CROCUS TECHNOLOGY
Intelligence in Sensing™

CT811x

Integrated Unipolar TMR Digital Latches

Features

- Sensitivity with B_{OP} as Low as 1.5 mT
- 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
- Under-Voltage 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

Product Description

The CT811x series of unipolar Tunnel Magneto-resistance (TMR) digital latches are designed for consumer and industrial applications. They are based on Crocus Technology's patented XtremeSense® TMR technology with integrated CMOS process to provide a monolithic solution for superior sensing performance. The CT811x digital latches 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. It supports magnetic fields down to 1.5 mT for applications where there is a large air gap requirement.

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

Ordering Information

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

Block Diagram

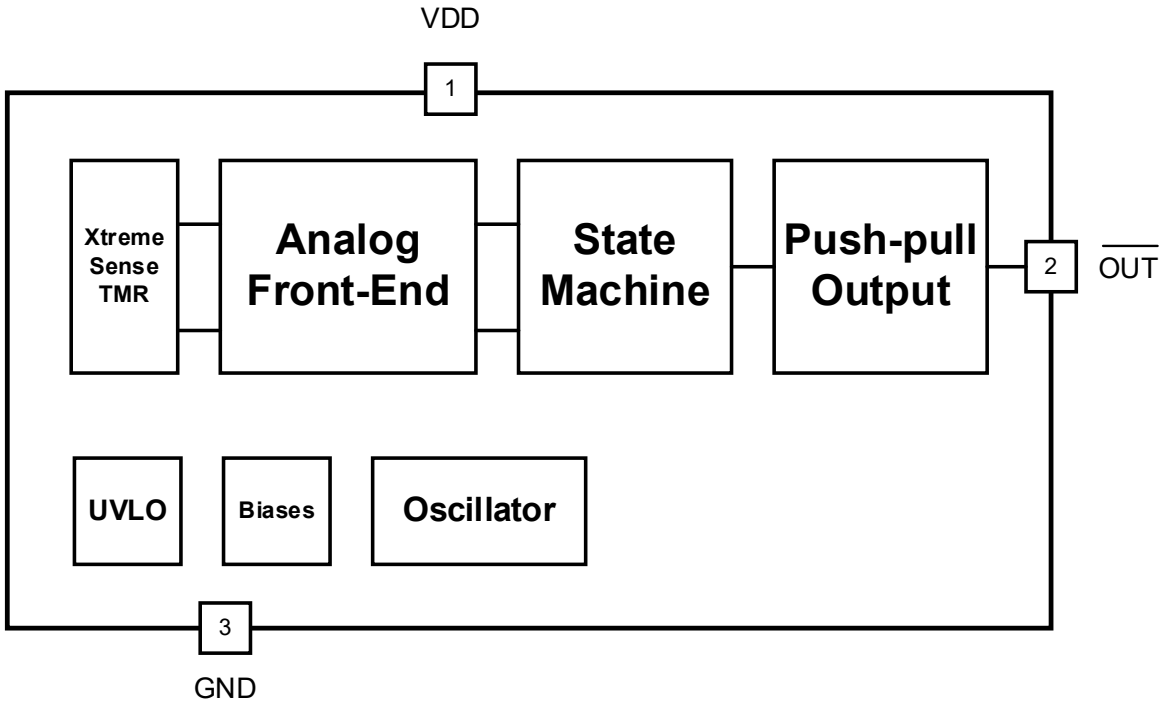


Figure 1. CT8112 with Push-pull Output Block Diagram for 3-lead SOT23 Package

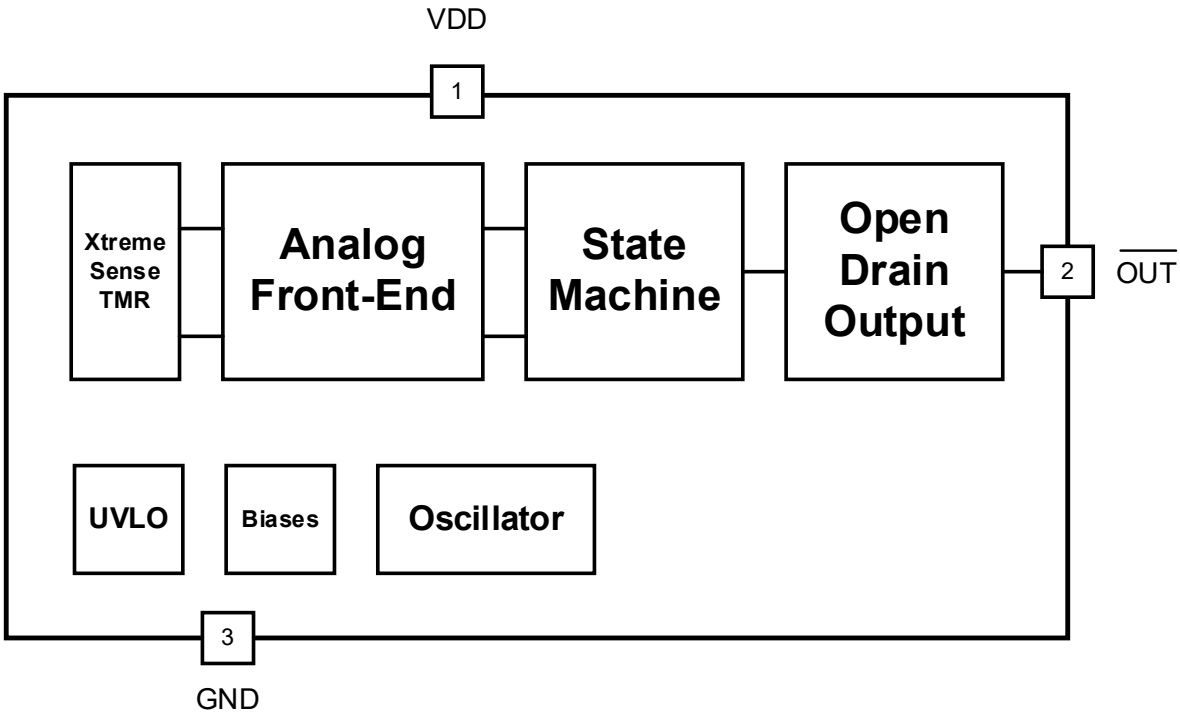


Figure 2. CT8111 with Open Drain Output Block Diagram for 3-lead SOT23 Package

SOT23 Pin Configuration

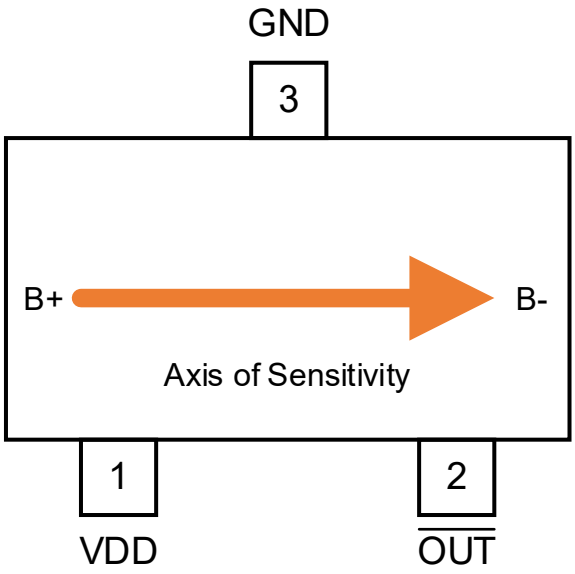


Figure 3. CT811x: 3-Lead SOT23 Package for Digital Output

Pin Definitions

Pin #	Pin Name	Pin Description
1	VDD	Supply Voltage
2	$\overline{\text{OUT}}$	Output Signal (Active LOW)
3	GND	Ground

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the CT811x. The CT811x products 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. Crocus Technology does not recommend exceeding or designing to absolute maximum ratings.

Symbol	Parameter		Min.	Max.	Unit
V_{DD}	Supply Voltage		-0.3	6.0	V
V_{OUT_PP}	Push-pull Output (Active LOW)		-0.3	V_{DD} + 0.3*	V
V_{OUT_OD}	Open Drain Output (Active LOW)		-0.3	6.0	V
$V_{I/O}$	Input/Output Pins Maximum Voltage		-0.3	V_{DD} + 0.3*	V
I_{IN} / I_{OUT}	Input and Output Current			±20.0	mA
B_{MAX}	Maximum External Magnetic Field @ T_A = +25°C			±200	mT
ESD	Electrostatic Discharge Protection Level	Human Body Model (HBM) per JESD22-A114	±4.0		kV
		Charged Device Model (CDM) per JESD22-C101	0.5		
T_J	Junction Temperature		-40	+150	°C
T_{STG}	Storage Temperature		-65	+150	°C
T_L	Lead Soldering Temperature, 10 Seconds			+260	°C

*The lower of V_{DD} + 0.3 V or 6.0 V.

Recommended Operating Conditions

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. Crocus Technology does not recommend exceeding or designing to absolute maximum ratings.

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_{DD}	Supply Voltage Range		1.7	3.3	5.5	V
V_{OUT}	OUT Voltage Range		0		V_{DD}	V
B_{OP}	Operating Magnetic Flux				30	mT
I_{OUT}	OUT Current				±3.0	mA
C_{BYP}	Bypass Capacitor			1.0		µF
T_A	Operating Ambient Temperature	Industrial	-40	+25	+85	°C
		Extended Industrial	-40	+25	+125	

Thermal Properties

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). Special attention must be paid to not exceed junction temperature $T_{J(MAX)}$ at a given ambient temperature T_A.

Symbol	Parameter	Min.	Typ.	Max.	Unit
θ_{JA}	Junction-to-Ambient Thermal Resistance, SOT23-3		202		°C/W

Electrical Specifications

General Parameters

Unless otherwise specified: V_{DD} = 1.7 V 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.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Push-pull Output						
V_{OH}	Output Voltage High $\overline{OUT}$ (1)		0.9 × V_{DD}			V
V_{OL}	Output Voltage LOW $\overline{OUT}$ (1)				0.1 × V_{DD}	V
I_{OUT}	Current for $\overline{OUT}$ (1)			±2.0		mA
Open Drain Output						
V_{OH}	Output Voltage High (1)				5.5	V
V_{OL}	Output Voltage Low	I_{OUT} ≤ 20 mA	0		0.5	V
I_{LEAK}	High Output Leakage Current (1)	V_{OH} = 5.5 V, B = 0		20		pA
Timings						
t_{ON}	Power-On Time (1)	V_{DD} ≥ 1.7 V		50	75	µs
t_{ACTIVE}	Active Mode Time (1)			2.6		µs
Protection						
V_{UVLO}	Under-Voltage Lockout (1)	Rising V_{DD}		1.60	1.64	V
		Falling V_{DD}	1.44	1.53		V
V_{UV_HYS}	UVLO Hysteresis (1)			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)

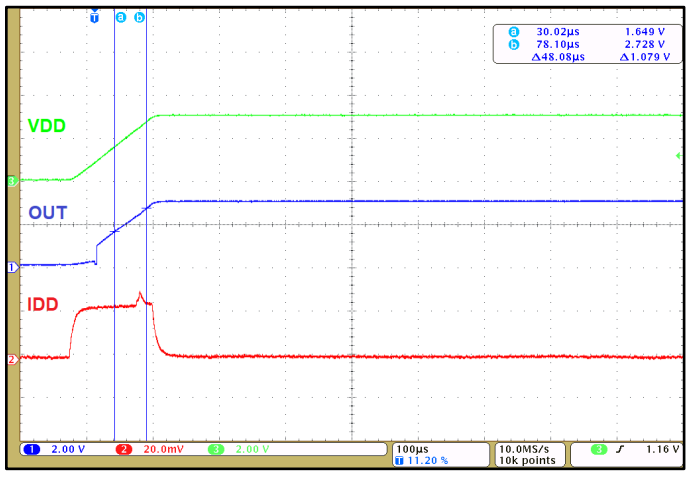


Figure 4. Power-On Time for Push-pull Output

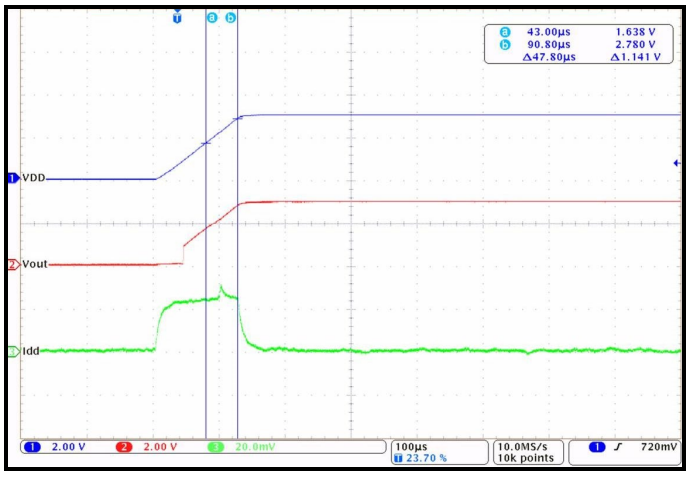


Figure 5. Power-On Time for Open Drain Output

CT8111BK Electrical & Magnetic Specifications

Unless otherwise specified: V_{DD} = 1.7 V 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.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{DD(AVG)}$	Average Supply Current	t ≥ 10 s		190	900	nA
$I_{DD(AVG)\_1.8V}$	Average Supply Current @ V_{DD} = 1.8 V	t ≥ 10 s, V_{DD} = 1.8 V		145	700	nA
f_{S1}	Sampling Frequency		6	10	14	Hz
t_{IDLE1}	Idle Mode Time	f_S = 10 Hz	71	100	167	ms
B_{OP}	Operate Point		+2.3	+3.0	+3.8	mT
B_{RP}	Release Point		+1.4	+2.0	+2.7	mT
B_{HYST}	Hysteresis		0.5	1.0		mT

CT8111BH Electrical & Magnetic Specifications

Unless otherwise specified: V_{DD} = 1.7 V 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.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{DD(AVG)}$	Average Supply Current	t ≥ 10 s		45	57	µA
$I_{DD(AVG)\_1.8V}$	Average Supply Current @ V_{DD} = 1.8 V	t ≥ 10 s, V_{DD} = 1.8 V		41	47	µA
f_{S1}	Sampling Frequency		6	10	14	kHz
t_{IDLE1}	Idle Mode Time	f_S = 10 Hz	71	100	167	µs
B_{OP}	Operate Point		+2.3	+3.0	+3.8	mT
B_{RP}	Release Point		+1.4	+2.0	+2.7	mT
B_{HYST}	Hysteresis		0.5	1.0		mT

Typical Magnetic Characteristics for CT8111Bx

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

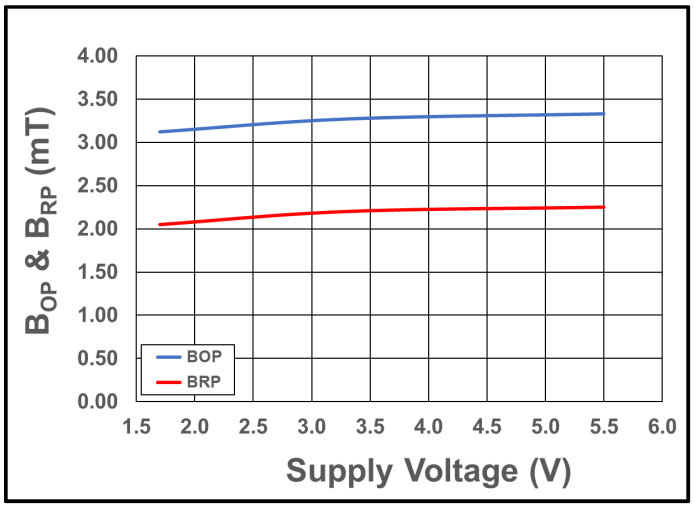


Figure 6. B_{OP} (Blue) and B_{RP} (Red) vs. Supply Voltage at T_A = +25°C

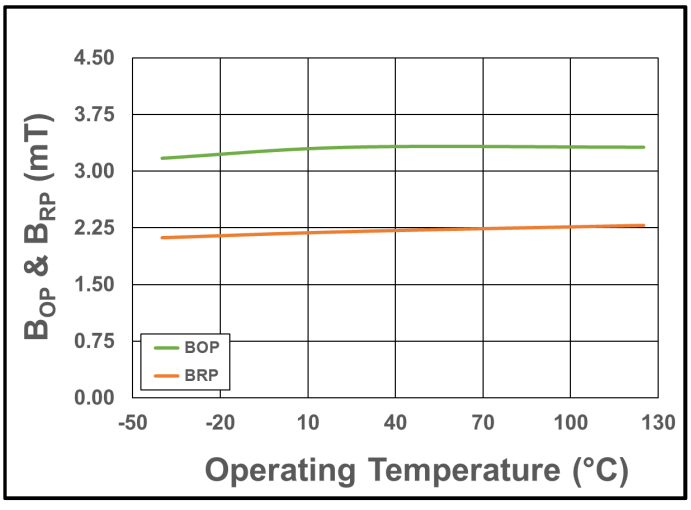


Figure 7. B_{OP} (Green) and B_{RP} (Orange) vs. Temperature at V_{DD} = 3.3 V.

Typical Electrical Characteristics for CT8111BK

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

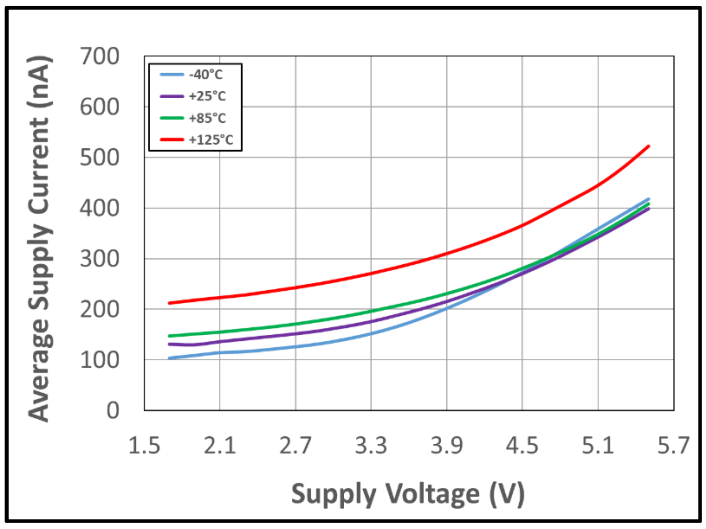


Figure 8. Average Supply Current vs. Supply Voltage vs. Temperature

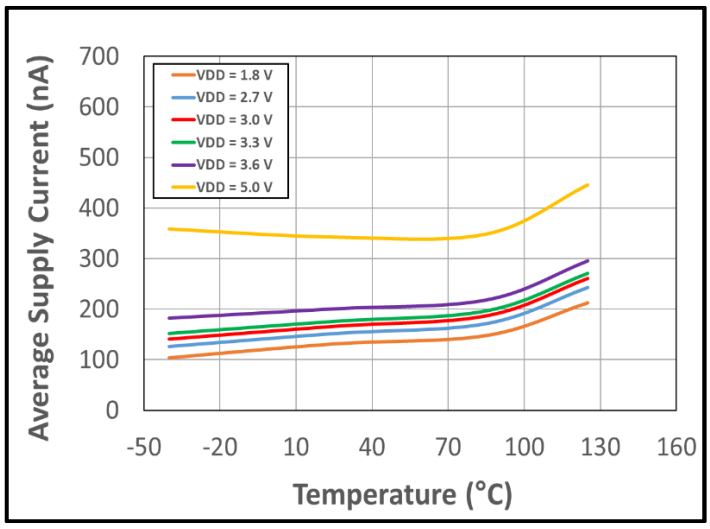


Figure 9. Average Supply Current vs. Temperature vs. Supply Voltage

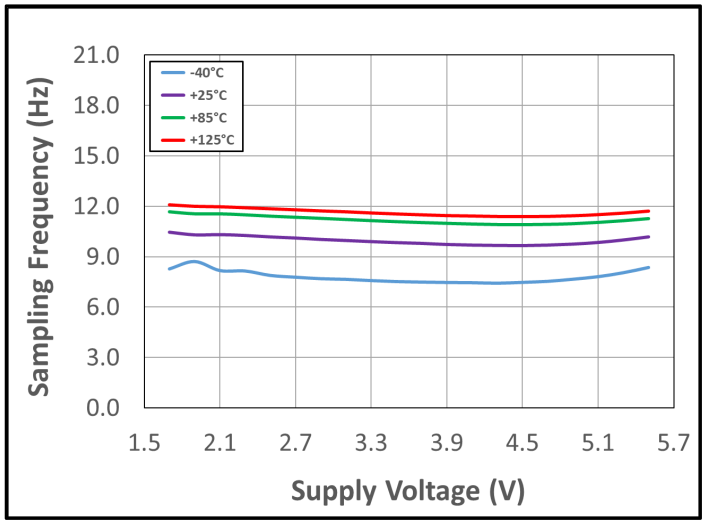


Figure 10.Sampling Frequency vs. Supply Voltage vs. Temperature

Typical Electrical Characteristics for CT8111BH

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

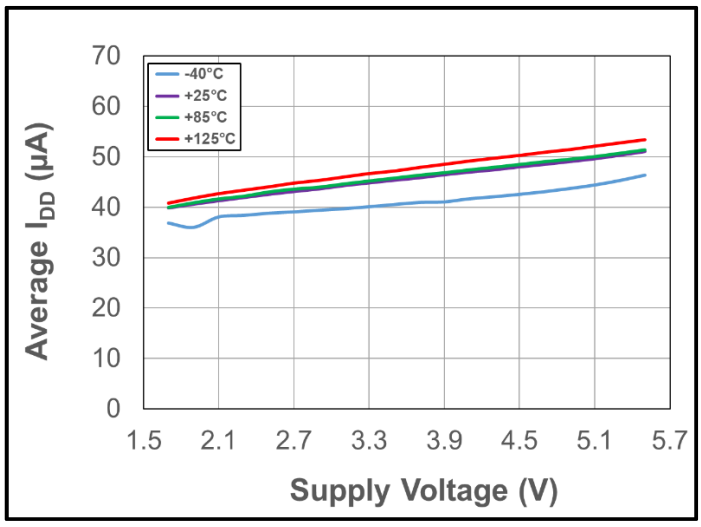


Figure 11. Average Supply Current vs. Supply Voltage vs. Temperature

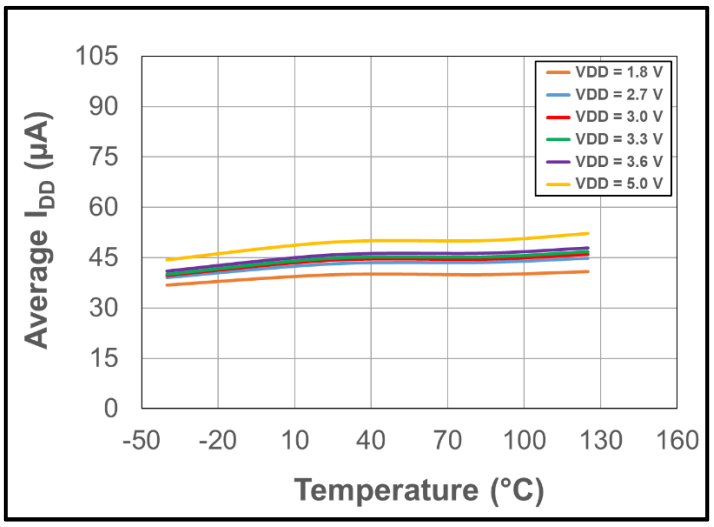


Figure 12. Average Supply Current vs. Temperature vs. Supply Voltage

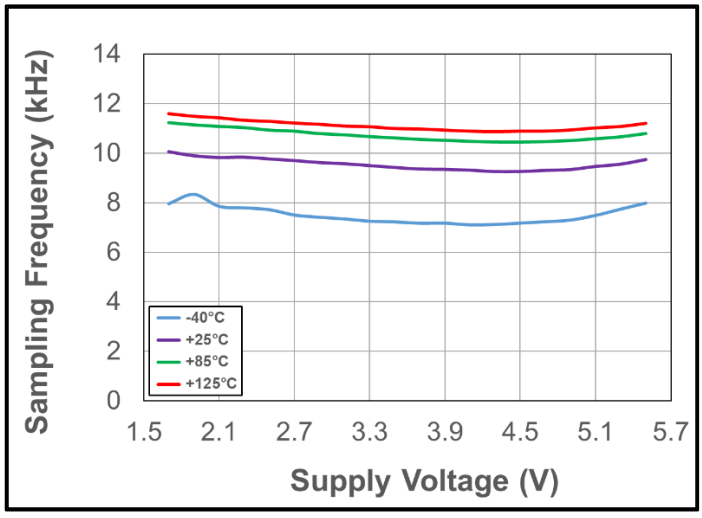


Figure 13. Sampling Frequency vs. Supply Voltage vs. Temperature

CT8111DK Electrical & Magnetic Specifications

Unless otherwise specified: V_{DD} = 1.7 V 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.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{DD(AVG)}$	Average Supply Current	t ≥ 10 s		190	900	nA
$I_{DD(AVG)\_1.8V}$	Average Supply Current @ V_{DD} = 1.8 V	t ≥ 10 s, V_{DD} = 1.8 V		145	700	nA
f_S	Sampling Frequency		6	10	14	Hz
t_{IDLE}	Idle Mode Time	f_S = 10 Hz	71	100	167	ms
B_{OP}	Operate Point		+1.1	+1.5	+1.9	mT
B_{RP}	Release Point		+0.6	+1.0	+1.4	mT
B_{HYST}	Hysteresis		0.3	0.5		mT

CT8111DT Electrical & Magnetic Specifications

Unless otherwise specified: V_{DD} = 1.7 V 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.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{DD(AVG)}$	Average Supply Current	t ≥ 10 s		220	900	nA
$I_{DD(AVG)\_1.8V}$	Average Supply Current @ V_{DD} = 1.8 V	t ≥ 10 s, V_{DD} = 1.8 V		175	700	nA
f_S	Sampling Frequency		14	20	26	Hz
t_{IDLE}	Idle Mode Time	f_S = 20 Hz	38	50	71	ms
B_{OP}	Operate Point		+1.1	+1.5	+1.9	mT
B_{RP}	Release Point		+0.6	+1.0	+1.4	mT
B_{HYST}	Hysteresis		0.3	0.5		mT

Typical Magnetic Characteristics for CT8111Dx

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

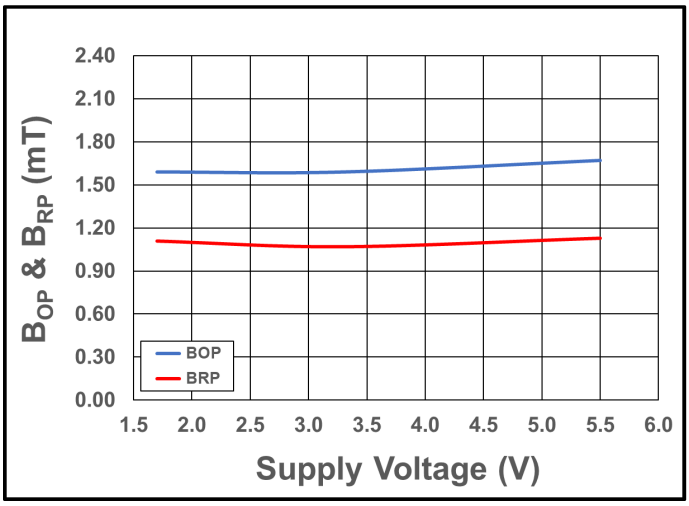


Figure 14. B_{OP} (Blue) and B_{RP} (Red) vs. Supply Voltage at T_A = +25°C

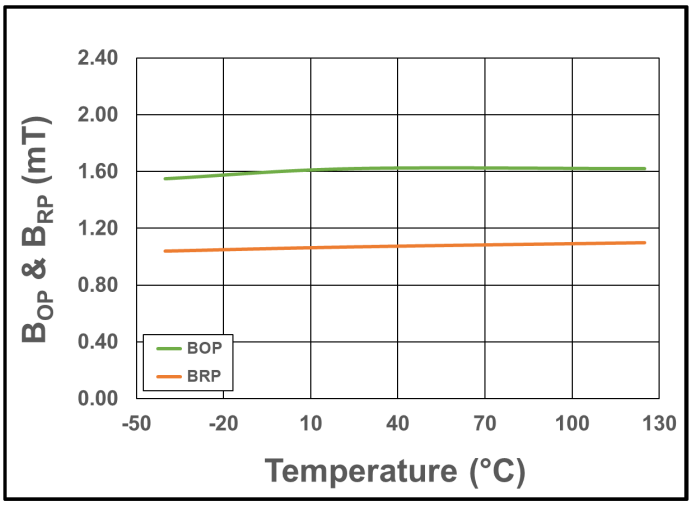


Figure 15. B_{OP} (Green) and B_{RP} (Orange) vs. Temperature at V_{DD} = 3.3 V.

Typical Electrical Characteristics for CT8111DK

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

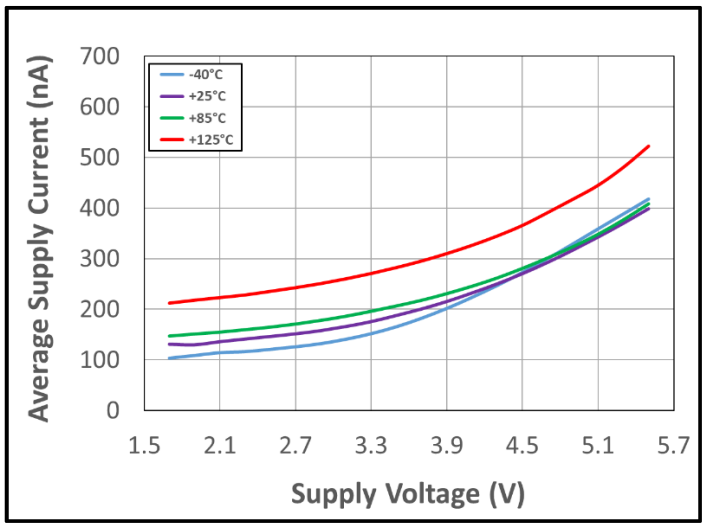


Figure 16. Average Supply Current vs. Supply Voltage vs. Temperature

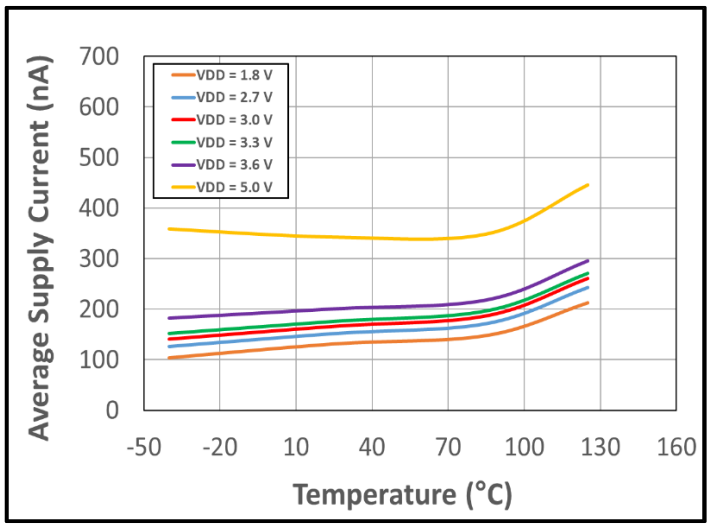


Figure 17. Average Supply Current vs. Temperature vs. Supply Voltage

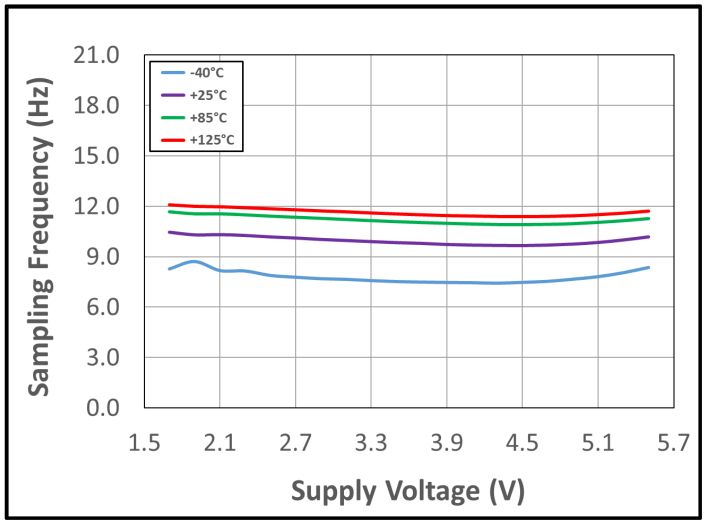


Figure 18.Sampling Frequency vs. Supply Voltage vs. Temperature

Typical Electrical Characteristics for CT8111DT

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

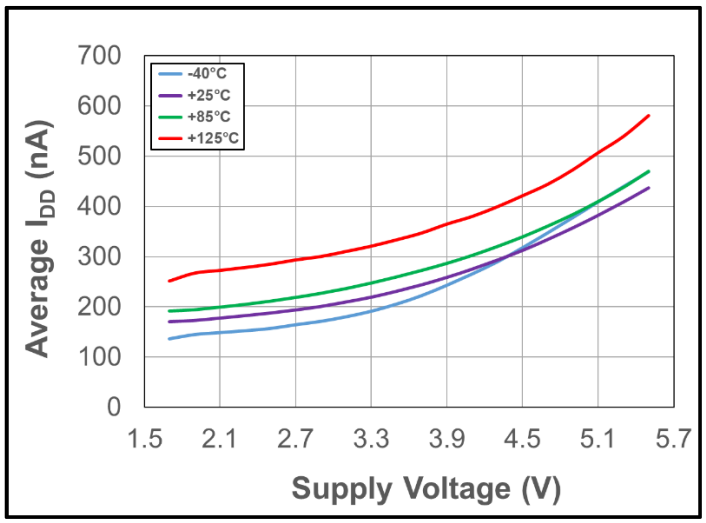


Figure 19. Average Supply Current vs. Supply Voltage vs. Temperature

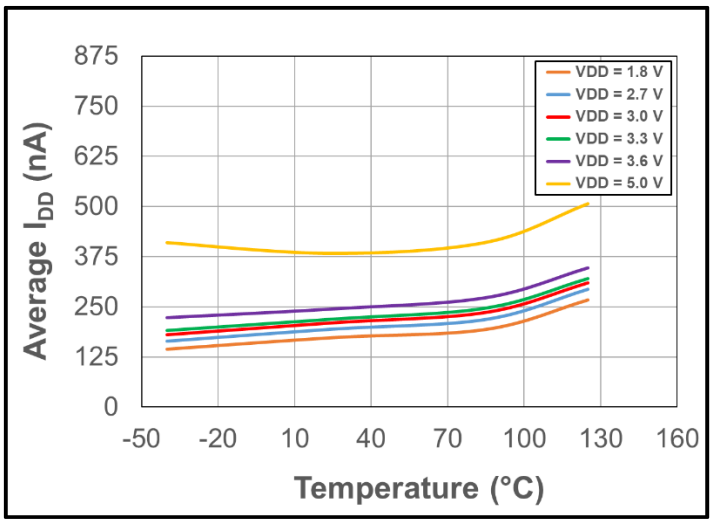


Figure 20. Average Supply Current vs. Temperature vs. Supply Voltage

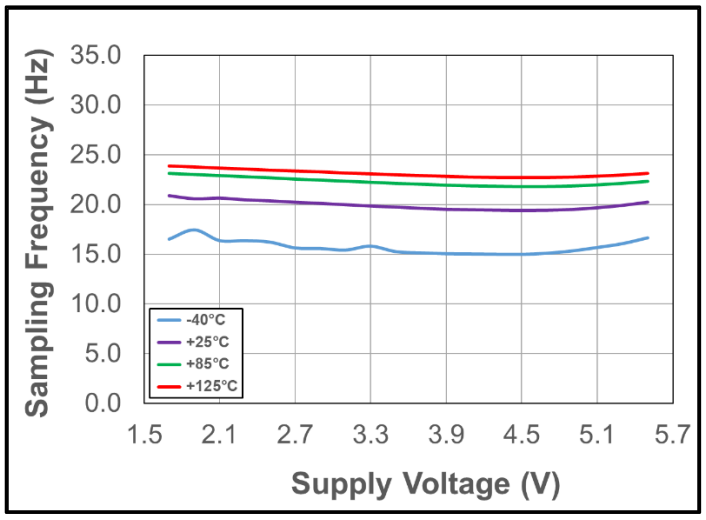


Figure 21.Sampling Frequency vs. Supply Voltage vs. Temperature

CT8112BK Electrical & Magnetic Specifications

Unless otherwise specified: V_{DD} = 1.7 V 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.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{DD(AVG)}$	Average Supply Current	t ≥ 10 s		190	900	nA
$I_{DD(AVG)\_1.8V}$	Average Supply Current @ V_{DD} = 1.8 V	t ≥ 10 s, V_{DD} = 1.8 V		145	700	nA
f_{S1}	Sampling Frequency		6	10	14	Hz
t_{IDLE1}	Idle Mode Time	f_S = 10 Hz	71	100	167	ms
B_{OP}	Operate Point		+2.3	+3.0	+3.8	mT
B_{RP}	Release Point		+1.4	+2.0	+2.7	mT
B_{HYST}	Hysteresis		0.5	1.0		mT

Typical Magnetic Characteristics for CT8112BK

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

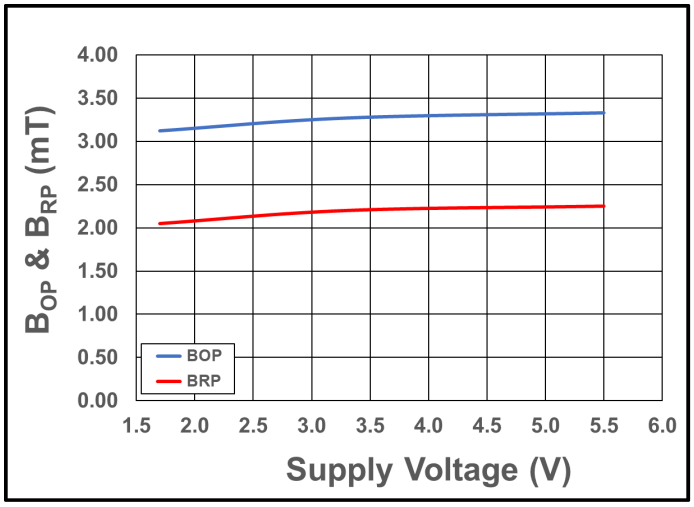


Figure 22. B_{OP} (Blue) and B_{RP} (Red) vs. Supply Voltage at T_A = +25°C

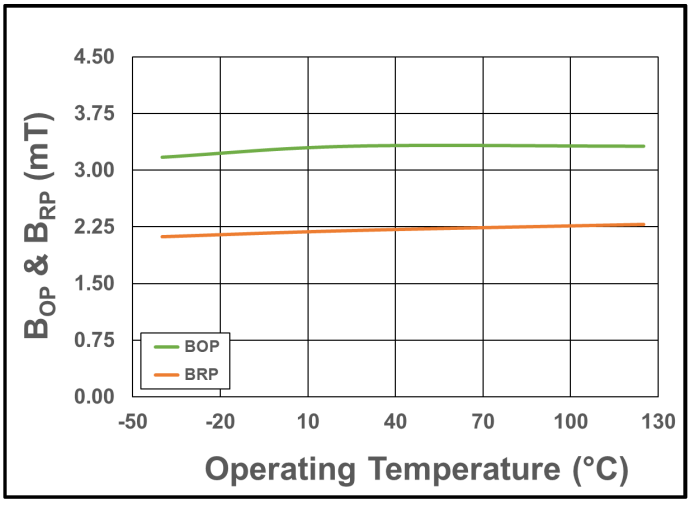


Figure 23. B_{OP} (Green) and B_{RP} (Orange) vs. Temperature at V_{DD} = 3.3 V.

Typical Electrical Characteristics for CT8112BK

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

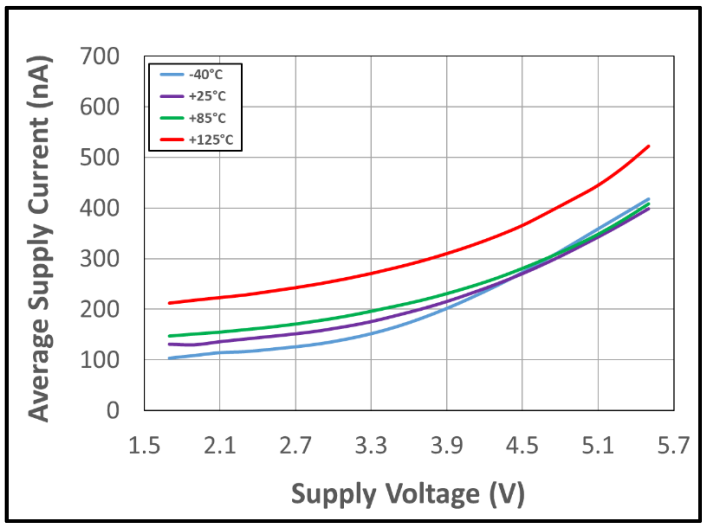


Figure 24. Average Supply Current vs. Supply Voltage vs. Temperature

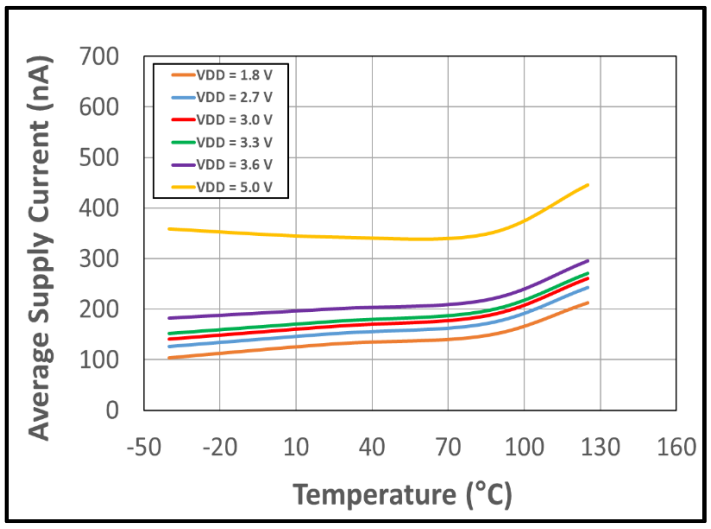


Figure 25. Average Supply Current vs. Temperature vs. Supply Voltage

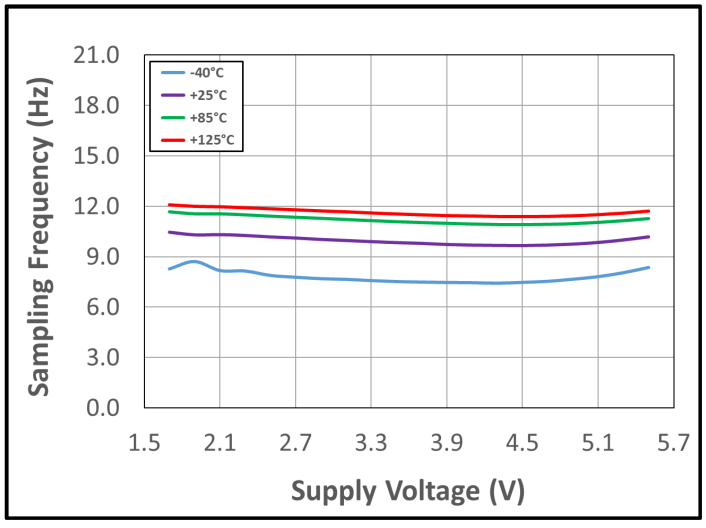


Figure 26.Sampling Frequency vs. Supply Voltage vs. Temperature

CT8112DK Electrical & Magnetic Specifications

Unless otherwise specified: V_{DD} = 1.7 V 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.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{DD(AVG)}$	Average Supply Current	t ≥ 10 s		190	900	nA
$I_{DD(AVG)\_1.8V}$	Average Supply Current @ V_{DD} = 1.8 V	t ≥ 10 s, V_{DD} = 1.8 V		145	700	nA
f_S	Sampling Frequency		6	10	14	Hz
t_{IDLE}	Idle Mode Time	f_S = 10 Hz	71	100	167	ms
B_{OP}	Operate Point		+1.1	+1.5	+1.9	mT
B_{RP}	Release Point		+0.6	+1.0	+1.4	mT
B_{HYST}	Hysteresis		0.3	0.5		mT

CT8112DT Electrical & Magnetic Specifications

Unless otherwise specified: V_{DD} = 1.7 V 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.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{DD(AVG)}$	Average Supply Current	t ≥ 10 s		220	900	nA
$I_{DD(AVG)\_1.8V}$	Average Supply Current @ V_{DD} = 1.8 V	t ≥ 10 s, V_{DD} = 1.8 V		175	700	nA
f_S	Sampling Frequency		14	20	26	Hz
t_{IDLE}	Idle Mode Time	f_S = 20 Hz	38	50	71	ms
B_{OP}	Operate Point		+1.1	+1.5	+1.9	mT
B_{RP}	Release Point		+0.6	+1.0	+1.4	mT
B_{HYST}	Hysteresis		0.3	0.5		mT

Typical Magnetic Characteristics for CT8112Dx

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

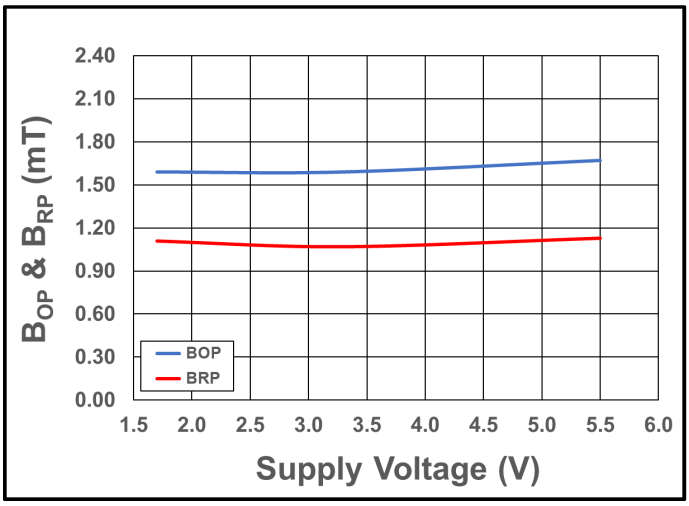


Figure 27. B_{OP} (Blue) and B_{RP} (Red) vs. Supply Voltage at T_A = +25°C

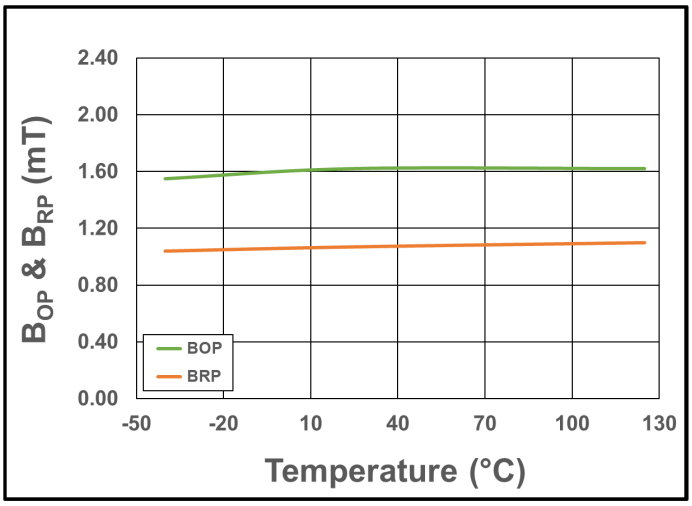


Figure 28. B_{OP} (Green) and B_{RP} (Orange) vs. Temperature at V_{DD} = 3.3 V.

Typical Electrical Characteristics for CT8112DK

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

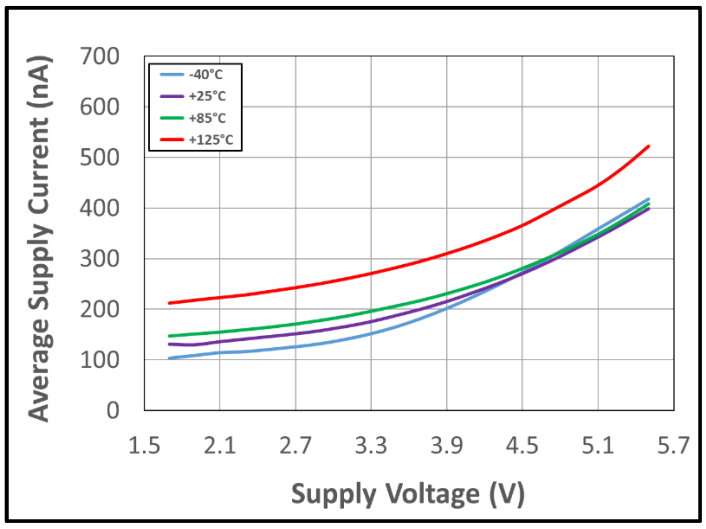


Figure 29. Average Supply Current vs. Supply Voltage vs. Temperature

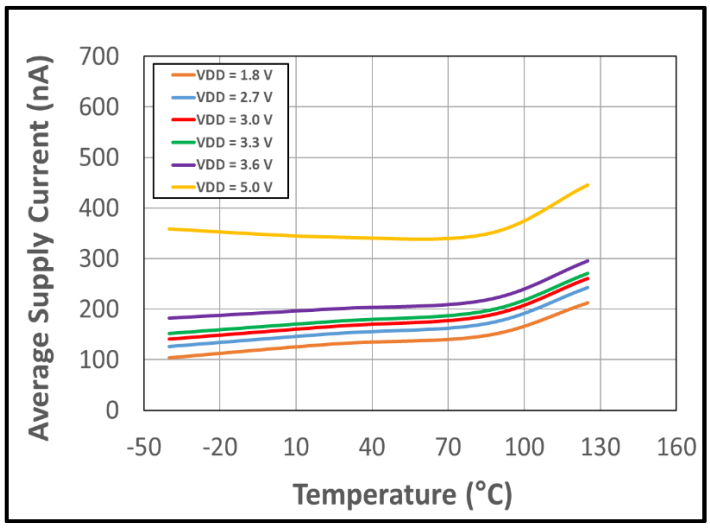


Figure 30. Average Supply Current vs. Temperature vs. Supply Voltage

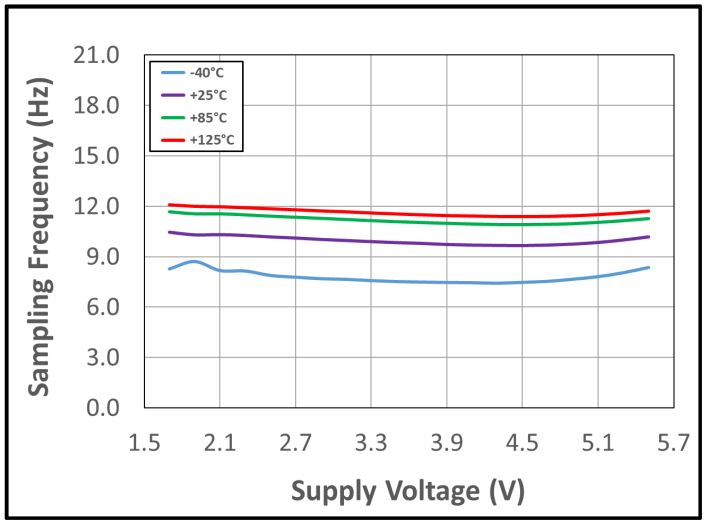


Figure 31.Sampling Frequency vs. Supply Voltage vs. Temperature

Typical Electrical Characteristics for CT8112DT

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

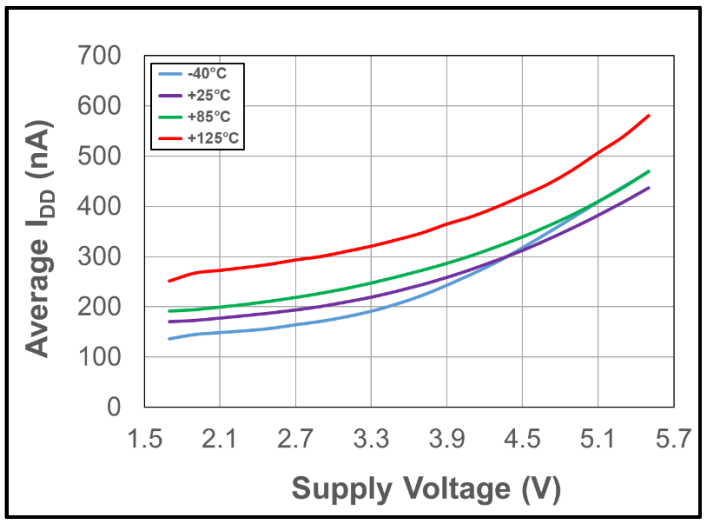


Figure 32. Average Supply Current vs. Supply Voltage vs. Temperature

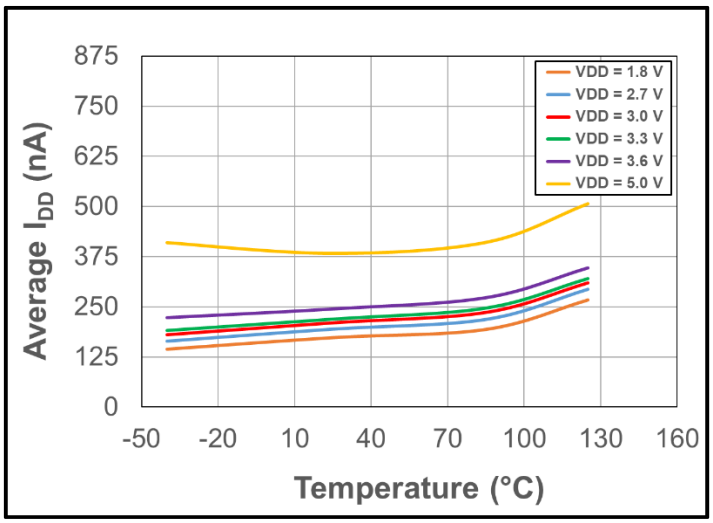


Figure 33. Average Supply Current vs. Temperature vs. Supply Voltage

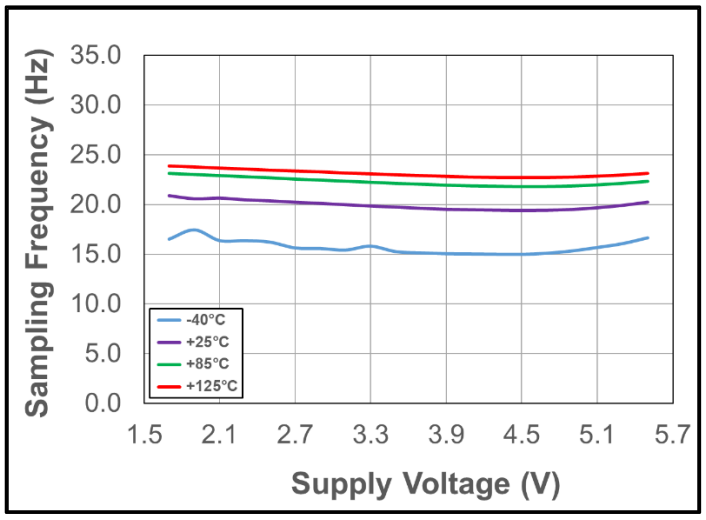


Figure 34.Sampling Frequency vs. Supply Voltage vs. Temperature

Circuit Description

Overview

The CT811x is a product family of unipolar TMR magnetic latches that supports a wide operating voltage range of 1.7 V to 5.5 V and is capable of providing two (2) digital output configurations: open drain or push-pull. These unipolar TMR digital latches 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.

Under-Voltage Lockout (UVLO)

The Under-Voltage Lock-out 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}.

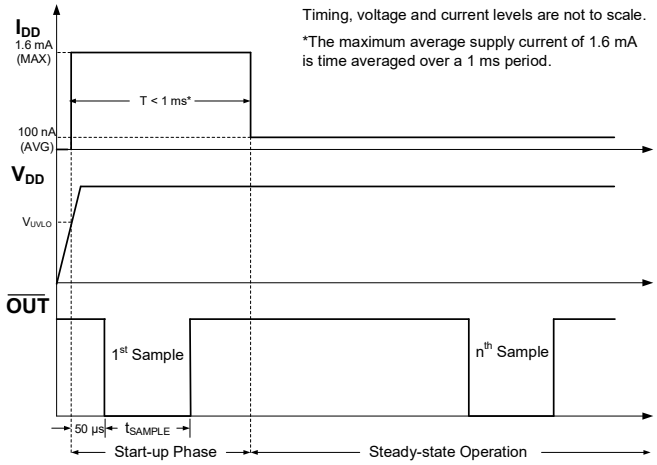


Figure 35. CT811x Power-On Timing Diagram

Unipolar Magnetic Flux

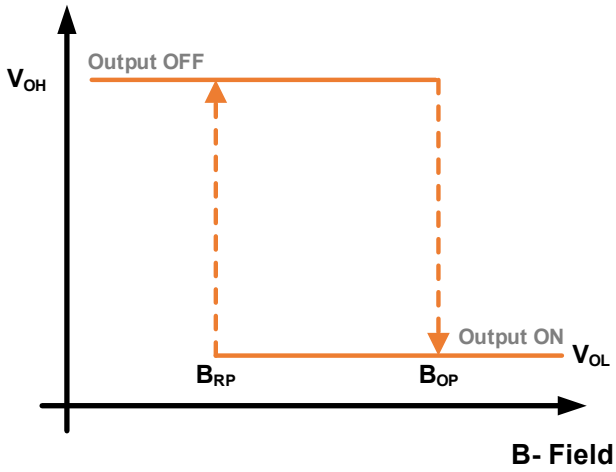


Figure 36. CT811x Output Behavior vs. Magnetic Field

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)

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 latch. A typical capacitor value of 1.0 µF (ceramic) will be sufficient. A pull-up resistor of 47 kΩ connected from the $\overline{OUT}$ to the system voltage (V_{SYS}) is required for the CT8111.

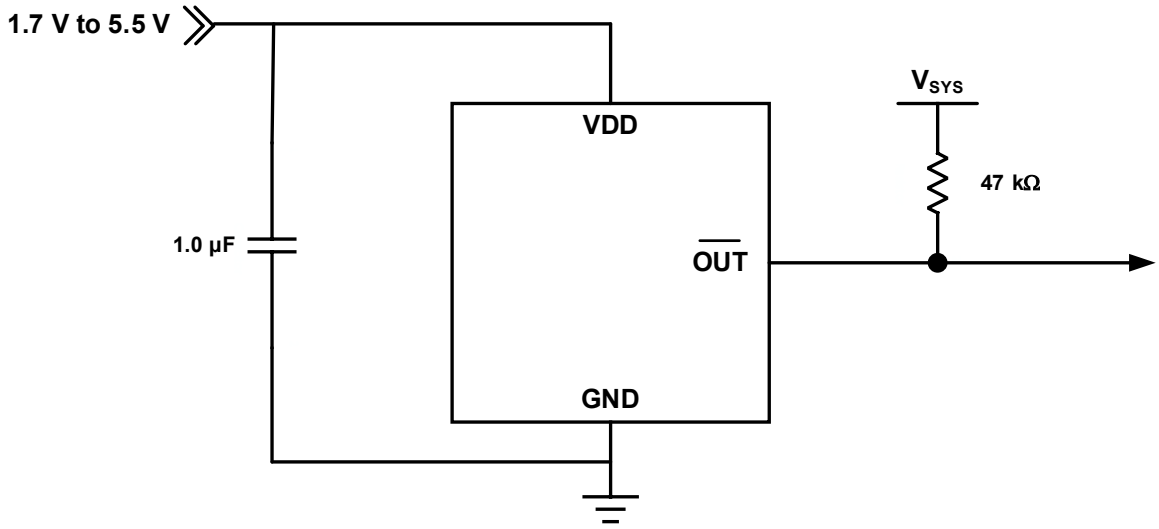


Figure 37. CT8111 Application Block Diagram

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

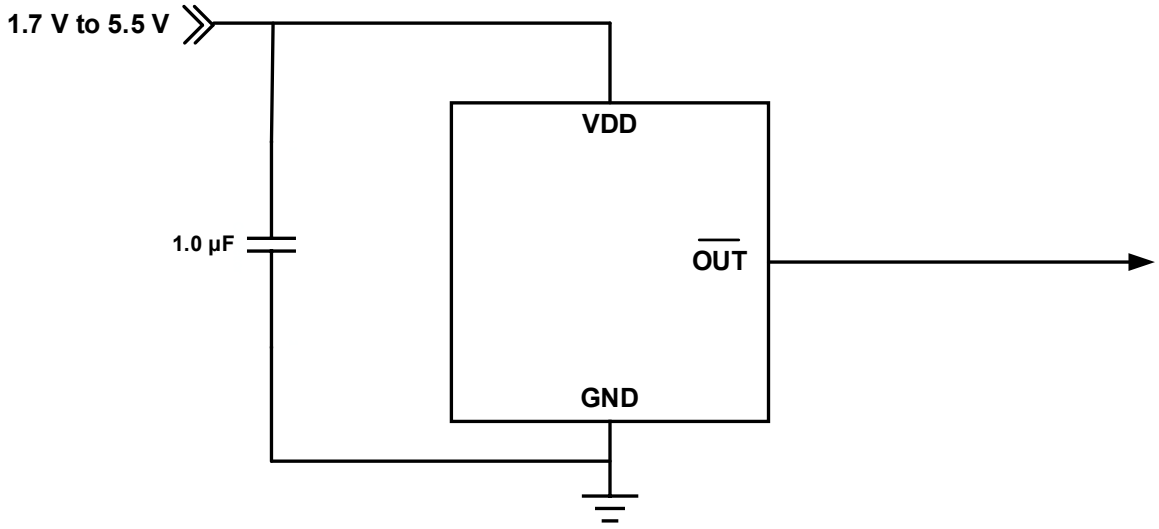


Figure 38. CT8112 Application Block Diagram

Applications Information

The XtremeSense TMR sensor location for the CT811x products are shown in Figure 39 and **Error! Reference source not found.**. The dimensions shown in both figures are typical values.

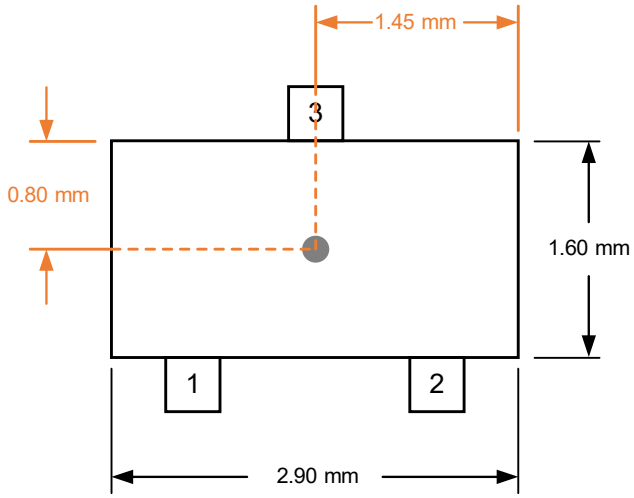


Figure 39. XtremeSense TMR Sensor Location for CT811x products in 3-lead SOT23 Package

SOT23-3 Package Drawing and Dimensions

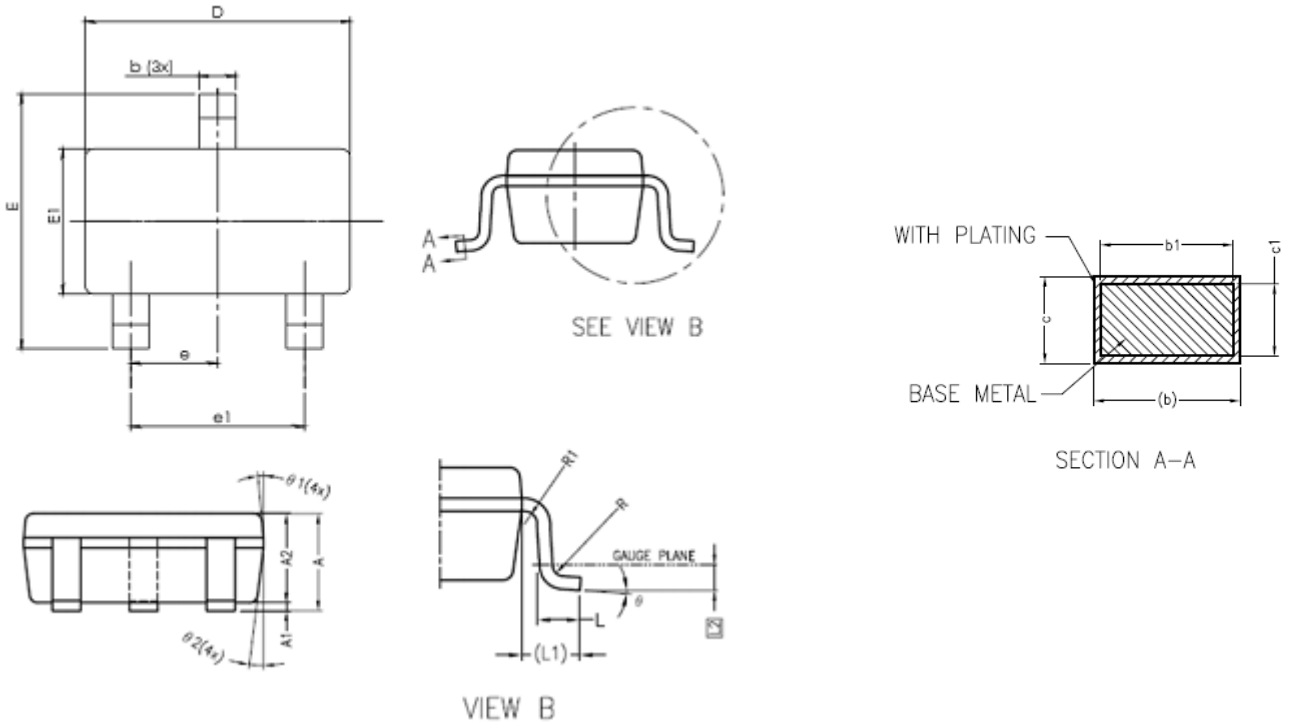


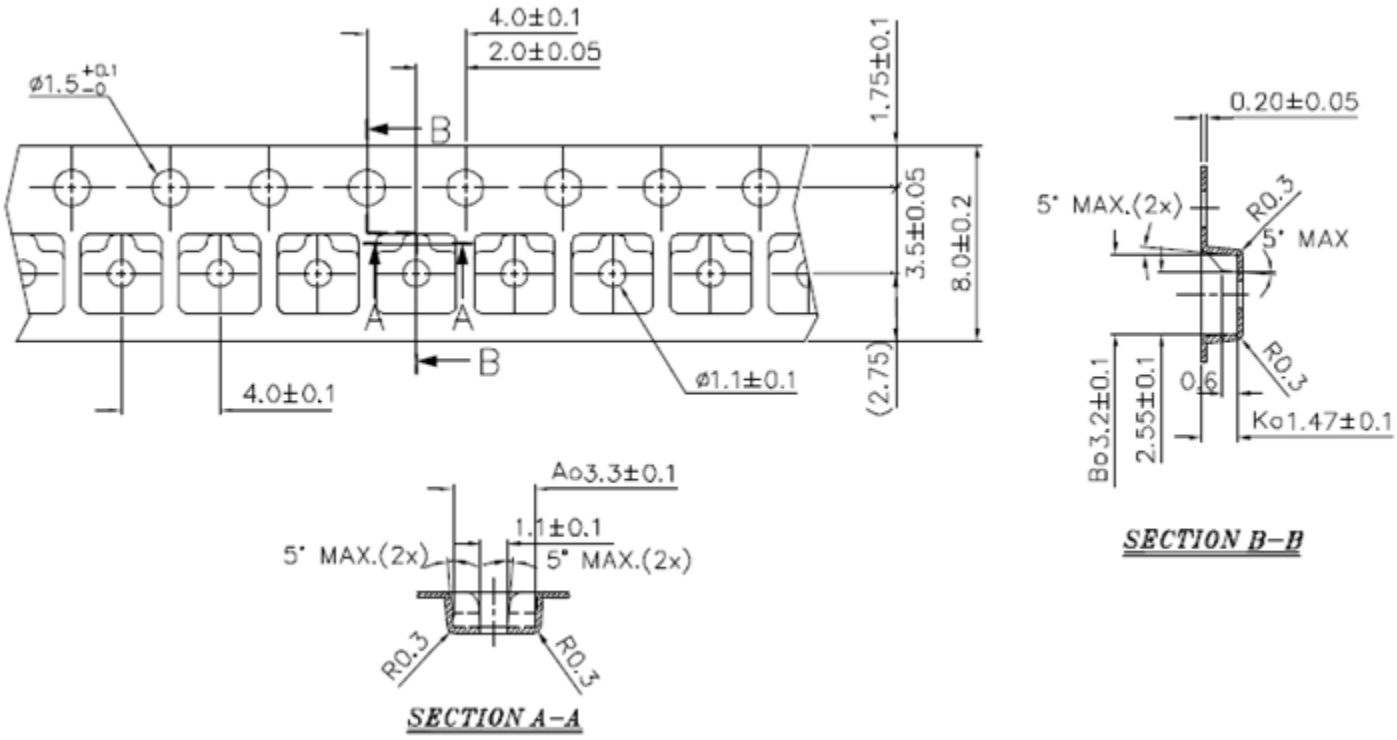
Figure 40. 3-Lead SOT23 Package Drawing

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
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°

Crocus Technology provides package drawings as a service to customers considering or planning to use Crocus products in their designs. Drawings may change without notice. Please note the revision and date of the data sheet and contact a Crocus Technology representative to verify or obtain the most recent version. The package specifications do not expand the terms of Crocus Technology's worldwide terms and conditions, specifically the warranty therein, which covers Crocus Technology's products.

SOT23 Tape & Pocket Drawing and Dimensions



NOTES:

1. Material: Conductive Polystyrene
2. Dimensions in mm.
3. 10 sprocket hole pitch cumulative tolerance ±0.20 mm.
4. Camber bot 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 SOT23 Package

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 (3)	Device Marking
CT8111BK-IS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +85°C	EK YWWS
CT8111BK-HS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +125°C	EK YWWS
CT8111BH-IS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +85°C	TBD
CT8111BH-HS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +125°C	TBD
CT8111DK-IS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +85°C	EJ YWWS
CT8111DK-HS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +125°C	EJ YWWS
CT8111DT-IS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +85°C	EL YWWS
CT8111DT-HS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +125°C	EL YWWS
CT8112BK-IS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +85°C	DK YWWS
CT8112BK-HS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +125°C	DK YWWS
CT8112DK-IS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +85°C	DJ YWWS
CT8112DK-HS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +125°C	DJ YWWS
CT8112DT-IS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +85°C	DL YWWS
CT8112DT-HS3	SOT23	3	3,000	Sn	Green & RoHS	1	-40°C to +125°C	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.

Product Status Definition

Data Sheet Identification	Product Status	Definition
Objective	Proposed New Product Idea or In Development	Data sheet contains design target specifications and are subject to change without notice at any time.
Preliminary	First Production	Data sheet contains preliminary specifications obtained by measurements of early samples. Follow-on data will be published at a later date as more test data is acquired. Crocus reserves the right to make changes to the data sheet at any time.
None	Full Production	Data sheet contains final specifications for all parameters. Crocus reserves the right to make changes to the data sheet at any time.
Obsolete	Not in Production	Data sheet for a product that is no longer in production at Crocus. It is for reference only.