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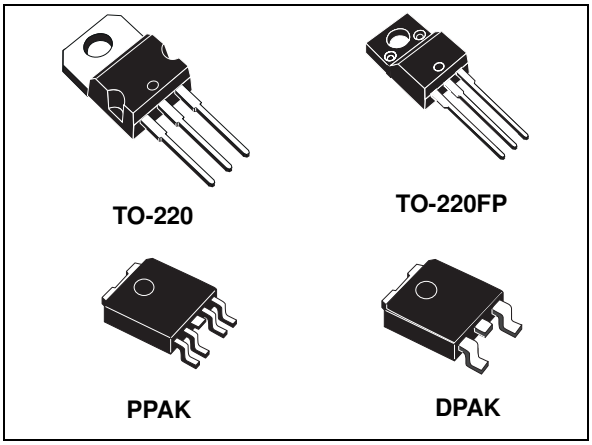
LFXX

Very low drop voltage regulator with inhibit function

Datasheet - production data



Features

- Very low-dropout voltage (0.45 V)
- Very low quiescent current (typ. 50 µA in OFF mode, 500 µA in ON mode)
- Output current up to 500 mA
- Logic-controlled electronic shutdown
- Output voltages of 1.5; 1.8; 2.5; 3.3; 4.7; 5; 6; 8; 8.5; 9; 12 V
- Automotive grade product: 1.8 V, 2.5 V, 3.3 V, 5.0 V, 8.0 V, 8.5 V V_{OUT} in DPAK and PPAK packages
- Internal current and thermal limit
- Only 2.2 µF for stability
- Available in ±1% (AB), ± 1.5% (AC) or ± 2% (C) selection at 25 °C
- Supply voltage rejection: 80 db (typ.)
- Temperature range: from -40 to 125 °C

Description

The LFXX is a very low drop regulator available in TO-220, TO-220FP, DPAK and PPAK packages and in a wide range of output voltages. The low drop voltage (0.45 V) and low quiescent current make it particularly suitable for low-noise, low-power applications and especially in battery-powered systems. In the 5 pin configuration (PPAK) a shutdown logic control function is available (pin 2, TTL compatible). This means that when the device is used as a local regulator, a part of the board can be put in standby, decreasing the total power consumption. In the three terminal configuration, the device has the same electrical performance, but it is fixed in ON state. It requires a capacitor of only 2.2 µF for stability, saving board space and costs. The LFXX is available as automotive grade in DPAK and PPAK packages, for the options of output voltages whose commercial part numbers are shown in the order codes. These devices are qualified according to the specification AEC-Q100 of the automotive market, in the temperature range - 40 °C to 125 °C, and the statistical tests PAT, SYL, SBL are performed.

Contents

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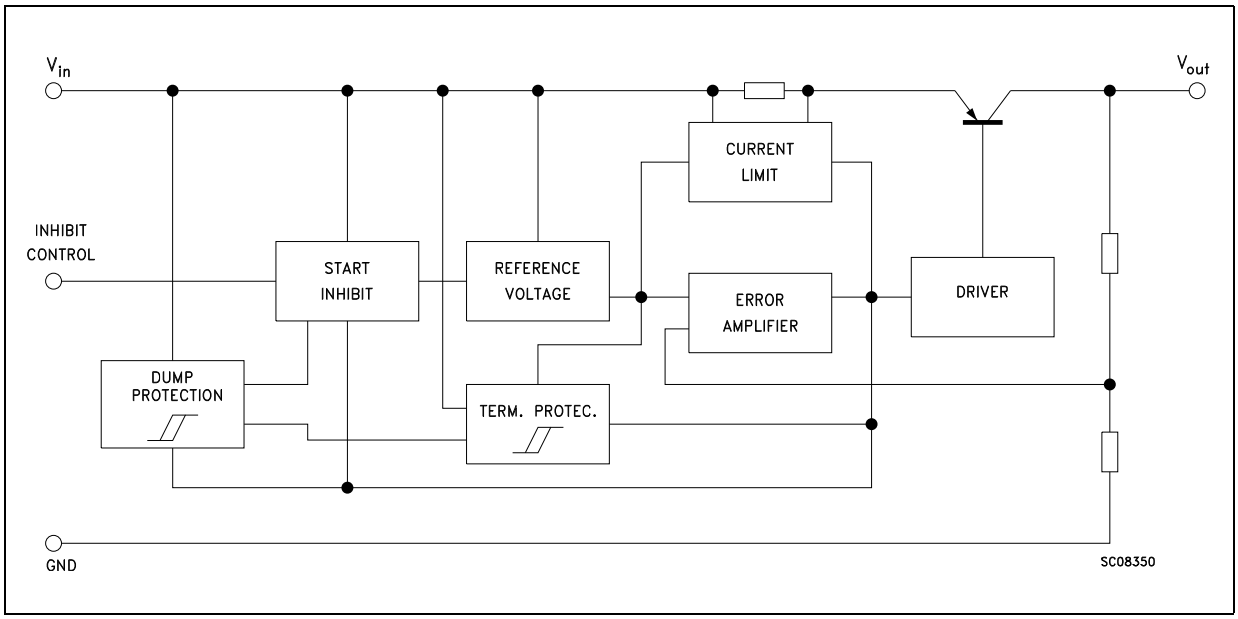
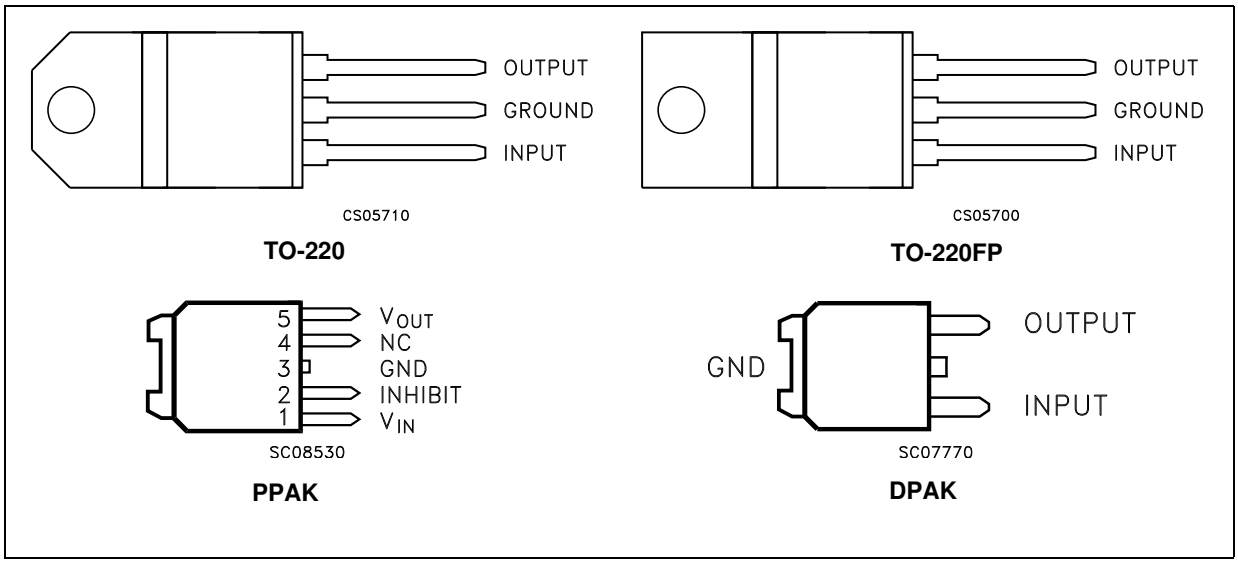
1 Diagram

Figure 1. Block diagram



2 Pin configuration

Figure 2. Pin connections (top view)



Note: TAB is electrically connected to GND on TO-220, PPAK and DPAK packages

3 Maximum ratings

Table 1. Absolute maximum ratings

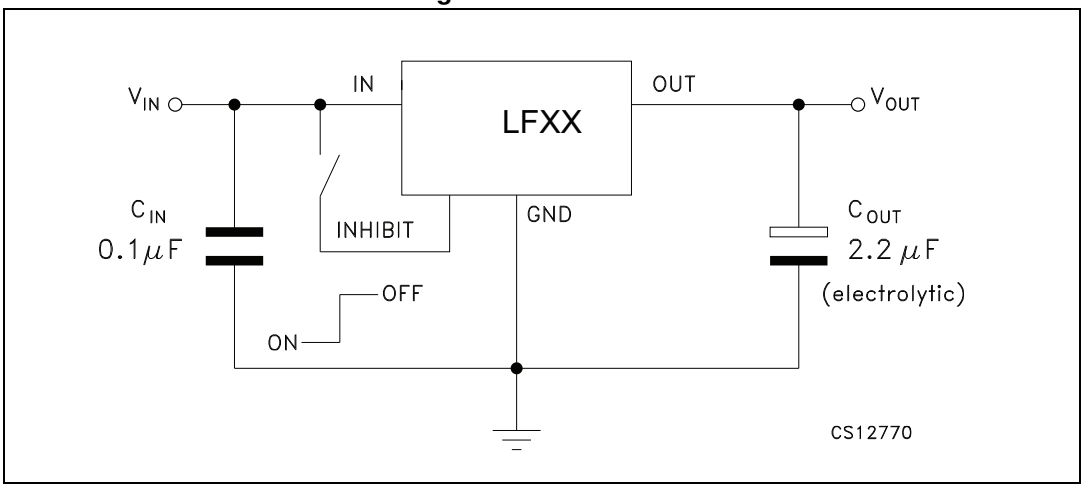
Symbol	Parameter	Value	Unit
V_I	DC input voltage	-0.5 to 40(1)	V
I_O	Output current	Internally limited	A
P_{TOT}	Power dissipation	Internally limited	W
T_{STG}	Storage temperature range	-40 to 150	°C
T_{OP}	Operating junction temperature range	-40 to 125	°C

1. For 18 < V_I < 40 the regulator is in shutdown.

Table 2. Thermal data

Symbol	Parameter	TO-220	TO-220FP	DPAK/PPAK	Unit
R_{thJC}	Thermal resistance junction-case	5	5	8	°C/W
R_{thJA}	Thermal resistance junction-ambient	50	60	100	°C/W

Figure 3. Test circuit



4 Electrical characteristics

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 3. LF15AB electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 3.5 V		1.485	1.5	1.515	V
		I_O = 50 mA, V_I = 3.5 V, T_a = -25 to 85 °C		1.470		1.530	
V_I	Operating input voltage	I_O = 500 mA		2.5		16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 2.5 to 16 V, I_O = 5 mA			2	10	mV
ΔV_O	Load regulation	V_I = 2.8 V, I_O = 5 to 500 mA			2	10	mV
I_d	Quiescent current	V_I = 2.5 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 2.8 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 3.5 ± 1 V	f = 120 Hz		82		dB
			f = 1 kHz		77		
			f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			1		V
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 4. LF18AB electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 3.3 V		1.782	1.8	1.818	V
		I_O = 50 mA, V_I = 3.3 V, T_a = -25 to 85 °C		1.764		1.836	
V_I	Operating input voltage	I_O = 500 mA		3		16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 2.8 to 16 V, I_O = 5 mA			2	12	mV
ΔV_O	Load regulation	V_I = 3.3 V, I_O = 5 to 500 mA			2	10	mV
I_d	Quiescent current	V_I = 2.5 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 3.1 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 3.5 ± 1 V	f = 120 Hz		82		dB
			f = 1 kHz		77		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.7		V
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 5. LF18C electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 3.5 V		1.764	1.8	1.836	V
		I_O = 50 mA, V_I = 3.5 V, T_a = -25 to 85 °C		1.728		1.872	
V_I	Operating input voltage	I_O = 500 mA		3		16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 2.8 to 16 V, I_O = 5 mA			2	12	mV
ΔV_O	Load regulation	V_I = 3.3 V, I_O = 5 to 500 mA			2	10	mV
I_d	Quiescent current	V_I = 2.5 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 3.1 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 3.5 ± 1 V	f = 120 Hz		82		dB
			f = 1 kHz		77		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.7		V
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_a = -40 to 125 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 6. LF18C (automotive grade) electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 3.5 V, T_a = 25 °C		1.764	1.8	1.836	V
		I_O = 50 mA, V_I = 3.5 V		1.713		1.887	
V_I	Operating input voltage	I_O = 500 mA		3		16	V
I_O	Output current limit	T_a = 25 °C			1		A
ΔV_O	Line regulation	V_I = 2.8 to 16 V, I_O = 5 mA			2	15	mV
ΔV_O	Load regulation	V_I = 3.3 V, I_O = 5 to 500 mA			2	15	mV
I_d	Quiescent current	V_I = 2.5 to 16 V, I_O = 0 mA	ON mode		0.5	2	mA
		V_I = 3.1 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	120	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 3.5 ± 1 V T_a = 25 °C	f = 120 Hz		82		dB
			f = 1 kHz		77		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz, T_a = 25 °C			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	1.3	V
		I_O = 500 mA			0.4	1.3	
V_{IL}	Control input logic low					0.8	V
V_{IH}	Control input logic high			2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V, T_a = 25 °C			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 7. LF25AB electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 4.5 V		2.475	2.5	2.525	V
		I_O = 50 mA, V_I = 4.5 V, T_a = -25 to 85 °C		2.450		2.550	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 3.5 to 16 V, I_O = 5 mA			2	12	mV
ΔV_O	Load regulation	V_I = 3.8 V, I_O = 5 to 500 mA			2	12	mV
I_d	Quiescent current	V_I = 3.5 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 3.8 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 4.5 ± 1 V	f = 120 Hz		82		dB
			f = 1 kHz		77		
			f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	0.35	V
		I_O = 500 mA			0.4	0.7	
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_a = -40 to 125 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 8. LF25AB (automotive grade) electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 4.5 V, T_a = 25 °C		2.475	2.5	2.525	V
		I_O = 50 mA, V_I = 4.5 V		2.435		2.565	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit	T_a = 25 °C			1		A
ΔV_O	Line regulation	V_I = 3.5 to 16 V, I_O = 5 mA			2	15	mV
ΔV_O	Load regulation	V_I = 3.8 V, I_O = 5 to 500 mA			2	15	mV
I_d	Quiescent current	V_I = 3.5 to 16 V, I_O = 0 mA	ON mode		0.5	2	mA
		V_I = 3.8 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	120	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 4.5 ± 1 V T_a = 25 °C	f = 120 Hz		82		dB
			f = 1 kHz		77		
			f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz, T_a = 25 °C			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	1.3	V
		I_O = 500 mA			0.4	1.3	
V_{IL}	Control input logic low					0.8	V
V_{IH}	Control input logic high			2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V, T_a = 25 °C			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 9. LF25C electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 4.5 V		2.45	2.5	2.55	V
		I_O = 50 mA, V_I = 4.5 V, T_a = -25 to 85 °C		2.4		2.6	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 3.5 to 16 V, I_O = 5 mA			2	12	mV
ΔV_O	Load regulation	V_I = 3.8 V, I_O = 5 to 500 mA			2	12	mV
I_d	Quiescent current	V_I = 3.5 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 3.8 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 4.5 ± 1 V	f = 120 Hz		82		dB
			f = 1 kHz		77		
			f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	0.35	V
		I_O = 500 mA			0.4	0.7	
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_a = -40 to 125 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 10. LF25C (automotive grade) electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 4.5 V, T_a = 25 °C		2.45	2.5	2.55	V
		I_O = 50 mA, V_I = 4.5 V		2.385		2.615	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit	T_a = 25 °C			1		A
ΔV_O	Line regulation	V_I = 3.5 to 16 V, I_O = 5 mA			2	15	mV
ΔV_O	Load regulation	V_I = 3.8 V, I_O = 5 to 500 mA			2	15	mV
I_d	Quiescent current	V_I = 3.5 to 16 V, I_O = 0 mA	ON mode		0.5	2	mA
		V_I = 3.8 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	120	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 4.5 ± 1 V T_a = 25 °C	f = 120 Hz		82		dB
			f = 1 kHz		77		
			f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz, T_a = 25 °C			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	1.3	V
		I_O = 500 mA			0.4	1.3	
V_{IL}	Control input logic low					0.8	V
V_{IH}	Control input logic high			2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V, T_a = 25 °C			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 11. LF33AB electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 5.3 V		3.267	3.3	3.333	V
		I_O = 50 mA, V_I = 5.3 V, T_a = -25 to 85 °C		3.234		3.366	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 4.3 to 16 V, I_O = 5 mA			3	16	mV
ΔV_O	Load regulation	V_I = 4.6 V, I_O = 5 to 500 mA			3	16	mV
I_d	Quiescent current	V_I = 4.3 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 4.6 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 5.3 ± 1 V	f = 120 Hz		80		dB
			f = 1 kHz		75		
			f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	0.35	V
		I_O = 500 mA			0.4	0.7	
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 12. LF33C electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 5.3 V		3.234	3.3	3.366	V
		I_O = 50 mA, V_I = 5.3 V, T_a = -25 to 85 °C		3.168		3.432	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 4.3 to 16 V, I_O = 5 mA			3	16	mV
ΔV_O	Load regulation	V_I = 4.6 V, I_O = 5 to 500 mA			3	16	mV
I_d	Quiescent current	V_I = 4.3 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 4.6 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 5.3 ± 1 V	f = 120 Hz		80		dB
			f = 1 kHz		75		
			f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	0.35	V
		I_O = 500 mA			0.4	0.7	
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_a = -40 to 125 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 13. LF33C (automotive grade) electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 5.3 V, T_a = 25 °C		3.234	3.3	3.366	V
		I_O = 50 mA, V_I = 5.3 V,		3.153		3.447	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit	T_a = 25 °C			1		A
ΔV_O	Line regulation	V_I = 4.3 to 16 V, I_O = 5 mA			3	19	mV
ΔV_O	Load regulation	V_I = 4.6 V, I_O = 5 to 500 mA			3	19	mV
I_d	Quiescent current	V_I = 4.3 to 16 V, I_O = 0 mA	ON mode		0.5	2	mA
		V_I = 4.6 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	120	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 5.3 ± 1 V T_a = 25 °C	f = 120 Hz		80		dB
			f = 1 kHz		75		
			f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz, T_a = 25 °C			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	1.3	V
		I_O = 500 mA			0.4	1.3	
V_{IL}	Control input logic low					0.8	V
V_{IH}	Control input logic high			2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V, T_a = 25 °C			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_a = -40 to 125 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 14. LF50AB electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 7 V		4.95	5	5.05	V
		I_O = 50 mA, V_I = 7 V, T_a = -25 to 85 °C		4.9		5.1	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 6 to 16 V, I_O = 5 mA			5	25	mV
ΔV_O	Load regulation	V_I = 6.3 V, I_O = 5 to 500 mA			5	25	mV
I_d	Quiescent current	V_I = 6 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 6.3 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 7 ± 1 V	f = 120 Hz		76		dB
			f = 1 kHz		71		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	0.35	V
		I_O = 500 mA			0.4	0.7	
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_a = -40 to 125 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 15. LF50AB (automotive grade) electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 7 V, T_a = 25 °C		4.95	5	5.05	V
		I_O = 50 mA, V_I = 7 V		4.885		5.115	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit	T_a = 25 °C			1		A
ΔV_O	Line regulation	V_I = 6 to 16 V, I_O = 5 mA			5	28	mV
ΔV_O	Load regulation	V_I = 6.3 V, I_O = 5 to 500 mA			5	28	mV
I_d	Quiescent current	V_I = 6 to 16 V, I_O = 0 mA	ON mode		0.5	2	mA
		V_I = 6.3 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	120	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 7 ± 1 V T_a = 25 °C	f = 120 Hz		76		dB
			f = 1 kHz		71		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz, T_a = 25 °C			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	1.3	V
		I_O = 500 mA			0.4	1.3	
V_{IL}	Control input logic low					0.8	V
V_{IH}	Control input logic high			2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V, T_a = 25 °C			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 16. LF50AC electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 7 V		4.925	5	5.075	V
		I_O = 50 mA, V_I = 7 V, T_a = -25 to 85 °C		4.875		5.125	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 6 to 16 V, I_O = 5 mA			5	25	mV
ΔV_O	Load regulation	V_I = 6.3 V, I_O = 5 to 500 mA			5	25	mV
I_d	Quiescent current	V_I = 6 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 6.3 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 7 ± 1 V	f = 120 Hz		76		dB
			f = 1 kHz		71		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	0.35	V
		I_O = 500 mA			0.4	0.7	
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 17. LF50C electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 7 V		4.9	5	5.1	V
		I_O = 50 mA, V_I = 7 V, T_a = -25 to 85 °C		4.8		5.2	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 6 to 16 V, I_O = 5 mA			5	25	mV
ΔV_O	Load regulation	V_I = 6.3 V, I_O = 5 to 500 mA			5	25	mV
I_d	Quiescent current	V_I = 6 to 16 V, I_O = 0 mA	ON mode		0.5	1	mA
		V_I = 6.3 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	100	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 7 ± 1 V	f = 120 Hz		76		dB
			f = 1 kHz		71		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	0.35	V
		I_O = 500 mA			0.4	0.7	
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_a = -40 to 125 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 18. LF50C (automotive grade) electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 7 V, T_a = 25 °C		4.9	5	5.1	V
		I_O = 50 mA, V_I = 7 V		4.785		5.215	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit	T_a = 25 °C			1		A
ΔV_O	Line regulation	V_I = 6 to 16 V, I_O = 5 mA			5	28	mV
ΔV_O	Load regulation	V_I = 6.3 V, I_O = 5 to 500 mA			5	28	mV
I_d	Quiescent current	V_I = 6 to 16 V, I_O = 0 mA	ON mode		0.5	2	mA
		V_I = 6.3 to 16 V, I_O = 500 mA				12	
		V_I = 6 V	OFF mode		50	120	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 7 ± 1 V T_a = 25 °C	f = 120 Hz		76		dB
			f = 1 kHz		71		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz, T_a = 25 °C			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	1.3	V
		I_O = 500 mA			0.4	1.3	
V_{IL}	Control input logic low					0.8	V
V_{IH}	Control input logic high			2			V
I_I	Control input current	V_I = 6 V, V_C = 6 V, T_a = 25 °C			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 19. LF60AB electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 8 V		5.94	6	6.06	V
		I_O = 50 mA, V_I = 8 V, T_a = -25 to 85 °C		5.88		6.12	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 7 to 16 V, I_O = 5 mA			6	30	mV
ΔV_O	Load regulation	V_I = 7.3 V, I_O = 5 to 500 mA			6	30	mV
I_d	Quiescent current	V_I = 7 to 16 V, I_O = 0 mA	ON mode		0.7	1.5	mA
		V_I = 7.3 to 16 V, I_O = 500 mA				12	
		V_I = 9 V	OFF mode		70	140	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 8 ± 1 V	f = 120 Hz		75		dB
			f = 1 kHz		70		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	0.35	V
		I_O = 500 mA			0.4	0.7	
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 9 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF

Refer to test circuits, T_J = 25 °C, C_I = 0.1 µF, C_O = 2.2 µF unless otherwise specified.

Table 20. LF60C electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_O	Output voltage	I_O = 50 mA, V_I = 8 V		5.88	6	6.12	V
		I_O = 50 mA, V_I = 8 V, T_a = -25 to 85 °C		5.76		6.24	
V_I	Operating input voltage	I_O = 500 mA				16	V
I_O	Output current limit				1		A
ΔV_O	Line regulation	V_I = 7 to 16 V, I_O = 5 mA			6	30	mV
ΔV_O	Load regulation	V_I = 7.3 V, I_O = 5 to 500 mA			6	30	mV
I_d	Quiescent current	V_I = 7 to 16 V, I_O = 0 mA	ON mode		0.7	1.5	mA
		V_I = 7.3 to 16 V, I_O = 500 mA				12	
		V_I = 9 V	OFF mode		70	140	µA
SVR	Supply voltage rejection	I_O = 5 mA, V_I = 8 ± 1 V	f = 120 Hz		75		dB
			f = 1 kHz		70		
			f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		µV
V_d	Dropout voltage	I_O = 200 mA			0.2	0.35	V
		I_O = 500 mA			0.4	0.7	
V_{IL}	Control input logic low	T_a = -40 to 125 °C				0.8	V
V_{IH}	Control input logic high	T_a = -40 to 125 °C		2			V
I_I	Control input current	V_I = 9 V, V_C = 6 V			10		µA
C_O	Output bypass capacitance	ESR = 0.1 to 10 Ω, I_O = 0 to 500 mA		2	10		µF