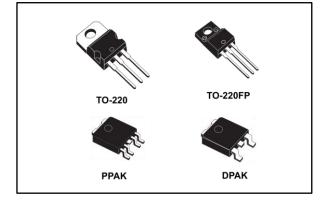


LFXX

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 batterypowered 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 gualified 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.

May 2017

DocID2574 Rev 31

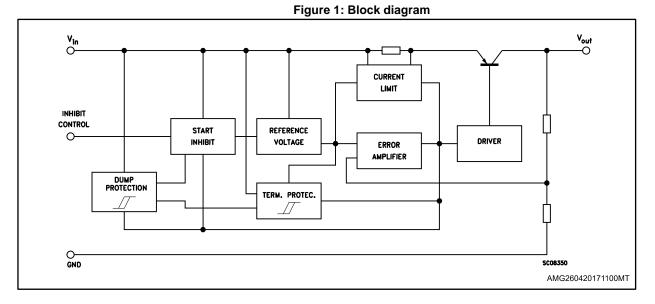
This is information on a product in full production.

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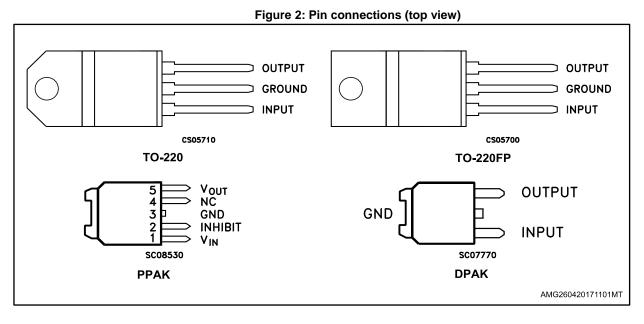


1 Diagram





2 Pin configuration



3

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





3 Maximum ratings

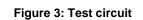
Table 1: Absolute maximum ratings

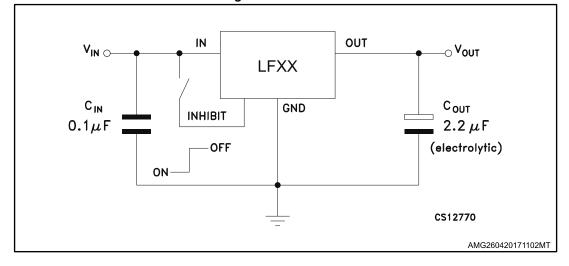
Symbol	Parameter	Value	Unit
Vi	DC input voltage	-0.5 to 40 ⁽¹⁾	V
lo	Output current	Internally limited	А
Ртот	Power dissipation	Internally limited	W
Tstg	Storage temperature range	-40 to 150	°C
T _{OP}	Operating junction temperature range	-40 to 125	°C

Notes:

 $^{(1)}\mbox{For 18} < V_I < 40$ 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				
RthJA	Thermal resistance junction-ambient	50	60	100	°C/W				







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

		Table 3: LF15AB elec	trical characte	eristics			
Symbol	Parameter	Test conditi	on	Min.	Тур.	Max.	Unit
		Io = 50 mA VI = 3.5 V		1.485	1.5	1.515	
Vo	Output voltage	$I_0 = 50 \text{ mA}$ $V_1 = 3.5 \text{ V}$ $T_a = -25 \text{ to } 85 \text{ °C}$		1.470		1.530	V
VI	Operating input voltage	I _O = 500 mA		2.5		16	V
lo	Output current limit				1		Α
ΔV_{O}	Line regulation	V _I = 2.5 to 16 V I _O = 5 mA			2	10	mV
ΔVo	Load regulation	V ₁ = 2.8 V I ₀ = 5 to 500 mA			2	10	mV
		V _I = 2.5 to 16 V I _O = 0 mA	0 mA 2.8 to 16 V ON mode		0.5	1	
l _d	Quiescent current	V _I = 2.8 to 16 V I _O = 500 mA				12	mA
		$V_{I} = 6 V$	OFF mode		50	100	μA
			f = 120 Hz		82		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ V ₁ = 3.5 ± 1 V	f = 1 kHz		77		dB
		VI = 0.0 ± 1 V	f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		μV
Vd	Dropout voltage	l _o = 200 mA			1		V
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V
VIH	Control input logic high	T _a = -40 to 125 °C		2			V
h	Control input current	$V_1 = 6 V$ $V_C = 6 V$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω I ₀ = 0 to 500 mA		2	10		μF

Table 3: LF15AB electrical characteristics



		Table 4: LF18AB ele	ectrical charact	eristics	<u>r</u>		·
Symbol	Parameter	Test condi	tion	Min.	Тур.	Max.	Unit
		lo = 50 mA VI = 3.3 V		1.782	1.8	1.818	
Vo	Output voltage	$I_0 = 50 \text{ mA}$ V ₁ = 3.3 V T _a = -25 to 85 °C		1.764		1.836	V
Vı	Operating input voltage	lo = 500 mA		3		16	V
lo	Output current limit				1		А
ΔV_{O}	Line regulation	$V_1 = 2.8 \text{ to } 16 \text{ V}$ $I_0 = 5 \text{ mA}$			2	12	mV
ΔV_{O}	Load regulation	V _I = 3.3 V I ₀ = 5 to 500 mA			2	10	mV
		$V_1 = 2.5 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$	ON made		0.5	1	mA
ld	Quiescent current	V _I = 3.1 to 16 V Io = 500 mA	ON mode			12	
		V _I = 6 V	OFF mode		50	100	μA
			f = 120 Hz		82		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ $V_1 = 3.5 \pm 1 \text{ V}$	f = 1 kHz		77		dB
		VI = 0.5 ± 1 V	f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		μV
Vd	Dropout voltage	l _o = 200 mA			0.7		V
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V
VIH	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
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF

Refer to test circuits, $T_J = 25$ °C, $C_I = 0.1 \ \mu\text{F}$, $C_O = 2.2 \ \mu\text{F}$ unless otherwise specified.

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	-	Table 5: LF18C elect	rical characte	ristics			
Symbol	Parameter	Test conditi	on	Min.	Тур.	Max.	Unit
		lo = 50 mA Vi = 3.5 V		1.764	1.8	1.836	
Vo	Output voltage	lo = 50 mA V ₁ = 3.5 V T _a = -25 to 85 °C		1.728		1.872	V
VI	Operating input voltage	lo = 500 mA		3		16	V
lo	Output current limit				1		Α
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 ₀ = 5 to 500 mA			2	10	mV
		V _I = 2.5 to 16 V I _O = 0 mA	Oblimada		0.5	5 1	
ld	Quiescent current	V _I = 3.1 to 16 V Io = 500 mA	ON mode			12	mA
		V ₁ = 6 V	OFF mode		50	100	μA
			f = 120 Hz		82		
SVR	Supply voltage rejection	lo = 5 mA V _I = 3.5 ± 1 V	f = 1 kHz		77		dB
		$V_1 = 5.5 \pm 1 V$	f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		μV
Vd	Dropout voltage	lo = 200 mA			0.7		V
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V
Vih	Control input logic high	T _a = -40 to 125 °C		2			V
Iı	Control input current	$V_{I} = 6 V$ $V_{C} = 6 V$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω lo = 0 to 500 mA		2	10		μF



Refer to test circuits, T_a = -40 to 125 °C, C_l = 0.1 $\mu F,$ C_O = 2.2 μF unless otherwise specified.

Symbol	Parameter	Test cond	lition	Min.	Тур.	Max.	Unit
Vo	Output voltage	$I_{O} = 50 \text{ mA}$ $V_{I} = 3.5 \text{ V}$ $T_{a} = 25 \text{ °C}$		1.764	1.8	1.836	V
		I ₀ = 50 mA V ₁ = 3.5 V	1			1.887	
Vı	Operating input voltage	lo = 500 mA		3		16	V
lo	Output current limit	T _a = 25 °C			1		А
ΔVo	Line regulation	$V_{I} = 2.8 \text{ to } 16 \text{ V}$ $I_{O} = 5 \text{ mA}$			2	15	mV
ΔVo	Load regulation	$V_1 = 3.3 V$ $I_0 = 5 \text{ to } 500 \text{ mA}$			2	15	mV
		V _I = 2.5 to 16 V I _O = 0 mA				2	
ld	Quiescent current	$V_{I} = 3.1 \text{ to } 16 \text{ V}$ $I_{O} = 500 \text{ mA}$ ON mode	ON mode			12	mA
		Vi = 6 V	OFF mode		50	120	μA
		lo = 5 mA	f = 120 Hz		82		
SVR	Supply voltage rejection	$V_{I} = 3.5 \pm 1 V$	f = 1 kHz		77		dB
		T _a = 25 °C	f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kHz T _a = 25 °C			50		μV
M	Dronoutualtana	I _O = 200 mA			0.2	1.3	N
Vd	Dropout voltage	lo = 500 mA			0.4	1.3	V
VIL	Control input logic low					0.8	V
VIH	Control input logic high			2			V
lı	Control input current	$V_{I} = 6 V$ $V_{C} = 6 V$ $T_{a} = 25 °C$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF

Table 6: LF18C (automotive grade) electrical characteristics



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		Table 7: LF25AB el	ectrical charact	eristics			
Symbol	Parameter	Test cond	ition	Min.	Тур.	Max.	Unit
		lo = 50 mA Vi = 4.5 V		2.475 2.5 2.52		2.525	
Vo	Output voltage	$I_0 = 50 \text{ mA}$ V ₁ = 4.5 V T _a = -25 to 85 °C	/ ₁ = 4.5 V			2.550	V
Vı	Operating input voltage	I _O = 500 mA				16	V
lo	Output current limit				1		А
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
		V _I = 3.5 to 16 V I _O = 0 mA	ON made		0.5	1	
ld	Quiescent current	V _I = 3.8 to 16 V I _O = 500 mA	ON mode			12	mA
		V _I = 6 V	OFF mode		50	100	μA
			f = 120 Hz		82		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ V ₁ = 4.5 ± 1 V	f = 1 kHz		77		dB
		VI = 4.5 ± 1 V	f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		μV
M	Dronoutwolfere	lo = 200 mA			0.2	0.35	V
Vd	Dropout voltage	l _o = 500 mA			0.4	0.7	V
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V
Vін	Control input logic high	T _a = -40 to 125 °C		2			V
h	Control input current	$V_1 = 6 V$ $V_C = 6 V$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω lo = 0 to 500 mA		2	10		μF



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

Symbol	Parameter	Test co	ndition	Min.	Тур.	Max.	Unit
Vo	Output voltage	$I_0 = 50 \text{ mA}$ $V_I = 4.5 \text{ V}$ $T_a = 25 \text{ °C}$		2.475	2.5	2.525	V
		lo = 50 mA VI = 4.5 V		2.435		2.565	
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit	T _a = 25 °C			1		А
ΔVo	Line regulation	$V_1 = 3.5$ to 16 V $I_0 = 5$ mA			2	15	mV
ΔVo	Load regulation	$V_1 = 3.8 V$ $I_0 = 5 to 500 mA$			2	15	mV
		V _I = 3.5 to 16 V I ₀ = 0 mA	ON		0.5	0.5 2	
ld	Quiescent current	VI = 3.8 to 16 V ON mode Io = 500 mA Io			12	mA	
		V1 = 6 V	OFF mode		50	120	μA
		lo = 5 mA	f = 120 Hz		82		
SVR	Supply voltage rejection	$V_1 = 4.5 \pm 1 V$	f = 1 kHz		77		dB
		T _a = 25 °C	f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kH T _a = 25 °C	Hz		50		μV
N/	Dramastarikans	I ₀ = 200 mA			0.2	1.3	Ň
Vd	Dropout voltage	lo= 500 mA			0.4	1.3	V
VIL	Control input logic low					0.8	V
Vih	Control input logic high			2			V
Iı	Control input current	$V_{I} = 6 V$ $V_{C} = 6 V$ $T_{a} = 25 °C$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF

Table 8: LF25AB (automotive grade) electrical characteristics



LFXX

		Table 9: LF25C	electrical charac	cteristics			
Symbol	Parameter	Test co	ndition	Min.	Тур.	Max.	Unit
		I ₀ = 50 mA V ₁ = 4.5 V		2.45	2.5	2.55	
Vo	Output voltage	$I_0 = 50 \text{ mA}$ $V_1 = 4.5 \text{ V}$ $T_a = -25 \text{ to } 85 \text{ °C}$	/ ₁ = 4.5 V			2.6	V
VI	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		А
ΔV_{O}	Line regulation	$V_1 = 3.5 \text{ to } 16 \text{ V}$ $I_0 = 5 \text{ mA}$			2	12	mV
ΔV_{O}	Load regulation	$V_1 = 3.8 V$ $I_0 = 5 to 500 mA$			2	12	mV
		$V_1 = 3.5 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$			0.5 1		
ld	Quiescent current	V _I = 3.8 to 16 V I _O = 500 mA	ON mode			12	mA
		V1 = 6 V	OFF mode		50	100	μA
			f = 120 Hz		82		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ $V_1 = 4.5 \pm 1 \text{ V}$	f = 1 kHz		77		dB
		VI = 4.0 ± 1 V	f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kH	łz		50		μV
Vd	Dropout voltage	l _o = 200 mA			0.2	0.35	v
Vd	Diopout voltage	I _O = 500 mA			0.4	0.7	v
VIL	Control input logic low	$T_a = -40$ to 125 °C				0.8	V
VIH	Control input logic high	T _a = -40 to 125 °C		2			V
lı	Control input current	V ₁ = 6 V V _C = 6 V			10		μA
Co	Output bypass capacitance	$ESR = 0.1 \text{ to } 10 \Omega$ $I_0 = 0 \text{ to } 500 \text{ mA}$		2	10		μF



Refer to test circuits, $T_a = -40$ to 125 °C, $C_I = 0.1 \ \mu\text{F}$, $C_O = 2.2 \ \mu\text{F}$ unless otherwise specified.

Symbol	Parameter	Test co	ondition	Min.	Тур.	Max.	Unit
Vo	Output voltage			2.5	2.55	V	
		lo = 50 mA V _I = 4.5 V		2.385		2.615	
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit	Ta = 25 °C			1		А
ΔVo	Line regulation	$V_1 = 3.5 \text{ to } 16 \text{ V}$ $I_0 = 5 \text{ mA}$			2	15	mV
ΔVo	Load regulation	$V_1 = 3.8 V$ $I_0 = 5 to 500 mA$			2	15	mV
		V _I = 3.5 to 16 V I _O = 0 mA			0.5	2	
ld	Quiescent current	$V_1 = 3.8 \text{ to } 16 \text{ V}$ $I_0 = 500 \text{ mA}$	ON mode			12	mA
		Vi = 6 V	OFF mode		50	120	μA
		lo = 5 mA	f = 120 Hz		82		
SVR	Supply voltage rejection	$V_1 = 4.5 \pm 1 V$	f = 1 kHz		77		dB
		Ta = 25 °C	f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 k T _a = 25 °C	κHz		50		μV
		I _O = 200 mA			0.2	1.3	
Vd	Dropout voltage	l _o = 500 mA			0.4	1.3	V
VIL	Control input logic low					0.8	V
VIH	Control input logic high			2			V
IJ	Control input current	$V_{I} = 6 V$ $V_{C} = 6 V$ $T_{a} = 25 °C$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF



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		Table 11: LF33AB	electrical chara	acteristics			
Symbol	Parameter	Test con	dition	Min.	Тур.	Max.	Unit
		Io = 50 mA VI = 5.3 V		3.267	3.3	3.333	
Vo	Output voltage	$I_0 = 50 \text{ mA}$ $V_1 = 5.3 \text{ V}$ $T_a = -25 \text{ to } 85 \text{ °C}$		3.234		3.366	V
VI	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		А
ΔV_{O}	Line regulation	$V_1 = 4.3 \text{ to } 16 \text{ V}$ $I_0 = 5 \text{ mA}$			3	16	mV
ΔV_{O}	Load regulation	V ₁ = 4.6 V I ₀ = 5 to 500 mA			3	16	mV
		$V_1 = 4.3 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$			0.5	1	_
ld	Quiescent current	VI = 4.6 to 16 V ON mode Io = 500 mA 0			12	mA	
		V ₁ = 6 V	OFF mode		50	100	μA
			f = 120 Hz		80		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ V ₁ = 5.3 ± 1 V	f = 1 kHz		75		dB
		VI = 0.0 ± 1 V	f = 10 kHz		65		
eN	Output noise voltage	B = 10 Hz to 100 kH	łz		50		μV
Vd	Dropout voltage	I ₀ = 200 mA			0.2	0.35	V
Vd	Dropout voltage	I _O = 500 mA			0.4	0.7	v
VIL	Control input logic low	$T_a = -40$ to 125 °C				0.8	V
VIH	Control input logic high	$T_a = -40$ to 125 °C		2			V
h	Control input current	$V_1 = 6 V$ $V_C = 6 V$	/1 = 6 V		10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF



Table 12: LF33C electrical characteristics										
Symbol	Parameter	Test cond	lition	Min.	Тур.	Max.	Unit			
		lo = 50 mA VI = 5.3 V		3.234	3.3	3.366				
Vo	Output voltage	$I_0 = 50 \text{ mA}$ V ₁ = 5.3 V T _a = -25 to 85 °C		3.168		3.432	V			
Vı	Operating input voltage	lo = 500 mA				16	V			
lo	Output current limit				1		А			
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			
		V _I = 4.3 to 16 V I _O = 0 mA			0.5	1				
ld	Quiescent current	V _I = 4.6 to 16 V I _O = 500 mA	ON mode			12	mA			
		V ₁ = 6 V	OFF mode		50	100	μA			
			f = 120 Hz		80					
SVR	Supply voltage rejection	lo = 5 mA Vi = 5.3 ± 1 V	f = 1 kHz		75		dB			
		VI = 5.5 ± 1 V	f = 10 kHz		65					
eN	Output noise voltage	B = 10 Hz to 100 kH	Z		50		μV			
M	Drenout veltere	lo = 200 mA			0.2	0.35	V			
Vd	Dropout voltage	I _O = 500 mA			0.4	0.7	v			
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V			
Vін	Control input logic high	T _a = -40 to 125 °C		2			V			
h	Control input current	$V_1 = 6 V$ $V_C = 6 V$			10		μA			
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF			

Refer to test circuits, $T_J = 25$ °C, $C_I = 0.1 \ \mu\text{F}$, $C_O = 2.2 \ \mu\text{F}$ unless otherwise specified.



Refer to test circuits, T_a = -40 to 125 °C, C_l = 0.1 $\mu F,$ C_O = 2.2 μF unless otherwise specified.

Symbol	Parameter	Test con		Min.	Тур.	Max.	Unit
Vo	Output voltage	$I_{O} = 50 \text{ mA}$ $V_{I} = 5.3 \text{ V}$ $T_{a} = 25 \text{ °C}$		3.234	3.3	3.366	V
		l _o = 50 mA V _I = 5.3 V,		3.153		3.447	
VI	Operating input voltage	l _o = 500 mA				16	V
lo	Output current limit	T _a = 25 °C			1		А
ΔVo	Line regulation	$V_{I} = 4.3 \text{ to } 16 \text{ V}$ $I_{O} = 5 \text{ mA}$			3	19	mV
ΔVo	Load regulation	$V_{I} = 4.6 V$ $I_{O} = 5 \text{ to } 500 \text{ mA}$			3	19	mV
		$V_{I} = 4.3 \text{ to } 16 \text{ V}$ $I_{O} = 0 \text{ mA}$			0.5	2	
ld	Quiescent current	$V_{I} = 4.6 \text{ to } 16 \text{ V}$ $I_{O} = 500 \text{ mA}$	- ON mode			12	mA
		Vi = 6 V	OFF mode		50	120	μA
		lo = 5 mA	f = 120 Hz		80		
SVR	Supply voltage rejection	$V_1 = 5.3 \pm 1 V$	f = 1 kHz		75		dB
		Ta = 25 °C	f = 10 kHz		65		
eN	Output noise voltage	$B = 10 \text{ Hz to } 100 \text{ kH}$ $T_a = 25 \text{ °C}$	Hz		50		μV
Vd	Dropout voltage	I _O = 200 mA			0.2	1.3	V
Vd	Diopout voltage	I ₀ = 500 mA			0.4	1.3	v
VIL	Control input logic low					0.8	V
VIH	Control input logic high			2			V
lı	Control input current	$V_{I} = 6 V$ $V_{C} = 6 V$ $T_{a} = 25 \text{ °C}$			10		μA
Co	Output bypass capacitance	$ESR = 0.1 \text{ to } 10 \Omega$ $I_0 = 0 \text{ to } 500 \text{ mA}$		2	10		μF

Table 13: LF33C (automotive grade) electrical characteristics



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

				ectrical characteristics						
Symbol	Parameter	Test co	ndition	Min.	Тур.	Max.	Unit			
		I _O = 50 mA V _I = 7 V		4.95	5	5.05				
Vo	Output voltage	$I_0 = 50 \text{ mA}$ V ₁ = 7 V T _a = -25 to 85 °C		4.9		5.1	V			
Vi	Operating input voltage	lo = 500 mA	o = 500 mA			16	V			
lo	Output current limit				1		А			
ΔVo	Line regulation	$V_I = 6 \text{ to } 16 \text{ V}$ $I_O = 5 \text{ mA}$			5	25	mV			
ΔVo	Load regulation	$V_{I} = 6.3 V$ $I_{O} = 5 \text{ to } 500 \text{ mA}$			5	25	mV			
		$V_I = 6 \text{ to } 16 \text{ V}$ $I_O = 0 \text{ mA}$	– ON mode		0.5	1	mA			
l _d	Quiescent current	$V_1 = 6.3 \text{ to } 16 \text{ V}$ Io = 500 mA	Civinide			12				
		$V_I = 6 V$	OFF mode		50	100	μA			
			f = 120 Hz		76					
SVR	Supply voltage rejection	lo = 5 mA V _l = 7 ± 1 V	f = 1 kHz		71		dB			
		VI = 7 ± 1 V	f = 10 kHz		60					
eN	Output noise voltage	B = 10 Hz to 100	kHz		50		μV			
	Dramantusti	I _O = 200 mA			0.2	0.35	V			
Vd	Dropout voltage	lo = 500 mA			0.4	0.7	V			
VIL	Control input logic low	T _a = -40 to 125 °C)			0.8	V			
VIH	Control input logic high	$T_a = -40$ to 125 °C	$T_a = -40$ to 125 °C				V			
h	Control input current	$V_1 = 6 V$ $V_C = 6 V$	Vi = 6 V		10		μA			
Co	Output bypass capacitance	ESR = 0.1 to 10 G $I_0 = 0$ to 500 mA	2	2	10		μF			

Table 14: LF50AB electrical characteristics



Symbol	Parameter	Test coi		Min.	Тур.	Max.	Unit
Vo	Output voltage	$I_{O} = 50 \text{ mA}$ $V_{I} = 7 \text{ V}$ $T_{a} = 25 \text{ °C}$		4.95	5	5.05	V
		I _O = 50 mA V _I = 7 V		4.885		5.115	
Vi	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit	T _a = 25 °C			1		А
ΔVo	Line regulation	$V_1 = 6 \text{ to } 16 \text{ V}$ $I_0 = 5 \text{ mA}$			5	28	mV
ΔVo	Load regulation	$V_1 = 6.3 V$ $I_0 = 5 to 500 mA$			5	28	mV
		$V_1 = 6 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$			0.5	2	
ld	Quiescent current	$V_1 = 6.3 \text{ to } 16 \text{ V}$ $I_0 = 500 \text{ mA}$	- ON mode			12	mA
		Vi = 6 V	OFF mode		50	120	μA
		lo = 5 mA	f = 120 Hz		76		
SVR	Supply voltage rejection	$V_{I} = 7 \pm 1 V$	f = 1 kHz		71		dB
		T _a = 25 °C	f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 H T _a = 25 °C	κHz		50		μV
Vd	Dropout voltage	I ₀ = 200 mA			0.2	1.3	V
Vd	Dropout voltage	lo = 500 mA			0.4	1.3	v
VIL	Control input logic low					0.8	V
VIH	Control input logic high			2			V
lı –	Control input current	$V_{I} = 6 V$ $V_{C} = 6 V$ $T_{a} = 25 °C$			10		μA
Co	Output bypass capacitance	$ESR = 0.1 \text{ to } 10 \Omega$ $I_0 = 0 \text{ to } 500 \text{ mA}$	2	2	10		μF

Table 15: LF50AB (automotive grade) electrical characteristics



		Table 16: LF50A	AC electrical cha	racteristics			
Symbol	Parameter	Test co	ndition	Min.	Тур.	Max.	Unit
		lo = 50 mA V ₁ = 7 V		4.925	5	5.075	
Vo	Output voltage	$\label{eq:loss} \begin{array}{l} I_{O}=50 \text{ mA} \\ V_{I}=7 \text{ V} \\ T_{a}=-25 \text{ to } 85 \ ^{\circ}\text{C} \end{array}$		4.875		5.125	V
VI	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		А
ΔVo	Line regulation	$V_1 = 6 \text{ to } 16 \text{ V}$ $I_0 = 5 \text{ mA}$			5	25	mV
ΔV_{O}	Load regulation	$V_1 = 6.3 V$ $I_0 = 5 to 500 mA$			5	25	mV
		$V_1 = 6 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$			0.5	1	
ld	Quiescent current	V ₁ = 6.3 to 16 V I ₀ = 500 mA	ON mode			12	mA
		V _I = 6 V	OFF mode		50	100	μA
			f = 120 Hz		76		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ $V_1 = 7 \pm 1 \text{ V}$	f = 1 kHz		71		dB
		VI-7±1V	f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100	kHz		50		μV
Vd	Dropout voltage	lo = 200 mA			0.2	0.35	V
Vd	Diopoul vollage	l _o = 500 mA			0.4	0.7	v
VIL	Control input logic low	$T_a = -40$ to 125 °C	;			0.8	V
Vih	Control input logic high	$T_a = -40$ to 125 °C	;	2			V
h	Control input current	V ₁ = 6 V V _C = 6 V			10		μA
Co	Output bypass capacitance	$ESR = 0.1 \text{ to } 10 \Omega$ $I_0 = 0 \text{ to } 500 \text{ mA}$	2	2	10		μF

Refer to test circuits, $T_J = 25$ °C, $C_I = 0.1 \ \mu\text{F}$, $C_O = 2.2 \ \mu\text{F}$ unless otherwise specified.



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Refer to test circuits, $T_J = 25 \text{ °C}$, $C_I = 0.1 \mu F$, $C_O = 2.2 \mu F$ unless otherwise specified.

		Table 17: LF50	C electrical char	racteristics			
Symbol	Parameter	Test co	ondition	Min.	Тур.	Max.	Unit
		lo = 50 mA Vi = 7 V		4.9	5	5.1	
Vo	Output voltage	$I_0 = 50 \text{ mA}$ $V_1 = 7 \text{ V}$ $T_a = -25 \text{ to } 85 \text{ °C}$		4.8		5.2	V
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		А
ΔV_{O}	Line regulation	V _I = 6 to 16 V I _O = 5 mA			5	25	mV
ΔV_{O}	Load regulation	$V_{I} = 6.3 V$ $I_{O} = 5 \text{ to } 500 \text{ mA}$			5	25	mV
		$V_1 = 6 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$			0.5	1	
ld	Quiescent current	$V_{I} = 6.3 \text{ to } 16 \text{ V}$ $I_{O} = 500 \text{ mA}$	- ON mode			12	mA
		V _I = 6 V	OFF mode		50	100	μA
			f = 120 Hz		76		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ $V_1 = 7 \pm 1 \text{ V}$	f = 1 kHz		71		dB
		VI = 7 ± 1 V	f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100	kHz		50		μV
Vd	Dropout voltage	I ₀ = 200 mA			0.2	0.35	V
Vd	Diopoul vollage	$I_0 = 500 \text{ mA}$			0.4	0.7	v
VIL	Control input logic low	$T_a = -40$ to 125 °C	C			0.8	V
Vін	Control input logic high	$T_a = -40$ to 125 °C		2			V
h	Control input current	$V_I = 6 V$ $V_C = 6 V$	V1 = 6 V		10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 I_0 = 0 to 500 mA	Ω	2	10		μF

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Refer to test circuits, $T_a = -40$ to 125 °C, $C_l = 0.1 \ \mu\text{F}$, $C_O = 2.2 \ \mu\text{F}$ unless otherwise specified.

	l able 1	8: LF50C (automoti	ve grade) electi	rical charac	cteristics		
Symbol	Parameter	Test con	dition	Min.	Тур.	Max.	Unit
Vo	Output voltage	$I_0 = 50 \text{ mA}$ $V_1 = 7 \text{ V}$ $T_a = 25 \text{ °C}$		4.9	5	5.1	V
		I ₀ = 50 mA V ₁ = 7 V		4.785		5.215	
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit	T _a = 25 °C			1		А
ΔVo	Line regulation	$V_1 = 6 \text{ to } 16 \text{ V}$ $I_0 = 5 \text{ mA}$			5	28	mV
ΔVo	Load regulation	$V_1 = 6.3 V$ $I_0 = 5 to 500 mA$			5	28	mV
		$V_1 = 6 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$	- ON mode		0.5	2	
ld	Quiescent current	$V_1 = 6.3 \text{ to } 16 \text{ V}$ $I_0 = 500 \text{ mA}$	3 to 16 V			12	mA
		V1 = 6 V	OFF mode		50	120	μA
		$I_0 = 5 \text{ mA}$	f = 120 Hz		76		
SVR	Supply voltage rejection	$V_1 = 7 \pm 1 V$	f = 1 kHz		71		dB
		Ta = 25 °C	f = 10 kHz		60		
eN	Output noise voltage	$B = 10 \text{ Hz to } 100 \text{ kH}$ $T_a = 25 \text{ °C}$	Ηz		50		μV
	Dreneutuskere	I _O = 200 mA			0.2	1.3	V
Vd	Dropout voltage	lo = 500 mA			0.4	1.3	V
VIL	Control input logic low					0.8	V
Vih	Control input logic high			2			V
I,	Control input current	$V_{I} = 6 V$ $V_{C} = 6 V$ $T_{a} = 25 °C$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF

Table 18: LF50C (automotive grade) electrical characteristics



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Refer to test circuits, $T_J = 25 \text{ °C}$, $C_I = 0.1 \mu F$, $C_O = 2.2 \mu F$ unless otherwise specified.

		Table 19: LF60A	B electrical chara	acteristics			
Symbol	Parameter	Test co	ndition	Min.	Тур.	Max.	Unit
		lo = 50 mA V ₁ = 8 V		5.94	6	6.06	
Vo	Output voltage	$I_{0} = 50 \text{ mA}$ $V_{I} = 8 \text{ V}$ $T_{a} = -25 \text{ to } 85 \text{ °C}$		5.88		6.12	V
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		Α
ΔV_{O}	Line regulation	V _I = 7 to 16 V I _O = 5 mA			6	30	mV
ΔV_{O}	Load regulation	$V_1 = 7.3 V$ $I_0 = 5 to 500 mA$			6	30	mV
		V _I = 7 to 16 V I _O = 0 mA			0.7	1.5	
ld	Quiescent current	$V_1 = 7.3 \text{ to } 16 \text{ V}$ $I_0 = 500 \text{ mA}$ ON mode			12	mA	
		V _I = 9 V	OFF mode		70	140	μA
			f = 120 Hz		75		
SVR	Supply voltage rejection	lo = 5 mA V _I = 8 ± 1 V	f = 1 kHz		70		dB
		VI = 0 ± 1 V	f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 k	Hz		50		μV
Vd	Dropout voltage	l _o = 200 mA			0.2	0.35	V
Vd	Dropout voltage	l _o = 500 mA			0.4	0.7	V
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V
Vін	Control input logic high	$T_a = -40$ to 125 °C		2			V
h	Control input current	$V_{I} = 9 V$ $V_{C} = 6 V$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF

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	-	Table 20: LF60C	electrical chara	cteristics			
Symbol	Parameter	Test cond	dition	Min.	Тур.	Max.	Unit
		I _O = 50 mA V _I = 8 V		5.88	6	6.12	
Vo	Output voltage	$I_0 = 50 \text{ mA}$ $V_1 = 8 \text{ V}$ $T_a = -25 \text{ to } 85 \text{ °C}$		5.76		6.24	V
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		Α
ΔV_{O}	Line regulation	$V_1 = 7$ to 16 V $I_0 = 5$ mA			6	30	mV
ΔV_{O}	Load regulation	V ₁ = 7.3 V I ₀ = 5 to 500 mA			6	30	mV
		$V_1 = 7 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$			0.7	1.5	
ld	Quiescent current	$V_1 = 7.3 \text{ to } 16 \text{ V}$ $I_0 = 500 \text{ mA}$	ON mode			12	mA
		V ₁ = 9 V	OFF mode		70	140	μA
			f = 120 Hz		75		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ $V_1 = 8 \pm 1 \text{ V}$	f = 1 kHz		70		dB
		VI = 0 ± 1 V	f = 10 kHz		60		
eN	Output noise voltage	B = 10 Hz to 100 kH	Iz		50		μV
Vd	Dropout voltage	l _o = 200 mA			0.2	0.35	V
Vd	Dropout voltage	l _o = 500 mA			0.4	0.7	v
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V
Vін	Control input logic high	T _a = -40 to 125 °C		2			V
h	Control input current	V ₁ = 9 V V _C = 6 V			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF

Refer to test circuits, $T_J = 25$ °C, $C_I = 0.1 \ \mu\text{F}$, $C_O = 2.2 \ \mu\text{F}$ unless otherwise specified.



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		Table 21: LF80	AB electrical char	racteristics			
Symbol	Parameter	Test o	ondition	Min.	Тур.	Max.	Unit
		lo = 50 mA Vi = 10 V			8	8.08	
Vo	Output voltage	$I_{O} = 50 \text{ mA}$ V _I = 10 V T _a = -25 to 85 °C	;	7.84		8.16	V
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		А
ΔV_{O}	Line regulation	V _I = 9 to 16 V I _O = 5 mA			8	40	mV
ΔV_{O}	Load regulation	V _I = 9.3 V I _O = 5 to 500 mA			8	40	mV
		$V_1 = 9 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$			0.7	1.5	
ld	Quiescent current	$V_1 = 9.3 \text{ to } 16 \text{ V}$ $I_0 = 500 \text{ mA}$	ON mode			12	mA
		V _I = 9 V	OFF mode		70	140	μA
			f = 120 Hz		72		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ $V_1 = 10 \pm 1 \text{ V}$	f = 1 kHz		67		dB
		VI = 10 ± 1 V	f = 10 kHz		57		
eN	Output noise voltage	B = 10 Hz to 100) kHz		50		μV
Vd	Dropout voltage	l _o = 200 mA			0.2	0.35	V
Vd	Dropout voltage	l _o = 500 mA			0.4	0.7	V
VIL	Control input logic low	$T_a = -40$ to 125 °	С			0.8	V
Vін	Control input logic high	$T_a = -40$ to 125 °	С	2			V
h	Control input current	V ₁ = 9 V V _C = 6 V	V ₁ = 9 V		10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 lo = 0 to 500 mA	Ω	2	10		μF



		Table 22: LF80	C electrical charac	cteristics			
Symbol	Parameter	Test co	ondition	Min.	Тур.	Max.	Unit
		lo = 50 mA V _I = 10 V		7.84	8	8.16	
Vo	Output voltage	$I_{O} = 50 \text{ mA}$ V _I = 10 V T _a = -25 to 85 °C		7.68		8.32	V
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		А
ΔV_{O}	Line regulation	$V_1 = 9 \text{ to } 16 \text{ V}$ $I_0 = 5 \text{ mA}$			8	40	mV
ΔV_{O}	Load regulation	V ₁ = 9.3 V I ₀ = 5 to 500 mA			8	40	mV
		$V_1 = 9 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$			0.7	1.5	
ld	Quiescent current	V _I = 9.3 to 16 V I _O = 500 mA	ON mode			12	mA
		V ₁ = 9 V	OFF mode		70	140	μA
			f = 120 Hz		72		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ $V_1 = 10 \pm 1 \text{ V}$	f = 1 kHz		67		dB
		VI = 10 ± 1 V	f = 10 kHz		57		
eN	Output noise voltage	B = 10 Hz to 100	kHz		50		μV
Vd	Dropout voltage	l _o = 200 mA			0.2	0.35	V
Vd	Dropout voltage	l _o = 500 mA			0.4	0.7	v
VIL	Control input logic low	T _a = -40 to 125 °C	;			0.8	V
Vін	Control input logic high	T _a = -40 to 125 °C	;	2			V
h	Control input current	V ₁ = 9 V V _C = 6 V			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω I ₀ = 0 to 500 mA	2	2	10		μF

Refer to test circuits, $T_J = 25$ °C, $C_I = 0.1 \ \mu\text{F}$, $C_O = 2.2 \ \mu\text{F}$ unless otherwise specified.

Refer to test circuits, T_a = -40 to 125 °C, C_l = 0.1 $\mu F,$ C_O = 2.2 μF unless otherwise specified.

Symbol	Parameter	Test co	• •	Min.	Тур.	Max.	Unit
Vo	Output voltage	$I_0 = 50 \text{ mA}$ $V_1 = 10 \text{ V}$ $T_a = 25 \text{ °C}$		7.84	8	8.16	V
		I _O = 50 mA V _I = 10 V		7.665		8.335	
Vi	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit	T _a = 25 °C			1		А
ΔVo	Line regulation	$V_I = 9 \text{ to } 16 \text{ V}$ $I_O = 5 \text{ mA}$			8	44	mV
ΔVo	Load regulation	$V_{I} = 9.3 V$ $I_{O} = 5 \text{ to } 500 \text{ mA}$			8	44	m∨
		V _i = 9 to 16 V I _O = 0 mA			0.7	2.5	
ld		$V_{I} = 9.3 \text{ to } 16 \text{ V}$ $I_{O} = 500 \text{ mA}$				12	mA
		V1 = 9 V	OFF mode		70	160	μA
		lo = 5 mA	f = 120 Hz		72		
SVR	Supply voltage rejection	$V_{I} = 10 \pm 1 V$	f = 1 kHz		67		dB
		Ta = 25 °C	f = 10 kHz		57		
eN	Output noise voltage	B = 10 Hz to 100 k T _a = 25 °C	κHz		50		μV
	Descontraction	I _O = 200 mA			0.2	1.3	Ň
Vd	Dropout voltage	lo = 500 mA		0.4	0.4 1.3	V	
VIL	Control input logic low					0.8	V
VIH	Control input logic high						V
lı –	Control input current	$V_{I} = 9 V$ $V_{C} = 6 V$ $T_{a} = 25 °C$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF

Table 23: LF80C (automotive grade) electrical characteristics

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Table 24: LF85AB electrical characteristics								
Symbol	Parameter	Test cond	Min.	Тур.	Max.	Unit		
	lo = 50 mA Vi = 10.5 V				8.415	8.5	8.585	
Vo	Output voltage	utput voltage Io = 50 mA 8.33 $V_I = 10.5 V$ 8.33 $T_a = -25$ to 85 °C 8.33	V ₁ = 10.5 V			8.67	V	
Vı	Operating input voltage	lo = 500 mA				16	V	
lo	Output current limit				1		А	
ΔV_{O}	Line regulation	V ₁ = 9.5 to 16 V Io = 5 mA			8	42	mV	
ΔV_{O}	Load regulation	V _I = 9.8 V I _O = 5 to 500 mA			8	42	mV	
	V _I = 9.5 to 16 V I _O = 0 mA			0.7	1.5			
ld	Quiescent current	V _I = 9.8 to 16 V Io = 500 mA			12	mA		
		V1 = 9 V	OFF mode		70	140	μA	
			f = 120 Hz		72			
SVR	Supply voltage rejection	lo = 5 mA Vi = 10.5 ± 1 V	f = 1 kHz		67		dB	
		VI = 10.5 ± 1 V	f = 10 kHz		57			
eN	Output noise voltage	B = 10 Hz to 100 kH	z		50		μV	
M	Dreneut veltere	lo = 200 mA			0.2	0.35	Ň	
Vd	Dropout voltage	I _O = 500 mA			0.4	0.7	V	
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V	
Vін	Control input logic high	T _a = -40 to 125 °C		2			V	
h	Control input current	V ₁ = 9 V V _C = 6 V			10		μA	
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF	

Refer to test circuits, $T_J = 25$ °C, $C_I = 0.1 \ \mu\text{F}$, $C_O = 2.2 \ \mu\text{F}$ unless otherwise specified.



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		Table 25: LF850	C electrical chara	cteristics			
Symbol	Parameter	Test co	ndition	Min.	Тур.	Max.	Unit
		lo = 50 mA V ₁ = 10.5 V		8.33	8.5	8.67	
Vo	Output voltage	$I_0 = 50 \text{ mA}$ V _I = 10.5 V T _a = -25 to 85 °C	V ₁ = 10.5 V			8.84	V
Vı	Operating input voltage	l _o = 500 mA				16	V
lo	Output current limit				1		А
ΔV_{O}	Line regulation	V _I = 9.5 to 16 V I _O = 5 mA			8	42	mV
ΔV_{O}	Load regulation	V1 = 9.8 V Io = 5 to 500 mA			8	42	mV
	Quiescent current	$V_{I} = 9.5 \text{ to } 16 \text{ V}$ $I_{O} = 0 \text{ mA}$			0.7	1.5	
ld		V _I = 9.8 to 16 V I _O = 500 mA	ON mode			12	- mA
		V ₁ = 9 V	OFF mode		70	140	μA
		$I_0 = 5 \text{ mA}$ V ₁ = 10.5 ± 1 V	f = 120 Hz		72		dB
SVR	Supply voltage rejection		f = 1 kHz		67		
		VI = 10.0 ± 1 V	f = 10 kHz		57		
eN	Output noise voltage	B = 10 Hz to 100 H	кНz		50		μV
Vd	Dropout voltage	I ₀ = 200 mA			0.2	0.35	v
Vd	Diopout voltage	I _O = 500 mA	l _o = 500 mA		0.4	0.7	v
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V
VIH	Control input logic high	T _a = -40 to 125 °C		2			V
h	Control input current	$V_1 = 9 V$ $V_C = 6 V$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω lo = 0 to 500 mA	2	2	10		μF



Refer to test circuits, $T_a = -40$ to 125 °C, $C_I = 0.1 \ \mu\text{F}$, $C_O = 2.2 \ \mu\text{F}$ unless otherwise specified.

Symbol	Parameter	Test con	dition	Min.	Тур.	Max.	Unit
Vo	Output voltage	$I_0 = 50 \text{ mA}$ V _I = 10.5 V T _a = 25 °C	VI = 10.5 V		8.5	8.67	V
		I ₀ = 50 mA				8.855	
VI	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit	T _a = 25 °C			1		А
ΔVo	Line regulation	$V_1 = 9.5 \text{ to } 16 \text{ V}$ $I_0 = 5 \text{ mA}$			8	44	mV
ΔVo	Load regulation	$V_1 = 9.8 V$ $I_0 = 5 to 500 mA$			8	44	mV
	Id Quiescent current	V _I = 9.5 to 16 V I _O = 0 mA	ON mode		0.7	2.5	
ld		V _I = 9.8 to 16 V I _O = 500 mA				12	mA
		Vi = 9 V	OFF mode		70	160	μA
		lo = 5 mA	f = 120 Hz		72		
SVR	Supply voltage rejection	$V_{I} = 10.5 \pm 1 \text{ V} T_{a} =$	f = 1 kHz		67		dB
		25 °C	f = 10 kHz		57		
eN	Output noise voltage	B = 10 Hz to 100 kHz T _a = 25 °C	Z		50		μV
N	Dran autoralita an	I _O = 200 mA			0.2	1.3	V
Vd	Dropout voltage	lo = 500 mA	00 mA		0.4	1.3	V
VIL	Control input logic low					0.8	V
VIH	Control input logic high			2			V
lı	Control input current	$V_{I} = 9 V$ $V_{C} = 6 V$ $T_{a} = 25 °C$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF

Table 26: LF85C (automotive grade	e) electrical characteristics
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Refer to test circuits, $T_J = 25 \text{ °C}$, $C_I = 0.1 \mu F$, $C_O = 2.2 \mu F$ unless otherwise specified.

		Table 27: LF90C	electrical charac	teristics			
Symbol	Parameter	Test con	Min.	Тур.	Max.	Unit	
		lo = 50 mA V _I = 11 V		8.82	9	9.18	
Vo	Output voltage	lo = 50 mA V _I = 11 V T _a = -25 to 85 °C		8.64		9.36	V
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		А
ΔV_{O}	Line regulation	V _I = 10 to 16 V I _O = 5 mA			9	45	mV
ΔV_{O}	Load regulation	Vi = 10.3 V Io = 5 to 500 mA			9	45	mV
	Id Quiescent current	V _I = 10 to 16 V I _O = 0 mA	- ON mode		0.7	1.5	
ld		V _I = 10.3 to 16V I _O = 500 mA				12	mA
		V _I = 10 V	OFF mode		70	140	μA
		$I_0 = 5 \text{ mA}$ $V_1 = 11 \pm 1 \text{ V}$	f = 120 Hz		71		dB
SVR	Supply voltage rejection		f = 1 kHz		66		
		VI = 11 ± 1 V	f = 10 kHz		56		
eN	Output noise voltage	B = 10 Hz to 100 kH	Z		50		μV
Vd	lo=200 mA				0.2	0.35	V
٧d	Dropout voltage	l _o = 500 mA			0.4	0.7	v
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V
Vih	Control input logic high	T _a = -40 to 125 °C		2			V
h	Control input current	V ₁ = 10 V V _C = 6 V			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF

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Table 28: LF120AB electrical characteristics									
Symbol	Parameter	Test co	Min.	Тур.	Max.	Unit			
		I _O = 50 mA V _I = 15 V		11.88	12	12.12			
Vo	Output voltage	$I_0 = 50 \text{ mA}$ V _I = 15 V T _a = -25 to 85 °C	V ₁ = 15 V			12.24	V		
Vı	Operating input voltage	I _O = 500 mA				16	V		
lo	Output current limit				1		А		
ΔV_{O}	Line regulation	V ₁ = 13 to 16 V I ₀ = 5 mA			12	60	mV		
ΔV_{O}	Load regulation	V _I = 13.3 V I _O = 5 to 500 mA			12	60	mV		
		V _I = 13 to 16 V I _O = 0 mA			0.7	1.5			
I _d Quiescent	Quiescent current	V _I = 13.3 to 16 V I _O = 500 mA	ON mode			12	mA		
		V _I = 13 V	OFF mode		70	140	μA		
		$I_0 = 5 \text{ mA}$ $V_1 = 14 \pm 1 \text{ V}$	f = 120 Hz		69		dB		
SVR	Supply voltage rejection		f = 1 kHz		64				
		VI = I + ± I V	f = 10 kHz		54				
eN	Output noise voltage	B = 10 Hz to 100 k	Hz		50		μV		
Vd	Dropout voltogo	l _o = 200 mA			0.2	0.35	V		
Vd	Dropout voltage	I _O = 500 mA			0.4	0.7	v		
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V		
Vін	Control input logic high	T _a = -40 to 125 °C		2			V		
h	Control input current	$V_{I} = 13 V$ $V_{C} = 6 V$			10		μA		
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω lo = 0 to 500 mA		2	10		μF		



LFXX

		Table 29: LF120C e	lectrical charac	teristics			
Symbol	Parameter	Test cond	Min.	Тур.	Max.	Unit	
		$I_{O} = 50 \text{ mA}$ $V_{I} = 14 \text{ V}$ $I_{O} = 50 \text{ mA}$ $V_{I} = 14 \text{ V}$ $T_{a} = -25 \text{ to } 85 \text{ °C}$		11.76	12	12.24	
Vo	Output voltage			11.52		12.48	V
Vı	Operating input voltage	lo = 500 mA				16	V
lo	Output current limit				1		А
ΔV_{O}	Line regulation	V _I = 13 to 16 V I _O = 5 mA			12	60	mV
ΔV_{O}	Load regulation	V ₁ = 13.3 V Io = 5 to 500 mA			12	60	mV
		$V_1 = 13 \text{ to } 16 \text{ V}$ $I_0 = 0 \text{ mA}$	- ON mode		0.7	1.5	
ld	Quiescent current	V _I = 13.3 to 16 V I _O = 500 mA				12	mA
		V ₁ = 13 V	OFF mode		70	140	μA
			f = 120 Hz		69		
SVR	Supply voltage rejection	$I_0 = 5 \text{ mA}$ V ₁ = 14 ± 1 V	f = 1 kHz		64		dB
		VI = 14 ± 1 V	f = 10 kHz		54		
eN	Output noise voltage	B = 10 Hz to 100 kHz			50		μV
	Dramauturaltana	lo = 200 mA			0.2	0.35	
Vd	Dropout voltage	I _O = 500 mA			0.4	0.7	V
VIL	Control input logic low	T _a = -40 to 125 °C				0.8	V
Vін	Control input logic high	T _a = -40 to 125 °C		2			V
h	Control input current	V _I = 13 V V _C = 6 V			10		μΑ
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω $I_0 = 0$ to 500 mA		2	10		μF



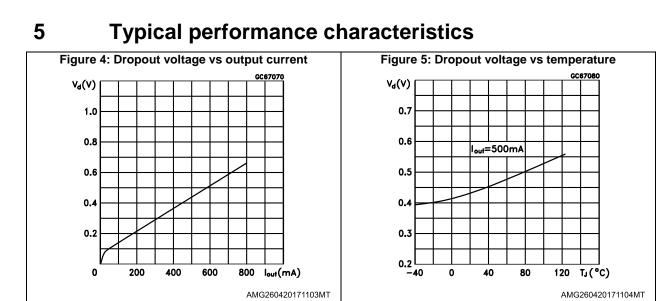


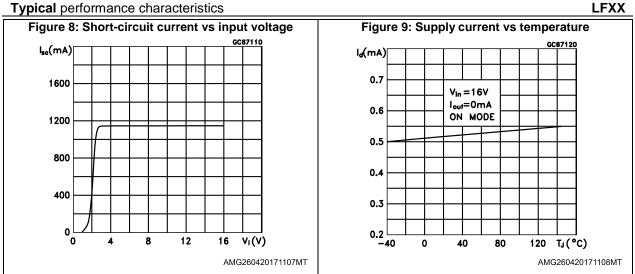
Figure 7: Supply current vs input voltage (no load) Figure 6: Supply current vs input voltage GC67100 GC67090 l₀(μA) l₄(mA)[1000 20 800 16 l_{out}=500mA ON MODE Am0=tuol ON MODE 600 12 Y 8 400 Vinhibit=2.5V OFF MODE 200 0 0 12 V1(V) 4 8 16 0 12 V1(V) 0 4 8 16 AMG260420171105MT AMG260420171106MT

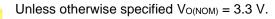
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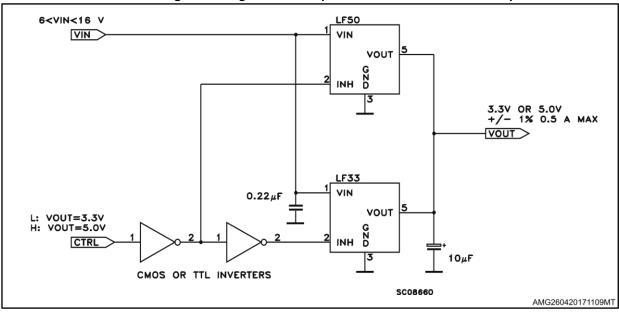
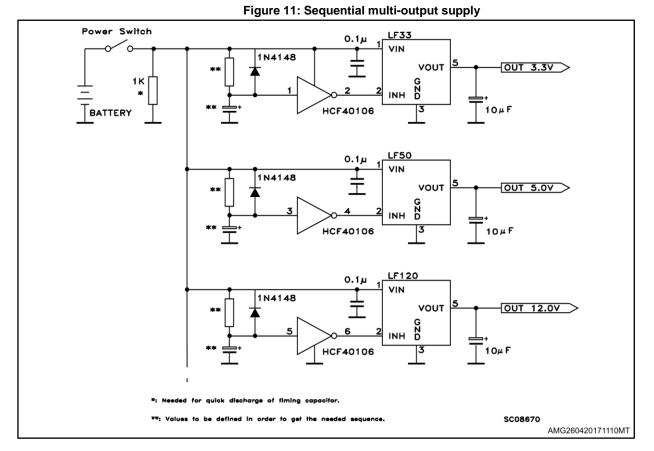


Figure 10: Logic-controlled precision 3.3/5.0 V selectable output



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Typical performance characteristics

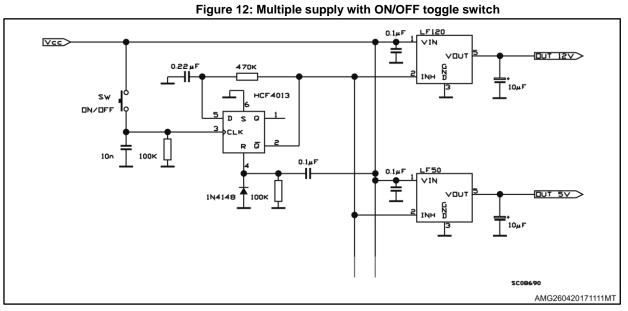
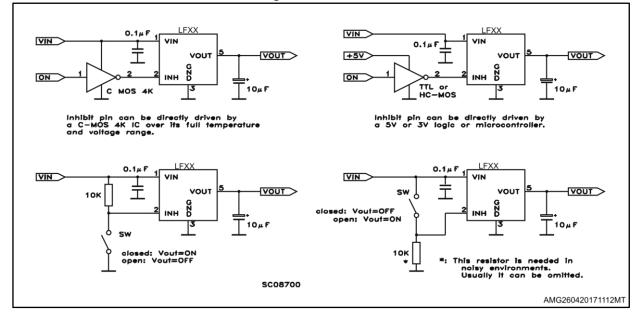
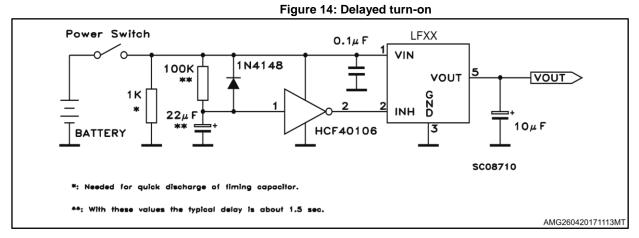
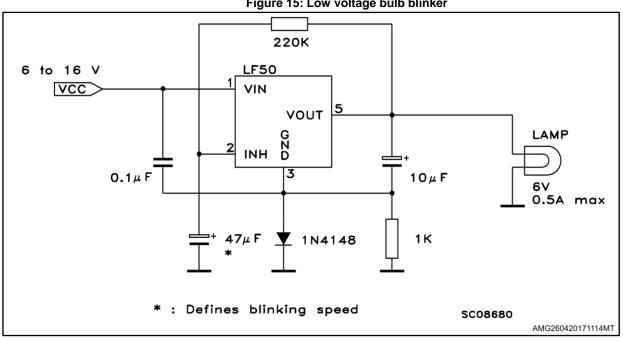


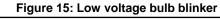
Figure 13: Basic inhibit functions









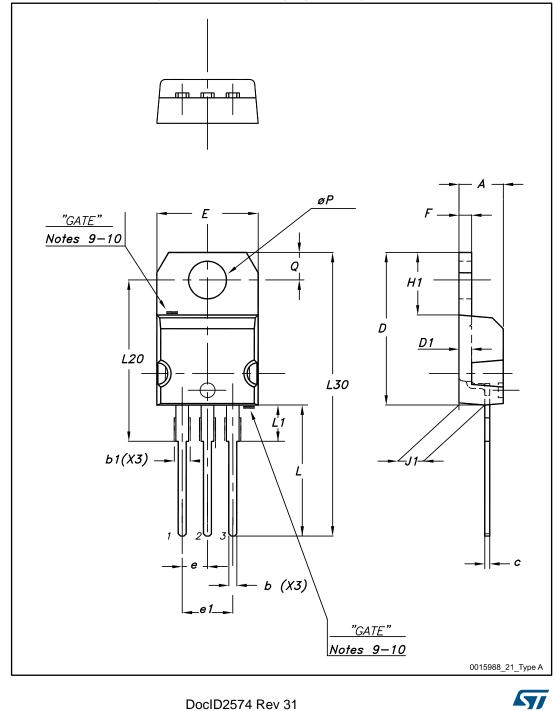




In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK[®] is an ST trademark.

6.1 TO-220 (dual gauge) package information

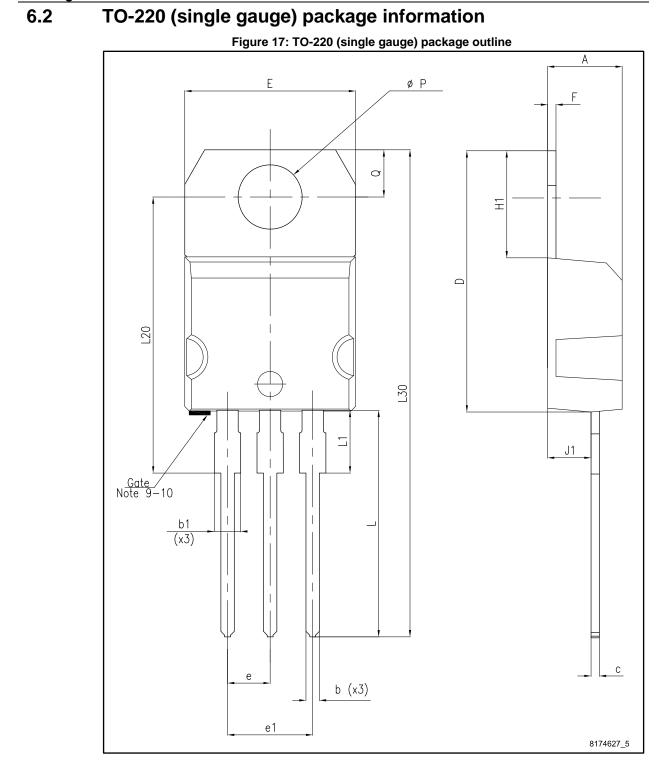
Figure 16: TO-220 (dual gauge) package outline



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Table 30: TO-220 (dual gauge) mechanical data			
Dim.			
	Min.	Тур.	Max.
A	4.40		4.60
b	0.61		0.88
b1	1.14		1.70
С	0.48		0.70
D	15.25		15.75
D1		1.27	
E	10		10.40
е	2.40		2.70
e1	4.95		5.15
F	1.23		1.32
H1	6.20		6.60
J1	2.40		2.72
L	13		14
L1	3.50		3.93
L20		16.40	
L30		28.90	
ØP	3.75		3.85
Q	2.65		2.95



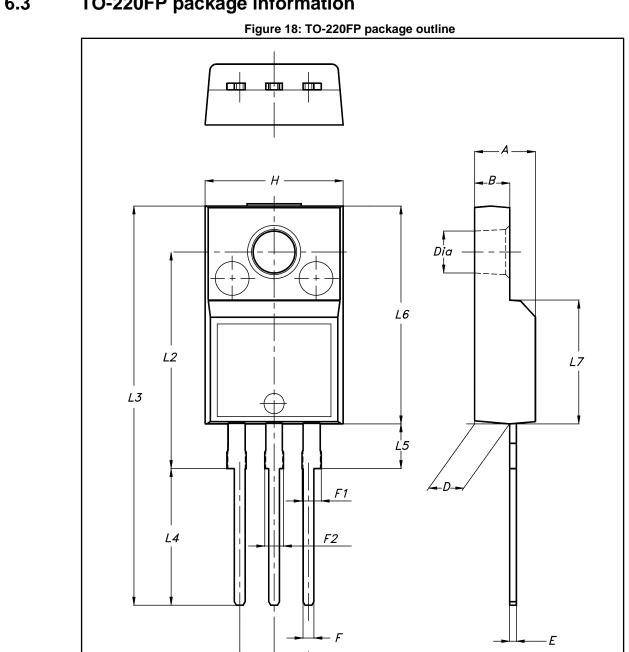




Package information

Table 31: TO-220 (single gauge) mechanical data					
Dim	mm				
Dim.	Min.	Тур.	Max.		
A	4.40		4.60		
b	0.61		0.88		
b1	1.14		1.70		
С	0.48		0.70		
D	15.25		15.75		
E	10.00		10.40		
е	2.40		2.70		
e1	e1 4.95		5.15		
F	0.51		0.60		
H1	6.20		6.60		
J1	2.40		2.72		
L	13.00		14.00		
L1	3.50		3.93		
L20		16.40			
L30		28.90			
ØP	3.75		3.85		
Q	2.65		2.95		





G1.

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7012510_type_A

			Package information		
	Table 32: TO-220FP package mechanical data				
Dim.		mm			
Dim.	Min.	Тур.	Max.		
A	4.4		4.6		
В	2.5		2.7		
D	2.5		2.75		
E	0.45		0.7		
F	0.75		1		
F1	1.15		1.70		
F2	1.15		1.70		
G	4.95		5.2		
G1	2.4		2.7		
Н	10		10.4		
L2		16			
L3	28.6		30.6		
L4	9.8		10.6		
L5	2.9		3.6		
L6	15.9		16.4		
L7	9		9.3		
Dia	3		3.2		



6.4 TO-220 packing information

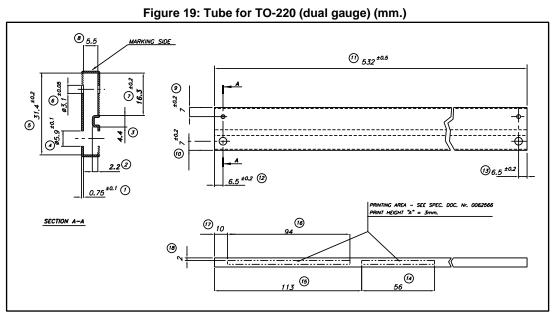
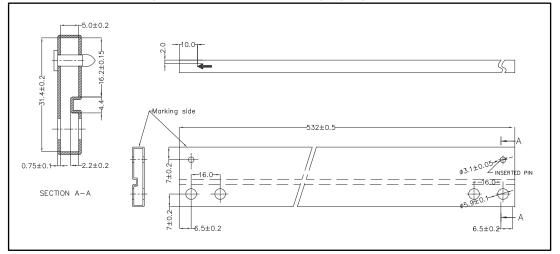


Figure 20: Tube for TO-220 (single gauge) (mm.)





6.5 DPAK package information

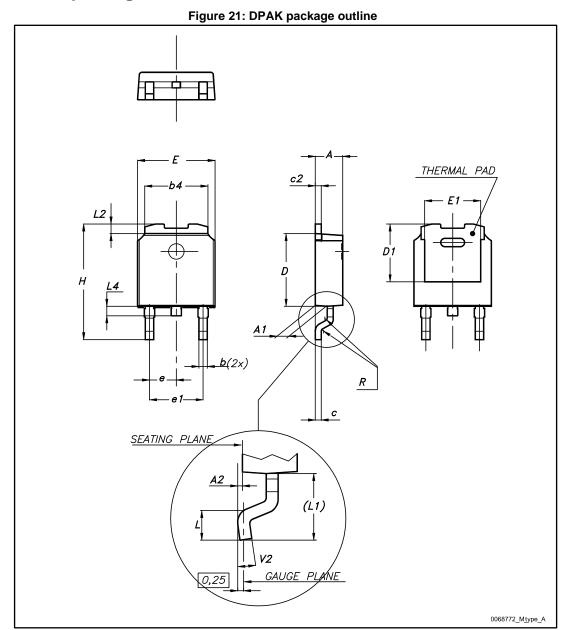
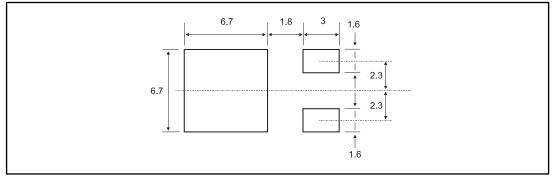




Table 33: DPAK mechanical data				
Dim.	mm			
Dini.	Min.	Тур.	Max.	
A	2.20		2.40	
A1	0.90		1.10	
A2	0.03		0.23	
b	0.64		0.90	
b4	5.20		5.40	
с	0.45		0.60	
c2	0.48		0.60	
D	6.00		6.20	
D1		5.10		
E	6.40		6.60	
E1		4.70		
е		2.28		
e1	4.40		4.60	
Н	9.35		10.10	
L	1.00		1.50	
(L1)		2.80		
L2		0.80		
L4	0.60		1.00	
R		0.20		
V2	0°		8°	

Figure 22: DPAK recommended footprint (dimensions are in mm)





6.6 PPAK package information

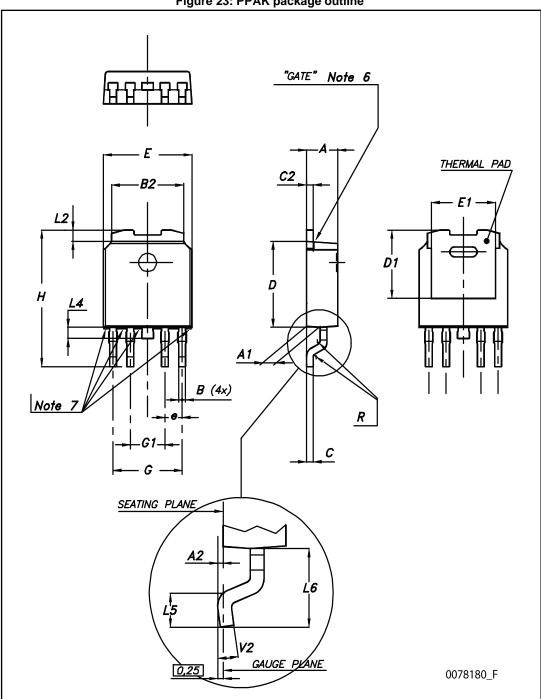


Figure 23: PPAK package outline



Dim.		mm	
	Min.	Тур.	Max.
А	2.2		2.4
A1	0.9		1.1
A2	0.03		0.23
В	0.4		0.6
B2	5.2		5.4
С	0.45		0.6
C2	0.48		0.6
D	6		6.2
D1		5.1	
E	6.4		6.6
E1		4.7	
е		1.27	
G	4.9		5.25
G1	2.38		2.7
Н	9.35		10.1
L2		0.8	1
L4	0.6		1
L5	1		
L6		2.8	
R		0.20	
V2	0°		8°

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PPAK and DPAK packing information

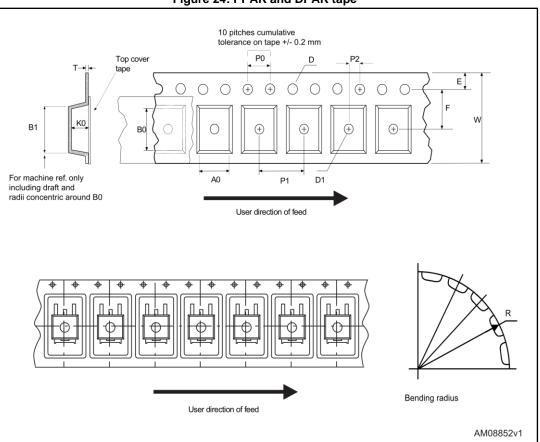
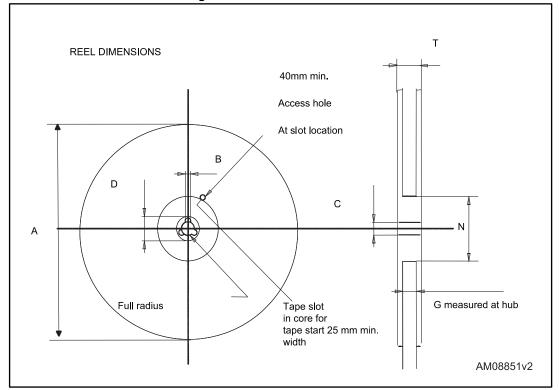


Figure 24: PPAK and DPAK tape



Figure 25: PPAK and DPAK reel



	Таре			Reel		
Dim.	mm		Dim	r	mm	
Dim.	Min.	Max.	Dim.	Min.	Max.	
A0	6.8	7	А		330	
B0	10.4	10.6	В	1.5		
B1		12.1	С	12.8	13.2	
D	1.5	1.6	D	20.2		
D1	1.5		G	16.4	18.4	
E	1.65	1.85	N	50		
F	7.4	7.6	Т		22.4	
K0	2.55	2.75				
P0	3.9	4.1	Base	e qty.	2500	
P1	7.9	8.1	Bulk	k qty.	2500	
P2	1.9	2.1				
R	40					
Т	0.25	0.35				
W	15.7	16.3				



7 Ordering information

Table 36: Order code					
Package					
TO-220	TO-220 (dual gauge)	TO-220FP	DPAK (tape and reel)	PPAK (tape and reel)	Output voltage (V)
			LF15ABDT-TR		1.5
			LF18CDT-TR	LF18CPT-TR	1.8
			LF18CDT-TRY ⁽¹⁾		1.8
			LF18ABDT-TR	LF18ABPT-TR	1.8
			LF25CDT-TR	LF25CPT-TR	2.5
			LF25CDT-TRY ⁽¹⁾		2.5
			LF25ABDT-TR		2.5
			LF25ABDT-TRY ⁽¹⁾		2.5
LF33CV	LF33CV-DG		LF33CDT-TR	LF33CPT-TR	3.3
			LF33CDT-TRY ⁽¹⁾	LF33CPT-TRY ⁽¹⁾	3.3
LF33ABV	LF33ABV-DG		LF33ABDT-TR		3.3
LF50CV	LF50CV-DG		LF50CDT-TR	LF50CPT-TR	5
			LF50CDT-TRY ⁽¹⁾	LF50CPT-TRY ⁽¹⁾	5
LF50ABV	LF50ABV-DG		LF50ABDT-TR	LF50ABPT-TR	5
		LF50ACP			5
			LF50ABDT-TRY ⁽¹⁾		5
LF60CV			LF60CDT-TR		6
LF60ABV			LF60ABDT-TR		6
			LF80CDT-TR		8
			LF80CDT-TRY ⁽¹⁾		8
			LF80ABDT-TR		8
			LF85CDT-TR	LF85CPT-TR	8.5
			LF85CDT-TRY ⁽¹⁾	LF85CPT-TRY ⁽¹⁾	8.5
LF90CV				LF90CPT-TR	9
			LF120CDT-TR		12
			LF120ABDT-TR		12

Notes:

⁽¹⁾Qualified and characterized according to AEC Q100 and Q003 or equivalent, advanced screening according to AEC Q001 and Q002 or equivalent.



Revision history 8

Та	able	37:	Document	revision	history

Date	Revision	Changes
21-Jun-2004	14	Document updating.
24-May-2006	15	Order codes updated.
02-Apr-2007	16	Order codes updated.
14-May-2007	17	Order codes updated.
26-Jul-2007	18	Add table 1 in cover page.
26-Nov-2007	19	Modified: Table 34.
16-Jan-2008	20	Added new order codes for automotive grade products see Table 34 on page 51.
12-Feb-2008	21	Modified: Table 34 on page 51.
10-Jul-2008	22	Modified: Table 34 on page 51.
05-May-2010	23	Added: Table 29 on page 41, fig 16, fig 17, fig 18 and fig 19.
16-Nov-2010	24	Modified: RthJc value for TO-220 Table 2 on page 7.
10-Feb-2012	25	Added: order code LF33CV-DG and LF33ABV-DG Table 34 on page 51.
09-Mar-2012	26	Added: order code LF50ABV-DG Table 34 on page 51.
28-Feb-2014	27	 Changed the part numbers LFxxAB and LFxxC to LFXX. Changed the title. Removed table from cover page. Removed PENTAWATT package from the figure in cover page, the Description and Figure 2. Updated the Description. Updated: Table 2, Table 6, Table 8, Table 10, Table 13, Table 15, Table 17, Table 22, Table 25 and Table 34. Changed title of Figure 7. Updated mechanical data.
03-Mar-2015	28	Updated Table 34: Order code. Minor text changes.
19-Jan-2017	29	Updated output voltage values in Table 16 and added new commercial type in TO-220FP in Table 35. Minor text changes.
27-Jan-2017	30	Updated features in cover page. Added Table 14 and updated Table 35.
22-May-2017	31	Updated <i>Table 36: "Order code"</i> . Minor text changes.



LFXX

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