CT811x

Integrated Unipolar TMR Digital Switches

FEATURES AND BENEFITS

- Sensitivity with B_{OP} as low as 15 G
- Ultra-low power consumption: ~145 nA @ V_{DD} = 1.8 V and f_S = 10 Hz
- Supply voltage range: 1.7 V to 5.5 V
- Sensor polarity: unipolar
- Digital CMOS outputs:
  - □ Push-pull
  - □ Open drain
- Undervoltage lockout (UVLO)
- 3-lead SOT23 package

APPLICATIONS

- IoT devices
- Door or lid closure
- Reed switch replacement
- Tamper-proofing for utility smart meters
- Fluid level sensing/detection
- Proximity detection
- Motor controllers
- Gimbals for camera systems in drones/UAVs
- Industrial machinery/robots
- Medical devices

DESCRIPTION

The CT811x series of unipolar tunnel magnetoresistance (TMR) digital switches are designed for consumer and industrial applications. The devices are based on Allegro patented XtremeSense™ TMR technology with integrated CMOS process to provide a monolithic solution for superior sensing performance. The CT811x digital switches offer stable magnetic operation over the operating temperature range.

This product family has very low power consumption—as low as 145 nA—which is ideal for battery-operated products where minimal current consumption is required. The devices support magnetic fields down to 15 G for applications where there is a large air gap requirement.

The CT811x is available in an industry-standard 3-lead SOT-23 package to support high-volume manufacturing for industrial markets.

PACKAGE:

3-lead SOT-23

Not to scale

FUNCTIONAL BLOCK DIAGRAMS

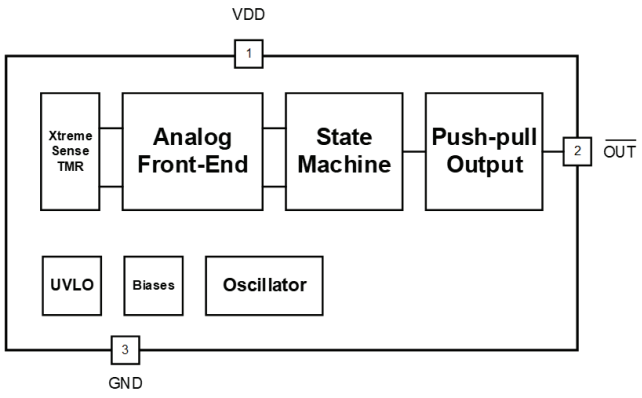

Figure 1: CT8112 with Push-Pull Output Block Diagram for 3-Lead SOT23 Package

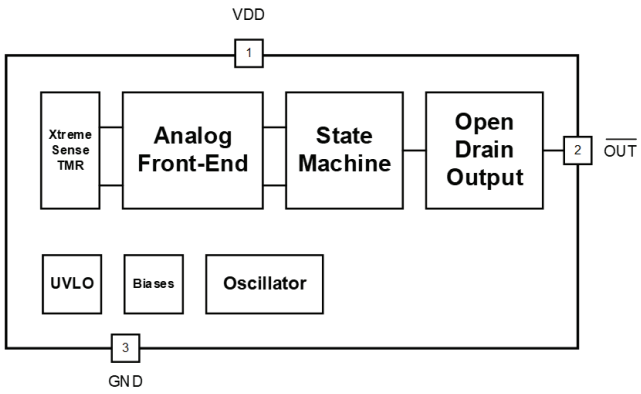

Figure 2: CT8111 with Open Drain Output Block Diagram for 3-Lead SOT23 Package

Table of Contents

SELECTION GUIDE

Part Number	Operating Temp. Range (°C)	Sensor Type	Output	B_{OP} (mT)	B_{RP} (mT)	f_S	Package	Packing
CT8111BK-IS3	–40 to 85	Unipolar	Open Drain	+3.0	+2.0	10 Hz	3-lead SOT23	Tape and Reel
CT8111BK-HS3	–40 to 125							
CT8111BH-IS3	–40 to 85	Unipolar	Open Drain	+3.0	+2.0	10 kHz	3-lead SOT23	Tape and Reel
CT8111BH-HS3	–40 to 125							
CT8111DK-IS3	–40 to 85	Unipolar	Open Drain	+1.5	+1.0	10 Hz	3-lead SOT23	Tape and Reel
CT8111DK-HS3	–40 to 125							
CT8111DT-IS3	–40 to 85	Unipolar	Open Drain	+1.5	+1.0	20 Hz	3-lead SOT23	Tape and Reel
CT8111DT-HS3	–40 to 125							
CT8112BK-IS3	–40 to 85	Unipolar	Push-Pull	+3.0	+2.0	10 Hz	3-lead SOT23	Tape and Reel
CT8112BK-HS3	–40 to 125							
CT8112DK-IS3	–40 to 85	Unipolar	Push-Pull	+1.5	+1.0	10 Hz	3-lead SOT23	Tape and Reel
CT8112DK-HS3	–40 to 125							
CT8112DT-IS3	–40 to 85	Unipolar	Push-Pull	+1.5	+1.0	20 Hz	3-lead SOT23	Tape and Reel
CT8112DT-HS3	–40 to 125							

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ABSOLUTE MAXIMUM RATINGS [1]

Characteristic	Symbol	Notes	Rating	Unit
Supply Voltage	V_{DD}		–0.3 to 6.0	V
Push-Pull Output (Active Low)	V_{OUT_PP}		–0.3 to V_{DD} + 0.3 [2]	V
Open Drain Output (Active Low)	V_{OUT_OD}		–0.3 to 6.0	V
Analog Input/Output Pins Maximum Voltage	$V_{I/O}$		–0.3 to V_{DD} + 0.3 [2]	V
Input and Output Current	I_{IN}, I_{OUT}		±20.0	mA
Maximum External Magnetic Field	B_{MAX}	T_A = 25°C	±2000	G
Electrostatic Discharge Protection Level	ESD	Human Body Model (HBM) per JESD22-A114	±4.0 (min)	kV
		Charged Device Model (CDM) per JESD22-C101	±0.5 (min)	kV
Junction Temperature	T_J		–40 to 150	°C
Storage Temperature	T_{STG}		–65 to 150	°C
Lead Soldering Temperature	T_L	10 seconds	260	°C

[1] Stresses exceeding the absolute maximum ratings may damage the CT811x and may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Allegro does not recommend exceeding or designing to absolute maximum ratings

[2] The lower of V_{DD} + 0.3 V or 6.0 V.

RECOMMENDED OPERATING CONDITIONS [1]

Characteristic	Symbol	Notes	Min.	Typ.	Max.	Unit
Supply Voltage Range	V_{DD}		1.7	3.3	5.5	V
Output Voltage Range	V_{OUT}		0	–	V_{DD}	V
Operating Magnetic Flux	B_{OP}		–	–	300	G
Output Current	I_{OUT}		–	–	±3.0	mA
Bypass Capacitor	C_{BYP}		–	1.0	–	µF
Operating Ambient Temperature	T_A	Industrial	–40	25	85	°C
		Extended Industrial	–40	25	125	°C

[1] The Recommended Operating Conditions table defines the conditions for actual operation of the CT811x. Recommended operating conditions are specified to ensure optimal performance to the specifications. Allegro does not recommend exceeding them or designing to absolute maximum ratings.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Test Conditions	Value	Unit
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	Junction-to-ambient thermal resistance is a function of application and board layout and is determined in accordance to JEDEC standard JESD51 for a four (4) layer 2s2p FR-4 printed circuit board (PCB) with 2 oz. of copper (Cu) and 4 oz. of copper (Cu) or more for 65 A. Special attention must be paid not to exceed junction temperature $T_{J(MAX)}$ at a given ambient temperature T_A.	202	°C/W

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PINOUT DIAGRAM AND TERMINAL LIST

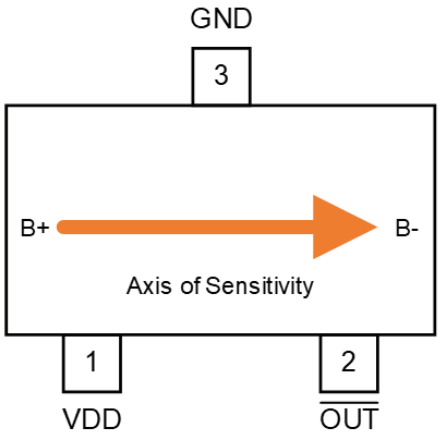

Figure 3: CT811x: 3-Lead SOT23 Package for Digital Output (Top-Down View)

Terminal List

Number	Name	Function
1	VDD	Supply Voltage
2	$\overline{\text{OUT}}$	Output Signal (Active Low)
3	GND	Ground

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ELECTRICAL CHARACTERISTICS: Valid for V_{DD} = 1.7 to 5.5 V, C_{BYP} = 1.0 µF, and T_A = –40°C to 125°C, typical values are V_{DD} = 3.3 V and T_A = 25°C, unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
PUSH-PULL OUTPUT						
Output Voltage High $\overline{OUT}$ [1]	V_{OH}		0.9 × V_{DD}	–	–	V
Output Voltage Low $\overline{OUT}$ [1]	V_{OL}		–	–	0.1 × V_{DD}	V
$\overline{OUT}$ Current [1]	I_{OUT}		–	±2.0	–	mA
OPEN DRAIN OUTPUT						
Output Voltage High [1]	V_{OH}		–	–	5.5	V
Output Voltage Low	V_{OL}	I_{OUT} ≤ 20 mA	0	–	0.5	V
High Output Leakage Current [1]	I_{LEAK}	V_{OH} = 5.5 V, B_{OP} = 0	–	20	–	pA
TIMINGS						
Power-On Time [1]	t_{ON}	V_{DD} ≥ 1.7 V	–	50	75	µs
Active Mode Time [1]	t_{ACTIVE}		–	2.6	–	µs
PROTECTION						
Undervoltage Lockout [1]	V_{UVLO}	Rising V_{DD}	–	1.60	1.64	V
		Falling V_{DD}	1.44	1.53	–	V
UVLO Hysteresis [1]	V_{UV_HYS}		–	70	–	mV

[1] Guaranteed by design and characterization; not tested in production.

TYPICAL TIMING CHARACTERISTICS

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

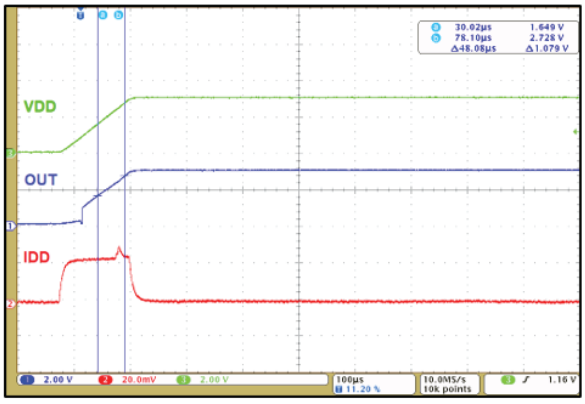

Figure 4: Power-On Time for Push-Pull Output

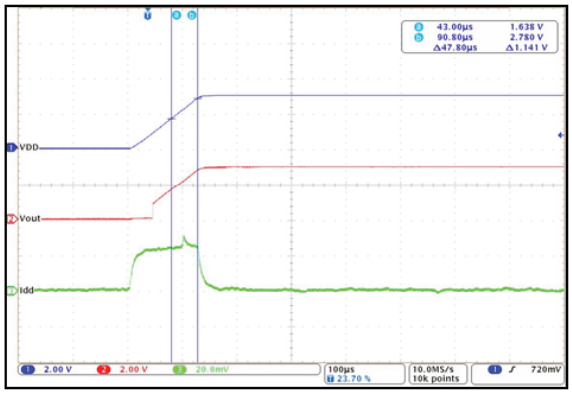

Figure 5: Power-On Time for Open Drain Output

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Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Average Supply Current	$I_{DD(AVG)}$	t ≥ 10 seconds	–	190	900	nA
	$I_{DD(AVG)\_1.8V}$	t ≥ 10 seconds, V_{DD} = 1.8 V	–	145	700	nA
Sampling Frequency	f_{S1}		6	10	14	Hz
Idle Mode Time	t_{IDLE1}	f_S = 2 Hz	71	100	167	ms
Operate Point	B_{OP}		23	30	38	G
Release Point	B_{RP}		14	20	27	G
Hysteresis	B_{HYST}		5	10	–	G

CT8111BH – ELECTRICAL CHARACTERISTICS and MAGNETIC SPECIFICATIONS: Uness otherwise specified, valid for V_{DD} = 1.7 to 5.5 V, C_{BYP} = 1.0 µF, and T_A = –40°C to 125°C, typical values are V_{DD} = 3.3 V and T_A = 25°C

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Average Supply Current	$I_{DD(AVG)}$	t ≥ 10 seconds	–	45	57	µA
	$I_{DD(AVG)\_1.8V}$	t ≥ 10 seconds, V_{DD} = 1.8 V	–	41	47	µA
Sampling Frequency	f_{S1}		6	10	14	kHz
Idle Mode Time	t_{IDLE1}	f_S = 10 Hz	71	100	167	µs
Operate Point	B_{OP}		23	30	38	G
Release Point	B_{RP}		14	20	27	G
Hysteresis	B_{HYST}		5	10	–	G

TYPICAL MAGNETIC CHARACTERISTICS FOR CT8111Bx

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

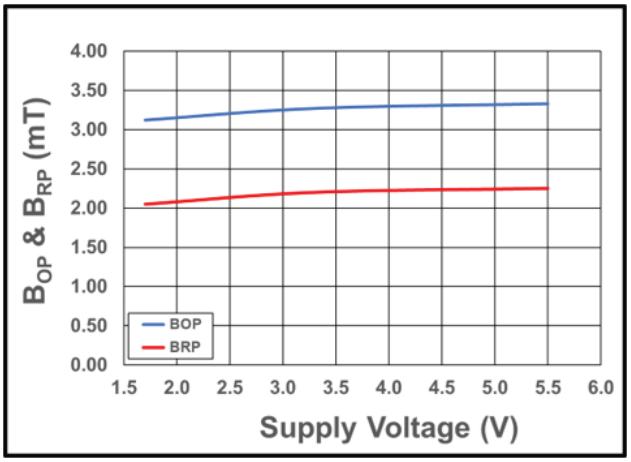

Figure 6: B_{OP} (Blue) and B_{RP} (Red) vs. Supply Voltage at T_A = 25°C

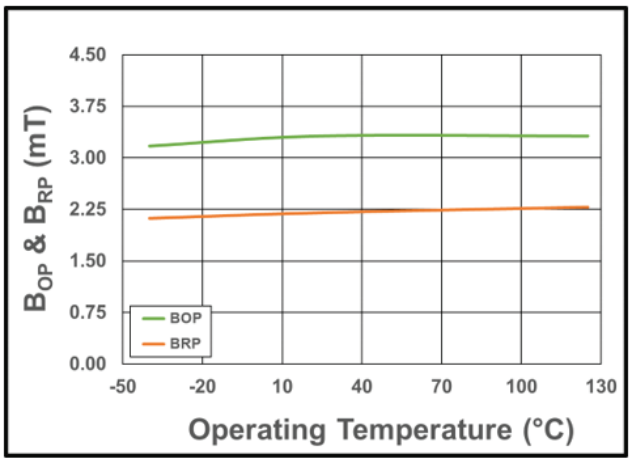

Figure 7: B_{OP} (Green) and B_{RP} (Orange) vs. Temperature at V_{DD} = 3.3 V

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TYPICAL ELECTRICAL CHARACTERISTICS FOR CT8111BK

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

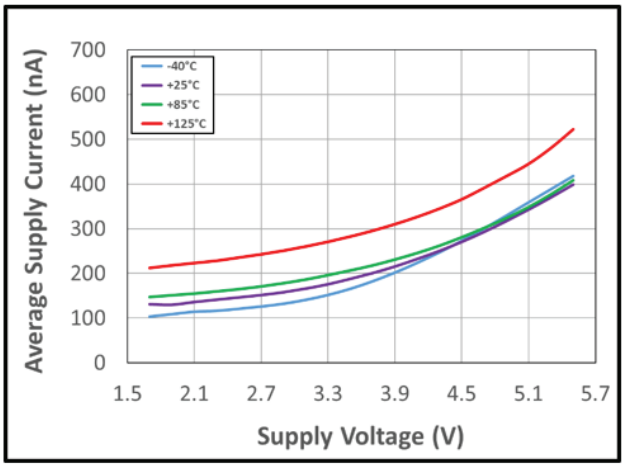

Figure 8: Average Supply Current vs. Supply Voltage vs. Temperature

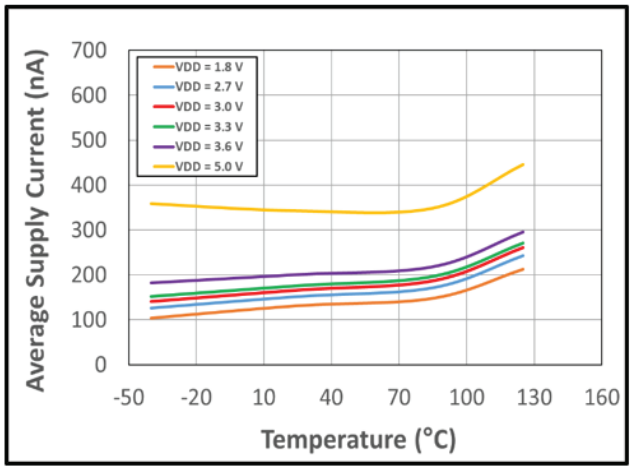

Figure 9: Average Supply Current vs. Temperature vs. Supply Voltage

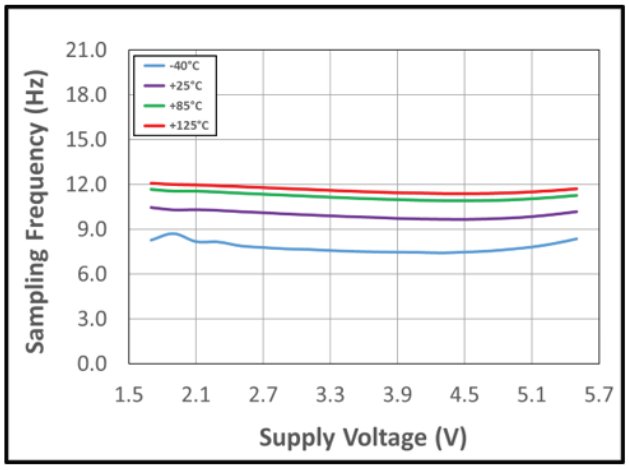

Figure 10: Sampling Frequency vs. Supply Voltage vs. Temperature

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TYPICAL ELECTRICAL CHARACTERISTICS FOR CT8111BH

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

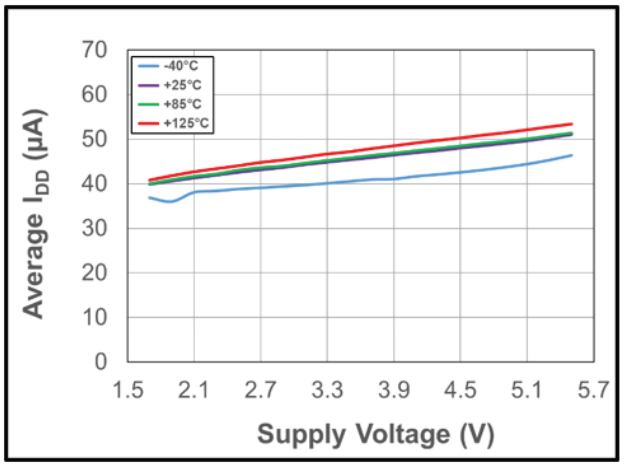

Figure 11: Average Supply Current vs. Supply Voltage vs. Temperature

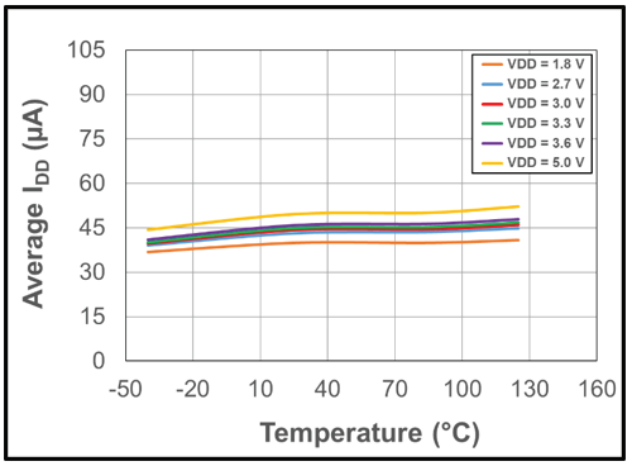

Figure 12: Average Supply Current vs. Temperature vs. Supply Voltage

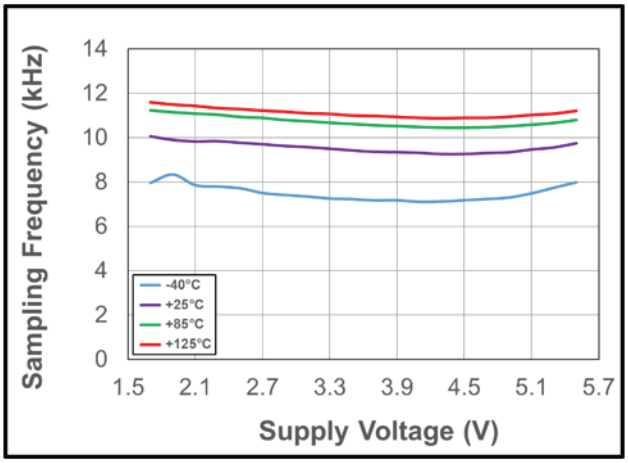

Figure 13: Sampling Frequency vs. Supply Voltage vs. Temperature

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CT8111DK – ELECTRICAL CHARACTERISTICS and MAGNETIC SPECIFICATIONS: Uness otherwise specified, valid for V_{DD} = 1.7 to 5.5 V, C_{BYP} = 1.0 µF, and T_A = –40°C to 125°C, typical values are V_{DD} = 3.3 V and T_A = 25°C

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Average Supply Current	$I_{DD(AVG)}$	t ≥ 10 seconds	–	190	900	nA
	$I_{DD(AVG)\_1.8V}$	t ≥ 10 seconds, V_{DD} = 1.8 V	–	145	700	nA
Sampling Frequency	f_S		6	10	14	Hz
Idle Mode Time	t_{IDLE}	f_S = 10 Hz	71	100	167	ms
Operate Point	B_{OP}		11	15	19	G
Release Point	B_{RP}		6	10	14	G
Hysteresis	B_{HYST}		3	5	–	G

CT8111DT – ELECTRICAL CHARACTERISTICS and MAGNETIC SPECIFICATIONS: Uness otherwise specified, valid for V_{DD} = 1.7 to 5.5 V, C_{BYP} = 1.0 µF, and T_A = –40°C to 125°C, typical values are V_{DD} = 3.3 V and T_A = 25°C

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Average Supply Current	$I_{DD(AVG)}$	t ≥ 10 seconds	–	220	900	nA
	$I_{DD(AVG)\_1.8V}$	t ≥ 10 seconds, V_{DD} = 1.8 V	–	175	700	nA
Sampling Frequency	f_S		14	20	26	Hz
Idle Mode Time	t_{IDLE}	f_S = 20 Hz	38	50	71	ms
Operate Point	B_{OP}		11	15	19	G
Release Point	B_{RP}		6	10	14	G
Hysteresis	B_{HYST}		3	5	–	G

TYPICAL MAGNETIC CHARACTERISTICS FOR CT8111Dx

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

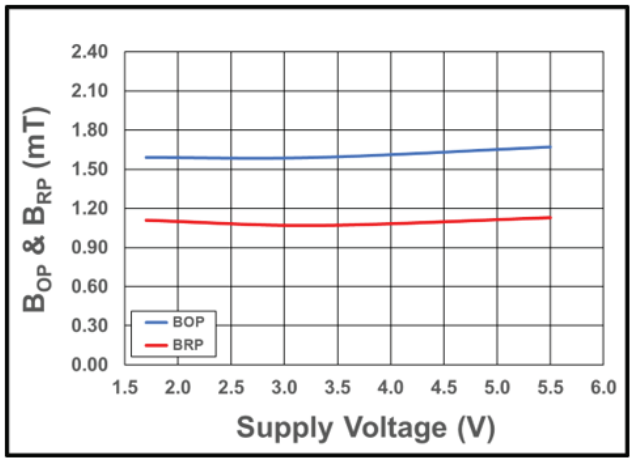

Figure 14: B_{OP} (Blue) and B_{RP} (Red) vs. Supply Voltage at T_A = 25°C

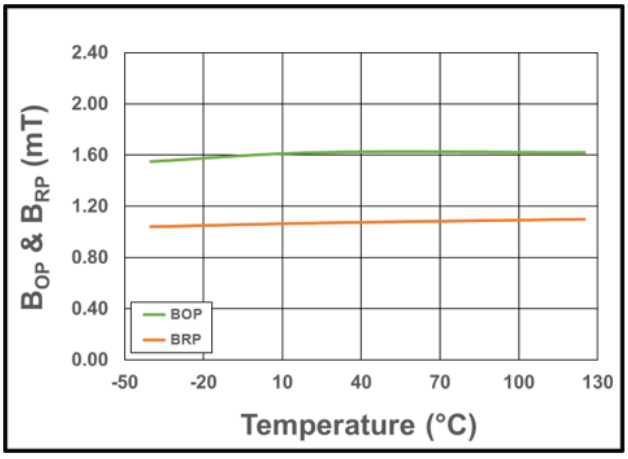

Figure 15: B_{OP} (Green) and B_{RP} (Orange) vs. Temperature at V_{DD} = 3.3 V

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TYPICAL ELECTRICAL CHARACTERISTICS FOR CT8111DK

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

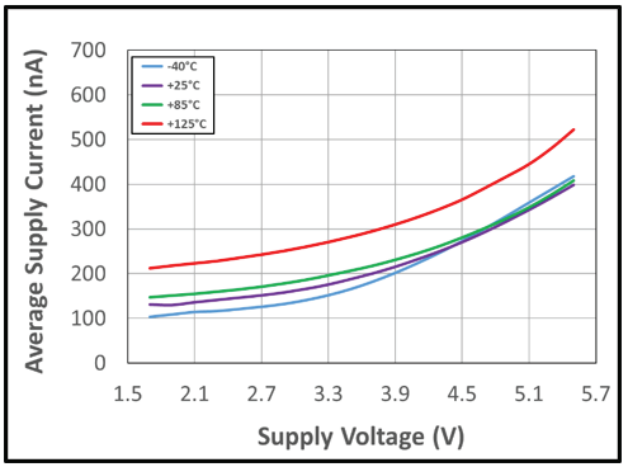

Figure 16: Average Supply Current vs. Supply Voltage vs. Temperature

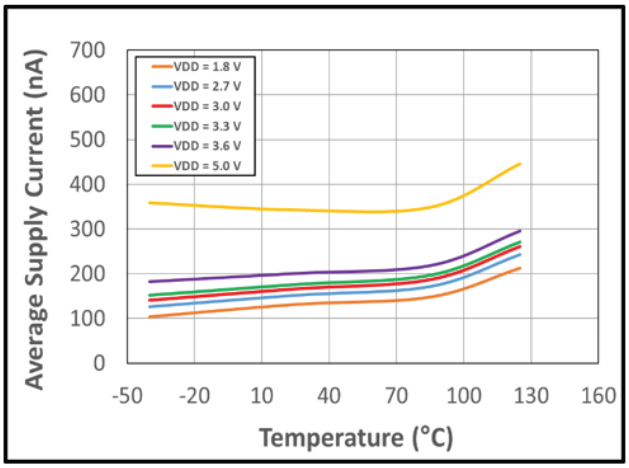

Figure 17: Average Supply Current vs. Temperature vs. Supply Voltage

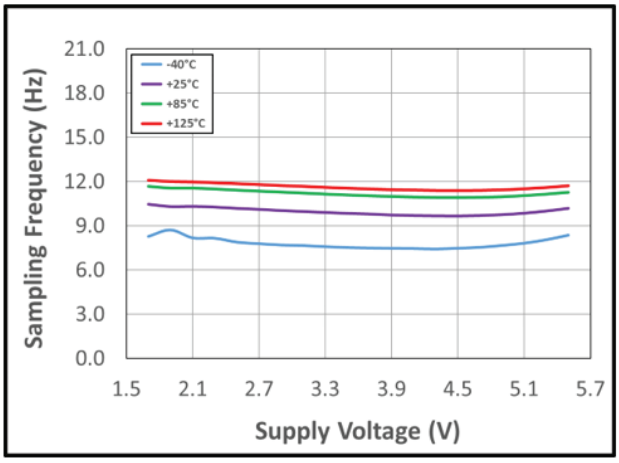

Figure 18: Sampling Frequency vs. Supply Voltage vs. Temperature

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TYPICAL ELECTRICAL CHARACTERISTICS FOR CT8111DT

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

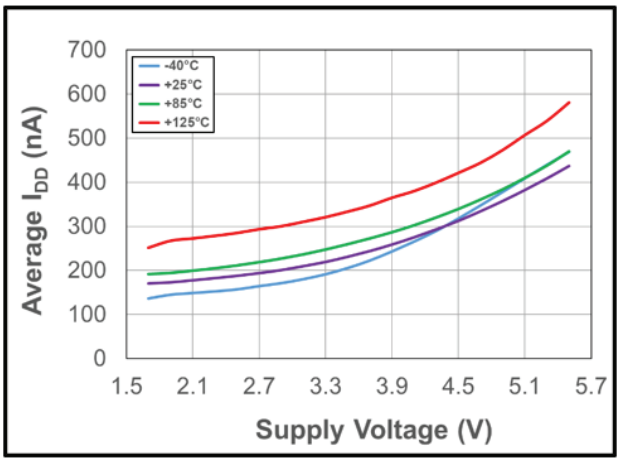

Figure 19: Average Supply Current vs. Supply Voltage vs. Temperature

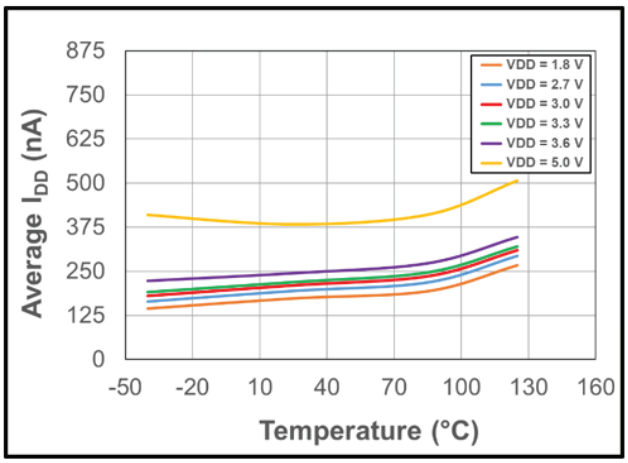

Figure 20: Average Supply Current vs. Temperature vs. Supply Voltage

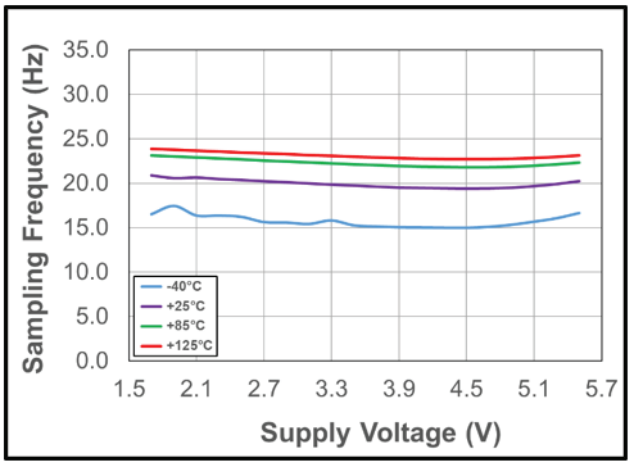

Figure 21: Sampling Frequency vs. Supply Voltage vs. Temperature

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Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Average Supply Current	$I_{DD(AVG)}$	t ≥ 10 seconds	–	190	900	nA
	$I_{DD(AVG)\_1.8V}$	t ≥ 10 seconds, V_{DD} = 1.8 V	–	145	700	nA
Sampling Frequency	f_{S1}		6	10	14	Hz
Idle Mode Time	t_{IDLE1}	f_S = 10 Hz	71	100	167	ms
Operate Point	B_{OP}		23	30	38	G
Release Point	B_{RP}		14	20	27	G
Hysteresis	B_{HYST}		5	10	–	G

TYPICAL MAGNETIC CHARACTERISTICS FOR CT8112BK

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

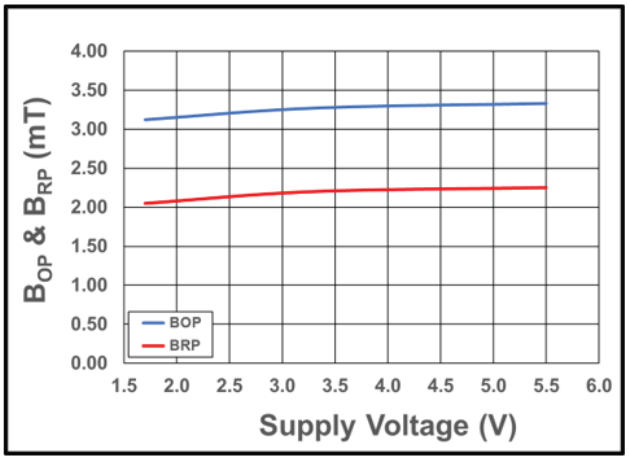

Figure 22: B_{OP} (Blue) and B_{RP} (Red) vs. Supply Voltage at T_A = 25°C

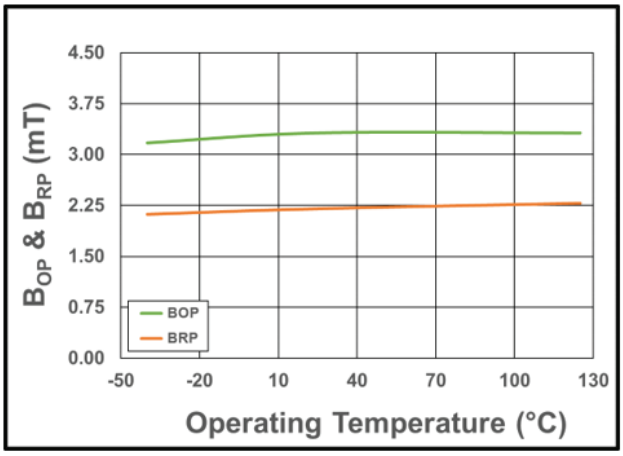

Figure 23: B_{OP} (Green) and B_{RP} (Orange) vs. Temperature at V_{DD} = 3.3 V

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TYPICAL ELECTRICAL CHARACTERISTICS FOR CT8112BK

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

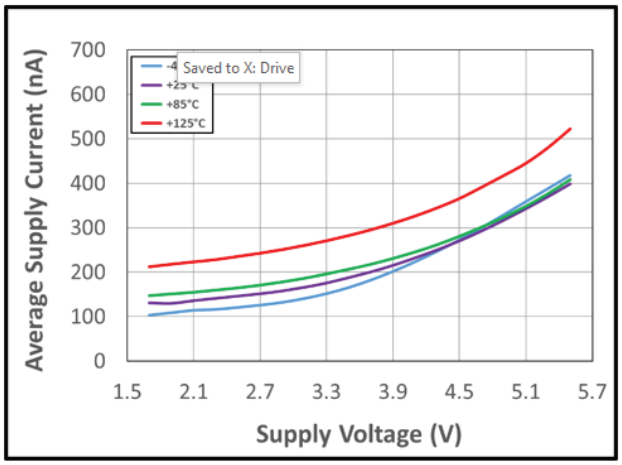

Figure 24: Average Supply Current vs. Supply Voltage vs. Temperature

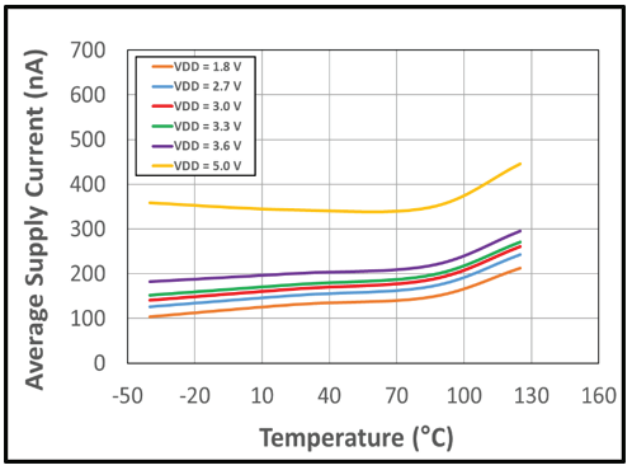

Figure 25: Average Supply Current vs. Temperature vs. Supply Voltage

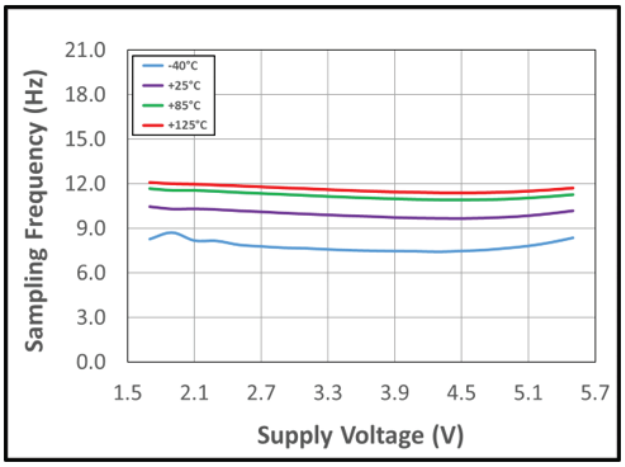

Figure 26: Sampling Frequency vs. Supply Voltage vs. Temperature

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CT8112DK – ELECTRICAL CHARACTERISTICS and MAGNETIC SPECIFICATIONS: Uness otherwise specified, valid for V_{DD} = 1.7 to 5.5 V, C_{BYP} = 1.0 µF, and T_A = –40°C to 125°C, typical values are V_{DD} = 3.3 V and T_A = 25°C

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Average Supply Current	$I_{DD(AVG)}$	t ≥ 10 seconds	–	190	900	nA
	$I_{DD(AVG)\_1.8V}$	t ≥ 10 seconds, V_{DD} = 1.8 V	–	145	700	nA
Sampling Frequency	f_S		6	10	14	Hz
Idle Mode Time	t_{IDLE}	f_S = 10 Hz	71	100	167	ms
Operate Point	B_{OP}		11	15	19	G
Release Point	B_{RP}		6	10	14	G
Hysteresis	B_{HYST}		3	5	–	G

CT8112DT – ELECTRICAL CHARACTERISTICS and MAGNETIC SPECIFICATIONS: Uness otherwise specified, valid for V_{DD} = 1.7 to 5.5 V, C_{BYP} = 1.0 µF, and T_A = –40°C to 125°C, typical values are V_{DD} = 3.3 V and T_A = 25°C

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Average Supply Current	$I_{DD(AVG)}$	t ≥ 10 seconds	–	220	900	nA
	$I_{DD(AVG)\_1.8V}$	t ≥ 10 seconds, V_{DD} = 1.8 V	–	175	700	nA
Sampling Frequency	f_S		14	20	26	Hz
Idle Mode Time	t_{IDLE}	f_S = 20 Hz	38	50	71	ms
Operate Point	B_{OP}		11	15	19	G
Release Point	B_{RP}		6	10	14	G
Hysteresis	B_{HYST}		3	5	–	G

TYPICAL MAGNETIC CHARACTERISTICS FOR CT8112Dx

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

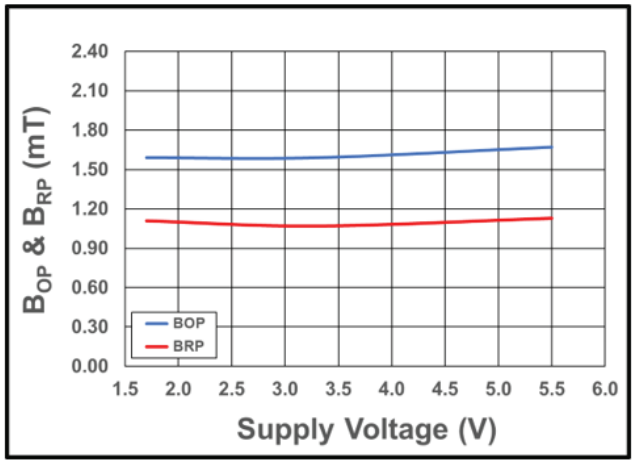

Figure 27: B_{OP} (Blue) and B_{RP} (Red) vs. Supply Voltage at T_A = 25°C

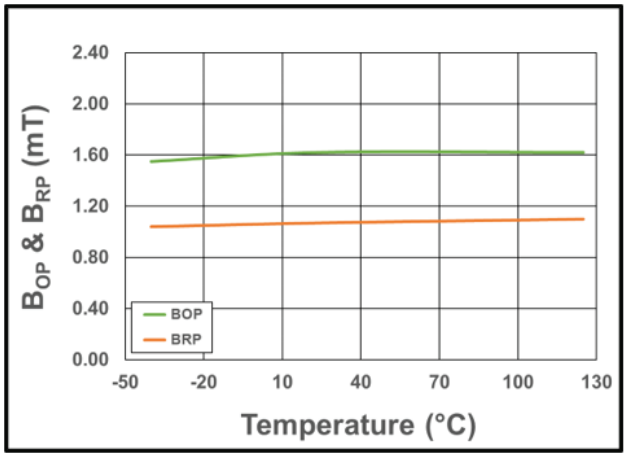

Figure 28: B_{OP} (Green) and B_{RP} (Orange) vs. Temperature at V_{DD} = 3.3 V

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TYPICAL ELECTRICAL CHARACTERISTICS FOR CT8112DK

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

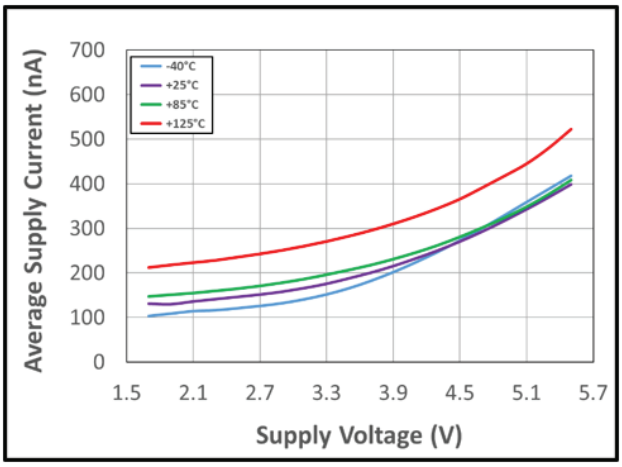

Figure 29: Average Supply Current vs. Supply Voltage vs. Temperature

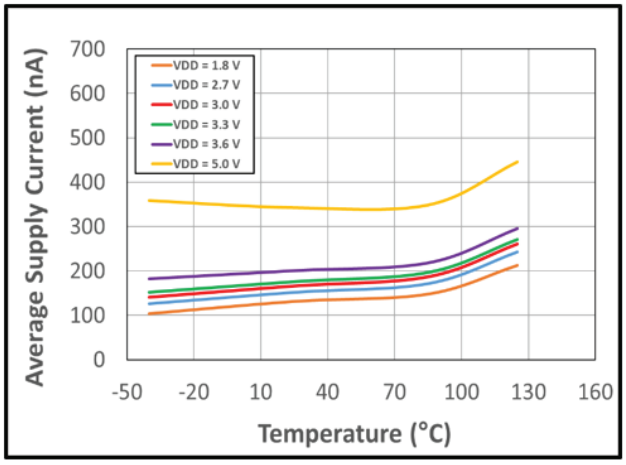

Figure 30: Average Supply Current vs. Temperature vs. Supply Voltage

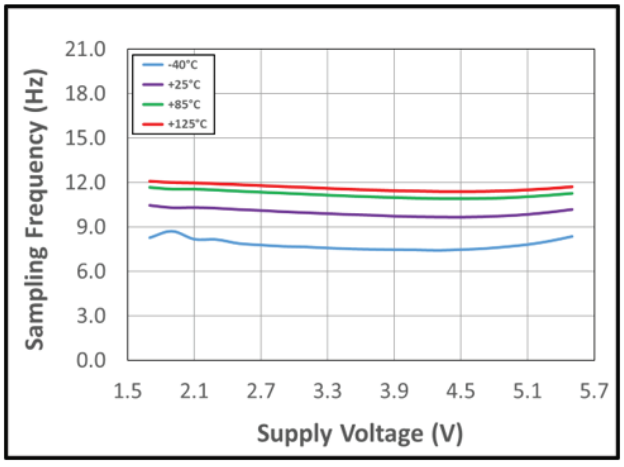

Figure 31: Sampling Frequency vs. Supply Voltage vs. Temperature

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TYPICAL ELECTRICAL CHARACTERISTICS FOR CT8112DT

V_{DD} = 3.3 V, T_A = 25°C, and C_{BYP} = 1.0 µF (unless otherwise specified)

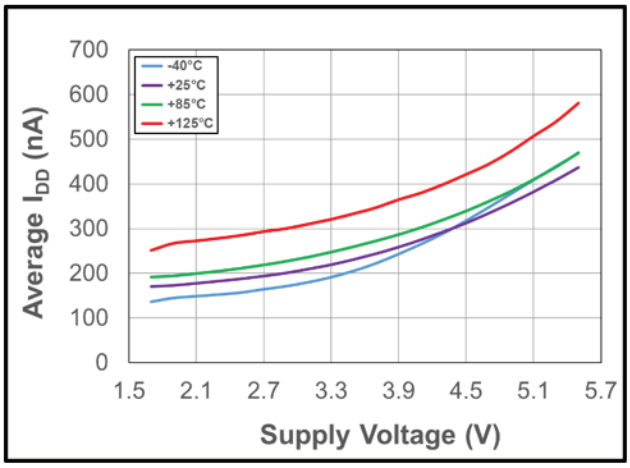

Figure 32: Average Supply Current vs. Supply Voltage vs. Temperature

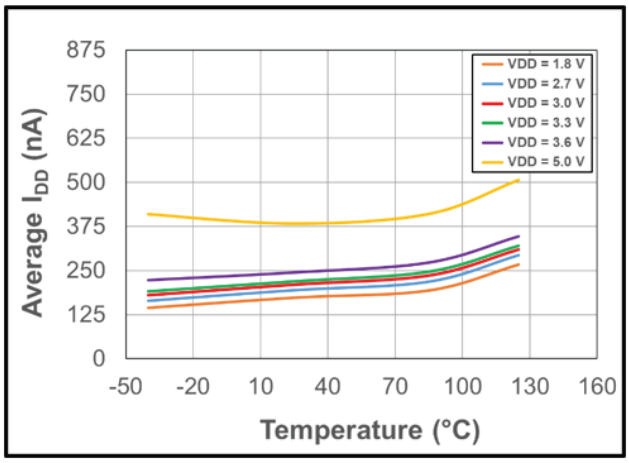

Figure 33: Average Supply Current vs. Temperature vs. Supply Voltage

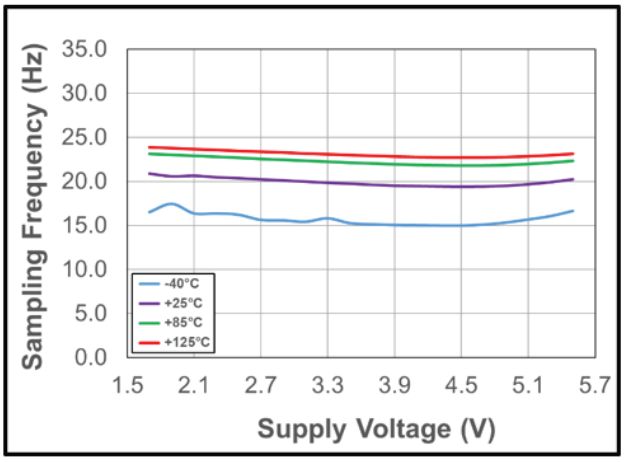

Figure 34: Sampling Frequency vs. Supply Voltage vs. Temperature

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FUNCTIONAL DESCRIPTION

Overview

The CT811x is a product family of unipolar TMR magnetic switches that supports a wide operating voltage range of 1.7 to 5.5 V and is capable of providing two digital output configurations: open drain or push-pull. These unipolar TMR digital switches are designed to consume a minimal amount of current which is ideal for battery-operated products. It also supports a wide range of sensitivity levels for various applications.

Undervoltage Lockout (UVLO)

The Undervoltage Lockout protection circuitry of the CT811x is activated when the supply voltage (V_{DD}) falls below 1.53 V. The CT811x remains in a low quiescent state and the $\overline{OUT}$ output is not valid until V_{DD} rises above the UVLO threshold (1.60 V).

Power-On Time (t_{ON})

The Power-On Time (t_{ON}) of 50 µs is the amount of time required by the CT811x to start up, power-on, and acquire the first sample. The chip is fully powered up and operational from the moment the supply voltage passes the rising UVLO point (1.60 V). This time includes the ramp-up time and the settling time (within 10% of steady-state voltage under an applied magnetic field) after the power supply have reach the minimum V_{DD}.

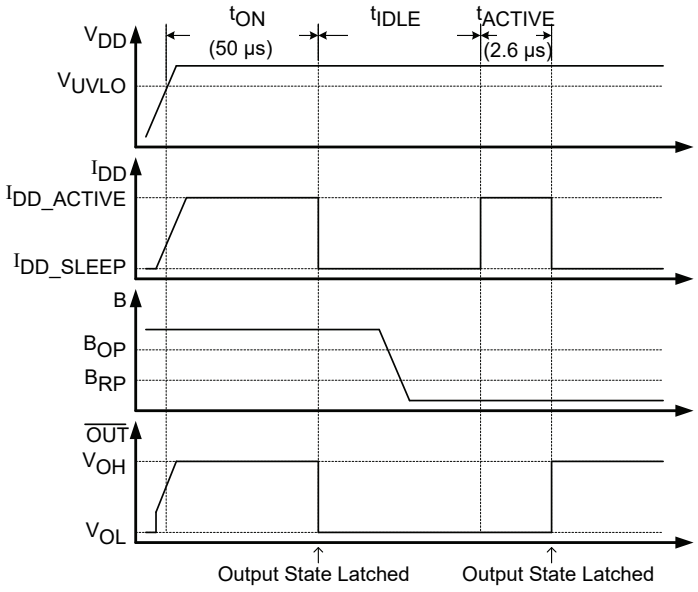

Figure 35: CT811x Power-On Timing Diagram

Unipolar Magnetic Flux

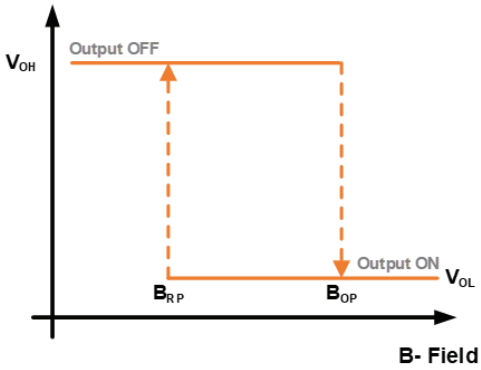

Figure 36: CT811x Output Behavior vs. Magnetic Field

Table 1: CT8111 Open Drain Output Behavior

Magnetic Field	Condition	Output
Positive Field	$B > B_{OP}$	High-Z (OFF)
Null or Weak Magnetic Field	$B < B_{RP}$	High-Z (OFF)
Negative Field	$B > B_{OP}$	Low (ON)

Table 2: CT8112 Push-Pull Output Behavior

Magnetic Field	Condition	Output
Positive Field	$B > B_{OP}$	High (OFF)
Null or Weak Magnetic Field	$B < B_{RP}$	High (OFF)
Negative Field	$B > B_{OP}$	Low (ON)

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APPLICATIONS INFORMATION

A decoupling capacitor, C_{BYP}, between the supply voltage (VDD) and ground (GND) is required to lower the noise going into the CT8111 as well as providing isolation from the other circuits. The decoupling capacitor should be placed close to the TMR digital switch. A typical capacitor value of 1.0 µF (ceramic) will be sufficient. A pull-up resistor of 47 kΩ connected from $\overline{OUT}$ to the system voltage (V_{SYS}) is required for the CT8111.

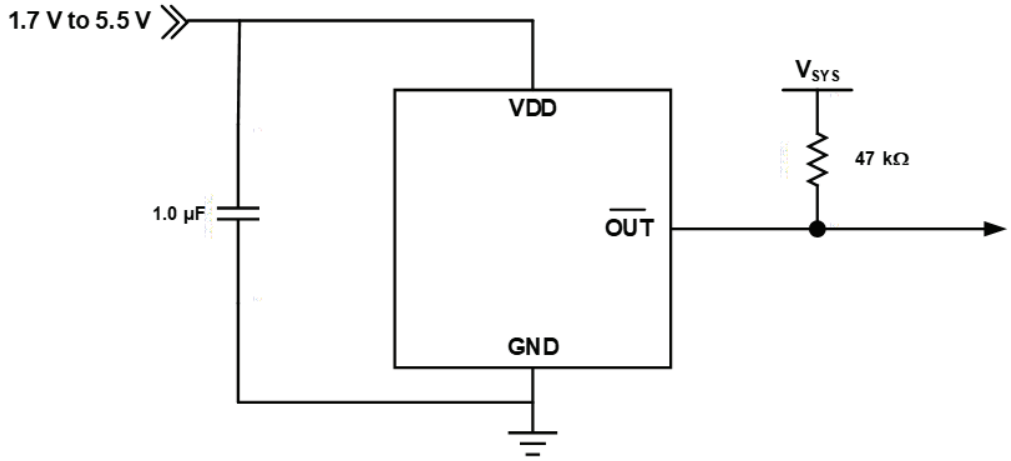

Figure 37: CT8111 Application Block Diagram

Like the CT8111, the CT8112 products require a 1.0 µF (ceramic) bypass capacitor to be connected between the supply voltage and ground.

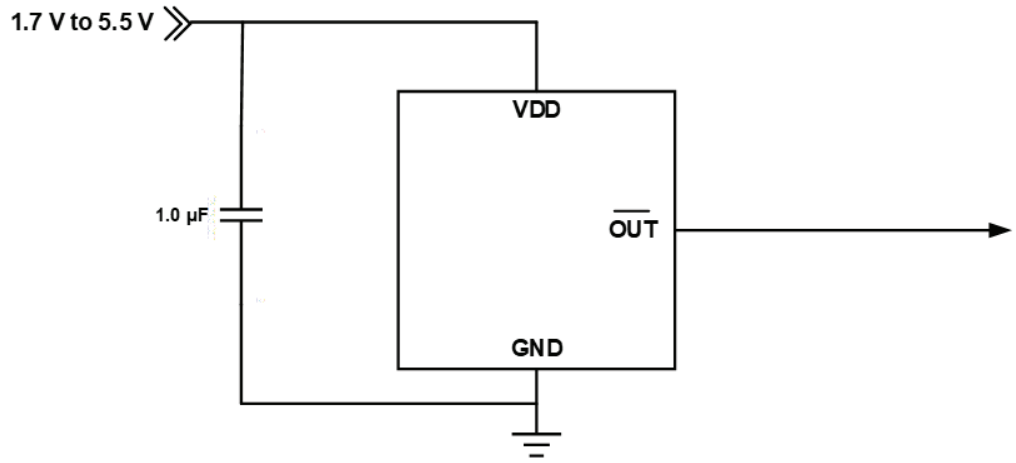

Figure 38: CT8112 Application Block Diagram

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XtremeSense TMR Current Sensor Location

The XtremeSense TMR sensor location for the CT811x products are shown in Figure 39. The dimensions shown are typical values.

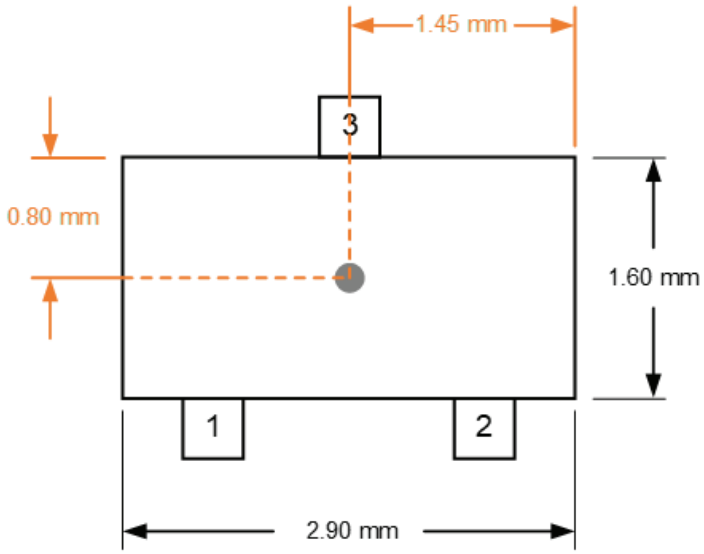

Figure 39: XtremeSense TMR Sensor Location for CT811x products in 3-lead SOT23 Package

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PACKAGE OUTLINE DRAWING

For Reference Only – Not for Tooling Use

Dimensions in millimeters – NOT TO SCALE

Dimensions exclusive of mold flash, gate burs, and dambar protrusions

Exact case and lead configuration at supplier discretion within limits shown

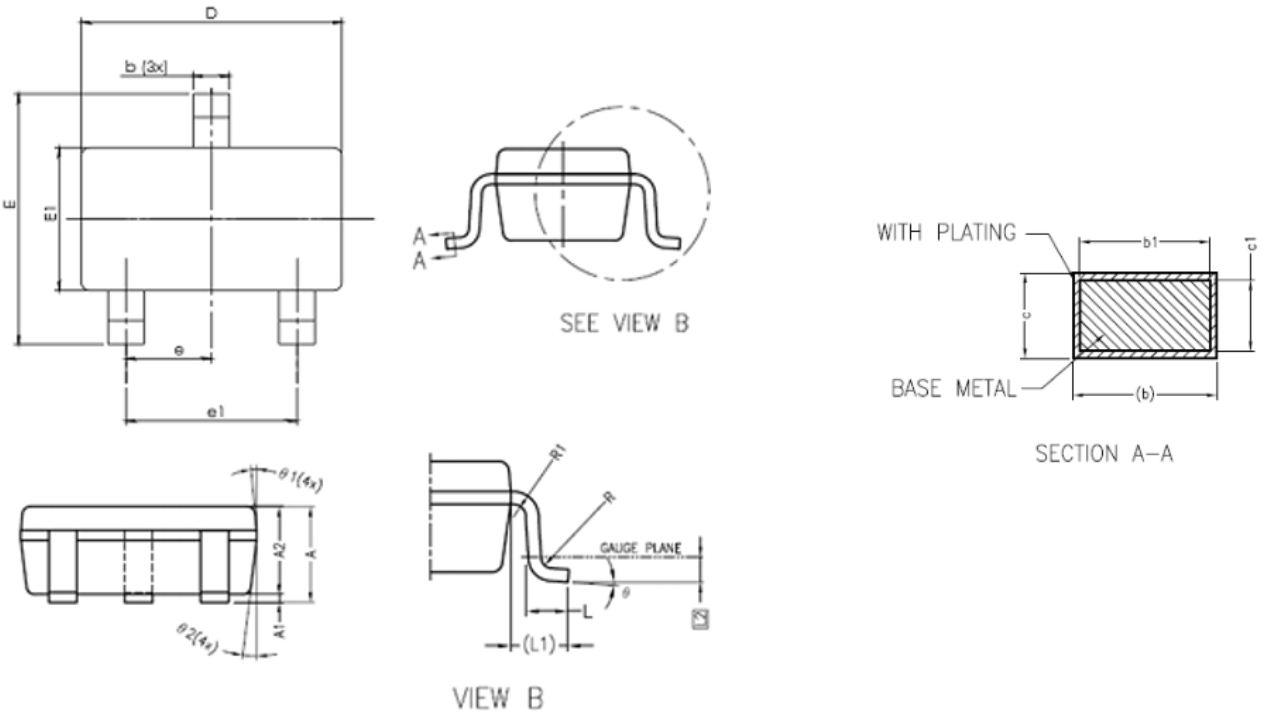

Figure 40: 3-Lead SOT23 Package Drawing

Table 3: CT811x 3-Lead SOT23 Package Dimensions

Symbol	Dimensions in Millimeters (mm)		
	Min.	Typ.	Max.
A	1.05	1.20	1.35
A1	0.00	0.10	0.15
A2	1.00	1.10	1.20
b	0.30	–	0.50
b1	0.30	0.35	0.45
c	0.08	–	0.22
c1	0.08	0.13	0.20
D	2.80	2.90	3.00
E	2.60	2.80	3.00
E1	1.50	1.60	1.70

Symbol	Dimensions in Millimeters (mm)		
	Min.	Typ.	Max.
e		0.95 BSC	
e1		1.90 BSC	
L	0.35	0.43	0.60
L1		0.50 REF	
L2		0.25 BSC	
R	0.10	–	–
R1	0.10	–	0.25
θ	0°	4°	8°
θ1	5°	6°	15°
θ2	5°	8°	15°

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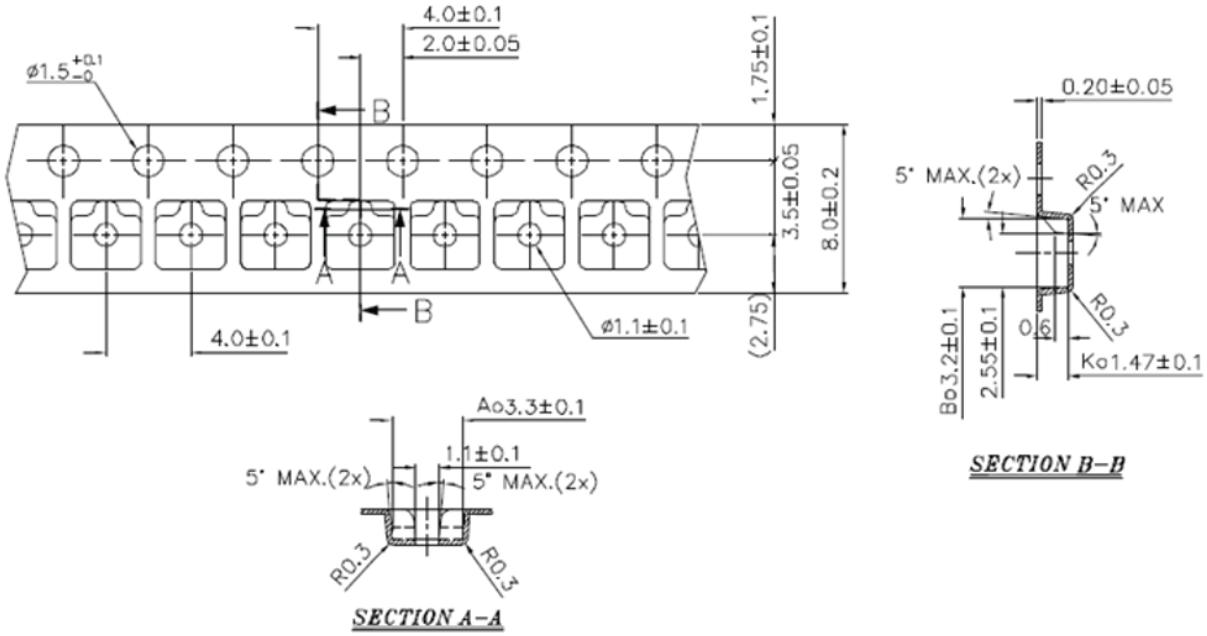
TAPE AND REEL POCKET DRAWING AND DIMENSIONS

For Reference Only – Not for Tooling Use

Dimensions in millimeters – NOT TO SCALE
Dimensions exclusive of mold flash, gate burs, and dambar protrusions
Exact case and lead configuration at supplier discretion within limits shown



NOTES:

1. Material: Conductive Polystyrene.
2. Dimensions in mm.
3. 10 sprocket hole pitch cumulative tolerance ±0.20 mm.
4. Camber not to exceed 1 mm in 100 mm.
5. Pocket position relative to sprocket hole measured as true position of pocket and not pocket hole.
6. (S.R. Ω/sq) means surface electric resistivity of the carrier tape.

Figure 41: Tape and Pocket Drawing for 3-lead SOT23 Package

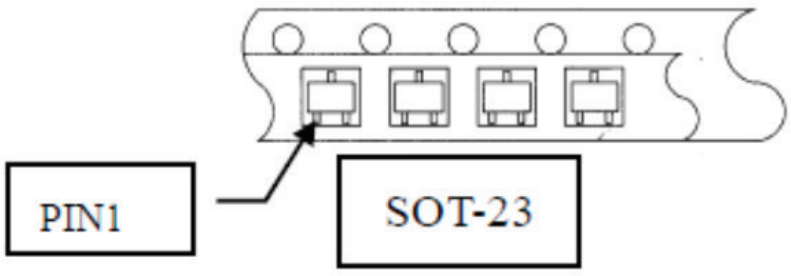


Figure 42: SOT23 Orientation in Tape Pocket

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PACKAGE INFORMATION

Table 4: CT811x Package Information

Part Number	Package Type	# of Leads	Package Quantity	Lead Finish	Eco Plan [1]	MSL Rating [2]	Operating Temperature (°C) [3]	Device Marking [4]
CT8111BK-IS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 85	EK YWWS
CT8111BK-HS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 125	EK YWWS
CT8111BH-IS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 85	TBD
CT8111BH-HS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 125	TBD
CT8111DK-IS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 85	EJ YWWS
CT8111DK-HS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 125	EJ YWWS
CT8111DT-IS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 85	EL YWWS
CT8111DT-HS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 125	EL YWWS
CT8112BK-IS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 85	DK YWWS
CT8112BK-HS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 125	DK YWWS
CT8112DK-IS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 85	DJ YWWS
CT8112DK-HS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 125	DJ YWWS
CT8112DT-IS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 85	DL YWWS
CT8112DT-HS3	SOT23	3	3000	Sn	Green & RoHS	1	–40 to 125	DL YWWS

[1] RoHS is defined as semiconductor products that are compliant to the current EU RoHS requirements. It also will meet the requirement that RoHS substances do not exceed 0.1% by weight in homogeneous materials. Green is defined as the content of chlorine (Cl), bromine (Br), and antimony trioxide based flame retardants satisfy JS709B low halogen requirements of ≤ 1,000 ppm.
[2] MSL Rating = Moisture Sensitivity Level Rating as defined by JEDEC standard classifications.
[3] Package will withstand ambient temperature range of –40°C to 150°C and storage temperature range of –65°C to 150°C.
[4] Device Marking for SOT23 is defined as XZ YWWS where XZ = part number, Y = year, WW = work week, and S = sequential number.

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Revision History

Number	Date	Description
2	December 11, 2023	Document rebranded and minor editorial updates
3	May 14, 2024	Changed “latch(es)” to “switch(es)”
4	June 5, 2024	Added notes to package drawings (pages 20 and 21)
5	March 27, 2025	Updated power-on timing diagram (page 17)

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