M16C/63

Standard Characteristics

Related Part No. :

R5F363A6NFA、R5F363A6NFB、R5F363A6NLG、R5F363B6NFE、
R5F363A6DFA、R5F363A6DFB、R5F363B6DFE、R5F363AENFA、
R5F363AENFB、R5F363AENLG、R5F363BENFE、R5F363AEDFA、
R5F363AEDFB、R5F363BEDFE、R5F363AKNFA、R5F363AKNFB、
R5F363AKNLG、R5F363AKDFA、R5F363AKDFB、R5F363AMNFA、
R5F363AMNFB、R5F363AMNLG、R5F363AMDFA、R5F363AMDFB

R01ZZ0010EJ0100_M16C63

Standard Characteristics

Table of Contents

1.Input voltage(1)

(1)“H” Input voltage

■Related Pin
P0_0-P0_7、P2_0-P2_7、P3_0
(in single-chip mode)
P3_1-P3_7、P4_0-P4_3、P5_0-P5_7、P6_0-P6_7、P7_0-P7_1、
P7_6-P7_7、P8_0-P8_7、P9_0、P9-2-P9_7、P10_0-P10_7
When using 100-Pin Package
P1_0-P1_7(in single-chip mode)、P4_4-P4_7、P7_2-P7_5、P9_1
■Operating Condition
Topr=-40,25,85 (degreesC)
Vcc=1.8V to 5.5V

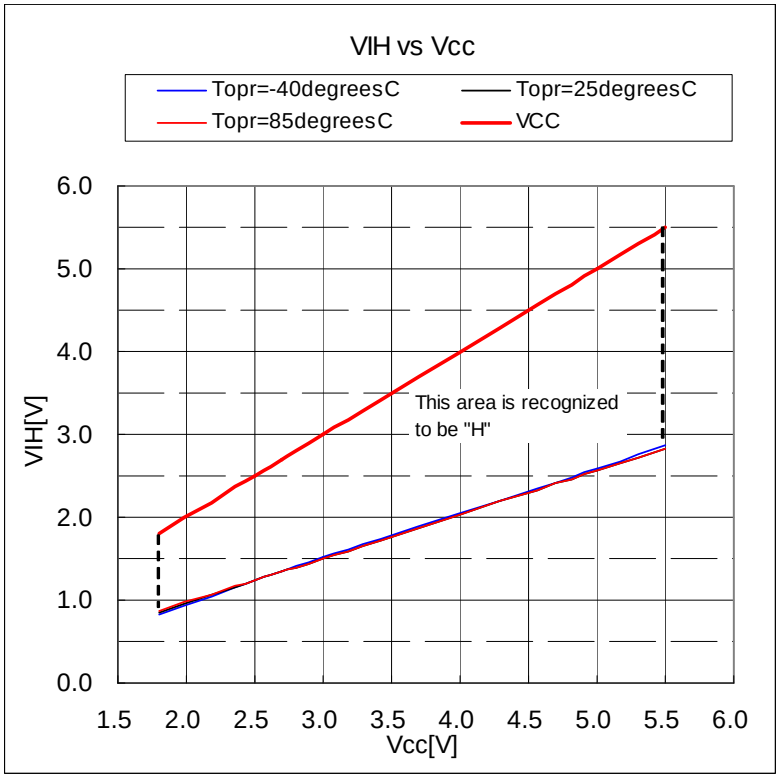


Figure1. VIH vs Vcc(in single-chip mode)

■Related Pin
P0_0-P0_7、P1_0-P1_7、P2_0-P2_7、P3_0
(data input in memory expansion and microprocessor mode
Do not use memory expansion mode and microprocessor mode in the 80-pin package)
■Operating Condition
Topr=-40,25,85 (degreesC)
Vcc=1.8V to 5.5V

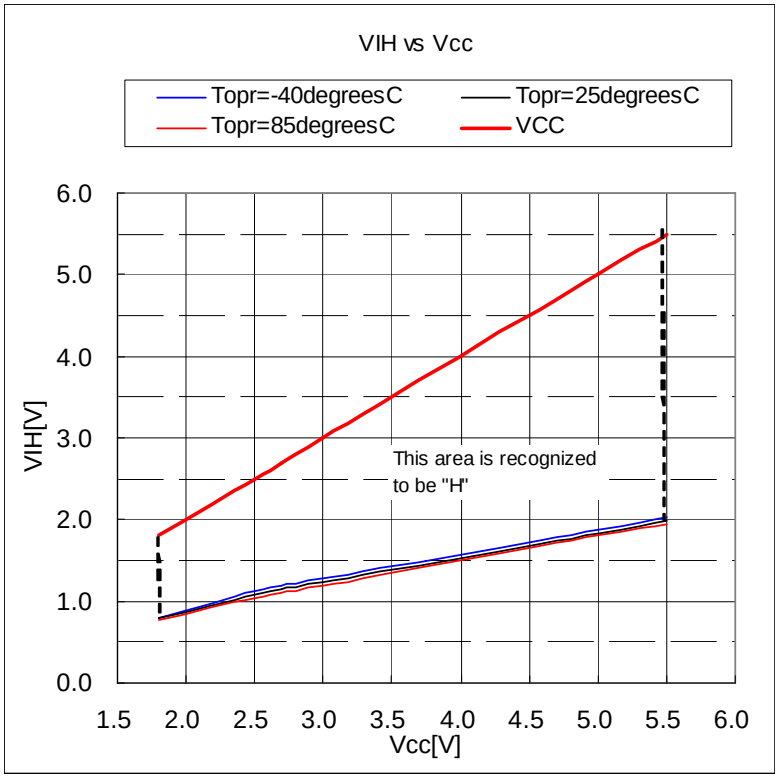


Figure2. VIH vs Vcc(data input in memory expansion and microprocessor mode)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

1.Input voltage(2)

(2)“L” Input voltage

■Related Pin
P0_0-P0_7、P2_0-P2_7、P3_0
(in single-chip mode)
P3_1-P3_7、P4_0-P4_3、P5_0-P5_7、P6_0-P6_7、P7_0-P7_1、
P7_6-P7_7、P8_0-P8_7、P9_0、P9-2-P9_7、P10_0-P10_7
When using 100-Pin Package
P1_0-P1_7(in single-chip mode)、P4_4-P4_7、P7_2-P7_5、P9_1
■Operating Condition
Topr=-40,25,85 (degreesC)
Vcc=1.8V to 5.5V

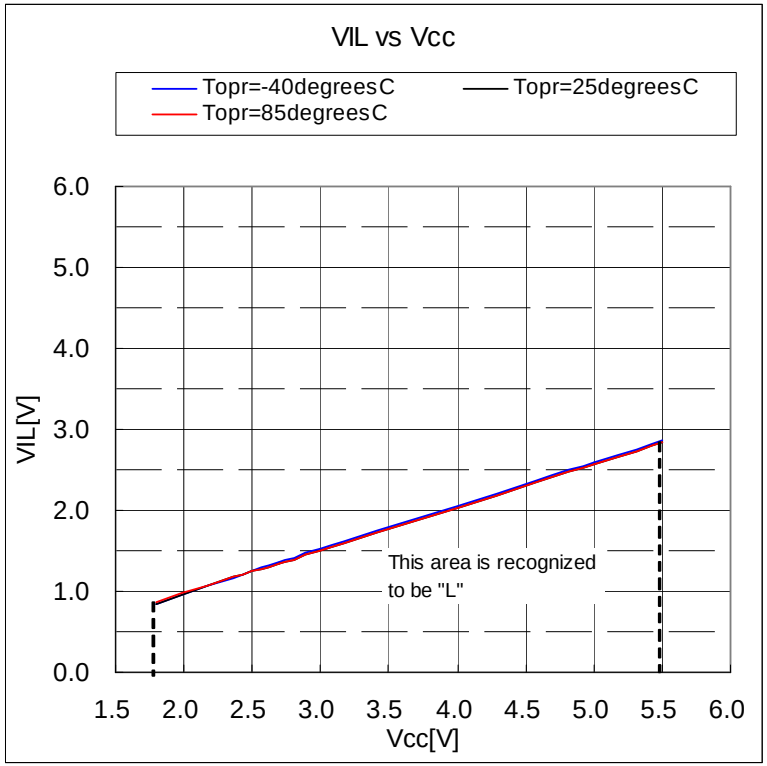


Figure3. VIL vs Vcc(in single-chip mode)

■Related Pin
P0_0-P0_7、P1_0-P1_7、P2_0-P2_7、P3_0
(data input in memory expansion and microprocessor mode
Do not use memory expansion mode and microprocessor mode in the 80-pin package)
■Operating Condition
Topr=-40,25,85 (degreesC)
Vcc=1.8V to 5.5V

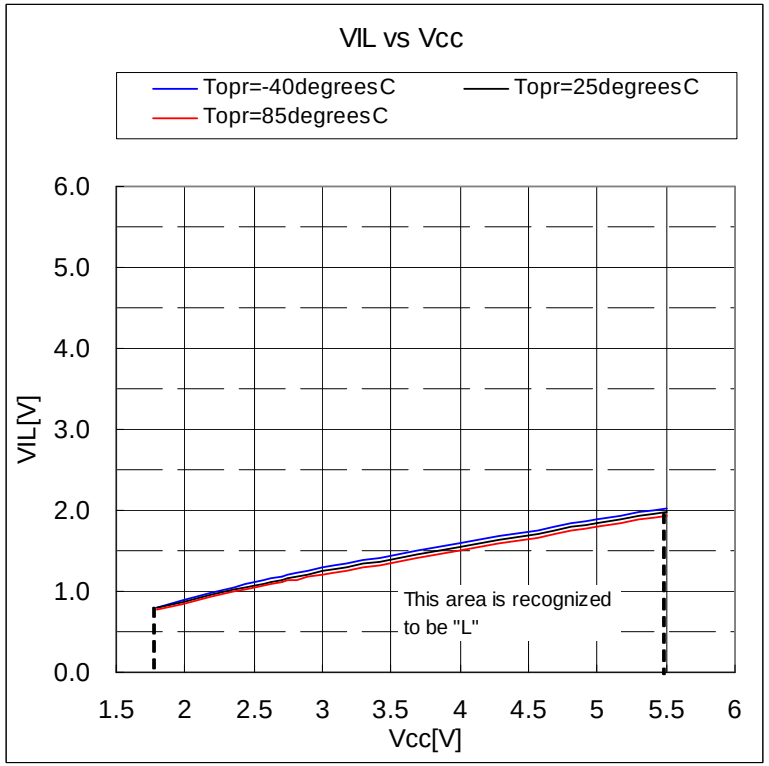


Figure4. VIL vs Vcc(data input in memory expansion and microprocessor mode)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

2.Hysteresis(1)

(1)Interrupt pin

■Related Pin

TA0IN,TA3IN-TA4IN,TB0IN,TB2IN-TB5IN,INT0-INT2,INT6-INT7,NMI,ADTRG,CTS0-CTS1,CTS5,SCL0-SCL2,SCL5,
SDA0-SDA2,SDA5,CLK0-CLK1,CLK3-CLK5,TA0OUT,TA3OUT-TA4OUT,KI0-KI7,RXD0-RXD2,RXD5,SIN4,PMC0
SCLMM,SDAMM,CEC,ZP

When using 100-Pin Package

HOLD,RDY,TA1IN-TA2IN,TB1IN,INT3-INT5,CTS2,CTS6-CTS7,SCL6-SCL7,SDA6-SDA7,CLK2,CLK6-CLK7,
TA1OUT-TA2OUT,RXD6-RXD7,SIN3,SD,PMC1,IDU,IDV,IDW

■Operating Condition

Topr=-40,25,85 (degrees C)

Vcc=1.8V to 5.5V

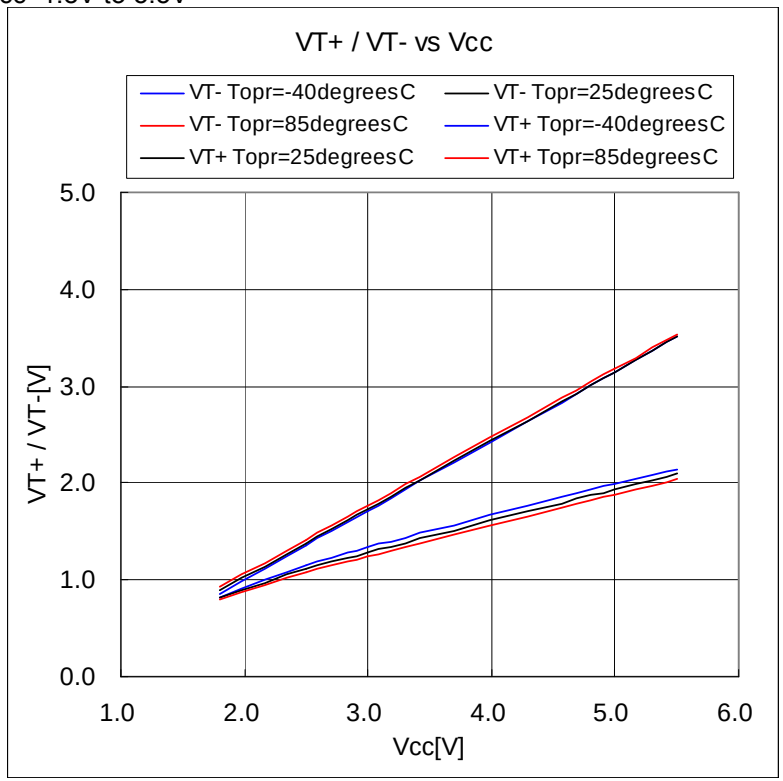


Figure5. VT+/VT- vs Vcc

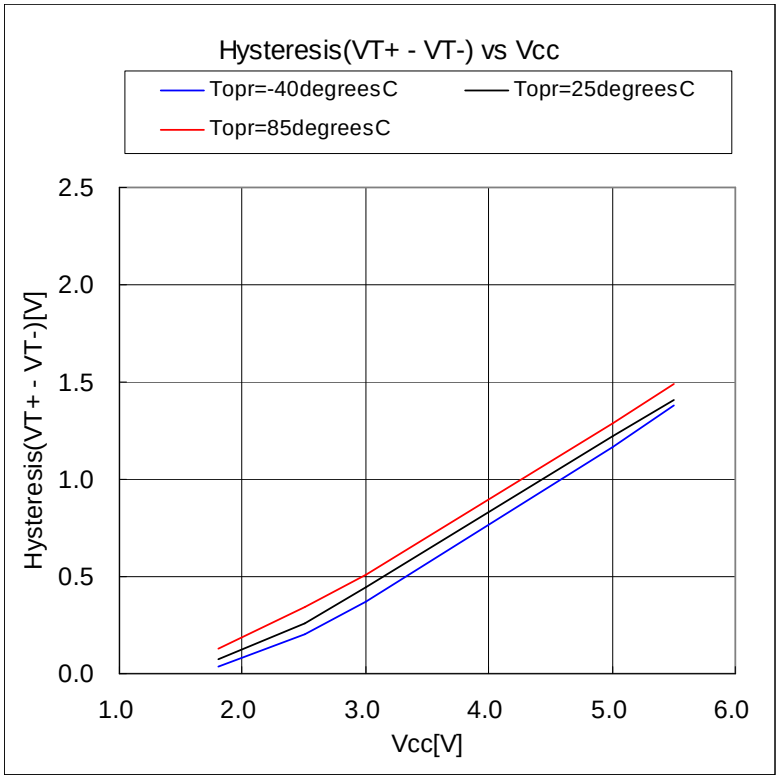


Figure6. Hysteresis (VT+-VT-) vs Vcc

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

2.Hysteresis(2)

(2)RESET

■Related Pin

RESET

■Operating Condition

Topr=-40,25,85 (degrees C)

Vcc=1.8V to 5.5V

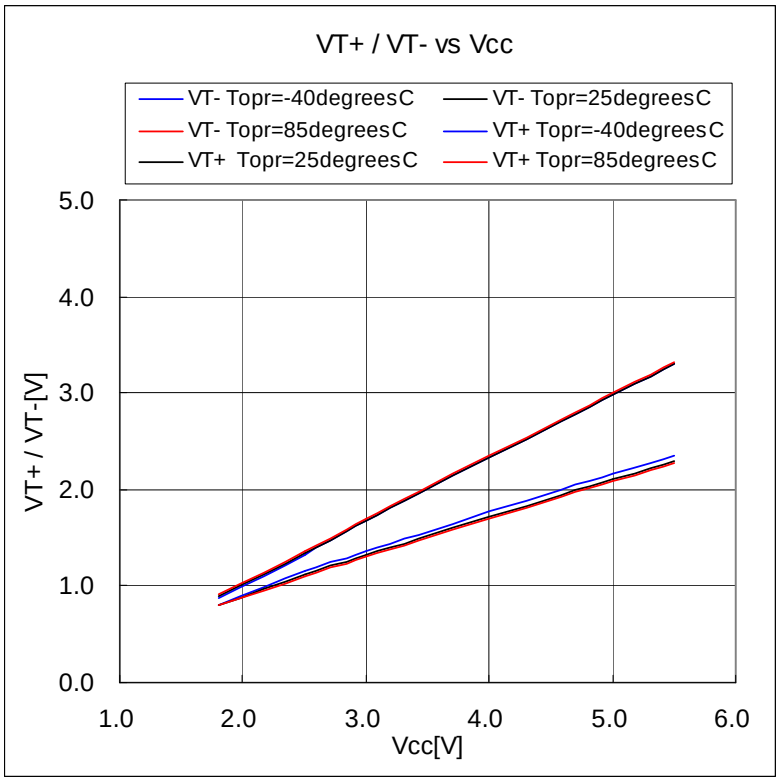


Figure7. VT+/VT- vs Vcc

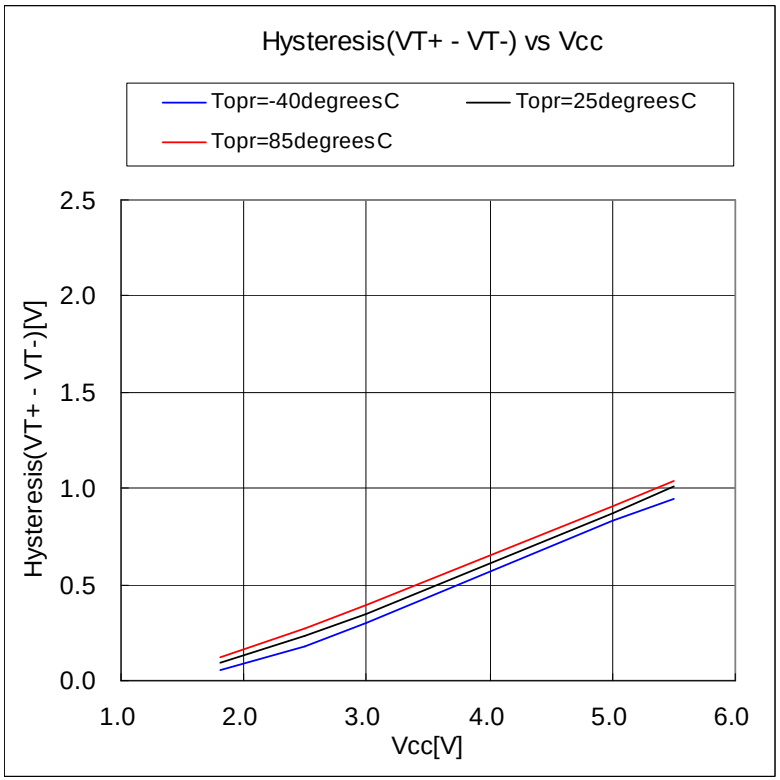


Figure8. Hysteresis (VT+-VT-) vs Vcc

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

3.Output voltage(1)

(1)“H” Output voltage

■ Related Pin
P0_0-P0_7、P2_0-P2_7、P3_0-P3_7、P4_0-P4_3、P5_0-P5_7、
P6_0-P6_7、P7_6-P7_7、P8_0-P8_4、P8_6-P8_7、
P9_0、P9_2-P9_7、P10_0-P10_7
When using 100-Pin Package
P1_0-P1_7、P4_4-P4_7、P7_2-P7_5、P9_1
■Operating Condition
Topr=-40,25,85 (degrees C)
Vcc=1.8V

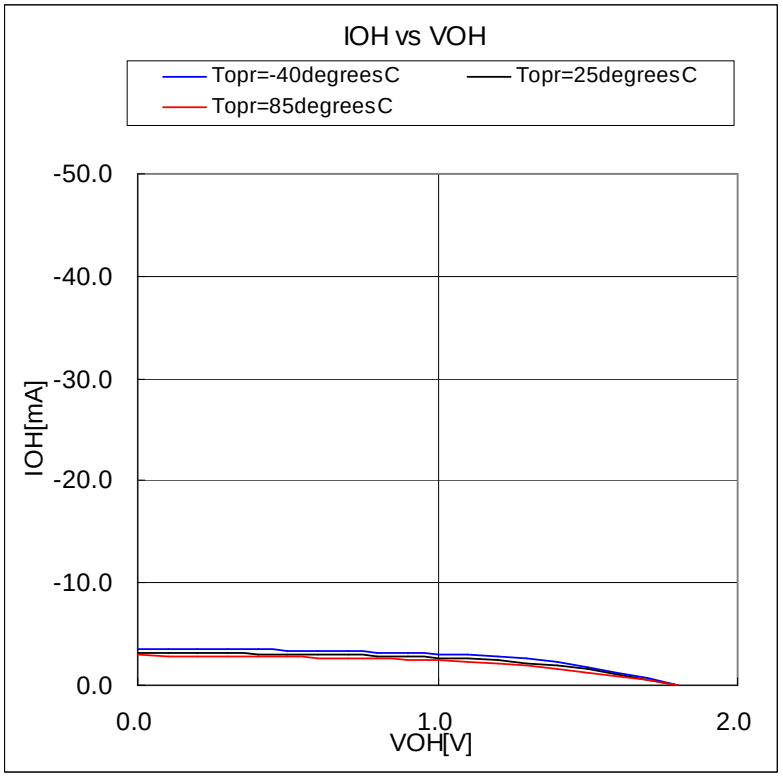


Figure9. IOH vs VOH (Vcc=1.8V)

■ Related Pin
P0_0-P0_7、P2_0-P2_7、P3_0-P3_7、P4_0-P4_3、P5_0-P5_7、
P6_0-P6_7、P7_6-P7_7、P8_0-P8_4、P8_6-P8_7、
P9_0、P9_2-P9_7、P10_0-P10_7
When using 100-Pin Package
P1_0-P1_7、P4_4-P4_7、P7_2-P7_5、P9_1
■Operating Condition
Topr=-40,25,85 (degrees C)
Vcc=3.0V

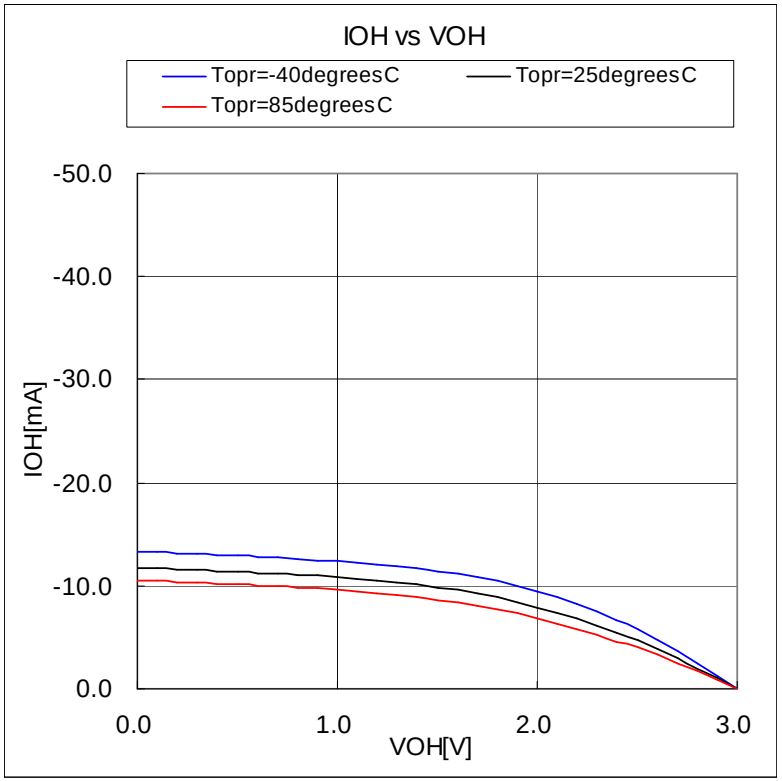


Figure10. IOH vs VOH (Vcc=3.0V)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

3.Output voltage(2)

(1)“H” Output voltage

■ Related Pin

P0_0-P0_7、P2_0-P2_7、P3_0-P3_7、P4_0-P4_3、P5_0-P5_7、
P6_0-P6_7、P7_6-P7_7、P8_0-P8_4、P8_6-P8_7、
P9_0、P9_2-P9_7、P10_0-P10_7
When using 100-Pin Package
P1_0-P1_7、P4_4-P4_7、P7_2-P7_5、P9_1

■Operating Condition

Topr=-40,25,85 (degrees C)
Vcc=5.0V

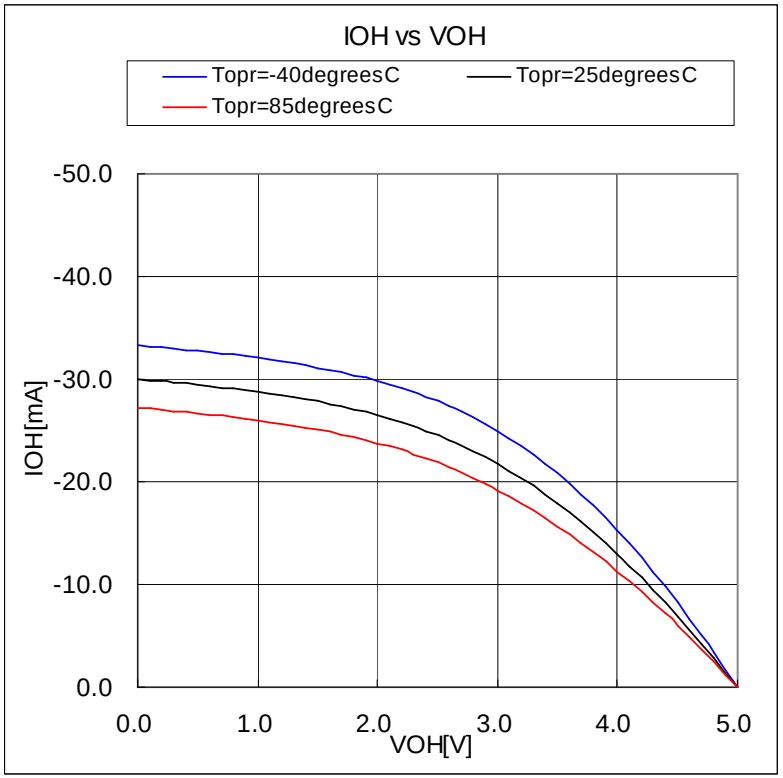


Figure11. IOH vs VOH (Vcc=5.0V)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

3.Output voltage(3)

(2)“L” Output voltage

■ Related Pin
P0_0-P0_7、P2_0-P2_7、P3_0-P3_7、P4_0-P4_3、P5_0-P5_7、P6_0-P6_7、P7_0-P7_1、P7_6-P7_7、P8_0-P8_7、P9_0、P9_2-P9_7、P10_0-P10_7
When using 100-Pin Package
P1_0-P1_7、P4_4-P4_7、P7_2-P7_5、P9_1
■Operating Condition
Topr=-40,25,85 (degrees C)
Vcc=1.8V

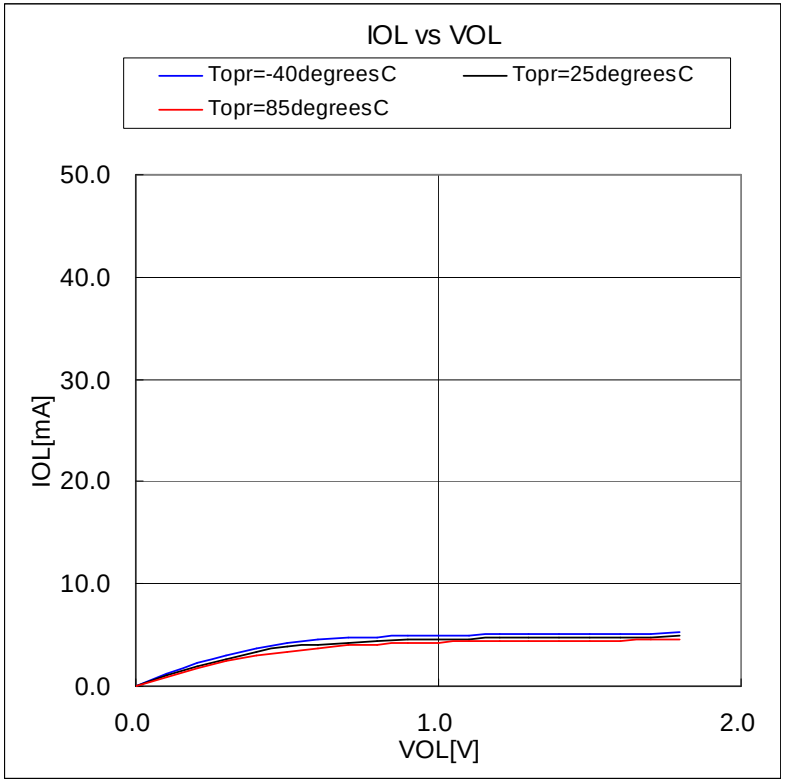


Figure12. IOL vs VOL (Vcc=1.8V)

■ Related Pin
P0_0-P0_7、P2_0-P2_7、P3_0-P3_7、P4_0-P4_3、P5_0-P5_7、P6_0-P6_7、P7_0-P7_1、P7_6-P7_7、P8_0-P8_7、P9_0、P9_2-P9_7、P10_0-P10_7
When using 100-Pin Package
P1_0-P1_7、P4_4-P4_7、P7_2-P7_5、P9_1
■Operating Condition
Topr=-40,25,85 (degrees C)
Vcc=3.0V

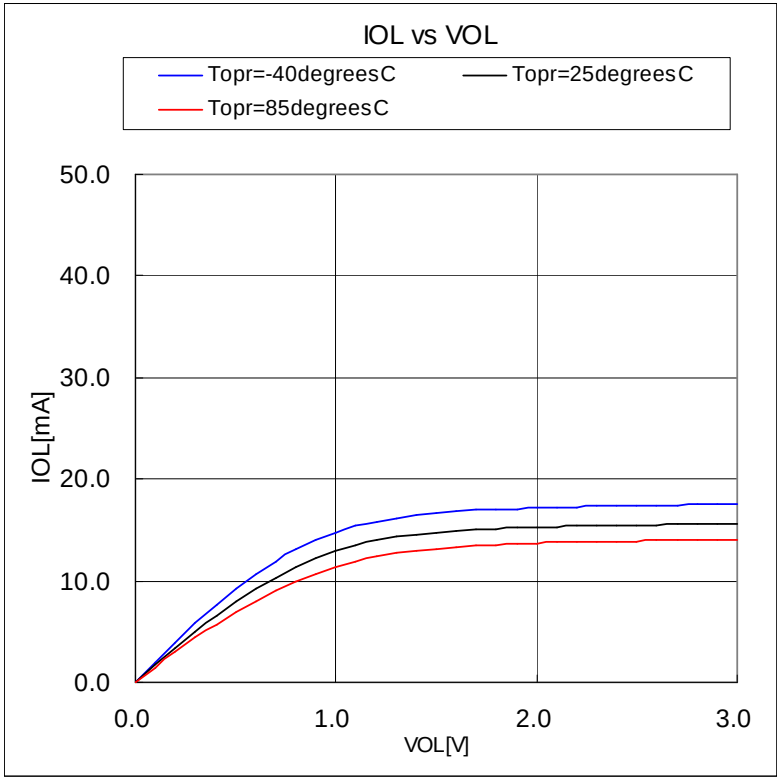


Figure13. IOL vs VOL (Vcc=3.0V)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

3.Output voltage(4)

(2)“L” Output voltage

■ Related Pin

P0_0-P0_7、P2_0-P2_7、P3_0-P3_7、P4_0-P4_3、P5_0-P5_7、
P6_0-P6_7、P7_0-P7_1、P7_6-P7_7、P8_0-P8_7、P9_0、
P9_2-P9_7、P10_0-P10_7

When using 100-Pin Package

P1_0-P1_7、P4_4-P4_7、P7_2-P7_5、P9_1

■Operating Condition

Topr=-40,25,85 (degrees C)

Vcc=5.0V

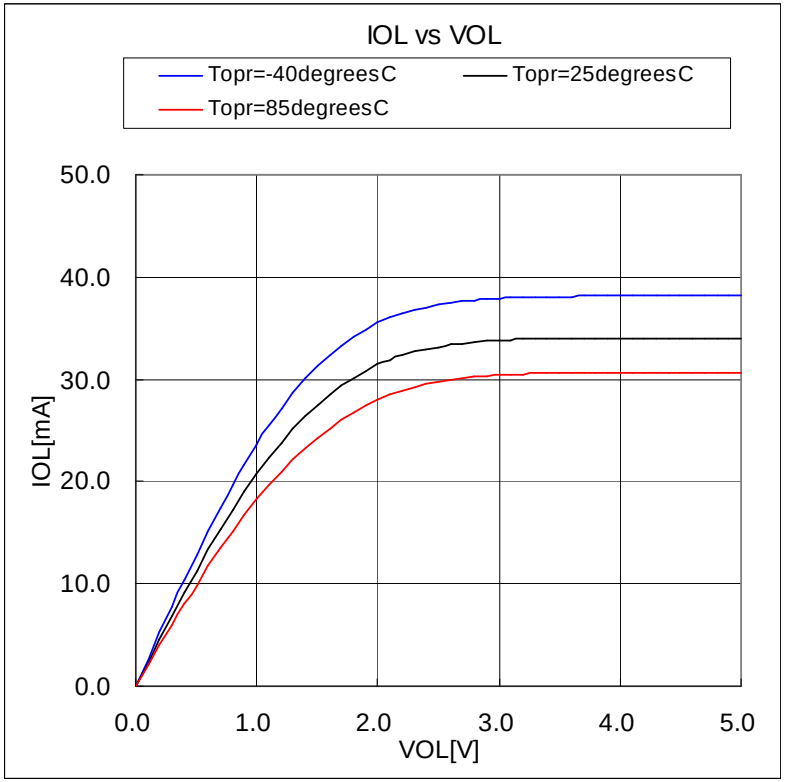


Figure14. IOL vs VOL (Vcc=5.0V)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

4.Pull-up resistance

(1)Pull-up MOS current(-Ip) vs Vcc

■ Related Pin

P0_0-P0_7、P2_0-P2_7、P3_0-P3_7、P4_0-P4_3、P5_0-P5_7、
P6_0-P6_7、P7_6-P7_7、P8_0-P8_4、P8_6-P8_7、P9_0、
P9_2-P9_7、P10_0-P10_7
When using 100-Pin Package
P1_0-P1_7、P4_4-P4_7、P7_2-P7_5、P9_1

■Operating Condition

Topr=-40,25,85 (degrees C)
Vcc=1.8V to 5.5V

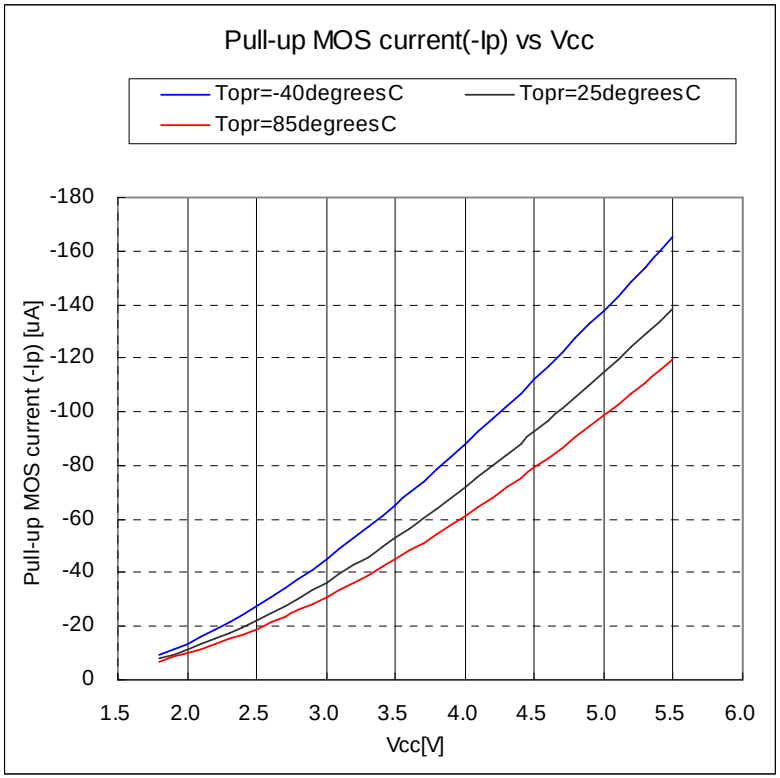


Figure15. Pull-up MOS current(-Ip) vs Vcc

(2)Rpullup vs Vcc

■ Related Pin

P0_0-P0_7、P2_0-P2_7、P3_0-P3_7、P4_0-P4_3、P5_0-P5_7、
P6_0-P6_7、P7_6-P7_7、P8_0-P8_4、P8_6-P8_7、P9_0、
P9_2-P9_7、P10_0-P10_7
When using 100-Pin Package
P1_0-P1_7、P4_4-P4_7、P7_2-P7_5、P9_1

■Operating Condition

Topr=-40,25,85 (degrees C)
Vcc=1.8V to 5.5V

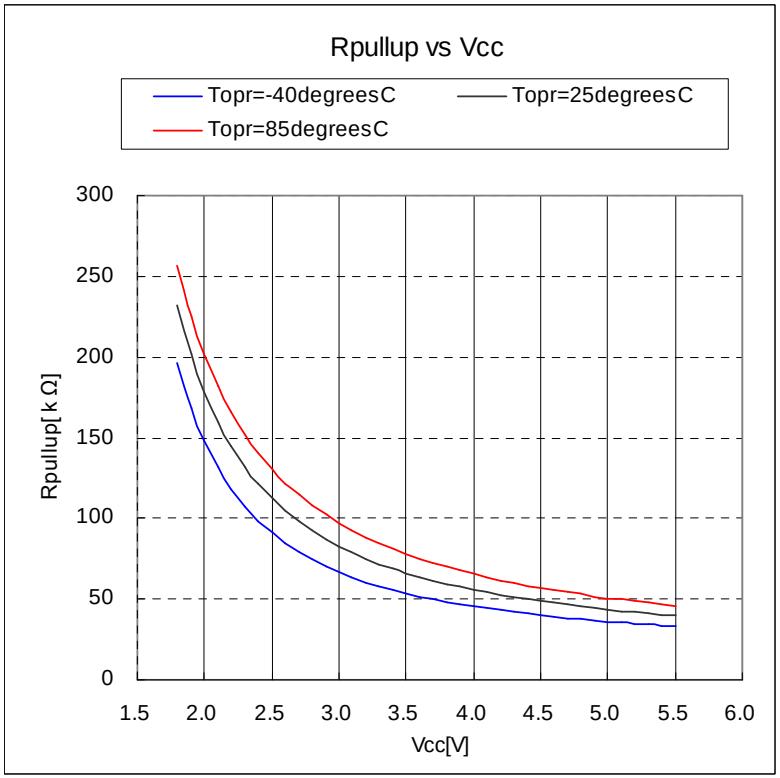


Figure16. Rpullup vs Vcc

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

5.A/D Accuracy(1)

■ Related Pin

AN0-AN7、 AN0_0-AN0_7 、AN2_0-AN2_7、 ANEX0、ANEX1

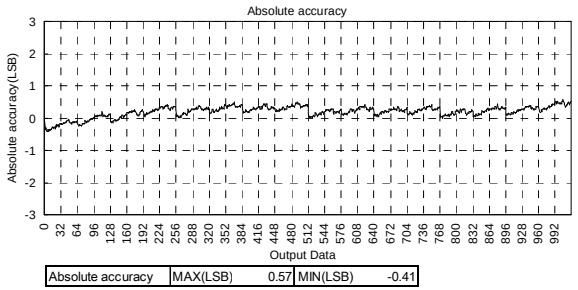
■Operating Condition

Topr=-40,25,85 (degrees C)

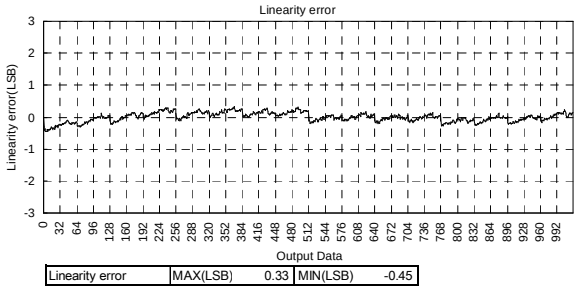
Vcc=AVcc=VREF =5.12V

φAD=20MHz

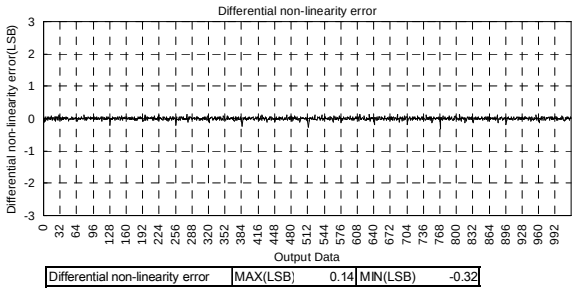
Topr=-40degreesC



Absolute accuracy	MAX(LSB)	0.57	MIN(LSB)	-0.41



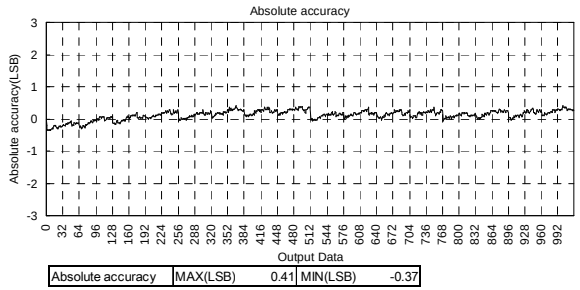
Linearity error	MAX(LSB)	0.33	MIN(LSB)	-0.45



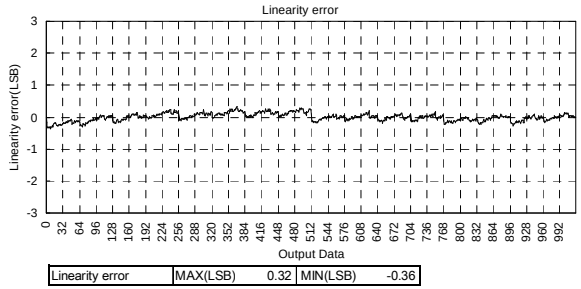
Differential non-linearity error	MAX(LSB)	0.14	MIN(LSB)	-0.32

Figure17. Topr=-40(degrees C)

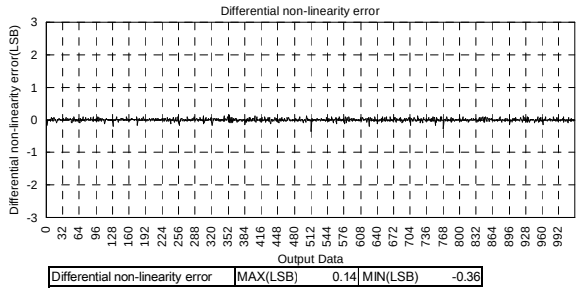
Topr=25degreesC



Absolute accuracy	MAX(LSB)	0.41	MIN(LSB)	-0.37



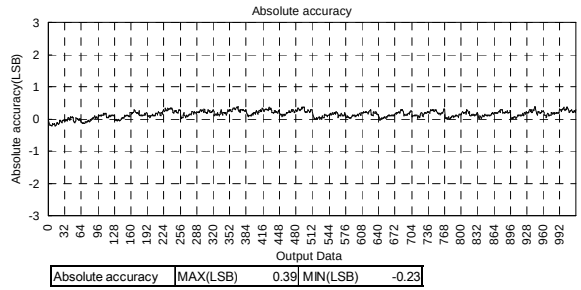
Linearity error	MAX(LSB)	0.32	MIN(LSB)	-0.36



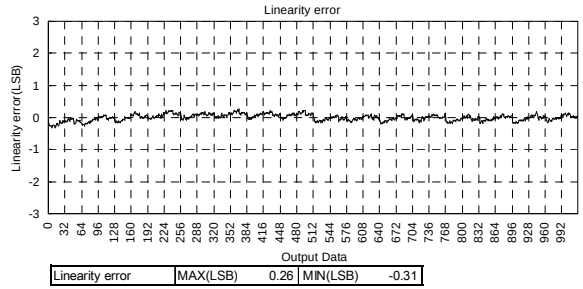
Differential non-linearity error	MAX(LSB)	0.14	MIN(LSB)	-0.36

Figure18. Topr=25(degrees C)

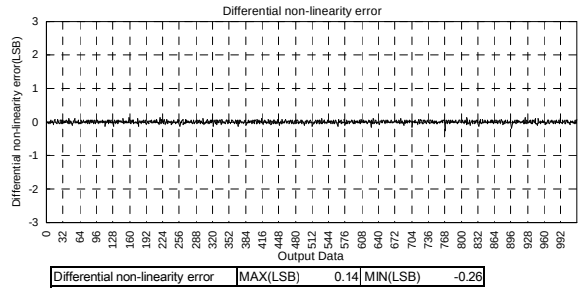
Topr=85degreesC



Absolute accuracy	MAX(LSB)	0.39	MIN(LSB)	-0.23



Linearity error	MAX(LSB)	0.26	MIN(LSB)	-0.31



Differential non-linearity error	MAX(LSB)	0.14	MIN(LSB)	-0.26

Figure19. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

5.A/D Accuracy(2)

■ Related Pin

AN0-AN7、 AN0_0-AN0_7 、AN2_0-AN2_7、 ANEX0、ANEX1

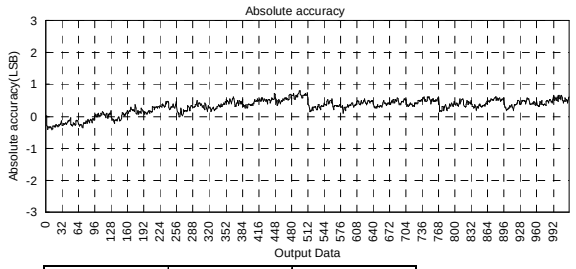
■Operating Condition

Topr=-40,25,85 (degrees C)

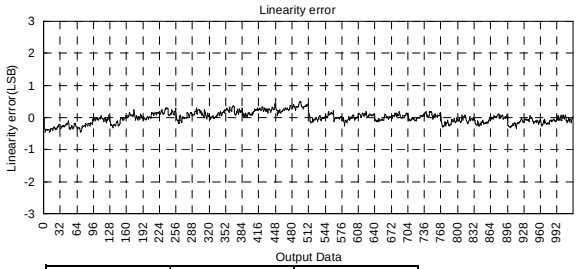
Vcc=AVcc=VREF =3.30V

φAD=16MHz

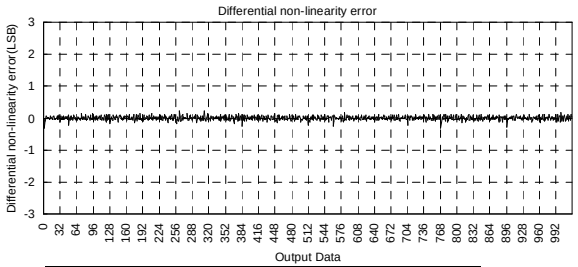
Topr=-40degreesC



Absolute accuracy	MAX(LSB)	0.801818	MIN(LSB)	-0.40836



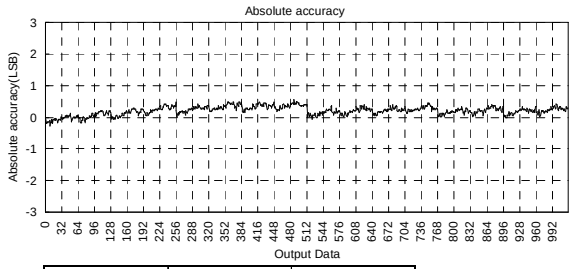
Linearity error	MAX(LSB)	0.50	MIN(LSB)	-0.44



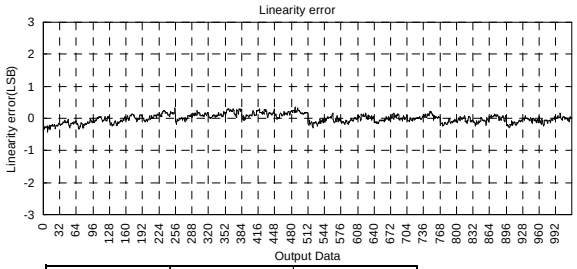
Differential non-linearity error	MAX(LSB)	0.217212	MIN(LSB)	-0.3103

Figure20. Topr=-40(degrees C)

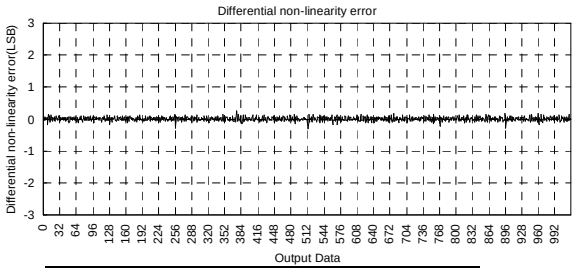
Topr=25degreesC



Absolute accuracy	MAX(LSB)	0.546545	MIN(LSB)	-0.29127



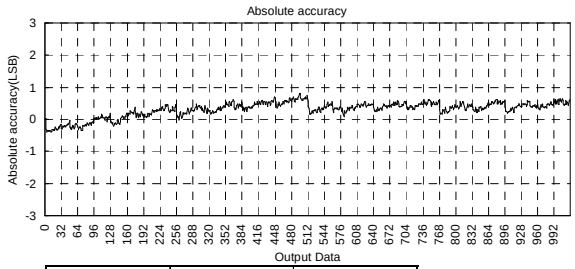
Linearity error	MAX(LSB)	0.34	MIN(LSB)	-0.43



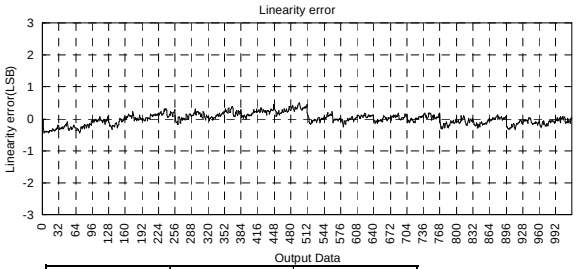
Differential non-linearity error	MAX(LSB)	0.248242	MIN(LSB)	-0.3103

Figure21. Topr=25(degrees C)

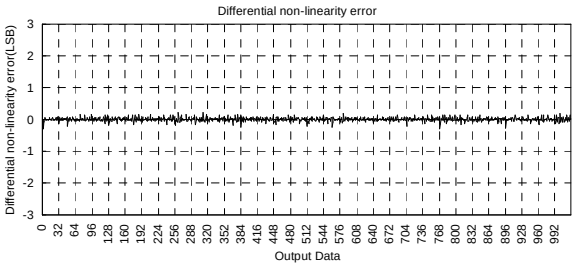
Topr=85degreesC



Absolute accuracy	MAX(LSB)	0.484485	MIN(LSB)	-0.38436



Linearity error	MAX(LSB)	0.34	MIN(LSB)	-0.34



Differential non-linearity error	MAX(LSB)	0.217212	MIN(LSB)	-0.27927

Figure22. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

5.A/D Accuracy(3)

■ Related Pin

AN0-AN7、 AN0_0-AN0_7 、AN2_0-AN2_7、 ANEX0、ANEX1

■Operating Condition

Topr=-40,25,85 (degrees C)

Vcc=AVcc=VREF =3.072V

φAD=10MHz

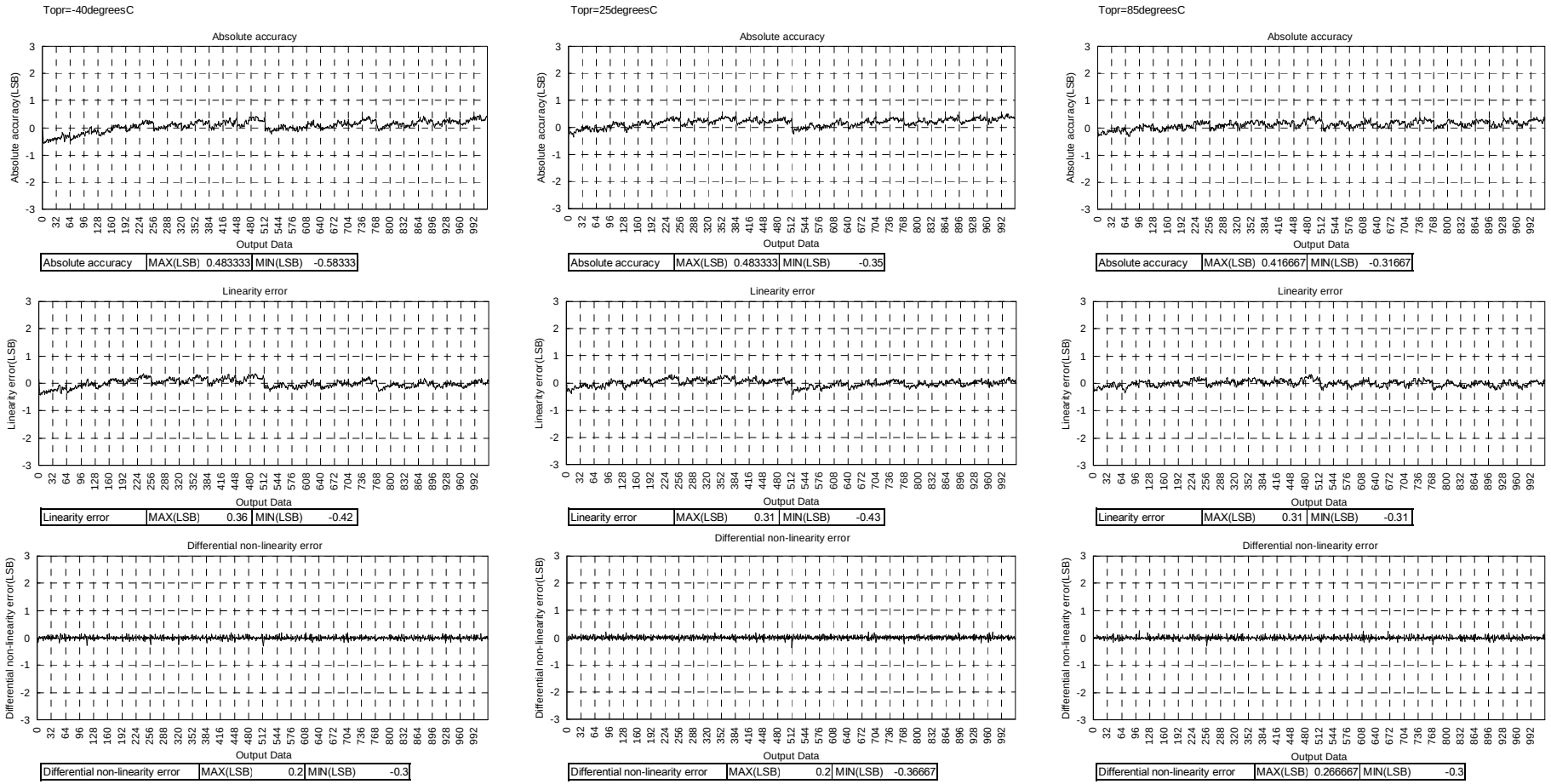


Figure23. Topr=-40(degrees C)

Figure24. Topr=25(degrees C)

Figure25. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

5.A/D Accuracy(4)

■ Related Pin

AN0-AN7、 AN0_0-AN0_7 、AN2_0-AN2_7、 ANEX0、ANEX1

■Operating Condition

Topr=-40,25,85 (degrees C)

Vcc=AVcc=VREF =1.8V (Voltage multiplier ON)

φAD=5MHz

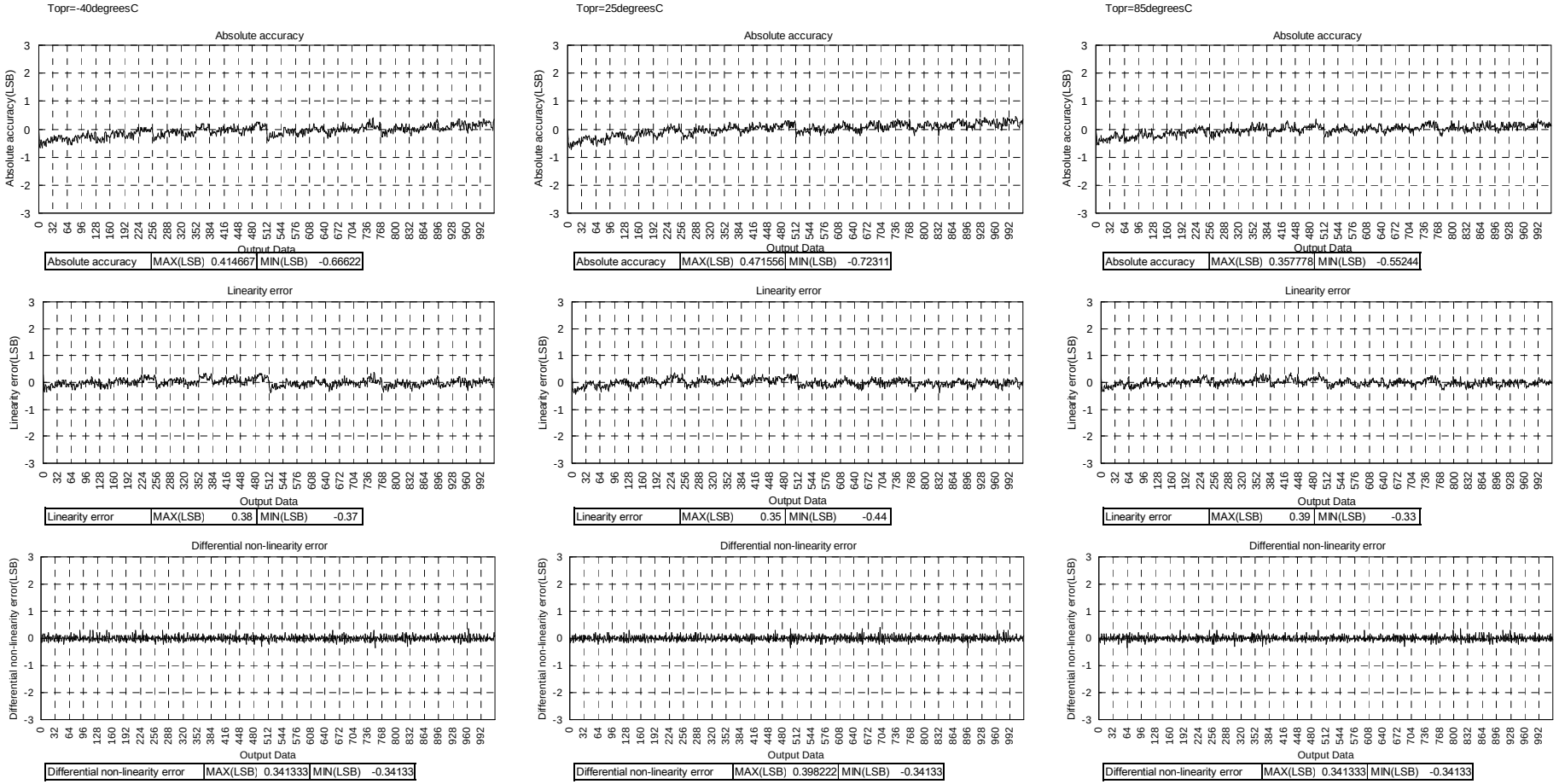


Figure26. Topr=-40(degrees C)

Figure27. Topr=25(degrees C)

Figure28. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

5.A/D Accuracy(5)

■ Related Pin

AN0-AN7、 AN0_0-AN0_7 、AN2_0-AN2_7、 ANEX0、ANEX1

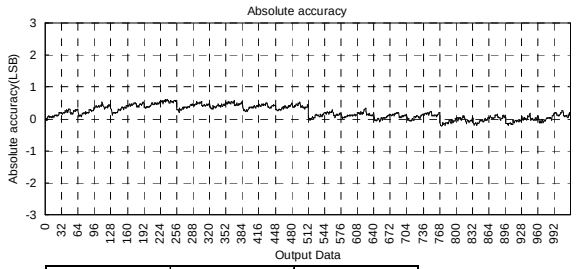
■Operating Condition

Topr=-40,25,85 (degrees C)

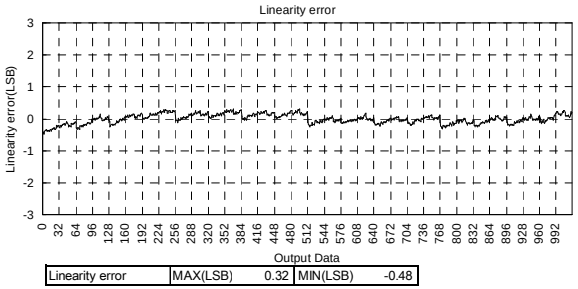
Vcc=AVcc=VREF =5.12V

φAD=20MHz (FOCO40M divided by 2)

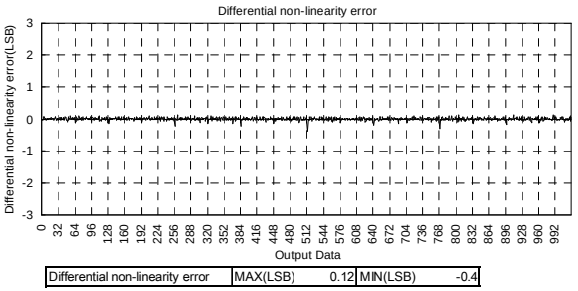
Topr=-40degreesC



Absolute accuracy	MAX(LSB)	0.61	MIN(LSB)	-0.23



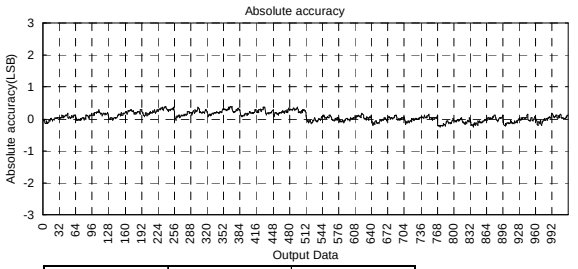
Linearity error	MAX(LSB)	0.32	MIN(LSB)	-0.48



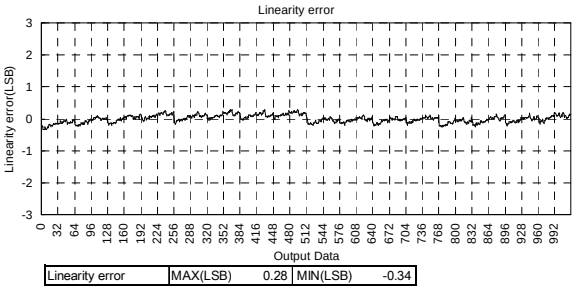
Differential non-linearity error	MAX(LSB)	0.12	MIN(LSB)	-0.4

Figure29. Topr=-40(degrees C)

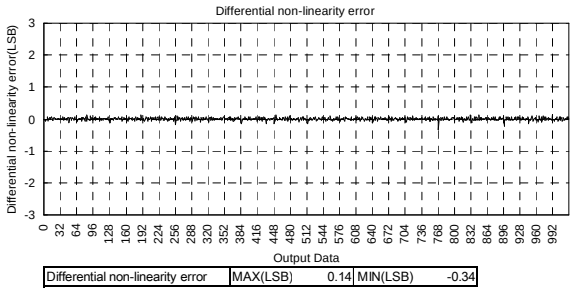
Topr=25degreesC



Absolute accuracy	MAX(LSB)	0.39	MIN(LSB)	-0.25



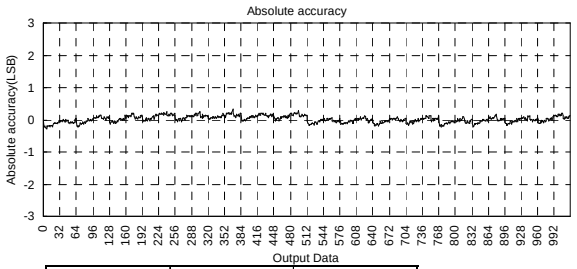
Linearity error	MAX(LSB)	0.28	MIN(LSB)	-0.34



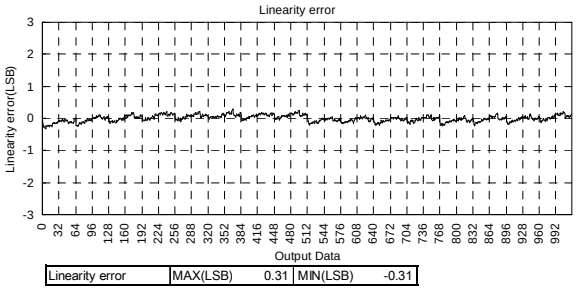
Differential non-linearity error	MAX(LSB)	0.14	MIN(LSB)	-0.34

Figure30. Topr=25(degrees C)

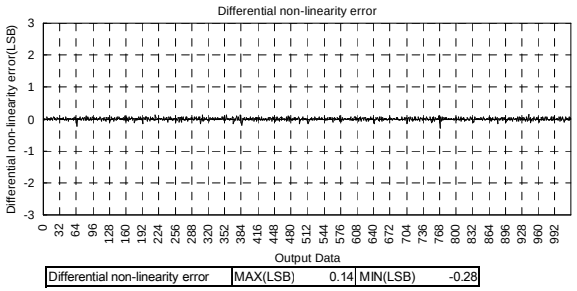
Topr=85degreesC



Absolute accuracy	MAX(LSB)	0.33	MIN(LSB)	-0.27



Linearity error	MAX(LSB)	0.31	MIN(LSB)	-0.31



Differential non-linearity error	MAX(LSB)	0.14	MIN(LSB)	-0.28

Figure31. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

5.A/D Accuracy(6)

■ Related Pin

AN0-AN7、 AN0_0-AN0_7 、AN2_0-AN2_7、 ANEX0、ANEX1

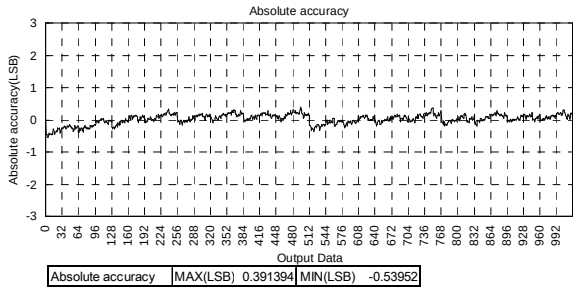
■Operating Condition

Topr=-40,25,85 (degrees C)

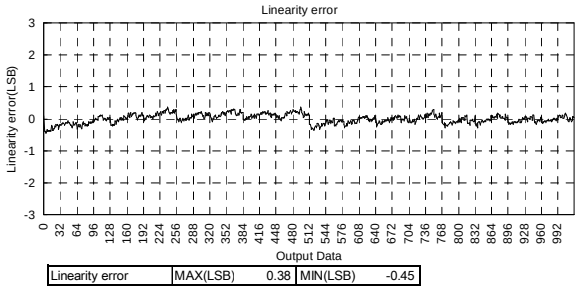
Vcc=AVcc=VREF =3.3V

φAD=13.3MHz (FOCO40M divided by 3)

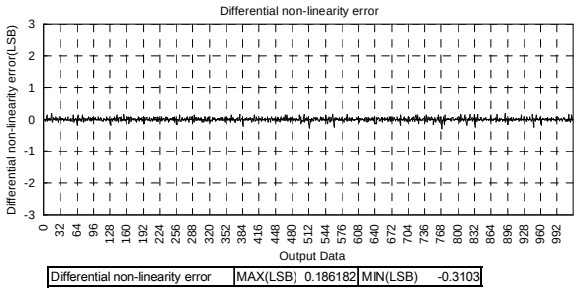
Topr=-40degreesC



Absolute accuracy	MAX(LSB) 0.391394	MIN(LSB) -0.53952



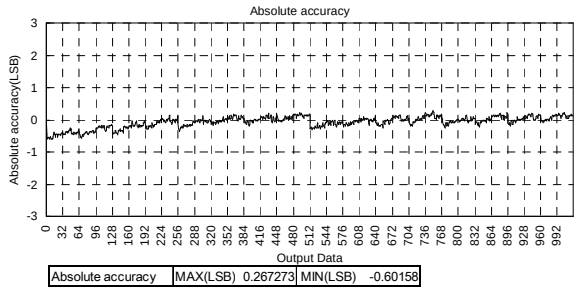
Linearity error	MAX(LSB) 0.38	MIN(LSB) -0.45



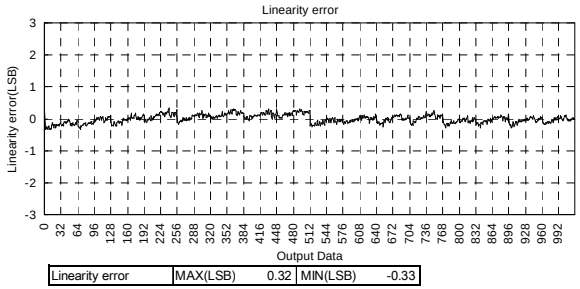
Differential non-linearity error	MAX(LSB) 0.186182	MIN(LSB) -0.3103

Figure32. Topr=-40(degrees C)

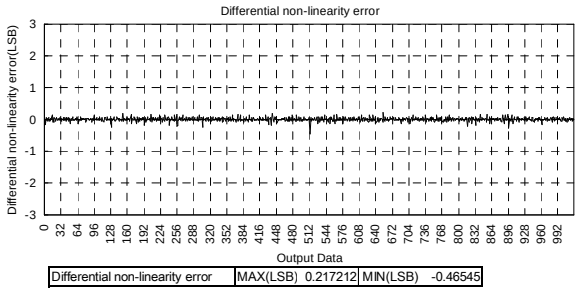
Topr=25degreesC



Absolute accuracy	MAX(LSB) 0.267273	MIN(LSB) -0.60158



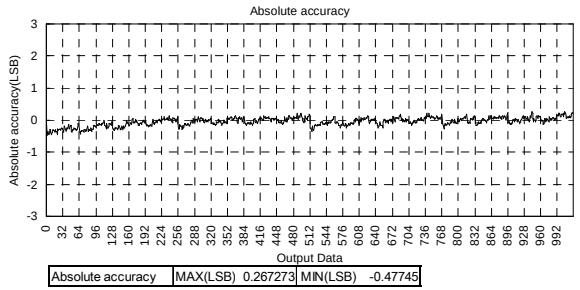
Linearity error	MAX(LSB) 0.32	MIN(LSB) -0.33



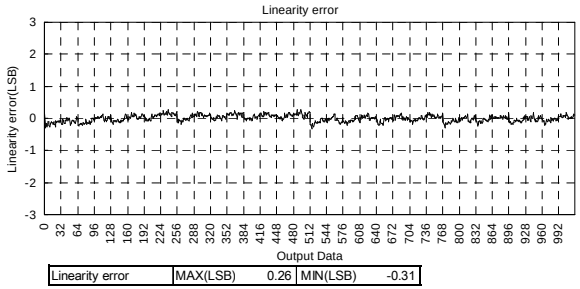
Differential non-linearity error	MAX(LSB) 0.217212	MIN(LSB) -0.46545

Figure33. Topr=25(degrees C)

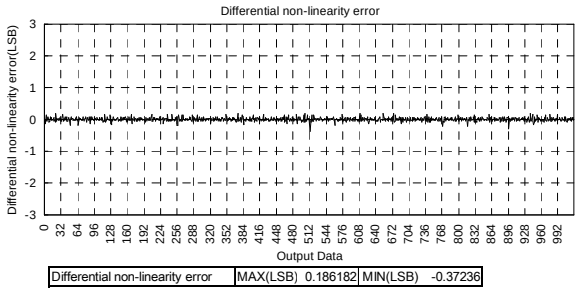
Topr=85degreesC



Absolute accuracy	MAX(LSB) 0.267273	MIN(LSB) -0.47745



Linearity error	MAX(LSB) 0.26	MIN(LSB) -0.31



Differential non-linearity error	MAX(LSB) 0.186182	MIN(LSB) -0.37236

Figure34. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

5.A/D Accuracy(7)

■ Related Pin

AN0-AN7、 AN0_0-AN0_7 、AN2_0-AN2_7、 ANEX0、ANEX1

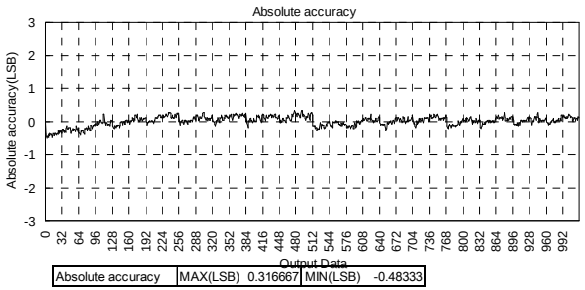
■Operating Condition

Topr=-40,25,85 (degrees C)

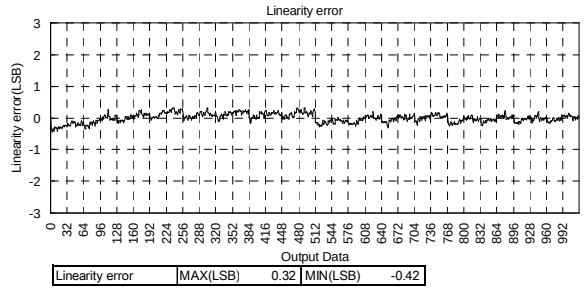
Vcc=AVcc=VREF =3.072V

φAD=10MHz (FOCO40M divided by 4)

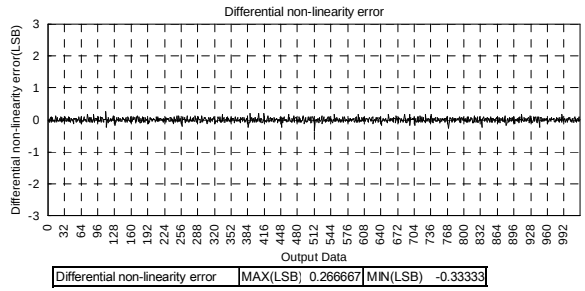
Topr=-40degreesC



Absolute accuracy	MAX(LSB) 0.316667	MIN(LSB) -0.48333



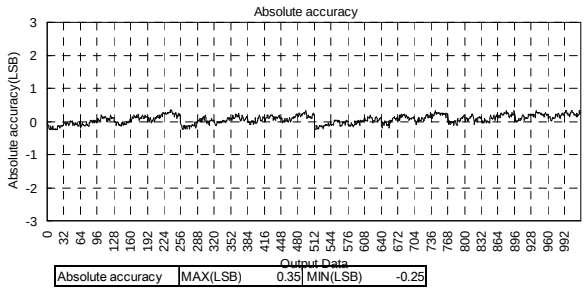
Linearity error	MAX(LSB) 0.32	MIN(LSB) -0.42



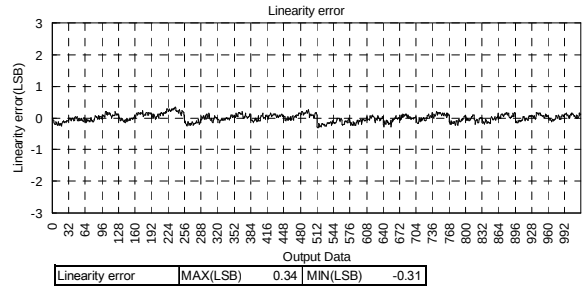
Differential non-linearity error	MAX(LSB) 0.266667	MIN(LSB) -0.33333

Figure35. Topr=-40(degrees C)

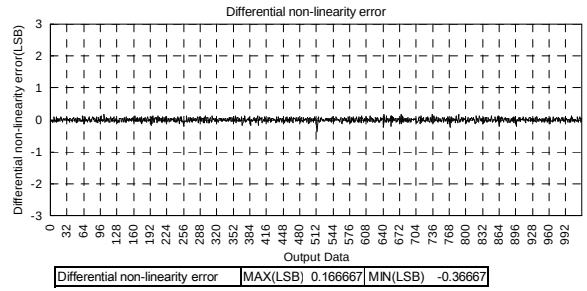
Topr=25degreesC



Absolute accuracy	MAX(LSB) 0.35	MIN(LSB) -0.25



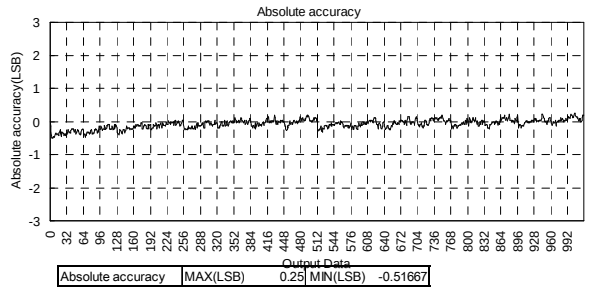
Linearity error	MAX(LSB) 0.34	MIN(LSB) -0.31



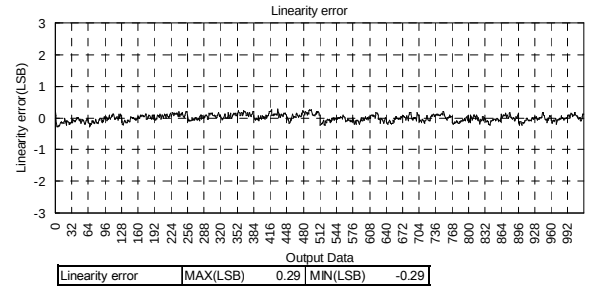
Differential non-linearity error	MAX(LSB) 0.166667	MIN(LSB) -0.36667

Figure36. Topr=25(degrees C)

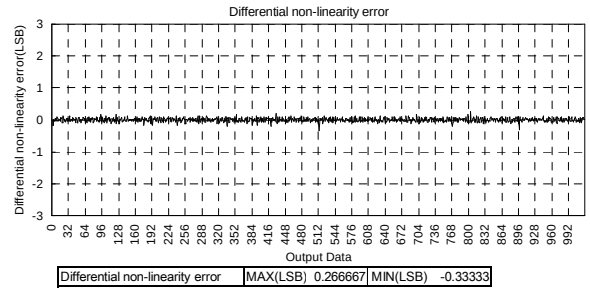
Topr=85degreesC



Absolute accuracy	MAX(LSB) 0.25	MIN(LSB) -0.51667



Linearity error	MAX(LSB) 0.29	MIN(LSB) -0.29



Differential non-linearity error	MAX(LSB) 0.266667	MIN(LSB) -0.33333

Figure37. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

5.A/D Accuracy(8)

■ Related Pin

AN0-AN7、 AN0_0-AN0_7 、AN2_0-AN2_7、 ANEX0、ANEX1

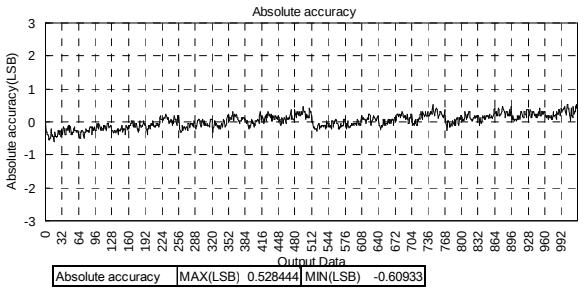
■Operating Condition

Topr=-40,25,85 (degrees C)

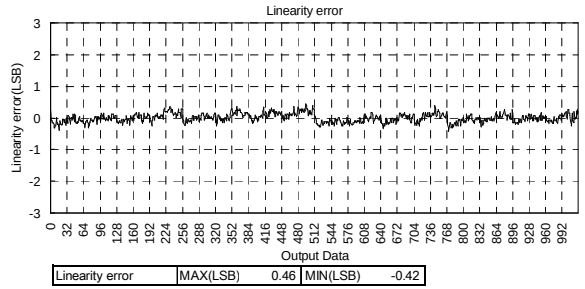
Vcc=AVcc=VREF =1.8V (Voltage multiplier ON)

φAD=5MHz (FOCO40M divided by 8)

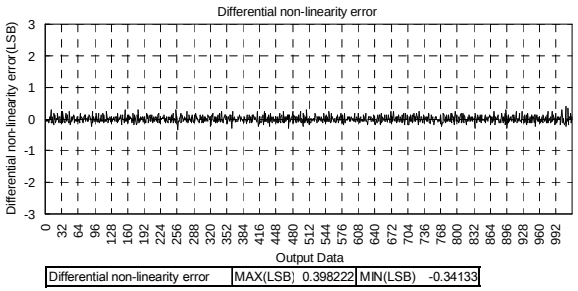
Topr=-40degreesC



Absolute accuracy	MAX(LSB) 0.528444	MIN(LSB) -0.60933



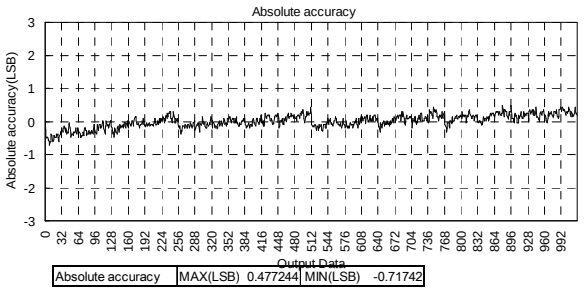
Linearity error	MAX(LSB) 0.46	MIN(LSB) -0.42



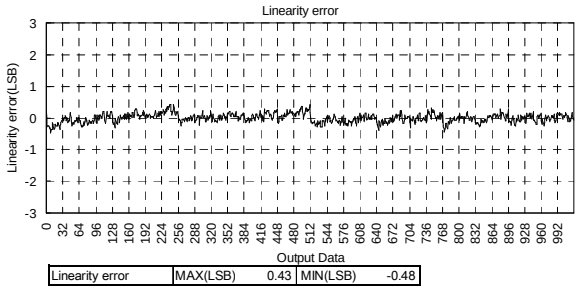
Differential non-linearity error	MAX(LSB) 0.398222	MIN(LSB) -0.34133

Figure38. Topr=-40(degrees C)

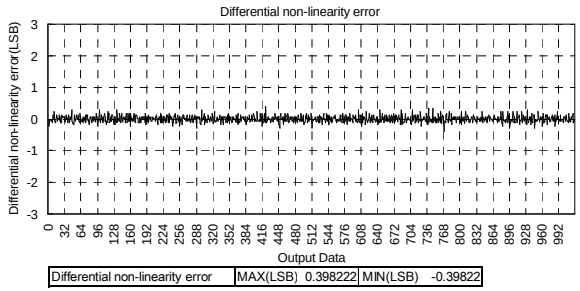
Topr=25degreesC



Absolute accuracy	MAX(LSB) 0.477244	MIN(LSB) -0.71742



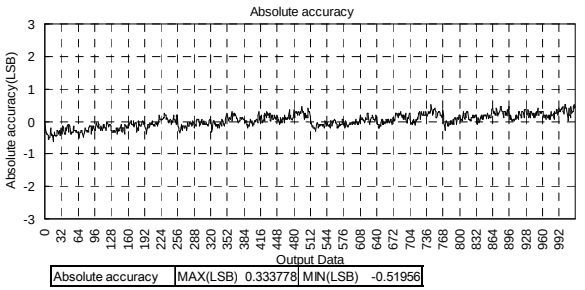
Linearity error	MAX(LSB) 0.43	MIN(LSB) -0.48



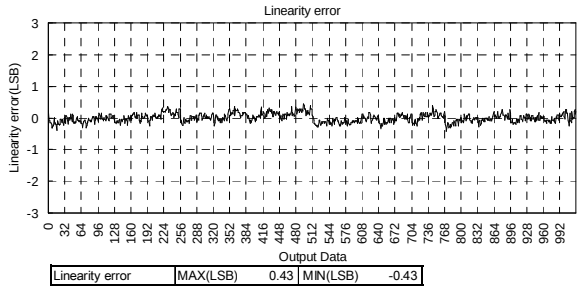
Differential non-linearity error	MAX(LSB) 0.398222	MIN(LSB) -0.39822

Figure39. Topr=25(degrees C)

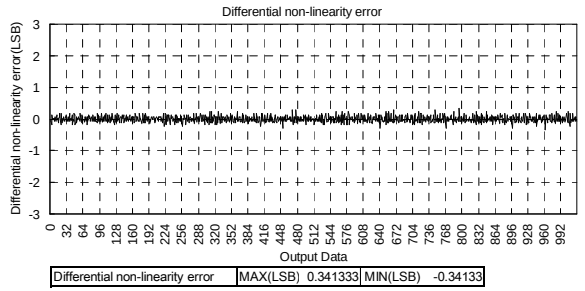
Topr=85degreesC



Absolute accuracy	MAX(LSB) 0.333778	MIN(LSB) -0.51956



Linearity error	MAX(LSB) 0.43	MIN(LSB) -0.43



Differential non-linearity error	MAX(LSB) 0.341333	MIN(LSB) -0.34133

Figure40. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

6.D/A Accuracy(1)

■ Related Pin
DA0、DA1

■Operating Condition
Topr=-40,25,85 (degrees C)
XIN CLOCK：20MHz
Vcc=5.12V

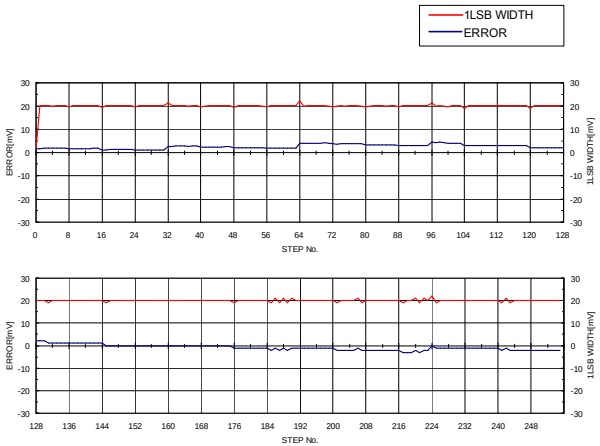


Figure41. Topr=-40(degrees C)

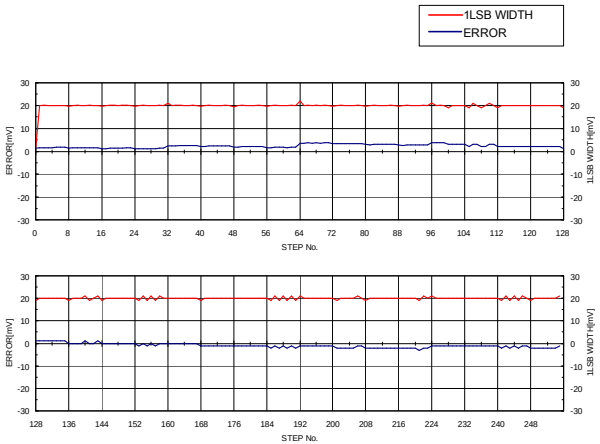


Figure42. Topr=25(degrees C)

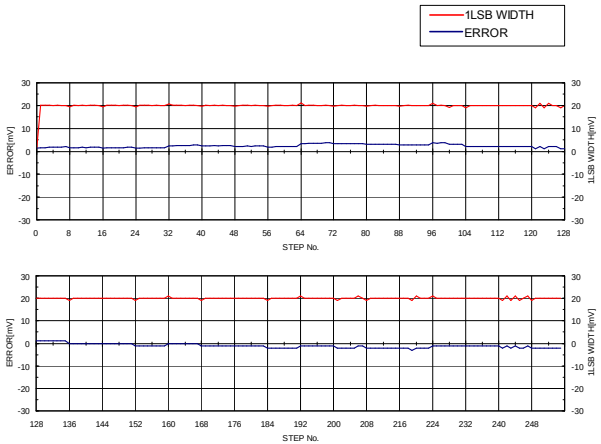


Figure43. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

6.D/A Accuracy(2)

■ Related Pin
DA0、DA1

■Operating Condition
Topr=-40,25,85 (degrees C)
XIN CLOCK：10MHz
Vcc=3.072V

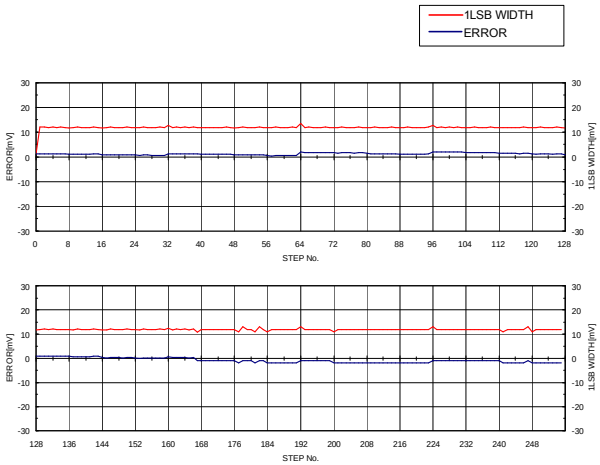


Figure44. Topr=-40(degrees C)

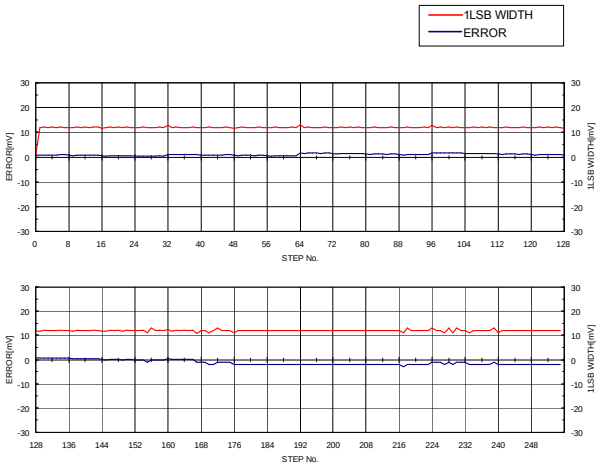


Figure45. Topr=25(degrees C)

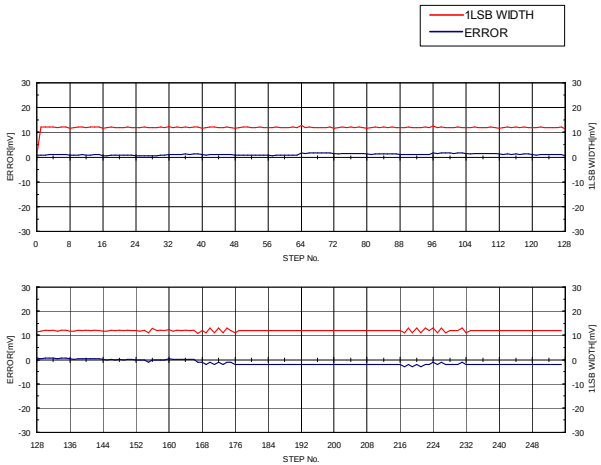


Figure46. Topr=85(degrees C)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(1)

(1)High-speedmode f(Xin)

1.Icc vs f(Xin)

■Operating Condition

XIN = 4 to 20 MHz (square wave)
125 kHz on-chip oscillator stop
Drive capacity High
Peripheral clock 0peration
Topr = 25(degrees C)

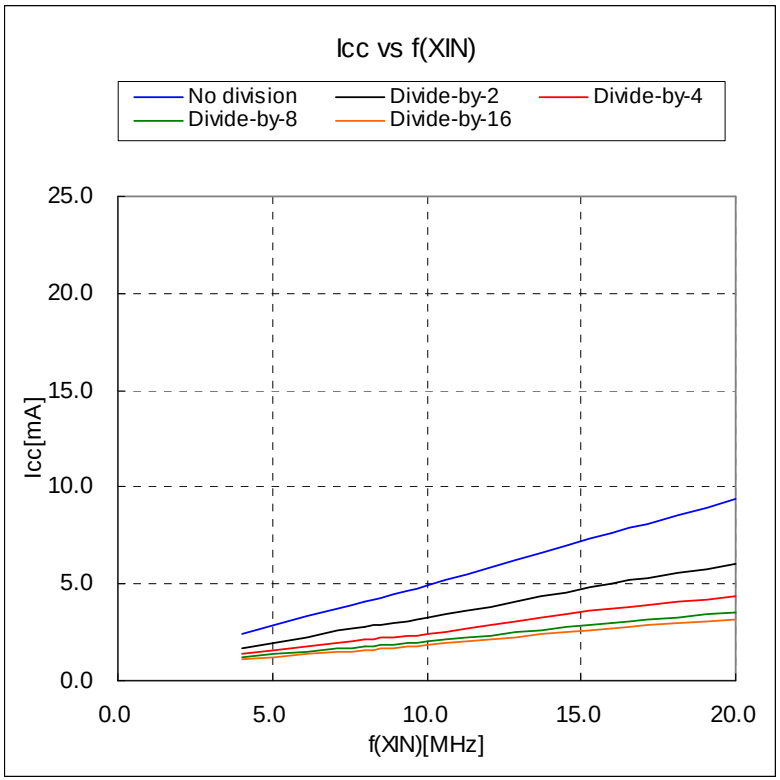


Figure47. Icc vs f(Xin) (Vcc=3.0V)

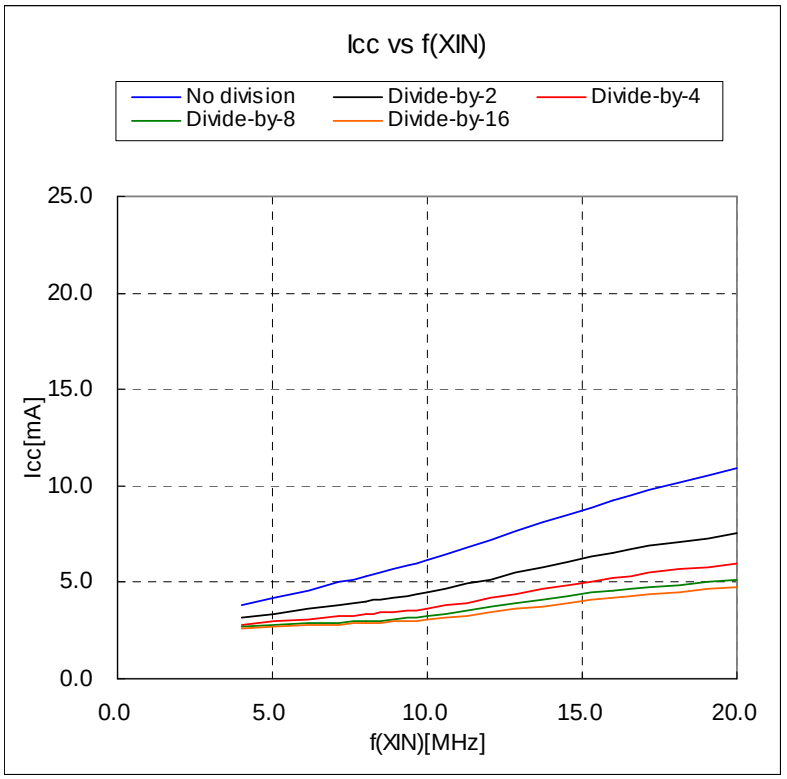


Figure48. Icc vs f(Xin) (Vcc=5.0V)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(2)

(1)High-speedmode f(Xin)

2.Icc vs Vcc

■Operating Condition
XIN = 4 MHz (square wave)
125 kHz on-chip oscillator stop
Drive capacity High
Peripheral clock 0peration
Topr = -40,25,85(degrees C)
No division

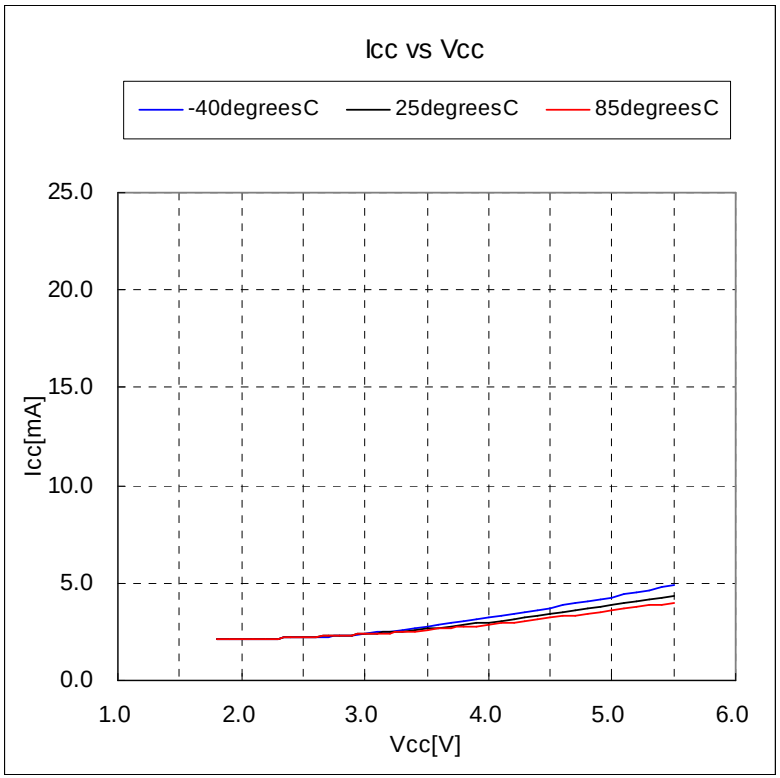


Figure49. Icc vs Vcc (f(Xin)=4MHz)

■Operating Condition
XIN = 8 MHz (square wave)
125 kHz on-chip oscillator stop
Drive capacity High
Peripheral clock 0peration
Topr = -40,25,85(degrees C)
No division

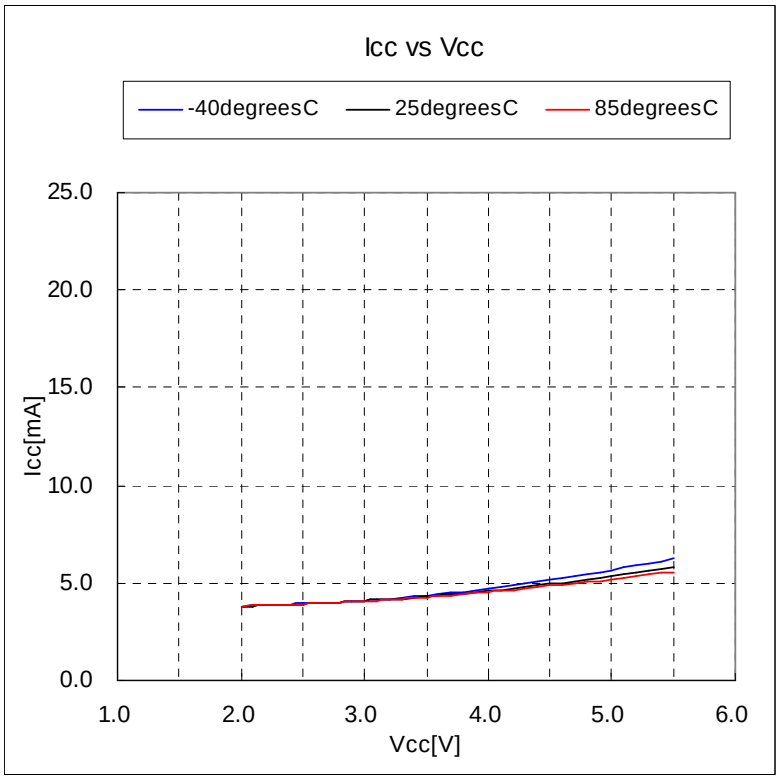


Figure50. Icc vs Vcc (f(Xin)=8MHz)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(3)

(1)High-speedmode f(Xin)

2.Icc vs Vcc

■Operating Condition
XIN = 10 MHz (square wave)
125 kHz on-chip oscillator stop
Drive capacity High
Peripheral clock 0peration
Topr = -40,25,85(degrees C)
No division

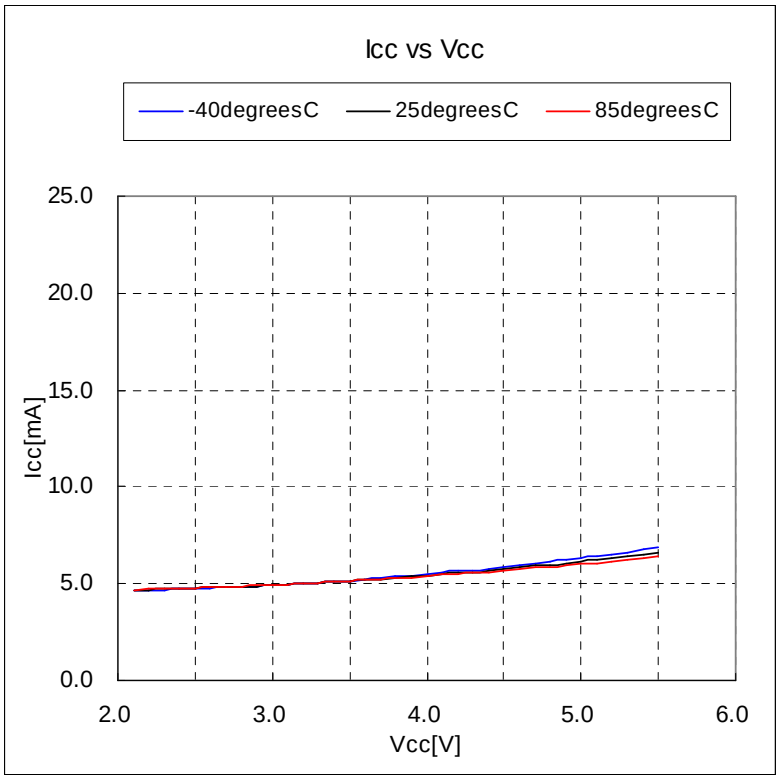


Figure51. Icc vs Vcc (f(Xin)=10MHz)

■Operating Condition
XIN = 20 MHz (square wave)
125 kHz on-chip oscillator stop
Drive capacity High
Peripheral clock 0peration
Topr = -40,25,85(degrees C)
No division

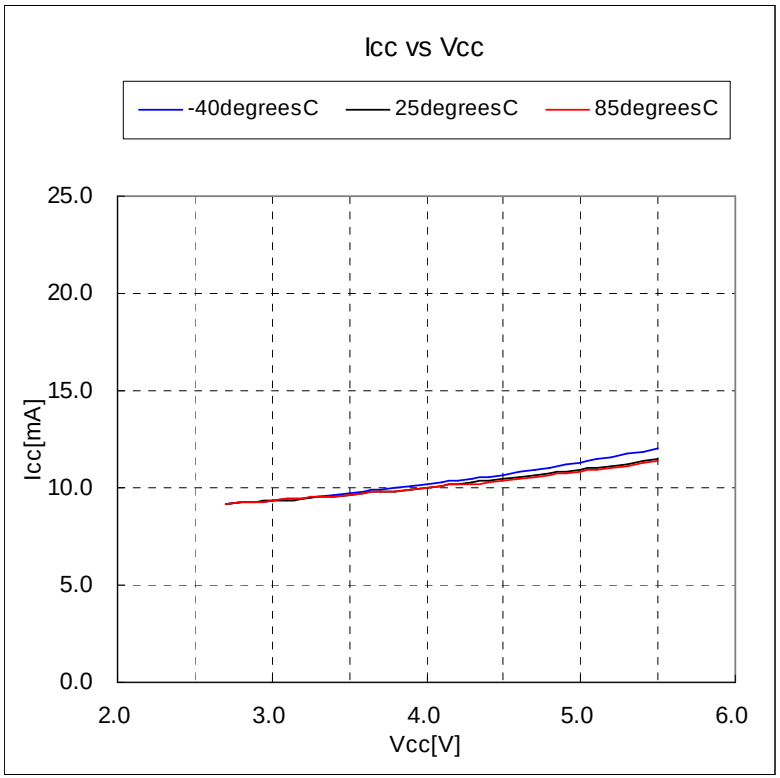


Figure52. Icc vs Vcc (f(Xin)=20MHz)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(4)

(1)High-speedmode f(Xin)

3.Icc vs Topr

■Operating Condition

XIN = 4,8,10,16,20 MHz (square wave)
125 kHz on-chip oscillator stop
Drive capacity High
Peripheral clock 0peration
Topr = -40 to 85(degrees C)
No division

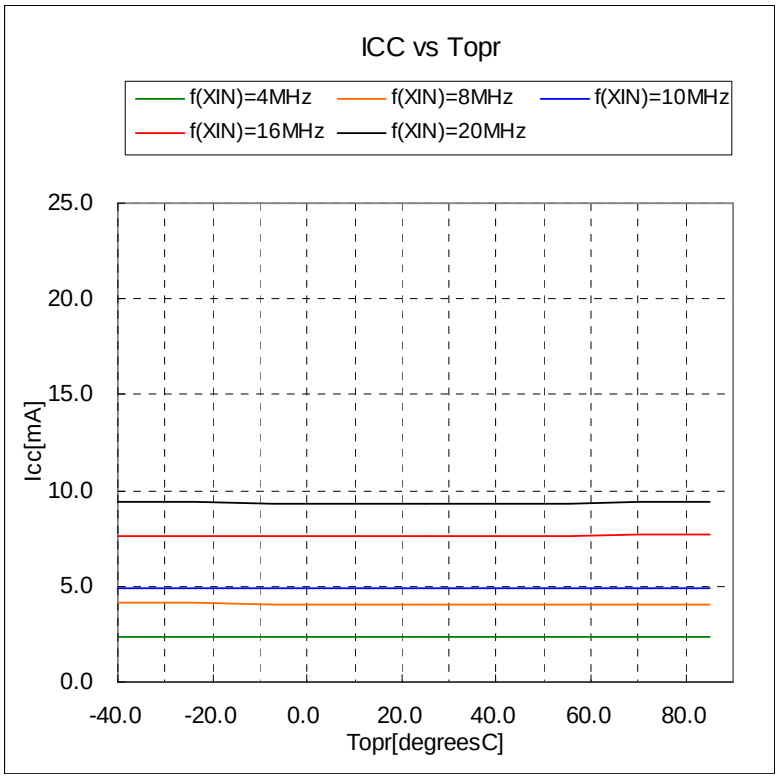


Figure53. Icc vs Topr (Vcc=3.0V)

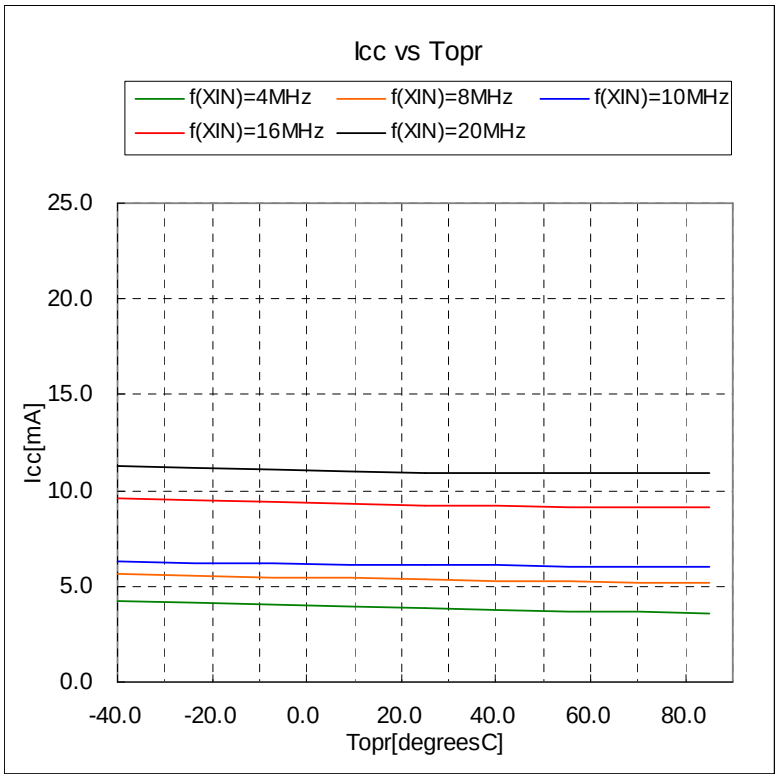


Figure54. Icc vs Topr (Vcc=5.0V)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(5)

(2)40MHz on-chip Oscillator mode

1.Icc vs Vcc

■Operating Condition
40MHz on-chip oscillator on
f(BCLK)=5,10,20MHz
Main clock stop
125kHz on-chip oscillator stop
Topr = 25(degrees C)

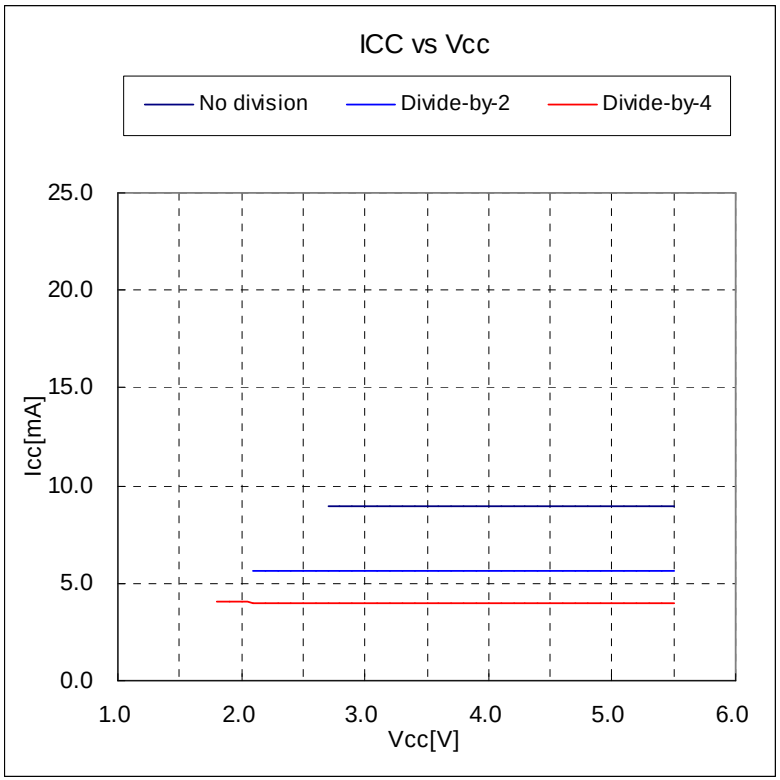


Figure55. Icc vs Vcc

2.Icc vs Topr

■Operating Condition
40MHz on-chip oscillator on
no division, f(BCLK)=20MHz
Main clock stop
125kHz on-chip oscillator stop
Topr = -40 to 85(degrees C)

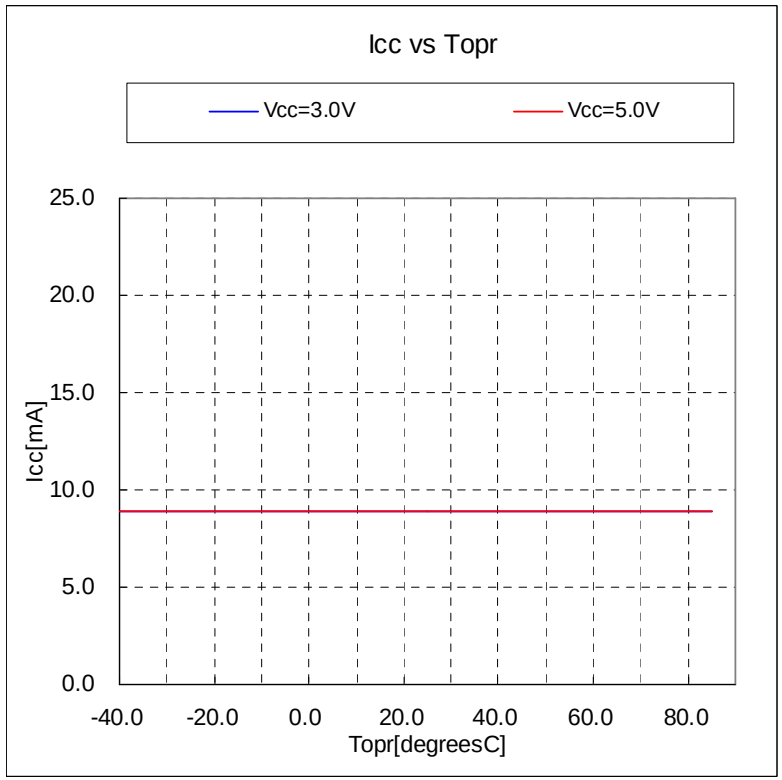


Figure56. Icc vs Topr

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(6)

(3)125kHz on-chip Oscillator mode

1.Icc vs Vcc

■Operating Condition
Main clock stop
125kHz on-chip oscillator on, no division
Topr = 25(degrees C)

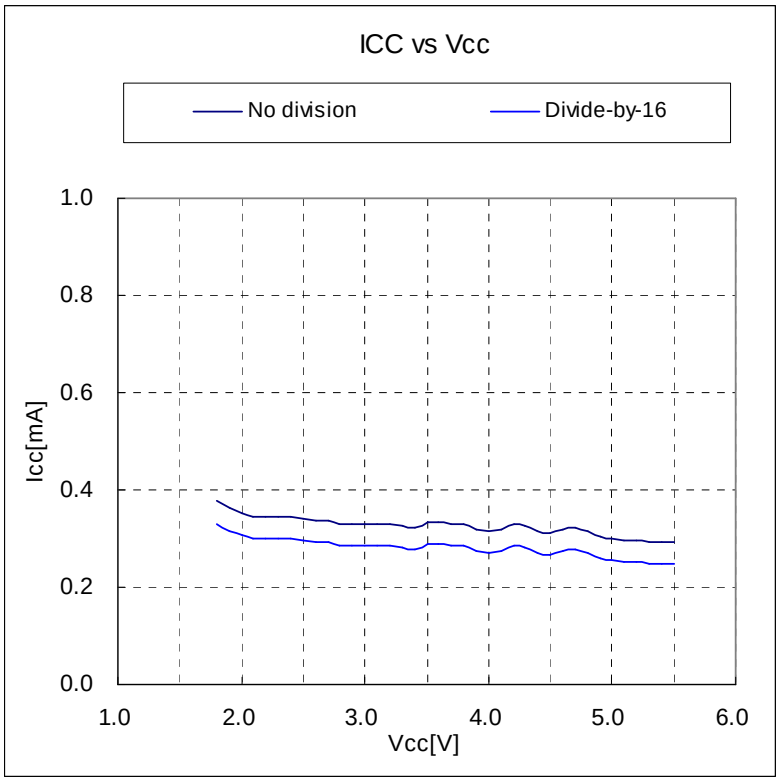


Figure57. Icc vs Vcc

■Operating Condition
Main clock stop
125kHz on-chip oscillator on, no division
FMR22=1
Topr = 25(degrees C)

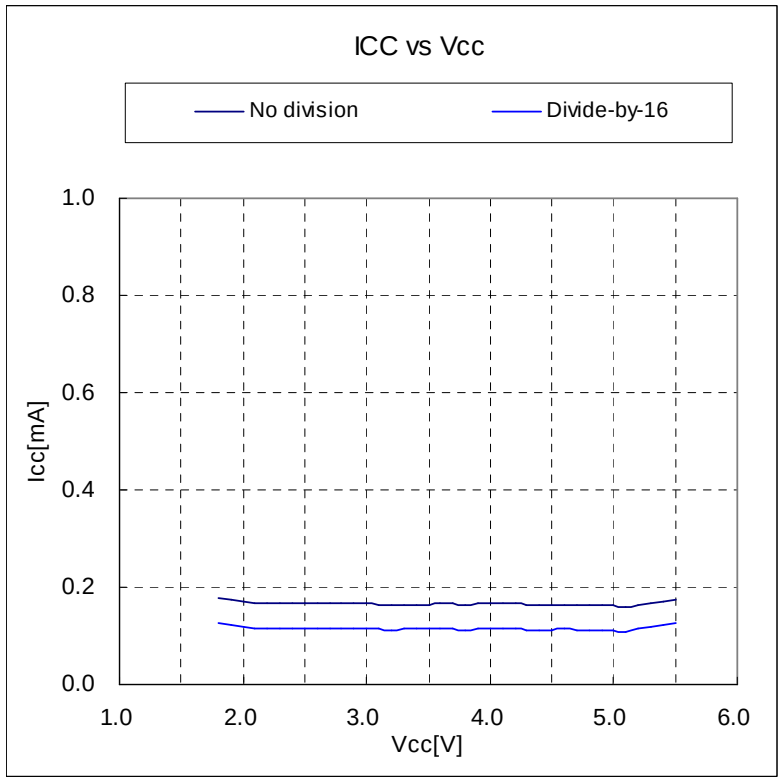


Figure58. Icc vs Vcc

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(7)

(3)125kHz on-chip Oscillator mode

2.Icc vs Topr

■Operating Condition
Main clock stop
125kHz on-chip oscillator on, no division
Topr = -40 to 85(degrees C)

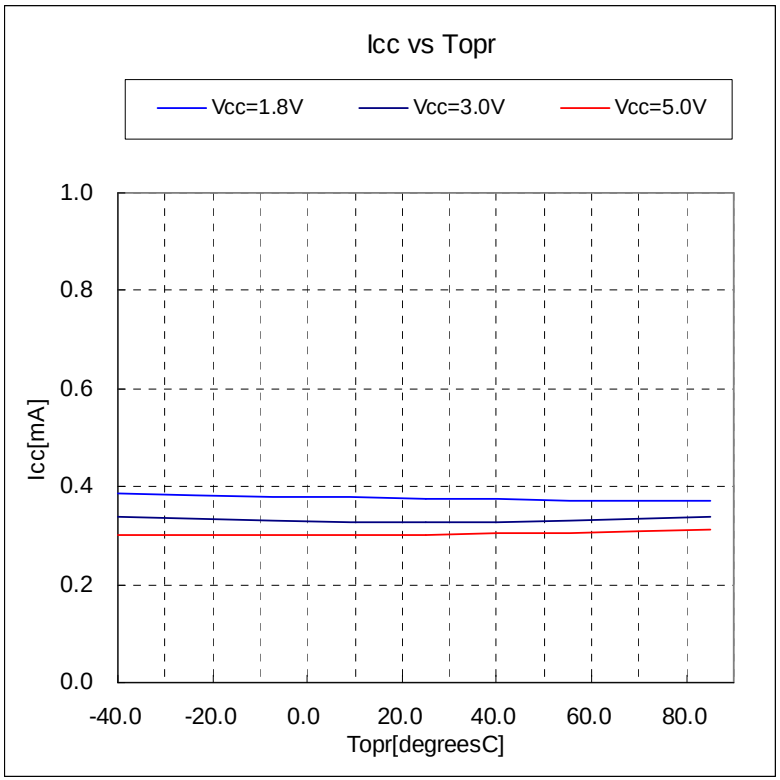


Figure59. Icc vs Topr

■Operating Condition
Main clock stop
125kHz on-chip oscillator on, no division
FMR22=1
Topr = -40 to 85(degrees C)

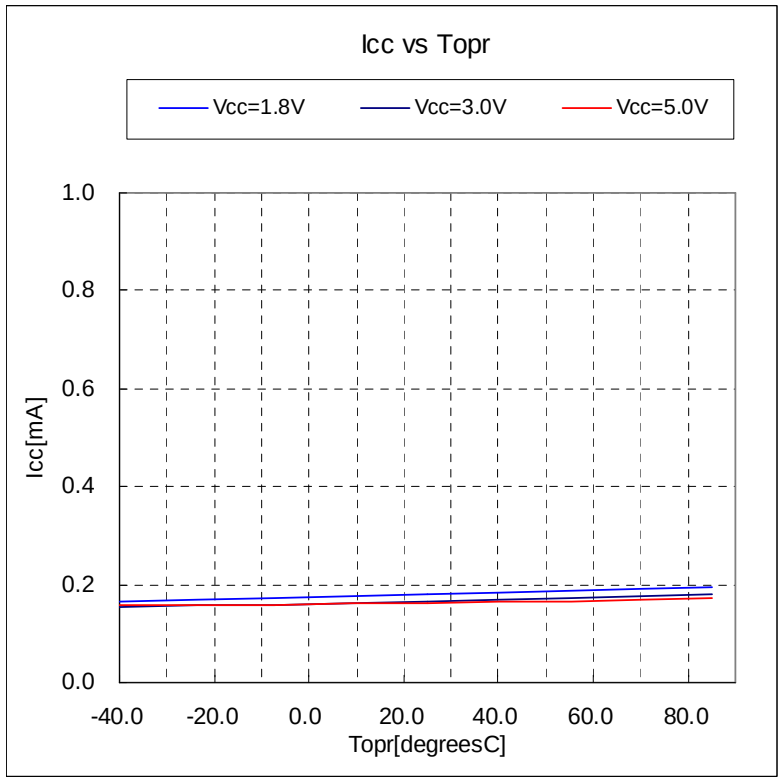


Figure60. Icc vs Topr

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(8)

(4)Low-Power mode f(Xcin)

1.Icc vs Vcc

■Operating Condition
f(Xcin) = 32kHz
In low-power mode
FMR22 = FMR23 = 1
on flash memory
Topr = -40,25,85(degrees C)

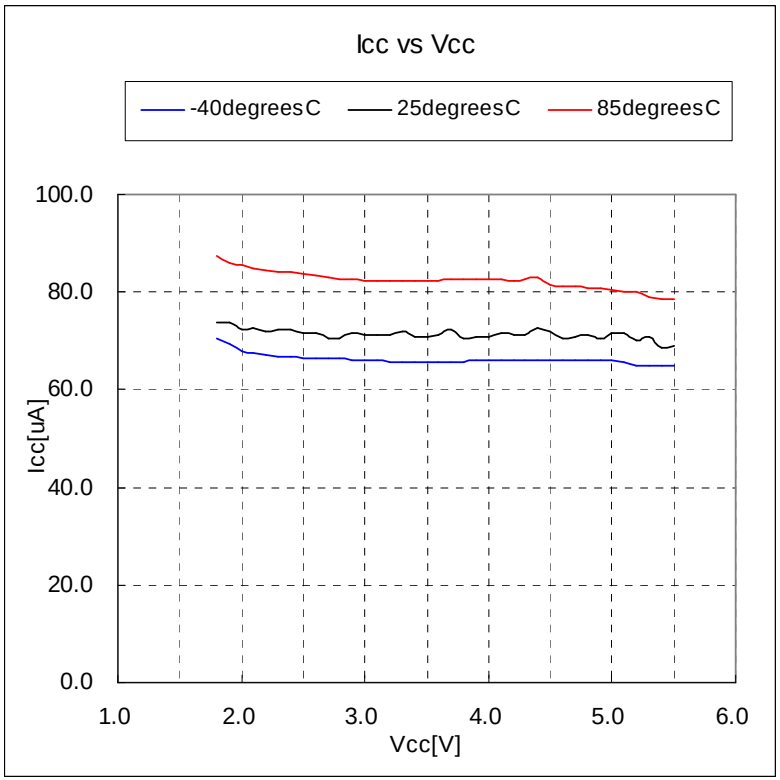


Figure61. Icc vs Vcc

■Operating Condition
f(Xcin) = 32kHz
In low-power mode
FMR22 = FMR23 = 1
on RAM
Topr = -40,25,85(degrees C)

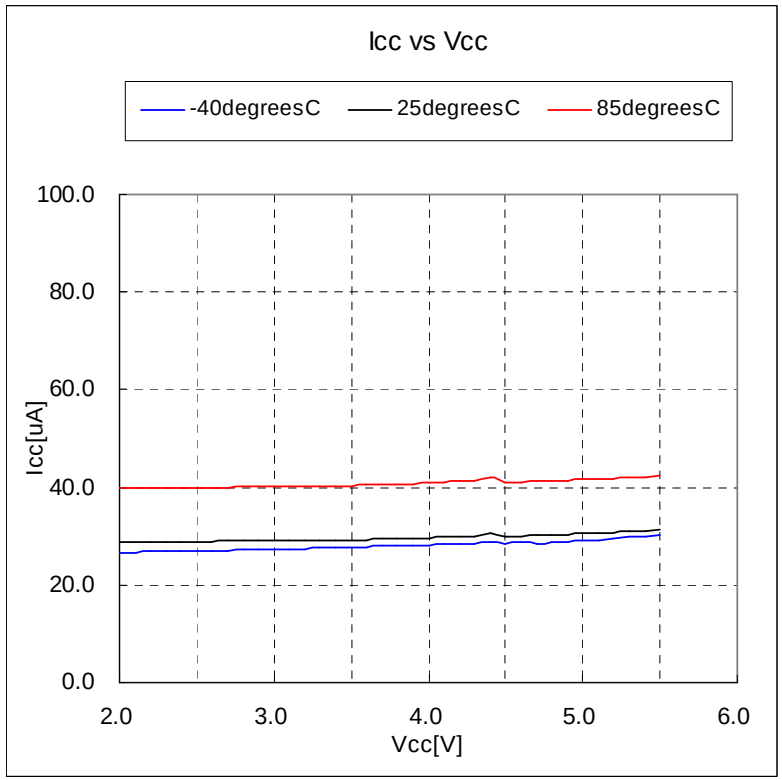


Figure62. Icc vs Vcc

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(9)

(4)Low-Power mode f(Xcin)

2.Icc vs Topr

■Operating Condition
f(Xcin) = 32kHz
In low-power mode
FMR22 = FMR23 = 1
on flash memory
Topr = -40 to 85(degrees C)

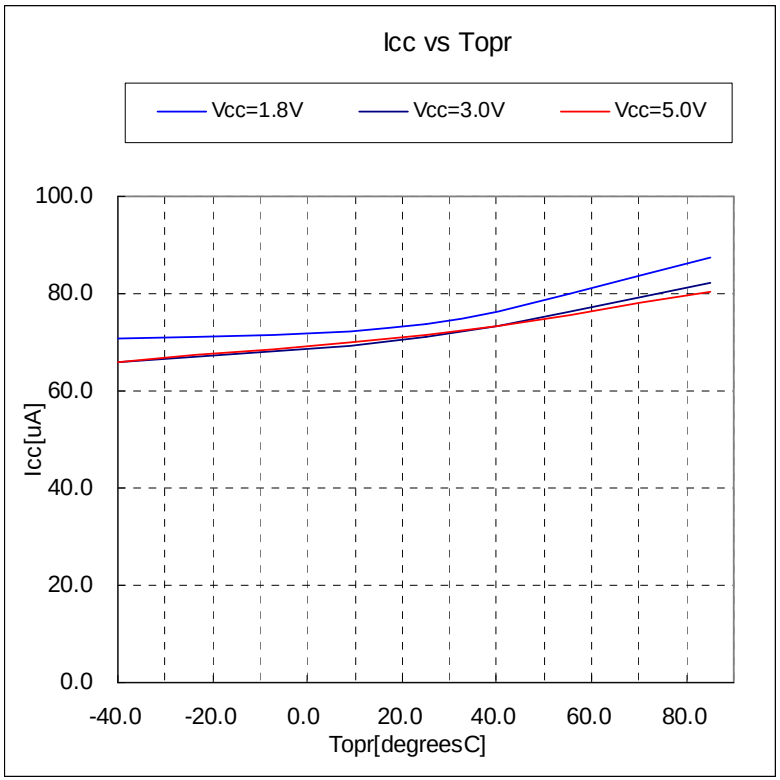


Figure63. Icc vs Topr

■Operating Condition
f(Xcin) = 32kHz
In low-power mode
FMSTP = 1
on RAM
Topr = -40 to 85(degrees C)

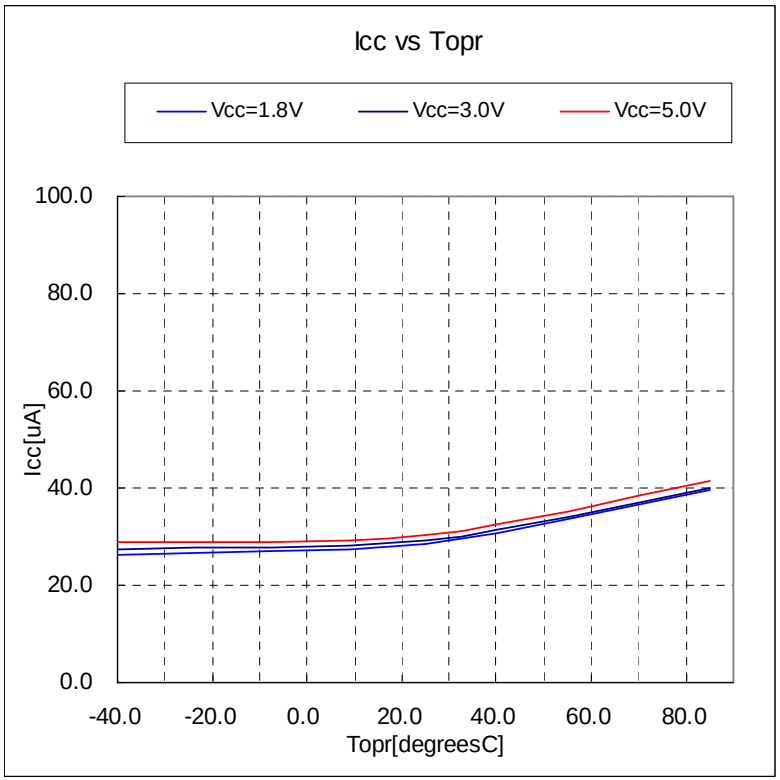


Figure64. Icc vs Topr

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(10)

(5)Wait mode f(Xcin)

1.Icc vs Vcc

■Operating Condition
f(Xcin) = 32kHz
40MHz on-chip oscillator stop
125kHz on-chip oscillator stop
Peripheral clock operation
Topr =-40,25,85(degrees C)

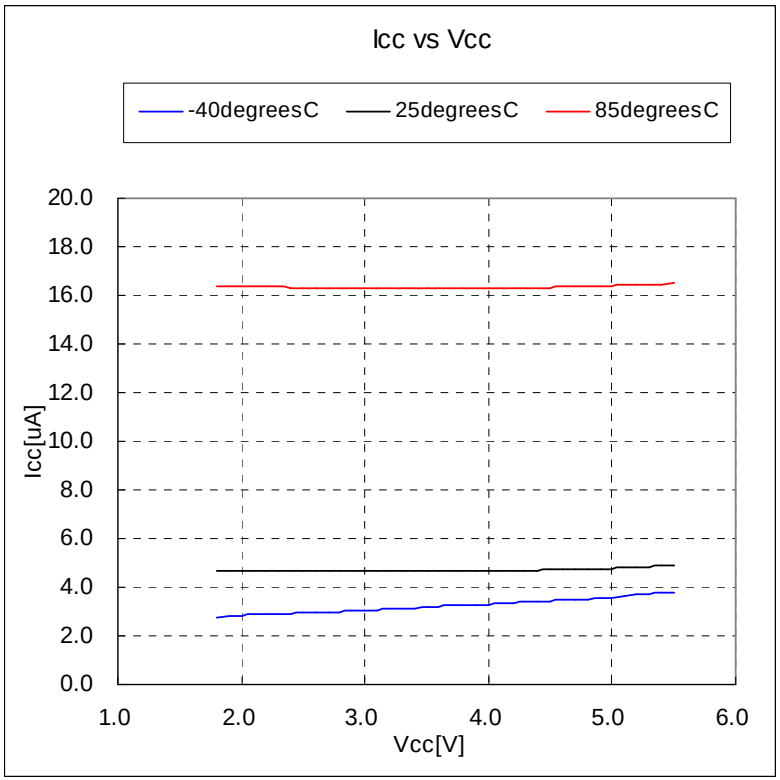


Figure65. Icc vs Vcc

2.Icc vs Topr

■Operating Condition
f(Xcin) = 32kHz
40MHz on-chip oscillator stop
125kHz on-chip oscillator stop
Peripheral clock operation
Topr = -40 to 85(degrees C)

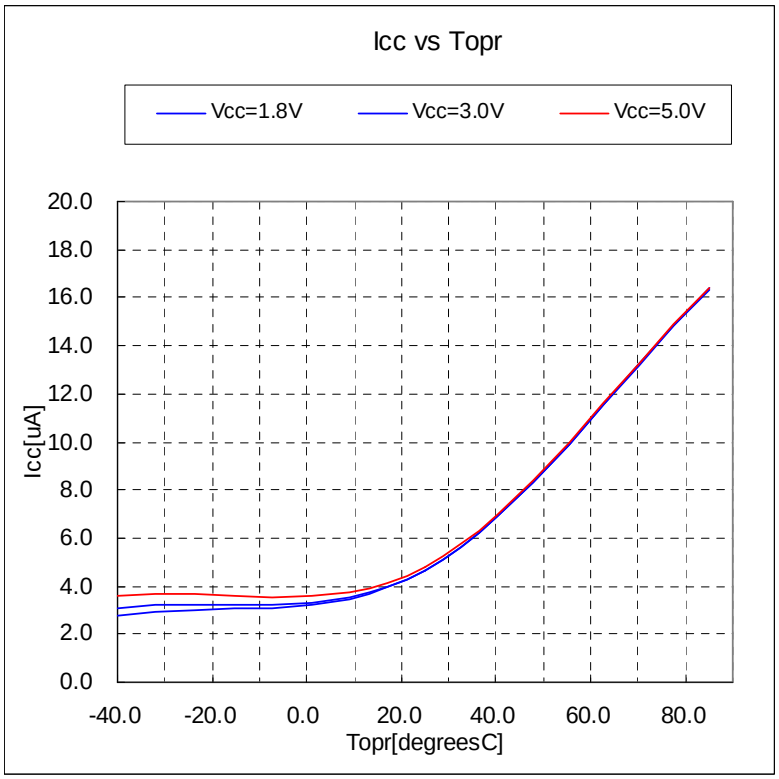


Figure66. Icc vs Topr

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(11)

(6)Wait mode f(OCO-S)

1.Icc vs Vcc

■Operating Condition
Main clock stop
40MHz on-chip oscillator stop
125kHz on-chip oscillator on
Peripheral clock operation
Topr = -40,25,85(degrees C)

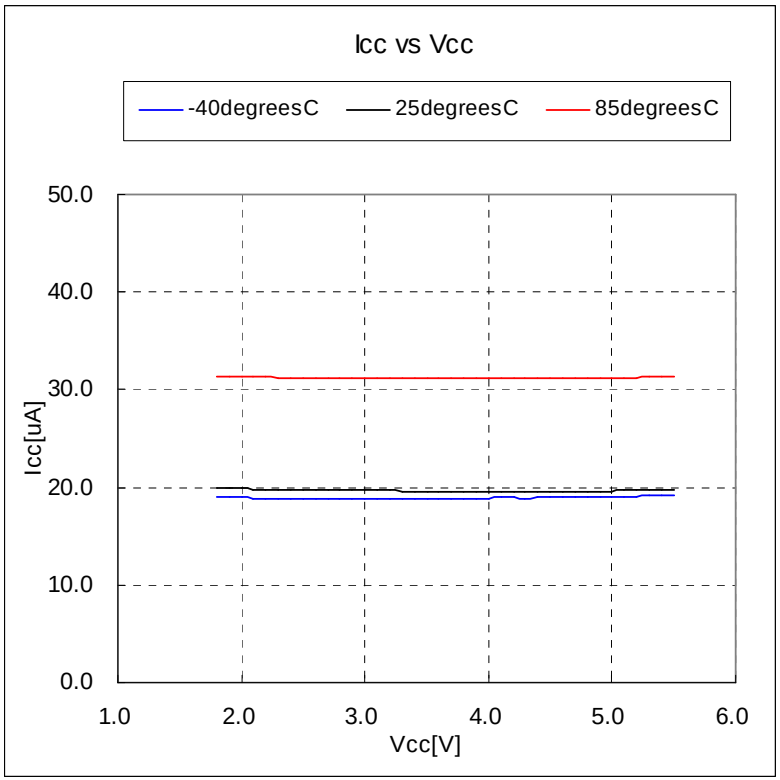


Figure67. Icc vs Vcc

■Operating Condition
Main clock stop
40MHz on-chip oscillator stop
125kHz on-chip oscillator on
Peripheral clock stop
Topr = -40,25,85(degrees C)

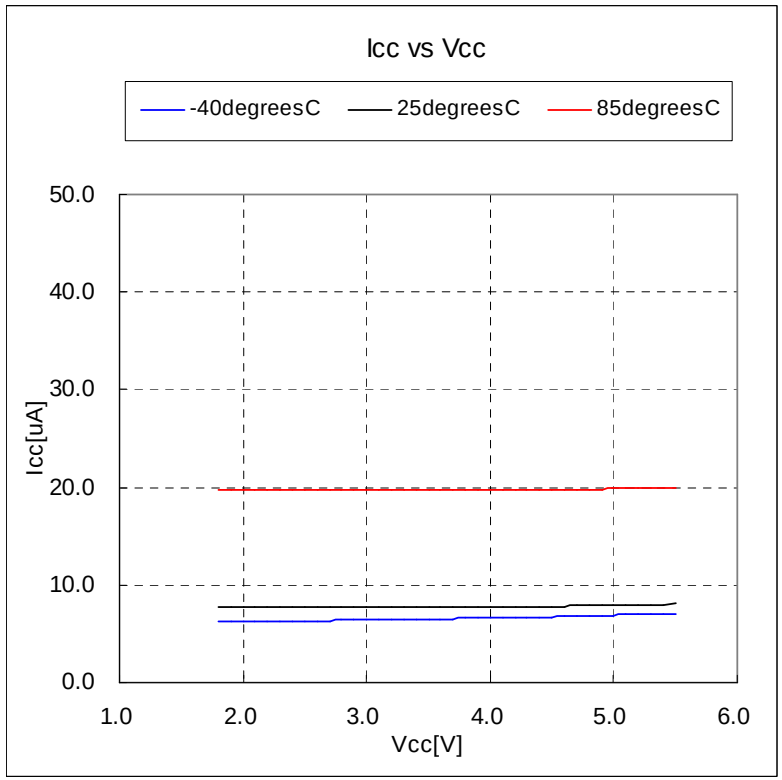


Figure68. Icc vs Vcc

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(12)

(6)Wait mode f(OCO-S)

2.Icc vs Topr

■Operating Condition
Main clock stop
40MHz on-chip oscillator stop
125kHz on-chip oscillator on
Peripheral clock operation
Topr = -40 to 85(degrees C)

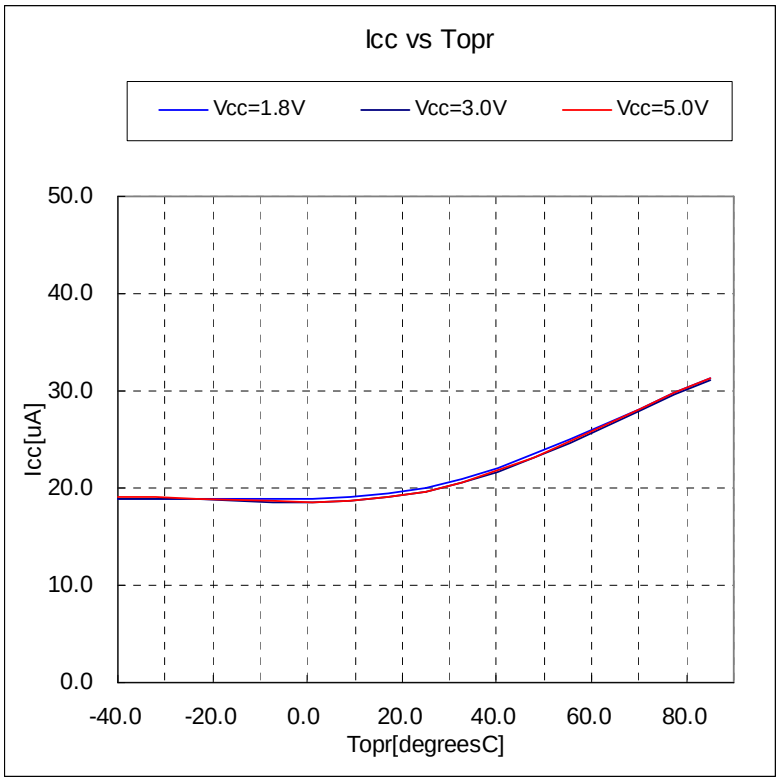


Figure69. Icc vs Topr

■Operating Condition
Main clock stop
40MHz on-chip oscillator stop
125kHz on-chip oscillator on
Peripheral clock stop
Topr = -40 to 85(degrees C)

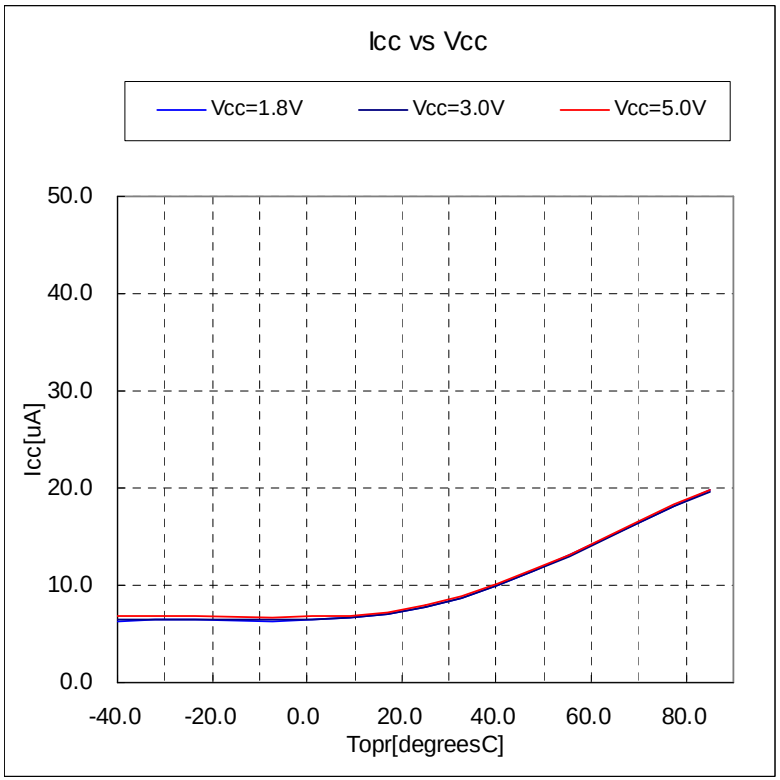


Figure70. Icc vs Topr

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(13)

(7)Stop mode

1.Icc vs Vcc

■Operating Condition
Main clock stop
40MHz on-chip oscillator stop
125kHz on-chip oscillator stop
Peripheral clock stop
Topr = -40,25,85(degrees C)

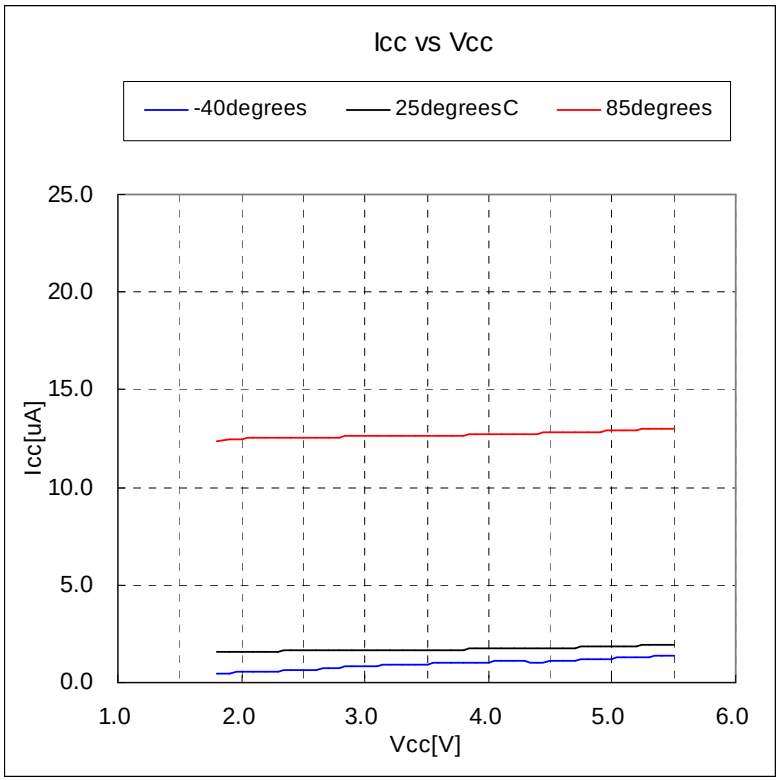


Figure71. Icc vs Vcc

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(14)

(7)Stop mode

2.Icc vs Topr

■Operating Condition
Main clock stop
40MHz on-chip oscillator stop
125kHz on-chip oscillator stop
Peripheral clock stop
Topr = -40 to 85(degrees C)

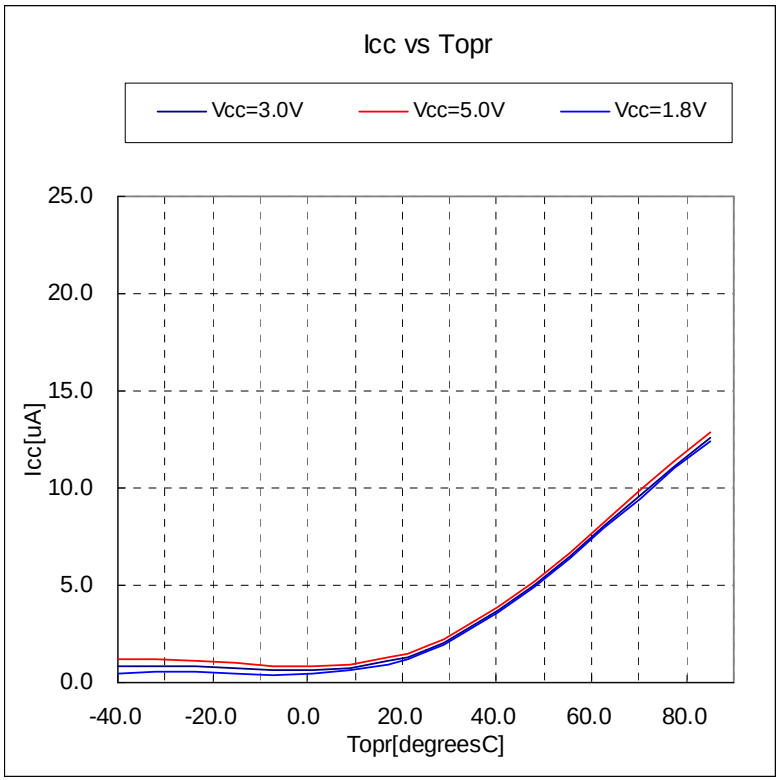


Figure72. Icc vs Topr

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(15)

(8)During A/D conversion

■Operating Condition
f(BCLK) = φAD = 10MHz
Vcc1 = Vcc2 = VREF
Topr = 25(degrees C)
No division

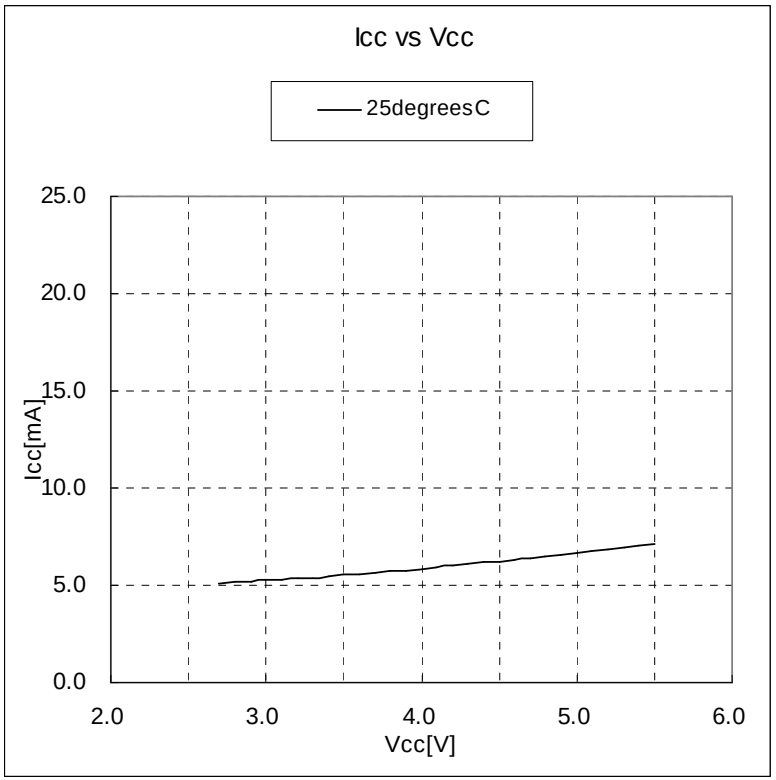


Figure73. Icc vs Vcc

■Operating Condition
f(BCLK) = φAD = 20MHz
Vcc1 = Vcc2 = VREF
Topr = 25(degrees C)
No division

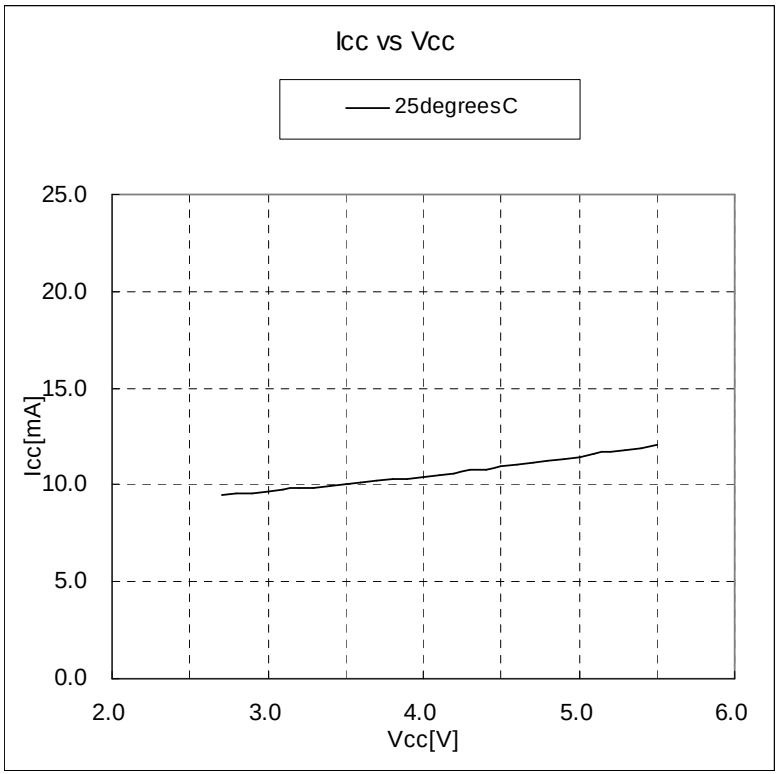


Figure74. Icc vs Vcc

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

7.Power supply current(16)

(9)During flash memory erase / program

■Operating Condition
f(BCLK) = 4 to 10MHz
PM17 = 1 (one wait)
Vcc=3.0V
Topr = 25(degrees C)
No division

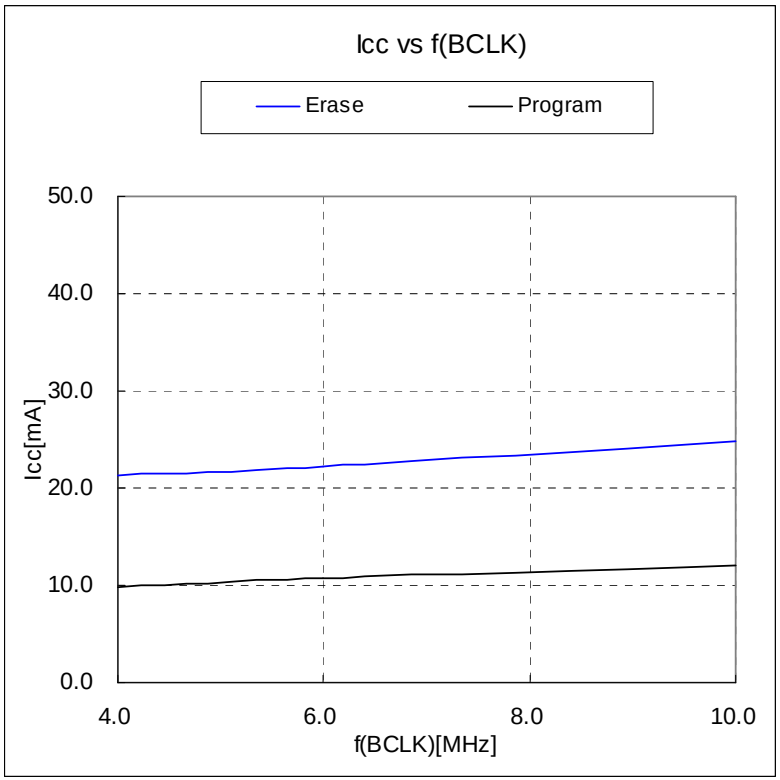


Figure75. Icc vs f(BCLK) (Vcc=3.0V)

■Operating Condition
f(BCLK) = 4 to 10MHz
PM17 = 1 (one wait)
Vcc=5.0V
Topr = 25(degrees C)
No division

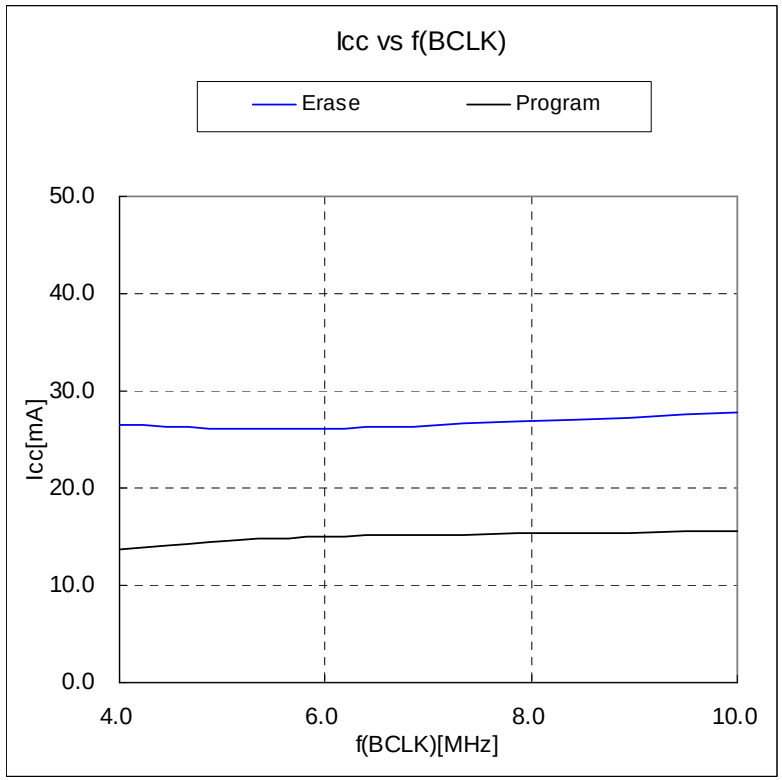


Figure76. Icc vs f(BCLK) (Vcc=5.0V)

The mentioned value is only for your reference. The value is for the arbitrary samples and does not guarantee the product's characteristics.

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