

Technical Data of Ceramic Resonator

Type CSA2.00MG040

CST2.00MG040

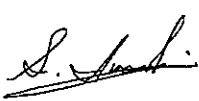
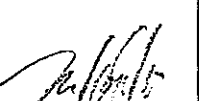
Applied to μ PD780032A

TOYAMA MURATA MANUFACTURING CO., LTD.

Product Engineering Service Section I

Engineering Service Department

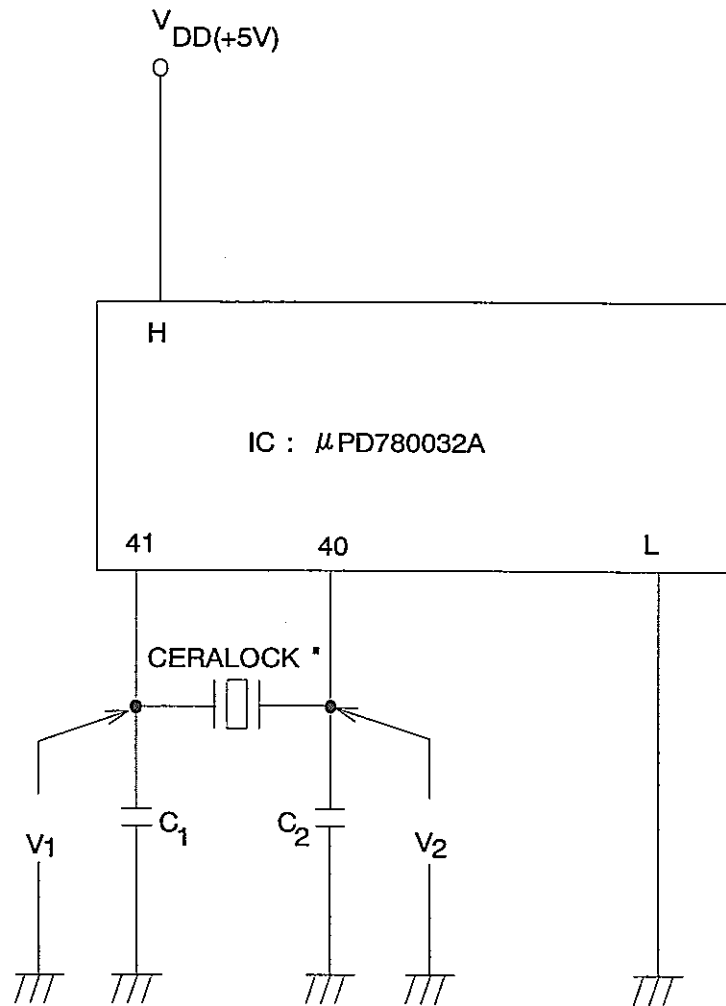
Piezoelectric Components Group

Approved by	Checked by	Checked by	Issued by	Issued Date	TCD No.
 S. Iwasaki	 K. Kuramoto	 M. Kurosaka	 Y. Ishiho	Jan 28, 1999	TCD-99-6A19

Contents

1.	Test Circuit	1
2.	Temperature Characteristics of Oscillating Frequency, Oscillating Voltage	2
3.	Rise Time, Oscillating Frequency, Oscillating Voltage vs Vdd Characteristics	3
4.	Oscillating Frequency, Oscillating Voltage vs (C1,C2) Characteristics	4
5.	Oscillating Frequency, Oscillating Voltage, Rise Time, Oscillating Voltage vs C(C1=C2) Characteristics	5

Test Circuit



H:10,24,35,36,38

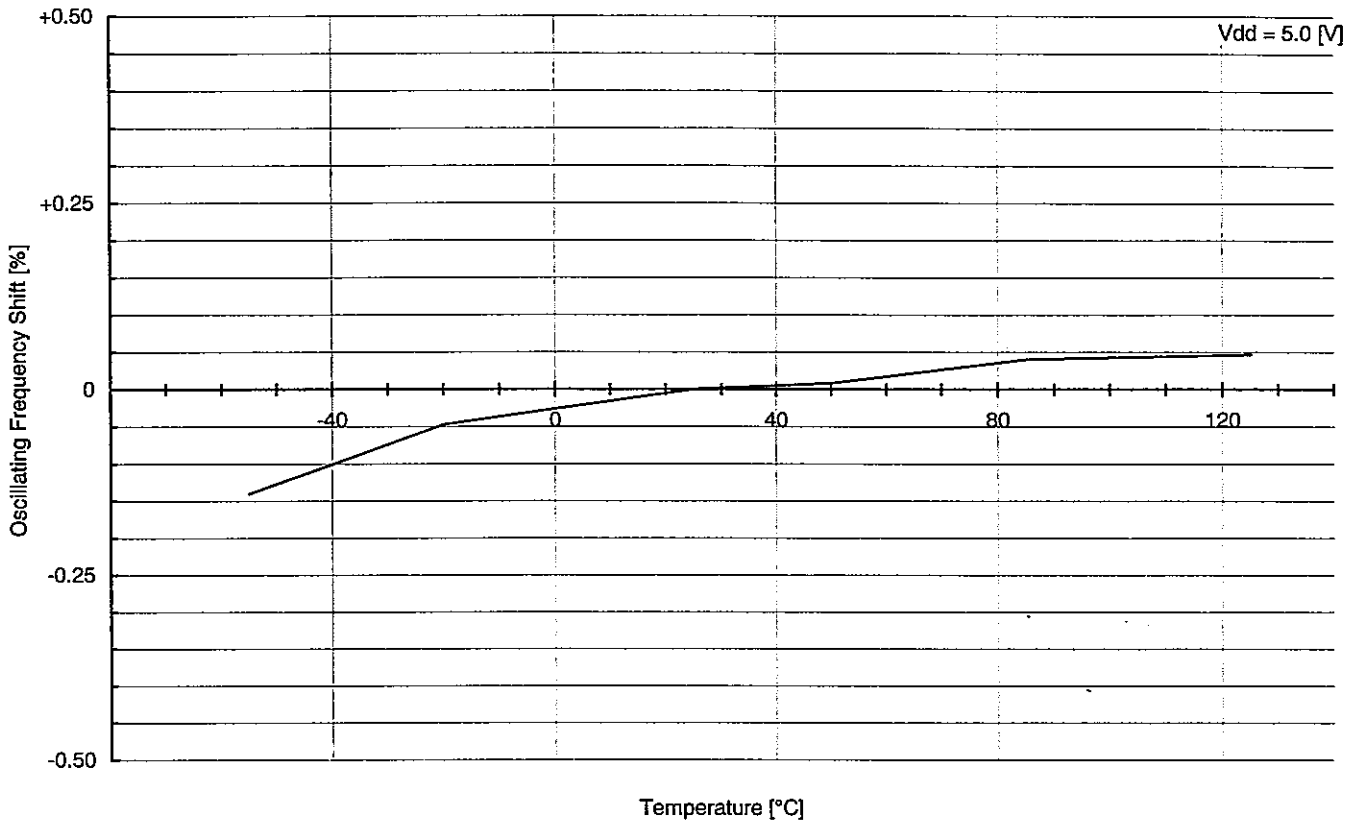
L:9,25 ~34,39,42

Recommendable Value

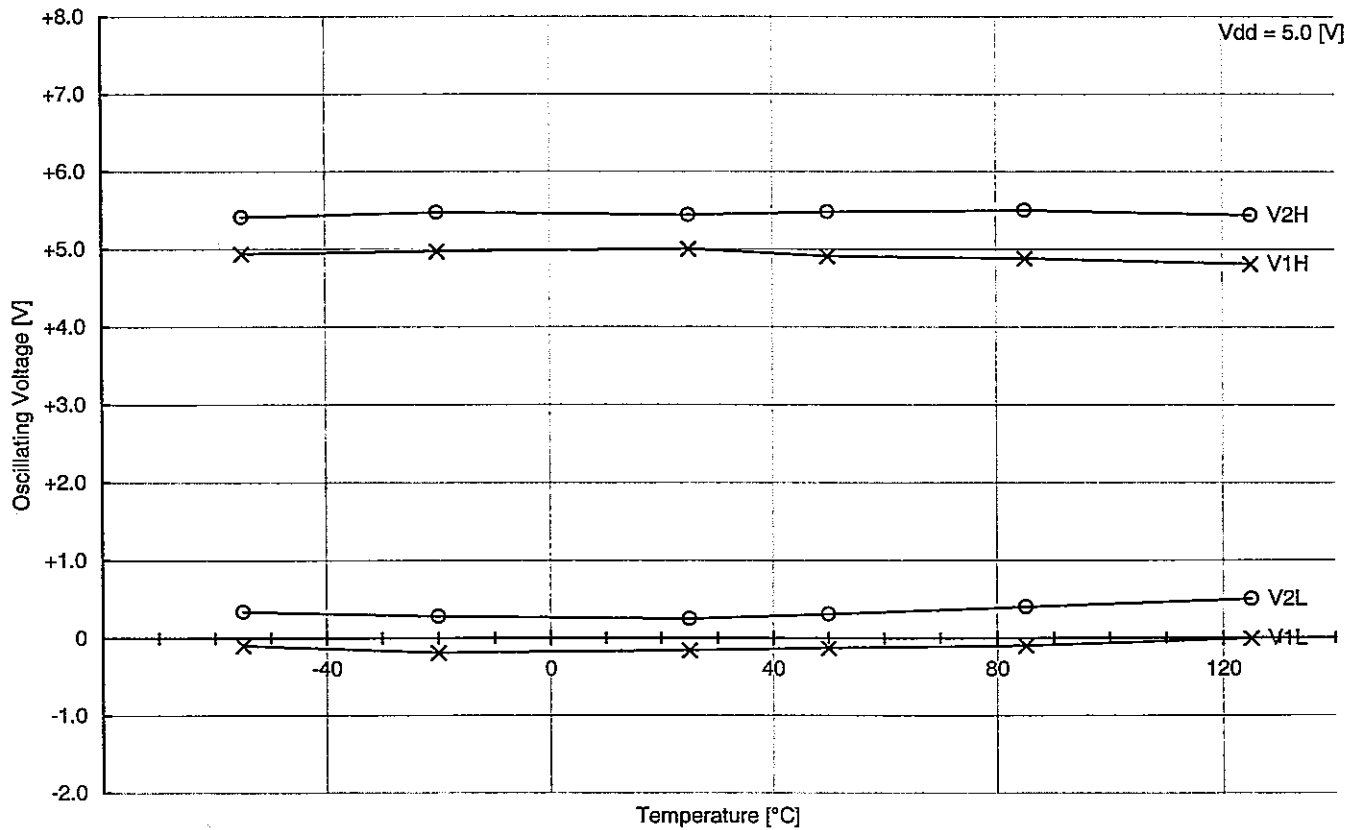
CERALOCK® : CSA2.00MG040

 $C_1 = 100 \text{ [pF]}$ $C_2 = 100 \text{ [pF]}$

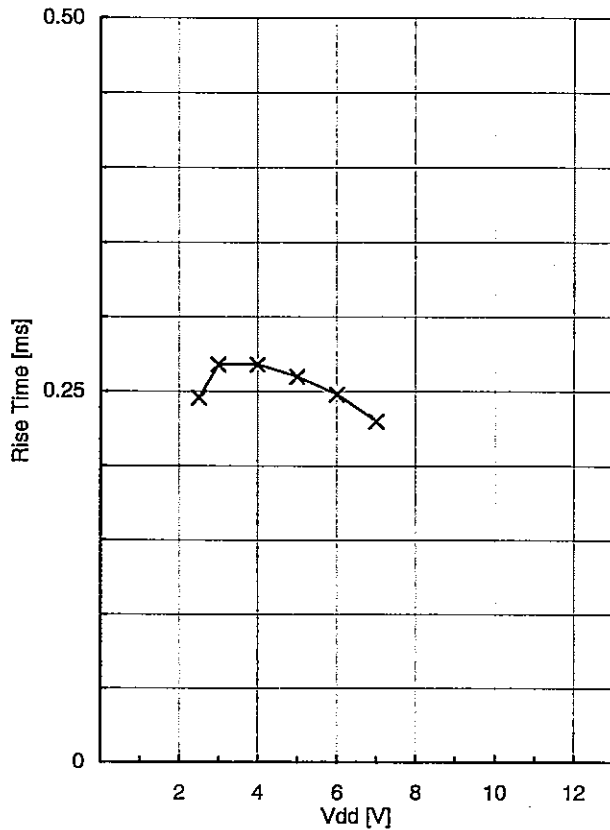
Temperature Characteristics of Oscillating Frequency
MODEL : CSA2.00MG040 with μ PD780032A



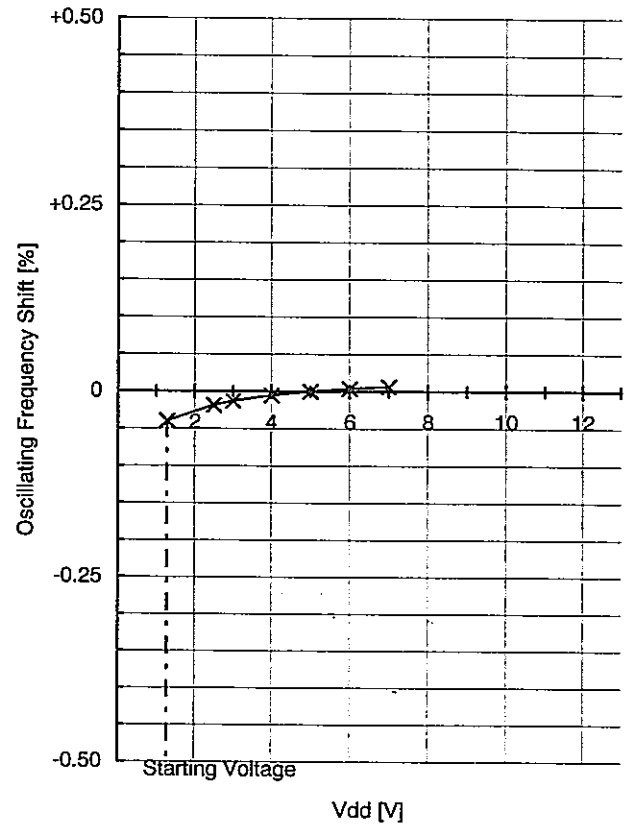
Temperature Characteristics of Oscillating Voltage
MODEL : CSA2.00MG040 with μ PD780032A



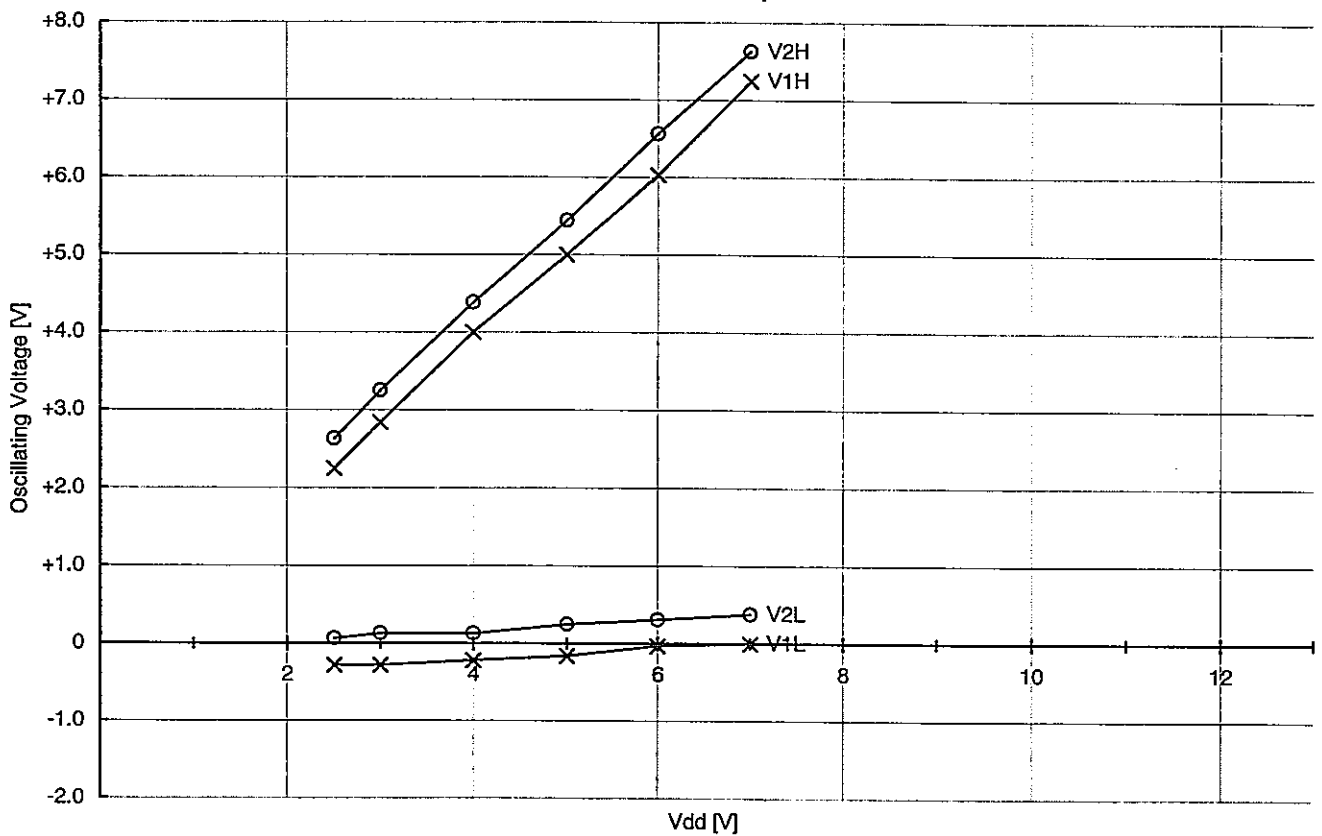
Rise Time vs Vdd Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



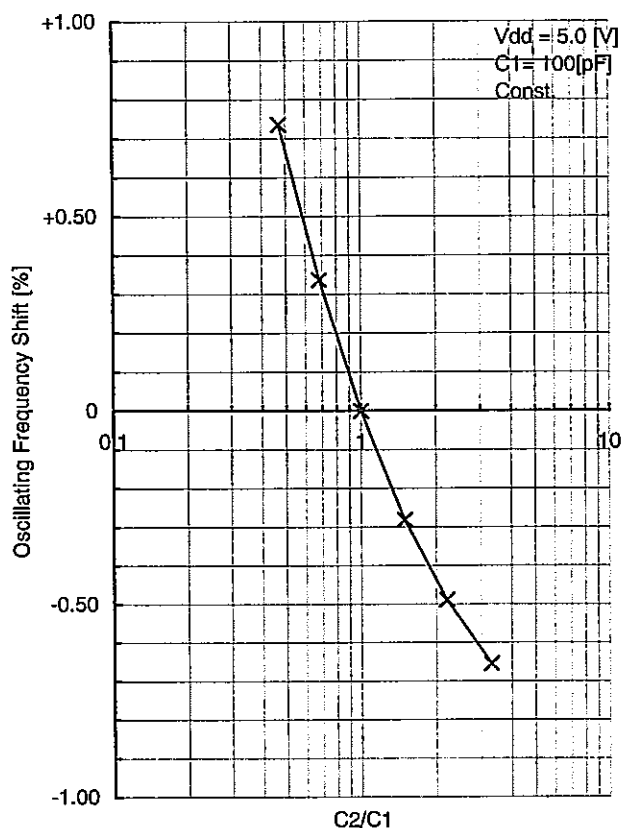
Oscillating Frequency vs Vdd Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



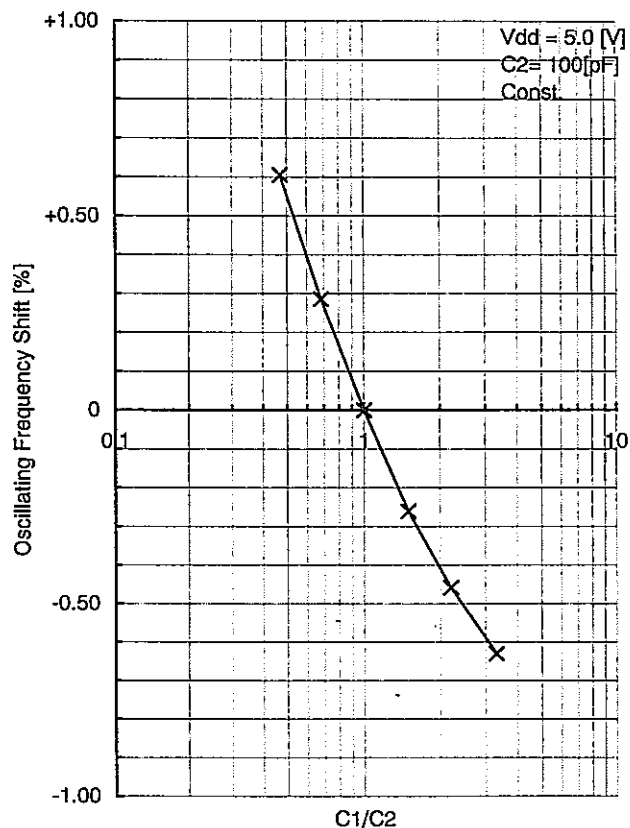
Oscillating Voltage vs Vdd Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



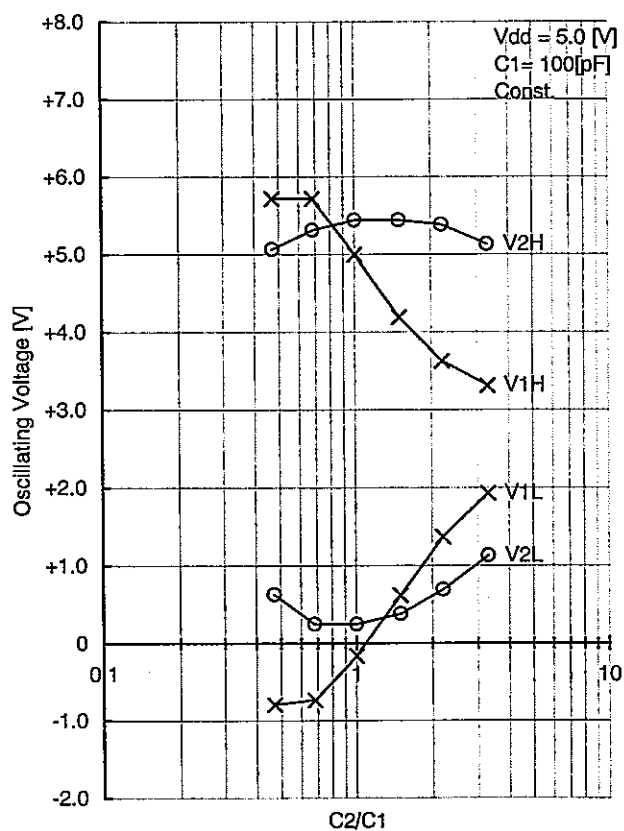
Oscillating Frequency vs (C1,C2) Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



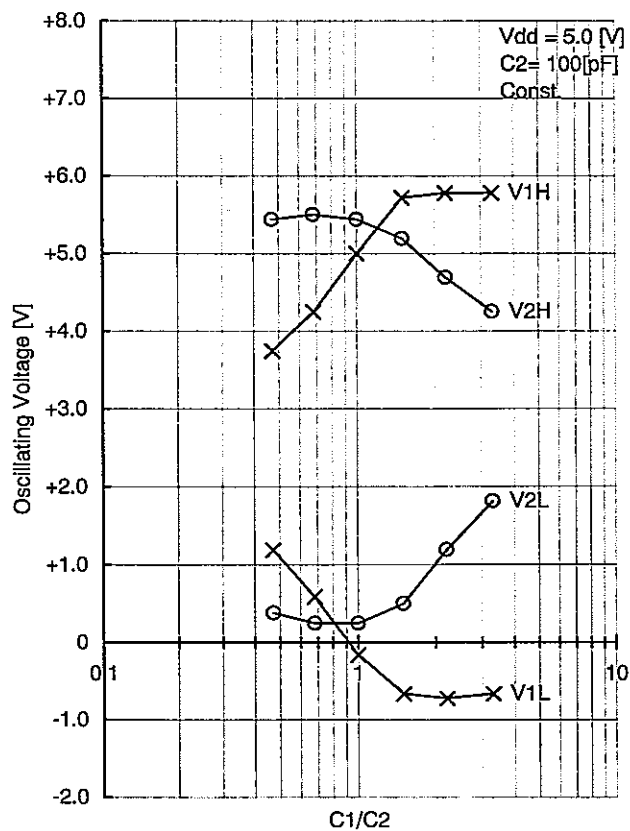
Oscillating Frequency vs (C1,C2) Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



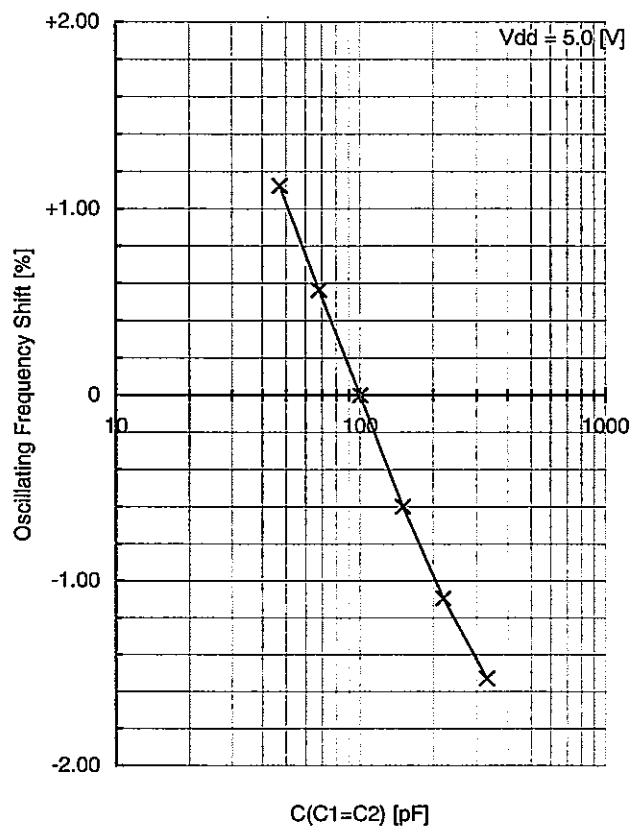
Oscillating Voltage vs (C1,C2) Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



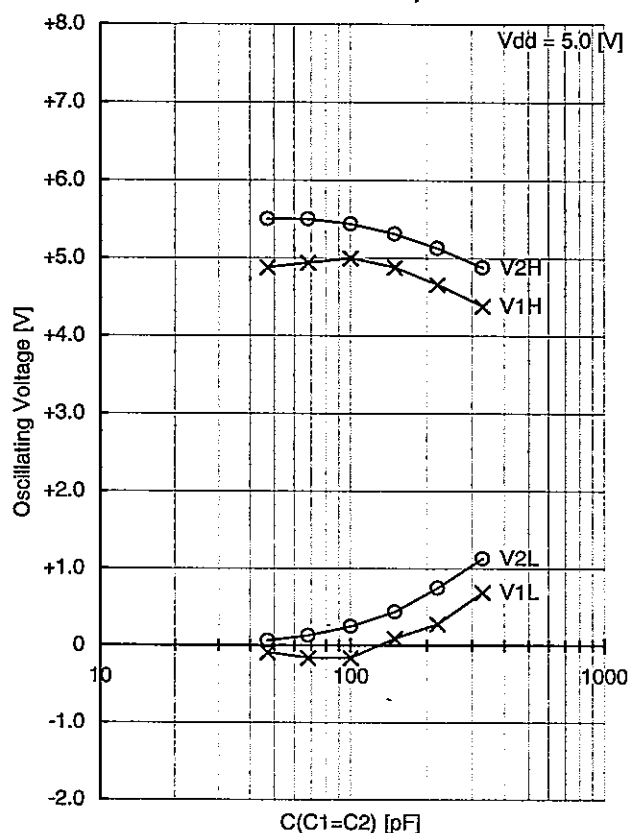
Oscillating Voltage vs (C1,C2) Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



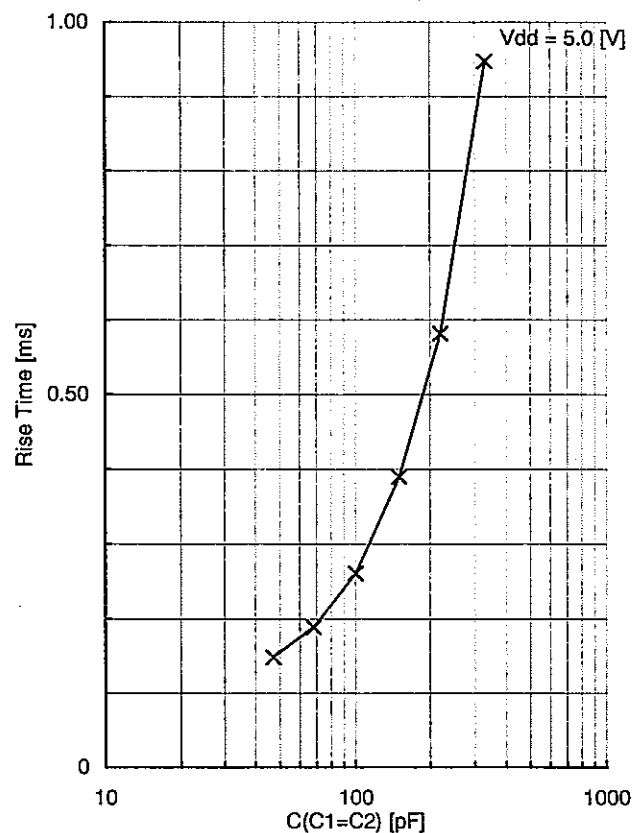
Oscillating Frequency vs C(C1=C2) Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



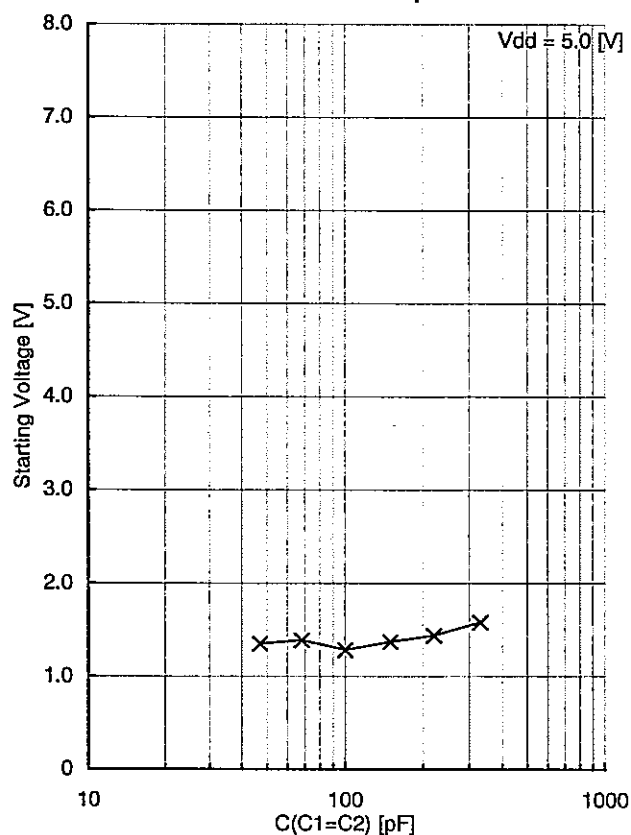
Oscillating Voltage vs C(C1=C2) Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



Rise Time vs C(C1=C2) Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



Starting Voltage vs C(C1=C2) Characteristics
MODEL : CSA2.00MG040 with μ PD780032A



Appendixes

6.	Comparison Table	6
7.	Frequency Correlation Data	7
8.	Rise Time vs Vdd Characteristics (Ta;Variable), Temperature Characteristics of Starting Voltage IC : W03	8
9.	Rise Time vs Vdd Characteristics (Ta;Variable), Temperature Characteristics of Starting Voltage IC : W05	9
10.	Rise Time vs Vdd Characteristics (Ta;Variable), Temperature Characteristics of Starting Voltage IC : W07	10
11.	Rise Time vs Vdd Characteristics (Ta;Variable), Temperature Characteristics of Starting Voltage IC : W09	11
12.	Rise Time vs Vdd Characteristics (Ta;Variable), Temperature Characteristics of Starting Voltage IC : W15	12
13.	Rs vs Vdd Characteritics	13
14.	Rs vs C(C1=C2) Characteritics	14

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	-0.29	5.26	5.38	0.19	5.19	2002.406	0.254	1.55
W05	5.06	-0.10	5.16	5.44	0.25	5.19	2002.426	0.272	1.17
W07	4.97	-0.29	5.26	5.38	0.19	5.19	2002.448	0.252	1.55
W09	5.06	-0.10	5.16	5.44	0.25	5.19	2002.433	0.274	1.30
W15	5.00	-0.16	5.16	5.44	0.25	5.19	2002.387	0.260	1.29

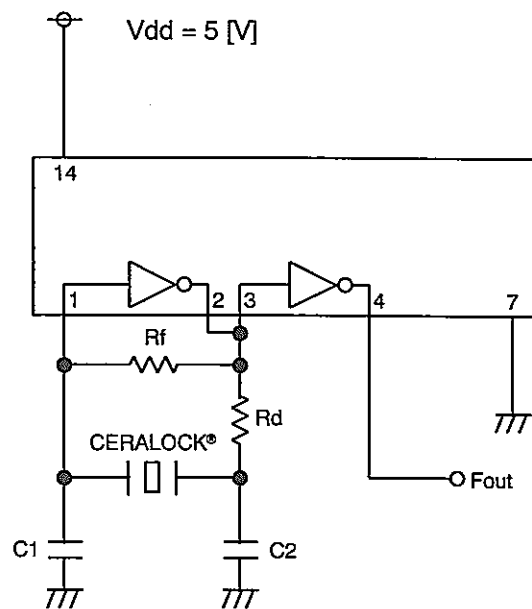
Ref.

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

Frequency Correlation Data

Sample No.	μ PD780032A Fosc [kHz]	TC74HCU04 Fosc [kHz]	Shift [%]
1	2002.410	2002.911	-0.0250
2	2003.649	2004.108	-0.0229
3	2003.075	2003.494	-0.0209
4	2002.734	2003.243	-0.0254
5	2002.465	2002.871	-0.0202
$\bar{X}$	2002.867	2003.325	-0.0229

muRata Standard Circuit



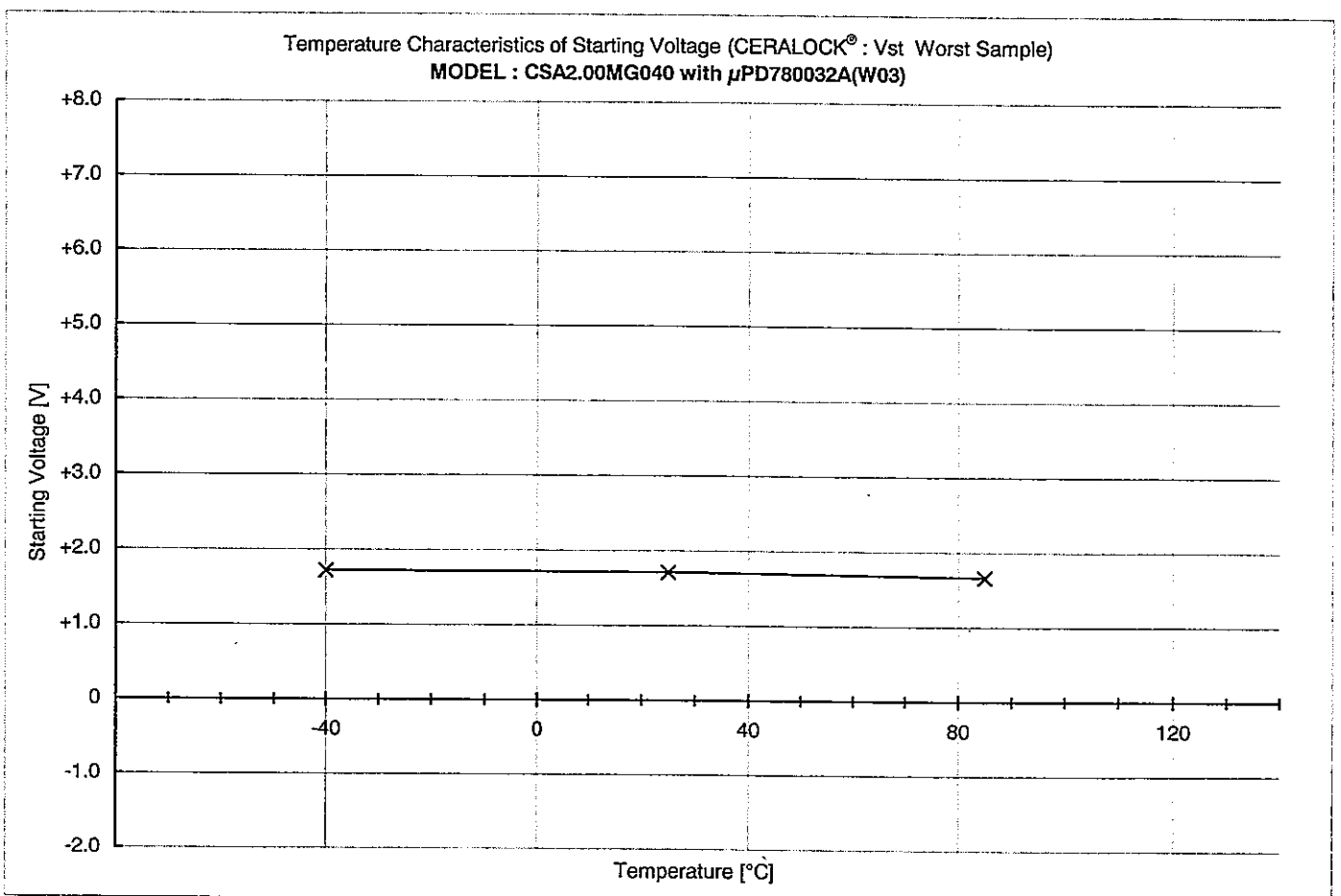
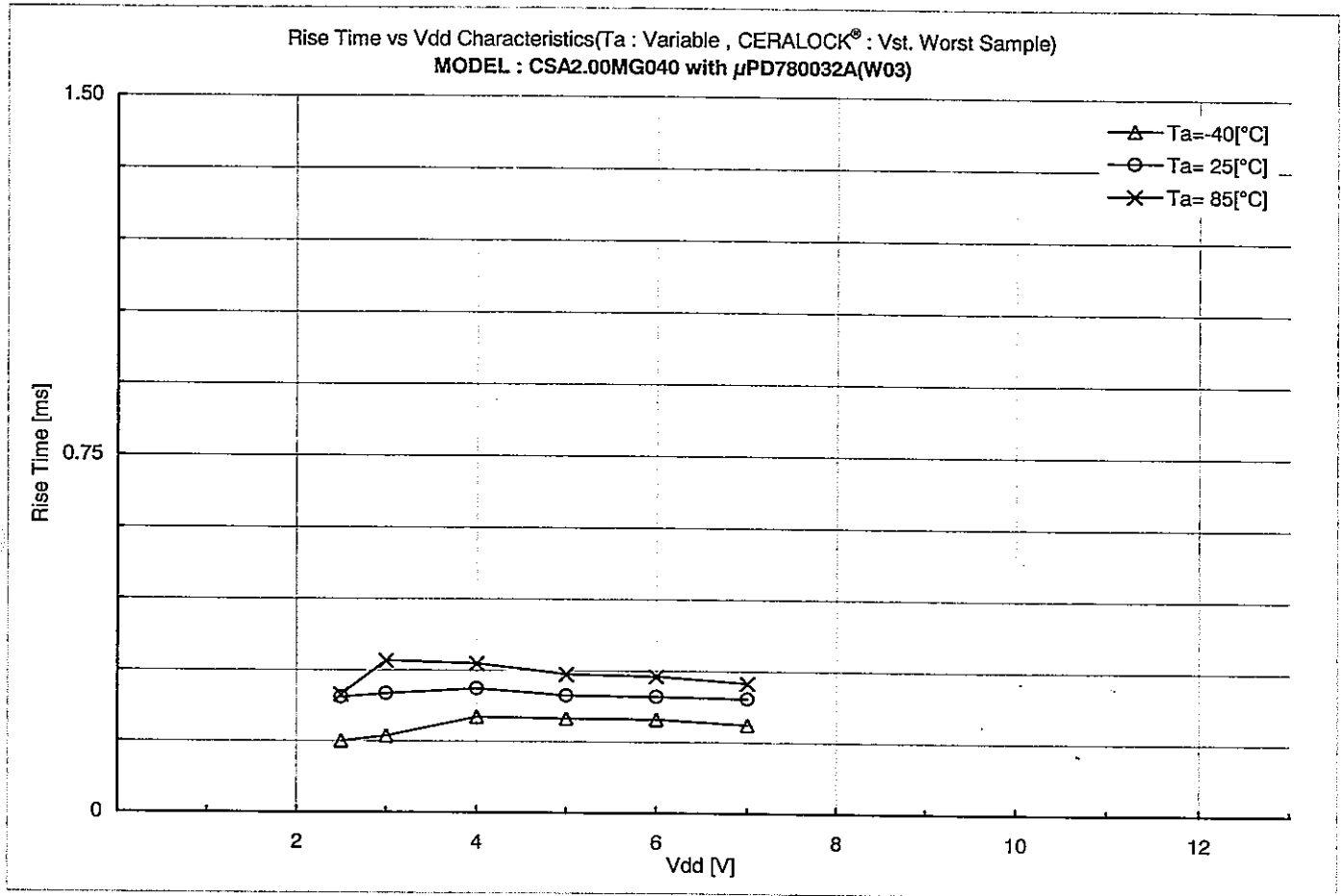
CERALOCK® : CSA2.00MG040

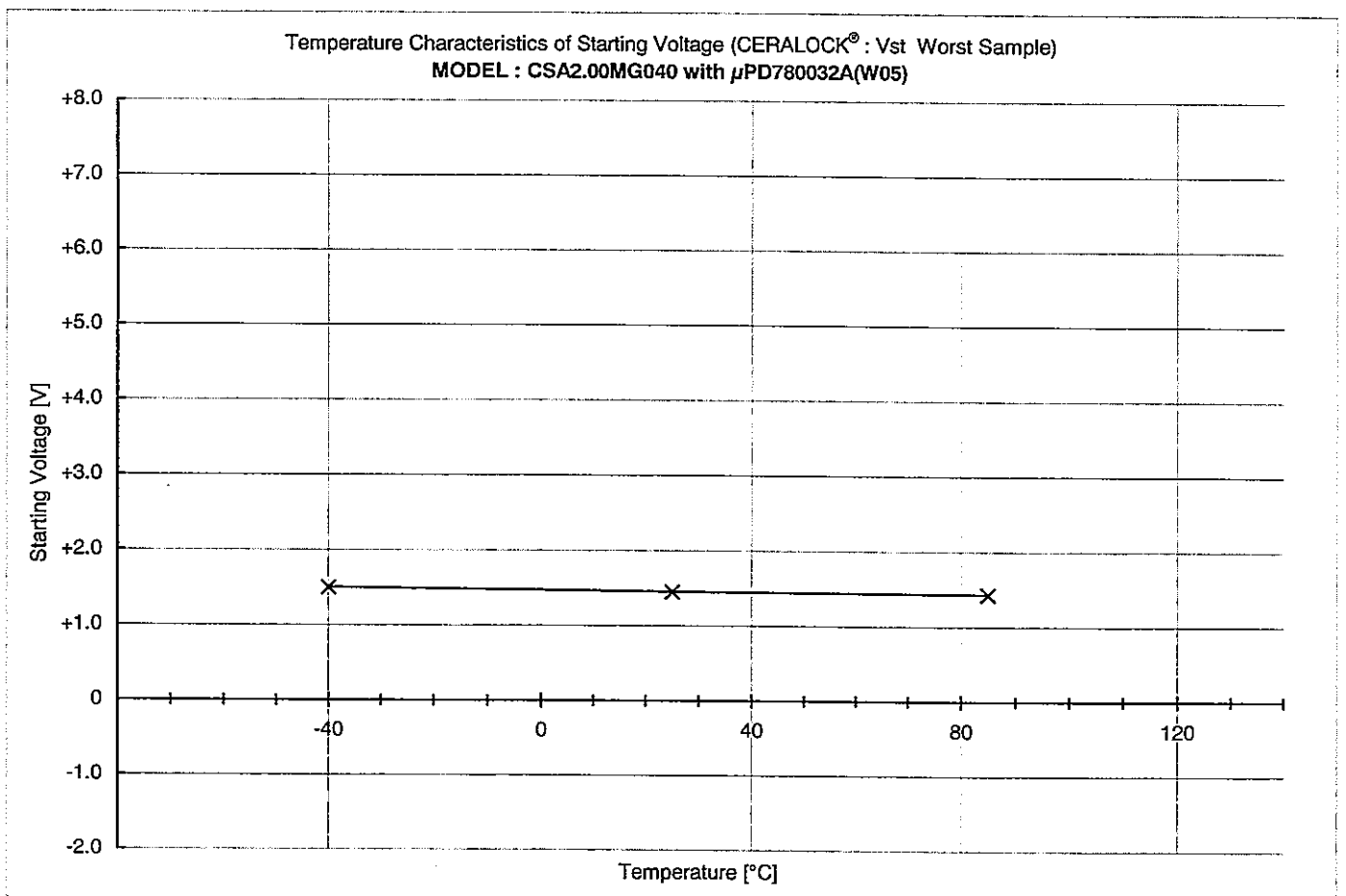
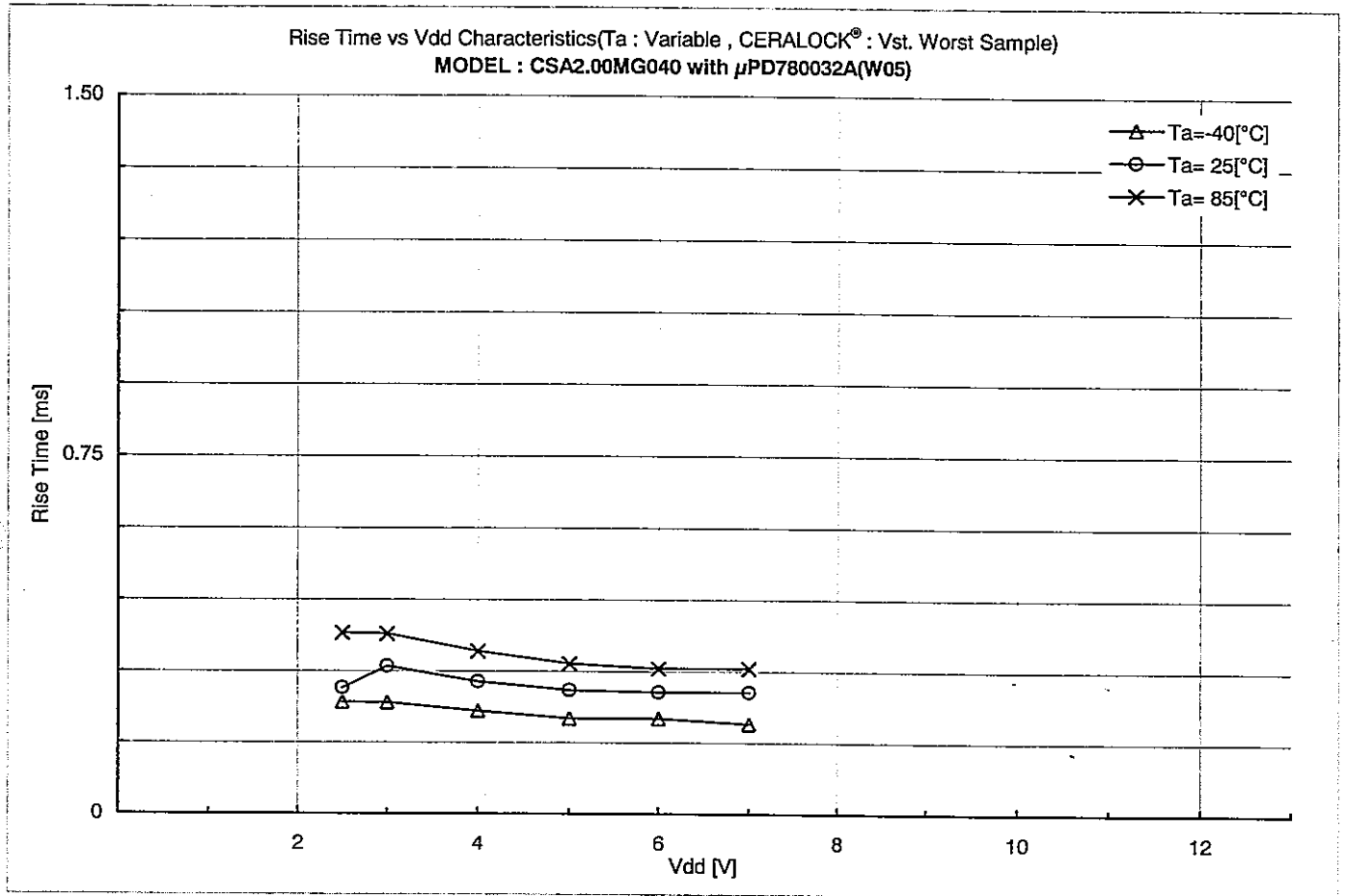
C1 = 100 [pF]

C2 = 100 [pF]

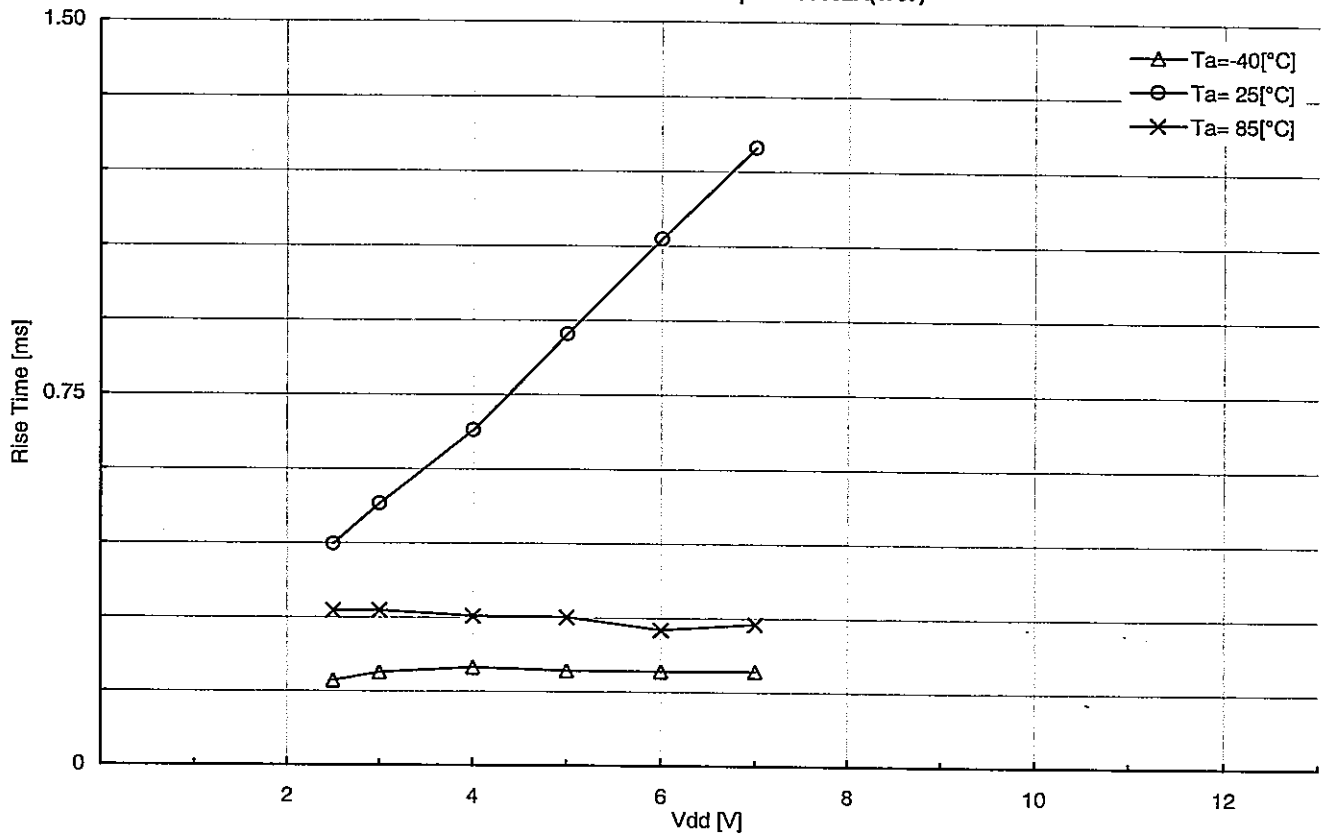
Rf = 1 [Mohm]

Rd = 680 [ohm]

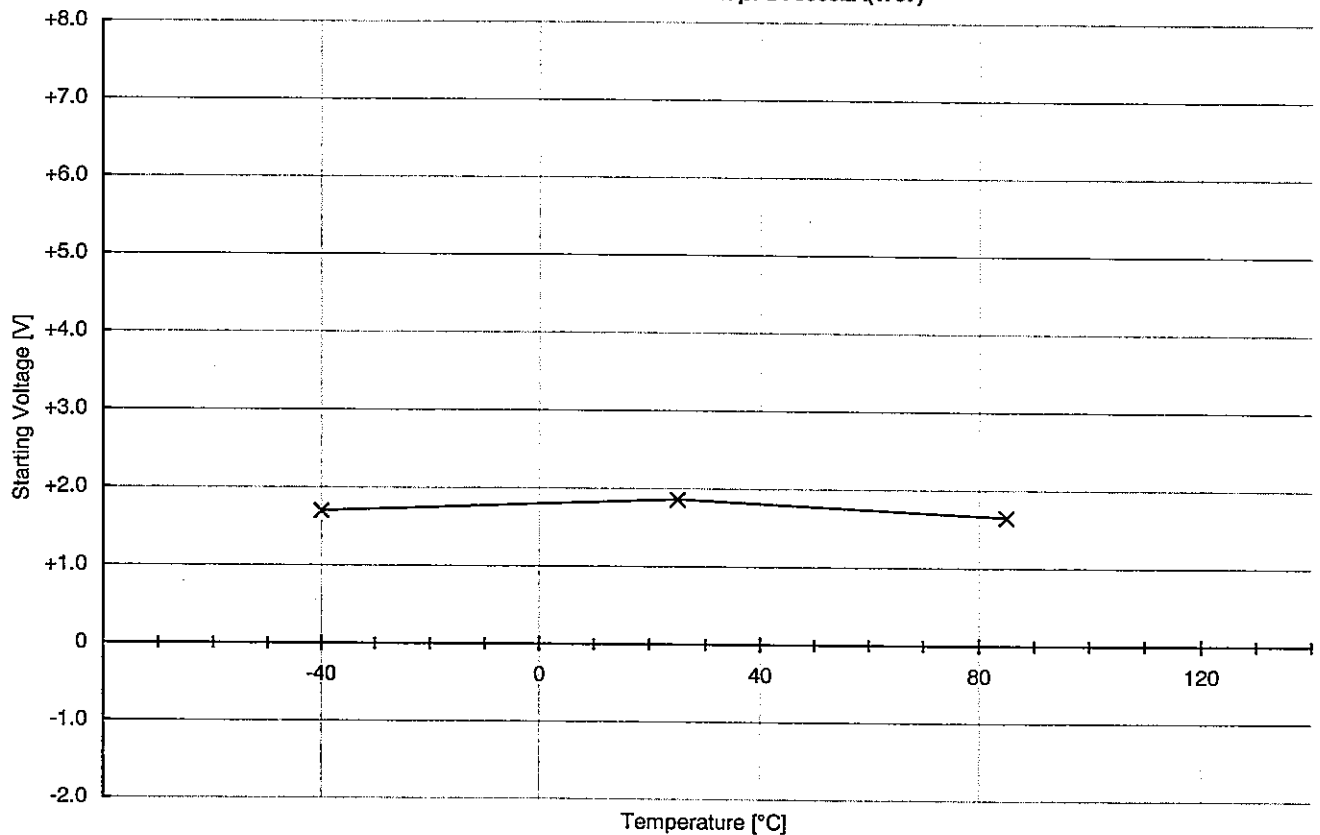


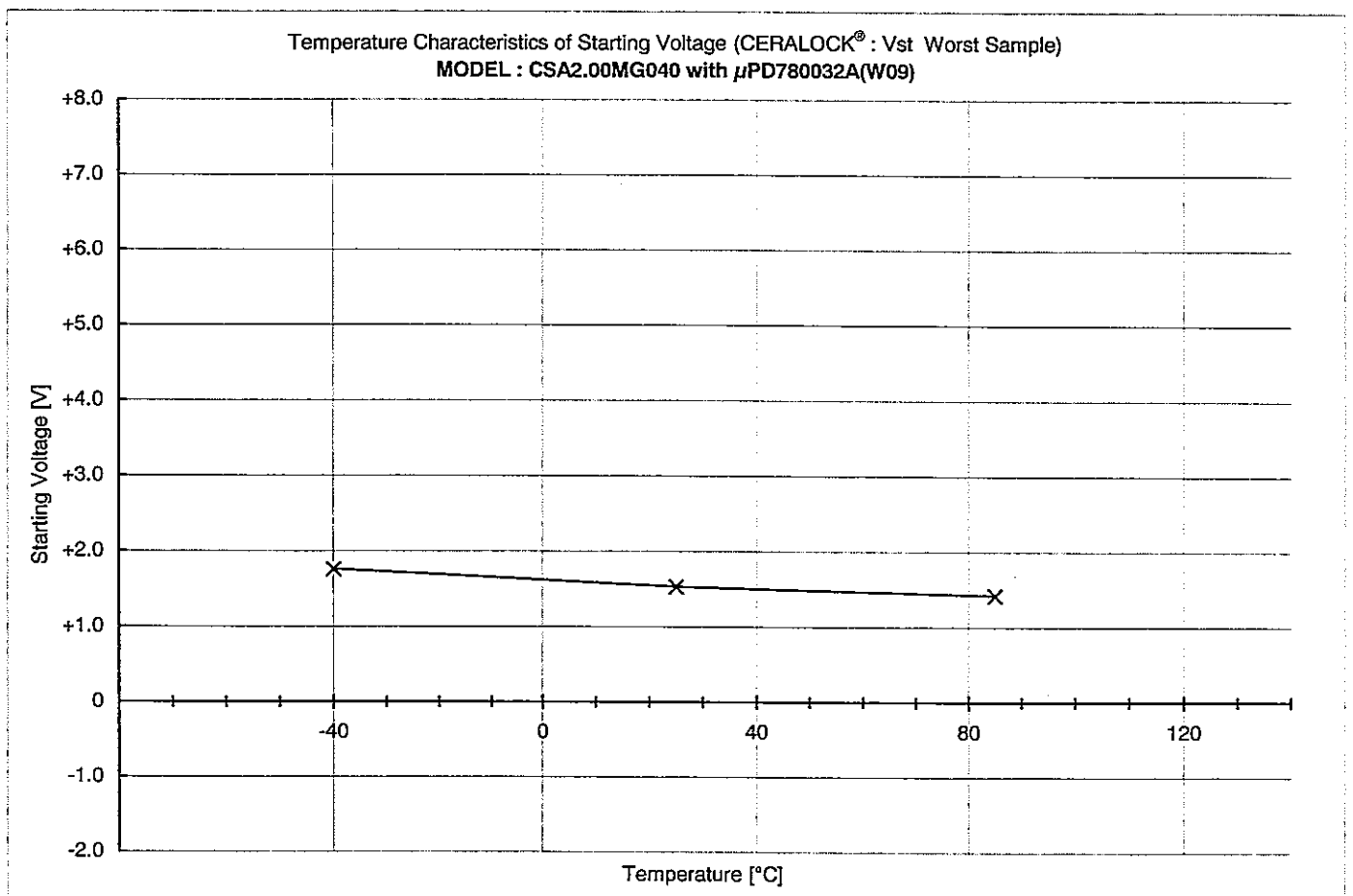
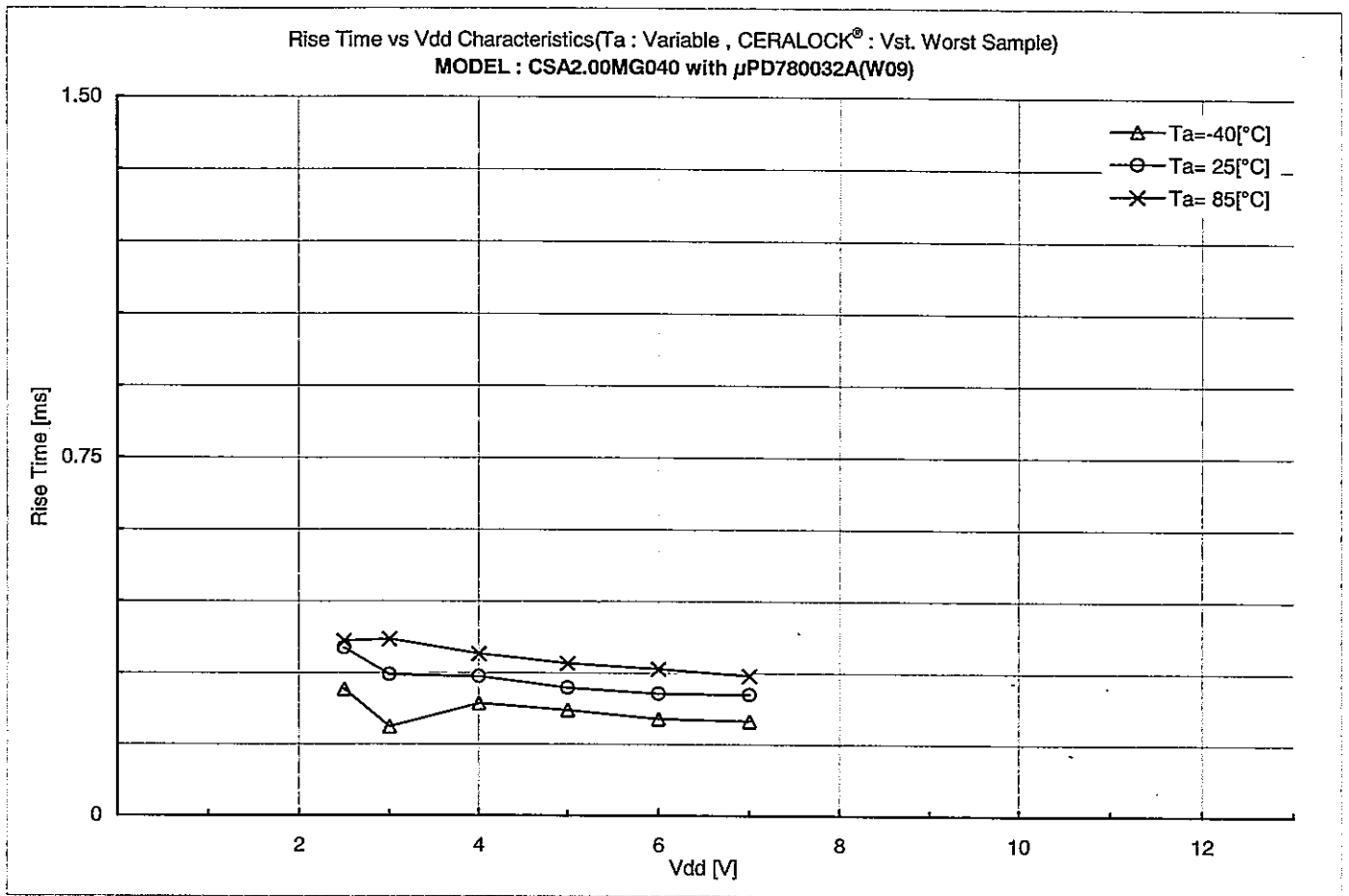


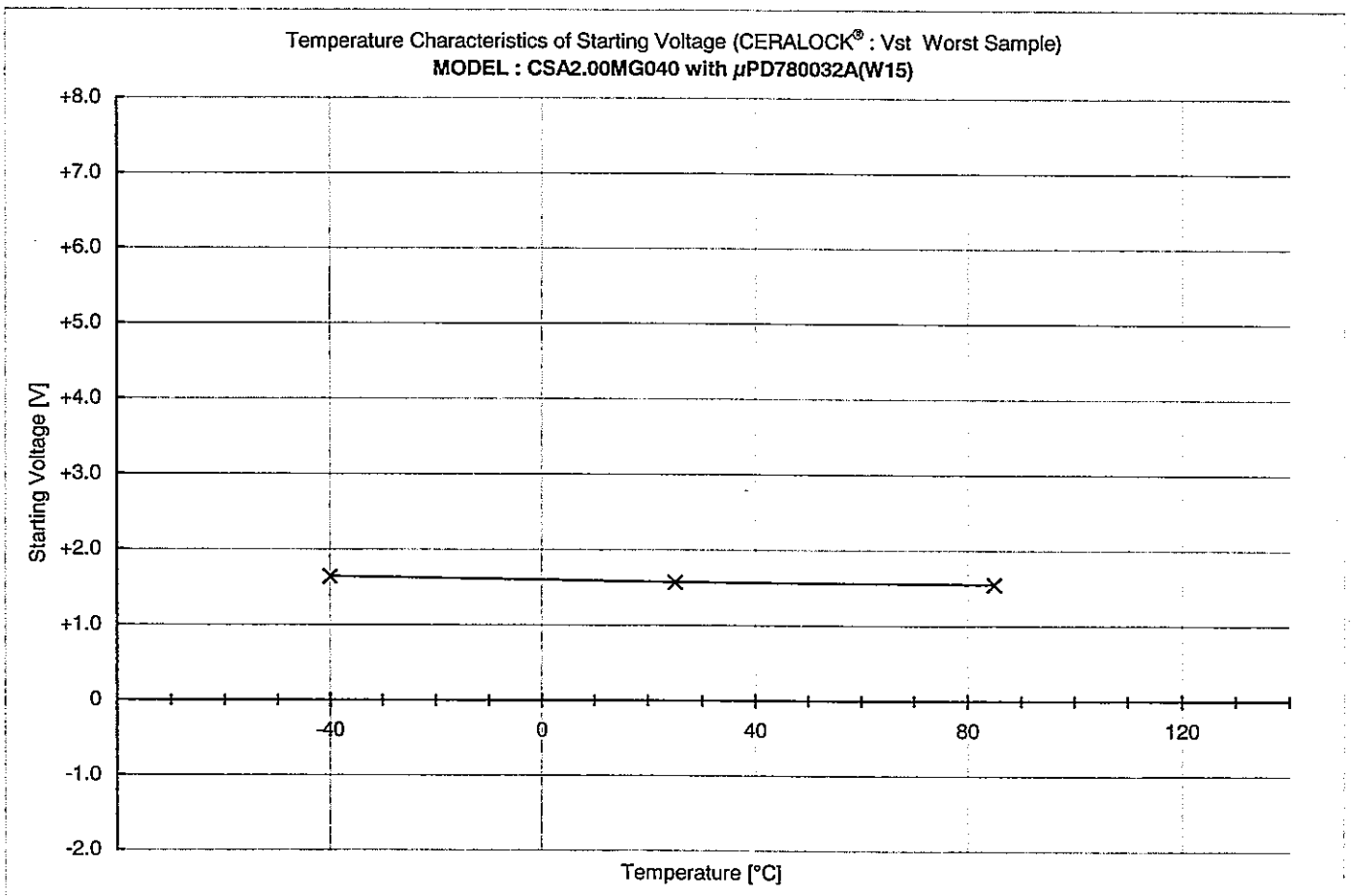
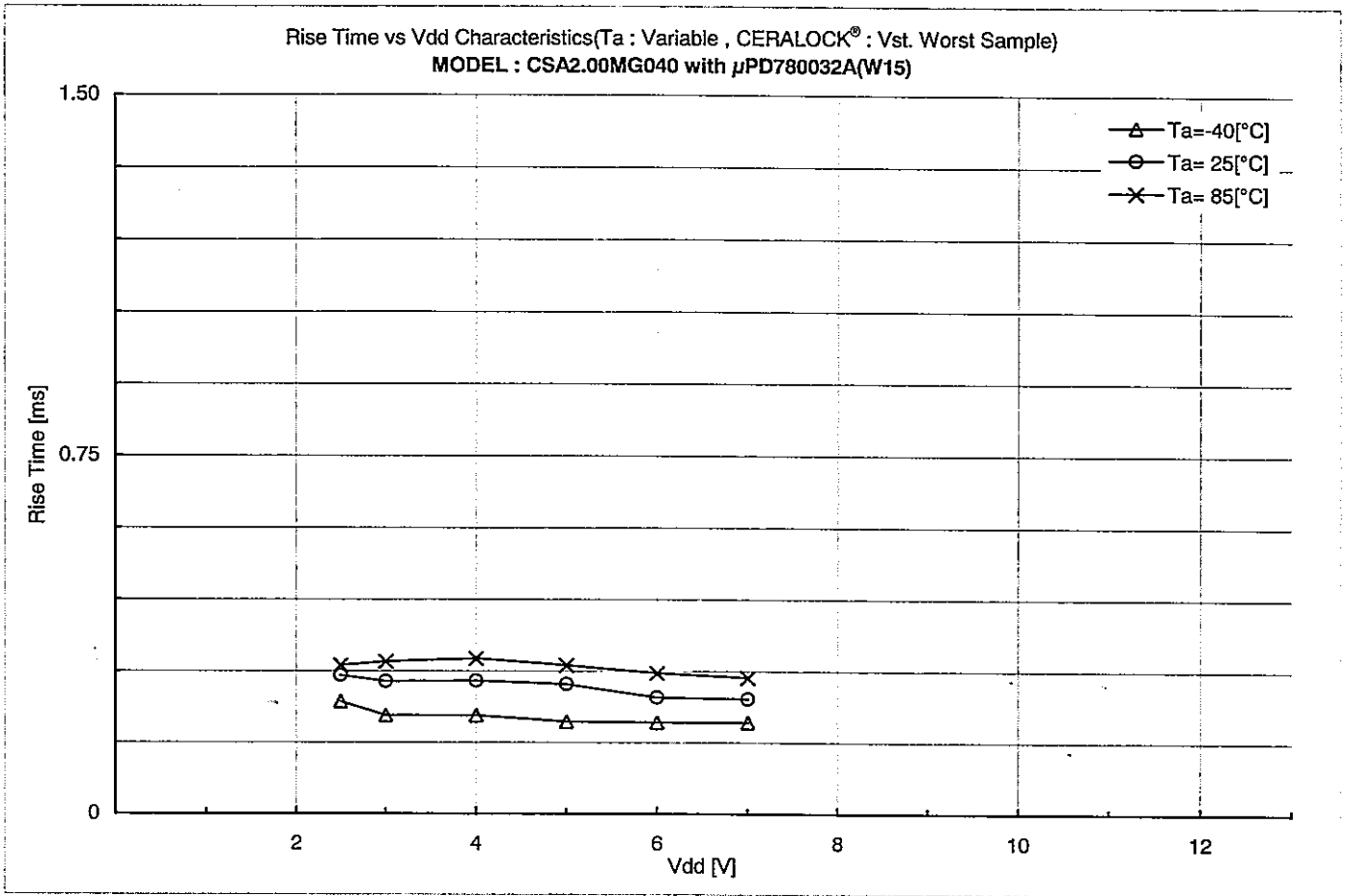
Rise Time vs Vdd Characteristics (Ta : Variable , CERALOCK® : Vst. Worst Sample)
 MODEL : CSA2.00MG040 with μ PD780032A(W07)

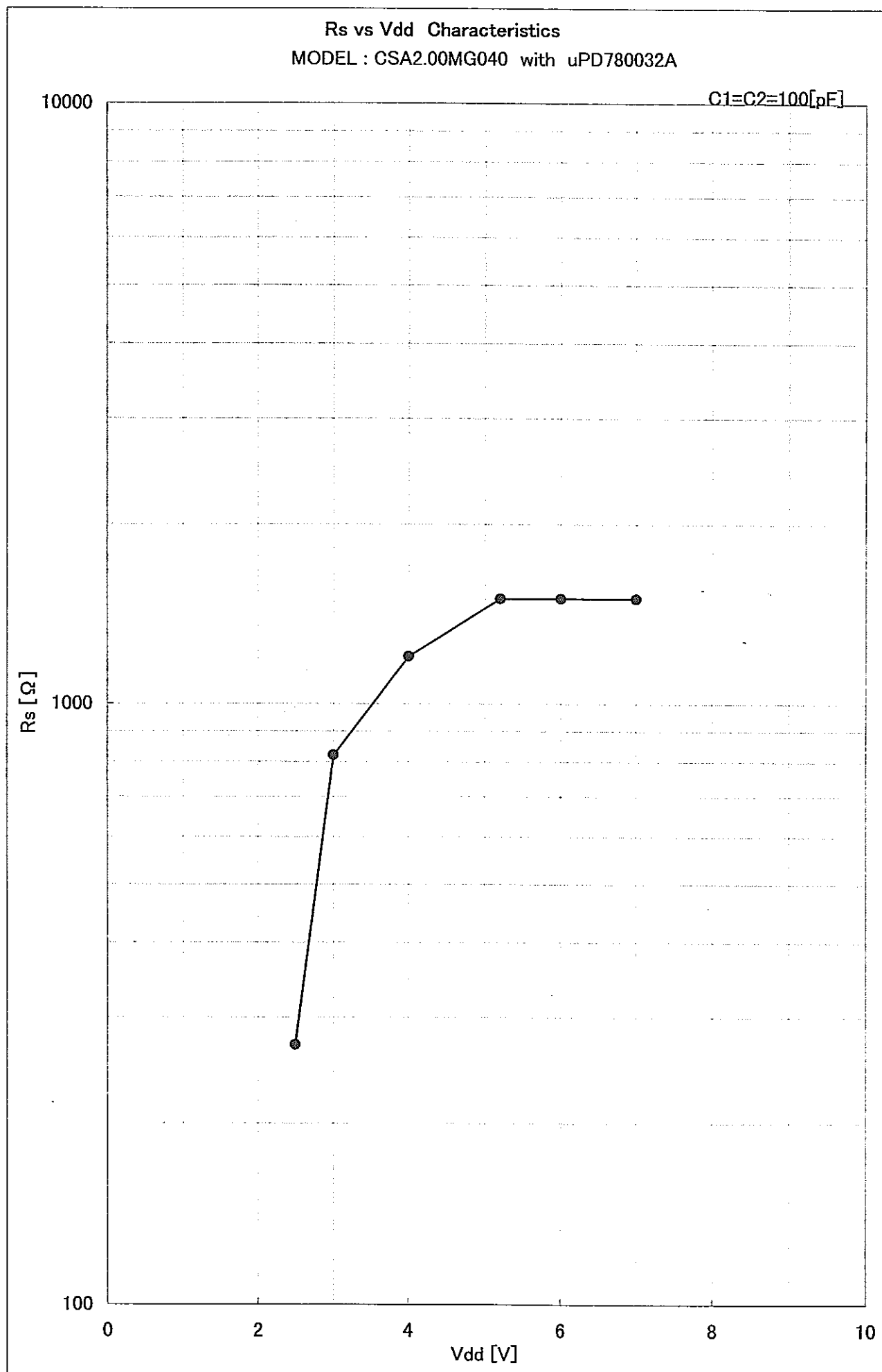


Temperature Characteristics of Starting Voltage (CERALOCK® : Vst. Worst Sample)
 MODEL : CSA2.00MG040 with μ PD780032A(W07)









Rs vs C(C1=C2) Characteristics

MODEL : CSA2.00MG040 with uPD780032A

Vdd=+5.0V

