Standard Characteristics Example

Standard characteristics described below are just examples of the 3803H Group(QzROM version)'s characteristics and are not guaranteed.
For rated values, refer to "3803 Group (Spec.H QzROM version) Datasheet".

(1) Power Supply Current Standard Characteristics Example (Vcc-Icc)

When system is operating in high-speed mode (ceramic oscillation, Ta = 25 °C, output transistor is in the cut-off state)

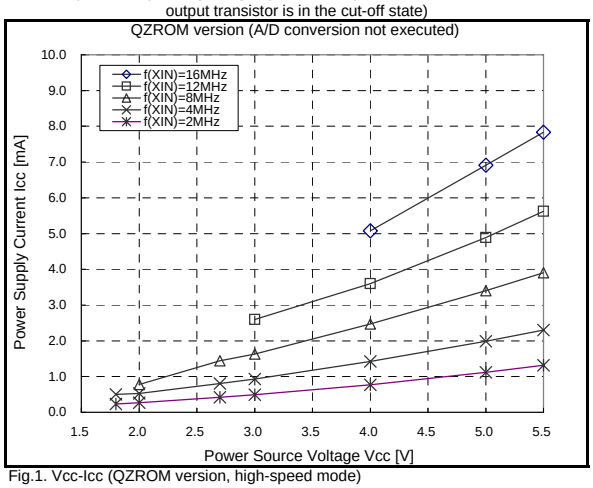

Fig.1. Vcc-Icc (QZROM version, high-speed mode)

When system is operating in middle-speed mode (ceramic oscillation, Ta = 25 °C output transistor is in the cut-off state)

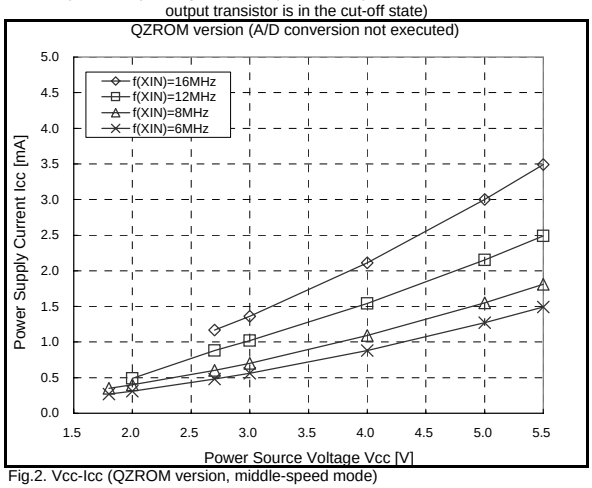

Fig.2. Vcc-Icc (QZROM version, middle-speed mode)

When system is operating in low-speed mode (crystal oscillation, Ta = 25 °C, f(XCIN)=32.768KHz, output transistor is in the cut-off state)

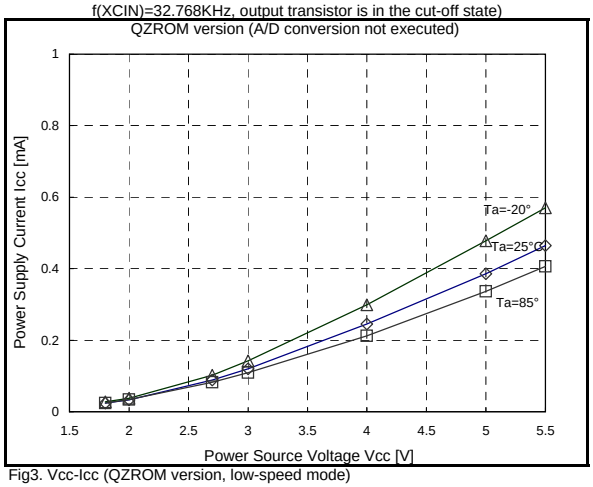

Fig3. Vcc-Icc (QZROM version, low-speed mode)

At STP instruction executed (Ta = 25 °C, output transistor is in the cut-off state)

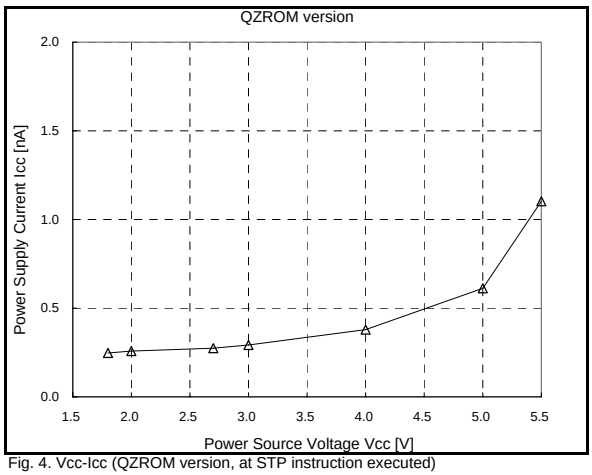

Fig. 4. Vcc-Icc (QZROM version, at STP instruction executed)

At 16 MHz high-speed mode, increment at A/D conversion executed (ceramic oscillation, Ta = 25 °C, output transistor is in the cut-off state)

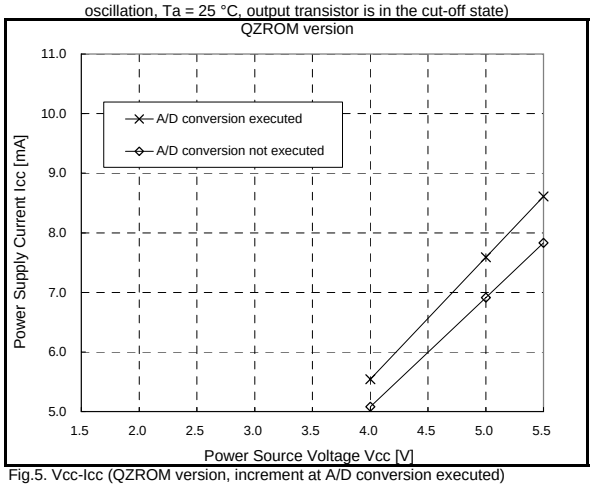

Fig.5. Vcc-Icc (QZROM version, increment at A/D conversion executed)

At WIT instruction executed (ceramic oscillation, Ta = 25 °C,f(XIN)=16MHz, output transistor is in the cut-off state)

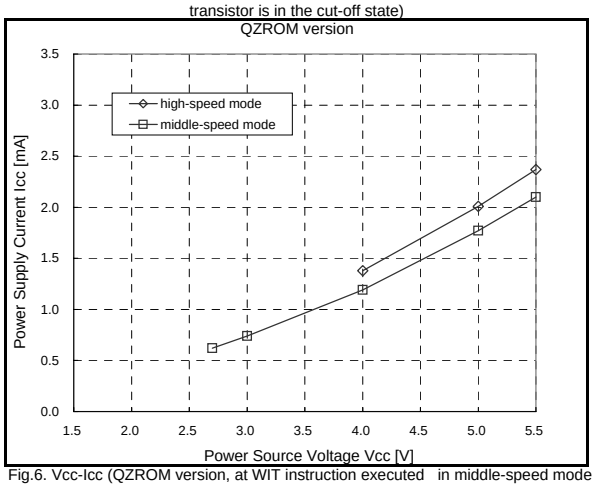

Fig.6. Vcc-Icc (QZROM version, at WIT instruction executed in middle-speed mode)

At WIT instruction executed (crystal oscillation, Ta = 25 °C, f(XCIN)=32.768KHz, output transistor is in the cut-off state)

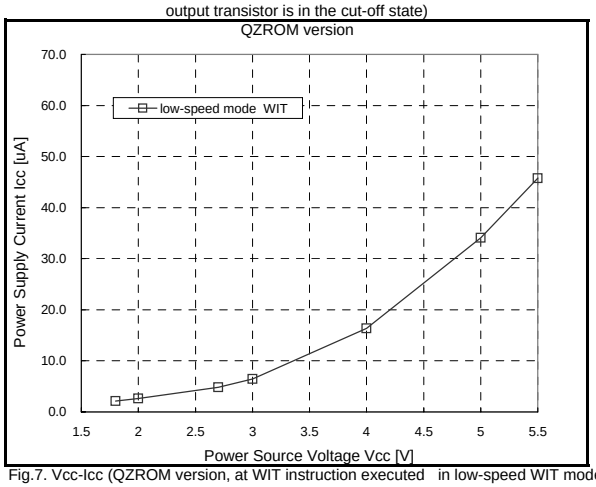

Fig.7. Vcc-Icc (QZROM version, at WIT instruction executed in low-speed WIT mode)

(2) Power Supply Current Standard Characteristics Example (f(XIN) -Icc)

When system is operating in high-speed mode (ceramic oscillation, Ta = 25 °C, output transistor is in the cut-off state)

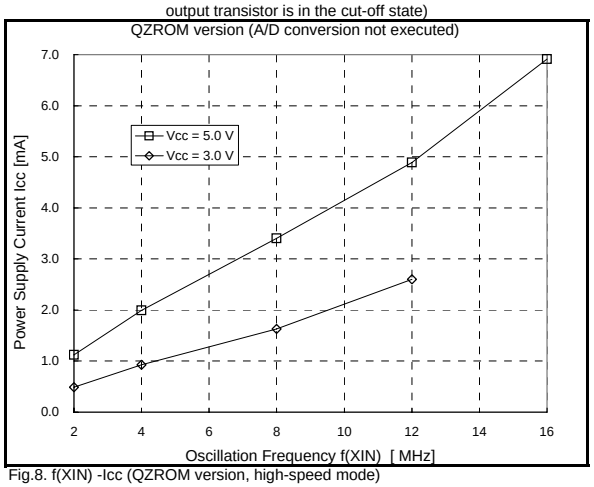

Fig.8. f(XIN) -Icc (QZROM version, high-speed mode)

When system is operating in middle-speed mode (ceramic oscillation, Ta = 25 °C output transistor is in the cut-off state)

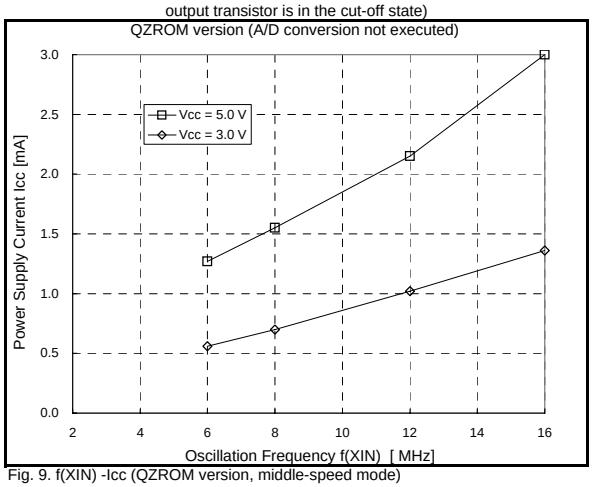

Fig. 9. f(XIN) -Icc (QZROM version, middle-speed mode)

At WIT instruction executed in middle-speed mode (ceramic oscillation, Ta = 90 °C, output transistor is in the cut-off state)

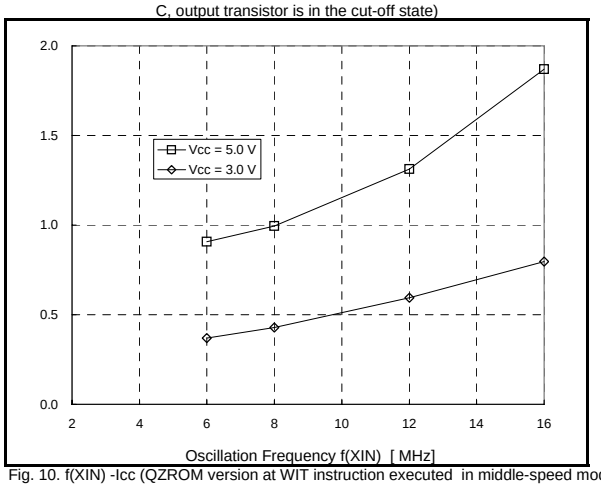

Fig. 10. f(XIN) -Icc (QZROM version at WIT instruction executed in middle-speed mode)

(3) Port Standard characteristics Example (VOH-IOH)

VOH-IOH (Vcc = 5.0 V, Ports P0, P1, P2, P30, P31, P34-P37, P4, P5, P6)

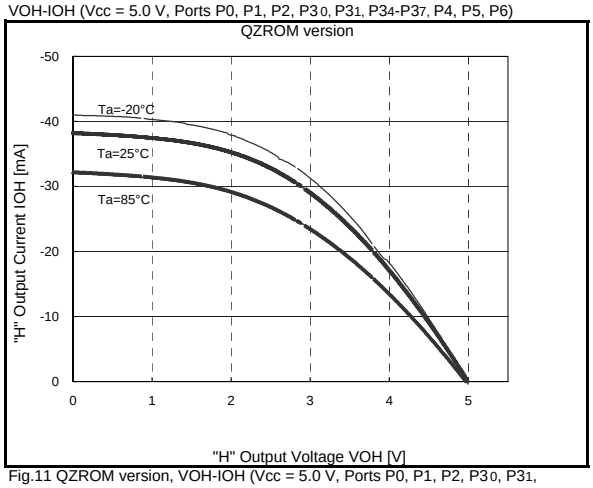

Fig.11 QZROM version, VOH-IOH (Vcc = 5.0 V, Ports P0, P1, P2, P30, P31, P34-P37, P4, P5, P6)

VOH-IOH (Vcc = 3.0 V, Ports P0, P1, P2, P30, P31, P34-P37, P4, P5, P6)

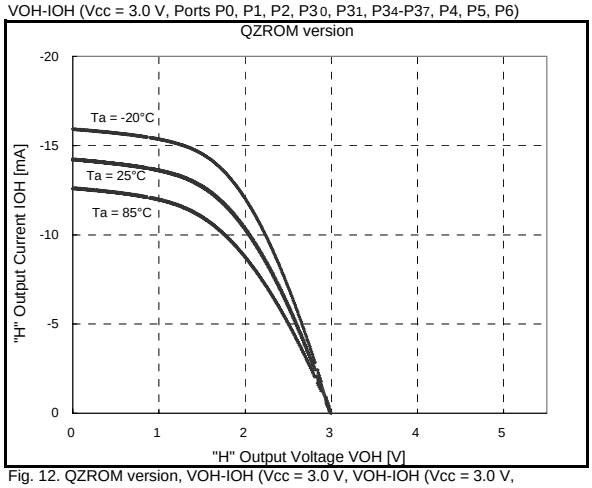

Fig. 12. QZROM version, VOH-IOH (Vcc = 3.0 V, VOH-IOH (Vcc = 3.0 V, Ports P0, P1, P2, P30, P31, P34-P37, P4, P5, P6))

(4) Port Standard Characteristics Example (VOL-IOL)

VOL-IOL (Vcc = 5.0 V, Ports P0, P1, P30,P31,P34-P37, P4, P5, P6)

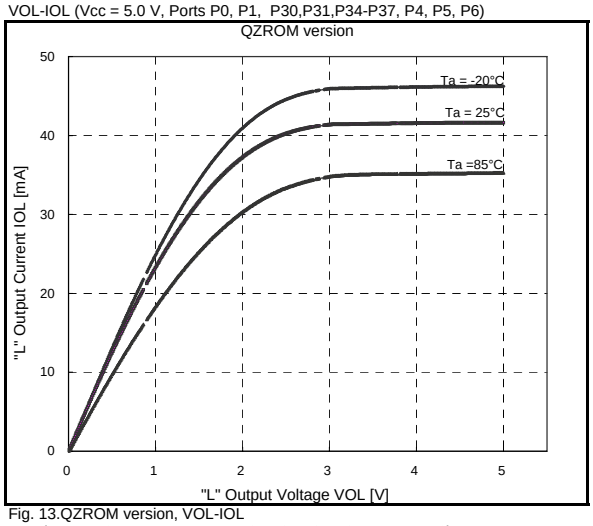

Fig. 13.QZROM version, VOL-IOL
(Vcc = 5.0 V, Ports P0, P1, P30,P31,P34-P37, P4, P5, P6)

VOL-IOL (Vcc = 3.0 V, Ports P0, P1, P30,P31,P34-P37, P4, P5, P6)

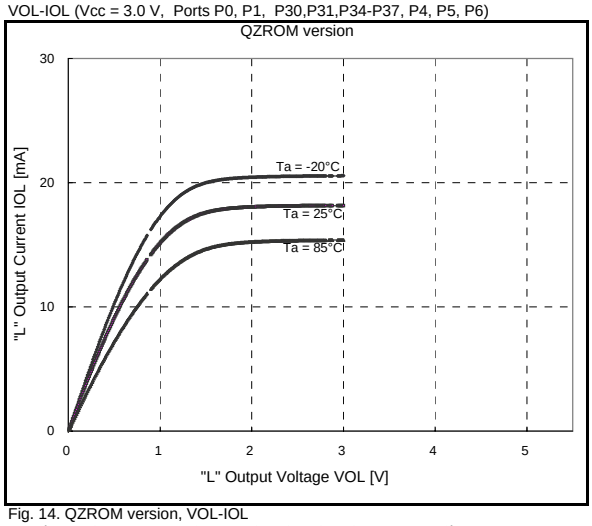

Fig. 14. QZROM version, VOL-IOL
(Vcc = 3.0 V, Ports P0, P1, P30,P31,P34-P37, P4, P5, P6)

VOL-IOL (Vcc = 5.0 V, Ports P2)

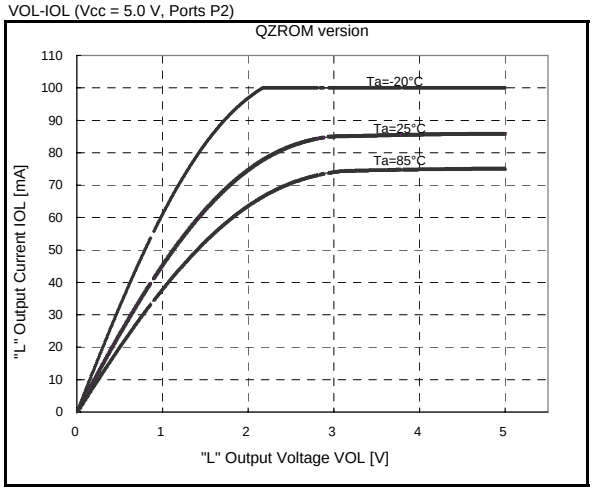

Fig. 15.QZROM version, VOL-IOL (Vcc = 5.0 V, Port P2)

VOL-IOL (Vcc = 3.0 V, Ports P2)

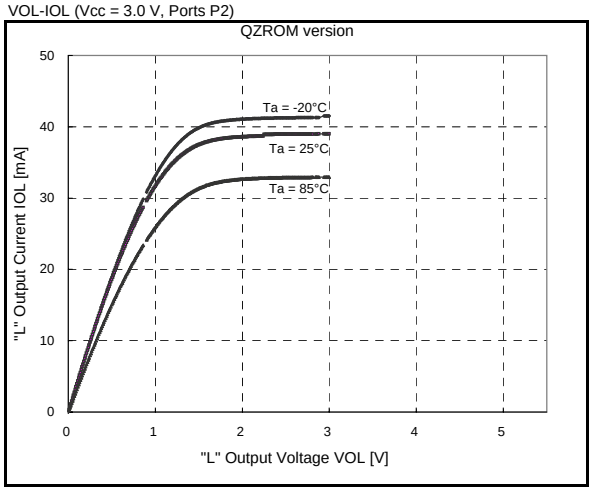

Fig. 16. QZROM version, VOL-IOL (Vcc = 3.0 V, Ports P2)

VOL-IOL (Vcc = 5.0 V, Ports P32,P33)

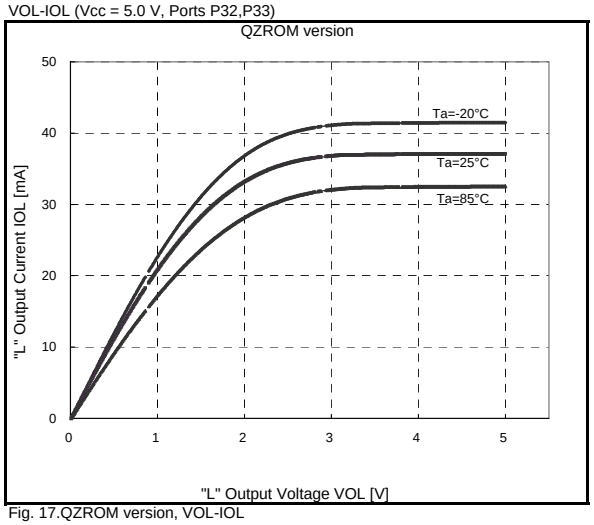

Fig. 17.QZROM version, VOL-IOL
(Vcc = 5.0 V, Ports P32,P33)

VOL-IOL (Vcc = 3.0 V, Ports P32,P33)

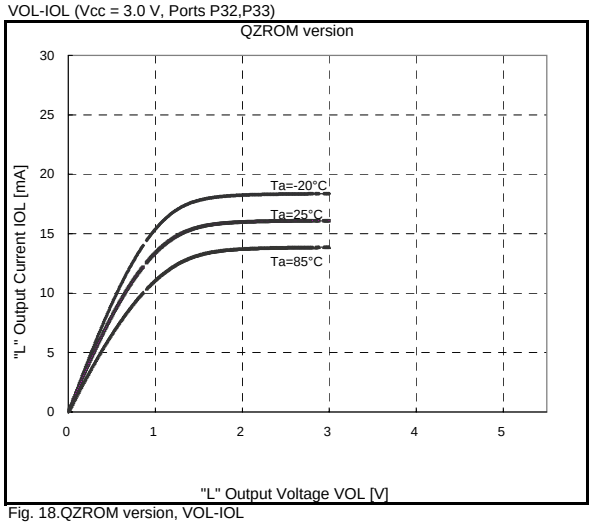

Fig. 18.QZROM version, VOL-IOL
(Vcc = 3.0 V, Ports P32,P33)

(5) Port Standard Characteristics Example (Vcc-IIL)

Vcc-IIL (When connecting pull-up transistor, Ports P0, P1, P2,P30, P31, P34-P37, P4, P5, P6)

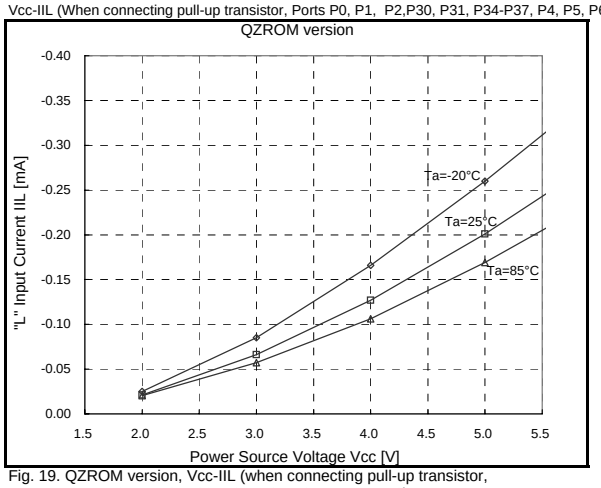

Fig. 19. QZROM version, Vcc-IIL (when connecting pull-up transistor,
Ports P0, P1,P2, P30, P31, P34-P37, P4, P5, P6)

(6) Port Standard Characteristics Example (Vcc-VIHL)

Vcc-VIHL (I/O Ports (CMOS) , Ta = 25 °C, Ports P6)

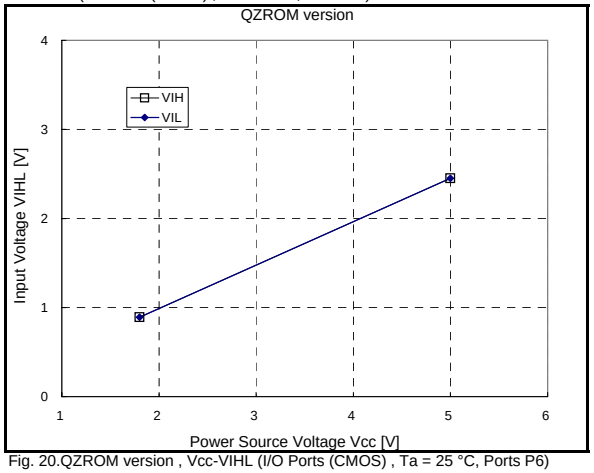

Fig. 20.QZROM version , Vcc-VIHL (I/O Ports (CMOS) , Ta = 25 °C, Ports P6)

Vcc-VIHL (CNTR0~CNTR2 pin,Ta=25 °C)

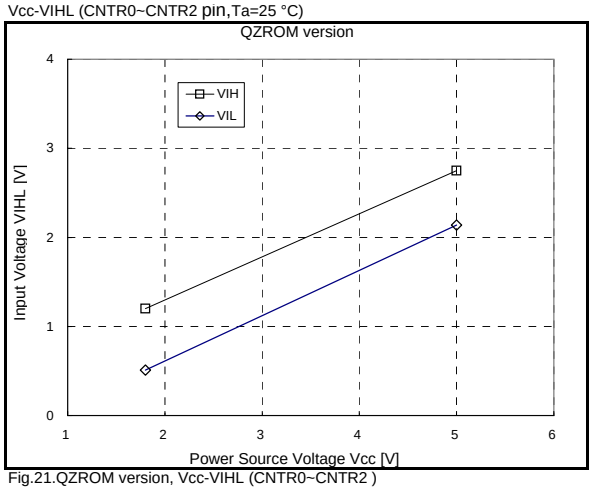

Fig.21.QZROM version, Vcc-VIHL (CNTR0~CNTR2)

Vcc-VIHL (RESET pin, Ta = 25 °C)

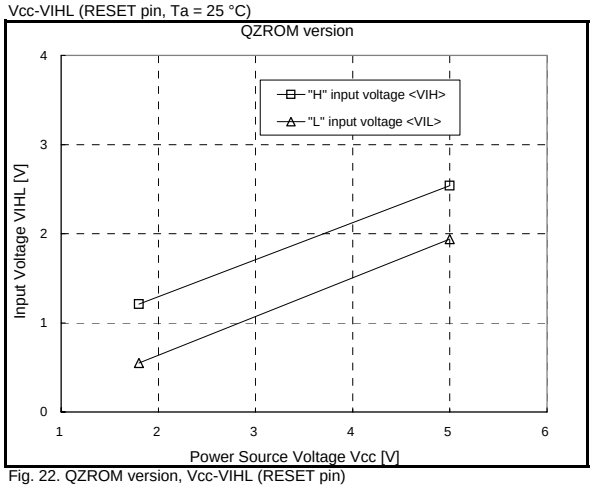

Fig. 22. QZROM version, Vcc-VIHL (RESET pin)

Vcc-VIHL (XIN pin, Ta = 25 °C)

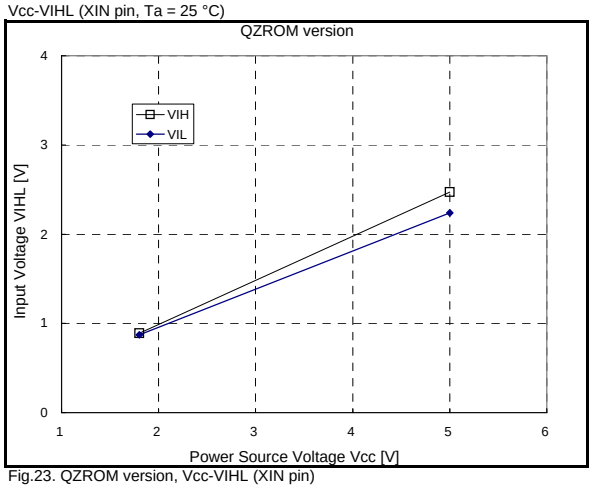

Fig.23. QZROM version, Vcc-VIHL (XIN pin)

Vcc-VIHL(INT0~INT4 pin, Ta = 25 °C)

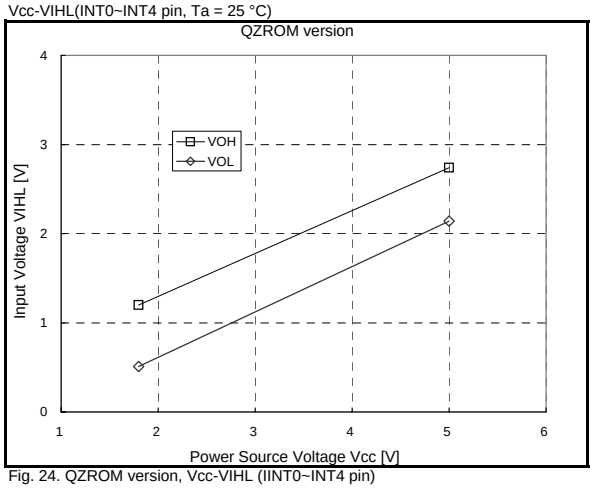

Fig. 24. QZROM version, Vcc-VIHL (IINT0~INT4 pin)

Vcc-HYS (INT0~INT4 pin , Ta = 25 °C)

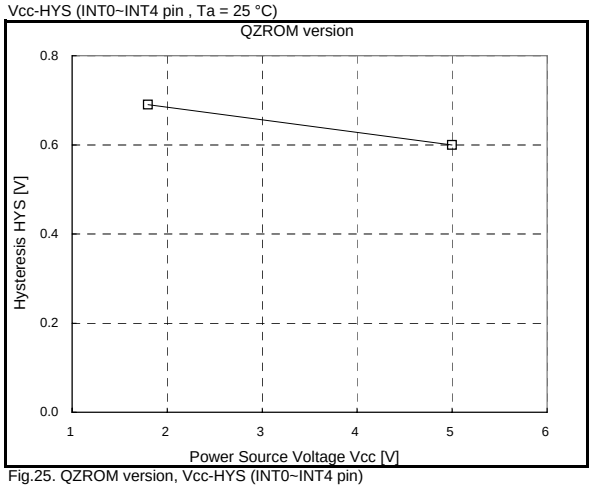

Fig.25. QZROM version, Vcc-HYS (INT0~INT4 pin)

Vcc-HYS (RESET pin, Ta = 25 °C)

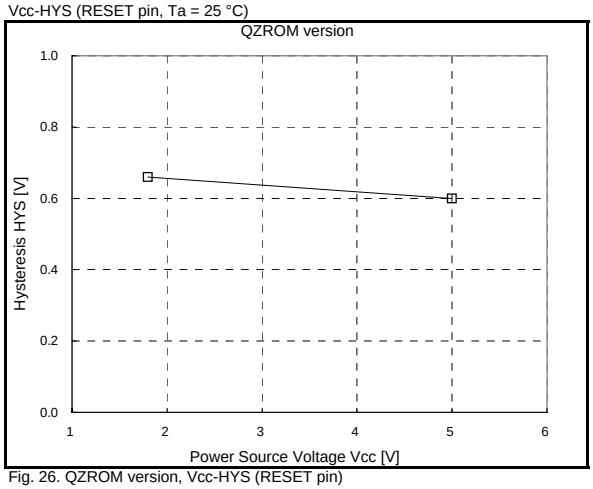

Fig. 26. QZROM version, Vcc-HYS (RESET pin)

Vcc-HYS (CNTR0~CNTR2 pin , Ta = 25 °C)

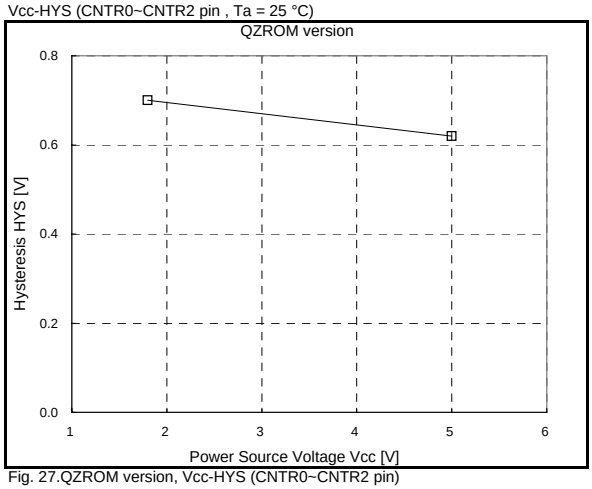

Fig. 27.QZROM version, Vcc-HYS (CNTR0~CNTR2 pin)

(7) Port Standard Characteristics Example (VIN-II (AD))

VIN-II (AD) (A/D converter operation, f(Xin) = 16 MHz, high-speed mode, Vcc = 5.0 V, Ta = 25 °C)
QZROM version

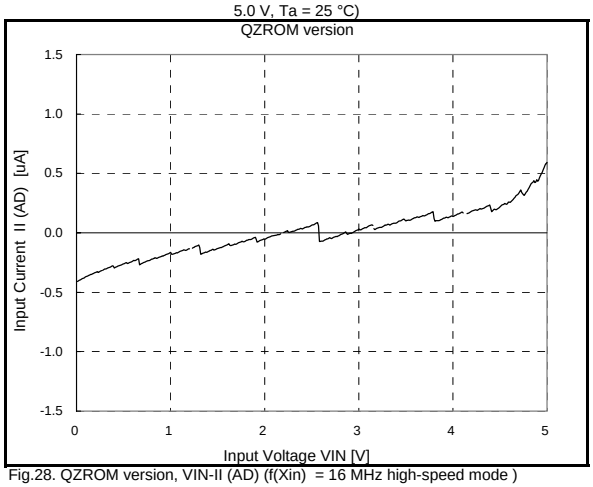

Fig.28. QZROM version, VIN-II (AD) (f(Xin) = 16 MHz high-speed mode)

VIN-II (AD) (A/D converter operation, f(Xin) = 12 MHz,high-speed mode, Vcc = 5.0 V, Ta = 25 °C)
QZROM version

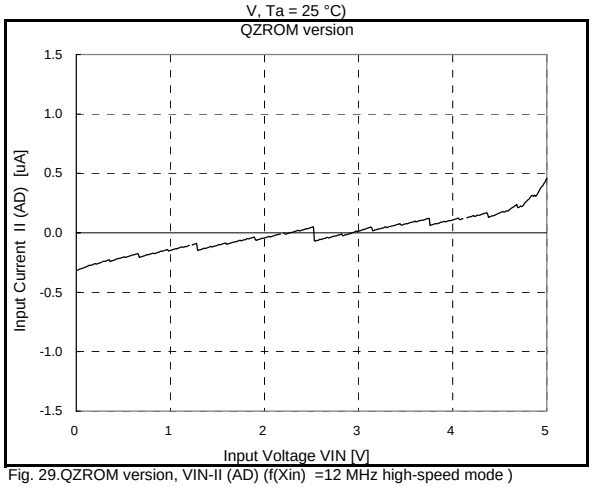

Fig. 29.QZROM version, VIN-II (AD) (f(Xin) =12 MHz high-speed mode)

VIN-II (AD) (A/D converter operationg, f(Xin) =8 MHz, high-speed mode , Vcc = 5.0 V, Ta = 25 °C)
QZROM version

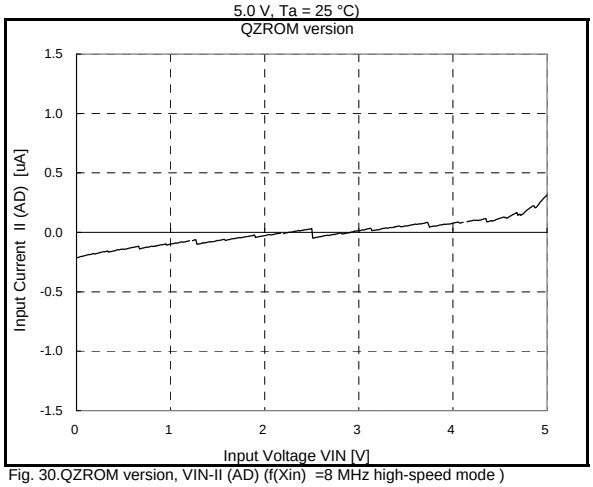

Fig. 30.QZROM version, VIN-II (AD) (f(Xin) =8 MHz high-speed mode)

(8) A/D Conversion Accuracy Characteristics
A/D conversion accuracy standard characteristics example

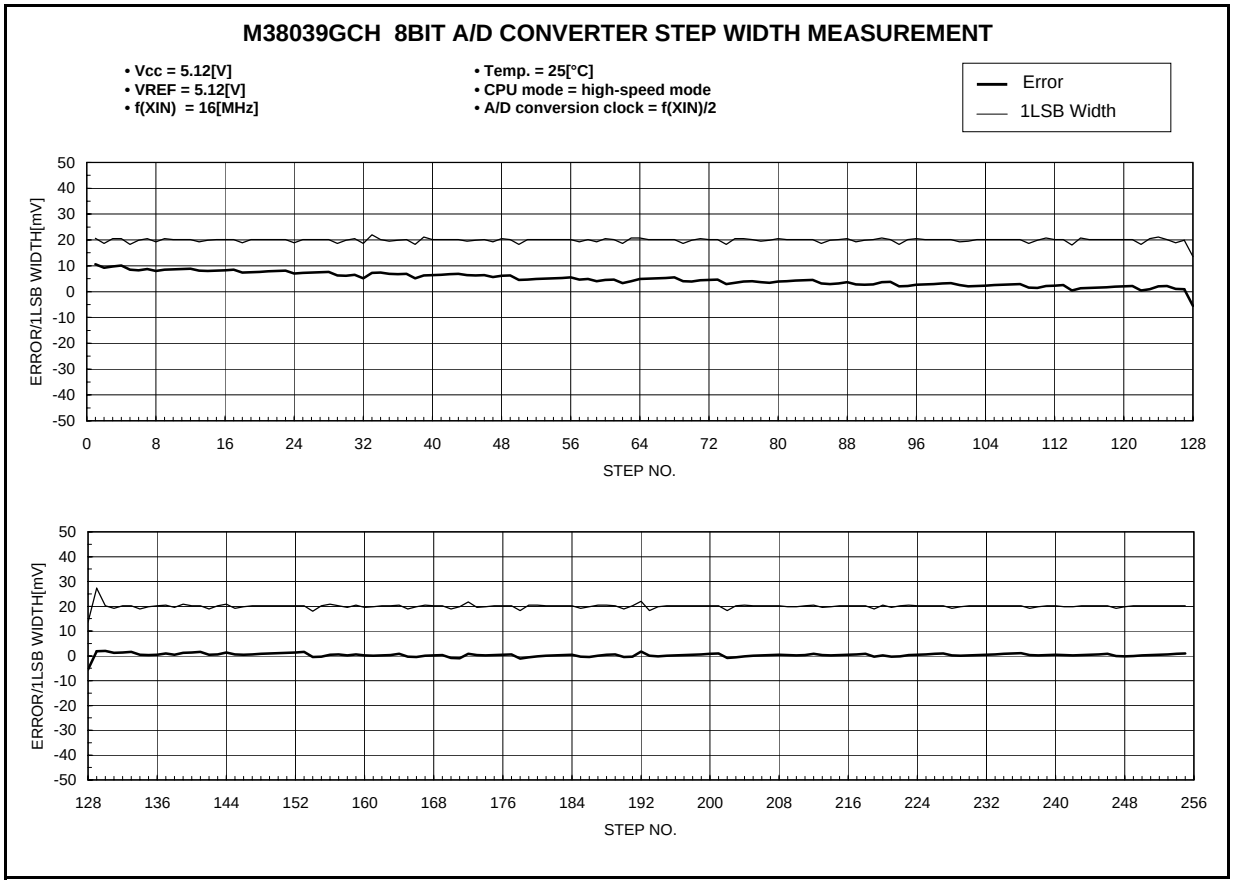

Fig. 31. 8bit A/D conversion accuracy standard characteristics

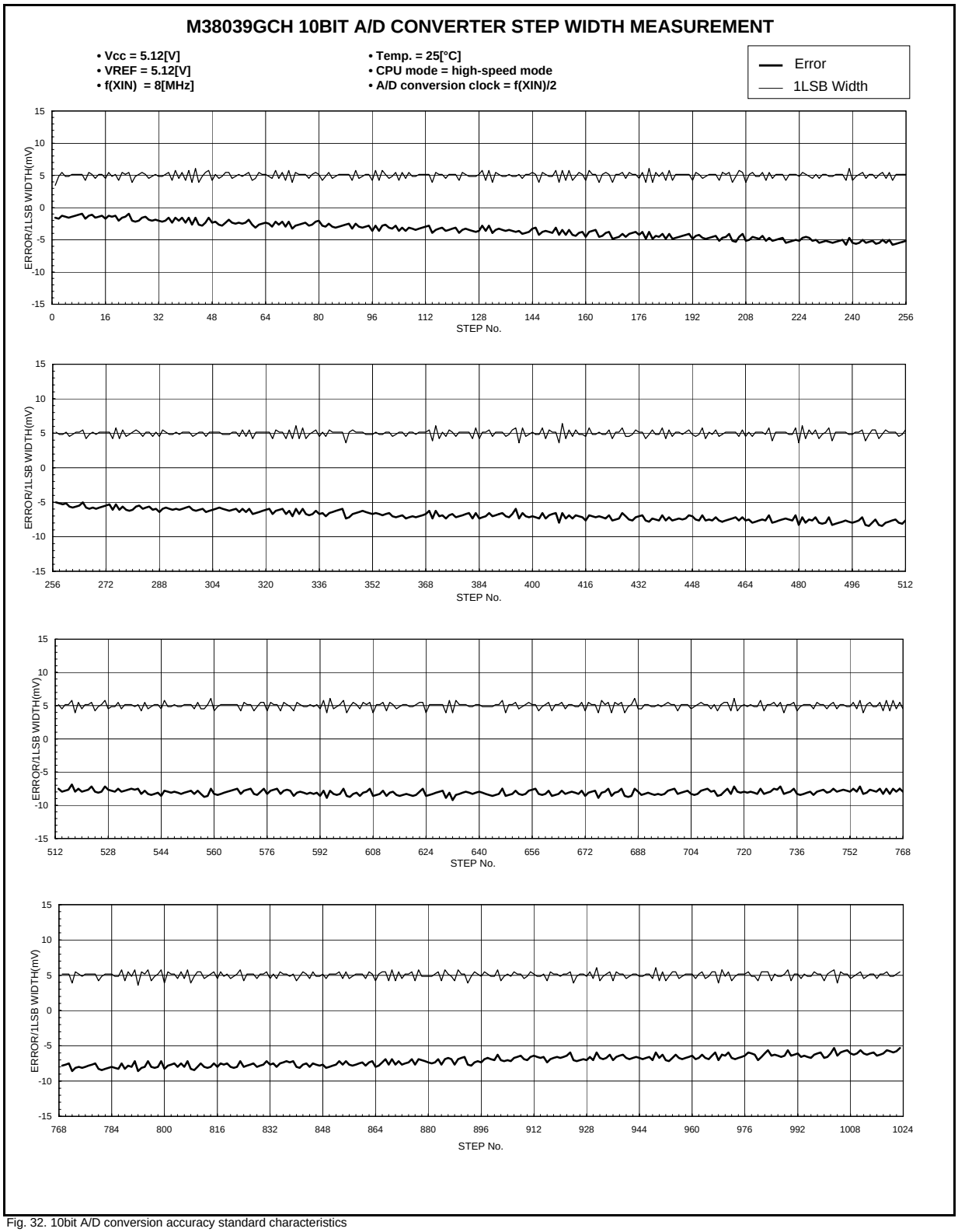

Fig. 32. 10bit A/D conversion accuracy standard characteristics

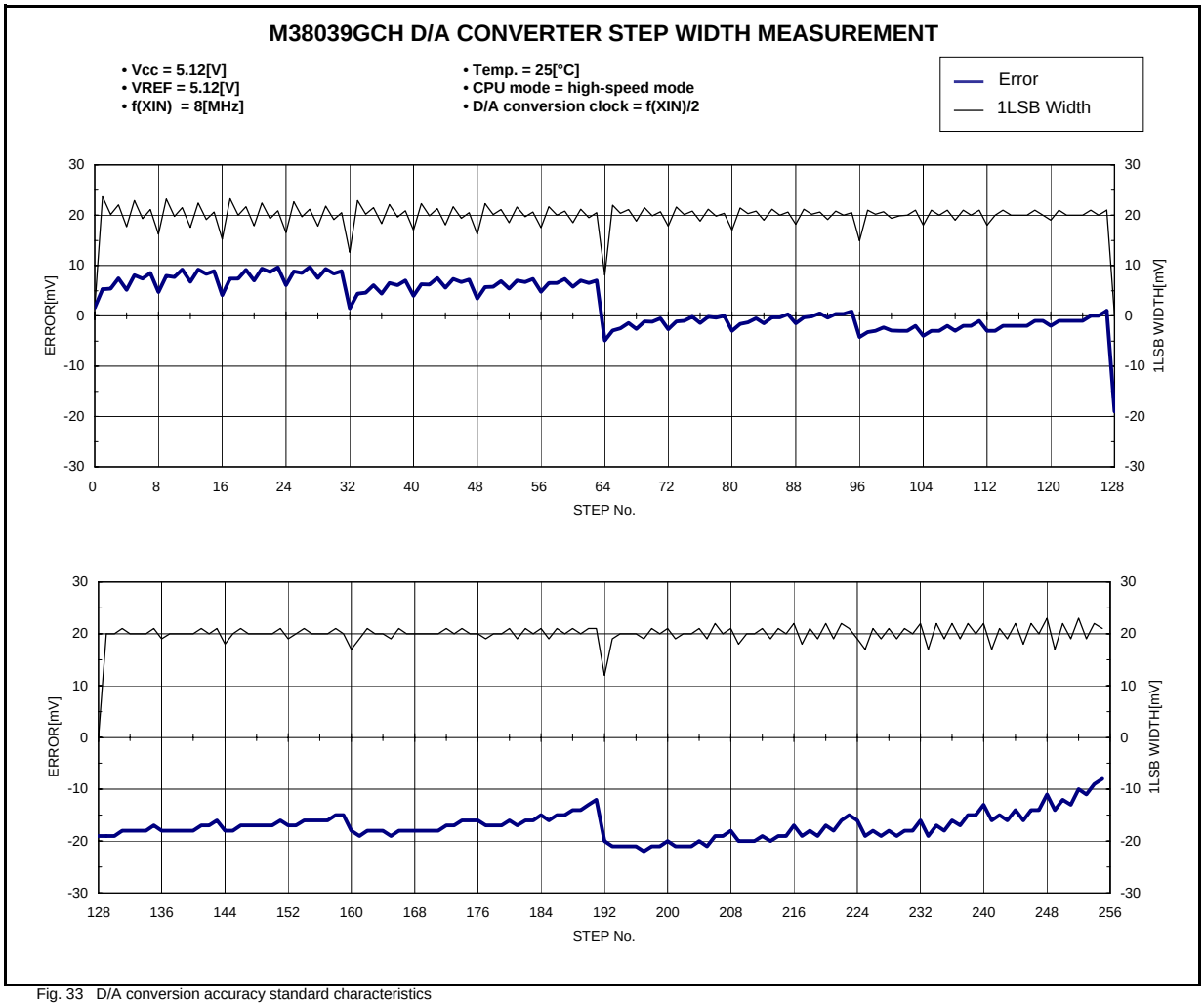

Fig. 33 D/A conversion accuracy standard characteristics

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