Contents

1	Diagram5
2	Pin configuration 6
3	Maximum ratings
4	Application circuit
5	Electrical characteristics9
6	Typical application
7	Package mechanical data 29
8	Order codes
9	Revision history

L4931ABxx - L4931Cxx

List of figures

Figure 1.	Schematic diagram	5
Figure 2.	Pin connections (top view)	6
Figure 3.	Test circuit	8
Figure 4.	Line regulation vs temperature	. 28
Figure 5.	Dropout voltage vs temperature	. 28
Figure 6.	Supply current vs input voltage	. 28
igure 7.	Supply current vs temperature	. 28
Figure 8.	Short circuit current vs dropout voltage	
Figure 9	S V B vs Input voltage signal frequency	28

List of tables

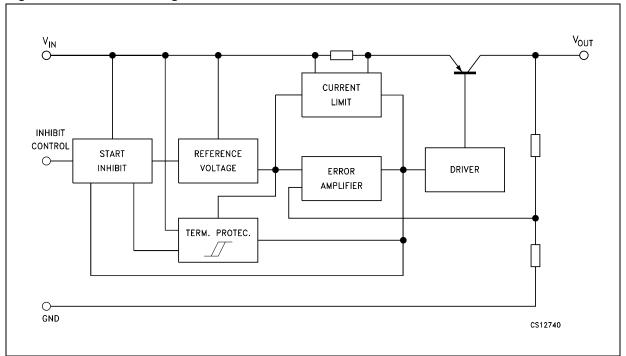
Table 1.	Device summary	1
Table 2.	Absolute maximum ratings	
Table 3.	Thermal data	7
Table 4.	Electrical characteristics of L4931ABxx15	9
Table 5.	Electrical characteristics of L4931Cxx15	10
Table 6.	Electrical characteristics of L4931ABxx25	11
Table 7.	Electrical characteristics of L4931Cxx25	12
Table 8.	Electrical characteristics of L4931ABxx27	13
Table 9.	Electrical characteristics of L4931Cxx27	14
Table 10.	Electrical characteristics of L4931Cxx27-TRY (Automotive Grade)	15
Table 11.	Electrical characteristics of L4931ABxx33	
Table 12.	Electrical characteristics of L4931Cxx33	17
Table 13.	Electrical characteristics of L4931Cxx33-TRY (Automotive Grade)	18
Table 14.	Electrical characteristics of L4931ABxx35	
Table 15.	Electrical characteristics of L4931ABxx35-TRY (Automotive Grade)	
Table 16.	Electrical characteristics of L4931Cxx35	21
Table 17.	Electrical characteristics of L4931ABxx50	
Table 18.	Electrical characteristics of L4931Cxx50	
Table 19.	Electrical characteristics of L4931ABxx80	
Table 20.	Electrical characteristics of L4931Cxx80	
Table 21.	Electrical characteristics of L4931ABxx120	
Table 22.	Electrical characteristics of L4931Cxx120	
Table 23.	Order codes	38
Table 24.	Document revision history	39

47/

L4931ABxx - L4931Cxx Diagram

1 Diagram

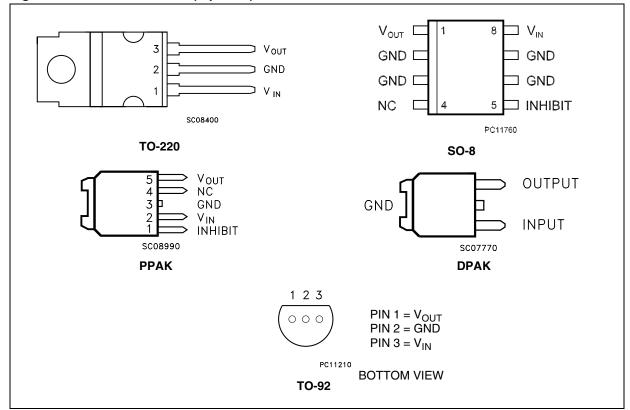
Figure 1. Schematic diagram



Pin configuration L4931ABxx - L4931Cxx

2 Pin configuration

Figure 2. Pin connections (top view)



L4931ABxx - L4931Cxx Maximum ratings

3 Maximum ratings

 Table 2.
 Absolute maximum ratings

Symbol	Parameter	Value	Unit
VI	DC Input voltage	20	V
I _O	Output current	Internally limited	mA
P _D	Power dissipation	Internally limited	mW
T _{STG}	Storage temperature range	-40 to 150	°C
T _{OP}	Operating junction temperature range	-40 to 125	°C

Note: Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied

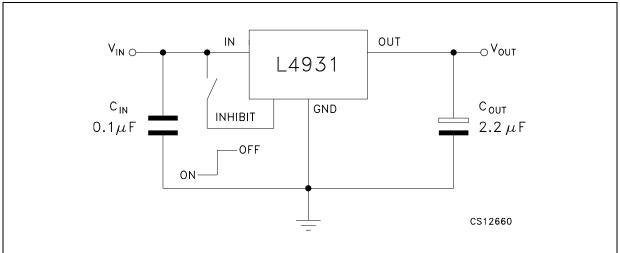
Table 3. Thermal data

Symbol	Parameter	TO-220	SO-8	DPAK	PPAK	TO-92	Unit
R _{thJC}	Thermal resistance junction-case	3	20	8	8		°C/W
R _{thJA}	Thermal resistance junction-ambient	50	55	100	100	200	°C/W

Application circuit L4931ABxx - L4931Cxx

4 Application circuit

Figure 3. Test circuit



5 Electrical characteristics

Table 4. Electrical characteristics of L4931ABxx15 (refer to the test circuits, $T_A = 25$ °C, $C_I = 0.1 \ \mu\text{F}, \ C_O = 2.2 \ \mu\text{F}$ unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit																																						
\ <u>/</u>	Output valtage	$I_O = 5 \text{ mA}, V_I = 3.9$	5 V	1.485	1.5	1.515	V																																						
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 3.9$	$_{\rm O}$ = 5 mA, $\rm V_{I}$ = 3.5 V, $\rm T_{A}$ =-25 to 85°C			1.53	V																																						
VI	Operating input voltage	I _O = 250 mA		2.5		20	V																																						
l _{out}	Output current limit				300		mA																																						
ΔV _O	Line regulation	$V_1 = 2.5 \text{ to } 20 \text{ V}, I_C$) = 0.5 mA		3	15	mV																																						
ΔV _O	Load regulation (1)	$V_1 = 2.7 \text{ V}, I_0 = 0.5$	5 to 250 mA		3	15	mV																																						
	Quiescent current	$V_1 = 2.7 \text{ to } 20 \text{ V}, I_C$) = 0 mA		0.6	1	Л																																						
I _d	ON MODE $V_I = 2.7 \text{ to } 20 \text{ V}, I_O = 250 \text{ mA}$) = 250 mA		4	6	mA																																							
	OFF MODE	V _I = 6 V			50	100	μΑ																																						
			f = 120 Hz		79																																								
SVR	Supply voltage rejection	$I_O = 5 \text{ mA}$ $V_I = 3.7 \pm 1 \text{ V}$																																							f = 1 kHz		76		dB
						f = 10 kHz		55																																					
eN	Output noise voltage	B = 10 Hz to 100 l	кНz		50		μV																																						
V _d	Dropout voltage (1)	I _O = 250 mA			1		٧																																						
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	V																																						
V _{IH}	Control Input Logic High	$T_A = -40 \text{ to } 125^{\circ}\text{C}$	T _A = -40 to 125°C				V																																						
I _I	Control input current	$V_1 = 6 \text{ V}, V_C = 6 \text{ V}$			10		μΑ																																						
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω	, I _O = 0 to 250 mA	2	10		μF																																						

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 5. Electrical characteristics of L4931Cxx15 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μF, C_O = 2.2 μF unless otherwise specified).

Symbol	Parameter	Test o	conditions	Min.	Тур.	Max.	Unit			
\/	Output valtage	$I_O = 5 \text{ mA}, V_I = 3.5$	$I_O = 5 \text{ mA}, V_I = 3.5 \text{ V}$			1.53	V			
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 3.5$	5 V, T _A =-25 to 85°C	1.44		1.56	V			
VI	Operating input voltage	I _O = 250 mA	I _O = 250 mA			20	V			
I _{out}	Output current limit				300		mA			
ΔV _O	Line regulation	$V_{I} = 2.5 \text{ to } 20 \text{ V}, I_{C}$	₀ = 0.5 mA		3	18	mV			
ΔV _O	Load regulation (1)	$V_1 = 2.7 \text{ V}, I_O = 0.5$	to 250 mA		3	18	mV			
	Quiescent current	$V_1 = 2.7 \text{ to } 20 \text{ V}, I_C$	o = 0 mA		0.6	1	4			
I_{d}	ON MODE $V_1 = 2.7 \text{ to } 20 \text{ V}, I_O = 250 \text{ mA}$	ON MODE	= 250 mA		4	6	mA			
	OFF MODE	V _I = 6 V			50	100	μA			
			f = 120 Hz		79					
SVR		$I_0 = 5 \text{ mA}$			$I_O = 5 \text{ mA}$ $V_I = 3.7 \pm 1 \text{ V}$		f = 1 kHz		76	
		V = 0.7 ± 1 V	f = 10 kHz		55					
eN	Output noise voltage	B = 10 Hz to 100 k	(Hz		50		μV			
V _d	Dropout voltage (1)	I _O = 250 mA			1		V			
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	V			
V _{IH}	Control Input Logic High	$T_A = -40 \text{ to } 125^{\circ}\text{C}$					V			
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$			10		μA			
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω	I _O = 0 to 250 mA	2	10		μF			

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 6. Electrical characteristics of L4931ABxx25 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μ F, C_O = 2.2 μ F unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit																																					
V	Output valtage	$I_O = 5 \text{ mA}, V_I = 4.5$	5 V	2.475	2.5	2.525	V																																					
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 4.5$	5 V, T _A =-25 to 85°C	2.45		2.55	V																																					
VI	Operating input voltage	I _O = 250 mA				20	V																																					
l _{out}	Output current limit				300		mA																																					
ΔV _O	Line regulation	$V_1 = 3.2 \text{ to } 20 \text{ V}, I_C$) = 0.5 mA		3	15	mV																																					
ΔV _O	Load regulation (1)	V _I = 3.4 V, I _O = 0.5	5 to 250 mA		3	15	mV																																					
	Quiescent current	$V_1 = 3.4 \text{ to } 20 \text{ V}, I_C$) = 0 mA		0.6	1	A																																					
l _d	ON MODE	$V_1 = 3.4 \text{ to } 20 \text{ V}, I_0$) = 250 mA		4	6	mA																																					
	OFF MODE	V _I = 6 V			50	100	μA																																					
		I _O = 5 mA	f = 120 Hz		75																																							
SVR	Supply voltage rejection																																							$I_O = 5 \text{ mA}$ $V_I = 4.4 \pm 1 \text{ V}$	f = 1 kHz		72	
		V - 4.4 ± 1 V	f = 10 kHz		55																																							
eN	Output noise voltage	B = 10 Hz to 100 l	кНz		50		μV																																					
.,	D (1)	I _O = 250 mA			0.4	0.6	V																																					
V_d	Dropout voltage ⁽¹⁾ $I_O = 250 \text{ mA}, T_A = -40 \text{ to } 125^{\circ}\text{C}$	-40 to 125°C			0.8	V																																						
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	٧																																					
V _{IH}	Control Input Logic High	$T_A = -40 \text{ to } 125^{\circ}\text{C}$	T _A = -40 to 125°C				V																																					
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$			10		μA																																					
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω	, I _O = 0 to 250 mA	2	10		μF																																					

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 7. Electrical characteristics of L4931Cxx25 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μF, C_O = 2.2 μF unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit																																												
W	Output voltage	$I_O = 5 \text{ mA}, V_I = 4.5$	5 V	2.45	2.5	2.55	٧																																												
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 4.9$	5 V, T _A =-25 to 85°C	2.4		2.6	V																																												
V _I	Operating input voltage	I _O = 250 mA	I _O = 250 mA			20	V																																												
l _{out}	Output current limit				300		mA																																												
ΔV _O	Line regulation	$V_1 = 3.3 \text{ to } 20 \text{ V}, I_C$) = 0.5 mA		3	18	mV																																												
ΔV _O	Load regulation (1)	$V_1 = 3.5 \text{ V}, I_0 = 0.5$	5 to 250 mA		3	18	mV																																												
	Quiescent current	$V_1 = 3.5 \text{ to } 20 \text{ V}, I_C$) = 0 mA		0.6	1																																													
I_d	ON MODE	$V_1 = 3.5 \text{ to } 20 \text{ V}, I_0$) = 250 mA		4	6	mA																																												
	OFF MODE	V _I = 6 V			50	100	μA																																												
		$I_{O} = 5 \text{ mA}$ $V_{I} = 4.4 \pm 1 \text{ V}$	f = 120 Hz		75																																														
SVR	Supply voltage rejection																																														f = 1 kHz		72		dB
			f = 10 kHz		55																																														
eN	Output noise voltage	B = 10 Hz to 100 l	······································		50		μV																																												
.,	(1)	I _O = 250 mA			0.4	0.6	٧																																												
V_d	Dropout voltage ⁽¹⁾ $I_O = 250 \text{ mA}, T_A = -40 \text{ to } 125^{\circ}\text{C}$	-40 to 125°C			0.8	٧																																													
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	··				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 _O = 0 to 250 mA	2	10		μF																																												

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 8. Electrical characteristics of L4931ABxx27 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μ F, C_O = 2.2 μ F unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit																																			
W	Output voltage	$I_O = 5 \text{ mA}, V_I = 4.7$	7 V	2.673	2.7	2.727	V																																			
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 4.7$	7 V, T _A =-25 to 85°C	2.646		2.754	V																																			
V _I	Operating input voltage	I _O = 250 mA	I _O = 250 mA			20	V																																			
I _{out}	Output current limit				300		mA																																			
ΔV _O	Line regulation	$V_1 = 3.4 \text{ to } 20 \text{ V}, I_C$) = 0.5 mA		3	15	mV																																			
ΔV _O	Load regulation (1)	$V_1 = 3.6 \text{ V}, I_O = 0.5$	5 to 250 mA		3	15	mV																																			
	Quiescent current	$V_1 = 3.6 \text{ to } 20 \text{ V}, I_C$) = 0 mA		0.6	1																																				
I_d	ON MODE	$V_1 = 3.6 \text{ to } 20 \text{ V}, I_C$) = 250 mA		4	6	mA																																			
	OFF MODE	V _I = 6 V			50	100	μA																																			
		$I_{O} = 5 \text{ mA}$ $V_{I} = 4.6 \pm 1 \text{ V}$ $f = 4.6 \pm 1 \text{ V}$	f = 120 Hz		74																																					
SVR	Supply voltage rejection		•	•	· ·	· ·	•	•	_	•	•	•	· ·		•	_	•	•	•	•	_	•	_	•	•	_	•		_	_			•	· ·	· ·	•	_	f = 1 kHz		71		dB
			f = 10 kHz		55																																					
eN	Output noise voltage	B = 10 Hz to 100 H	······································		50		μV																																			
.,	(1)	I _O = 250 mA			0.4	0.6	٧																																			
V_d	Oropout voltage ⁽¹⁾ $I_O = 250 \text{ mA}, T_A = -40 \text{ to } 125^{\circ}\text{C}$	-40 to 125°C			0.8	٧																																				
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	V																																			
V _{IH}	Control Input Logic High	T _A = -40 to 125°C	••				V																																			
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$			10		μA																																			
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω	, I _O = 0 to 250 mA	2	10		μF																																			

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 9. Electrical characteristics of L4931Cxx27 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μF, C_O = 2.2 μF unless otherwise specified).

Symbol	Parameter	Test o	conditions	Min.	Тур.	Max.	Unit
\/	Output valtage	$I_O = 5 \text{ mA}, V_I = 4.7$	$I_0 = 5 \text{ mA}, V_1 = 4.7 \text{ V}$			2.754	V
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 4.7$	' V, T _A =-25 to 85°C	2.592		2.808	V
VI	Operating input voltage	I _O = 250 mA	I _O = 250 mA			20	V
I _{out}	Output current limit				300		mA
ΔV _O	Line regulation	$V_{I} = 3.4 \text{ to } 20 \text{ V}, I_{O}$	= 0.5 mA		3	18	mV
ΔV _O	Load regulation (1)	V _I = 3.6 V, I _O = 0.5	to 250 mA		3	18	mV
	Quiescent current	$V_{I} = 3.6 \text{ to } 20 \text{ V}, I_{O}$	= 0 mA		0.6	1	
Ι _d	ON MODE	$V_{I} = 3.6 \text{ to } 20 \text{ V}, I_{O}$	= 250 mA		4	6	mA
	OFF MODE	V _I = 6 V			50	100	μA
		'	f = 120 Hz		74		
SVR	Supply voltage rejection	$I_O = 5 \text{ mA}$ $V_I = 4.6 \pm 1 \text{ V}$	f = 1 kHz		71		dB
			f = 10 kHz		55		
eN	Output noise voltage	B = 10 Hz to 100 k	Hz		50		μV
	(1)	I _O = 250 mA			0.4	0.6	V
V_d	Dropout voltage ⁽¹⁾ $I_{O} = 250 \text{ mA}, T_{A} = -40 \text{ to } 125^{\circ}\text{C}$			0.8	V		
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	V
V _{IH}	Control Input Logic High	$T_A = -40 \text{ to } 125^{\circ}\text{C}$					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 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 10. Electrical characteristics of L4931Cxx27-TRY (Automotive Grade) (refer to the test circuits, $T_A = -40$ to 12 5°C, $C_I = 0.1~\mu F$, $C_O = 2.2~\mu F$ unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit			
V	Output voltage	$I_{O} = 5 \text{ mA}, V_{I} = 4.$	7 V, T _A = 25°C	2.646	2.7	2.754	V			
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 4.$	7 V	2.592		2.808	V			
VI	Operating input voltage	I _O = 250 mA				20	٧			
I _{out}	Output current limit	T _A = 25°C			300		mA			
ΔV _O	Line regulation	$V_1 = 3.4 \text{ to } 20 \text{ V}, I_0$	_O = 0.5 mA			20	mV			
ΔV _O	Load regulation	V _I = 3.6 V, I _O = 0.5	5 to 250 mA			38	mV			
	Quiescent current	$V_1 = 3.6 \text{ to } 20 \text{ V}, I_0$	_O = 0 mA			1	4			
l _d	ON MODE	$V_1 = 3.6 \text{ to } 20 \text{ V}, I_0$	_O = 250 mA			6	mA			
	OFF MODE	V _I = 6 V				100	μA			
		I _O = 5 mA	f = 120 Hz		74					
SVR	Supply voltage rejection	$V_1 = 4.6 \pm 1 \text{ V}$	$V_1 = 4.6 \pm 1 \text{ V}$	$V_1 = 4.6 \pm 1 \text{ V}$	$V_1 = 4.6 \pm 1 \text{ V}$	f = 1 kHz		71		dB
		$T_A = 25^{\circ}C$	f = 10 kHz		55					
eN	Output noise voltage	B = 10 Hz to 100	kHz, T _A = 25°C		50		μV			
.,	D	I _O = 250 mA, T _A =	25°C		0.4	0.6	V			
V_d	Dropout voltage	I _O = 250 mA				0.82	V			
V _{IL}	Control input logic low					0.82	V			
V _{IH}	Control Input Logic High						V			
l _l	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$, T _A = 25°C		10		μA			
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω T _A = 25°C	$I_0 = 0 \text{ to } 250 \text{ mA},$	2	10		μF			

Table 11. Electrical characteristics of L4931ABxx33 (refer to the test circuits, $T_A = 25$ °C, $C_I = 0.1 \ \mu\text{F}, \ C_O = 2.2 \ \mu\text{F}$ unless otherwise specified).

Symbol	Parameter	Test c	onditions	Min.	Тур.	Max.	Unit
\/	Outrout valta as	$I_O = 5 \text{ mA}, V_I = 5.3$	V	3.267	3.3	3.333 3.366 20	V
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 5.3$	V, T _A =-25 to 85°C	3.234			V
V _I	Operating input voltage	I _O = 250 mA				20	٧
l _{out}	Output current limit				300		mA
ΔV _O	Line regulation	$V_{I} = 4 \text{ to } 20 \text{ V}, I_{O} =$	0.5 mA		3	15	mV
ΔV _O	Load regulation (1)	V _I = 4.2 V, I _O = 0.5	to 250 mA		3	3.333 3.366 20 15 15 16 100 0.6 0.8 0.8	mV
	Quiescent current	$V_{I} = 4.2 \text{ to } 20 \text{ V}, I_{O}$	= 0 mA		0.6	1	
I _d	ON MODE	$V_1 = 4.2 \text{ to } 20 \text{ V}, I_0$	= 250 mA		4	3.333 3.366 20 15 15 1 6 100 0.6 0.8	mA
	OFF MODE	V _I = 6 V			50	100	μA
			f = 120 Hz		73		
SVR	Supply voltage rejection	$I_O = 5 \text{ mA}$ $V_I = 5.2 \pm 1 \text{ V}$	f = 1 kHz		70	3.366 20 15 15 1 6 100 0.6 0.8	dB
		V - 3.2 ± 1 V	f = 10 kHz		55		
eN	Output noise voltage	B = 10 Hz to 100 k	Hz		50		μV
.,	(1)	I _O = 250 mA			0.4	1 6 100 0.6 0.8	V
V_d	Dropout voltage (1)	$I_O = 250 \text{ mA}, T_A = -6$	40 to 125°C			0.8	٧
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		μΑ
C _O	Output bypass capacitance	ESR = 0.1 to 10 Ω	I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 12. Electrical characteristics of L4931Cxx33 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μ F, C_O = 2.2 μ F unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit
V	Output voltage	$I_{O} = 5 \text{ mA}, V_{I} = 5.3$	3 V	3.234	3.3	Max. 3.366 3.432 20 18 18 1 6 100 0.6 0.8 0.8	V
Vo	Output voltage	$I_{O} = 5 \text{ mA}, V_{I} = 5.3$	3 V, T _A =-25 to 85°C	3.168		3.432	V
VI	Operating input voltage	I _O = 250 mA				20	V
I _{out}	Output current limit				300		mA
ΔV_{O}	Line regulation	$V_1 = 4.1 \text{ to } 20 \text{ V}, I_0$) = 0.5 mA		3	18	mV
ΔV _O	Load regulation (1)	V _I = 4.3 V, I _O = 0.5	= 4.3 to 20 V, I _O = 0 mA		3	18	mV
	Quiescent current	$V_1 = 4.3 \text{ to } 20 \text{ V}, I_0$) = 0 mA		0.6	1	A
I _d	ON MODE	$V_1 = 4.3 \text{ to } 20 \text{ V}, I_0$) = 250 mA		4	6	mA
	OFF MODE	$V_{I} = 4.1 \text{ to } 20 \text{ V}, I_{O} = 0.5 \text{ mA}$ $V_{I} = 4.3 \text{ V}, I_{O} = 0.5 \text{ to } 250 \text{ mA}$ $V_{I} = 4.3 \text{ to } 20 \text{ V}, I_{O} = 0 \text{ mA}$ $V_{I} = 4.3 \text{ to } 20 \text{ V}, I_{O} = 250 \text{ mA}$ $V_{I} = 6 \text{ V}$ $I_{O} = 5 \text{ mA}$ $V_{I} = 5.3 \pm 1 \text{ V}$ $I_{O} = 5 \text{ mA}$ $V_{I} = 5.3 \pm 1 \text{ V}$ $I_{O} = 5 \text{ mA}$ $I_{O} = 250 \text{ mA}$		50	100	μA	
			f = 120 Hz		73		
SVR	Supply voltage rejection		f = 1 kHz		70		dB
		$V_{I} = 4.1 \text{ to } 20 \text{ V}, I_{O} = 0.5 \text{ n}$ $V_{I} = 4.3 \text{ V}, I_{O} = 0.5 \text{ to } 250 \text{ m}$ $V_{I} = 4.3 \text{ to } 20 \text{ V}, I_{O} = 0 \text{ mA}$ $V_{I} = 4.3 \text{ to } 20 \text{ V}, I_{O} = 250 \text{ mA}$ $V_{I} = 6 \text{ V}$ $I_{O} = 5 \text{ mA}$ $V_{I} = 5.3 \pm 1 \text{ V}$ $\begin{cases} f = 1 \\ f = 1 \end{cases}$	f = 10 kHz		55		
eN	Output noise voltage	B = 10 Hz to 100 l	A, $V_{I} = 5.3 \text{ V}$ A, $V_{I} = 5.3 \text{ V}$ A, $V_{I} = 5.3 \text{ V}$, $T_{A} = -25 \text{ to } 85^{\circ}\text{C}$ 3.168 The equation of the equation		μV		
.,	D (1)	I _O = 250 mA			0.4	0.6	V
V_d	Dropout voltage (1)	$I_O = 250 \text{ mA}, T_A =$	-40 to 125°C			0.8	V
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	٧
V _{IH}	Control Input Logic High	$T_A = -40 \text{ to } 125^{\circ}\text{C}$		2			٧
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω	, I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 13. Electrical characteristics of L4931Cxx33-TRY (Automotive Grade) (refer to the test circuits, T_A = -40 to 125 °C, C_I = 0.1 μ F, C_O = 2.2 μ F unless otherwise specified).

Symbol	Parameter	Test c	onditions	Min.	Тур.	Max.	Unit
V	Output voltage	$I_O = 5 \text{ mA}, V_I = 5.3$	3 V, T _A = 25°C	3.234	3.3	3.366	V
Vo	Output voltage	$I_O = 5 \text{ mA}, V_I = 5.3$	3 V	3.168		3.432	V
VI	Operating input voltage	I _O = 250 mA				20	V
I _{out}	Output current limit	T _A = 25°C			300		mA
ΔV_{O}	Line regulation	$V_{I} = 4.1 \text{ to } 20 \text{ V}, I_{O}$	= 0.5 mA			20	mV
ΔV_{O}	Load regulation	$V_1 = 4.3 \text{ V}, I_O = 0.5$	to 250 mA			38	mV
	Quiescent current	$V_1 = 4.3 \text{ to } 20 \text{ V}, I_O$	= 0 mA			1	А
I _d	ON MODE	$V_1 = 4.3 \text{ to } 20 \text{ V}, I_0$	= 250 mA			6	mA
	OFF MODE	V _I = 6 V				100	μA
		I _O = 5 mA	f = 120 Hz		73		
SVR	Supply voltage rejection	$V_1 = 5.3 \pm 1 \text{ V}$	f = 1 kHz		70		dB
		$T_A = 25^{\circ}C$	f = 10 kHz		55		
eN	Output noise voltage	B = 10 Hz to 100 k	Hz, T _A = 25°C		50		μV
.,	B	$I_O = 250 \text{ mA}, T_A = 100 \text{ mA}$	25°C		0.4	0.6	V
V _d	Dropout voltage	I _O = 250 mA				0.82	V
V _{IL}	Control input logic low					0.82	٧
V _{IH}	Control Input Logic High			2			V
I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V},$	T _A = 25°C		10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω T _A = 25°C	I _O = 0 to 250 mA,	2	10		μF

47/

Table 14. Electrical characteristics of L4931ABxx35 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μ F, C_O = 2.2 μ F unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit
V	Output valtage	$I_O = 5 \text{ mA}, V_I = 5.8$	5 V	3.465	3.5	Max. 3.535 3.57 20 15 15 1 6 100 0.6 0.8 0.8	V
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 5.8$	5 V, T _A =-25 to 85°C	3.43		3.57	V
VI	Operating input voltage	I _O = 250 mA				20	V
l _{out}	Output current limit				300		mA
ΔV _O	Line regulation	$V_1 = 4.2 \text{ to } 20 \text{ V}, I_0$	_O = 0.5 mA		3	15	mV
ΔV _O	Load regulation (1)	V _I = 4.4 V, I _O = 0.5	= 4.4 to 20 V, I _O = 0 mA		3	15	mV
	Quiescent current	$V_1 = 4.4 \text{ to } 20 \text{ V, } I_0$	_O = 0 mA		0.6	1	
l _d	ON MODE	$V_1 = 4.4 \text{ to } 20 \text{ V}, I_0$	_O = 250 mA		4	6	mA
	OFF MODE	$I_{O} = 5 \text{ mA}, V_{I} = 5.5 \text{ V}, T_{A} = -25 \text{ to } 85^{\circ}\text{C}$ $I_{O} = 250 \text{ mA}$ $V_{I} = 4.2 \text{ to } 20 \text{ V}, I_{O} = 0.5 \text{ mA}$ $V_{I} = 4.4 \text{ V}, I_{O} = 0.5 \text{ to } 250 \text{ mA}$ $V_{I} = 4.4 \text{ to } 20 \text{ V}, I_{O} = 0 \text{ mA}$ $V_{I} = 4.4 \text{ to } 20 \text{ V}, I_{O} = 250 \text{ mA}$ $V_{I} = 6 \text{ V}$ $I_{O} = 5 \text{ mA}$ $V_{I} = 5.4 \pm 1 \text{ V}$ $I_{O} = 10 \text{ kHz}$ $I_{O} = 250 \text{ mA}$ $I_{O} = 250 \text{ mA}, T_{A} = -40 \text{ to } 125^{\circ}\text{C}$ $T_{A} = -40 \text{ to } 125^{\circ}\text{C}$		50	100	μA	
			f = 120 Hz		73		
SVR	Supply voltage rejection		f = 1 kHz		70		dB
		$\begin{split} &I_{O} = 250 \text{ mA} \\ &V_{I} = 4.2 \text{ to } 20 \text{ V}, I_{O} = 0.5 \text{ to } 250 \\ &V_{I} = 4.4 \text{ V}, I_{O} = 0.5 \text{ to } 250 \\ &V_{I} = 4.4 \text{ to } 20 \text{ V}, I_{O} = 0 \text{ m/} \\ &V_{I} = 4.4 \text{ to } 20 \text{ V}, I_{O} = 250 \\ &V_{I} = 6 \text{ V} \\ &I_{O} = 5 \text{ mA} \\ &V_{I} = 5.4 \pm 1 \text{ V} \\ &I_{O} = 250 \text{ mA} \\ &I_{O} = 250 \text{ mA} \\ &I_{O} = 250 \text{ mA}, T_{A} = -40 \text{ to } 1 \\ &T_{A} = -40 \text{ to } 125^{\circ}\text{C} \\ &T_{A} = -40 \text{ to } 125^{\circ}\text{C} \\ &V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V} \end{split}$	f = 10 kHz		55		
eN	Output noise voltage	B = 10 Hz to 100	mA, $V_{I} = 5.5 \text{ V}$ mA, $V_{I} = 5.5 \text{ V}$, $T_{A} = -25 \text{ to } 85^{\circ}\text{C}$ 0 mA 2 to 20 V, $I_{O} = 0.5 \text{ mA}$ 300 2 to 20 V, $I_{O} = 0.5 \text{ mA}$ 3 to 20 V, $I_{O} = 0 \text{ mA}$ 4 to 20 V, $I_{O} = 0 \text{ mA}$ 4 to 20 V, $I_{O} = 250 \text{ mA}$ 4 to 20 V, $I_{O} = 250 \text{ mA}$ 50 The first section of the first sectio		μV		
.,	(1)	I _O = 250 mA			0.4	0.6	٧
V_d	Dropout voltage (1)	$I_O = 250 \text{ mA}, T_A =$	-40 to 125°C			0.8	V
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				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
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω	Q I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 15. Electrical characteristics of L4931ABxx35-TRY (Automotive Grade) (refer to the 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	conditions	Min.	Тур.	Max.	Unit
\/	Output voltage	$I_O = 5 \text{ mA}, V_I = 5.$	5 V, T _A = 25°C	3.465	3.5	3.535	V
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 5.$	5 V	3.43		3.57	V
VI	Operating input voltage	I _O = 250 mA	= 250 mA = 25°C = 4.2 to 20 V, I _O = 0.5 mA = 4.4 V, I _O = 0.5 to 250 mA = 4.4 to 20 V, I _O = 0 mA = 4.4 to 20 V, I _O = 250 mA = 6 V = 5 mA = 5.4 ± 1 V = 25°C = 10 Hz to 100 kHz, T _A = 25°C = 250 mA = 25°C			20	V
l _{out}	Output current limit	T _A = 25°C			300		mA
ΔV _O	Line regulation	$V_1 = 4.2 \text{ to } 20 \text{ V}, I_0$	_O = 0.5 mA			17	mV
ΔV _O	Load regulation	$V_1 = 4.4 \text{ V}, I_0 = 0.5$	-			35	mV
	Quiescent current	$V_1 = 4.4 \text{ to } 20 \text{ V}, I_0$	O = 0 mA			1	
I_{d}	ON MODE	$V_1 = 4.4 \text{ to } 20 \text{ V}, I_0$	= 4.4 to 20 V, I _O = 250 mA			6	mA
	OFF MODE	V _I = 6 V				100	μA
		L ₂ = 5 mΛ	f = 120 Hz		73		
SVR	Supply voltage rejection	$V_1 = 5.4 \pm 1 \text{ V}$	f = 1 kHz		70		dB
		$T_{A} = 25^{\circ}C$ $V_{I} = 4.2 \text{ to } 20 \text{ V, } I_{O} = 0.5 \text{ mA}$ $V_{I} = 4.4 \text{ V, } I_{O} = 0.5 \text{ to } 250 \text{ m}$ $V_{I} = 4.4 \text{ to } 20 \text{ V, } I_{O} = 0 \text{ mA}$ $V_{I} = 4.4 \text{ to } 20 \text{ V, } I_{O} = 250 \text{ m/s}$ $V_{I} = 6 \text{ V}$ $I_{O} = 5 \text{ mA}$ $V_{I} = 5.4 \pm 1 \text{ V}$ $T_{A} = 25^{\circ}C$ $B = 10 \text{ Hz to } 100 \text{ kHz, } T_{A} = 25^{\circ}C$ $I_{O} = 250 \text{ mA}$ $V_{I} = 6 \text{ V, } V_{C} = 6 \text{ V, } T_{A} = 25^{\circ}C$ $V_{I} = 6 \text{ V, } V_{C} = 6 \text{ V, } T_{A} = 25^{\circ}C$	f = 10 kHz		55		
eN	Output noise voltage	B = 10 Hz to 100	kHz, T _A = 25°C		50		μV
.,		I _O = 250 mA, T _A =	: 25°C		0.4	0.6	V
V_d	Dropout voltage	I _O = 250 mA				0.82	V
V _{IL}	Control input logic low					0.82	V
V _{IH}	Control Input Logic High			2			V
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$, T _A = 25°C		10		μA
Co	Output bypass capacitance		$I_0 = 0 \text{ to } 250 \text{ mA},$	2	10		μF

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Table 16. Electrical characteristics of L4931Cxx35 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μ F, C_O = 2.2 μ F unless otherwise specified).

Symbol	Parameter	Test c	onditions	Min.	Тур.	Max.	Unit
\/	Output valtage	$I_{O} = 5 \text{ mA}, V_{I} = 5.5$	V	3.43	3.5	Max. 3.57 3.64 20 18 18 1 6 100 0.6 0.8 0.8	V
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 5.5$	V, T _A =-25 to 85°C	3.36		3.57 3.64 20 18 18 1 6 100	V
VI	Operating input voltage	I _O = 250 mA				20	V
l _{out}	Output current limit				300		mA
ΔV _O	Line regulation	$V_{I} = 4.3 \text{ to } 20 \text{ V}, I_{O}$	= 0.5 mA		3	18	mV
ΔV _O	Load regulation (1)	$V_1 = 4.5 \text{ V}, I_O = 0.5$	to 250 mA		3	18	mV
	Quiescent current	$V_{I} = 4.5 \text{ to } 20 \text{ V}, I_{O}$	= 0 mA		0.6	1	
I _d	ON MODE	$V_1 = 4.5 \text{ to } 20 \text{ V}, I_0$	= 250 mA		4	3.57 3.64 20 18 18 1 6 100	mA
	OFF MODE	V _I = 6 V			50	100	μΑ
			f = 120 Hz		73		
SVR	Supply voltage rejection	$I_O = 5 \text{ mA}$ $V_I = 5.5 \pm 1 \text{ V}$	f = 1 kHz		70		dB
		V - 3.3 ± 1 V	f = 10 kHz		55	3.64 20 18 18 1 6 100 0.6 0.8	
eN	Output noise voltage	B = 10 Hz to 100 k	Hz		50		μV
	D (1)	I _O = 250 mA			0.4	18 1 6 100 0.6 0.8	V
V_d	Dropout voltage (1)	$I_O = 250 \text{ mA}, T_A = -$	40 to 125°C			0.8	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		μΑ
C _O	Output bypass capacitance	ESR = 0.1 to 10 Ω	I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 17. Electrical characteristics of L4931ABxx50 (refer to the test circuits, $T_A = 25$ °C, $C_I = 0.1~\mu\text{F}, C_O = 2.2~\mu\text{F}$ unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit
V	Output voltage	$I_{O} = 5 \text{ mA}, V_{I} = 7$	' V	4.95	5	5.05	V
Vo	Output voltage	$\begin{split} &I_{O} = 5 \text{ mA}, \ V_{I} = 7 \text{ V} \\ &I_{O} = 5 \text{ mA}, \ V_{I} = 7 \text{ V}, \ T_{A} = \\ &I_{O} = 250 \text{ mA} \\ &V_{I} = 5.8 \text{ to } 20 \text{ V}, \ I_{O} = 0.3 \text{ to } 250 \text{ W} \\ &V_{I} = 6 \text{ V}, \ I_{O} = 0.5 \text{ to } 250 \text{ W} \\ &V_{I} = 6 \text{ to } 20 \text{ V}, \ I_{O} = 250 \text{ mA} \\ &V_{I} = 6 \text{ V} \\ &I_{O} = 5 \text{ mA} \\ &V_{I} = 7 \pm 1 \text{ V} \\ &I_{O} = 250 \text{ mA} \\ &I_{O} = 250 \text{ mA} \\ &I_{O} = 250 \text{ mA}, \ T_{A} = -40 \text{ to } 125^{\circ}\text{C} \\ &T_{A} = -40 \text{ to } 125^{\circ}\text{C} \\ &V_{I} = 6 \text{ V}, \ V_{C} = 6 \text{ V} \\ \end{split}$	′ V, T _A =-25 to 85°C	4.9		5.1	V
VI	Operating input voltage	I _O = 250 mA				20	V
l _{out}	Output current limit				300		mA
ΔV_{O}	Line regulation	$V_I = 5.8 \text{ to } 20 \text{ V},$	I _O = 0.5 mA		3.5	17.5	mV
ΔV_{O}	Load regulation (1)	$V_{I} = 6 \text{ V}, I_{O} = 0.5$	to 250 mA		3	15	mV
	Quiescent current	V _I = 6 to 20 V, I _O	= 0 mA		0.6	1	А
Ι _d	ON MODE	$V_{I} = 6 \text{ to } 20 \text{ V}, I_{O} = 0 \text{ mA}$ 0.6 1 $V_{I} = 6 \text{ to } 20 \text{ V}, I_{O} = 250 \text{ mA}$ 4 6 $V_{I} = 6 \text{ V}$ 50 100 $I_{O} = 5 \text{ mA}$ $f = 120 \text{ Hz}$ 70 $I_{O} = 5 \text{ mA}$ 67	6	mA			
	OFF MODE		100	μΑ			
			f = 120 Hz		70		
SVR	Supply voltage rejection		f = 1 kHz		67		dB
		$V_{I} = 6 \text{ V}$ $I_{O} = 5 \text{ mA}$ $V_{I} = 7 \pm 1 \text{ V}$ $f = 1$ $f = 1$ $f = 1$ $f = 1$	f = 10 kHz		55		
eN	Output noise voltage	B = 10 Hz to 100	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	50		μV	
.,	D (1)	I _O = 250 mA			0.4	0.6	V
V_d	Dropout voltage (1)	$I_{O} = 250 \text{ mA}, T_{A} =$	= -40 to 125°C			0.8	٧
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	٧
V _{IH}	Control Input Logic High	$T_A = -40 \text{ to } 125^{\circ}\text{C}$		2			V
l _l	Control input current	$V_1 = 6 \text{ V}, V_C = 6 \text{ V}$	V		10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10	Ω , I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 18. Electrical characteristics of L4931Cxx50 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μ F, C_O = 2.2 μ F unless otherwise specified).

Symbol	Parameter	Test o	conditions	Min.	Тур.	Max.	Unit
V	Output voltage	$I_{O} = 5 \text{ mA}, V_{I} = 7 \text{ V}$	/	4.9	5	Max. 5.1 5.2 20 17.5 15 1 6 100 0.6 0.8 0.8	V
V _O	Output voitage	$I_0 = 5 \text{ mA}, V_1 = 7 \text{ V}$	/, T _A =-25 to 85°C	4.8		5.2	V
VI	Operating input voltage	I _O = 250 mA				20	V
l _{out}	Output current limit				300		mA
ΔV _O	Line regulation	$V_{I} = 5.8 \text{ to } 20 \text{ V}, I_{O}$	= 0.5 mA		3.5	17.5	mV
ΔV _O	Load regulation (1)	$V_1 = 6 \text{ V}, I_0 = 0.5 \text{ to}$	250 mA		3	15	mV
	Quiescent current	$V_{I} = 6 \text{ to } 20 \text{ V}, I_{O} =$	0 mA		0.6	1	4
I_{d}	ON MODE	$V_{I} = 6 \text{ to } 20 \text{ V}, I_{O} =$	250 mA		4	5.1 5.2 20 17.5 15 1 6 100 0.6 0.8	mA
	OFF MODE	V _I = 6 V			50	100	μA
			f = 120 Hz		70	100	
SVR	Supply voltage rejection	$I_O = 5 \text{ mA}$ $V_I = 7 \pm 1 \text{ V}$	f = 1 kHz		67		dB
		V - 7 ± 1 V	f = 10 kHz		55	5.1 5.2 20 17.5 15 1 6 100 0.6 0.8	
eN	Output noise voltage	B = 10 Hz to 100 k	Hz		50		μV
	D (1)	I _O = 250 mA			0.4	0.6	V
V_d	Dropout voltage (1)	$I_{O} = 250 \text{ mA}, T_{A} = -$	-40 to 125°C			0.8	V
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	V
V _{IH}	Control Input Logic High	$T_A = -40 \text{ to } 125^{\circ}\text{C}$		2			V
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$			10		μΑ
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω	I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 19. Electrical characteristics of L4931ABxx80 (refer to the test circuits, $T_A = 25$ °C, $C_I = 0.1$ μF, $C_O = 2.2$ μF unless otherwise specified).

Symbol	Parameter	Test o	conditions	Min.	Тур.	Max.	Unit
V	Output valtage	$I_{O} = 5 \text{ mA}, V_{I} = 10$	V	7.92	8	8.08	V
V _O	Output voltage	$I_{O} = 5 \text{ mA}, V_{I} = 10$	V, T _A =-25 to 85°C	7.84			V
VI	Operating input voltage	I _O = 250 mA				20	V
l _{out}	Output current limit				300		mA
ΔV _O	Line regulation	$V_{I} = 8.8 \text{ to } 20 \text{ V}, I_{O}$	= 0.5 mA		4	20	mV
ΔV _O	Load regulation (1)	V _I = 9 V, I _O = 0.5 to 250 mA			3	15	mV
	Quiescent current	$V_{I} = 9 \text{ to } 20 \text{ V}, I_{O} =$	0 mA		0.8	1.6	A
I_d	ON MODE	$V_{I} = 9 \text{ to } 20 \text{ V}, I_{O} =$	250 mA		4.5	8.08 8.16 20 20 15 1.6 7 140 0.6 0.8	mA
	OFF MODE	V _I = 6 V			70	140	μΑ
			f = 120 Hz		67		
SVR	Supply voltage rejection	$I_O = 5 \text{ mA}$ $V_I = 10 \pm 1 \text{ V}$	f = 1 kHz		64		dB
		V - 10 ± 1 V	f = 10 kHz		55	8.16 20 20 15 1.6 7 140 0.6 0.8	
eN	Output noise voltage	B = 10 Hz to 100 k	Hz		50		μV
	D (1)	I _O = 250 mA			0.4	1.6 7 140 0.6 0.8	V
V_d	Dropout voltage (1)	$I_{O} = 250 \text{ mA}, T_{A} = -$	-40 to 125°C			0.8	V
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	V
V _{IH}	Control Input Logic High	$T_A = -40 \text{ to } 125^{\circ}\text{C}$		2			V
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$			10		μΑ
C _O	Output bypass capacitance	ESR = 0.1 to 10 Ω	I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 20. Electrical characteristics of L4931Cxx80 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μ F, C_O = 2.2 μ F unless otherwise specified).

Symbol	Parameter	Test c	onditions	Min.	Тур.	Max.	Unit
\/	Output valtage	$I_{O} = 5 \text{ mA}, V_{I} = 10$	V	7.84	8	Max. 8.16 8.32 20 24 18 1.6 7 140 0.6 0.8 0.8	V
V _O	Output voltage	$I_{O} = 5 \text{ mA}, V_{I} = 10$	V, T _A =-25 to 85°C	7.68		8.32	V
VI	Operating input voltage	I _O = 250 mA				20	V
l _{out}	Output current limit				300		mA
ΔV _O	Line regulation	$V_{I} = 8.9 \text{ to } 20 \text{ V}, I_{O}$	= 0.5 mA		4	24	mV
ΔV _O	Load regulation (1)	V _I = 9.1 V, I _O = 0.5	to 250 mA		3	18	mV
	Quiescent current	V _I = 9.1 to 20 V, I _O	= 0 mA		0.8	1.6	4
I_d	ON MODE	$V_{I} = 9.1 \text{ to } 20 \text{ V}, I_{O}$	= 250 mA		4.5	8.16 8.32 20 24 18 1.6 7 140	mA
	OFF MODE	V _I = 6 V			70	140	μΑ
			f = 120 Hz		67	110	
SVR	Supply voltage rejection	$I_O = 5 \text{ mA}$ $V_I = 10.1 \pm 1 \text{ V}$	f = 1 kHz		64		dB
		V = 10.1 ± 1 V	f = 10 kHz		55	8.16 8.32 20 24 18 1.6 7 140	
eN	Output noise voltage	B = 10 Hz to 100 kl	Hz		50		μV
	D (1)	I _O = 250 mA			0.4	20 24 18 1.6 7 140 0.6 0.8	V
V_d	Dropout voltage (1)	$I_O = 250 \text{ mA}, T_A = -6$	40 to 125°C			0.8	V
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	V
V _{IH}	Control Input Logic High	$T_A = -40 \text{ to } 125^{\circ}\text{C}$		2			V
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$			10		μΑ
C _O	Output bypass capacitance	ESR = 0.1 to 10 Ω	I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 21. Electrical characteristics of L4931ABxx120 (refer to the test circuits, $T_A = 25$ °C, $C_I = 0.1$ μF, $C_O = 2.2$ μF unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit
V	Output valtage	I _O = 5 mA, V _I = 14	1 V	11.88	12	12.12	V
V _O	Output voltage	$\begin{aligned} &V_{I} = 13 \text{ to } 20 \text{ V, } I_{O} = 0 \text{ m/s} \\ &V_{I} = 13 \text{ to } 20 \text{ V, } I_{O} = 250 \end{aligned}$ $\begin{aligned} &V_{I} = 6 \text{ V} \end{aligned}$ $\begin{aligned} &I_{O} = 5 \text{ mA} \\ &V_{I} = 14 \pm 1 \text{ V} \end{aligned}$ $\begin{aligned} &B = 10 \text{ Hz to } 100 \text{ kHz} \end{aligned}$ $\begin{aligned} &I_{O} = 250 \text{ mA} \end{aligned}$	1 V, T _A =-25 to 85°C	11.76		12.24	V
VI	Operating input voltage	I _O = 250 mA				20	V
I _{out}	Output current limit				300		mA
ΔV_{O}	Line regulation	V _I = 12.8 to 20 V,	I _O = 0.5 mA		4	20	mV
ΔV _O	Load regulation (1)	V _I = 13 V, I _O = 0.5	to 250 mA		3	15	mV
	Quiescent current	$V_{I} = 13 \text{ to } 20 \text{ V}, I_{C}$	o = 0 mA		0.8	1.6	A
l _d	ON MODE	$V_{I} = 13 \text{ to } 20 \text{ V}, I_{C}$	= 250 mA		4.5	7	mA
	OFF MODE	V _I = 6 V	$V_{I} = 13 \text{ V}, I_{O} = 0.5 \text{ to } 250 \text{ mA}$ $V_{I} = 13 \text{ to } 20 \text{ V}, I_{O} = 0 \text{ mA}$ $V_{I} = 13 \text{ to } 20 \text{ V}, I_{O} = 250 \text{ mA}$ $V_{I} = 6 \text{ V}$ $V_{I} = 6 \text{ V}$ $V_{I} = 6 \text{ V}$ $V_{I} = 14 \pm 1 \text{ V}$ $V_{I} = 14 \pm 1 \text{ V}$ $V_{I} = 10 \text{ kHz}$		90	180	μA
			f = 120 Hz		64		
SVR	Supply voltage rejection		f = 1 kHz		61		dB
		$\begin{split} I_O &= 5 \text{ mA}, \ V_I = 14 \text{ V}, \ T_A \\ I_O &= 250 \text{ mA} \\ \end{split}$ $V_I &= 12.8 \text{ to } 20 \text{ V}, \ I_O = 0 \\ V_I &= 13 \text{ V}, \ I_O = 0.5 \text{ to } 25 \\ \end{split}$ $V_I &= 13 \text{ to } 20 \text{ V}, \ I_O = 0 \text{ m} \\ \end{split}$ $V_I &= 13 \text{ to } 20 \text{ V}, \ I_O = 250 \\ \end{split}$ $V_I &= 6 \text{ V} \\ \end{split}$ $I_O &= 5 \text{ mA} \\ V_I &= 14 \pm 1 \text{ V} \\ \end{split}$ $I_O &= 250 \text{ mA} \\ I_O &= 250 \text{ mA} \\ \end{split}$ $I_O &= 250 \text{ mA} \\ \end{split}$ $I_O &= 250 \text{ mA}, \ T_A = -40 \text{ to } 125^\circ \text{C} \\ \end{split}$ $T_A &= -40 \text{ to } 125^\circ \text{C} \\ \end{split}$	f = 10 kHz		55		
eN	Output noise voltage	B = 10 Hz to 100	kHz		50	12.12 12.24 20 20 15 1.6	μV
.,	D (1)	I _O = 250 mA			0.4	0.6	V
V_d	Dropout voltage (1)	$I_O = 250 \text{ mA}, T_A =$	-40 to 125°C			0.8	V
V _{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	٧
V _{IH}	Control Input Logic High	T _A = -40 to 125°C		2			V
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 \$	2, I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

Table 22. Electrical characteristics of L4931Cxx120 (refer to the test circuits, T_A = 25 °C, C_I = 0.1 μ F, C_O = 2.2 μ F unless otherwise specified).

Symbol	Parameter	Test	conditions	Min.	Тур.	Max.	Unit
\/	Output valtage	$I_O = 5 \text{ mA}, V_I = 14$	V	11.76	12	12.24	V
V _O	Output voltage	$I_O = 5 \text{ mA}, V_I = 14$	= 5 mA, V _I = 14 V	11.52		12.48	V
VI	Operating input voltage	I _O = 250 mA				20	V
I _{out}	Output current limit				300		mA
ΔV_{O}	Line regulation	V _I = 12.9 to 20 V, I	_O = 0.5 mA		4	24	mV
ΔV _O	Load regulation (1)	V _I = 13.1 V, I _O = 0	5 to 250 mA		3	18	mV
	Quiescent current	V _I = 13.1 to 20 V, I	O = 0 mA		0.8	1.6	А
I_d	ON MODE	V _I = 13.1 to 20 V, I	_O = 250 mA		4.5	7	mA
	OFF MODE	V _I = 6 V			90	180	μA
			f = 120 Hz		64		
SVR	Supply voltage rejection		f = 1 kHz		61		dB
		$I_O = 250 \text{ mA}$ $V_I = 12.9 \text{ to } 20 \text{ V}, I_O = 0$ $V_I = 13.1 \text{ V}, I_O = 0.5 \text{ to } 0$ $V_I = 13.1 \text{ to } 20 \text{ V}, I_O = 0$ $V_I = 13.1 \text{ to } 20 \text{ V}, I_O = 0$ $V_I = 6 \text{ V}$ $I_O = 5 \text{ mA}$ $V_I = 14.1 \pm 1 \text{ V}$ $I_O = 250 \text{ mA}$ $I_O = 250 \text{ mA}$	f = 10 kHz		55		
eN	Output noise voltage	B = 10 Hz to 100 k	Hz		50		μV
	D (1)	I _O = 250 mA			0.4	0.6	V
V_d	Dropout voltage (1)	$I_{O} = 250 \text{ mA}, T_{A} = -$	-40 to 125°C			0.8	V
V_{IL}	Control input logic low	$T_A = -40 \text{ to } 125^{\circ}\text{C}$				0.8	V
V _{IH}	Control Input Logic High	T _A = -40 to 125°C		2			V
I _I	Control input current	$V_{I} = 6 \text{ V}, V_{C} = 6 \text{ V}$			10		μA
Co	Output bypass capacitance	ESR = 0.1 to 10 Ω	I _O = 0 to 250 mA	2	10		μF

^{1.} For SO-8 package the maximum limit of load regulation and dropout is increased by 20 mV.

6 Typical application

Figure 4. Line regulation vs temperature

Figure 5. Dropout voltage vs temperature

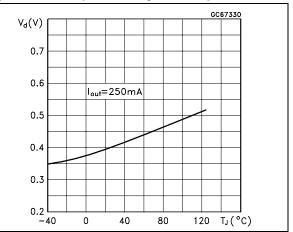


Figure 6. Supply current vs input voltage

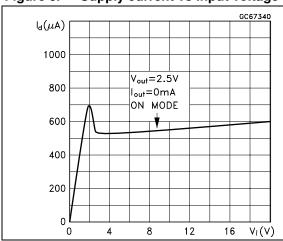


Figure 7. Supply current vs temperature

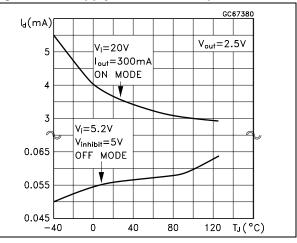
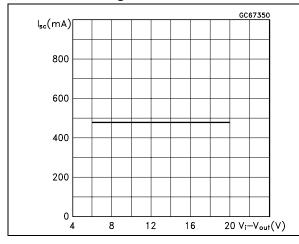
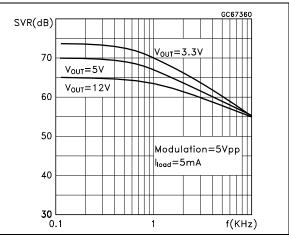


Figure 8. Short circuit current vs dropout voltage

Figure 9. S.V.R. vs Input voltage signal frequency





28/40

7 Package mechanical data

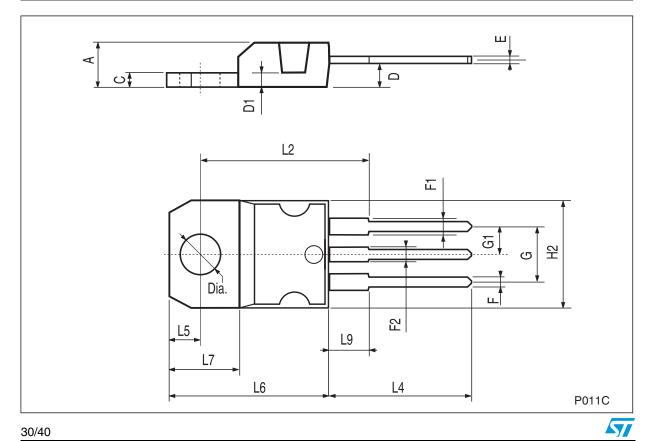
In order to meet environmental requirements, ST offers these devices in ECOPACK[®] packages. These packages have a lead-free second level interconnect. The category of second Level Interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

<u>577</u>

29/40

TO-220 mechanical data

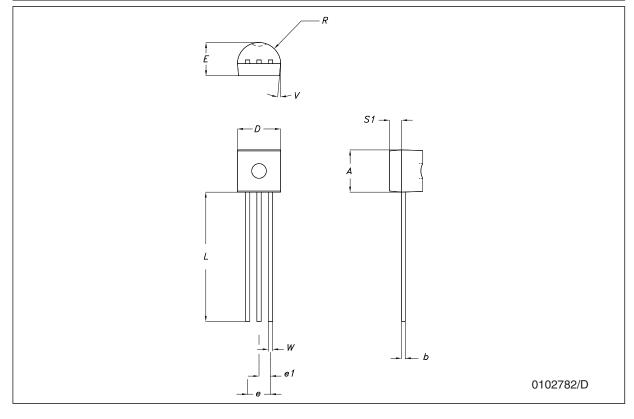
Dim		mm.		inch.			
Dim.	Min.	Тур.	Max.	Min.	Тур.	Max.	
А	4.40		4.60	0.173		0.181	
С	1.23		1.32	0.048		0.051	
D	2.40		2.72	0.094		0.107	
D1		1.27			0.050		
E	0.49		0.70	0.019		0.027	
F	0.61		0.88	0.024		0.034	
F1	1.14		1.70	0.044		0.067	
F2	1.14		1.70	0.044		0.067	
G	4.95		5.15	0.194		0.203	
G1	2.4		2.7	0.094		0.106	
H2	10.0		10.40	0.393		0.409	
L2		16.4			0.645		
L4	13.0		14.0	0.511		0.551	
L5	2.65		2.95	0.104		0.116	
L6	15.25		15.75	0.600		0.620	
L7	6.2		6.6	0.244		0.260	
L9	3.5		3.93	0.137		0.154	
DIA.	3.75		3.85	0.147		0.151	



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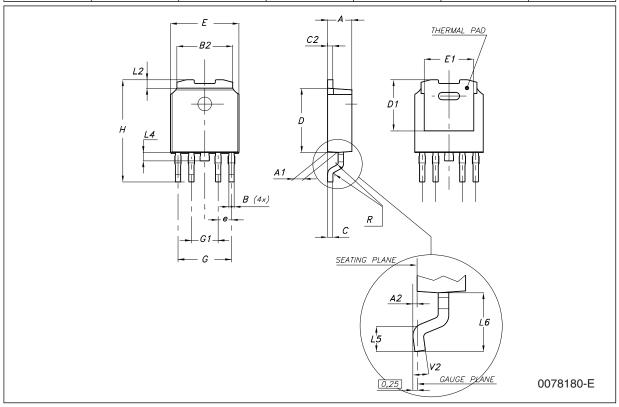
TO-92 mechanical data

Dim.		mm.				
Dilli.	Min.	Тур.	Max.	Min.	Тур.	Max.
А	4.32		4.95	170.1		194.9
b	0.36		0.51	14.2		20.1
D	4.45		4.95	175.2		194.9
E	3.30		3.94	129.9		155.1
е	2.41		2.67	94.9		105.1
e1	1.14		1.40	44.9		55.1
L	12.7		15.49	500.0		609.8
R	2.16		2.41	85.0		94.9
S1	0.92		1.52	36.2		59.8
W	0.41		0.56	16.1		22.0
α		5°			5°	



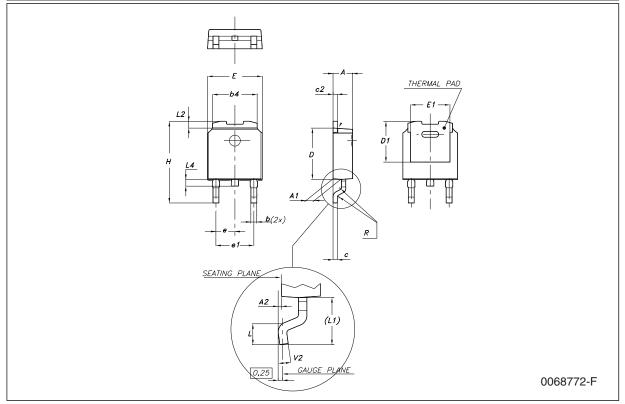
PPAK mechanical data

Dim		mm.		inch.		
Dim.	Min.	Тур.	Max.	Min.	Тур.	Max.
Α	2.2		2.4	0.086		0.094
A1	0.9		1.1	0.035		0.043
A2	0.03		0.23	0.001		0.009
В	0.4		0.6	0.015		0.023
B2	5.2		5.4	0.204		0.212
С	0.45		0.6	0.017		0.023
C2	0.48		0.6	0.019		0.023
D	6		6.2	0.236		0.244
D1		5.1			0.201	
E	6.4		6.6	0.252		0.260
E1		4.7			0.185	
е		1.27			0.050	
G	4.9		5.25	0.193		0.206
G1	2.38		2.7	0.093		0.106
Н	9.35		10.1	0.368		0.397
L2		0.8	1		0.031	0.039
L4	0.6		1	0.023		0.039
L5	1			0.039		
L6		2.8			0.110	



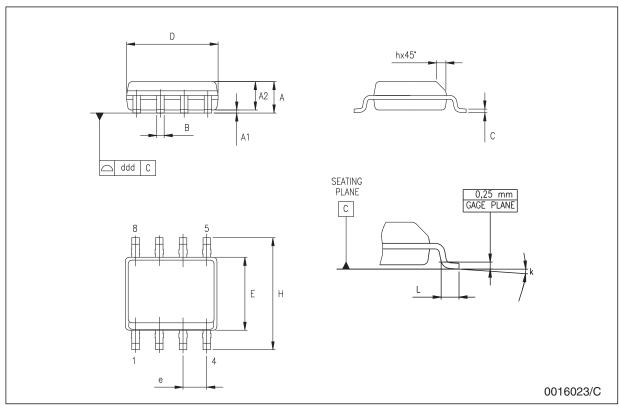
DPAK mechanical data

Dim		mm.		inch.			
Dim.	Min.	Тур.	Max.	Min.	Тур.	Max.	
Α	2.2		2.4	0.086		0.094	
A1	0.9		1.1	0.035		0.043	
A2	0.03		0.23	0.001		0.009	
В	0.64		0.9	0.025		0.035	
b4	5.2		5.4	0.204		0.212	
С	0.45		0.6	0.017		0.023	
C2	0.48		0.6	0.019		0.023	
D	6		6.2	0.236		0.244	
D1		5.1			0.200		
E	6.4		6.6	0.252		0.260	
E1		4.7			0.185		
е		2.28			0.090		
e1	4.4		4.6	0.173		0.181	
Н	9.35		10.1	0.368		0.397	
L	1			0.039			
(L1)		2.8			0.110		
L2		0.8			0.031		
L4	0.6		1	0.023		0.039	
R		0.2			0.008		
V2	0°		8°	0°		8°	



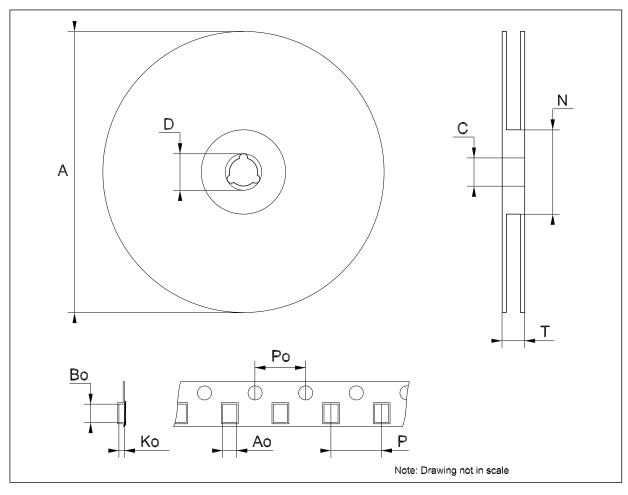
SO-8 mechanical data

Dim.		mm.			inch.	
Dilli.	Min.	Тур.	Max.	Min.	Тур.	Max.
А	1.35		1.75	0.053		0.069
A1	0.10		0.25	0.04		0.010
A2	1.10		1.65	0.043		0.065
В	0.33		0.51	0.013		0.020
С	0.19		0.25	0.007		0.010
D	4.80		5.00	0.189		0.197
E	3.80		4.00	0.150		0.157
е		1.27			0.050	
Н	5.80		6.20	0.228		0.244
h	0.25		0.50	0.010		0.020
L	0.40		1.27	0.016		0.050
k			8° (n	nax.)		
ddd			0.1			0.04



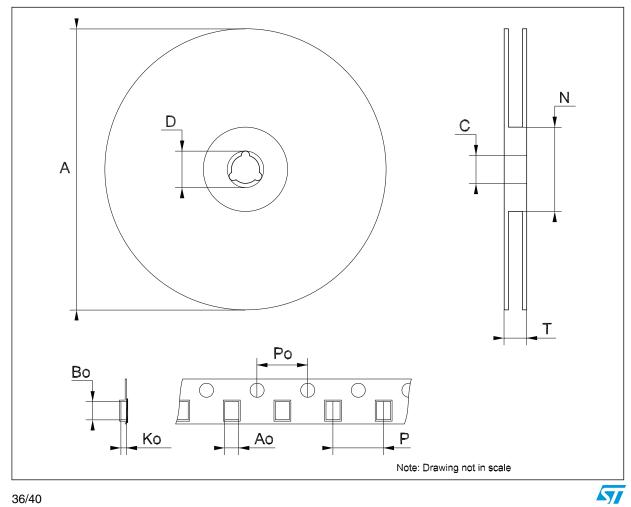
Tape & ree	I DPAK-PPAK	mechanical	data
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Dim.		mm.		inch.		
Dilli.	Min.	Тур.	Max.	Min.	Тур.	Max.
А			330			12.992
С	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
Т			22.4			0.882
Ao	6.80	6.90	7.00	0.268	0.272	0.2.76
Во	10.40	10.50	10.60	0.409	0.413	0.417
Ko	2.55	2.65	2.75	0.100	0.104	0.105
Po	3.9	4.0	4.1	0.153	0.157	0.161
Р	7.9	8.0	8.1	0.311	0.315	0.319



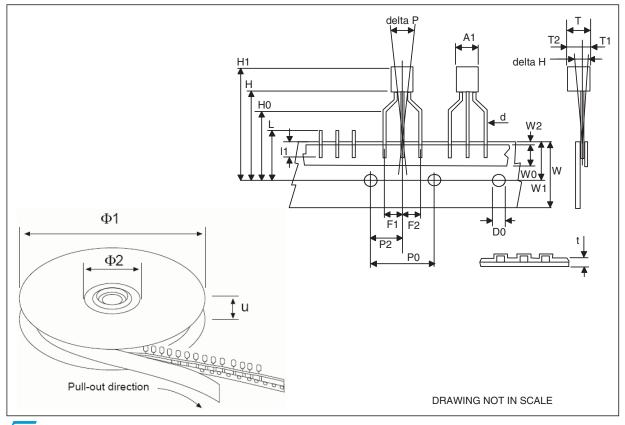
Tape	&	reel	SO-8	mechanical	data
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Dim.		mm.		inch.		
Dilli.	Min.	Тур.	Max.	Min.	Тур.	Max.
А			330			12.992
С	12.8		13.2	0.504		0.519
D	20.2			0.795		
N	60			2.362		
Т			22.4			0.882
Ao	8.1		8.5	0.319		0.335
Во	5.5		5.9	0.216		0.232
Ko	2.1		2.3	0.082		0.090
Ро	3.9		4.1	0.153		0.161
Р	7.9		8.1	0.311		0.319



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Dim.		mm.			inch.		
Diiii.	Min.	Тур.	Max.	Min.	Тур.	Max.	
A1		4.80			0.189		
Т		3.80			0.150		
T1		1.60			0.063		
T2		2.30			0.091		
d		0.48			0.019		
P0	12.5		12.9	0.492		0.508	
P2	5.65		7.05	0.222		0.278	
F1, F2	2.44	2.54	2.94	0.096	0.100	0.116	
delta H		±2			0.079		
W	17.5	18.00	19.0	0.689	0.709	0.748	
W0	5.7		6.3	0.224		0.248	
W1	8.5		9.25	0.335		0.364	
W2		0.50			0.20		
Н		18.50	18.70		0.728	0.726	
H0	15.50		16.50	0.610		0.650	
H1		25.00			0.984		
D0	3.8		4.2	0.150		0.165	
t		0.90			0.035		
L1		3			0.118		
delta P		±1			0.039		
u		50			1.968		
Ф1		360			14.173		
Ф2		30			1.181		



Order codes L4931ABxx - L4931Cxx

8 Order codes

Table 23. Order codes

	Packages							
TO-220	SO-8	PPAK	DPAK	TO-92	voltage			
	L4931CD15-TR				1.5 V			
		L4931CPT25-TR	L4931CDT25-TR		2.5 V			
		L4931ABPT25TR			2.5 V			
	L4931CD27-TR	L4931CPT27-TR			2.7 V			
	L4931CD27-TRY ⁽¹⁾	L4931ABPT27TR			2.7 V			
	L4931CD33-TR	L4931CPT33-TR	L4931CDT33-TR	L4931CZ33-AP	3.3 V			
L4931ABV33	L4931ABD33-TR		L4931ABDT33-TR		3.3 V			
	L4931CD33-TRY ⁽¹⁾				3.3 V			
	L4931CD35-TR		L4931CDT35-TR	L4931CZ35-AP	3.5 V			
	L4931ABD35-TR		L4931ABDT35-TR	L4931ABZ35-AP	3.5 V			
	L4931ABD35-TRY ⁽¹⁾				3.5 V			
	L4931CD50-TR	L4931CPT50-TR	L4931CDT50-TR	L4931CZ50-AP	5 V			
			L4931ABDT50-TR		5 V			
	L4931CD80-TR	L4931CPT80-TR	L4931CDT80-TR		8 V			
		L4931ABPT80TR	L4931ABDT80-TR		8 V			
	L4931CD120-TR	L4931CPT120-TR	L4931CDT120-TR		12 V			
	L4931ABD120-TR	L4931ABPT120R			12 V			

^{1.} Automotive Grade products.

L4931ABxx - L4931Cxx Revision history

9 Revision history

Table 24. Document revision history

Date	Revision	Changes
21-Jun-2004	11	Document updating.
14-Jun-2006	12	Order codes updated.
31-Jan-2008	13	Added: Table 1 and new order codes for Automotive grade products.
20-Feb-2008	14	Modified: Table 23 on page 38.

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