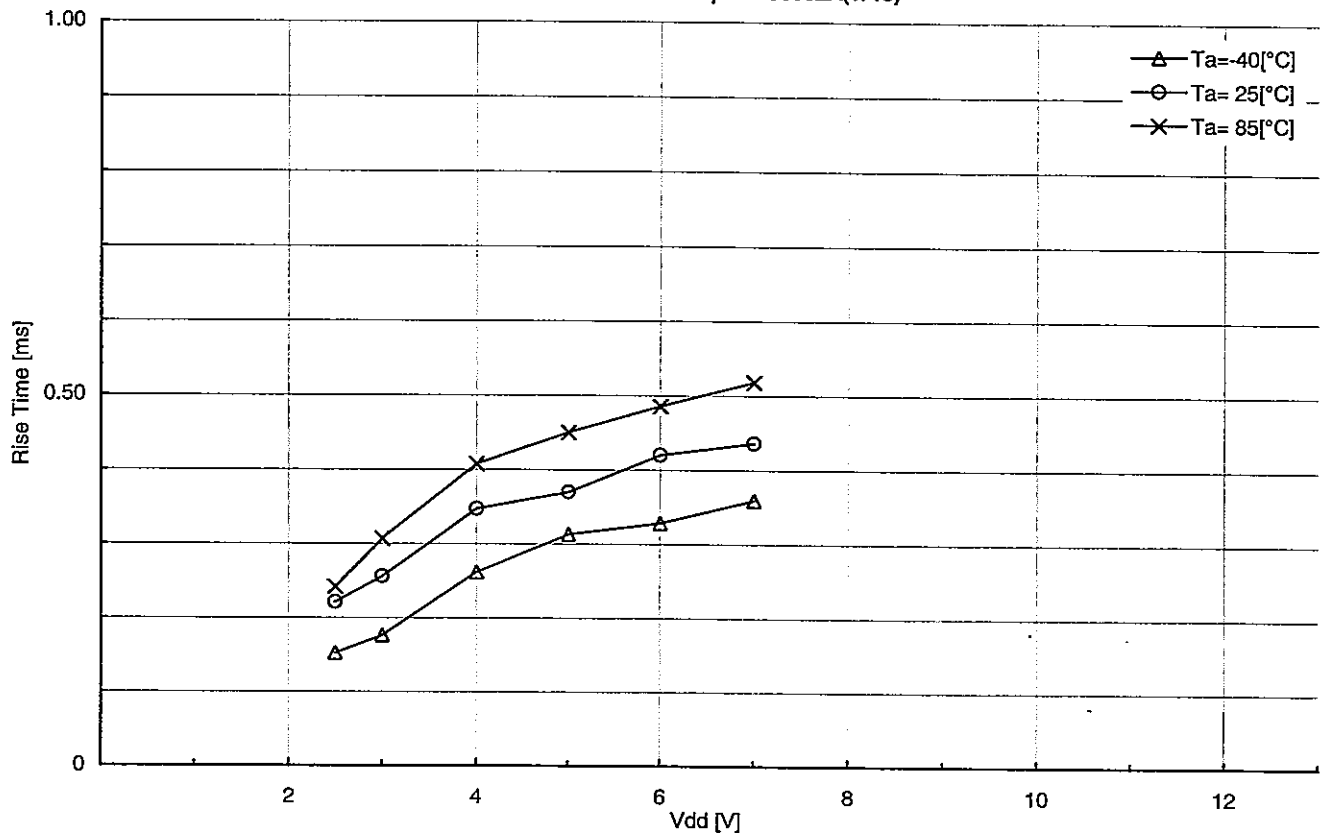
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSB1000J with μPD780032A(W09)



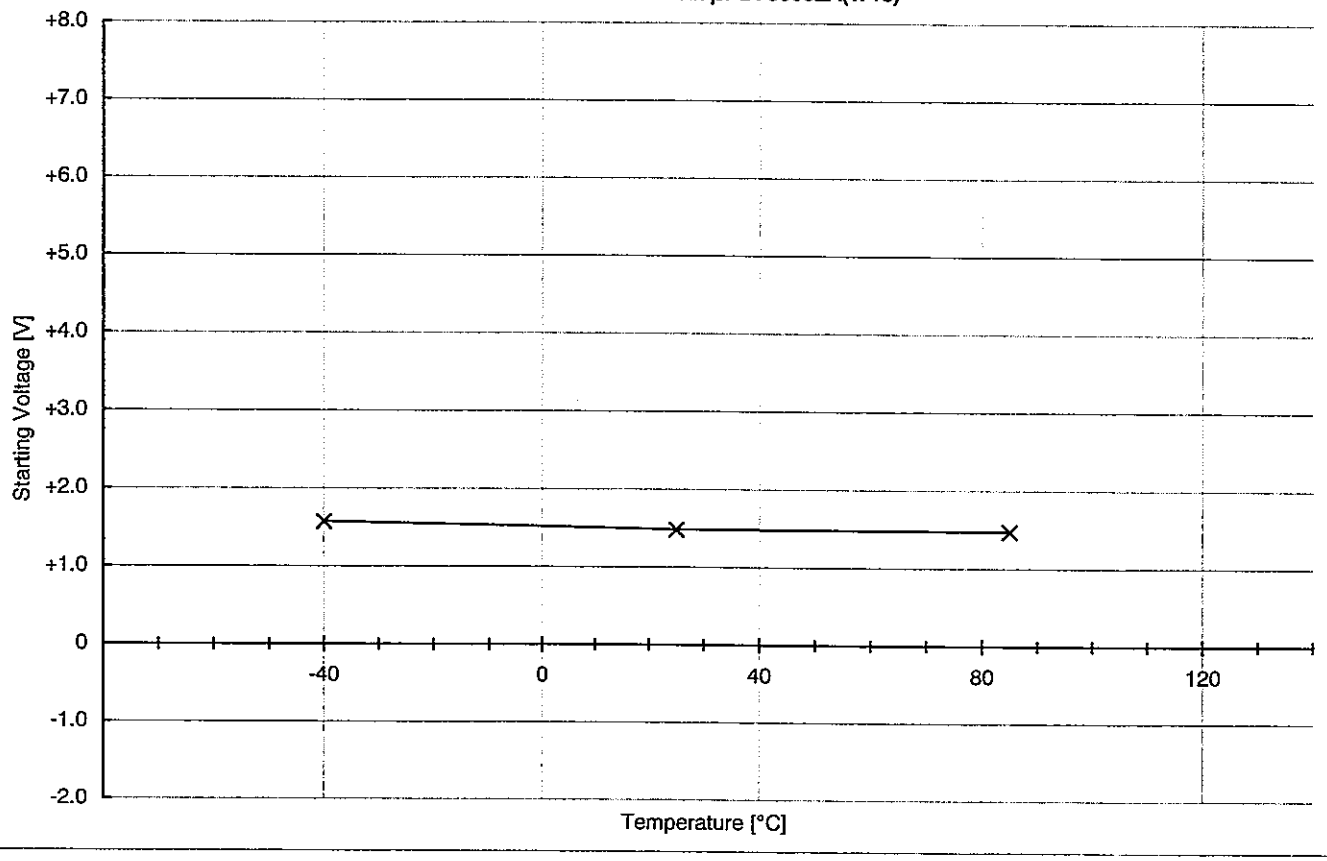
Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSB1000J with μPD780032A(W09)

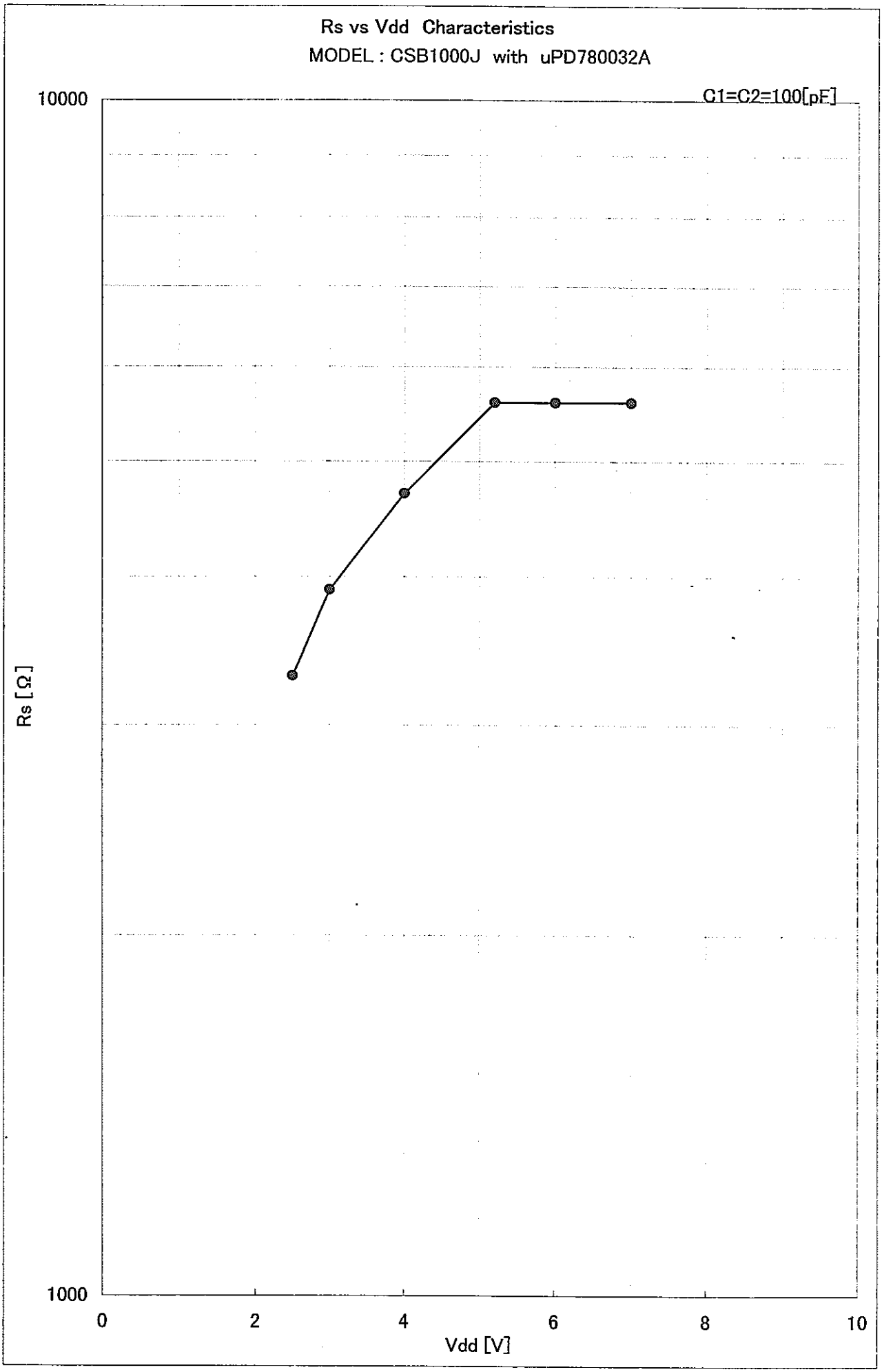


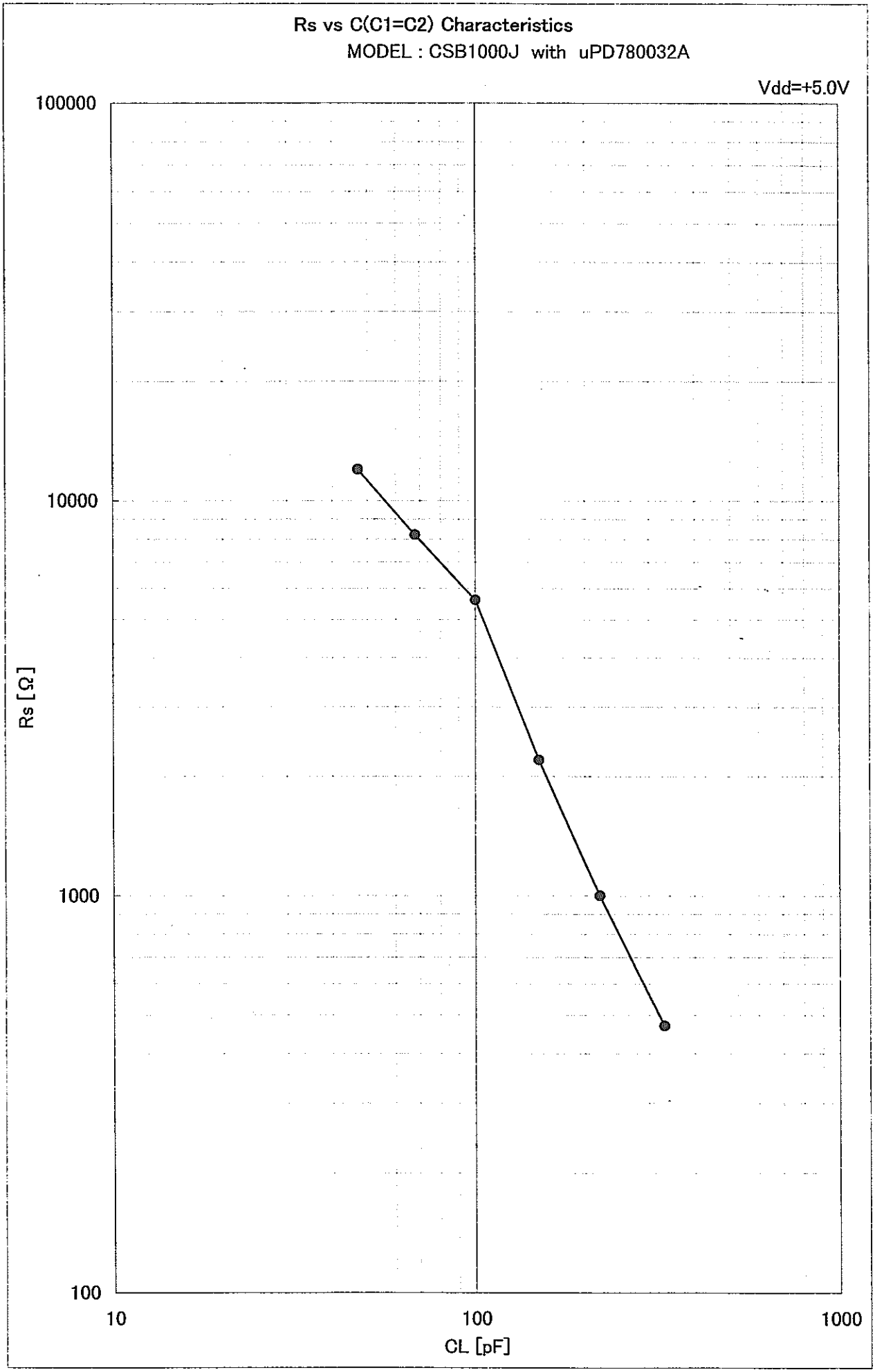
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSB1000J with μPD780032A(W15)



Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSB1000J with μPD780032A(W15)




Rs vs Vdd Characteristics
MODEL : CSB1000J with uPD780032A
C1=C2=100[pF]
10000
1000
Rs [Ω]
0
2
4
6
8
10
Vdd [V]


Rs vs C(C1=C2) Characteristics
MODEL : CSB1000J with uPD780032A
Vdd=+5.0V
100000
10000
1000
100
Rs [Ω]
10
100
1000
CL [pF]