ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_J = 25°C. V_{PWR} = V_{IN_SNS} = 12V, V_{DD33}, V_{DD25}, REFP and REFM pins floating, unless otherwise indicated. C_{VDD33} = 100nF, C_{VDD25} = 100nF and C_{REF} = 100nF. (Note 2)

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
Power Supply Characteristics							
V_{PWR}	V_{PWR} Supply Input Operating Range		●	4.5		15	V
I_{PWR}	V_{PWR} Supply Current	4.5V ≤ V_{PWR} ≤ 15V, V_{DD33} Floating	●		10	13	mA
I_{VDD33}	V_{DD33} Supply Current	3.13V ≤ V_{DD33} ≤ 3.47V, V_{PWR} = V_{DD33}	●		10	13	mA
V_{UVLO_VDD33}	V_{DD33} Undervoltage Lockout	V_{DD33} Ramping Up, V_{PWR} = V_{DD33}	●	2.35	2.55	2.8	V
	V_{DD33} Undervoltage Lockout Hysteresis				120		mV
V_{DD33}	Supply Input Operating Range	V_{PWR} = V_{DD33}	●	3.13		3.47	V
	Regulator Output Voltage	4.5V ≤ V_{PWR} ≤ 15V	●	3.13	3.26	3.47	V
	Regulator Output Short-Circuit Current	V_{PWR} = 4.5V, V_{DD33} = 0V	●	75	90	140	mA
V_{DD25}	Regulator Output Voltage	3.13V ≤ V_{DD33} ≤ 3.47V	●	2.35	2.5	2.6	V
	Regulator Output Short-Circuit Current	V_{PWR} = V_{DD33} = 3.47V, V_{DD25} = 0V	●	30	55	80	mA
t_{INIT}	Initialization Time	Time from V_{IN} Applied Until the TON_DELAY Timer Starts			30		ms
Voltage Reference Characteristics							
V_{REF}	Output Voltage (Note 3)	V_{REF} = V_{REFP} – V_{REFM}, 0 < I_{REFP} < 100µA			1.232		V
	Temperature Coefficient				3		ppm/°C
	Hysteresis	(Note 4)			100		ppm
ADC Characteristics							
V_{IN_ADC}	Voltage Sense Input Range	Differential Voltage: V_{IN_ADC} = ($V_{SENSEPn}$ – $V_{SENSEMn}$)	●	0		6	V
		Single-Ended Voltage: $V_{SENSEMn}$	●	–0.1		0.1	V
	Current Sense Input Range (Odd Numbered Channels Only)	Single-Ended Voltage: $V_{SENSEPn}$, $V_{SENSEMn}$	●	–0.1		6	V
		Differential Voltage: V_{IN_ADC}	●	–170		170	mV
N_ADC	Voltage Sense Resolution Uses L16 Format	0V ≤ V_{IN_ADC} ≤ 6V Mfr_config_adc_hires = 0			122		µV/LSB
	Current Sense Resolution (Odd Numbered Channels Only)	0mV ≤ |V_{IN_ADC}| < 16mV (Note 12) 16mV ≤ |V_{IN_ADC}| < 32mV 32mV ≤ |V_{IN_ADC}| < 63.9mV 63.9mV ≤ |V_{IN_ADC}| < 127.9mV 127.9mV ≤ |V_{IN_ADC}| Mfr_config_adc_hires = 1			15.625 31.25 62.5 125 250		µV/LSB µV/LSB µV/LSB µV/LSB µV/LSB
TUE_ADC_VOLT_SNS	Total Unadjusted Error (Note 3)	Voltage Sense Mode V_{IN_ADC} ≥ 1V	●			±0.25	% of Reading
		Voltage Sense Mode 0 ≤ V_{IN_ADC} ≤ 1V	●			±2.5	mV
TUE_ADC_CURR_SNS	Total Unadjusted Error (Note 3)	Current Sense Mode, Odd Numbered Channels Only, 20mV ≤ V_{IN_ADC} ≤ 170mV	●			±0.7	% of Reading
		Current Sense Mode, Odd Numbered Channels Only, V_{IN_ADC} ≤ 20mV	●			100 ±140	µV
V_{OS_ADC}	Offset Error	Current Sense Mode, Odd Numbered Channels Only	●			±~~35~~	µV
t_{CONV_ADC}	Conversion Time	Voltage Sense Mode (Note 5)			6.15		ms
		Current Sense Mode (Note 5)			24.6		ms
		Temperature Input (Note 5)			24.6		ms

ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_J = 25°C. V_{PWR} = V_{IN_SNS} = 12V; V_{DD33}, V_{DD25}, REFP and REFM pins floating, unless otherwise indicated. C_{VDD33} = 100nF, C_{VDD25} = 100nF and C_{REF} = 100nF. (Note 2)

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
TUE_{VIN_SNS}	VIN_ON, VIN_OFF Threshold Total Unadjusted Error	3V ≤ V_{VIN_SNS} ≤ 8V	●			±2.0	% of Reading
		V_{VIN_SNS} > 8V	●			±1.0	
	READ_VIN Total Unadjusted Error	3V ≤ V_{VIN_SNS} ≤ 8V	●			±1.5	% of Reading
		V_{VIN_SNS} > 8V	●			±1.0	
DAC Soft-Connect Comparator Characteristics							
V_{OS_CMP}	Offset Voltage	V_{DACP}*n* = 0.2V	●		±1	±18	mV
		V_{DACP}*n* = 1.3V	●		±2	±26	mV
		V_{DACP}*n* = 2.65V	●		±3	±52	mV
Temperature Sensor Characteristics							
TUE_TS	Total Unadjusted Error				±1		°C
V_{OUT} Enable Output (V_{OUT_EN} [3:0]) Characteristics							
V_{VOUT_EN}*n*	Output High Voltage (Note 11)	I_{VOUT_EN}*n* = –5µA, V_{DD33} = 3.3V	●	10	12.5	14.7	V
I_{VOUT_EN}*n*	Output Sourcing Current	V_{VOUT_EN}*n* Pull-Up Enabled, V_{VOUT_EN}*n* = 1V	●	–5	–6	–8	µA
	Output Sinking Current	Strong Pull-Down Enabled, V_{VOUT_EN}*n* = 0.4V	●	3	5	8	mA
		Weak Pull-Down Enabled, V_{VOUT_EN}*n* = 0.4V	●	~~33~~ 28	~~50~~ 43	60	µA
	Output Leakage Current	Internal Pull-Up Disabled, 0V ≤ V_{VOUT_ENn} ≤ 15V	●			±1	µA
V_{VOUT_VALID}	Minimum V_{DD33} when V_{VOUT_EN}*n* Valid	V_{VOUT_EN}*n* ≤ 0.4V	●			1.1	V
V_{OUT} Enable Output (V_{OUT_EN} [7:4]) Characteristics							
I_{VOUT_EN}*n*	Output Sinking Current	Strong Pull-Down Enabled, V_{OUT_EN}*n* = 0.1V	~~●~~	~~3~~	6	~~9~~	mA
	Output Leakage Current	0V ≤ V_{VOUT_ENn} ≤ 6V	●			±1	µA
V_{VOUT_VALID}	Minimum V_{DD33} when V_{VOUT_EN}*n* Valid	V_{VOUT_EN}*n* ≤ 0.4V	●			1.1	V
V_{IN} Enable Output (V_{IN_EN}) Characteristics							
V_{VIN_EN}	Output High Voltage	I_{VIN_EN} = –5µA, V_{DD33} = 3.3V	●	10	12.5	14.7	V
I_{VIN_EN}	Output Sourcing Current	V_{IN_EN} Pull-Up Enabled, V_{VIN_EN} = 1V	●	–5	–6	–8	µA
	Output Sinking Current	V_{VIN_EN} = 0.4V	●	3	5	8	mA
	Leakage Current	Internal Pull-Up Disabled, 0V ≤ V_{VIN_EN} ≤ 15V	●			±1	µA
EEPROM Characteristics							
Endurance	(Notes 7, 10)	0°C < T_J < 85°C During EEPROM Write Operations	●	10,000			Cycles
Retention	(Notes 7, 10)	T_J < 105°C	●	20			Years
t_{MASS_WRITE}	Mass Write Operation Time (Note 8)	STORE_USER_ALL, 0°C < T_J < 85°C During EEPROM Write Operations	●		440	4100	ms