

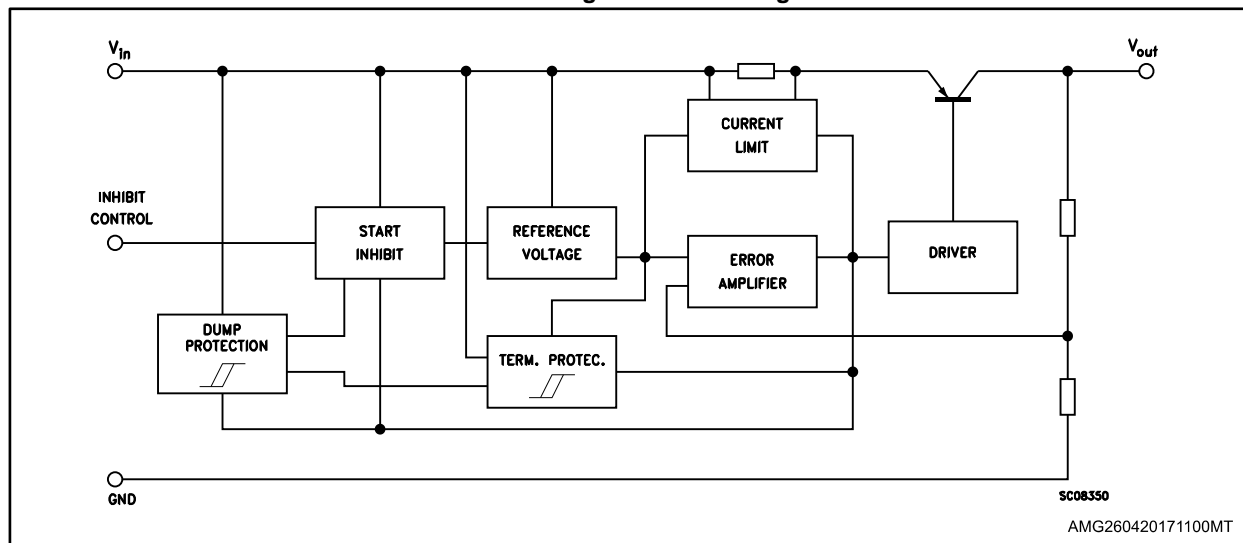
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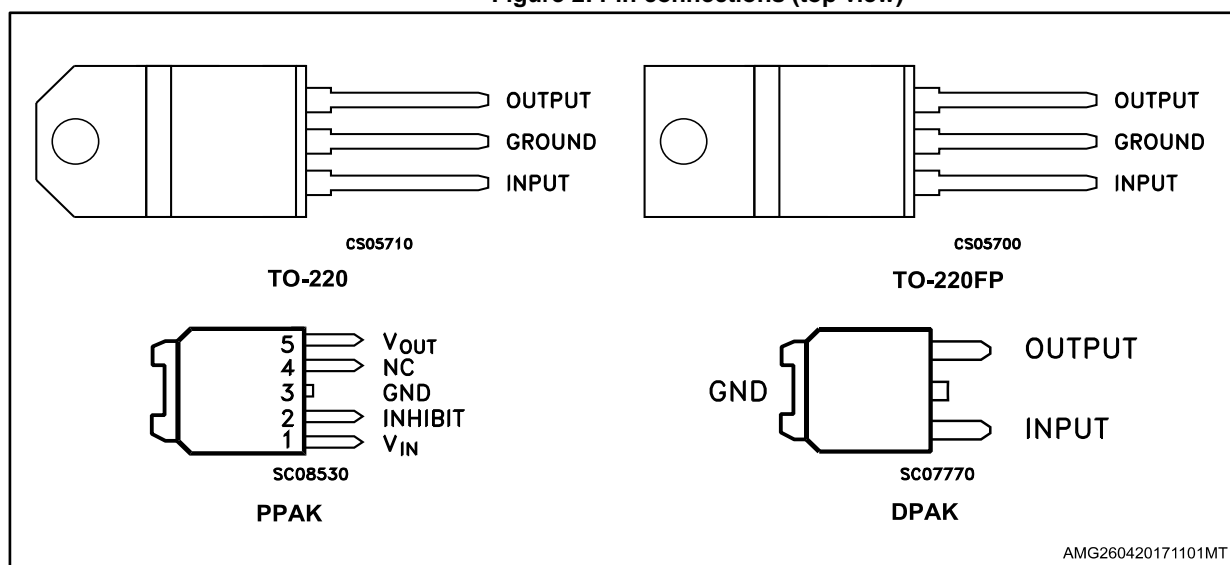
# 1 Diagram

Figure 1: Block diagram



## 2 Pin configuration

Figure 2: Pin connections (top view)



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

### 3 Maximum ratings

Table 1: Absolute maximum ratings

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

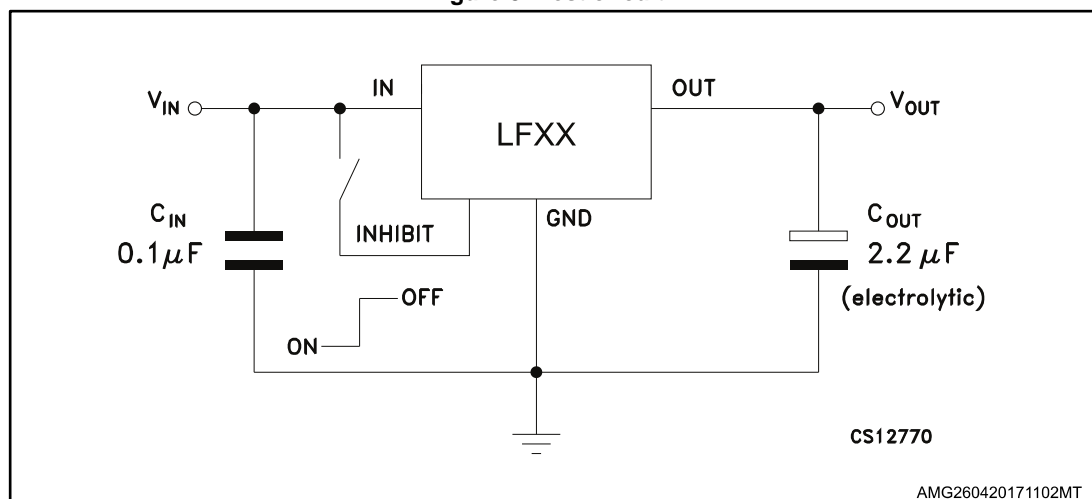
**Notes:**

<sup>(1)</sup>For  $18 < V_I < 40$  the regulator is in shutdown.

Table 2: Thermal data

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

Figure 3: Test circuit



## 4 Electrical characteristics

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

Table 3: LF15AB electrical characteristics

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

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

Table 4: LF18AB electrical characteristics

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

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

Table 5: LF18C electrical characteristics

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

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

Table 6: LF18C (automotive grade) electrical characteristics

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

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

Table 7: LF25AB electrical characteristics

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

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

**Table 8: LF25AB (automotive grade) electrical characteristics**

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

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

Table 9: LF25C electrical characteristics

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

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

**Table 10: LF25C (automotive grade) electrical characteristics**

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

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

Table 11: LF33AB electrical characteristics

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

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

Table 12: LF33C electrical characteristics

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

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

Table 13: LF33C (automotive grade) electrical characteristics

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

Refer to test circuits,  $T_a = -40$  to  $125\text{ }^{\circ}\text{C}$ ,  $C_i = 0.1\text{ }\mu\text{F}$ ,  $C_o = 2.2\text{ }\mu\text{F}$  unless otherwise specified.

Table 14: LF50AB electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_o$	Output voltage	$I_o = 50\text{ mA}$ $V_i = 7\text{ V}$		4.95	5	5.05	V
		$I_o = 50\text{ mA}$ $V_i = 7\text{ V}$ $T_a = -25$ to $85\text{ }^{\circ}\text{C}$		4.9		5.1	
$V_i$	Operating input voltage	$I_o = 500\text{ mA}$				16	V
$I_o$	Output current limit				1		A
$\Delta V_o$	Line regulation	$V_i = 6$ to $16\text{ V}$ $I_o = 5\text{ mA}$			5	25	mV
$\Delta V_o$	Load regulation	$V_i = 6.3\text{ V}$ $I_o = 5$ to $500\text{ mA}$			5	25	mV
$I_d$	Quiescent current	$V_i = 6$ to $16\text{ V}$ $I_o = 0\text{ mA}$	ON mode		0.5	1	mA
		$V_i = 6.3$ to $16\text{ V}$ $I_o = 500\text{ mA}$				12	
		$V_i = 6\text{ V}$	OFF mode		50	100	$\mu\text{A}$
SVR	Supply voltage rejection	$I_o = 5\text{ mA}$ $V_i = 7 \pm 1\text{ V}$	$f = 120\text{ Hz}$		76		dB
			$f = 1\text{ kHz}$		71		
			$f = 10\text{ kHz}$		60		
eN	Output noise voltage	$B = 10\text{ Hz}$ to $100\text{ kHz}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_o = 200\text{ mA}$			0.2	0.35	V
		$I_o = 500\text{ mA}$			0.4	0.7	
$V_{iL}$	Control input logic low	$T_a = -40$ to $125\text{ }^{\circ}\text{C}$				0.8	V
$V_{iH}$	Control input logic high	$T_a = -40$ to $125\text{ }^{\circ}\text{C}$		2			V
$I_i$	Control input current	$V_i = 6\text{ V}$ $V_c = 6\text{ V}$			10		$\mu\text{A}$
$C_o$	Output bypass capacitance	ESR = $0.1$ to $10\text{ }\Omega$ $I_o = 0$ to $500\text{ mA}$		2	10		$\mu\text{F}$

Refer to test circuits,  $T_a = -40$  to  $125\text{ }^{\circ}\text{C}$ ,  $C_i = 0.1\text{ }\mu\text{F}$ ,  $C_o = 2.2\text{ }\mu\text{F}$  unless otherwise specified.

Table 15: LF50AB (automotive grade) electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_o$	Output voltage	$I_o = 50\text{ mA}$ $V_i = 7\text{ V}$ $T_a = 25\text{ }^{\circ}\text{C}$		4.95	5	5.05	V
		$I_o = 50\text{ mA}$ $V_i = 7\text{ V}$		4.885		5.115	
$V_i$	Operating input voltage	$I_o = 500\text{ mA}$				16	V
$I_o$	Output current limit	$T_a = 25\text{ }^{\circ}\text{C}$			1		A
$\Delta V_o$	Line regulation	$V_i = 6$ to $16\text{ V}$ $I_o = 5\text{ mA}$			5	28	mV
$\Delta V_o$	Load regulation	$V_i = 6.3\text{ V}$ $I_o = 5$ to $500\text{ mA}$			5	28	mV
$I_d$	Quiescent current	$V_i = 6$ to $16\text{ V}$ $I_o = 0\text{ mA}$	ON mode		0.5	2	mA
		$V_i = 6.3$ to $16\text{ V}$ $I_o = 500\text{ mA}$				12	
		$V_i = 6\text{ V}$	OFF mode		50	120	$\mu\text{A}$
SVR	Supply voltage rejection	$I_o = 5\text{ mA}$ $V_i = 7 \pm 1\text{ V}$ $T_a = 25\text{ }^{\circ}\text{C}$	$f = 120\text{ Hz}$		76		dB
			$f = 1\text{ kHz}$		71		
			$f = 10\text{ kHz}$		60		
eN	Output noise voltage	$B = 10\text{ Hz}$ to $100\text{ kHz}$ $T_a = 25\text{ }^{\circ}\text{C}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_o = 200\text{ mA}$			0.2	1.3	V
		$I_o = 500\text{ mA}$			0.4	1.3	
$V_{IL}$	Control input logic low					0.8	V
$V_{IH}$	Control input logic high			2			V
$I_i$	Control input current	$V_i = 6\text{ V}$ $V_c = 6\text{ V}$ $T_a = 25\text{ }^{\circ}\text{C}$			10		$\mu\text{A}$
$C_o$	Output bypass capacitance	ESR = $0.1$ to $10\text{ }\Omega$ $I_o = 0$ to $500\text{ mA}$		2	10		$\mu\text{F}$

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

Table 16: LF50AC electrical characteristics

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

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

Table 17: LF50C electrical characteristics

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

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

**Table 18: LF50C (automotive grade) electrical characteristics**

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

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

Table 19: LF60AB electrical characteristics

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

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

**Table 20: LF60C electrical characteristics**

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

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

Table 21: LF80AB electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 50\text{ mA}$ $V_I = 10\text{ V}$		7.92	8	8.08	V
		$I_O = 50\text{ mA}$ $V_I = 10\text{ V}$ $T_a = -25\text{ to }85\text{ }^{\circ}\text{C}$		7.84		8.16	
$V_I$	Operating input voltage	$I_O = 500\text{ mA}$				16	V
$I_O$	Output current limit				1		A
$\Delta V_O$	Line regulation	$V_I = 9\text{ to }16\text{ V}$ $I_O = 5\text{ mA}$			8	40	mV
$\Delta V_O$	Load regulation	$V_I = 9.3\text{ V}$ $I_O = 5\text{ to }500\text{ mA}$			8	40	mV
$I_d$	Quiescent current	$V_I = 9\text{ to }16\text{ V}$ $I_O = 0\text{ mA}$	ON mode		0.7	1.5	mA
		$V_I = 9.3\text{ to }16\text{ V}$ $I_O = 500\text{ mA}$				12	
		$V_I = 9\text{ V}$	OFF mode		70	140	$\mu\text{A}$
SVR	Supply voltage rejection	$I_O = 5\text{ mA}$ $V_I = 10 \pm 1\text{ V}$	$f = 120\text{ Hz}$		72		dB
			$f = 1\text{ kHz}$		67		
			$f = 10\text{ kHz}$		57		
eN	Output noise voltage	$B = 10\text{ Hz to }100\text{ kHz}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_O = 200\text{ mA}$			0.2	0.35	V
		$I_O = 500\text{ mA}$			0.4	0.7	
$V_{IL}$	Control input logic low	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$				0.8	V
$V_{IH}$	Control input logic high	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$		2			V
$I_i$	Control input current	$V_I = 9\text{ V}$ $V_C = 6\text{ V}$			10		$\mu\text{A}$
$C_O$	Output bypass capacitance	ESR = 0.1 to 10 $\Omega$ $I_O = 0\text{ to }500\text{ mA}$		2	10		$\mu\text{F}$

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

Table 22: LF80C electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 50\text{ mA}$ $V_I = 10\text{ V}$		7.84	8	8.16	V
		$I_O = 50\text{ mA}$ $V_I = 10\text{ V}$ $T_a = -25\text{ to }85\text{ }^{\circ}\text{C}$		7.68		8.32	
$V_I$	Operating input voltage	$I_O = 500\text{ mA}$				16	V
$I_O$	Output current limit				1		A
$\Delta V_O$	Line regulation	$V_I = 9\text{ to }16\text{ V}$ $I_O = 5\text{ mA}$			8	40	mV
$\Delta V_O$	Load regulation	$V_I = 9.3\text{ V}$ $I_O = 5\text{ to }500\text{ mA}$			8	40	mV
$I_d$	Quiescent current	$V_I = 9\text{ to }16\text{ V}$ $I_O = 0\text{ mA}$	ON mode		0.7	1.5	mA
		$V_I = 9.3\text{ to }16\text{ V}$ $I_O = 500\text{ mA}$				12	
		$V_I = 9\text{ V}$	OFF mode		70	140	$\mu\text{A}$
SVR	Supply voltage rejection	$I_O = 5\text{ mA}$ $V_I = 10 \pm 1\text{ V}$	$f = 120\text{ Hz}$		72		dB
			$f = 1\text{ kHz}$		67		
			$f = 10\text{ kHz}$		57		
eN	Output noise voltage	$B = 10\text{ Hz to }100\text{ kHz}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_O = 200\text{ mA}$			0.2	0.35	V
		$I_O = 500\text{ mA}$			0.4	0.7	
$V_{IL}$	Control input logic low	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$				0.8	V
$V_{IH}$	Control input logic high	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$		2			V
$I_i$	Control input current	$V_I = 9\text{ V}$ $V_C = 6\text{ V}$			10		$\mu\text{A}$
$C_O$	Output bypass capacitance	ESR = 0.1 to 10 $\Omega$ $I_O = 0\text{ to }500\text{ mA}$		2	10		$\mu\text{F}$

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

Table 23: LF80C (automotive grade) electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 50\text{ mA}$ $V_I = 10\text{ V}$ $T_a = 25\text{ }^{\circ}\text{C}$		7.84	8	8.16	V
		$I_O = 50\text{ mA}$ $V_I = 10\text{ V}$		7.665		8.335	
$V_I$	Operating input voltage	$I_O = 500\text{ mA}$				16	V
$I_O$	Output current limit	$T_a = 25\text{ }^{\circ}\text{C}$			1		A
$\Delta V_O$	Line regulation	$V_I = 9$ to $16\text{ V}$ $I_O = 5\text{ mA}$			8	44	mV
$\Delta V_O$	Load regulation	$V_I = 9.3\text{ V}$ $I_O = 5$ to $500\text{ mA}$			8	44	mV
$I_d$	Quiescent current	$V_I = 9$ to $16\text{ V}$ $I_O = 0\text{ mA}$	ON mode		0.7	2.5	mA
		$V_I = 9.3$ to $16\text{ V}$ $I_O = 500\text{ mA}$				12	
		$V_I = 9\text{ V}$	OFF mode		70	160	$\mu\text{A}$
SVR	Supply voltage rejection	$I_O = 5\text{ mA}$ $V_I = 10 \pm 1\text{ V}$ $T_a = 25\text{ }^{\circ}\text{C}$	$f = 120\text{ Hz}$		72		dB
			$f = 1\text{ kHz}$		67		
			$f = 10\text{ kHz}$		57		
eN	Output noise voltage	$B = 10\text{ Hz}$ to $100\text{ kHz}$ $T_a = 25\text{ }^{\circ}\text{C}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_O = 200\text{ mA}$			0.2	1.3	V
		$I_O = 500\text{ mA}$			0.4	1.3	
$V_{IL}$	Control input logic low					0.8	V
$V_{IH}$	Control input logic high			2			V
$I_I$	Control input current	$V_I = 9\text{ V}$ $V_C = 6\text{ V}$ $T_a = 25\text{ }^{\circ}\text{C}$			10		$\mu\text{A}$
$C_O$	Output bypass capacitance	ESR = $0.1$ to $10\text{ }\Omega$ $I_O = 0$ to $500\text{ mA}$		2	10		$\mu\text{F}$

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

Table 24: LF85AB electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 50\text{ mA}$ $V_I = 10.5\text{ V}$		8.415	8.5	8.585	V
		$I_O = 50\text{ mA}$ $V_I = 10.5\text{ V}$ $T_a = -25\text{ to }85\text{ }^{\circ}\text{C}$		8.33		8.67	
$V_I$	Operating input voltage	$I_O = 500\text{ mA}$				16	V
$I_O$	Output current limit				1		A
$\Delta V_O$	Line regulation	$V_I = 9.5\text{ to }16\text{ V}$ $I_O = 5\text{ mA}$			8	42	mV
$\Delta V_O$	Load regulation	$V_I = 9.8\text{ V}$ $I_O = 5\text{ to }500\text{ mA}$			8	42	mV
$I_d$	Quiescent current	$V_I = 9.5\text{ to }16\text{ V}$ $I_O = 0\text{ mA}$	ON mode		0.7	1.5	mA
		$V_I = 9.8\text{ to }16\text{ V}$ $I_O = 500\text{ mA}$				12	
		$V_I = 9\text{ V}$	OFF mode		70	140	$\mu\text{A}$
SVR	Supply voltage rejection	$I_O = 5\text{ mA}$ $V_I = 10.5 \pm 1\text{ V}$	$f = 120\text{ Hz}$		72		dB
			$f = 1\text{ kHz}$		67		
			$f = 10\text{ kHz}$		57		
eN	Output noise voltage	$B = 10\text{ Hz to }100\text{ kHz}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_O = 200\text{ mA}$			0.2	0.35	V
		$I_O = 500\text{ mA}$			0.4	0.7	
$V_{IL}$	Control input logic low	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$				0.8	V
$V_{IH}$	Control input logic high	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$		2			V
$I_i$	Control input current	$V_I = 9\text{ V}$ $V_C = 6\text{ V}$			10		$\mu\text{A}$
$C_O$	Output bypass capacitance	ESR = 0.1 to 10 $\Omega$ $I_O = 0\text{ to }500\text{ mA}$		2	10		$\mu\text{F}$

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

Table 25: LF85C electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 50\text{ mA}$ $V_I = 10.5\text{ V}$		8.33	8.5	8.67	V
		$I_O = 50\text{ mA}$ $V_I = 10.5\text{ V}$ $T_a = -25\text{ to }85\text{ }^{\circ}\text{C}$		8.16		8.84	
$V_I$	Operating input voltage	$I_O = 500\text{ mA}$				16	V
$I_O$	Output current limit				1		A
$\Delta V_O$	Line regulation	$V_I = 9.5\text{ to }16\text{ V}$ $I_O = 5\text{ mA}$			8	42	mV
$\Delta V_O$	Load regulation	$V_I = 9.8\text{ V}$ $I_O = 5\text{ to }500\text{ mA}$			8	42	mV
$I_d$	Quiescent current	$V_I = 9.5\text{ to }16\text{ V}$ $I_O = 0\text{ mA}$	ON mode		0.7	1.5	mA
		$V_I = 9.8\text{ to }16\text{ V}$ $I_O = 500\text{ mA}$				12	
		$V_I = 9\text{ V}$	OFF mode		70	140	$\mu\text{A}$
SVR	Supply voltage rejection	$I_O = 5\text{ mA}$ $V_I = 10.5 \pm 1\text{ V}$	$f = 120\text{ Hz}$		72		dB
			$f = 1\text{ kHz}$		67		
			$f = 10\text{ kHz}$		57		
eN	Output noise voltage	$B = 10\text{ Hz to }100\text{ kHz}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_O = 200\text{ mA}$			0.2	0.35	V
		$I_O = 500\text{ mA}$			0.4	0.7	
$V_{IL}$	Control input logic low	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$				0.8	V
$V_{IH}$	Control input logic high	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$		2			V
$I_i$	Control input current	$V_I = 9\text{ V}$ $V_C = 6\text{ V}$			10		$\mu\text{A}$
$C_O$	Output bypass capacitance	ESR = 0.1 to 10 $\Omega$ $I_O = 0\text{ to }500\text{ mA}$		2	10		$\mu\text{F}$

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

Table 26: LF85C (automotive grade) electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 50\text{ mA}$ $V_I = 10.5\text{ V}$ $T_a = 25\text{ }^{\circ}\text{C}$		8.33	8.5	8.67	V
		$I_O = 50\text{ mA}$ $V_I = 10.5\text{ V}$		8.145		8.855	
$V_I$	Operating input voltage	$I_O = 500\text{ mA}$				16	V
$I_O$	Output current limit	$T_a = 25\text{ }^{\circ}\text{C}$			1		A
$\Delta V_O$	Line regulation	$V_I = 9.5$ to $16\text{ V}$ $I_O = 5\text{ mA}$			8	44	mV
$\Delta V_O$	Load regulation	$V_I = 9.8\text{ V}$ $I_O = 5$ to $500\text{ mA}$			8	44	mV
$I_d$	Quiescent current	$V_I = 9.5$ to $16\text{ V}$ $I_O = 0\text{ mA}$	ON mode		0.7	2.5	mA
		$V_I = 9.8$ to $16\text{ V}$ $I_O = 500\text{ mA}$				12	
		$V_I = 9\text{ V}$	OFF mode		70	160	$\mu\text{A}$
SVR	Supply voltage rejection	$I_O = 5\text{ mA}$ $V_I = 10.5 \pm 1\text{ V}$ $T_a = 25\text{ }^{\circ}\text{C}$	$f = 120\text{ Hz}$		72		dB
			$f = 1\text{ kHz}$		67		
			$f = 10\text{ kHz}$		57		
eN	Output noise voltage	$B = 10\text{ Hz}$ to $100\text{ kHz}$ $T_a = 25\text{ }^{\circ}\text{C}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_O = 200\text{ mA}$			0.2	1.3	V
		$I_O = 500\text{ mA}$			0.4	1.3	
$V_{IL}$	Control input logic low					0.8	V
$V_{IH}$	Control input logic high			2			V
$I_I$	Control input current	$V_I = 9\text{ V}$ $V_C = 6\text{ V}$ $T_a = 25\text{ }^{\circ}\text{C}$			10		$\mu\text{A}$
$C_O$	Output bypass capacitance	ESR = $0.1$ to $10\text{ }\Omega$ $I_O = 0$ to $500\text{ mA}$		2	10		$\mu\text{F}$

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

Table 27: LF90C electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 50\text{ mA}$ $V_I = 11\text{ V}$		8.82	9	9.18	V
		$I_O = 50\text{ mA}$ $V_I = 11\text{ V}$ $T_a = -25\text{ to }85\text{ }^{\circ}\text{C}$		8.64		9.36	
$V_I$	Operating input voltage	$I_O = 500\text{ mA}$				16	V
$I_O$	Output current limit				1		A
$\Delta V_O$	Line regulation	$V_I = 10\text{ to }16\text{ V}$ $I_O = 5\text{ mA}$			9	45	mV
$\Delta V_O$	Load regulation	$V_I = 10.3\text{ V}$ $I_O = 5\text{ to }500\text{ mA}$			9	45	mV
$I_d$	Quiescent current	$V_I = 10\text{ to }16\text{ V}$ $I_O = 0\text{ mA}$	ON mode		0.7	1.5	mA
		$V_I = 10.3\text{ to }16\text{ V}$ $I_O = 500\text{ mA}$				12	
		$V_I = 10\text{ V}$	OFF mode		70	140	$\mu\text{A}$
SVR	Supply voltage rejection	$I_O = 5\text{ mA}$ $V_I = 11 \pm 1\text{ V}$	$f = 120\text{ Hz}$		71		dB
			$f = 1\text{ kHz}$		66		
			$f = 10\text{ kHz}$		56		
eN	Output noise voltage	$B = 10\text{ Hz to }100\text{ kHz}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_O = 200\text{ mA}$			0.2	0.35	V
		$I_O = 500\text{ mA}$			0.4	0.7	
$V_{IL}$	Control input logic low	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$				0.8	V
$V_{IH}$	Control input logic high	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$		2			V
$I_i$	Control input current	$V_I = 10\text{ V}$ $V_C = 6\text{ V}$			10		$\mu\text{A}$
$C_O$	Output bypass capacitance	ESR = 0.1 to 10 $\Omega$ $I_O = 0\text{ to }500\text{ mA}$		2	10		$\mu\text{F}$

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

Table 28: LF120AB electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 50\text{ mA}$ $V_I = 15\text{ V}$		11.88	12	12.12	V
		$I_O = 50\text{ mA}$ $V_I = 15\text{ V}$ $T_a = -25\text{ to }85\text{ }^{\circ}\text{C}$		11.76		12.24	
$V_I$	Operating input voltage	$I_O = 500\text{ mA}$				16	V
$I_O$	Output current limit				1		A
$\Delta V_O$	Line regulation	$V_I = 13\text{ to }16\text{ V}$ $I_O = 5\text{ mA}$			12	60	mV
$\Delta V_O$	Load regulation	$V_I = 13.3\text{ V}$ $I_O = 5\text{ to }500\text{ mA}$			12	60	mV
$I_d$	Quiescent current	$V_I = 13\text{ to }16\text{ V}$ $I_O = 0\text{ mA}$	ON mode		0.7	1.5	mA
		$V_I = 13.3\text{ to }16\text{ V}$ $I_O = 500\text{ mA}$				12	
		$V_I = 13\text{ V}$	OFF mode		70	140	$\mu\text{A}$
SVR	Supply voltage rejection	$I_O = 5\text{ mA}$ $V_I = 14 \pm 1\text{ V}$	$f = 120\text{ Hz}$		69		dB
			$f = 1\text{ kHz}$		64		
			$f = 10\text{ kHz}$		54		
eN	Output noise voltage	$B = 10\text{ Hz to }100\text{ kHz}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_O = 200\text{ mA}$			0.2	0.35	V
		$I_O = 500\text{ mA}$			0.4	0.7	
$V_{IL}$	Control input logic low	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$				0.8	V
$V_{IH}$	Control input logic high	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$		2			V
$I_i$	Control input current	$V_I = 13\text{ V}$ $V_C = 6\text{ V}$			10		$\mu\text{A}$
$C_O$	Output bypass capacitance	ESR = 0.1 to 10 $\Omega$ $I_O = 0\text{ to }500\text{ mA}$		2	10		$\mu\text{F}$

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

Table 29: LF120C electrical characteristics

Symbol	Parameter	Test condition		Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 50\text{ mA}$ $V_I = 14\text{ V}$		11.76	12	12.24	V
		$I_O = 50\text{ mA}$ $V_I = 14\text{ V}$ $T_a = -25\text{ to }85\text{ }^{\circ}\text{C}$		11.52		12.48	
$V_I$	Operating input voltage	$I_O = 500\text{ mA}$				16	V
$I_O$	Output current limit				1		A
$\Delta V_O$	Line regulation	$V_I = 13\text{ to }16\text{ V}$ $I_O = 5\text{ mA}$			12	60	mV
$\Delta V_O$	Load regulation	$V_I = 13.3\text{ V}$ $I_O = 5\text{ to }500\text{ mA}$			12	60	mV
$I_d$	Quiescent current	$V_I = 13\text{ to }16\text{ V}$ $I_O = 0\text{ mA}$	ON mode		0.7	1.5	mA
		$V_I = 13.3\text{ to }16\text{ V}$ $I_O = 500\text{ mA}$				12	
		$V_I = 13\text{ V}$	OFF mode		70	140	$\mu\text{A}$
SVR	Supply voltage rejection	$I_O = 5\text{ mA}$ $V_I = 14 \pm 1\text{ V}$	$f = 120\text{ Hz}$		69		dB
			$f = 1\text{ kHz}$		64		
			$f = 10\text{ kHz}$		54		
eN	Output noise voltage	$B = 10\text{ Hz to }100\text{ kHz}$			50		$\mu\text{V}$
$V_d$	Dropout voltage	$I_O = 200\text{ mA}$			0.2	0.35	V
		$I_O = 500\text{ mA}$			0.4	0.7	
$V_{IL}$	Control input logic low	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$				0.8	V
$V_{IH}$	Control input logic high	$T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$		2			V
$I_i$	Control input current	$V_I = 13\text{ V}$ $V_C = 6\text{ V}$			10		$\mu\text{A}$
$C_O$	Output bypass capacitance	ESR = 0.1 to 10 $\Omega$ $I_O = 0\text{ to }500\text{ mA}$		2	10		$\mu\text{F}$

## 5 Typical performance characteristics

Figure 4: Dropout voltage vs output current

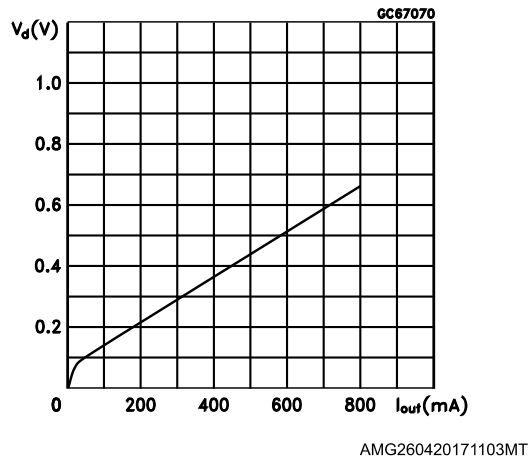


Figure 5: Dropout voltage vs temperature

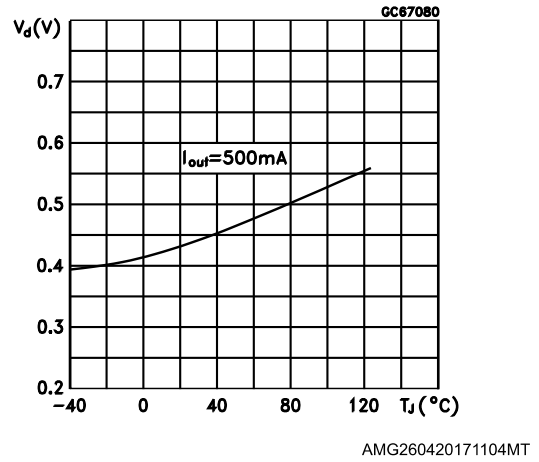


Figure 6: Supply current vs input voltage

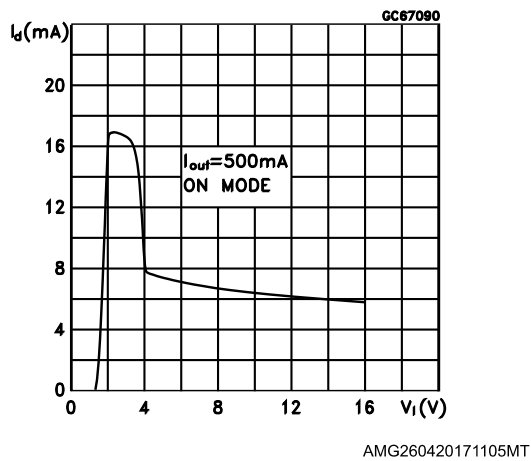


Figure 7: Supply current vs input voltage (no load)

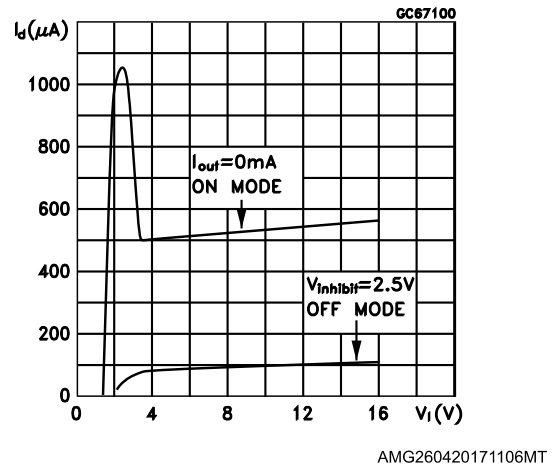


Figure 8: Short-circuit current vs input voltage

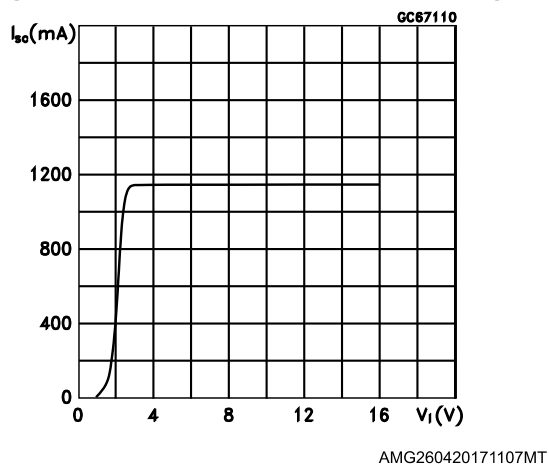
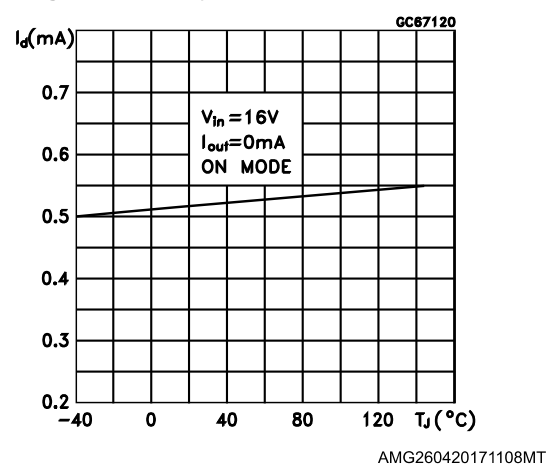


Figure 9: Supply current vs temperature



Unless otherwise specified  $V_{O(NOM)} = 3.3 V$ .

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

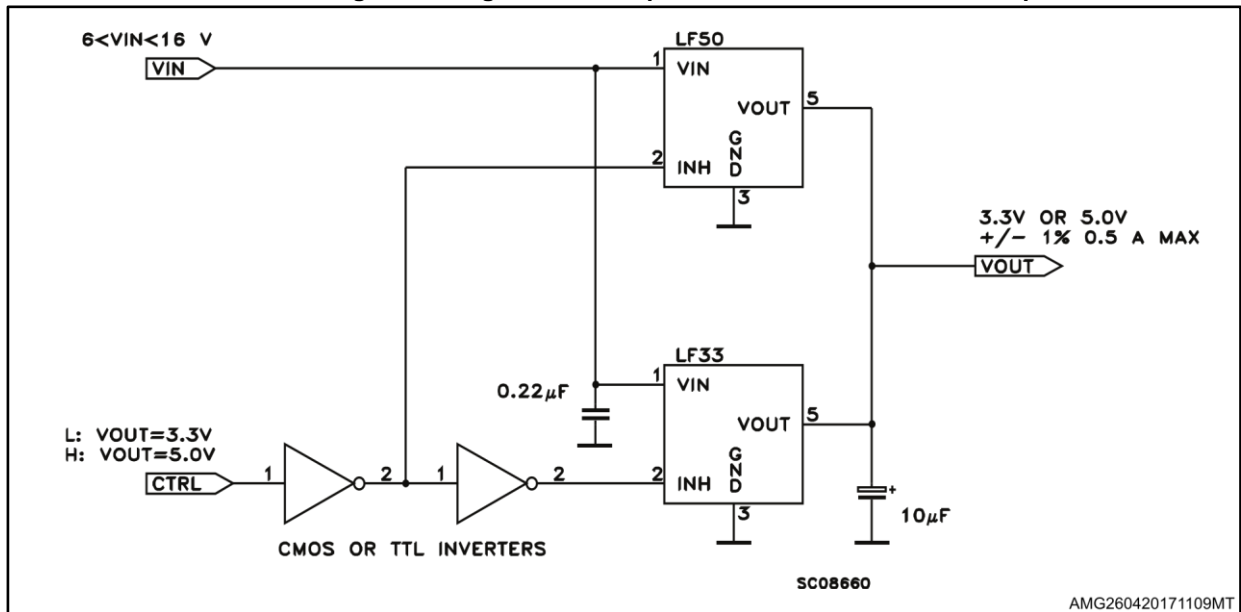


Figure 11: Sequential multi-output supply

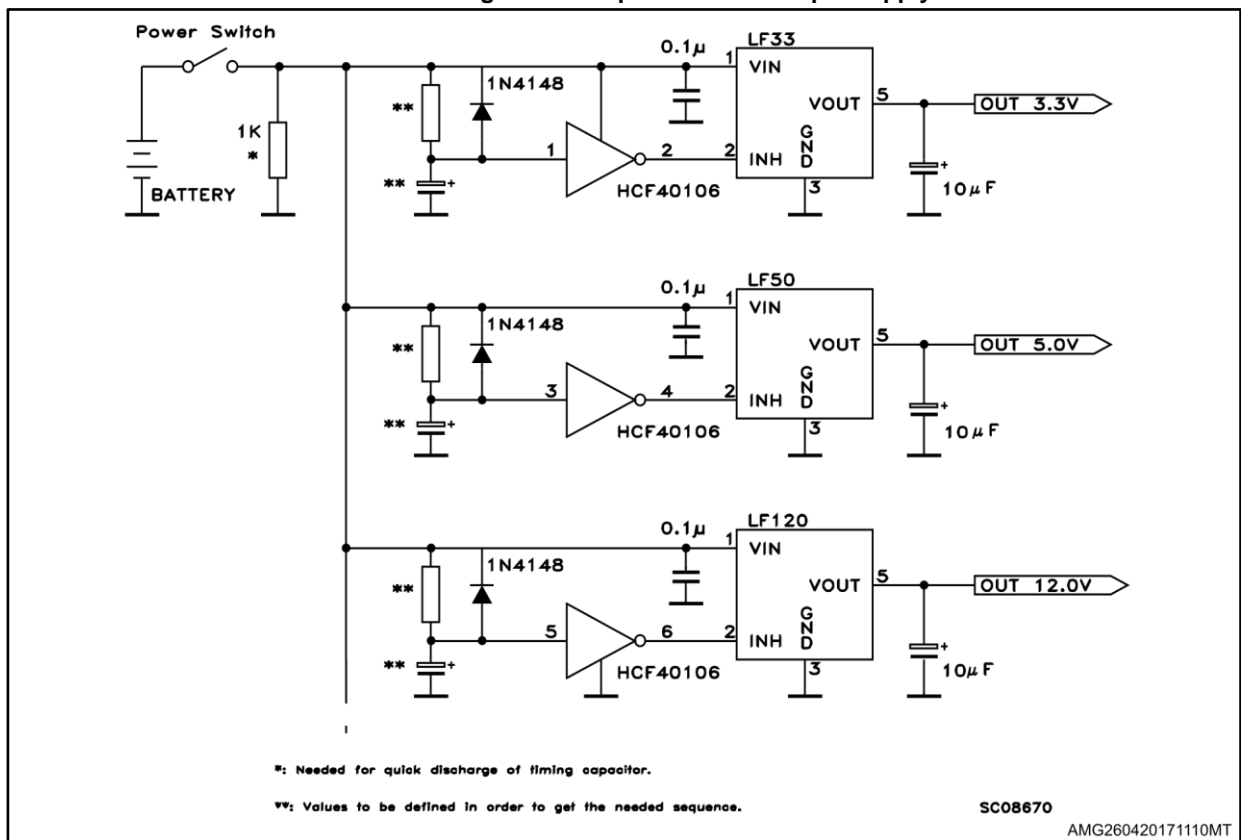


Figure 12: Multiple supply with ON/OFF toggle switch

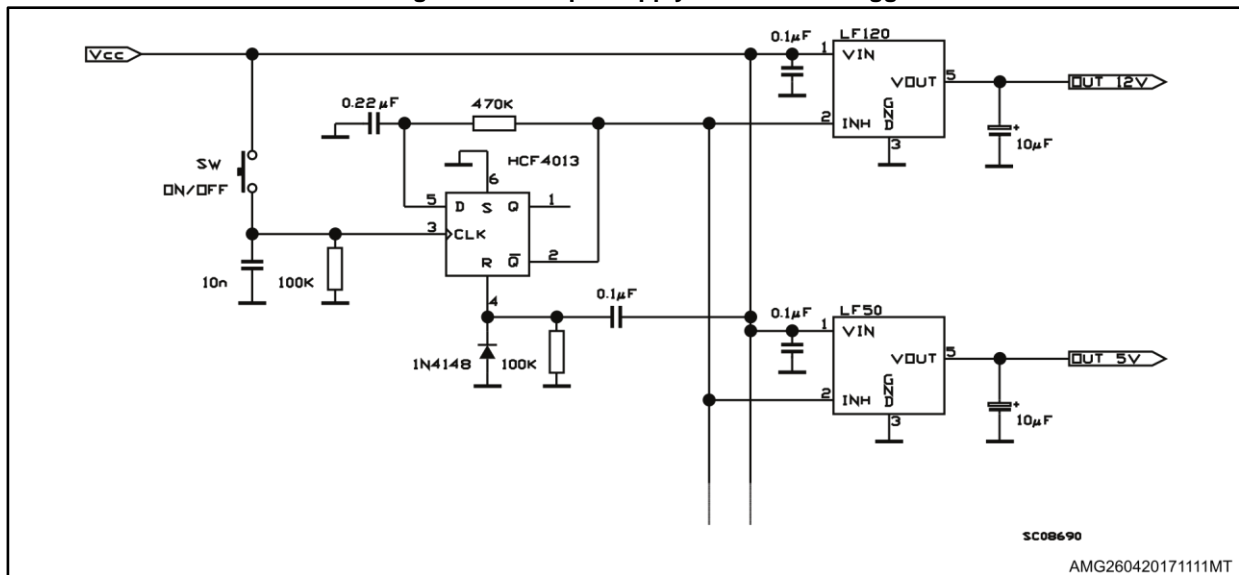


Figure 13: Basic inhibit functions

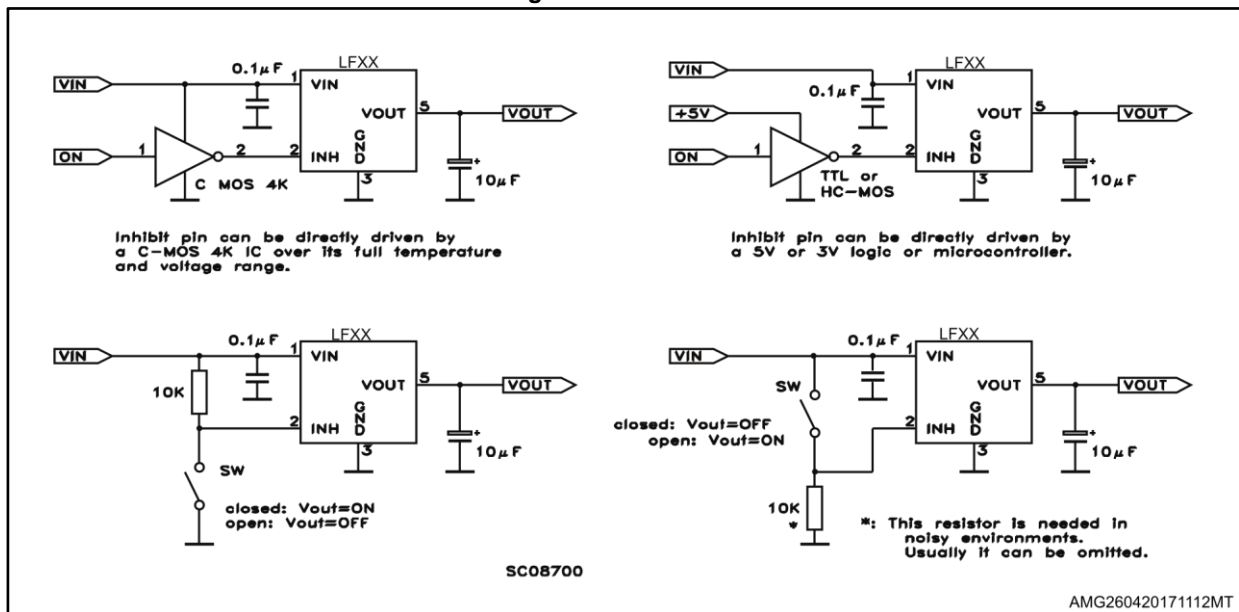


Figure 14: Delayed turn-on

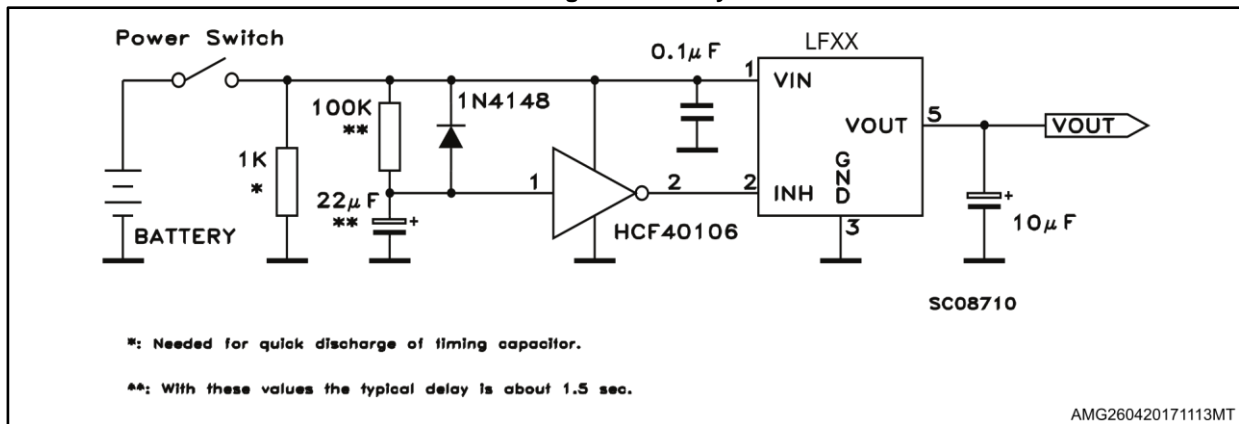
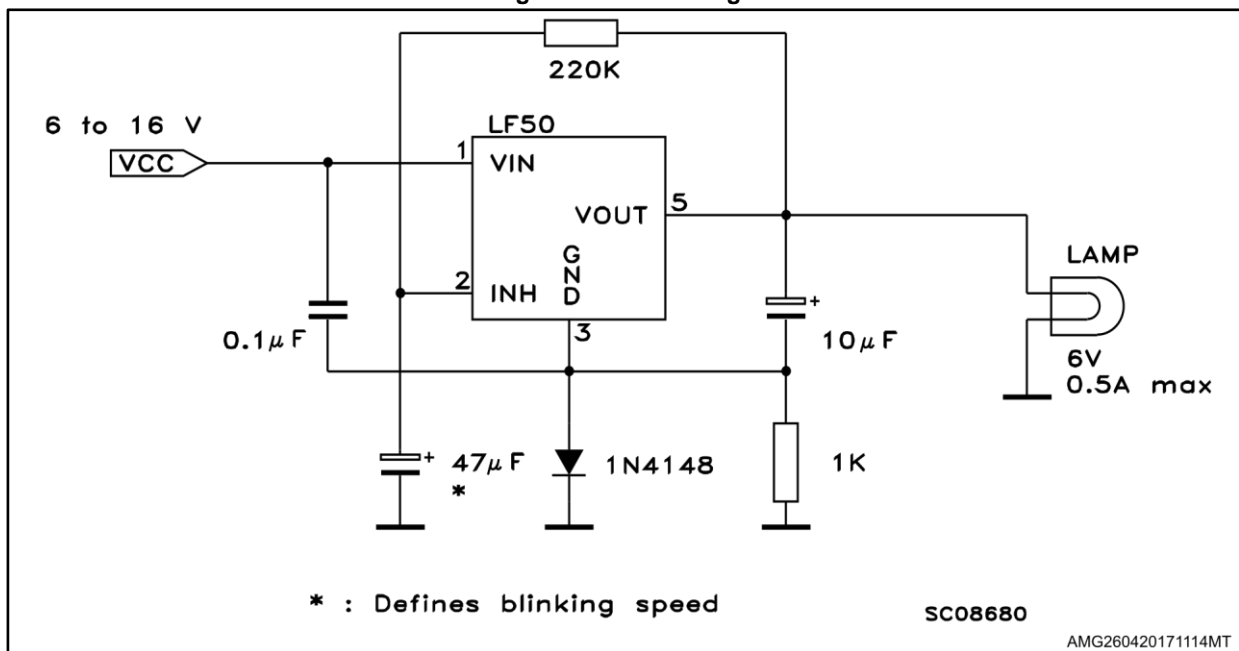


Figure 15: Low voltage bulb blinker



## 6 Package information

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](http://www.st.com). ECOPACK® is an ST trademark.

### 6.1 TO-220 (dual gauge) package information

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

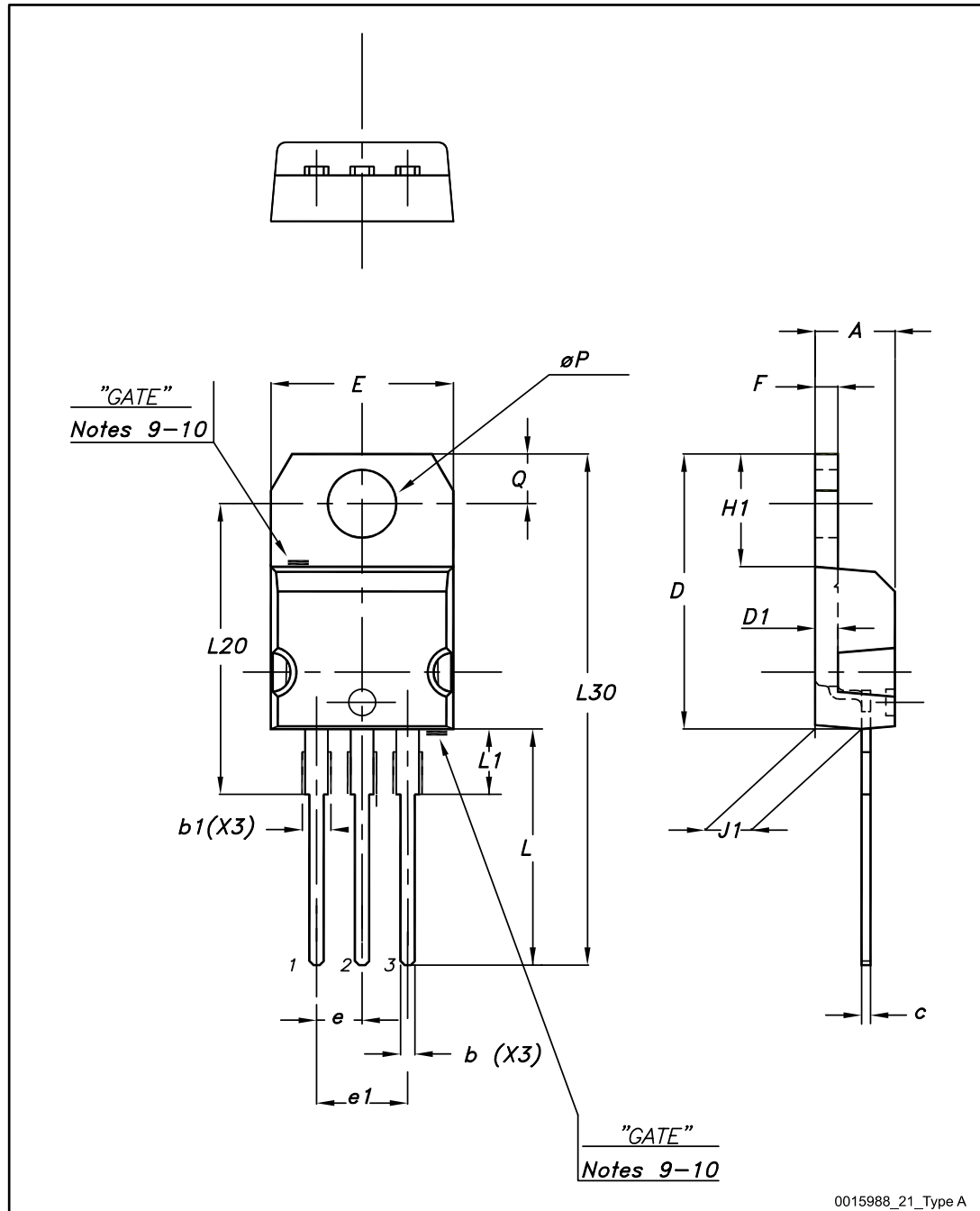


Table 30: TO-220 (dual gauge) mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	4.40		4.60
b	0.61		0.88
b1	1.14		1.70
c	0.48		0.70
D	15.25		15.75
D1		1.27	
E	10		10.40
e	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

## 6.2 TO-220 (single gauge) package information

Figure 17: TO-220 (single gauge) package outline

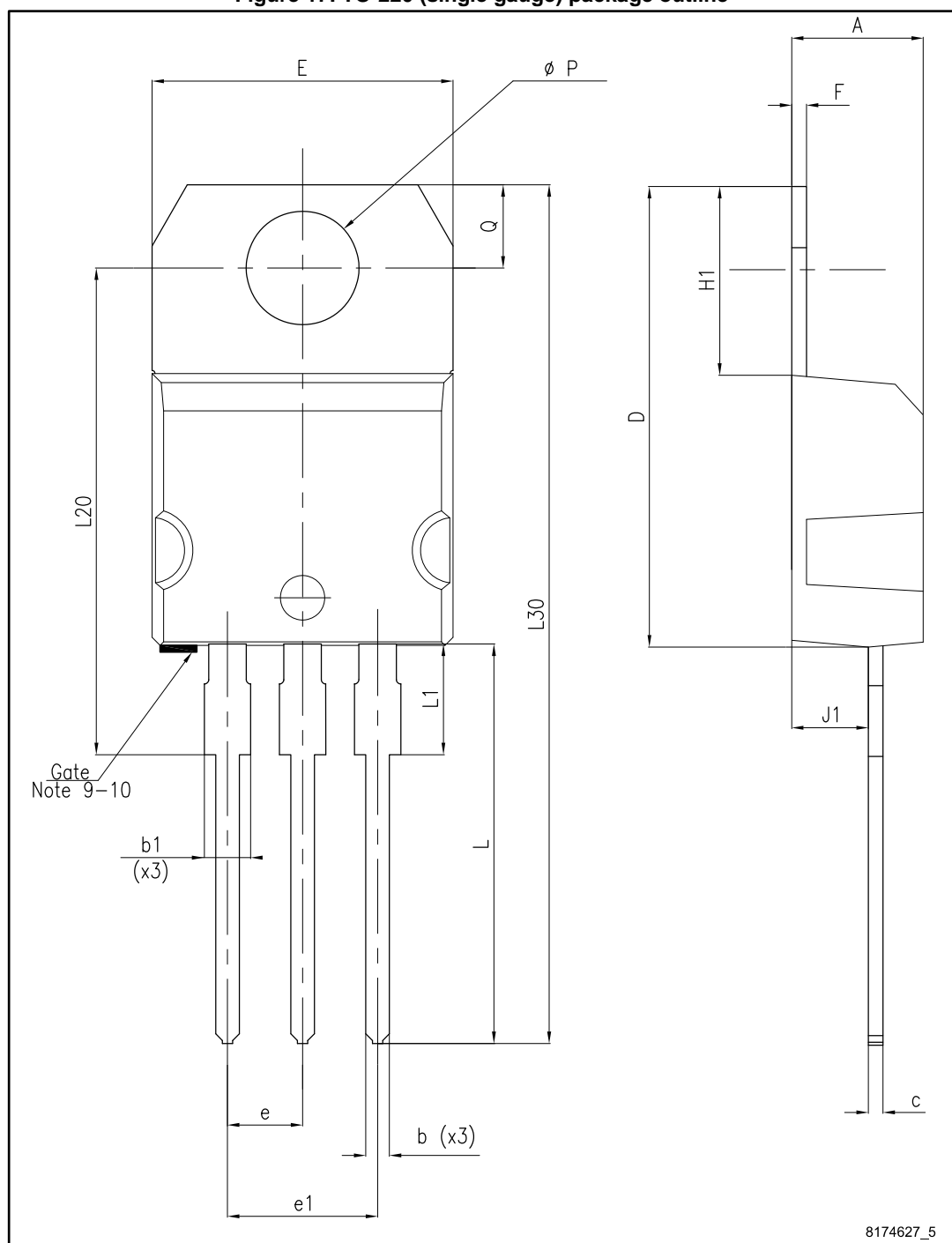


Table 31: TO-220 (single gauge) mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	4.40		4.60
b	0.61		0.88
b1	1.14		1.70
c	0.48		0.70
D	15.25		15.75
E	10.00		10.40
e	2.40		2.70
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

### 6.3 TO-220FP package information

**Figure 18: TO-220FP package outline**

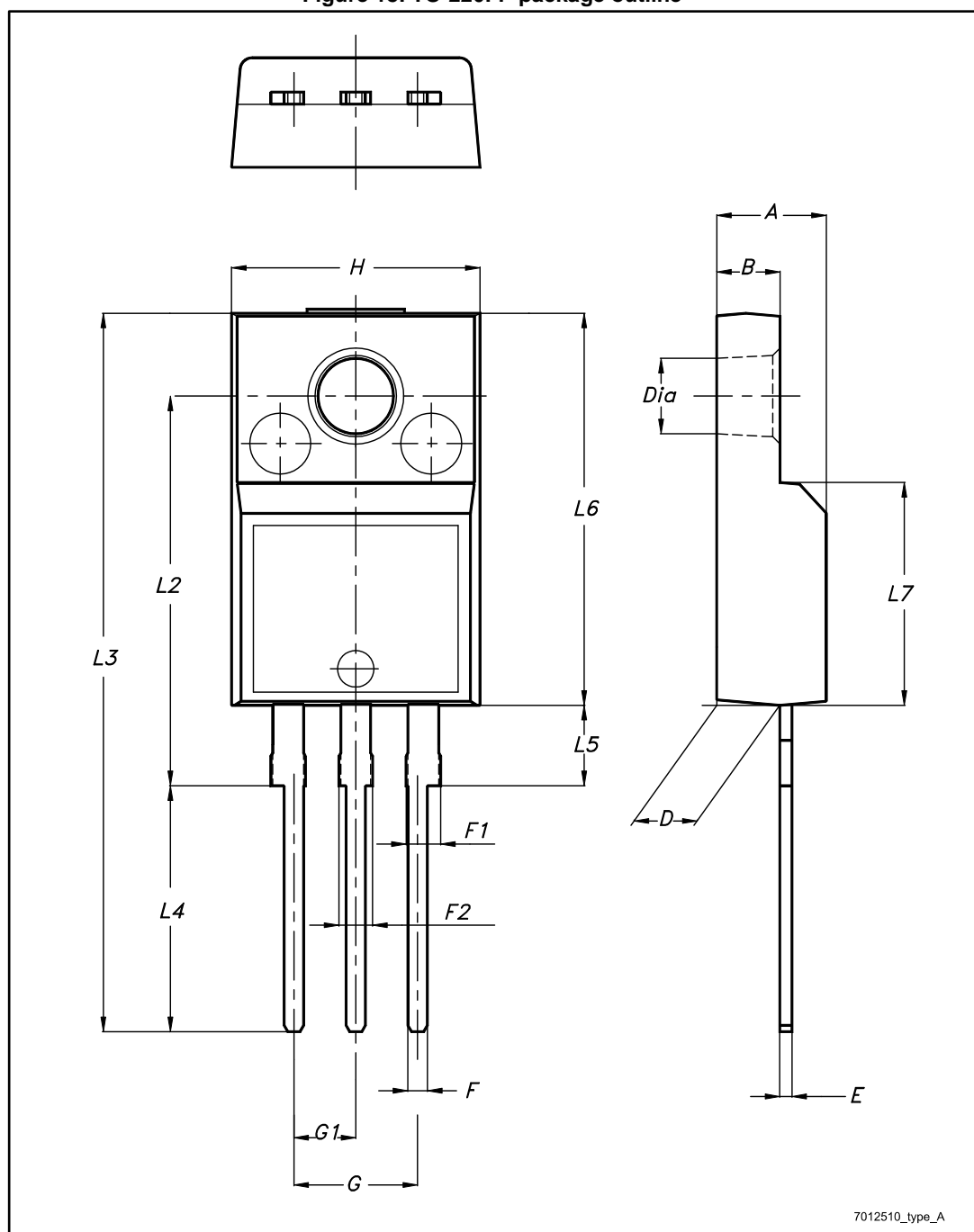


Table 32: TO-220FP package mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	4.4		4.6
B	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
H	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 19: Tube for TO-220 (dual gauge) (mm.)

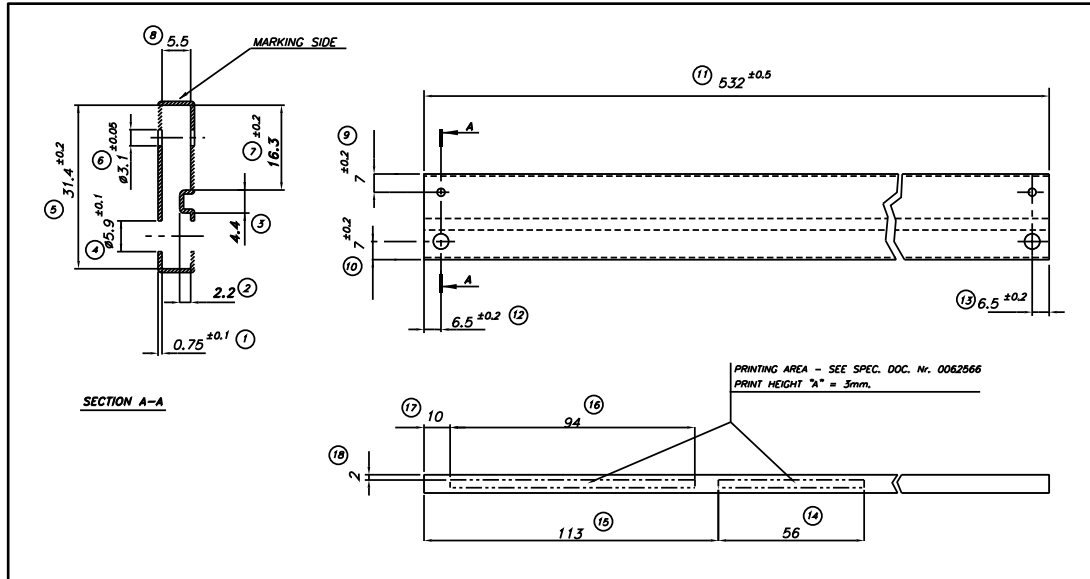
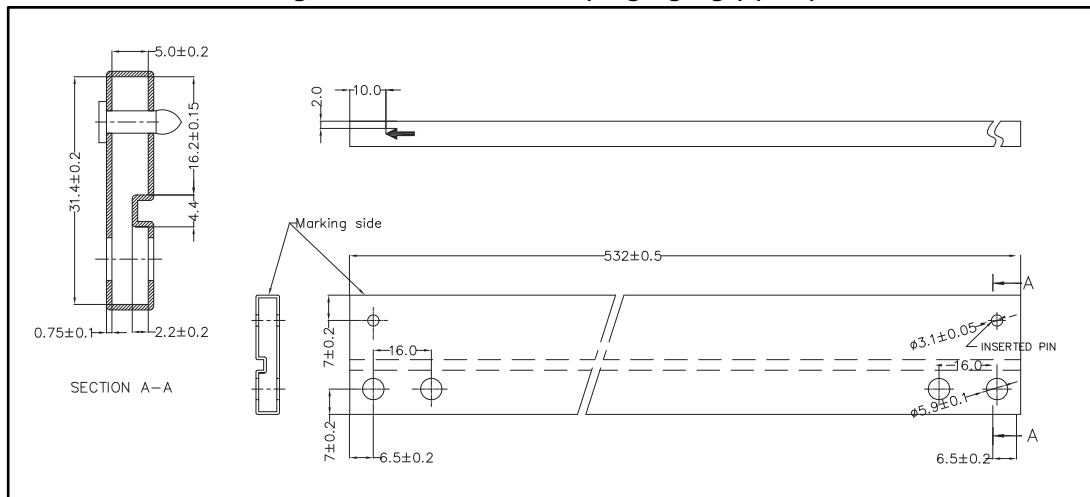


Figure 20: Tube for TO-220 (single gauge) (mm.)



## 6.5 DPAK package information

Figure 21: DPAK package outline

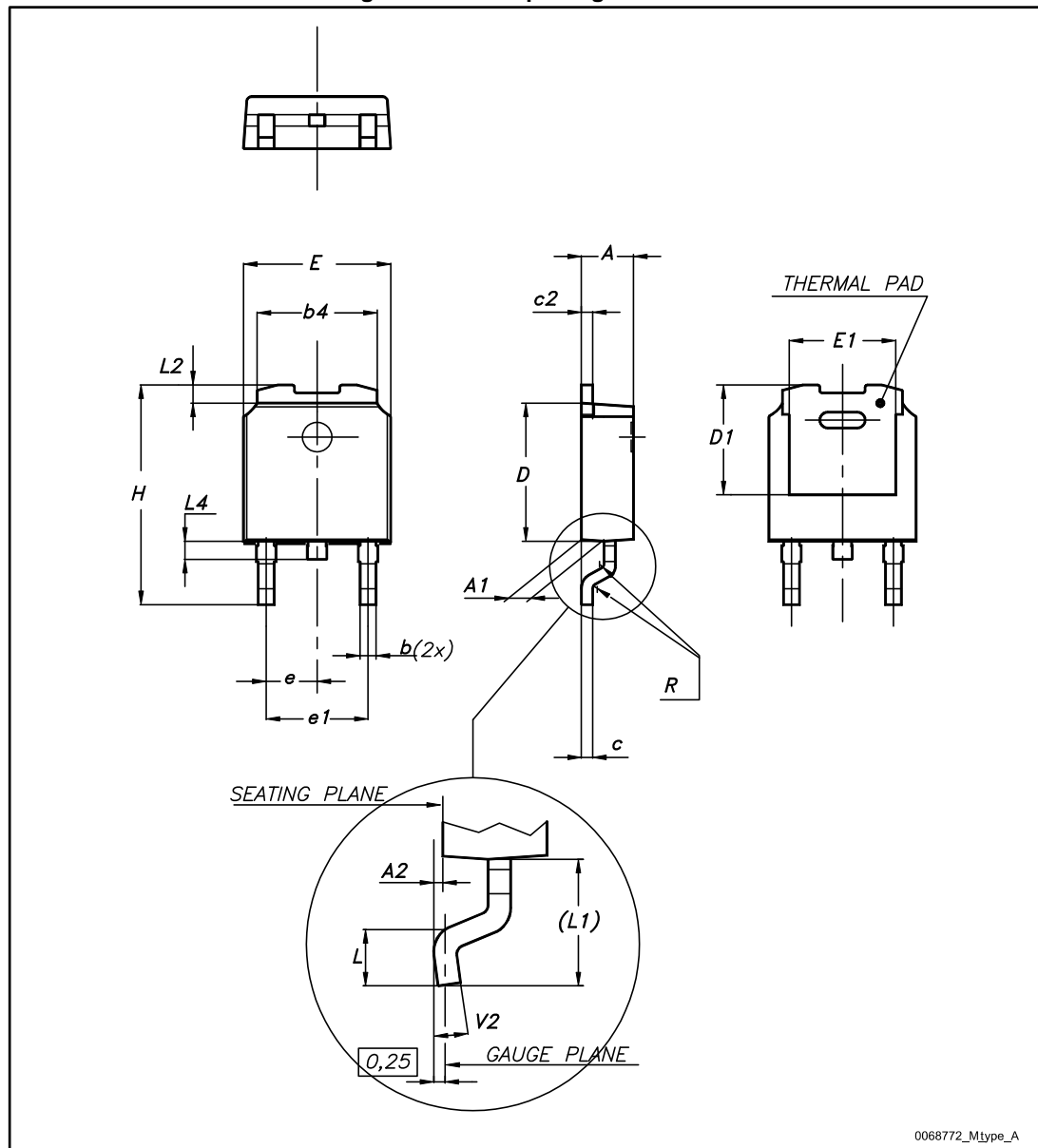
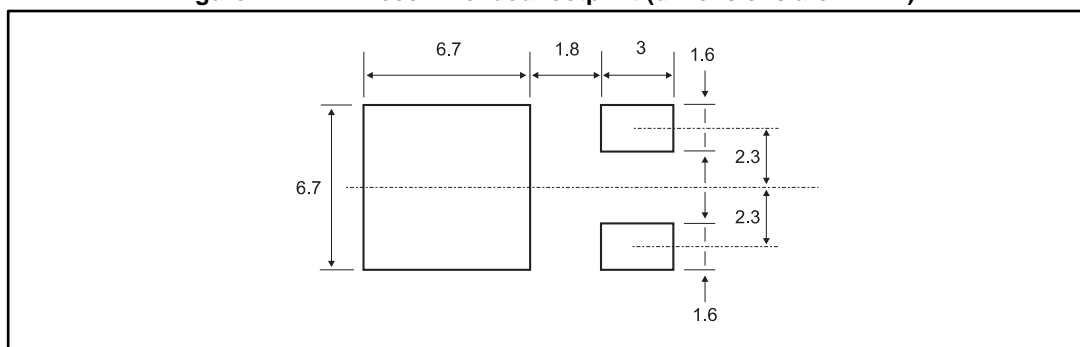


Table 33: DPAK mechanical data

Dim.	mm		
	Min.	Typ.	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
c	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	
e		2.28	
e1	4.40		4.60
H	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

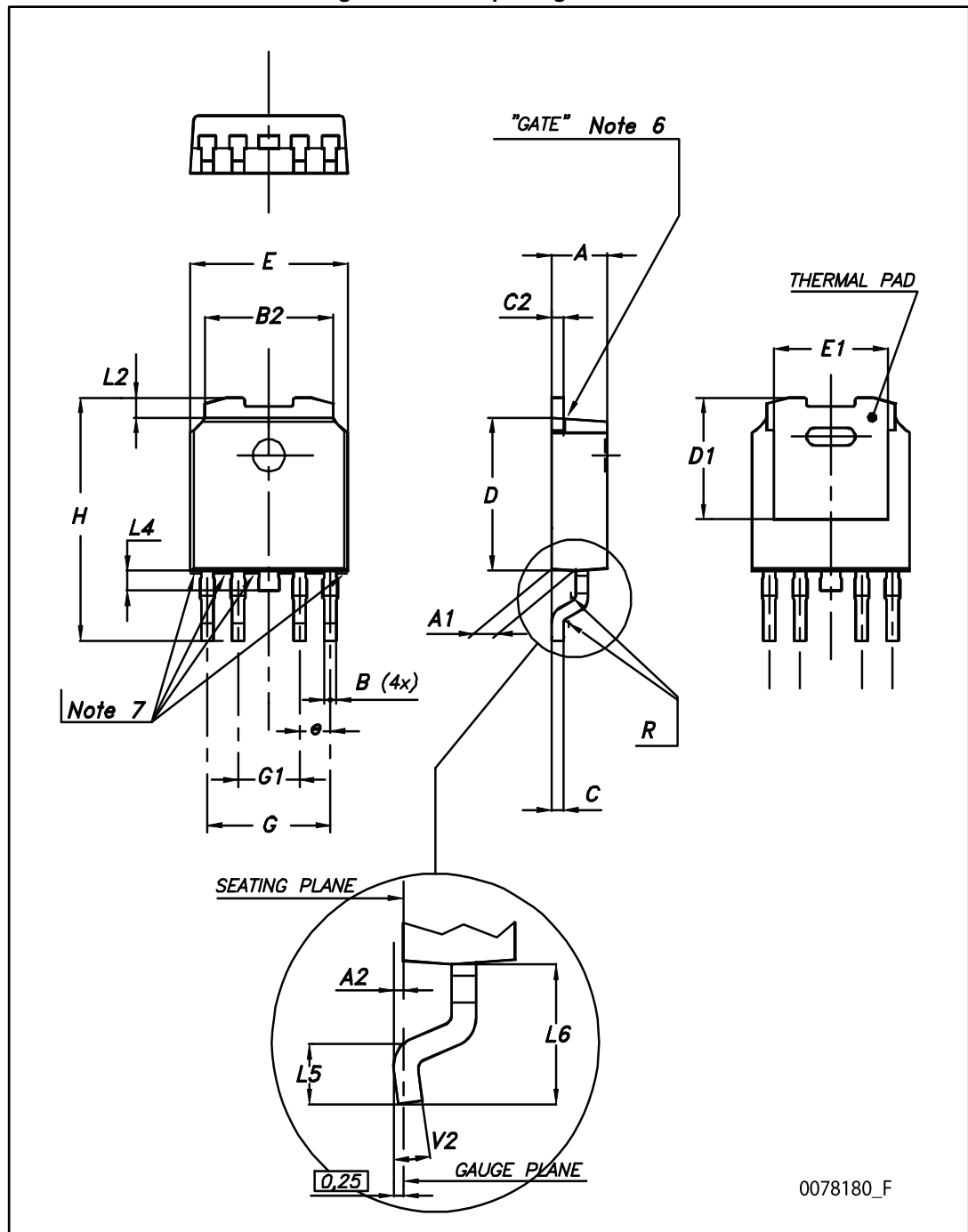


Table 34: PPAK mechanical data

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

## 6.7 PPAK and DPAK packing information

Figure 24: PPAK and DPAK tape

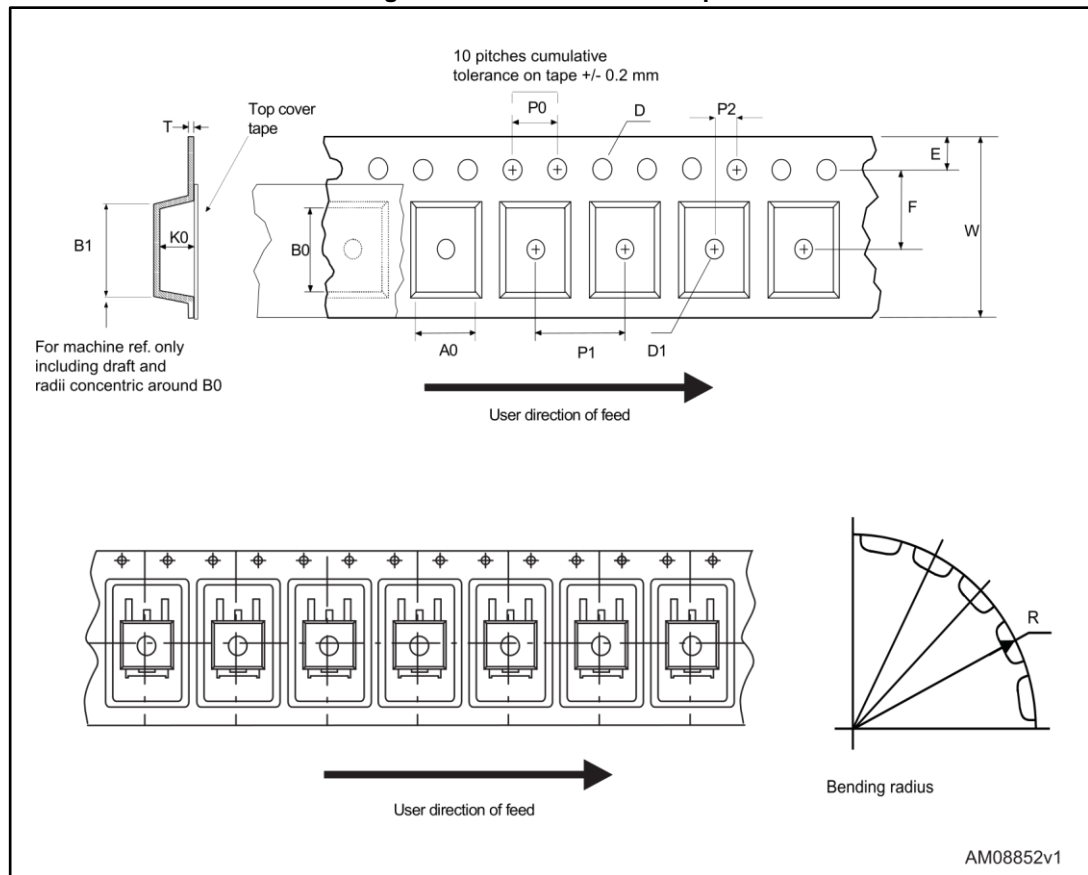


Figure 25: PPAK and DPAK reel

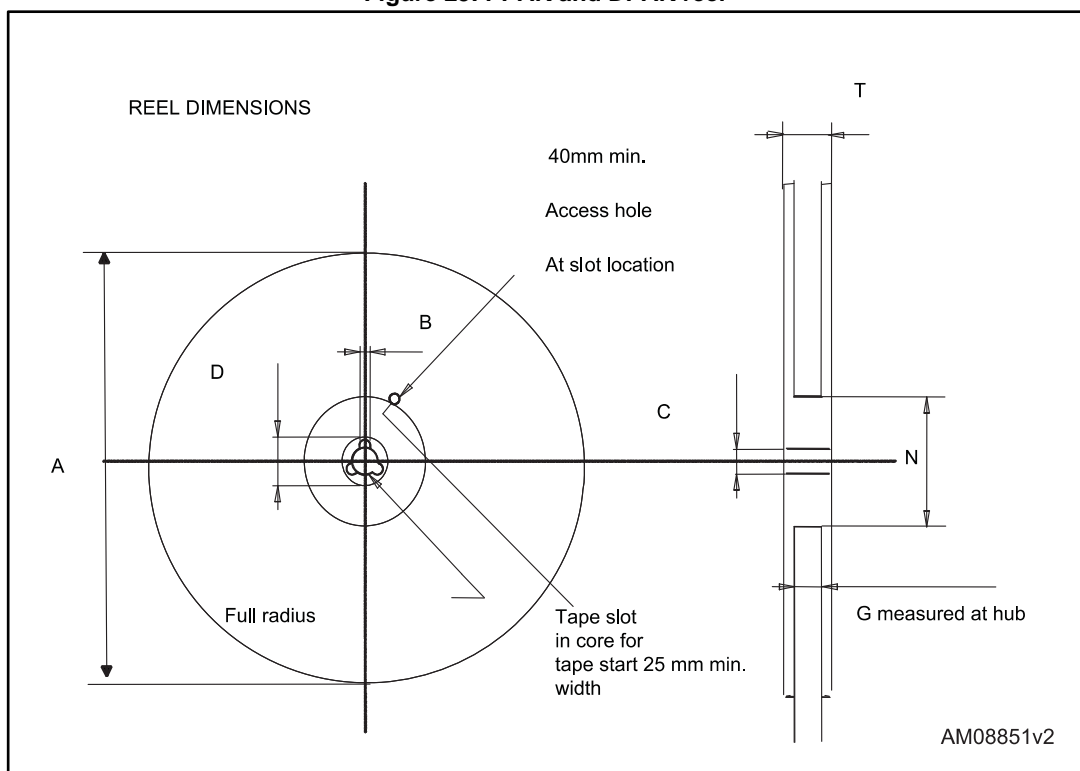


Table 35: PPAK and DPAK tape and reel mechanical data

Tape			Reel		
Dim.	mm		Dim.	mm	
	Min.	Max.		Min.	Max.
A0	6.8	7	A		330
B0	10.4	10.6	B	1.5	
B1		12.1	C	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	T		22.4
K0	2.55	2.75			
P0	3.9	4.1	Base qty.		2500
P1	7.9	8.1	Bulk qty.		2500
P2	1.9	2.1			
R	40				
T	0.25	0.35			
W	15.7	16.3			

## 7 Ordering information

Table 36: Order code

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

### Notes:

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

## 8 Revision history

Table 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: $R_{thJC}$ 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	<p>Changed the part numbers LFxxAB and LFxxC to LFXX.</p> <p>Changed the title.</p> <p>Removed table from cover page.</p> <p>Removed PENTAWATT package from the figure in cover page, the Description and Figure 2.</p> <p>Updated the Description.</p> <p>Updated: Table 2, Table 6, Table 8, Table 10, Table 13, Table 15, Table 17, Table 22, Table 25 and Table 34.</p> <p>Changed title of Figure 7.</p> <p>Updated mechanical data.</p>
03-Mar-2015	28	<p>Updated Table 34: Order code.</p> <p>Minor text changes.</p>
19-Jan-2017	29	<p>Updated output voltage values in Table 16 and added new commercial type in TO-220FP in Table 35.</p> <p>Minor text changes.</p>
27-Jan-2017	30	Updated features in cover page. Added Table 14 and updated Table 35.
22-May-2017	31	<p>Updated <a href="#">Table 36: "Order code"</a>.</p> <p>Minor text changes.</p>

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