Technical Data of Ceramic Resonator

Type CSA8.00MTZ
CST8.00MTW

Applied to $\mu$PD780032A

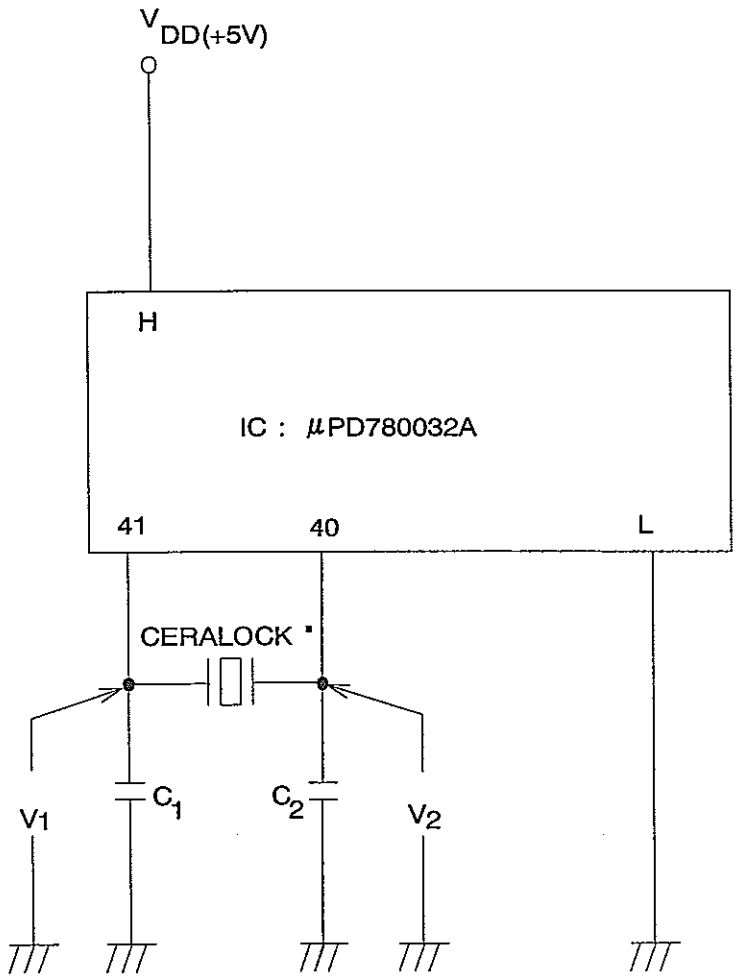

*TOYAMA MURATA MANUFACTURING CO., LTD.*

Product Engineering Service Section I
Engineering Service Department
Piezoelectric Components Group


| Approved by | Checked by | Checked by | Issued by | Issued Date | TCD No. |
|---|---|---|---|---|---|
| S.Iwasaki | K.Kuramoto | M.Kurosaka | Y.Ishiho | Feb 1, 1999 | TCD-99-6A21 |

Contents

Test Circuit




H:10,24,35,36,38

L:9,25 ~34,39,42

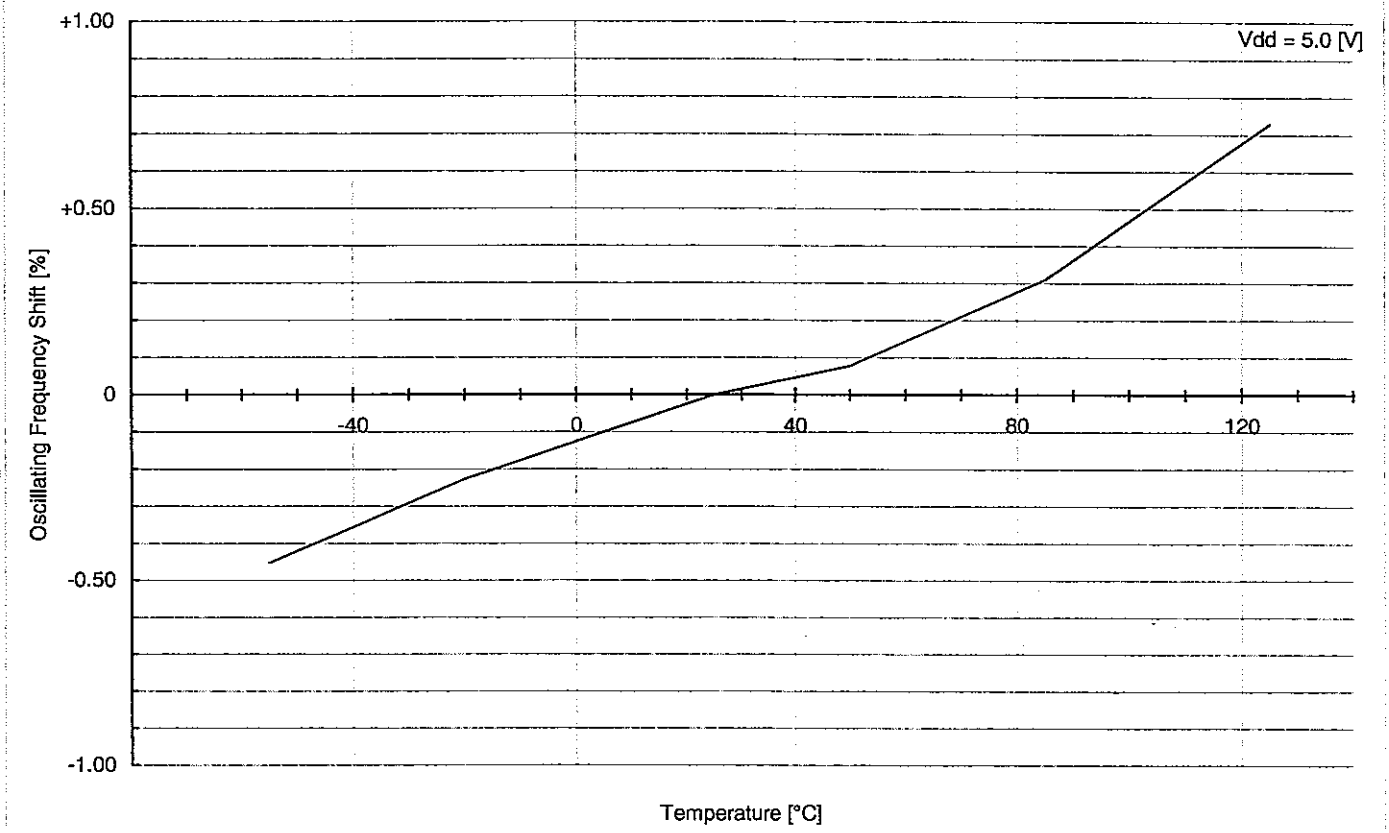
Recommendable Value

CERALOCK® : CSA8.00MTZ

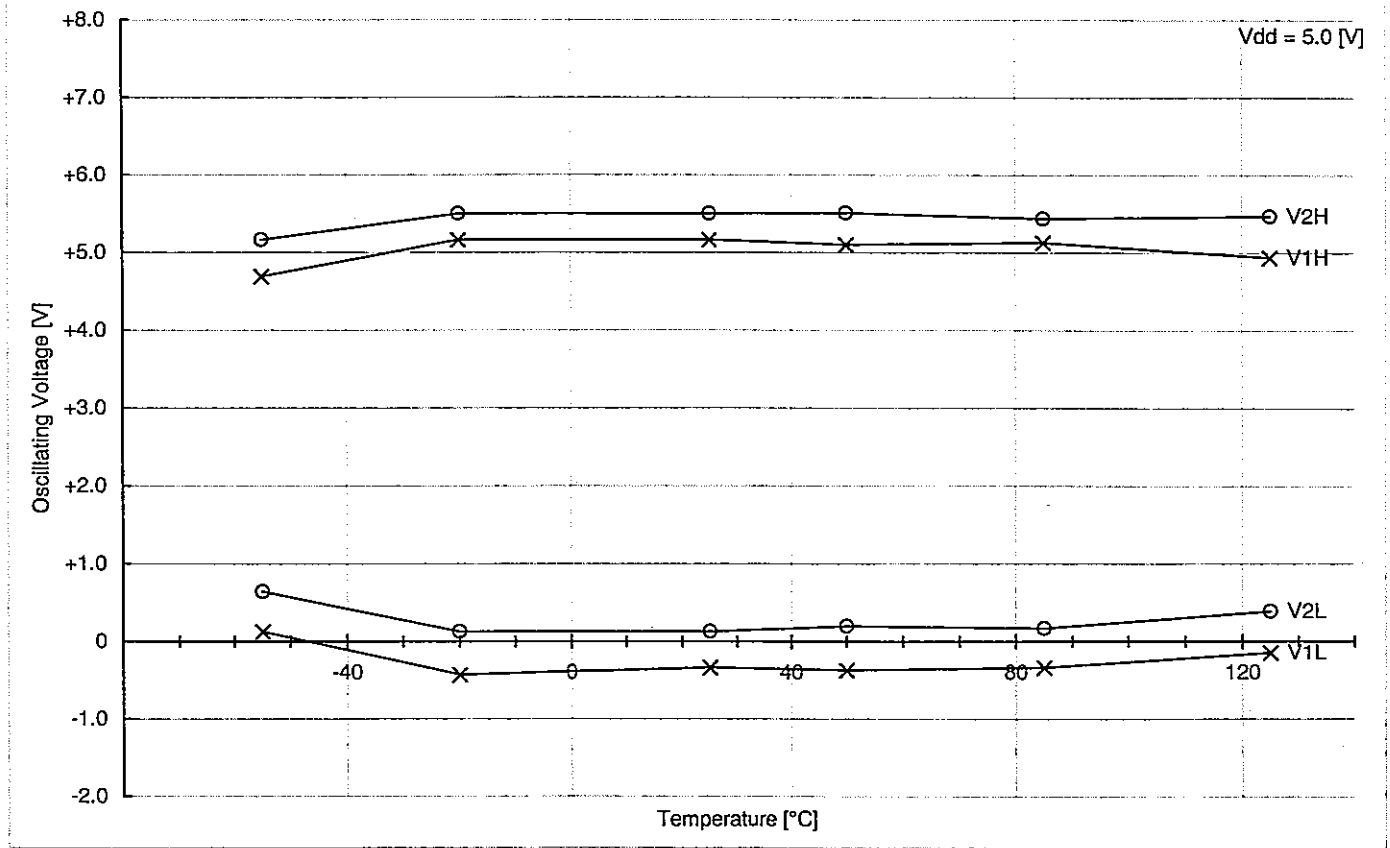
C1 = 30 [pF]

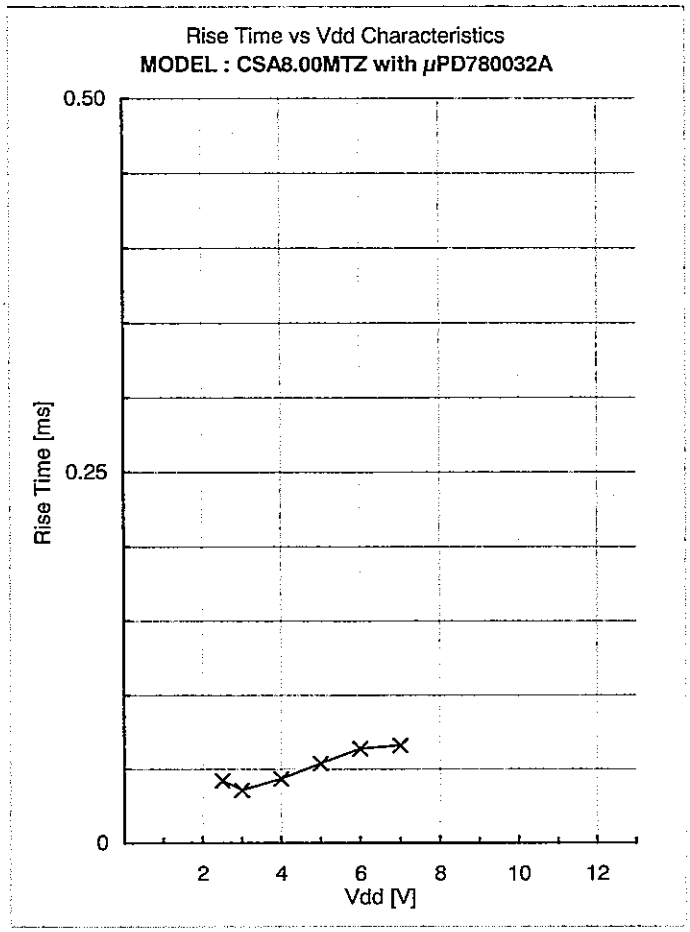
C2 = 30 [pF]

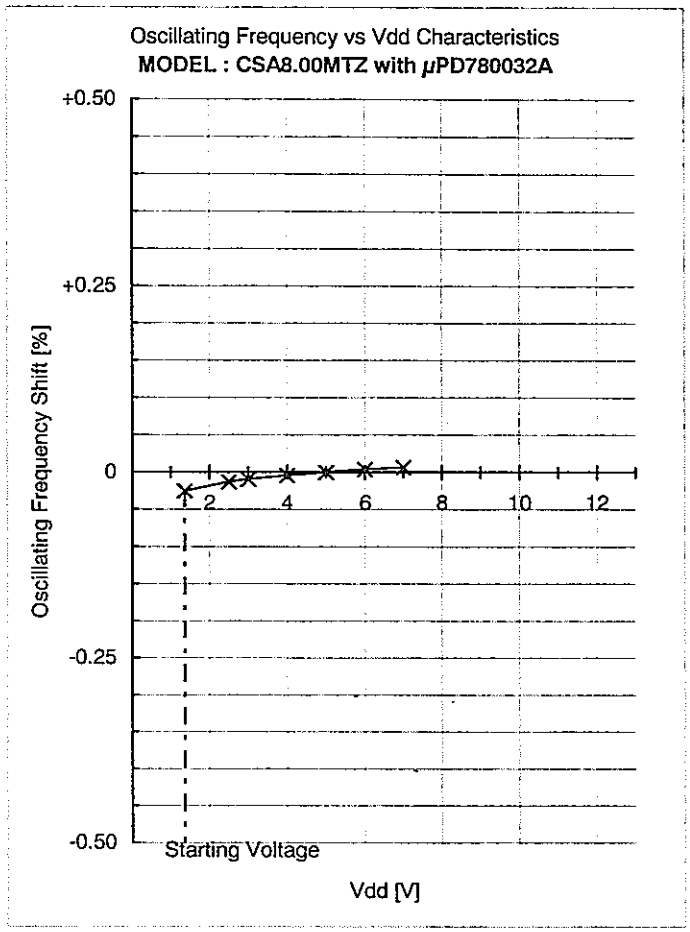
Temperature Characteristics of Oscillating Frequency
**MODEL : CSA8.00MTZ with μPD780032A**

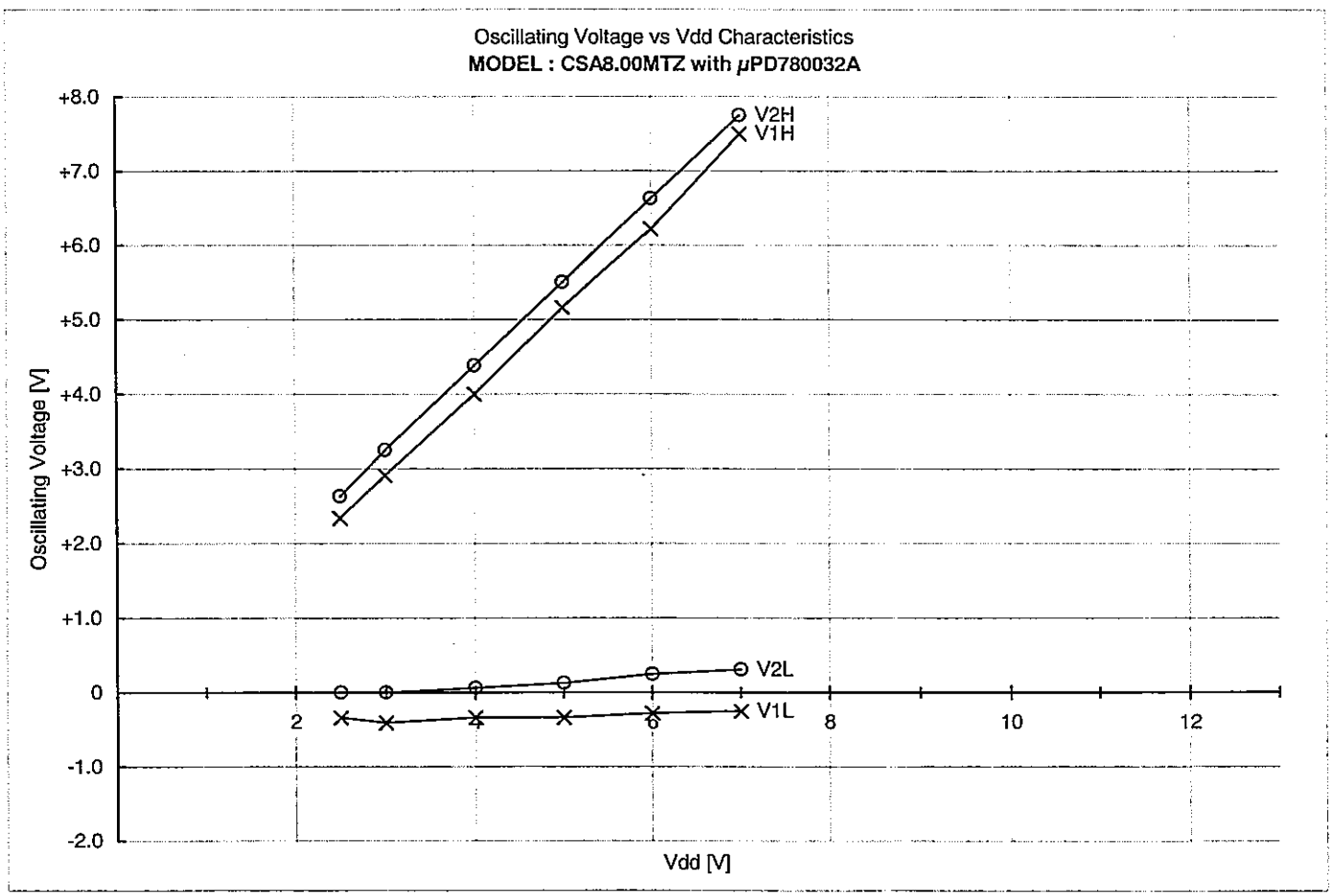


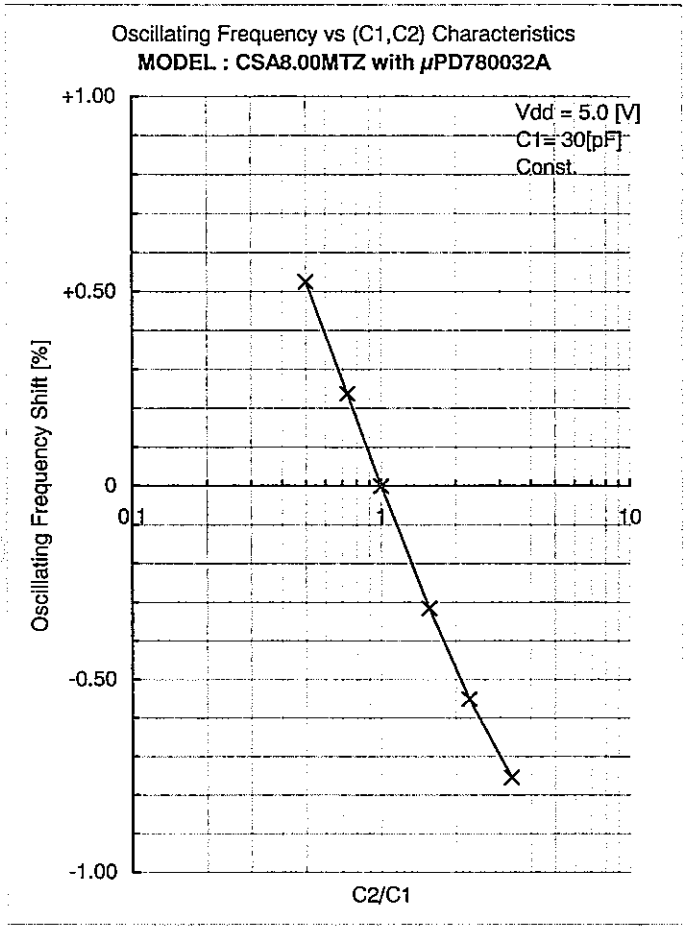

Temperature Characteristics of Oscillating Voltage
**MODEL : CSA8.00MTZ with μPD780032A**

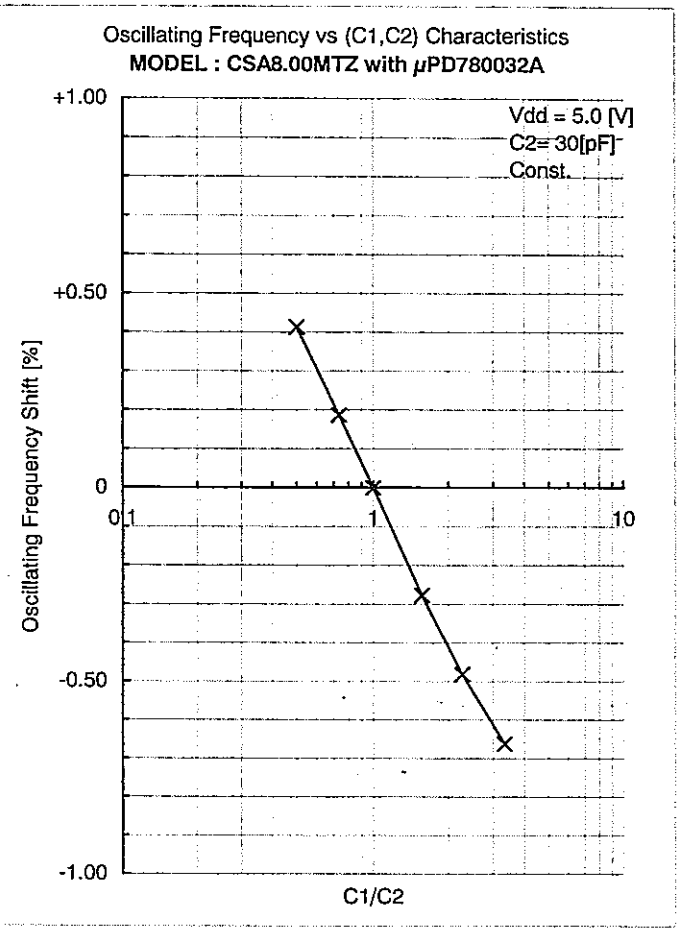


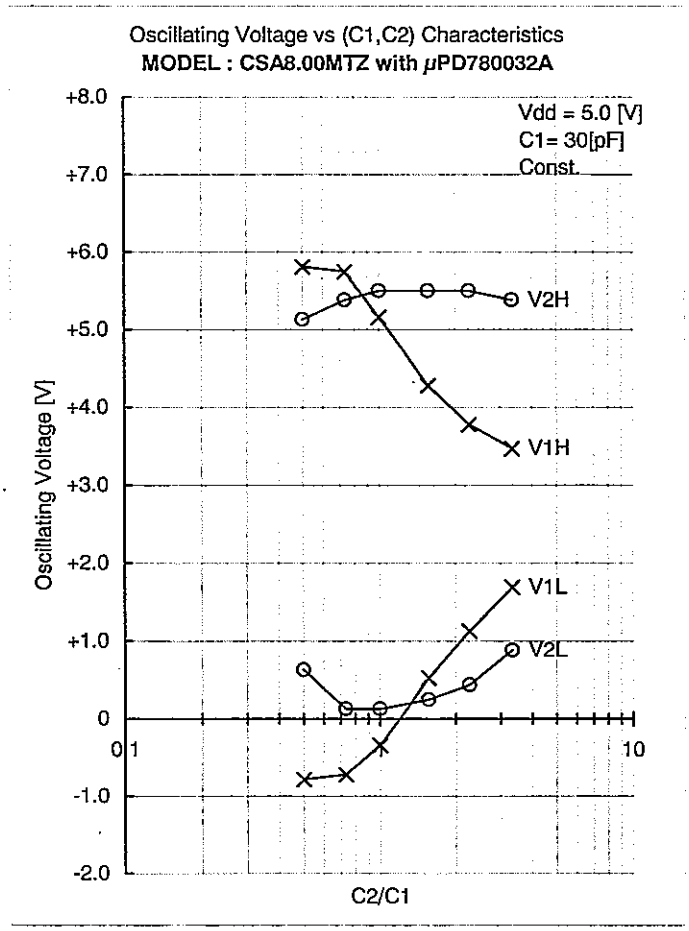

Rise Time vs Vdd Characteristics
MODEL : CSA8.00MTZ with μPD780032A
Rise Time [ms]
0.50
0.25
0
2
4
6
8
10
12
Vdd [V]

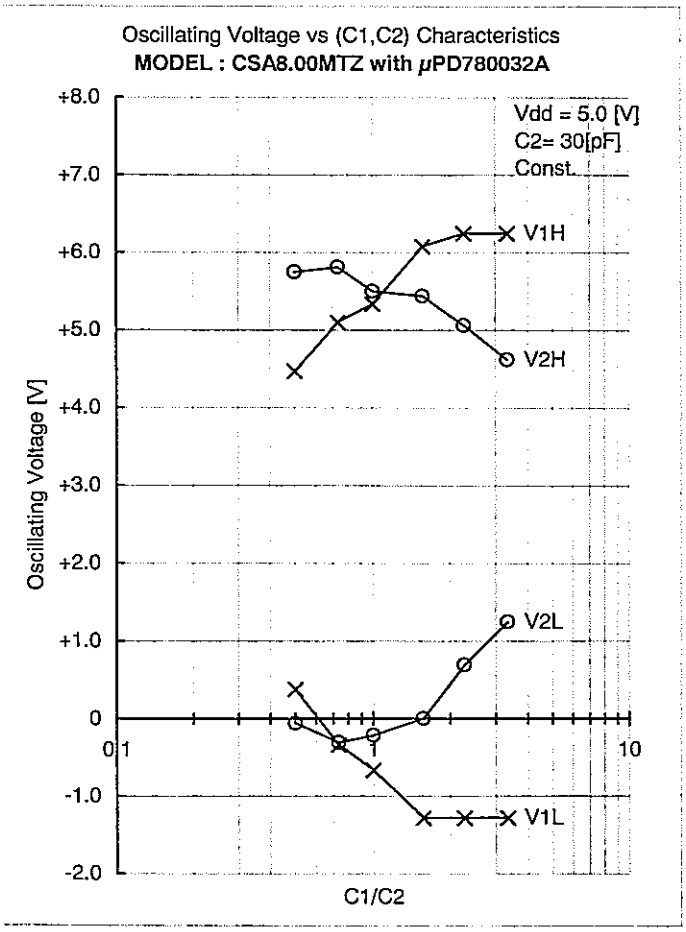

Oscillating Frequency vs Vdd Characteristics
MODEL : CSA8.00MTZ with μPD780032A
Oscillating Frequency Shift [%]
+0.50
+0.25
0
-0.25
-0.50
2
4
6
8
10
12
Starting Voltage
Vdd [V]


Oscillating Voltage vs Vdd Characteristics
MODEL : CSA8.00MTZ 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
4
6
8
10
12
Vdd [V]

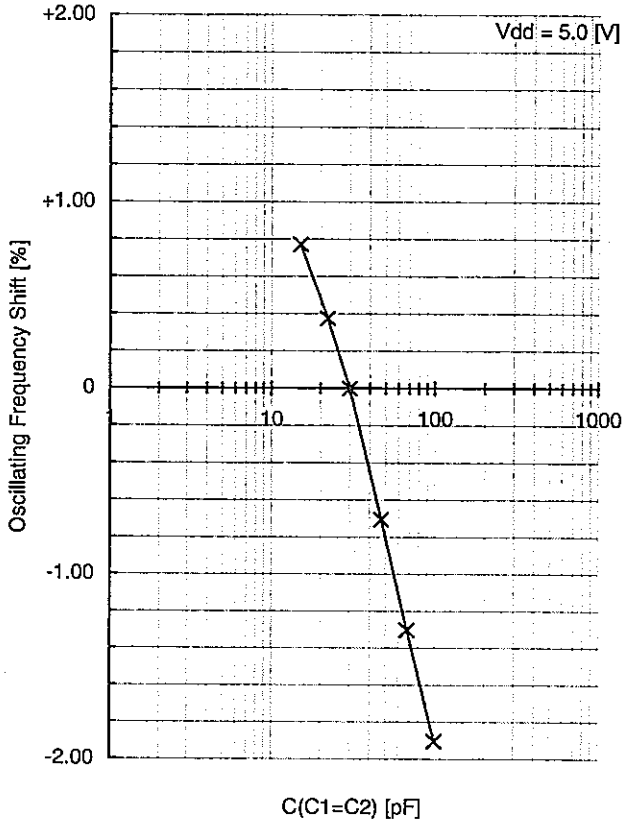

Oscillating Frequency vs (C1,C2) Characteristics
MODEL : CSA8.00MTZ with μPD780032A
Vdd = 5.0 [V]
C1= 30[pF]
Const.
+1.00
+0.50
0
-0.50
-1.00
0.1
1
10
Oscillating Frequency Shift [%]
C2/C1


Oscillating Frequency vs (C1,C2) Characteristics
MODEL : CSA8.00MTZ 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

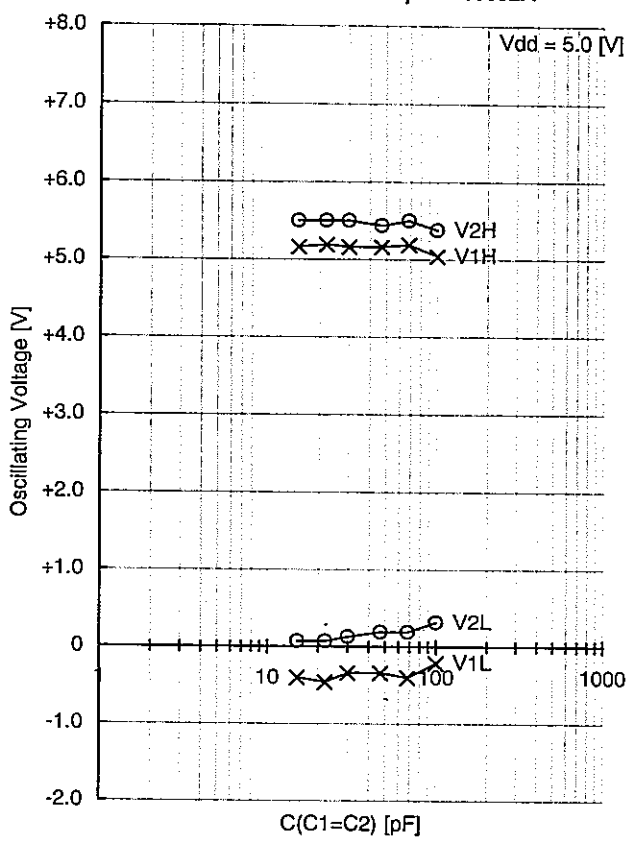

Oscillating Voltage vs (C1,C2) Characteristics
MODEL : CSA8.00MTZ with μPD780032A
Vdd = 5.0 [V]
C1= 30[pF]
Const.
+8.0
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
0
-1.0
-2.0
0.1
1
10
V2H
V1H
V1L
V2L
Oscillating Voltage [V]
C2/C1


Oscillating Voltage vs (C1,C2) Characteristics
MODEL : CSA8.00MTZ 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

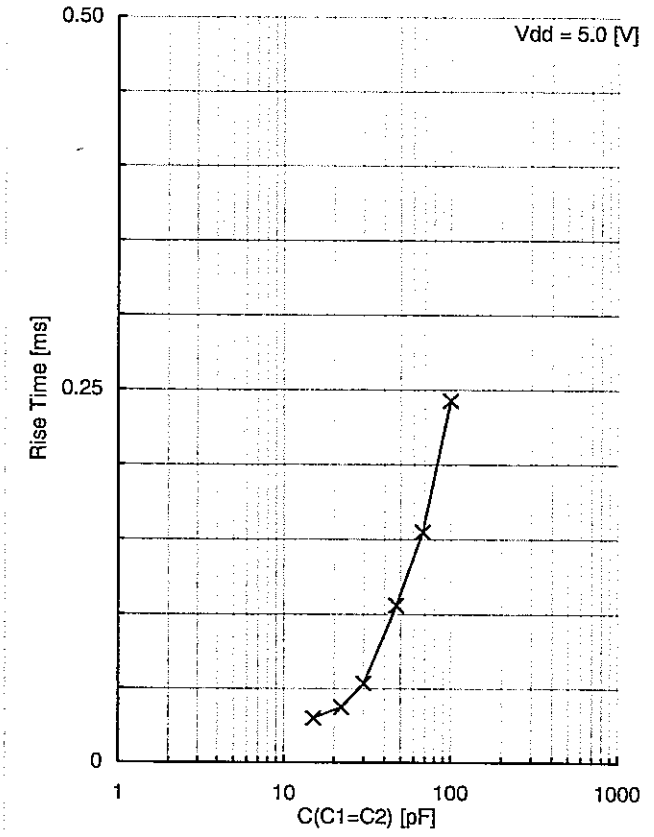
Oscillating Frequency vs C(C1=C2) Characteristics
**MODEL : CSA8.00MTZ with μPD780032A**



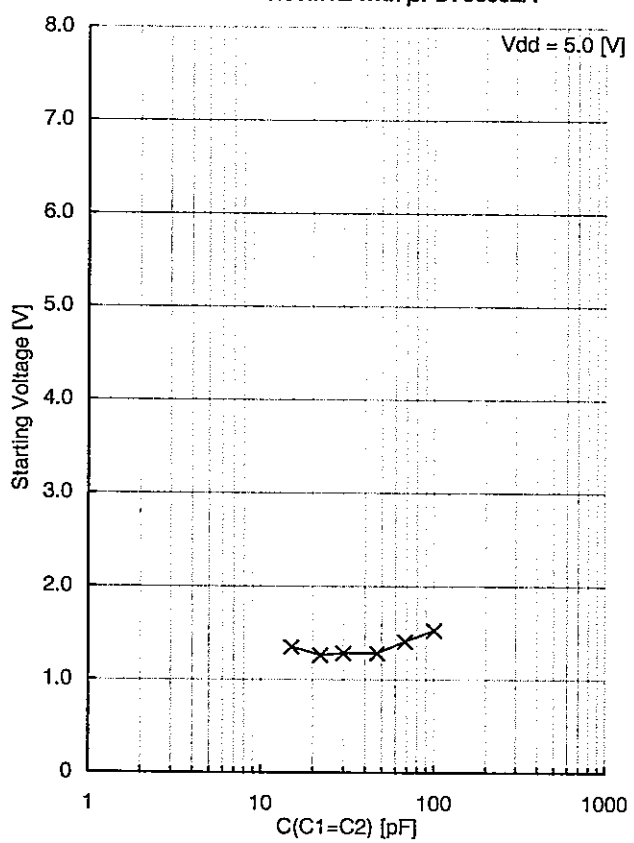

Oscillating Voltage vs C(C1=C2) Characteristics
**MODEL : CSA8.00MTZ with μPD780032A**




Rise Time vs C(C1=C2) Characteristics
**MODEL : CSA8.00MTZ with μPD780032A**




Starting Voltage vs C(C1=C2) Characteristics
**MODEL : CSA8.00MTZ with μPD780032A**



Appendixes

**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 | 5.13 | -0.40 | 5.53 | 5.50 | 0.13 | 5.37 | 8152.114 | 0.048 | 1.35 |
| W05 | 5.16 | -0.34 | 5.50 | 5.50 | 0.19 | 5.31 | 8152.219 | 0.059 | 1.26 |
| W07 | 5.09 | -0.40 | 5.49 | 5.50 | 0.06 | 5.44 | 8152.367 | 0.050 | 1.48 |
| W09 | 5.16 | -0.28 | 5.44 | 5.56 | 0.19 | 5.37 | 8152.315 | 0.064 | 1.24 |
| W15 | 5.16 | -0.34 | 5.50 | 5.50 | 0.13 | 5.37 | 8152.075 | 0.055 | 1.37 |

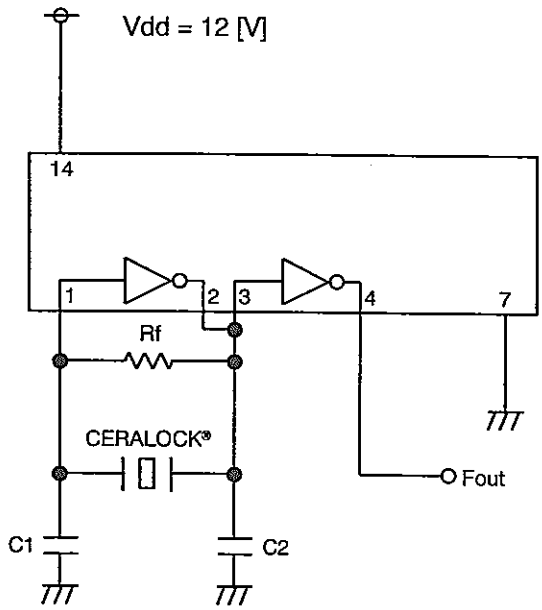
Ref.

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 | 8154.454 | 8120.285 | 0.4208 |
| 2 | 8137.874 | 8105.432 | 0.4003 |
| 3 | 8148.982 | 8116.523 | 0.3999 |
| 4 | 8165.681 | 8133.015 | 0.4016 |
| 5 | 8144.321 | 8111.520 | 0.4044 |
| $\bar{X}$ | 8150.262 | 8117.355 | 0.4054 |

muRata Standard Circuit



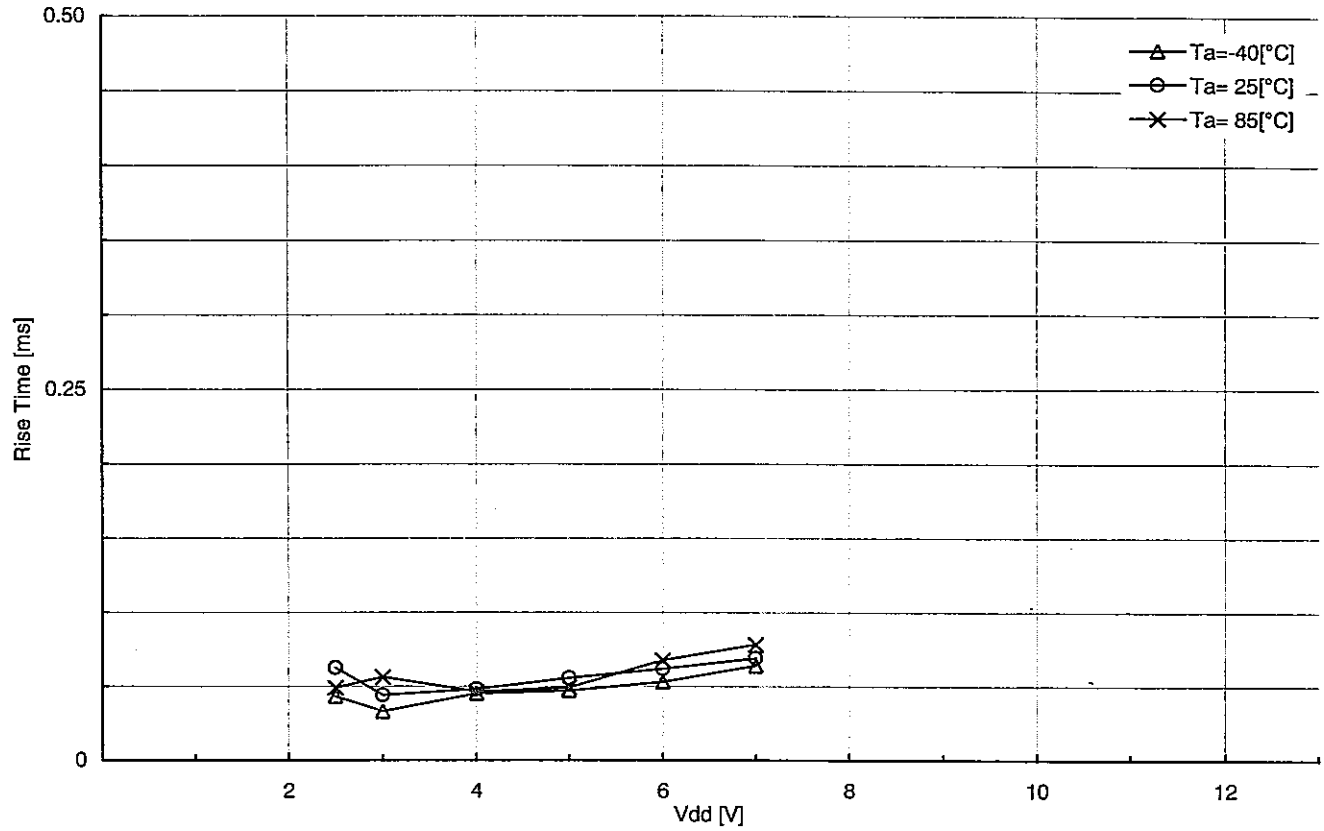

CERALOCK® : CSA8.00MTZ

C1 = 30 [pF]

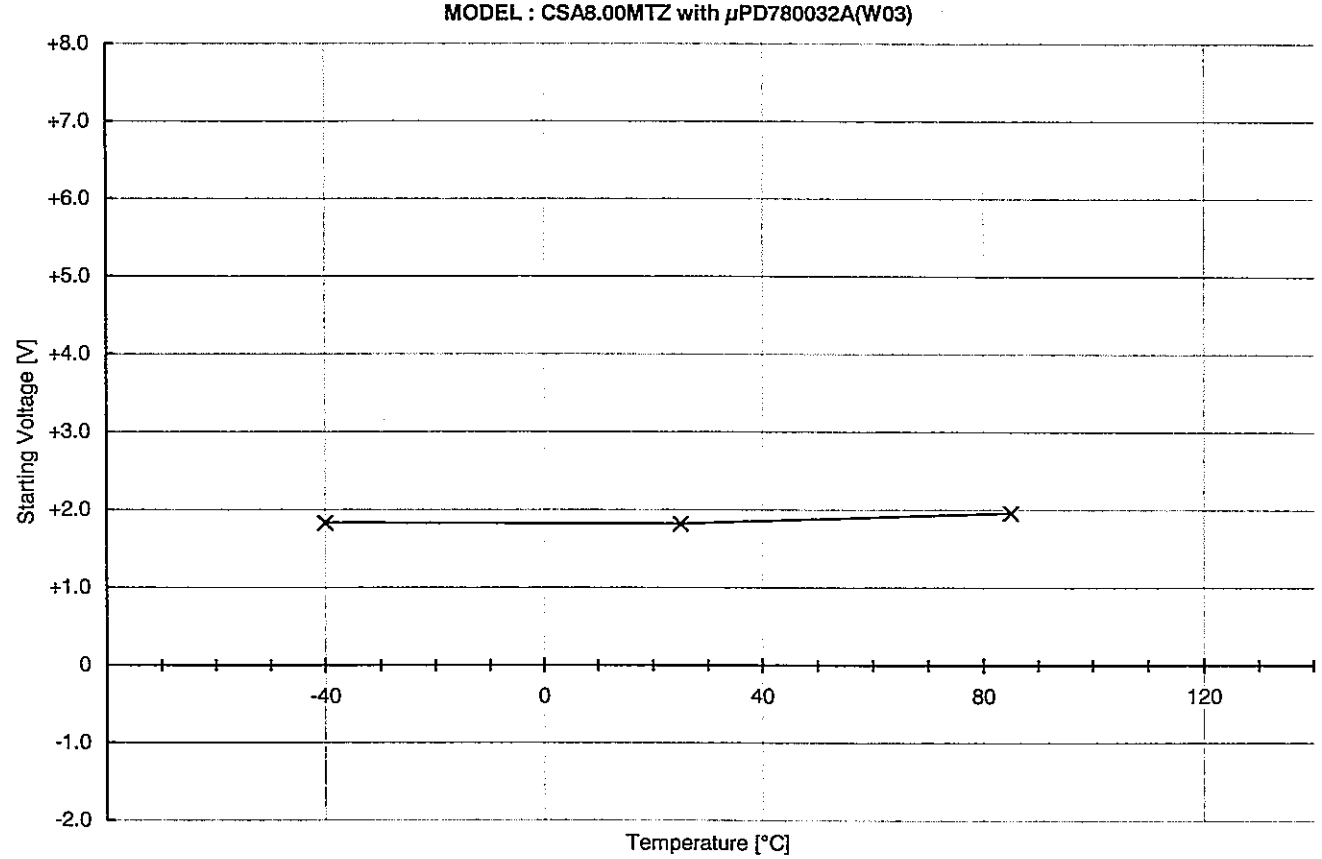
C2 = 30 [pF]

Rf = 1 [Mohm]

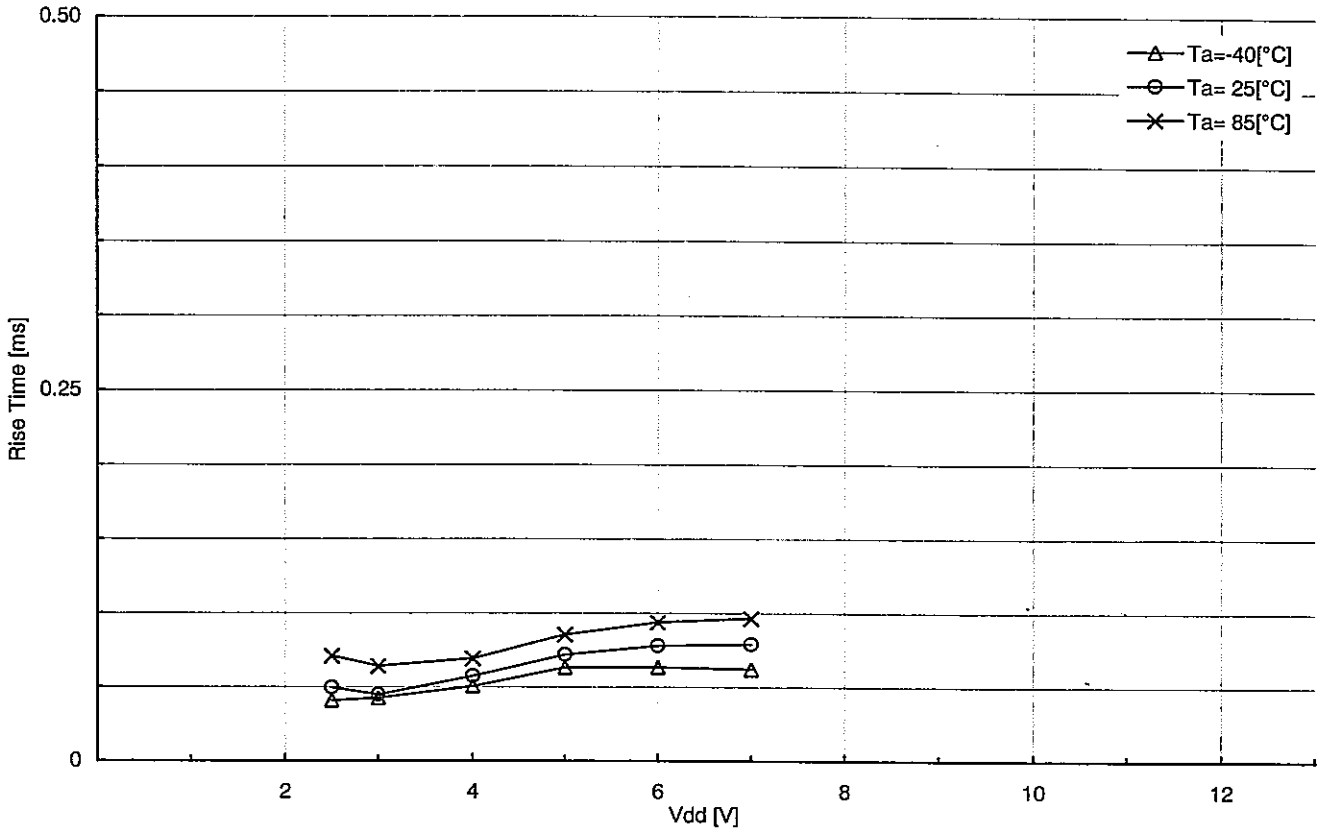
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W03)**



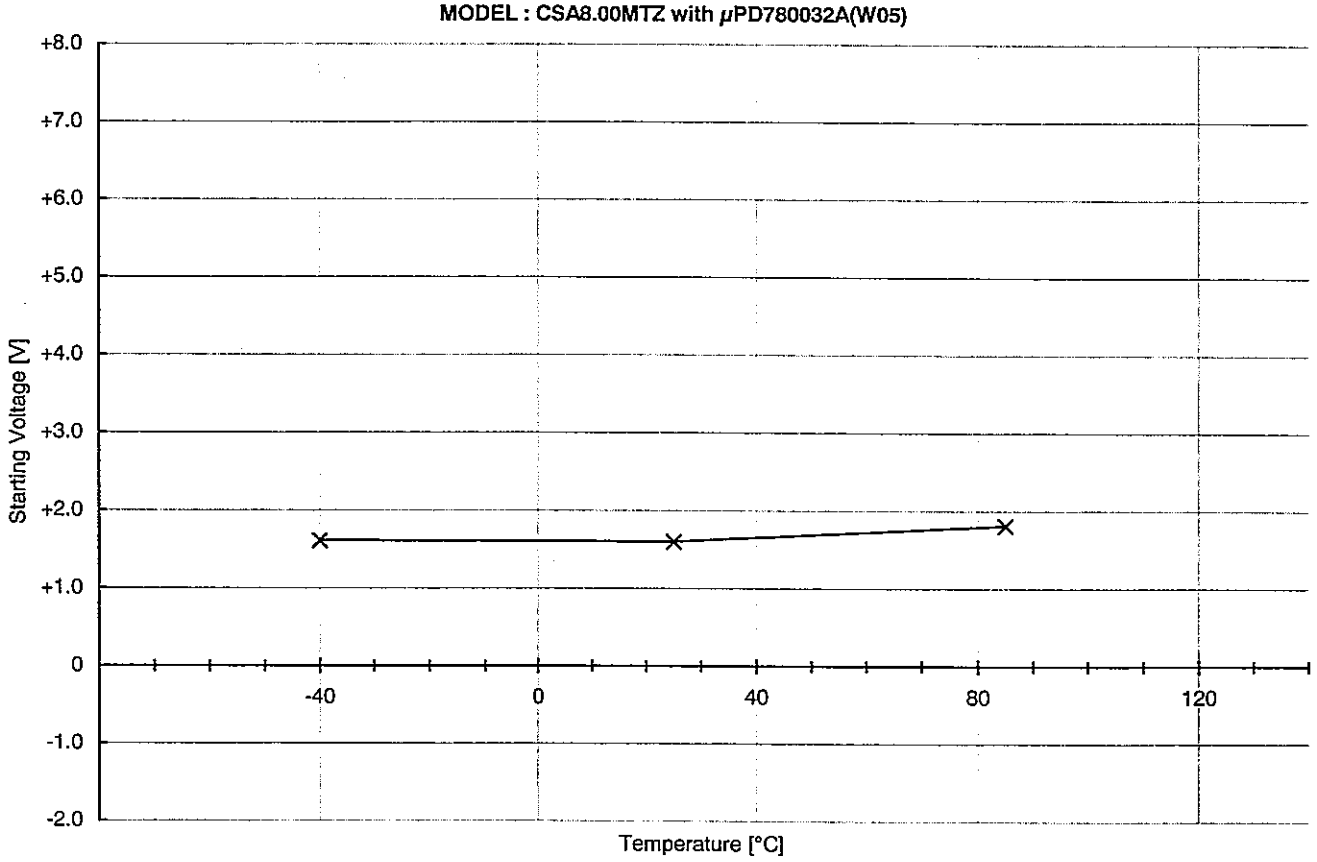

Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W03)**



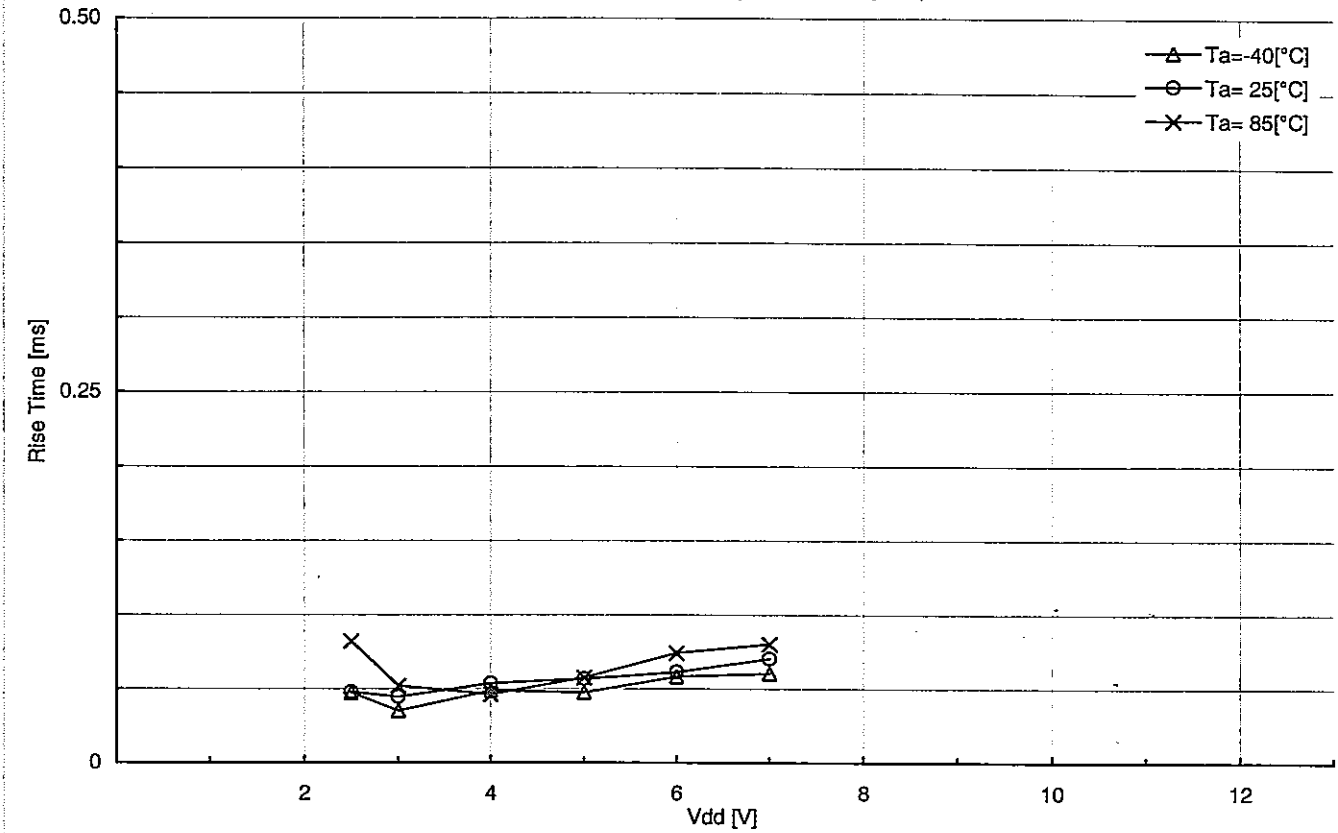
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W05)**



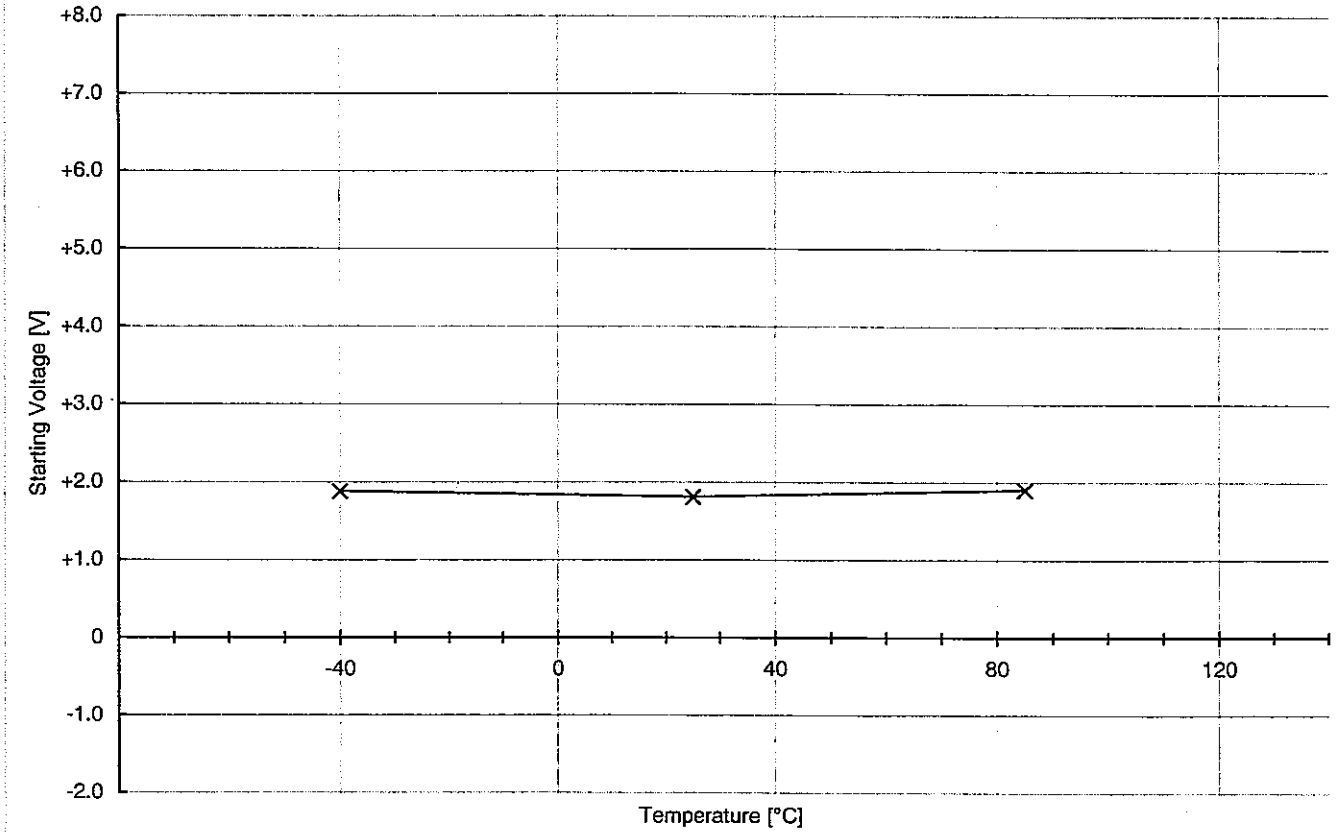

Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W05)**



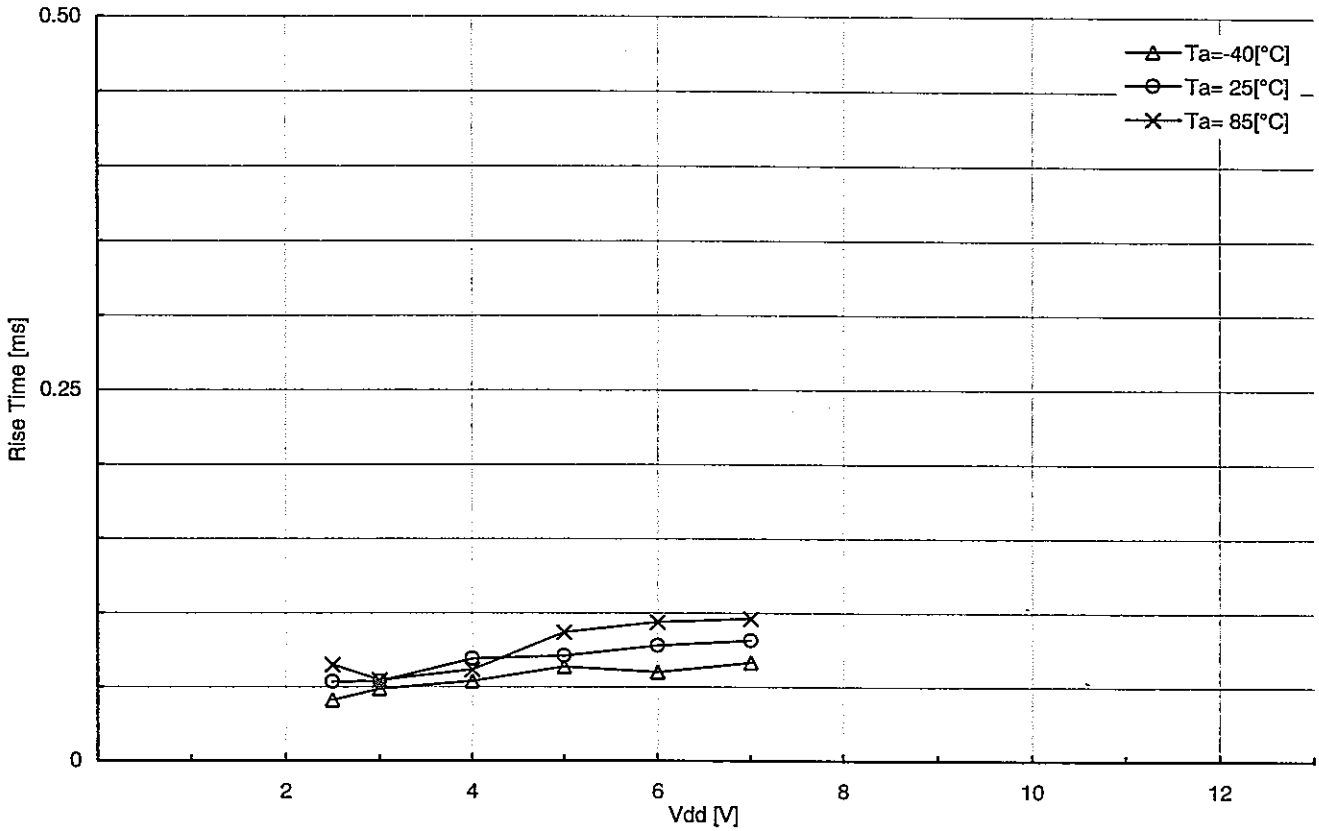
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W07)**



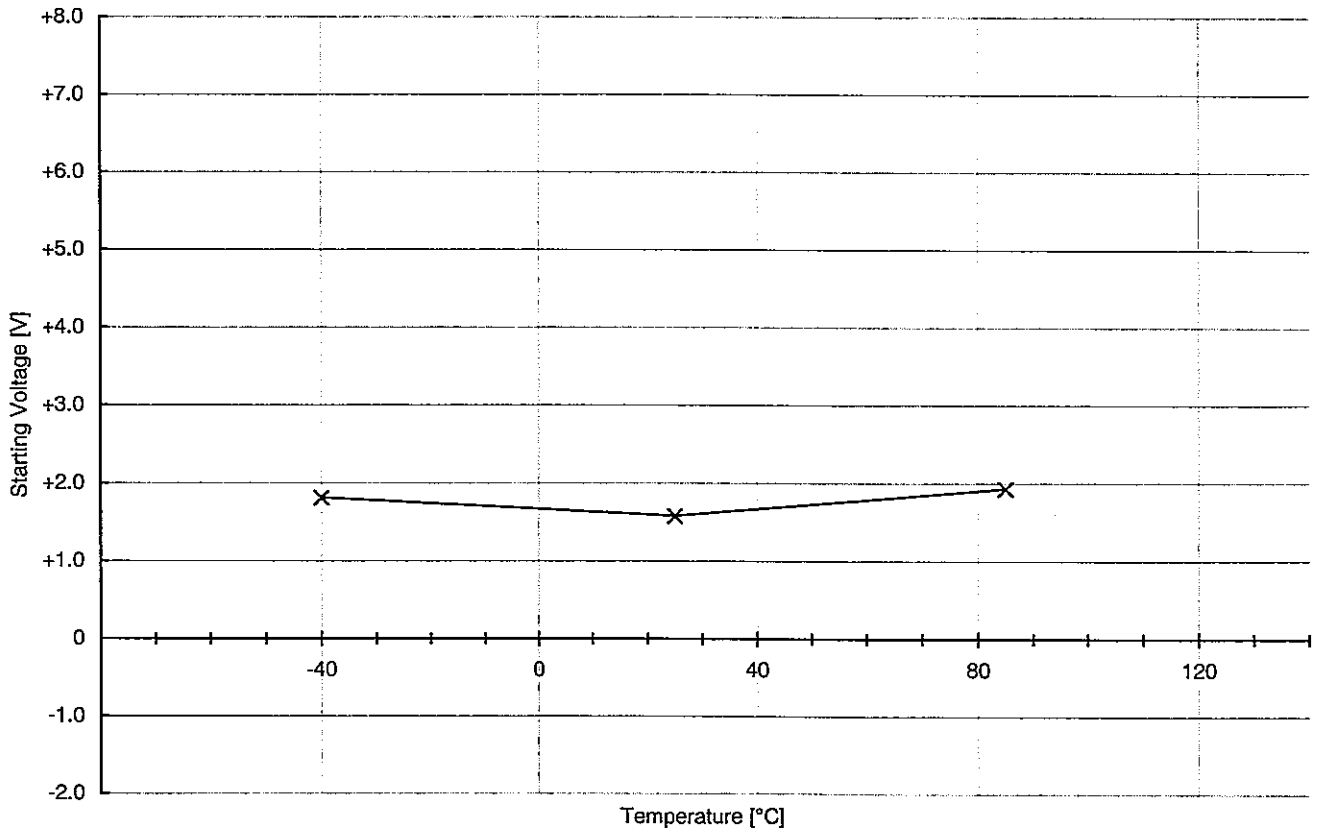

Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W07)**



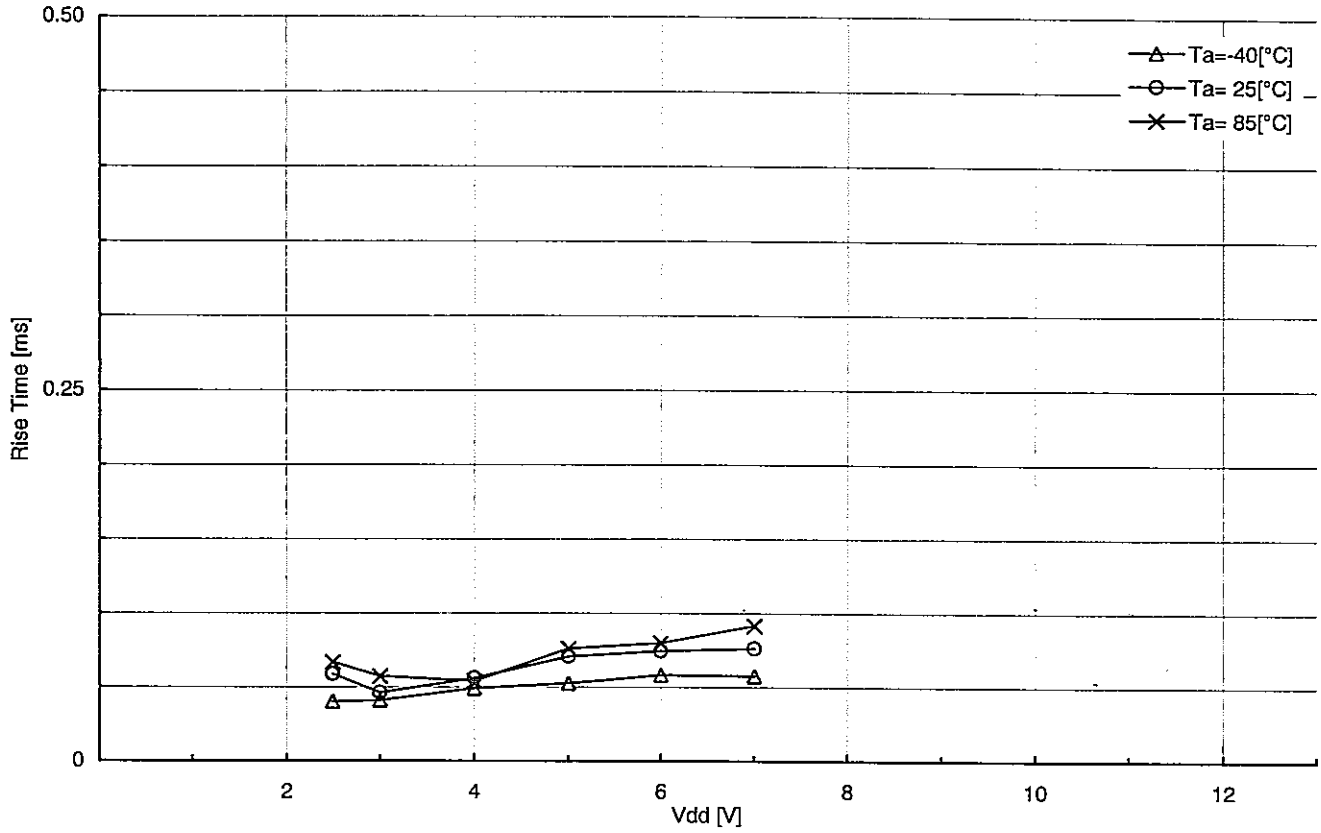
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W09)**



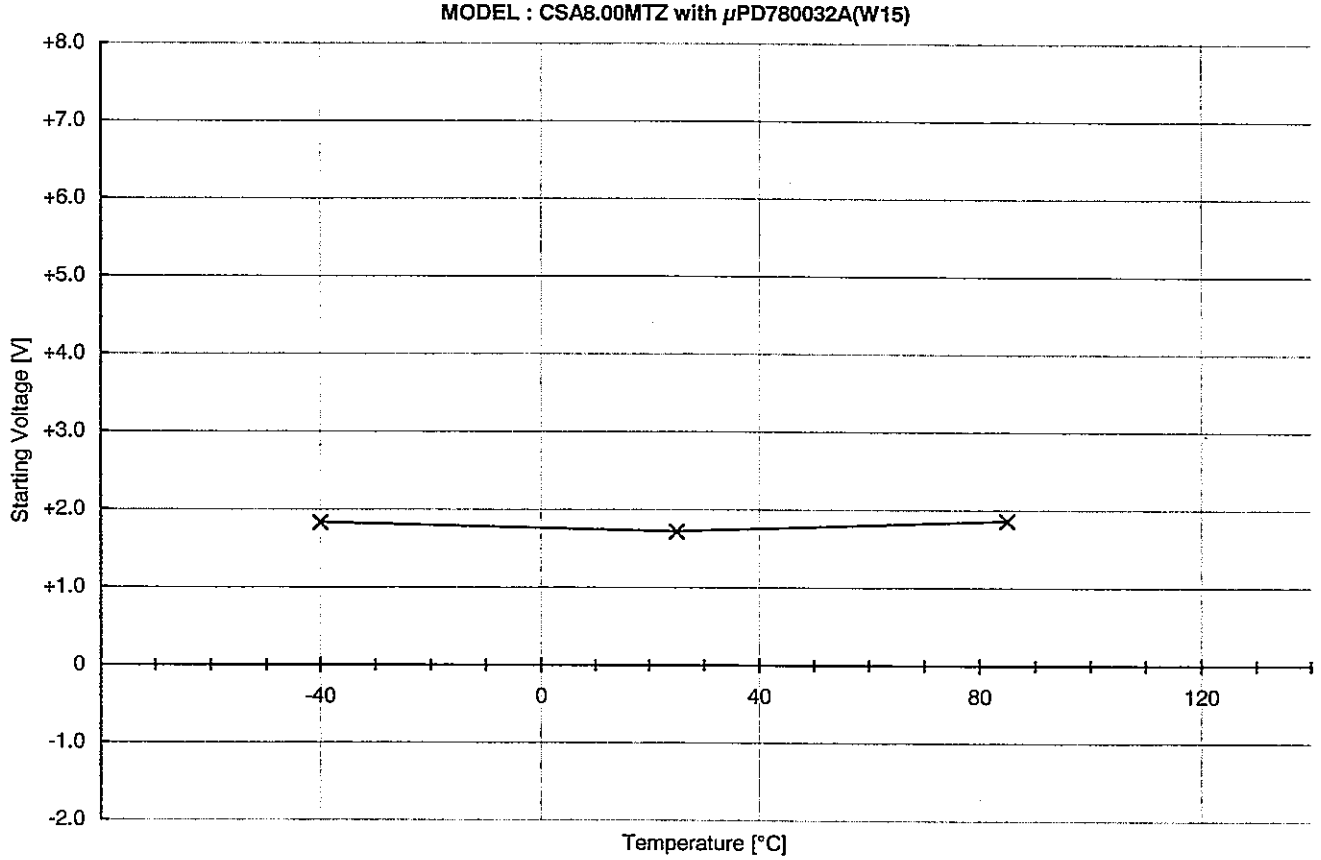

Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W09)**

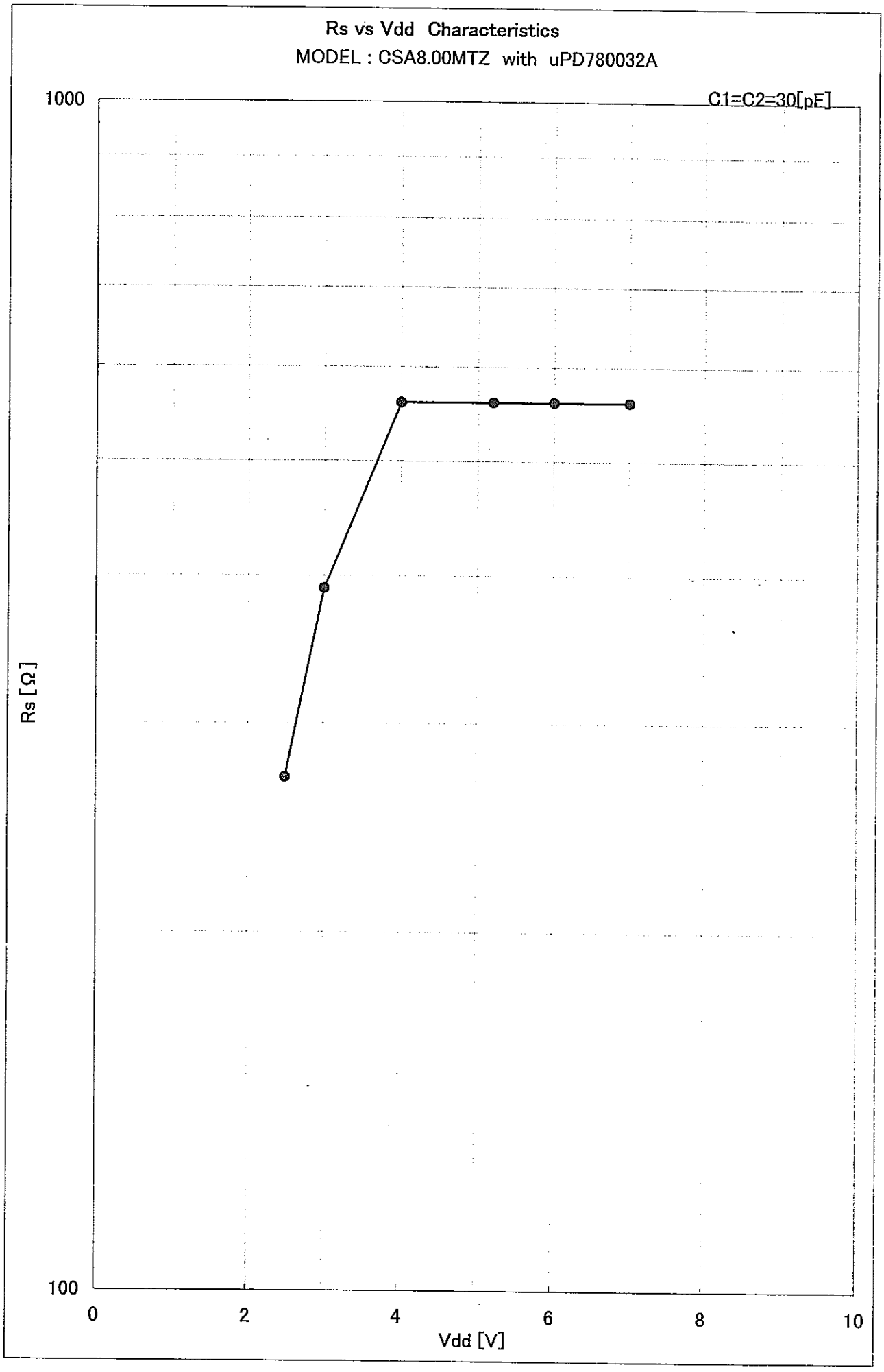


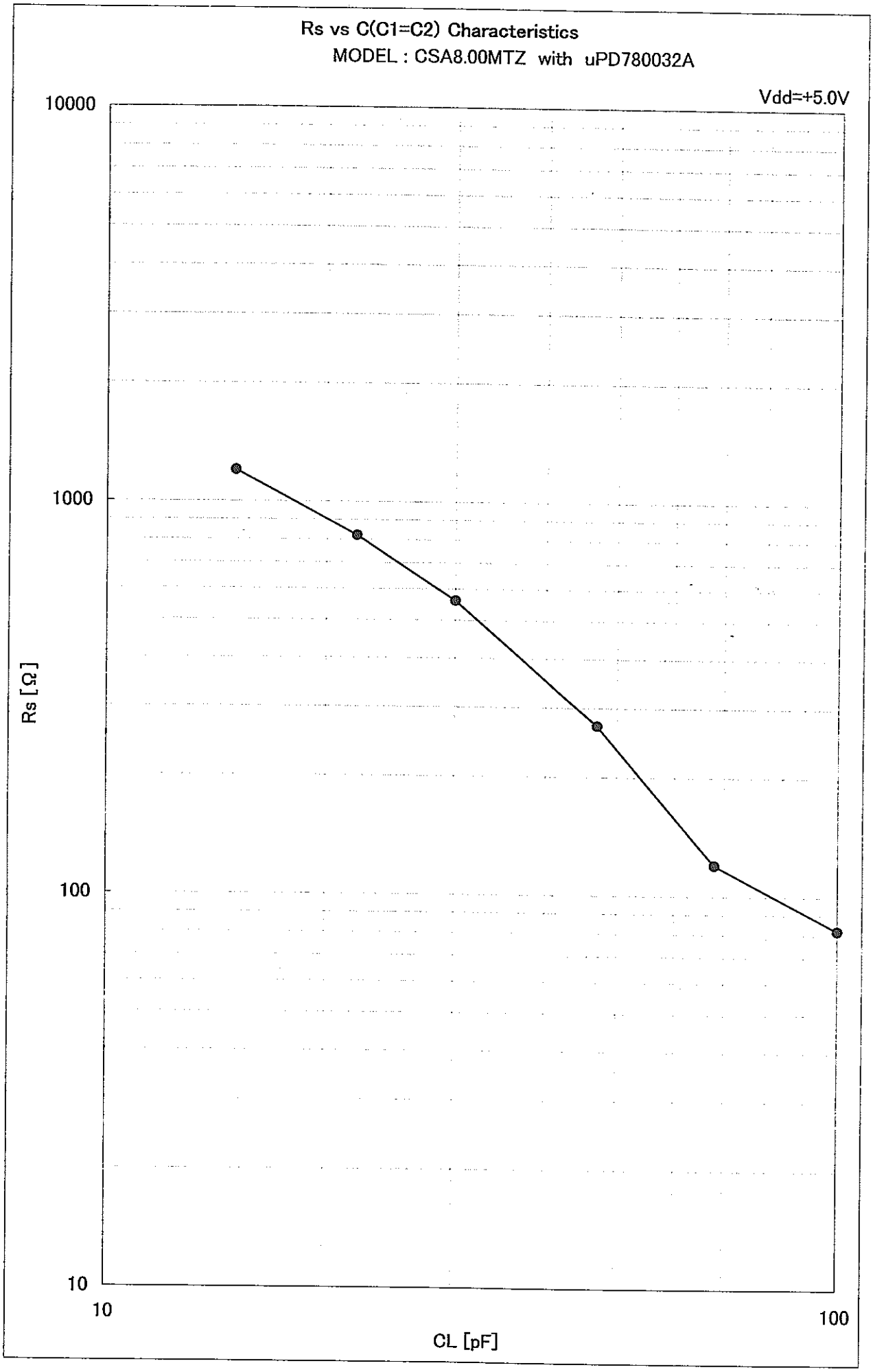
Rise Time vs Vdd Characteristics(Ta : Variable , CERALOCK® : Vst. Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W15)**




Temperature Characteristics of Starting Voltage (CERALOCK® : Vst Worst Sample)
**MODEL : CSA8.00MTZ with μPD780032A(W15)**




Rs vs Vdd Characteristics
MODEL : CSA8.00MTZ with uPD780032A
C1=C2=30[pF]
1000
100
Rs [Ω]
0
2
4
6
8
10
Vdd [V]


Rs vs C(C1=C2) Characteristics
MODEL : CSA8.00MTZ with uPD780032A
Vdd=+5.0V
10000
1000
100
10
Rs [Ω]
10
100
CL [pF]