6.5 Electrical Characteristics

Unless otherwise specified, all limits ensured for T_A = 25°C, V_{DD} = 3.3 V. See (1)

PARAMETER		TEST CONDITIONS(2)	MIN(3)	TYP(4)	MAX(3)	UNIT
POWER						
V_{DD}	Supply Voltage	T_A = -40°C to +125°C	2.7		3.6	V
I_{DD}	Supply Current (not including sensor current)(5)	f_{CLKIN} = 10 MHz (6)		2.1		mA
I_{DDSL}	Sleep Mode Supply Current(5)	SLEEP_MODE_EN = b1		35	60	µA
I_{SD}	Shutdown Mode Supply Current(5)	SD = V_{DD}		0.2	1	µA
SENSOR						
$I_{SENSORMAX}$	Sensor Maximum Current drive	HIGH_CURRENT_DRV = b0 DRIVE_CURRENTx = 0xF800		1.5		mA
R_P	Sensor R_P		1		100	kΩ
$IHD_{SENSORMAX}$	High current sensor drive mode: Sensor Maximum Current	HIGH_CURRENT_DRV = b1 DRIVE_CURRENT0 = 0xF800 Channel 0 only		6		mA
$R_{P\_HD\_MIN}$	Minimum sensor R_P			250		Ω
f_{SENSOR}	Sensor Resonance Frequency	T_A = -40°C to +125°C	0.001		10	MHz
$V_{SENSORMAX}$	Maximum oscillation amplitude (peak)			1.8		V
N_{BITS}	Number of bits				28	bits
f_{CS}	Maximum Channel Sample Rate	single active channel continuous conversion, SCL=400 kHz			4.08	kSPS
C_{IN}	Sensor Pin input capacitance			4		pF
DIGITAL PIN LEVELS						
V_{IL}	Low voltage threshold (ADDR and SD)				0.3*V_{DD}	V
V_{IH}	High voltage threshold (ADDR and SD)		0.7*V_{DD}			V
V_{OL}	INTB low voltage output level	3mA sink current			0.4	V
V_{OH}	INTB high voltage output level		2.4			V
REFERENCE CLOCK						
f_{CLKIN}	External Reference Clock Input Frequency (CLKIN)	T_A = -40°C to +125°C	2		40	MHz
$CLKIN_{DUTY\_MIN}$	External Reference Clock minimum acceptable duty cycle (CLKIN)			40%		
$CLKIN_{DUTY\_MAX}$	External Reference Clock maximum acceptable duty cycle (CLKIN)			60%		
V_{CLKIN_LO}	CLKIN low voltage threshold				0.3*V_{DD}	V
V_{CLKIN_HI}	CLKIN high voltage threshold		0.7*V_{DD}			V

(1) Electrical Characteristics Table values apply only for factory testing conditions at the temperature indicated. Factory testing conditions result in very limited self-heating of the device such that $T_J = T_A$. No guarantee of parametric performance is indicated in the electrical tables under conditions of internal self-heating where $T_J > T_A$. Absolute Maximum Ratings indicate junction temperature limits beyond which the device may be permanently degraded, either mechanically or electrically.
(2) Register values are represented as either binary (b is the prefix to the digits), or hexadecimal (0x is the prefix to the digits). Decimal values have no prefix.
(3) Limits are ensured by testing, design, or statistical analysis at 25°C. Limits over the operating temperature range are ensured through correlations using statistical quality control (SQC) method.
(4) Typical values represent the most likely parametric norm as determined at the time of characterization. Actual typical values may vary over time and will also depend on the application and configuration. The typical values are not tested and are not guaranteed on shipped production material.
(5) I^2C read/write communication and pull-up resistors current through SCL, SDA not included.
(6) Sensor inductor: 2 layer, 32 turns/layer, 14 mm diameter, PCB inductor with L=19.4 µH, R_P=5.7 kΩ at 2 MHz Sensor capacitor: 330 pF 1% COG/NP0 Target: Aluminum, 1.5 mm thickness Channel = Channel 0 (continuous mode) f_{CLKIN} = 40 MHz, FIN_DIVIDER0 = b0000, FREF_DIVIDER0 = 0x0001, RCOUNT0 = 0xFFFF, SETTLECOUNT0 = 0x0100, RP_OVERRIDE = b1, AUTO_AMP_DIS = b1, DRIVE_CURRENT0 = 0x9800