Technical Data of Ceramic Resonator

Type CSA4.19MG
CST4.19MGW

Applied to μPD780032A

TOYAMA MURATA MANUFACTURING CO., LTD.

Product Engineering Service Section I
Engineering Service Department
Piezoelectric Components Group

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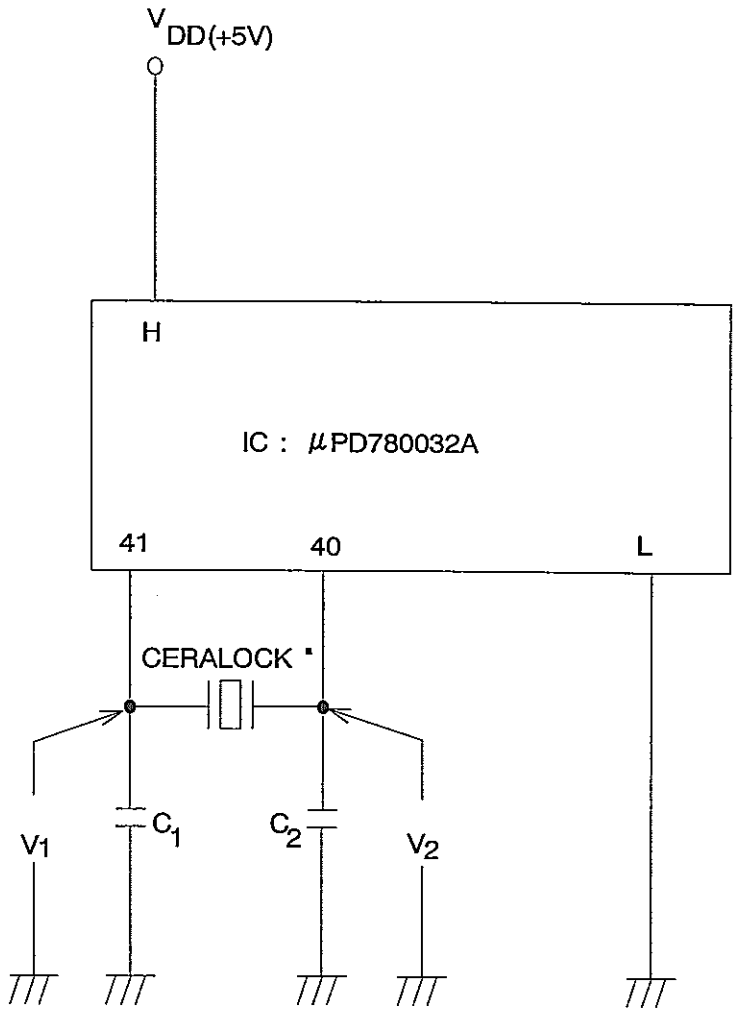
Test Circuit



H:10,24,35,36,38

L:9,25 ~34,39,42

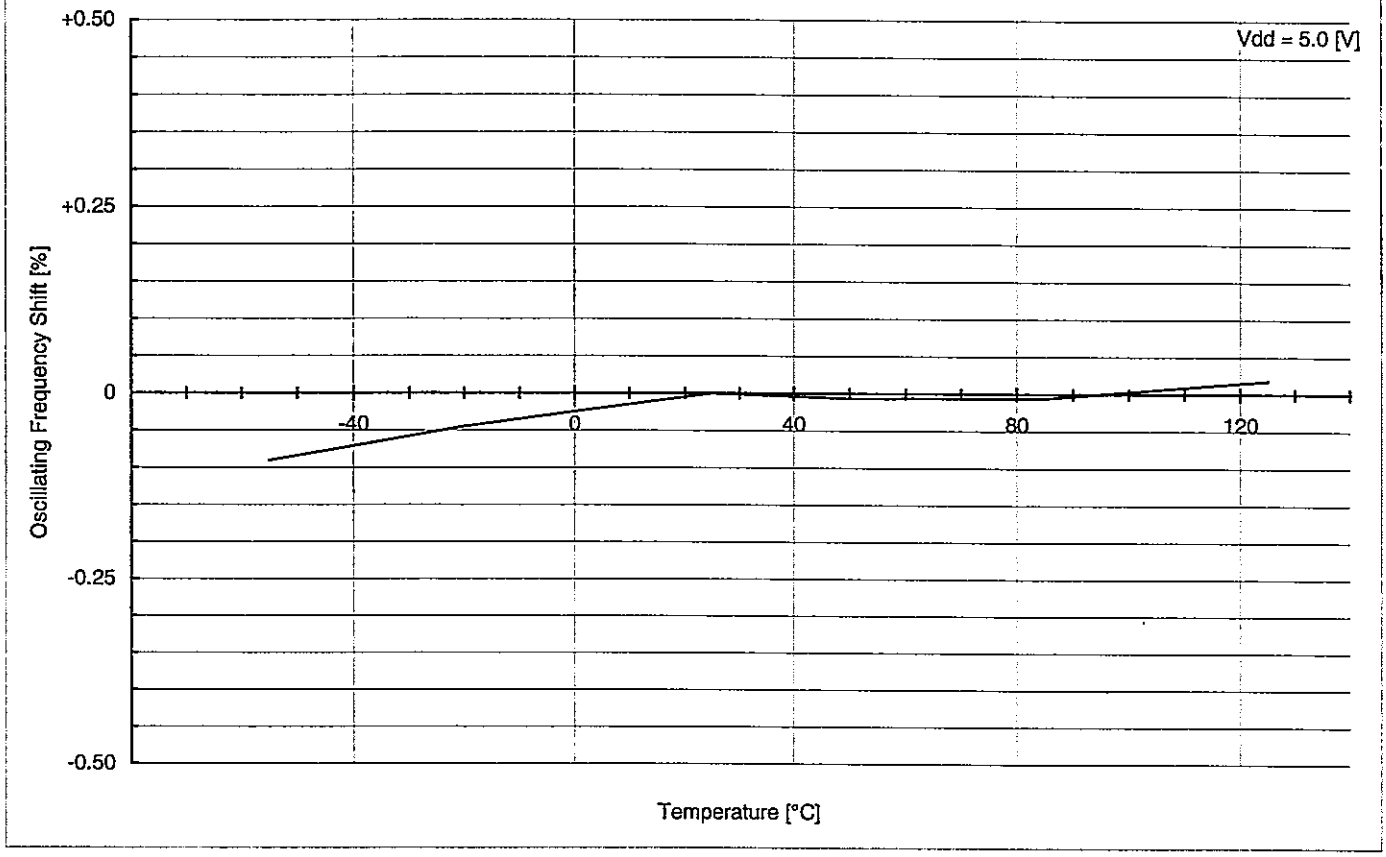
Recommendable Value

CERALOCK® : CSA4.19MG

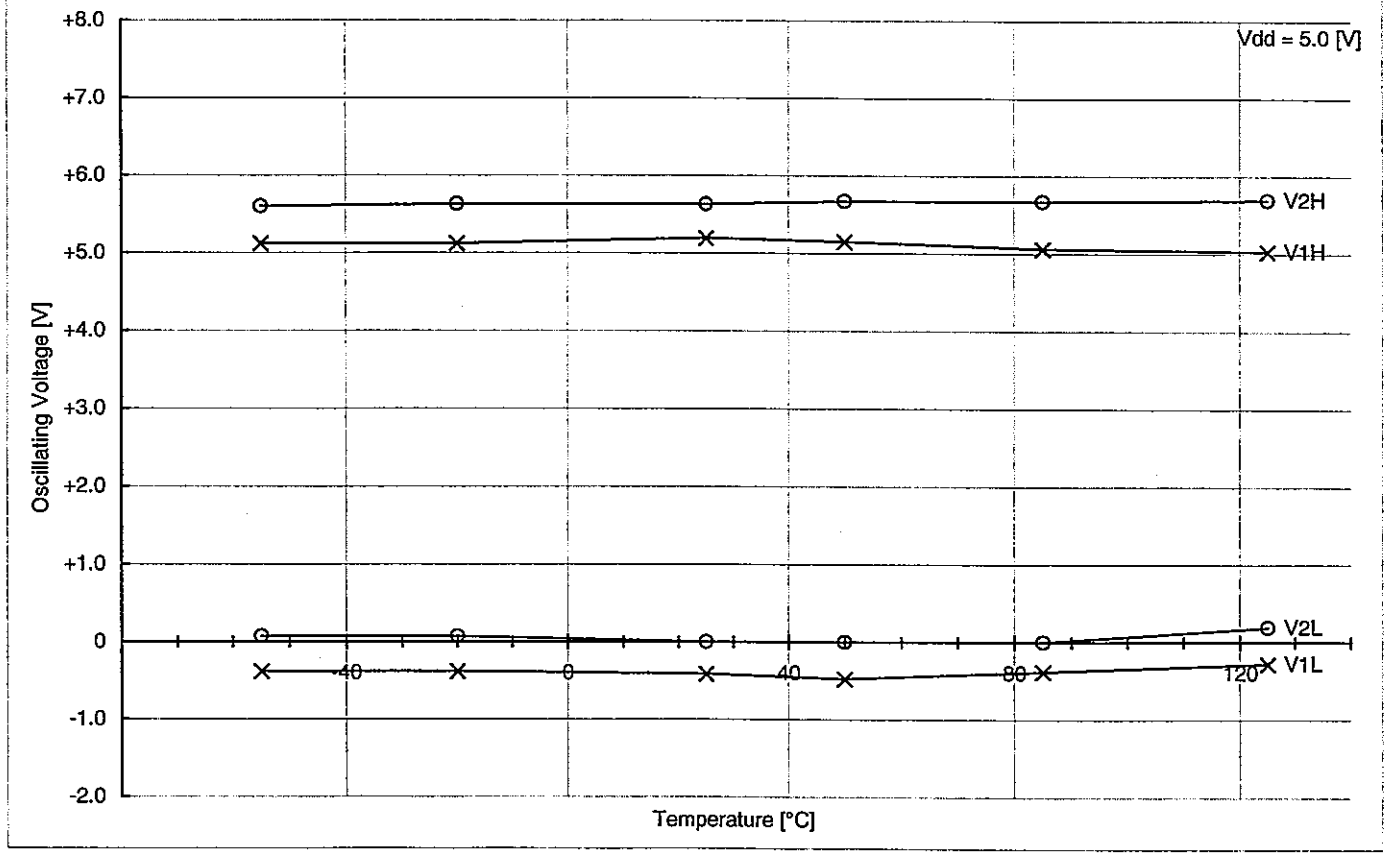
C1 = 30 [pF]

C2 = 30 [pF]

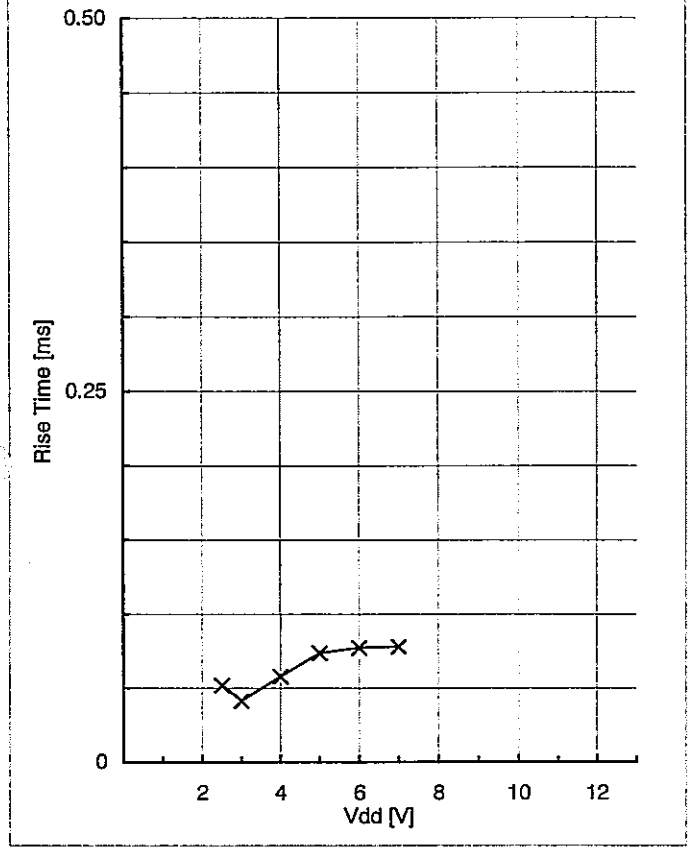
Temperature Characteristics of Oscillating Frequency
MODEL : CSA4.19MG with μPD780032A



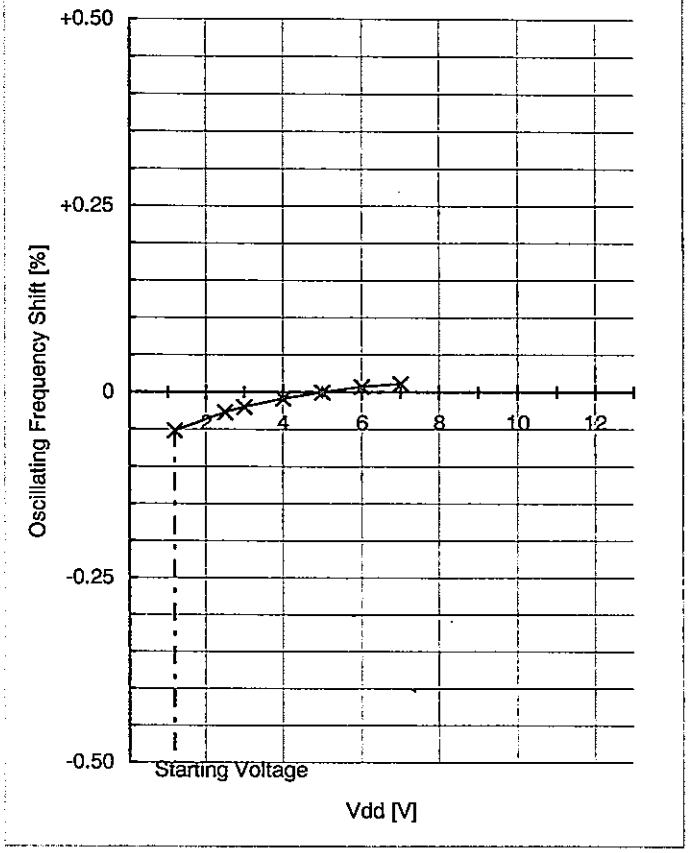
Temperature Characteristics of Oscillating Voltage
MODEL : CSA4.19MG with μPD780032A



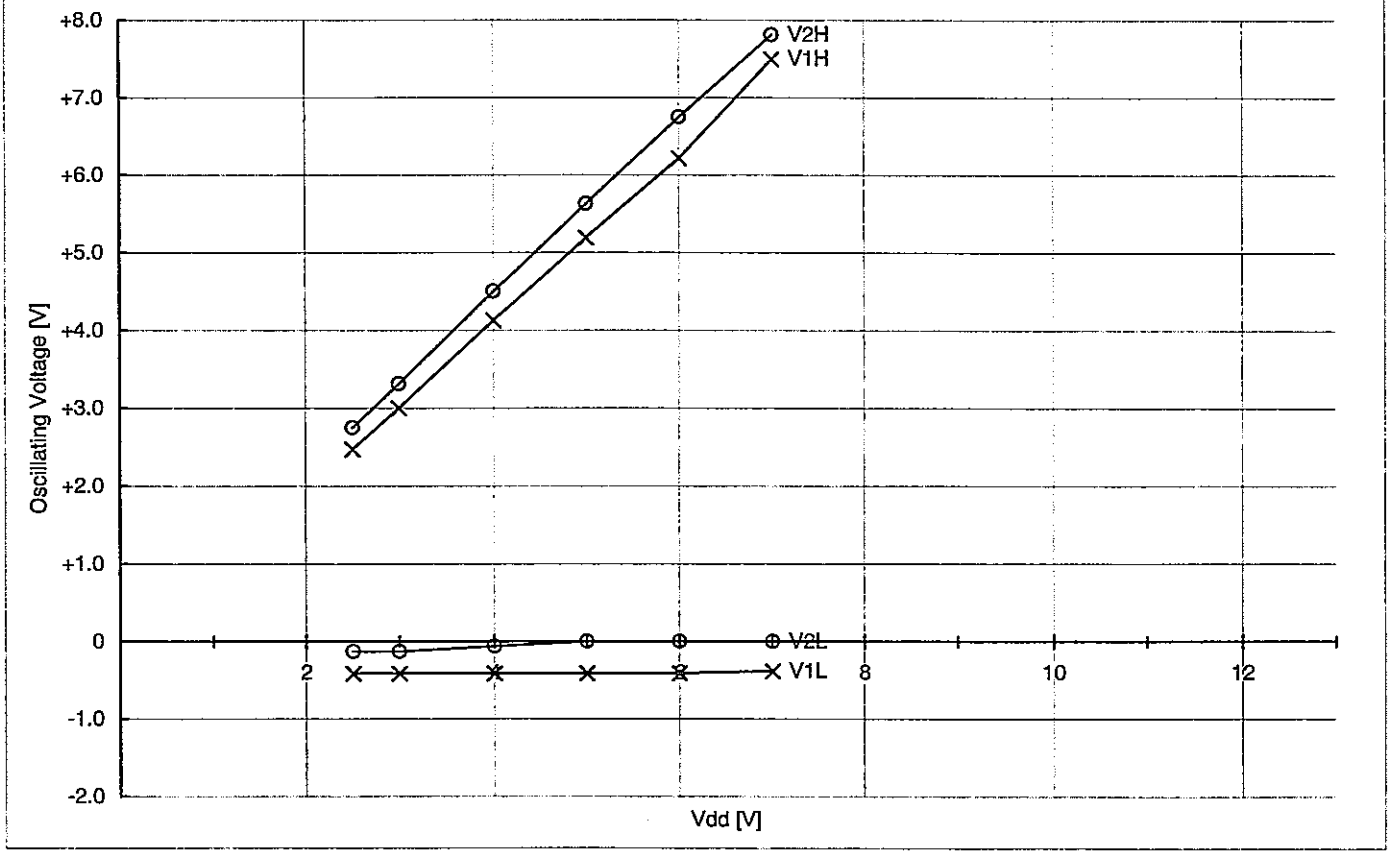
Rise Time vs Vdd Characteristics
MODEL : CSA4.19MG with μPD780032A

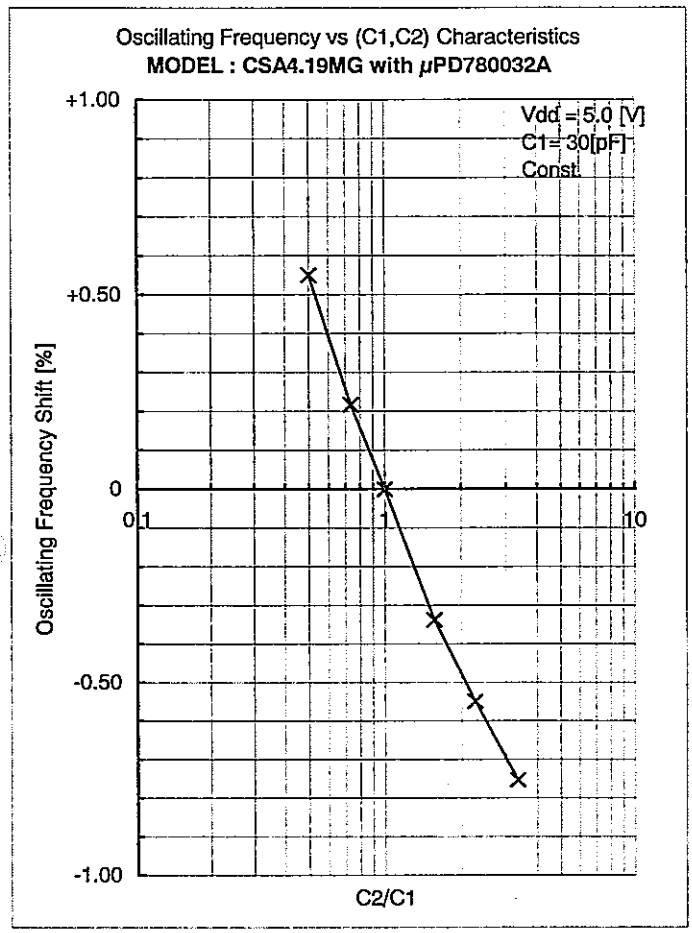


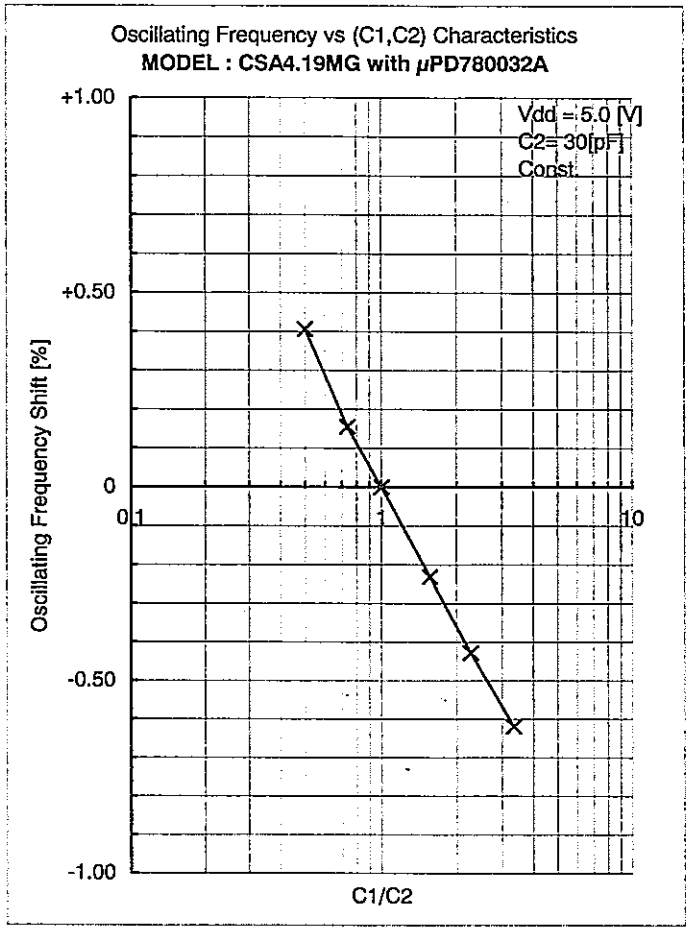
Oscillating Frequency vs Vdd Characteristics
MODEL : CSA4.19MG with μPD780032A

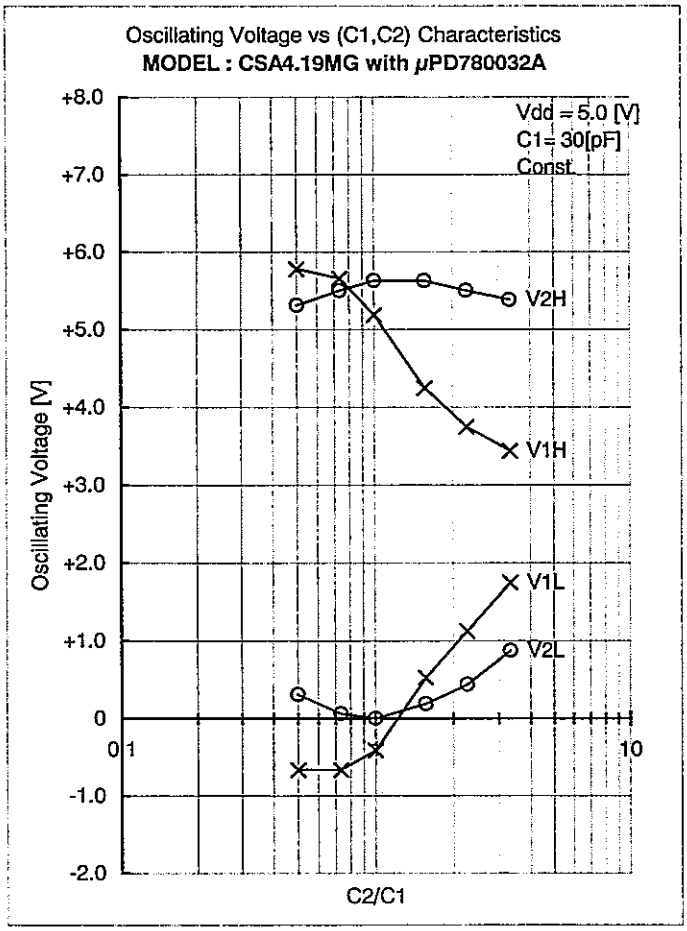


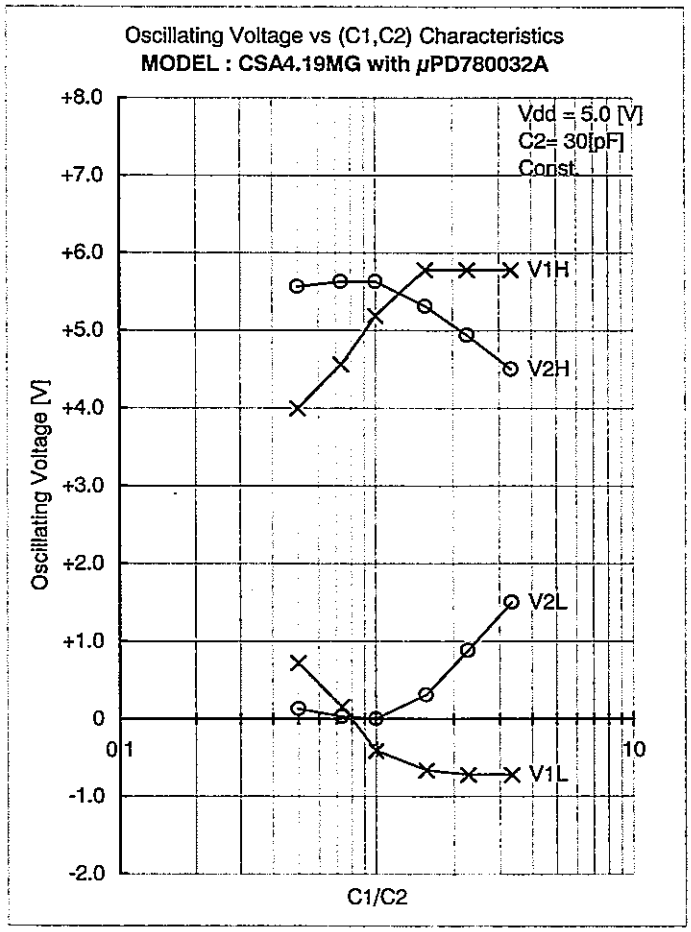
Oscillating Voltage vs Vdd Characteristics
MODEL : CSA4.19MG with μPD780032A

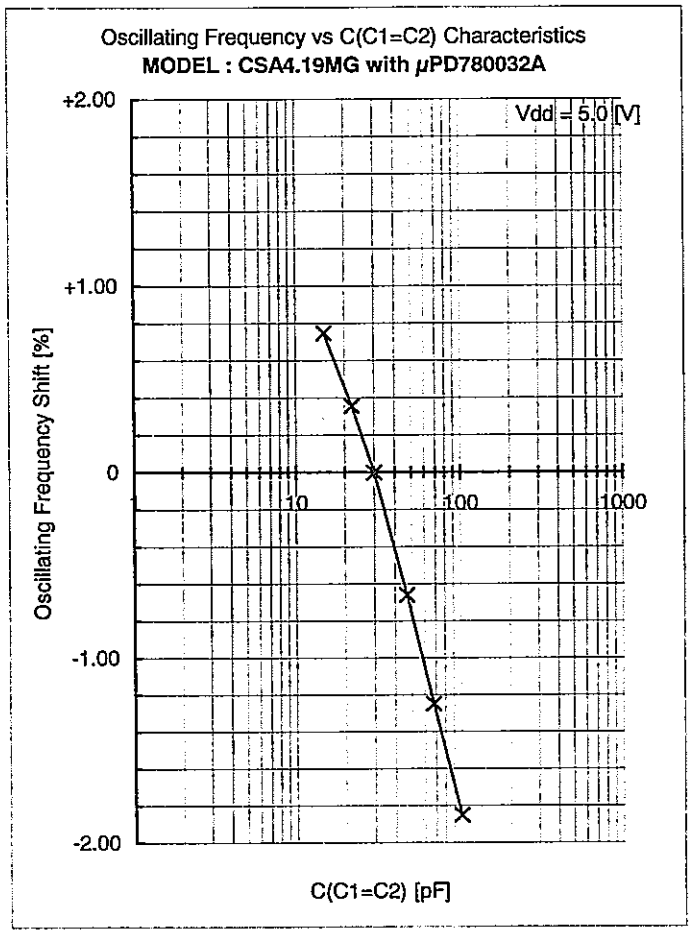


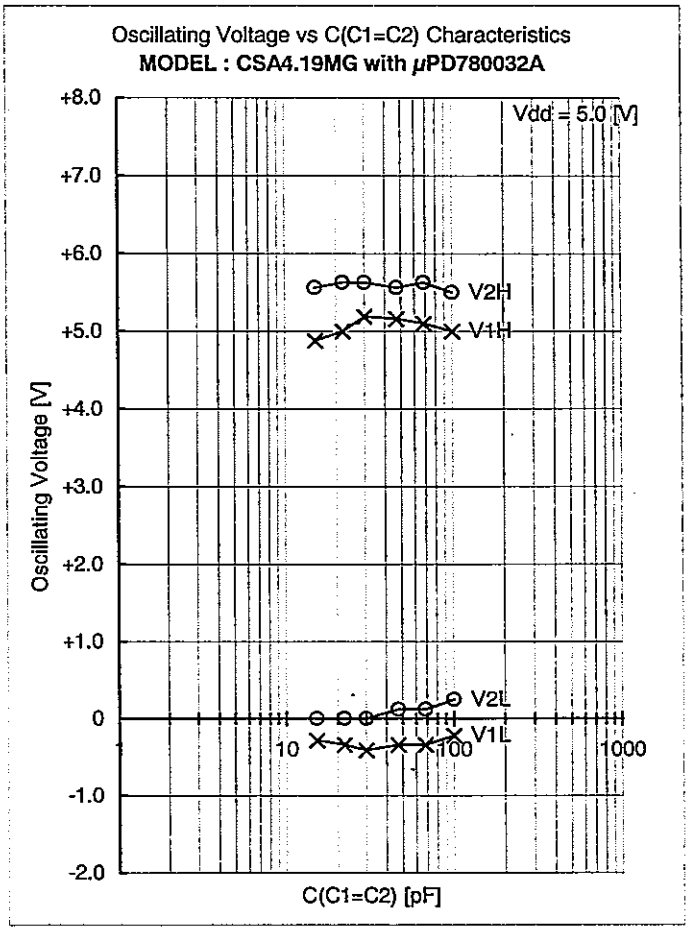

Oscillating Frequency vs (C1,C2) Characteristics
MODEL : CSA4.19MG with μPD780032A
Vdd = 5.0 [V]
C1= 30[pF]
Const.
+1.00
+0.50
0
-0.50
-1.00
0.1
1
10
Oscillating Frequency Shift [%]
C2/C1

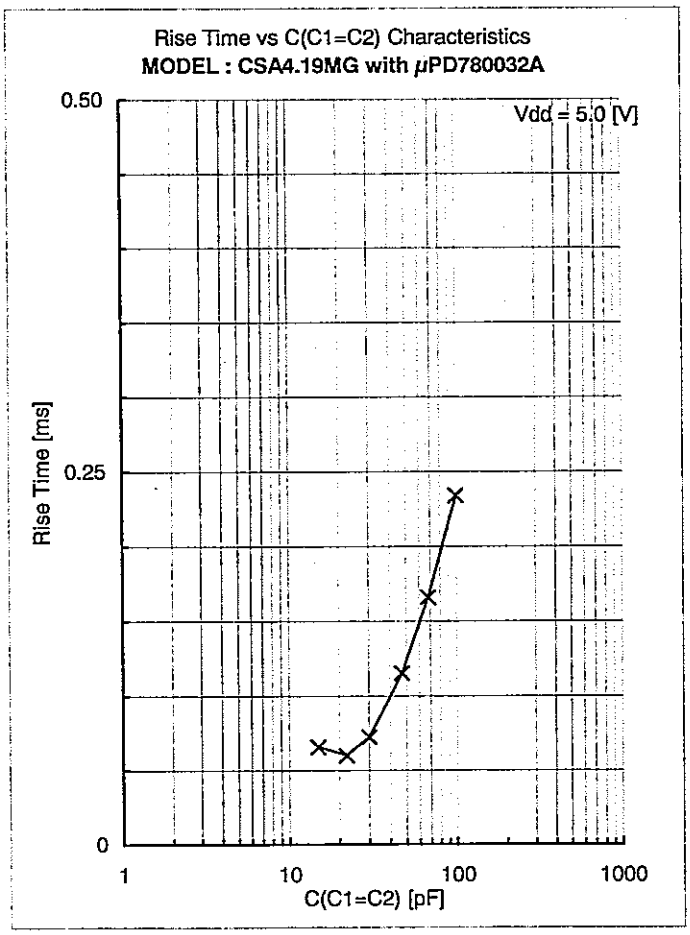

Oscillating Frequency vs (C1,C2) Characteristics
MODEL : CSA4.19MG with μPD780032A
Vdd = 5.0 [V]
C2= 30[pF]
Const.
+1.00
+0.50
0
-0.50
-1.00
0.1
1
10
Oscillating Frequency Shift [%]
C1/C2

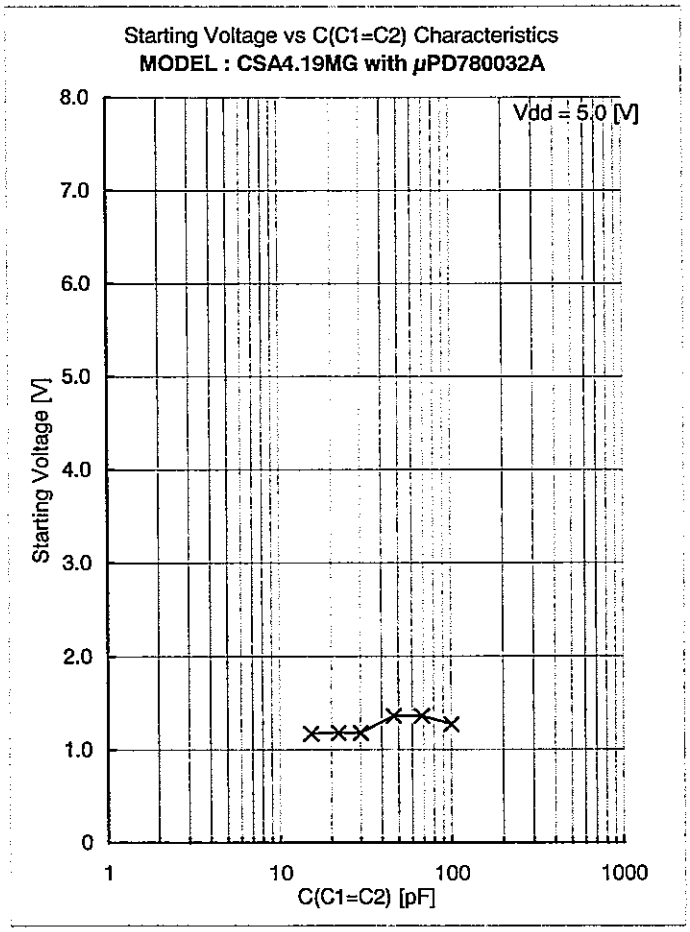

Oscillating Voltage vs (C1,C2) Characteristics
MODEL : CSA4.19MG with μPD780032A
Vdd = 5.0 [V]
C1= 30[pF]
Const.
+8.0
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
0
-1.0
-2.0
0.1
1
10
V2H
V1H
V1L
V2L
Oscillating Voltage [V]
C2/C1


Oscillating Voltage vs (C1,C2) Characteristics
MODEL : CSA4.19MG with μPD780032A
Vdd = 5.0 [V]
C2= 30[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 : CSA4.19MG with μPD780032A
Vdd = 5.0 [V]
+2.00
+1.00
0
-1.00
-2.00
Oscillating Frequency Shift [%]
10
100
1000
C(C1=C2) [pF]


Oscillating Voltage vs C(C1=C2) Characteristics
MODEL : CSA4.19MG 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 : CSA4.19MG with μPD780032A
Vdd = 5.0 [V]
0.50
0.25
0
Rise Time [ms]
1
10
100
1000
C(C1=C2) [pF]


Starting Voltage vs C(C1=C2) Characteristics
MODEL : CSA4.19MG 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]
1
10
100
1000
C(C1=C2) [pF]

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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	5.19	-0.41	5.60	5.63	-0.06	5.69	4216.265	0.064	1.29
W05	5.19	-0.34	5.53	5.63	0.00	5.63	4216.365	0.080	1.08
W07	5.19	-0.41	5.60	5.63	-0.13	5.76	4216.319	0.067	1.29
W09	5.22	-0.34	5.56	5.63	0.00	5.63	4216.371	0.085	1.15
W15	5.19	-0.41	5.60	5.63	0.00	5.63	4216.365	0.073	1.19

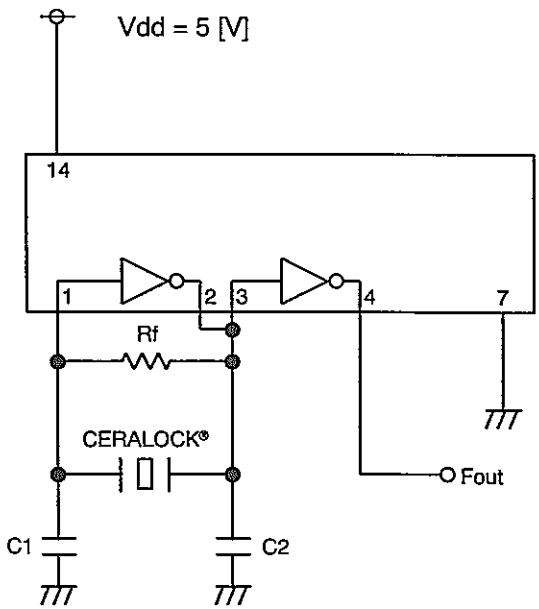
Ref.

Performance described page 2 to 5 were measured with IC No. 107

Frequency Correlation Data

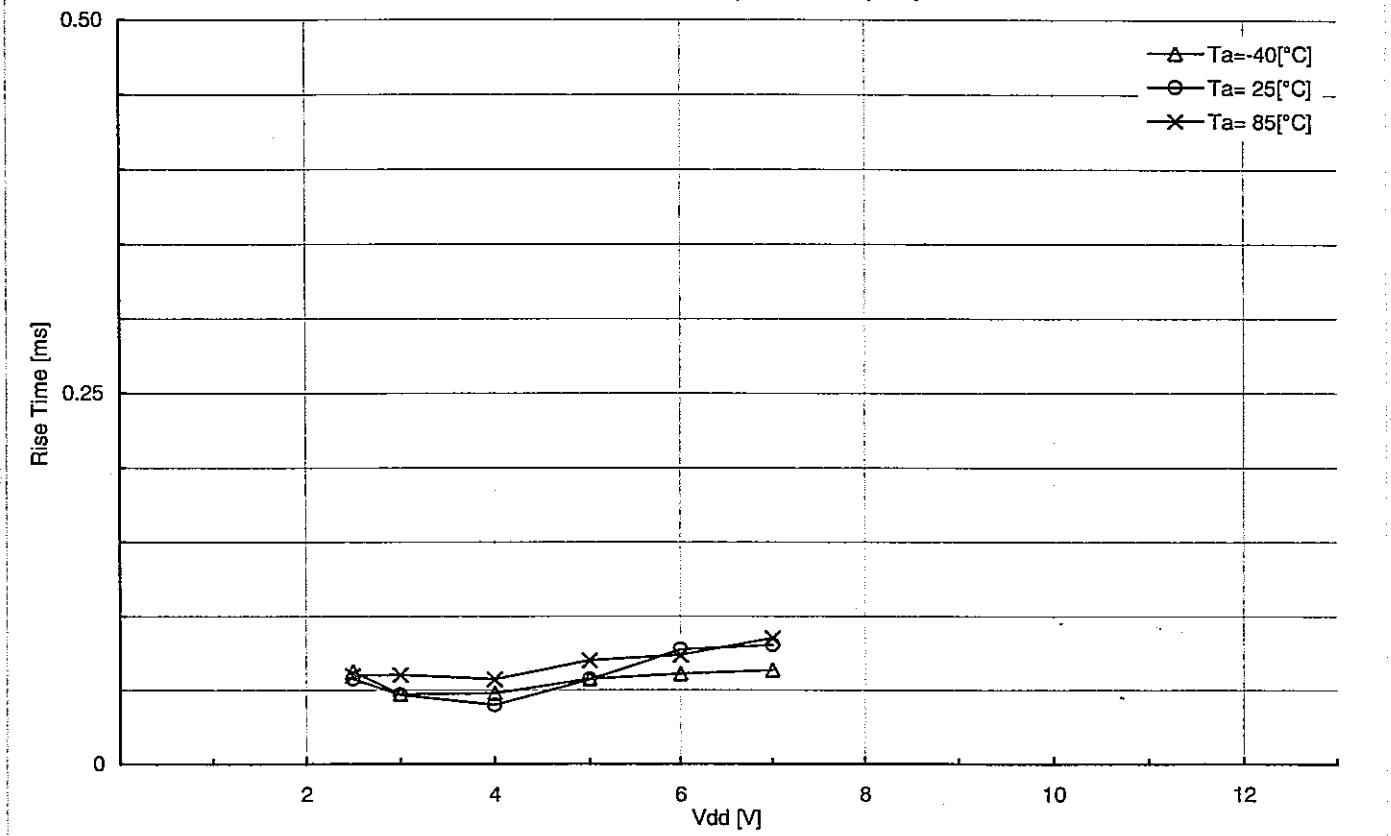
Sample No.	μPD780032A Fosc [kHz]	CD4069UBE Fosc [kHz]	Shift [%]
1	4216.332	4200.790	0.3700
2	4200.494	4185.329	0.3624
3	4202.359	4186.862	0.3701
4	4204.464	4188.815	0.3736
5	4203.591	4188.158	0.3685
$\bar{X}$	4205.448	4189.991	0.3689

muRata Standard Circuit

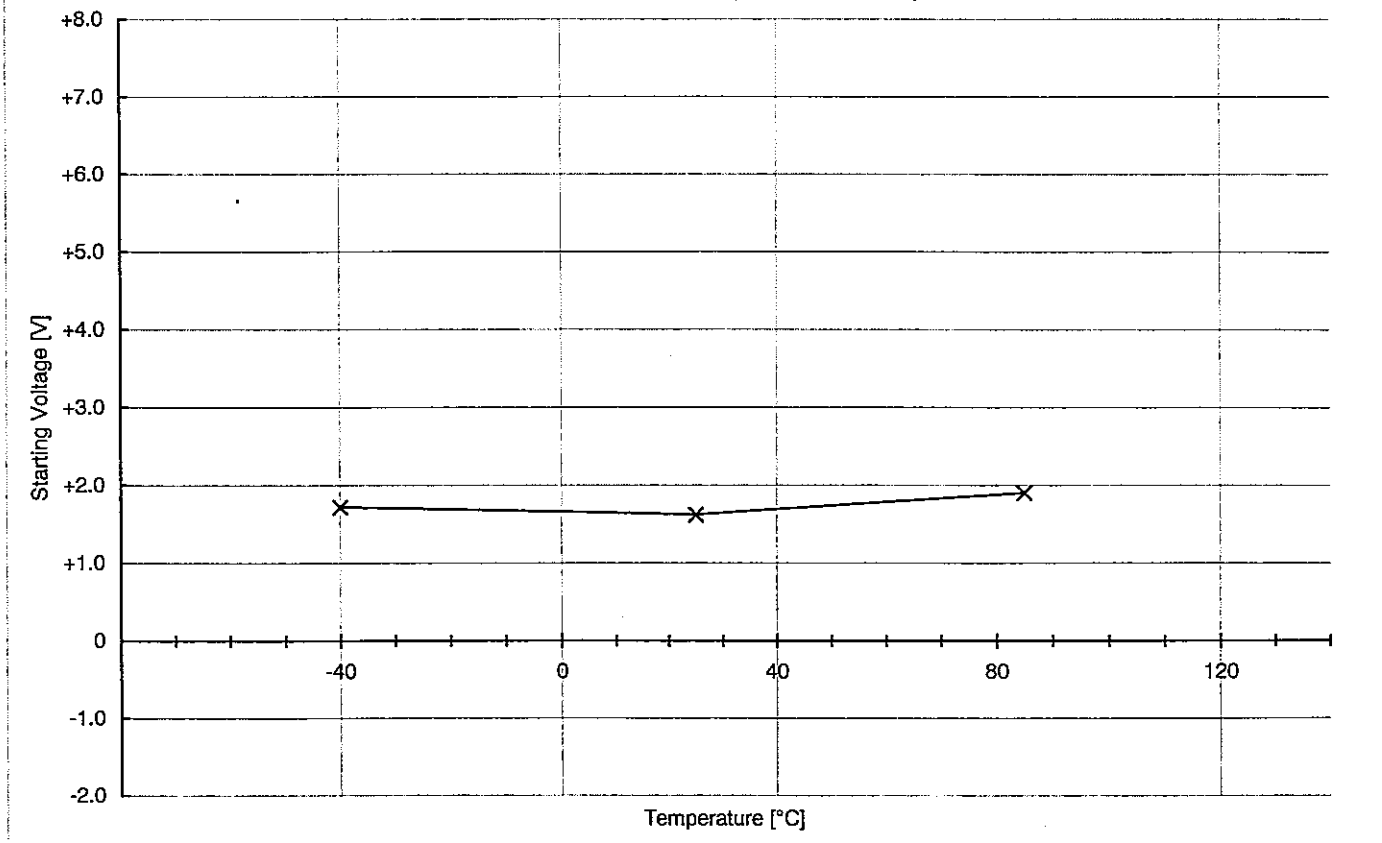


CERALOCK® : CSA4.19MG
C1 = 30 [pF]
C2 = 30 [pF]
Rf = 1 [Mohm]

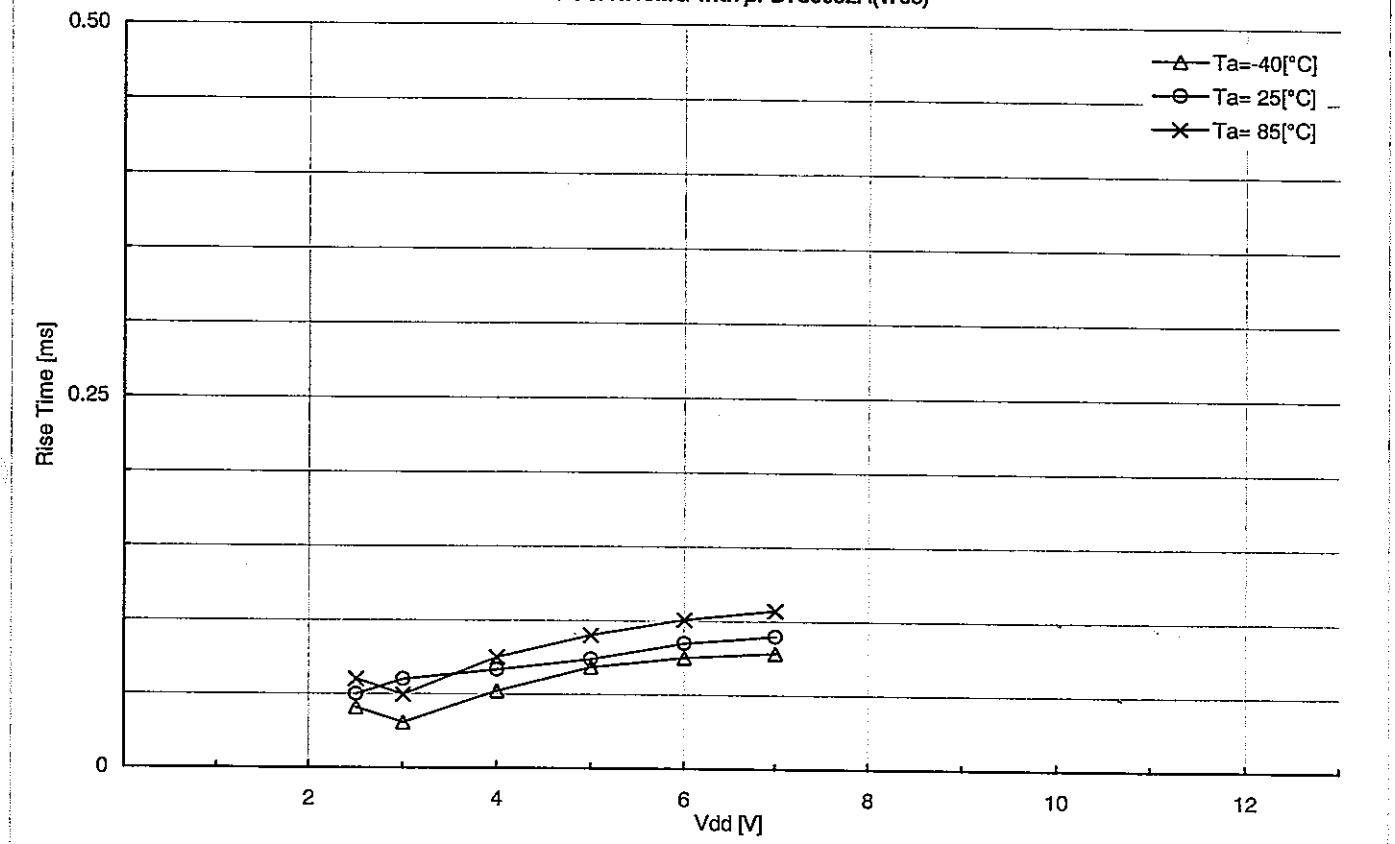
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W03)



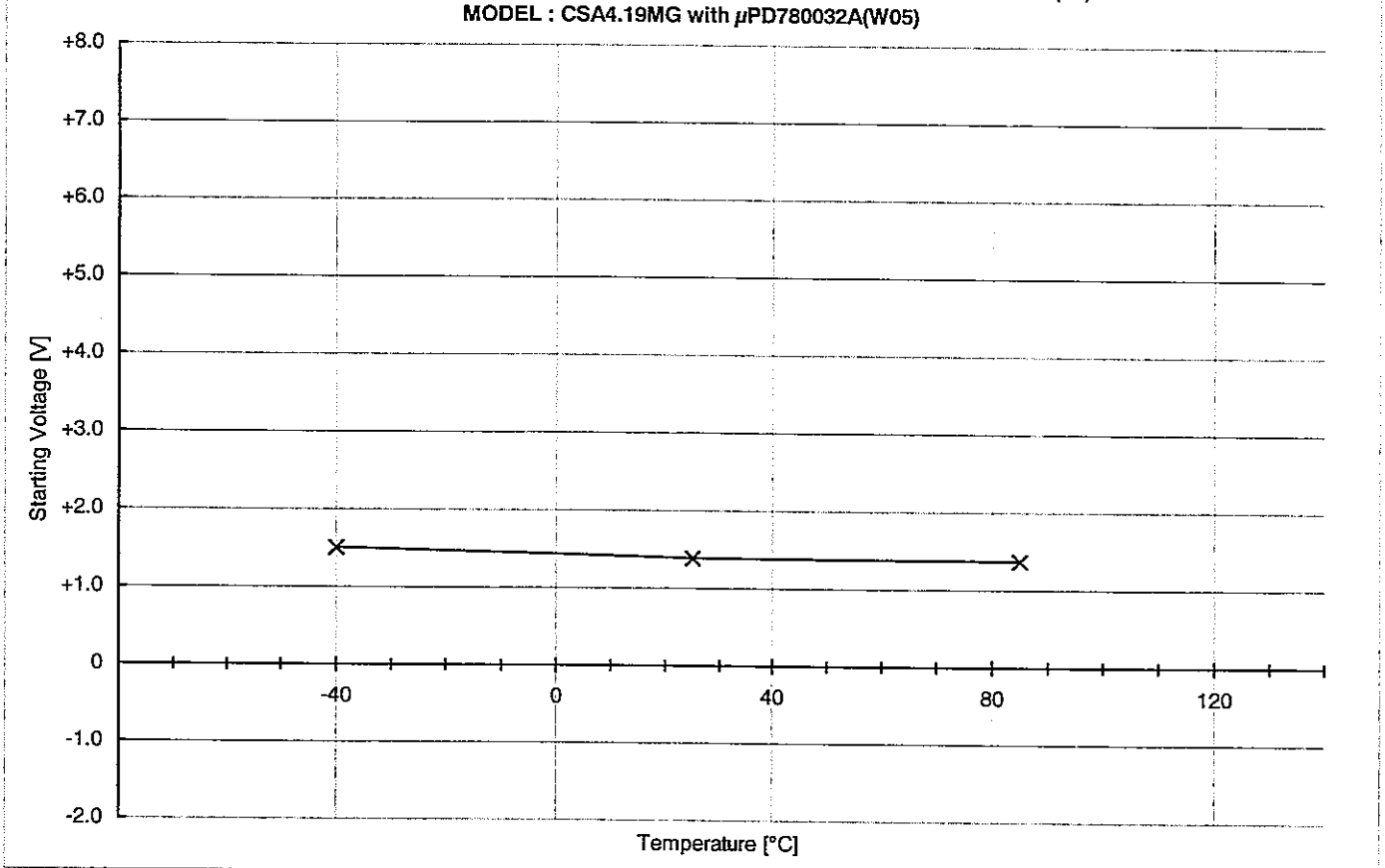
Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W03)



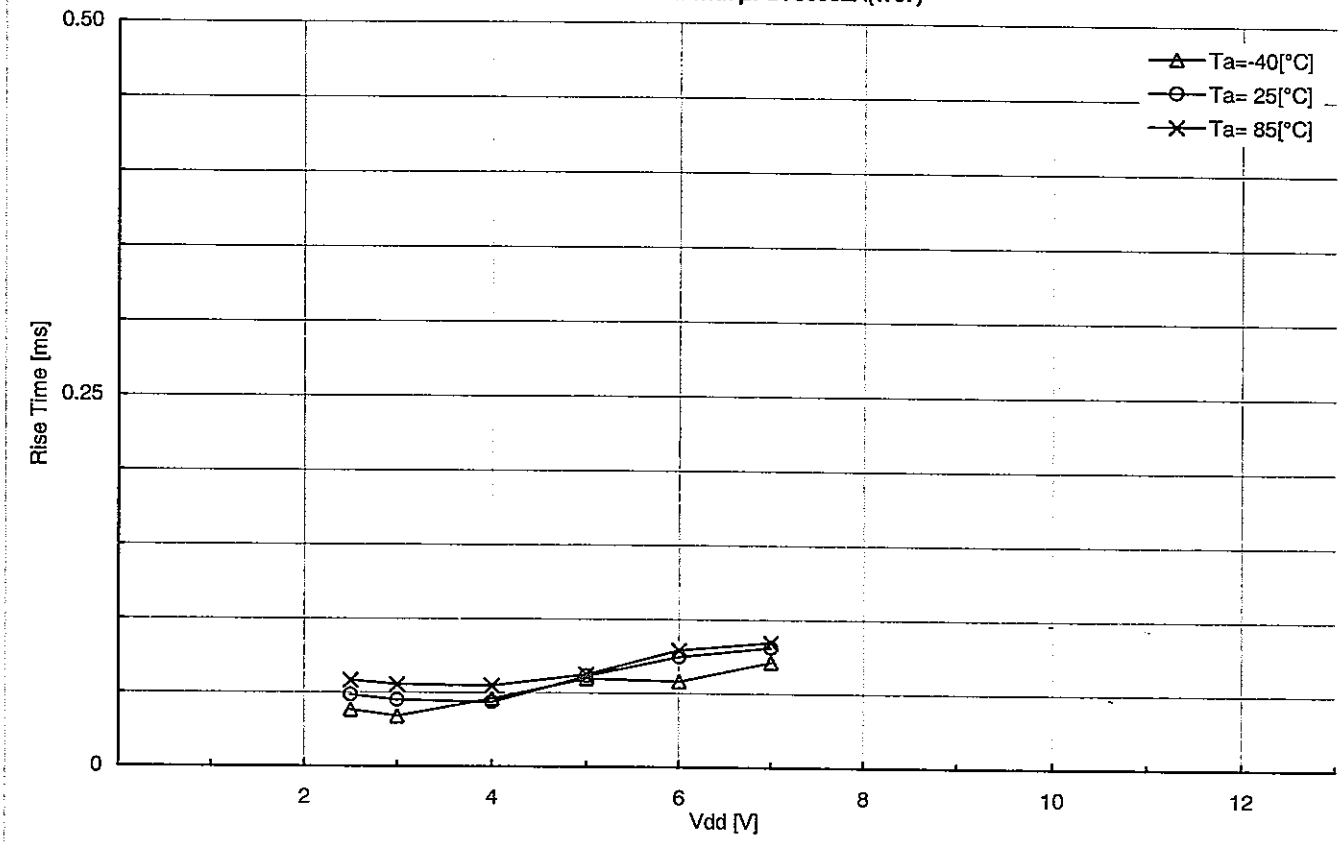
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W05)



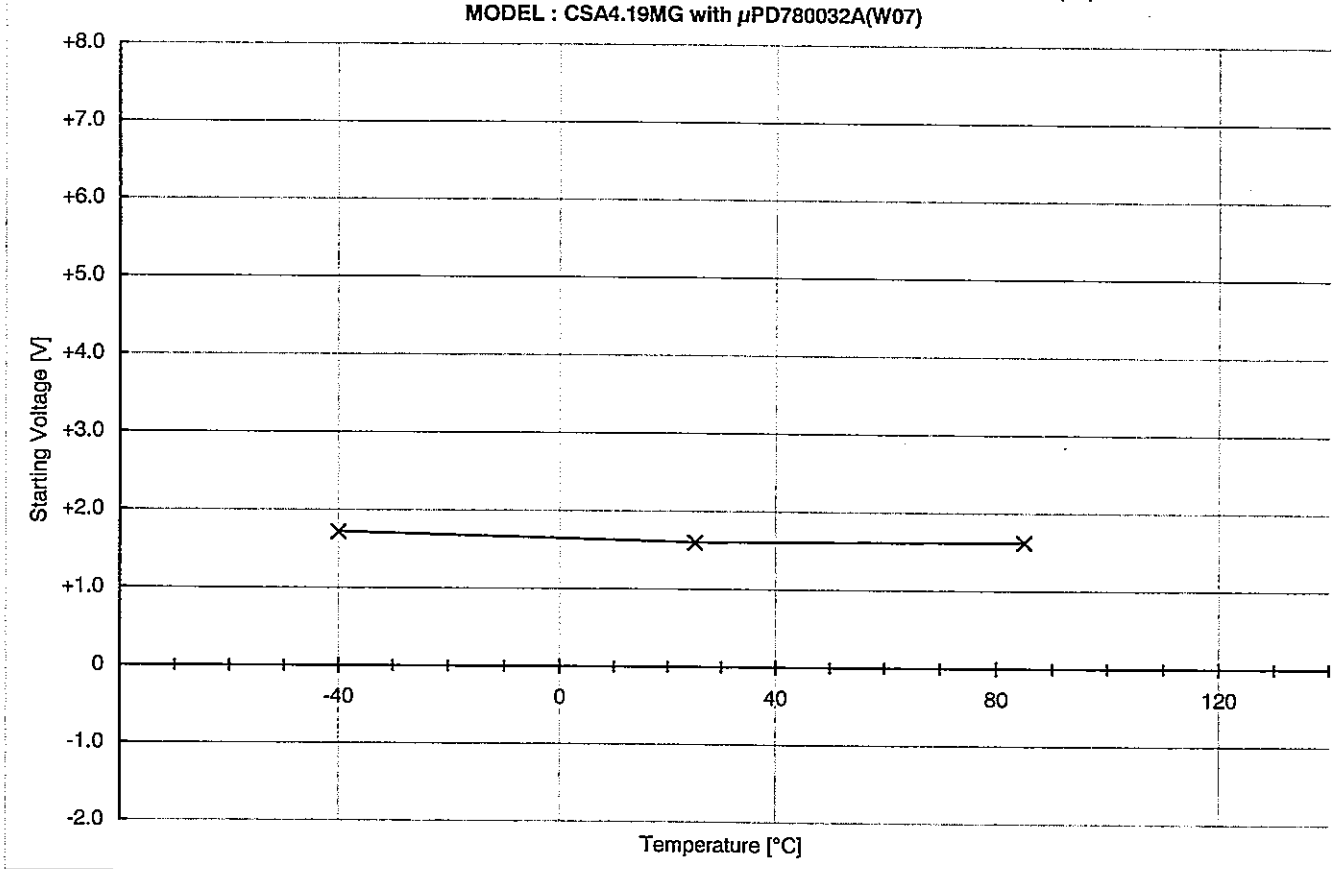
Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W05)



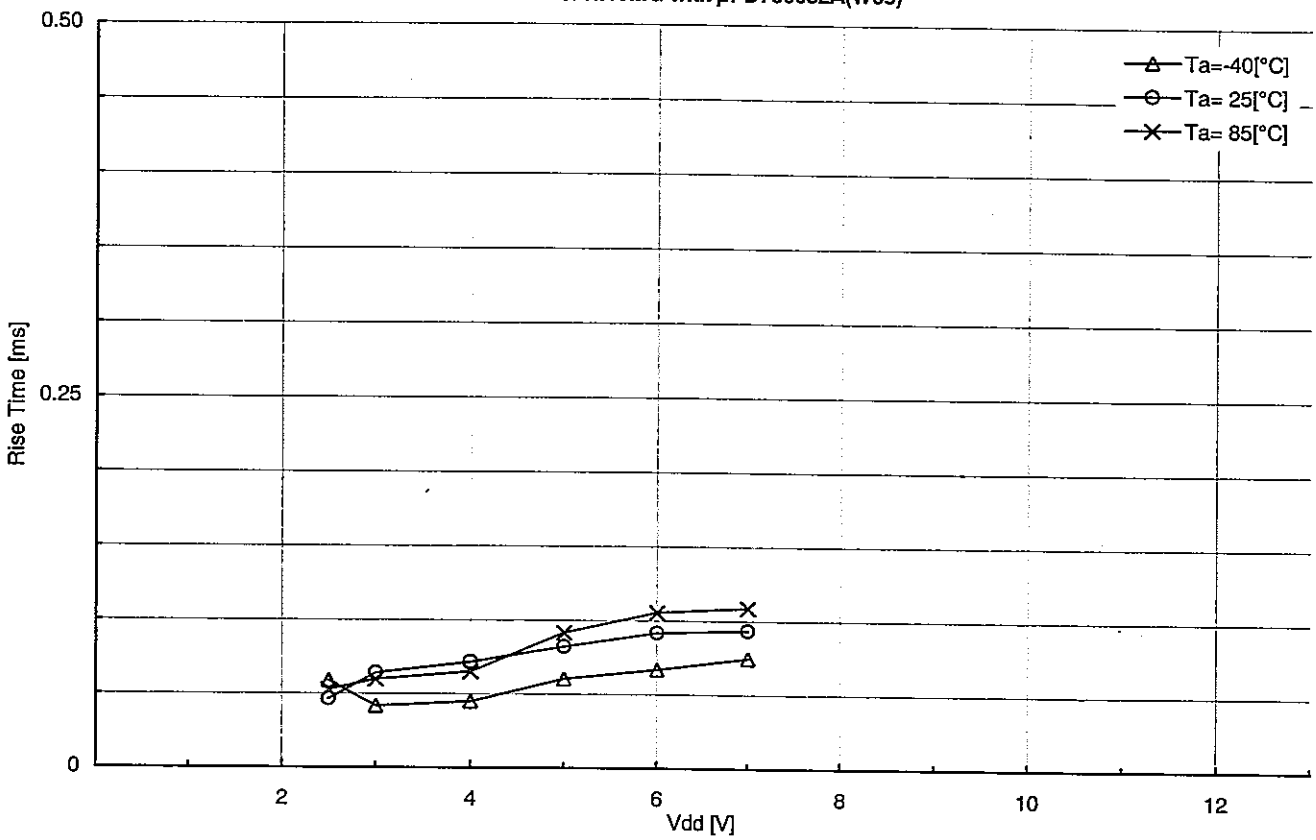
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W07)



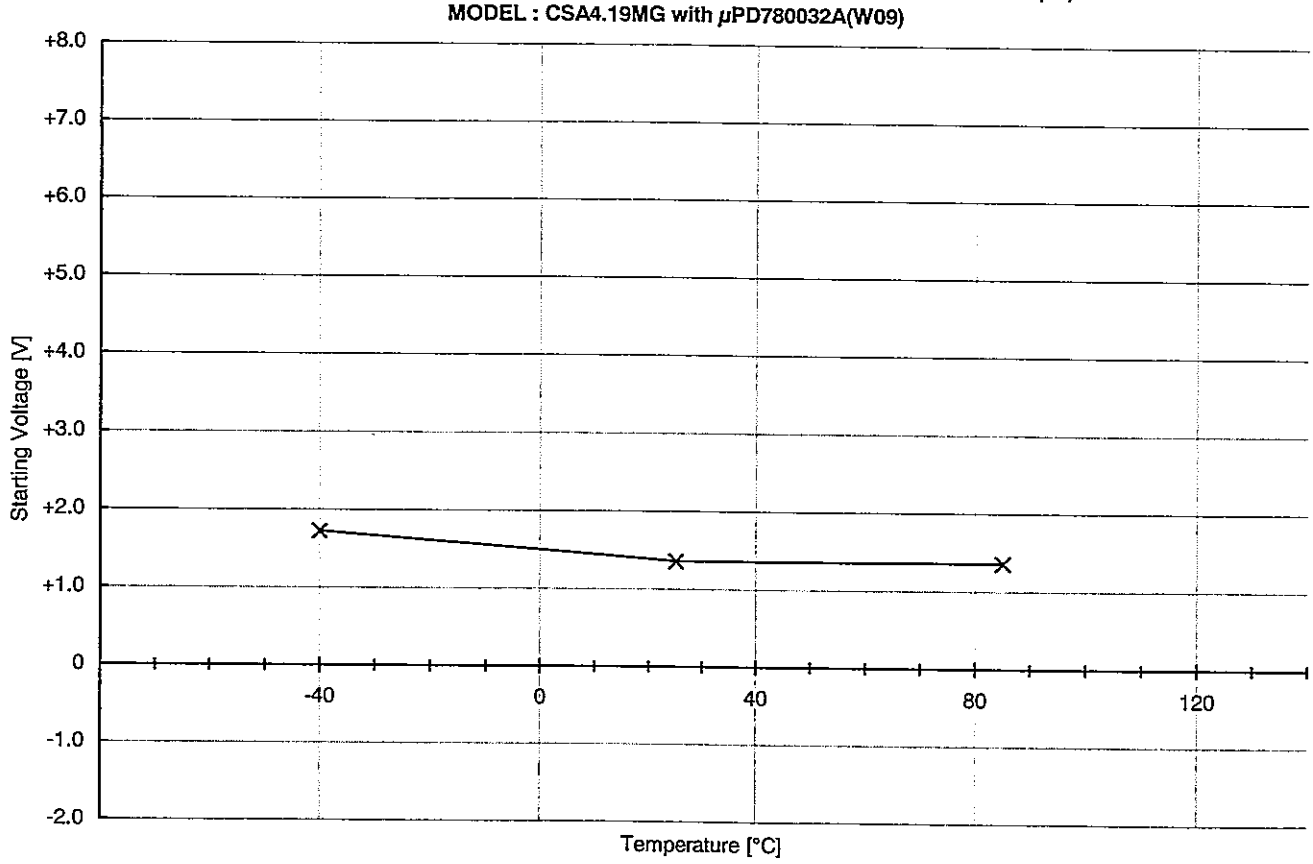
Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W07)

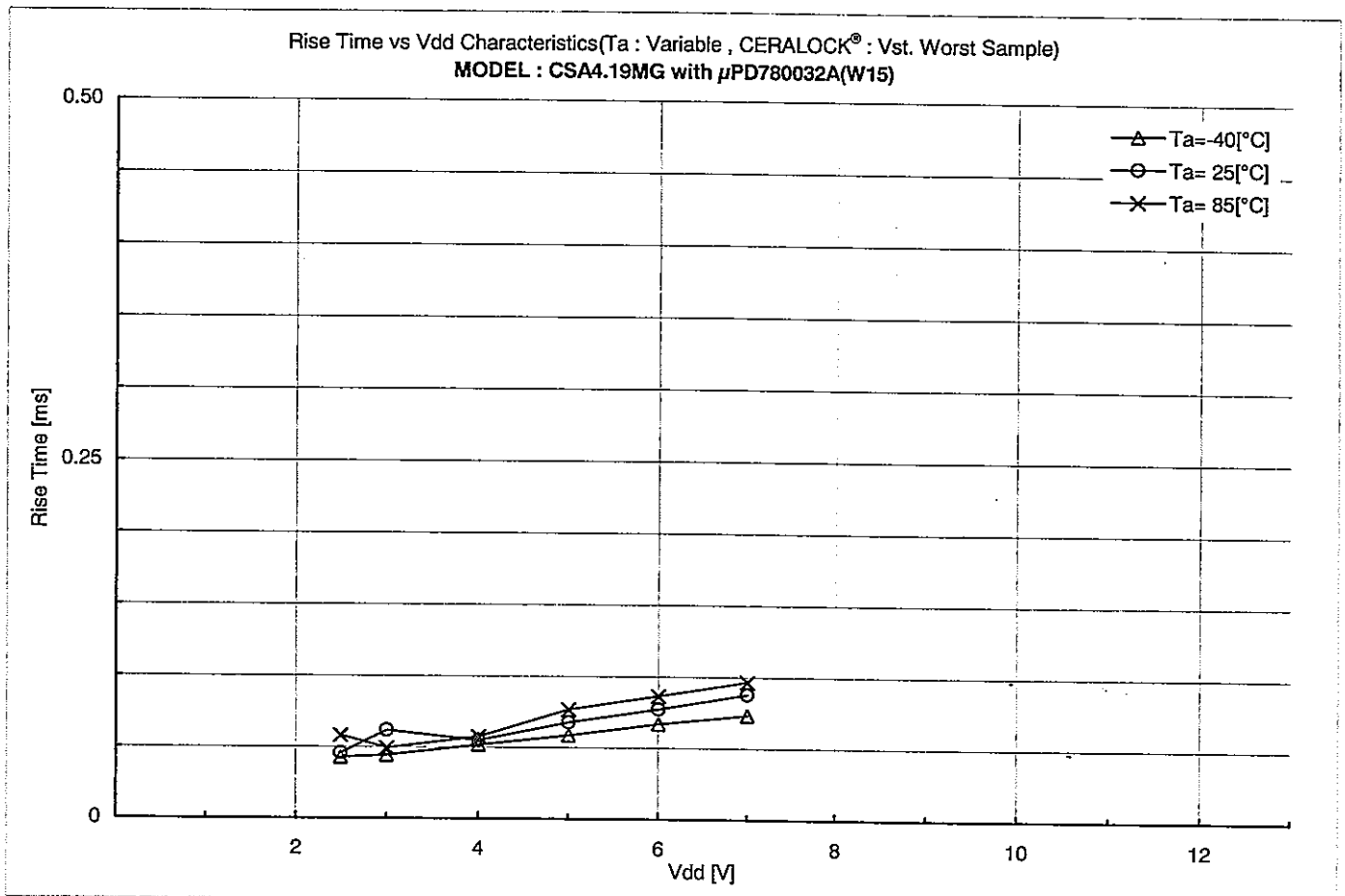


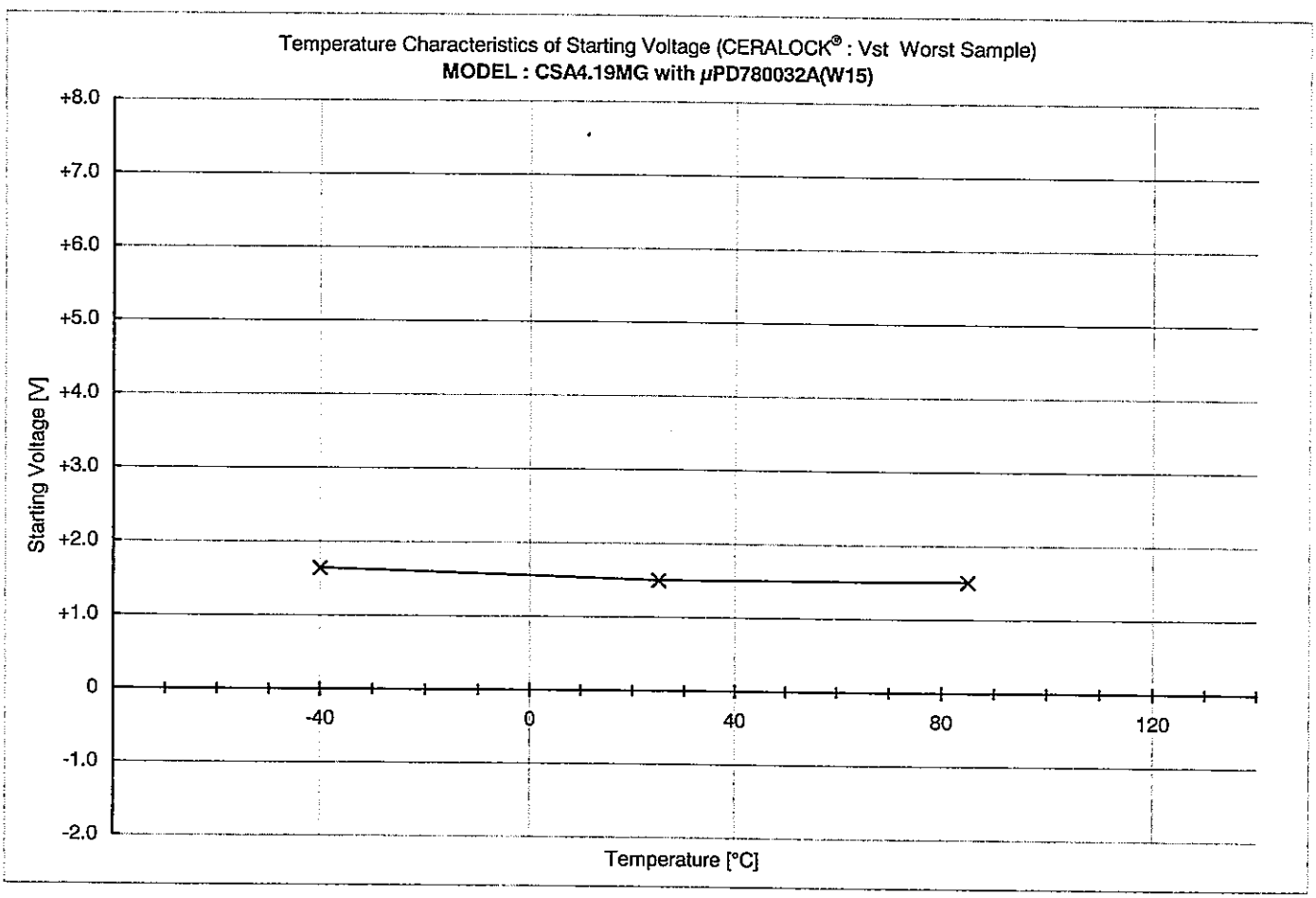
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W09)

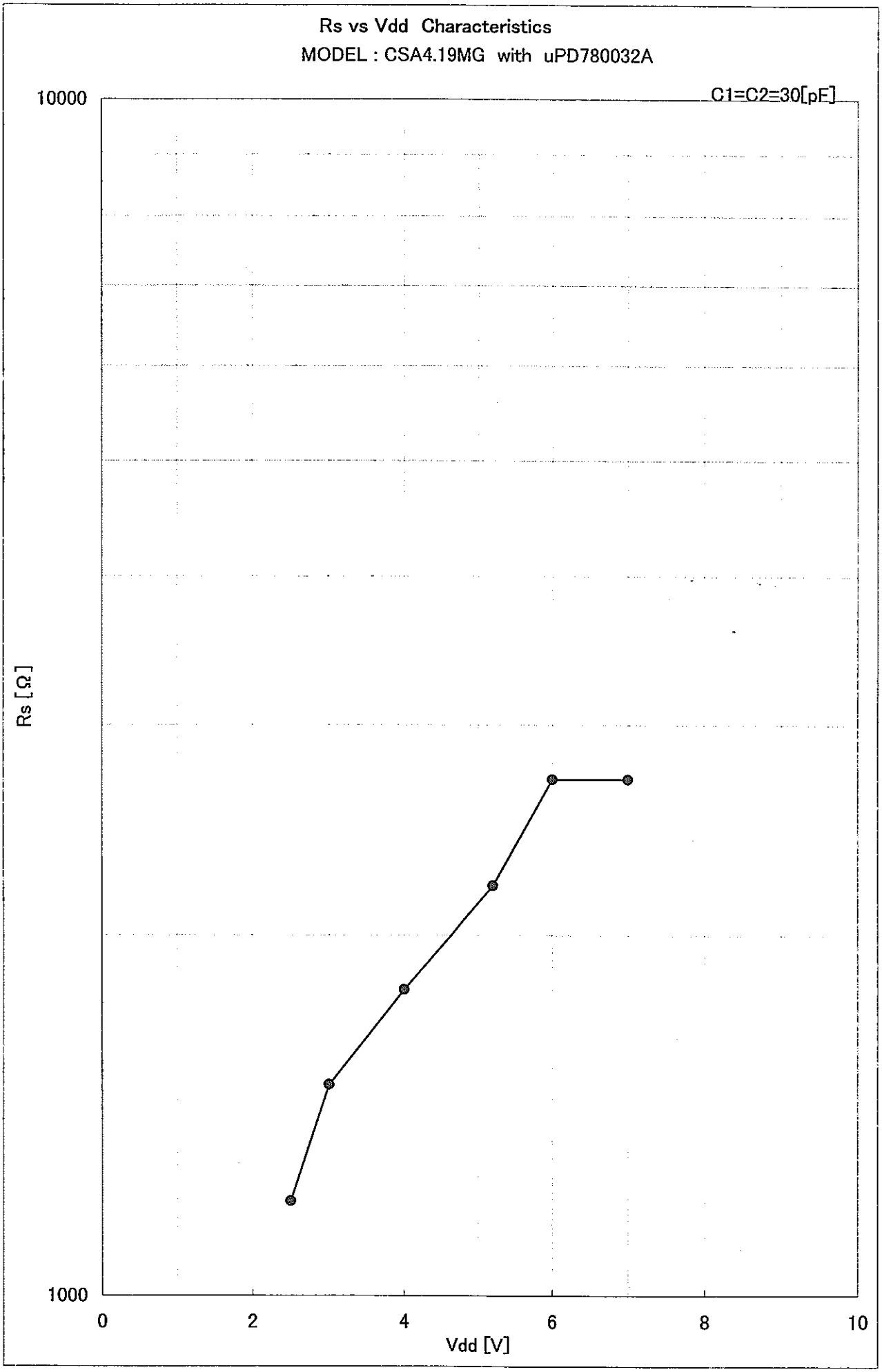


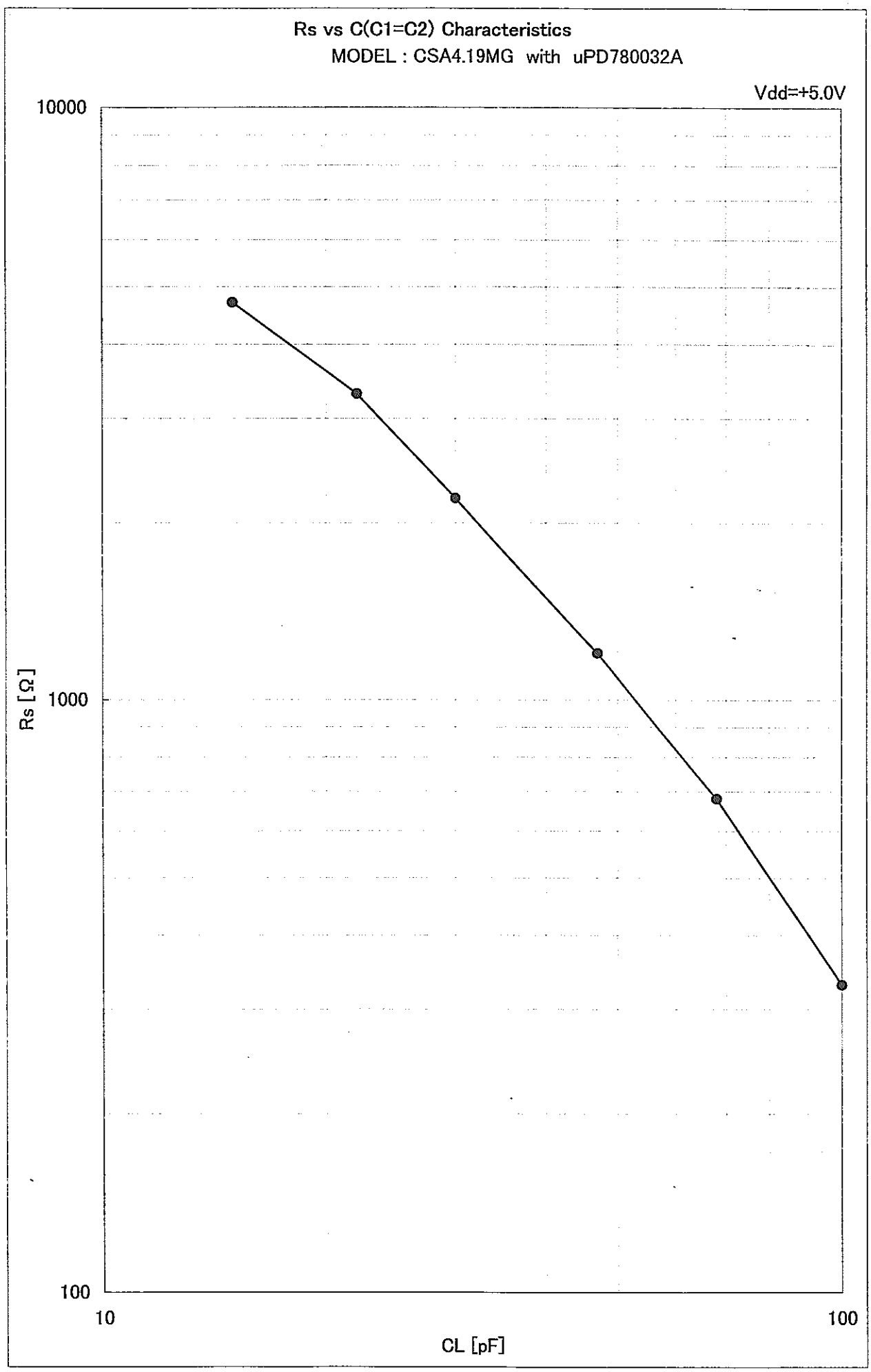
Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W09)




Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W15)
Ta=-40[°C]
Ta= 25[°C]
Ta= 85[°C]
Rise Time [ms]
0.50
0.25
0
2
4
6
8
10
12
Vdd [V]


Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
MODEL : CSA4.19MG with μPD780032A(W15)
Starting Voltage [V]
+8.0
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
0
-1.0
-2.0
-40
0
40
80
120
Temperature [°C]


Rs vs Vdd Characteristics
MODEL : CSA4.19MG with uPD780032A
C1=C2=30[pF]
10000
1000
Rs [Ω]
0
2
4
6
8
10
Vdd [V]


Rs vs C(C1=C2) Characteristics
MODEL : CSA4.19MG with uPD780032A
Vdd=+5.0V
10000
1000
100
Rs [Ω]
10
100
CL [pF]