

1.5 A adjustable and fixed low drop positive voltage regulator

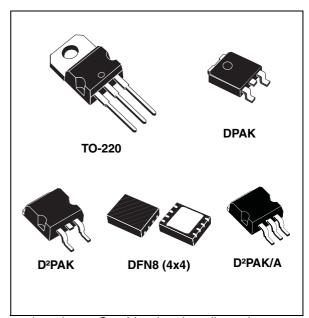
Datasheet - production data

Features

- Typical dropout: 1.3 V at 1.5 A
- Three-terminal adjustable or fixed output voltage: 1.8 V, 2.5 V, 3.3 V, 5 V, 12 V
- Automotive grade (adjustable V_{OUT} in TO-220 and DPAK packages only)
- Output current guaranteed up to 1.5 A
- Output tolerance: ± 1 % at 25 °C and ± 2 % in full temperature range
- Internal power and thermal limit
- Wide operating temperature range 40 °C to 125 °C
- Package available: TO-220, D²PAK, D²PAK/A, DPAK and DFN8 (4x4 mm)
- Pinout compatibility with standard adjustable voltage regulators

Description

The LD1086xx is a low drop voltage regulator capable of providing up to 1.5 A of output current. Dropout is guaranteed at a maximum of 1.2 V at the maximum output current, decreasing at lower loads. The LD1086xx is pin-to-pin compatible with older 3-terminal adjustable regulators, but has better performance in terms of drop and output tolerance. The 2.85 V output version is suitable for SCSI-2 active terminations. Unlike PNP regulators, where a part of the output current is wasted as quiescent current, the LD1086xx quiescent current flows into the load, increasing efficiency. Only a 10 μF (minimum) capacitor is needed for stability. The device is available in a TO-220, D²PAK, D²PAK/A, DPAK or DFN8 (4x4



mm) package. On-chip trimming allows the regulator to reach a very tight output voltage tolerance; within ± 1 % at 25 °C. The LD1086xx is available as automotive grade for adjustable output voltages in the TO-220 and DPAK packages. The PAT, SYL, SBL statistical tests have been performed, and the devices are qualified according to the AEC-Q100 specification for the automotive market in the temperature range of - 40 °C to 125 °C.

Table 1. Device summary

Part numbers				
LD1086XX	LD1086XX18	LD1086XX33		
LD1086XX12	LD1086XX25	LD1086XX50		

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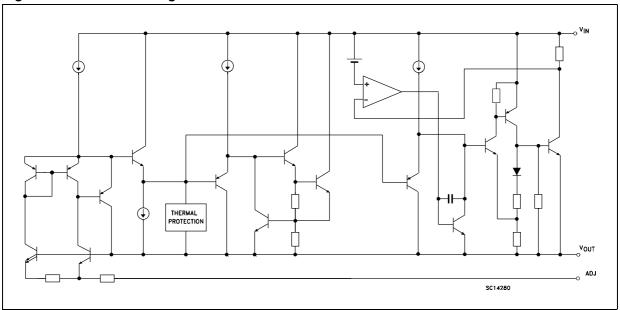
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LD1086xx Diagram

1 Diagram

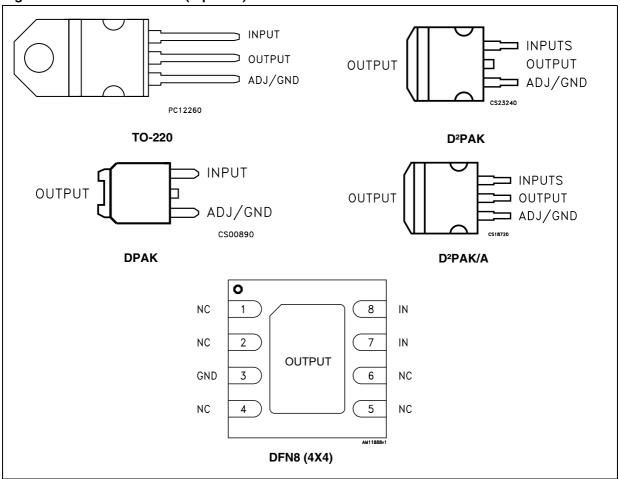
Figure 1. Schematic diagram



Pin configuration LD1086xx

2 Pin configuration

Figure 2. Pin connections (top view)



Note: The TAB is physically connected to the output (this is valid for the TO-220 package too).

LD1086xx Maximum ratings

3 Maximum ratings

Table 2. Absolute maximum ratings

Symbol	Symbol Parameter Value		Unit
V _I	DC input voltage	30	V
Io	Output current	Internally Limited	
P _D	Power dissipation	Internally Limited	mW
T _{STG}	Storage temperature range	-55 to +150	°C
T _{OP}	Operating junction temperature range -40 to +125		°C

Note:

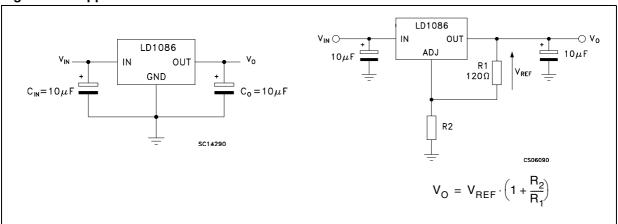
Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

Table 3. Thermal data

Symbol	Parameter	TO-220	D²PAK D²PAK/A	DPAK	DFN8	Unit
R _{thJC}	Thermal resistance junction-case	5	3	8	1.5	°C/W
R _{thJA}	Thermal resistance junction-ambient	50	62.5		33	°C/W

4 Schematic application

Figure 3. Application circuit



5 Electrical characteristics

 V_I = 4.8 V, C_I = C_O =10 $\mu F,\, T_A$ = -40 to 125 $^{\circ}C,\, unless$ otherwise specified.

Table 4. Electrical characteristics of LD1086#18

Symbol	Parameter	Test condition	Min.	Тур.	Max.	Unit
V	Output voltage ⁽¹⁾	$I_O = 0$ mA, $T_J = 25$ °C	1.782	1.8	1.818	V
Vo	Output voltage 🗥	$I_O = 0$ to 1.5A, $V_I = 3.4$ to 30V	1.764	1.8	1.836	V
A\/ -	Line regulation	$I_O = 0$ mA, $V_I = 3.4$ to 18V, $T_J = 25$ °C		0.2	4	mV
ΔV _O	Line regulation	I _O = 0 mA, V _I = 3.4 to 15V		0.4	4	mV
A\/ -	Load regulation	$I_{O} = 0$ to 1.5A, $T_{J} = 25^{\circ}C$		0.5	8	mV
ΔV _O	Load regulation	I _O = 0 to 1.5A		1	16	mV
V _d	Dropout voltage	I _O = 1.5A		1.3	1.5	٧
Iq	Quiescent current	$V_1 \le 30V$		5	10	mA
	Short circuit current	$V_I - V_O = 5V$	1.5	2		Α
I _{sc}	Short circuit current	$V_{I} - V_{O} = 25V$	0.05	0.02		Α
	Thermal regulation	T _A = 25°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	$f = 120 \text{ Hz}, C_O = 25 \mu\text{F}, I_O = 1.5\text{A} $ $V_I = 6.8 \pm 3\text{V}$	60	82		dB
eN	RMS Output noise voltage (% of V_O)	T _A = 25°C, f =10Hz to 10kHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T _A = 125°C, 1000Hrs		0.5		%

^{1.} See short-circuit current curve for available output current at fixed dropout.

Electrical characteristics LD1086xx

 V_I = 5.5 V, C_I = C_O =10 $\mu F,\, T_A$ = -40 to 125 $^{\circ} C,\, unless otherwise specified.$

Table 5. Electrical characteristics of LD1086#25

Symbol	Parameter	Test condition	Min.	Тур.	Max.	Unit
V	Output voltage ⁽¹⁾	$I_{O} = 0 \text{ mA}, T_{J} = 25^{\circ}\text{C}$	2.475	2.5	2.525	V
Vo	Output voltage 🗥	I _O = 0 to 1.5A, V _I = 4.1 to 30V	2.45	2.5	2.55	V
۸\/ .	Line regulation	$I_O = 0$ mA, $V_I = 4.1$ to 18V, $T_J = 25$ °C		0.2	4	mV
ΔV _O	Line regulation	I _O = 0 mA, V _I = 4.1 to 18V		0.4	4	mV
ΔV _O	Load regulation	$I_{O} = 0$ to 1.5A, $T_{J} = 25^{\circ}C$		0.5	8	mV
ΔVO	Load regulation	I _O = 0 to 1.5A		1	16	mV
V _d	Dropout voltage	I _O = 1.5A		1.3	1.5	V
Iq	Quiescent current	$V_1 \le 30V$		5	10	mA
	Short circuit current	$V_I - V_O = 5V$	1.5	2		Α
I _{sc}	Short circuit current	$V_I - V_O = 25V$	0.05	0.2		Α
	Thermal regulation	T _A = 25°C, 30ms pulse		0.008	0.04	%/W
SVR	Supply voltage rejection	$f = 120 \text{ Hz}, C_O = 25 \mu\text{F}, I_O = 1.5\text{A} \ V_I = 7.5 \pm 3\text{V}$	60	81		dB
eN	RMS Output noise voltage (% of V_O)	T _A = 25°C, f =10Hz to 10kHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T _A = 125°C, 1000Hrs		0.5		%

^{1.} See short-circuit current curve for available output current at fixed dropout.

 V_I = 6.3 V, C_I = C_O =10 $\mu F,\ T_A$ = -40 to 125 $^{\circ}C,$ unless otherwise specified.

Table 6. Electrical characteristics of LD1086#33

Symbol	Parameter	Test condition	Min.	Тур.	Max.	Unit
V	0 1 1 (1)	$I_{O} = 0 \text{ mA}, T_{J} = 25^{\circ}\text{C}$	3.267	3.3	3.333	V
V _O	Output voltage (1)	$I_O = 0$ to 1.5A, $V_I = 4.9$ to 30V	3.234	3.3	3.366	V
AV/ -	Line regulation	$I_O = 0$ mA, $V_I = 4.9$ to 18V, $T_J = 25$ °C		0.5	6	mV
ΔV _O	Line regulation	$I_O = 0 \text{ mA}, V_I = 4.9 \text{ to } 18V$		1	6	mV
AV/ -	Load regulation	$I_{O} = 0$ to 1.5A, $T_{J} = 25^{\circ}C$		1	10	mV
ΔV _O	Load regulation	I _O = 0 to 1.5A		7	25	mV
V _d	Dropout voltage	I _O = 1.5A		1.3	1.5	V
Iq	Quiescent current	$V_1 \le 30V$		5	10	mA
	Short circuit current	$V_I - V_O = 5V$	1.5	2		Α
I _{sc}	Short circuit current	$V_I - V_O = 25V$	0.05	0.2		Α
	Thermal regulation	T _A = 25°C, 30ms pulse		0.008	0.04	%/W
SVR	Supply voltage rejection	$f = 120 \text{ Hz}, C_O = 25 \mu\text{F}, I_O = 1.5\text{A} $ $V_I = 8.3 \pm 3\text{V}$	60	79		dB
eN	RMS Output noise voltage (% of V_O)	T _A = 25°C, f =10Hz to 10kHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T _A = 125°C, 1000Hrs		0.5		%

^{1.} See short-circuit current curve for available output current at fixed dropout.

Electrical characteristics LD1086xx

 V_I = 6.6 V, C_I = C_O =10 $\mu F,\, T_A$ = -40 to 125 $^{\circ} C,\, unless otherwise specified.$

Table 7. Electrical characteristics of LD1086#36

Symbol	Parameter	Test condition	Min.	Тур.	Max.	Unit
V	Output voltage ⁽¹⁾	$I_{O} = 0 \text{ mA}, T_{J} = 25^{\circ}\text{C}$	3.564	3.6	3.636	V
Vo	Output voltage 🗥	$I_O = 0$ to 1.5A, $V_I = 5.2$ to 30V	3.528	3.6	3.672	٧
۸\/ .	Line regulation	$I_O = 0$ mA, $V_I = 5.2$ to 18V, $T_J = 25$ °C		0.5	10	mV
ΔV _O	Line regulation	I _O = 0 mA, V _I = 5.2 to 18V		1	10	mV
ΔV _O	Load regulation	$I_{O} = 0$ to 1.5A, $T_{J} = 25^{\circ}C$		3	15	mV
ΔVO	Load regulation	I _O = 0 to 1.5A		7	25	mV
V _d	Dropout voltage	I _O = 1.5A		1.3	1.5	V
Iq	Quiescent current	$V_1 \le 30V$		5	10	mA
	Short circuit current	$V_I - V_O = 5V$	1.5	2		Α
I _{sc}	Short circuit current	$V_I - V_O = 25V$	0.05	0.2		Α
	Thermal regulation	T _A = 25°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	$f=120~Hz,~C_O=25~\mu\text{F},~I_O=1.5\text{A}$ $V_I=8.6\pm3\text{V}$	60	78		dB
eN	RMS Output noise voltage (% of V_O)	T _A = 25°C, f =10Hz to 10kHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T _A = 125°C, 1000Hrs		0.5		%

^{1.} See short-circuit current curve for available output current at fixed dropout.

 V_I = 8 V, C_I = C_O =10 $\mu F,\, T_A$ = -40 to 125 $^{\circ} C,$ unless otherwise specified.

Table 8. Electrical characteristics of LD1086#50

Symbol	Parameter	Test condition	Min.	Тур.	Max.	Unit
V	Output voltage ⁽¹⁾	$I_{O} = 0 \text{ mA}, T_{J} = 25^{\circ}\text{C}$	4.95	5	5.05	V
V _O	Output voltage 🗥	I _O = 0 to 1.5A, V _I = 6.6 to 30V	4.9	5	5.1	V
AV/ -	Line regulation	$I_O = 0$ mA, $V_I = 6.6$ to 20V, $T_J = 25$ °C		0.5	10	mV
ΔV _O	Line regulation	I _O = 0 mA, V _I = 6.6 to 20V		1	10	mV
AV/ -	Load regulation	$I_{O} = 0$ to 1.5A, $T_{J} = 25^{\circ}C$		5	20	mV
ΔV _O	Load regulation	I _O = 0 to 1.5A		10	35	mV
V _d	Dropout voltage	I _O = 1.5A		1.3	1.5	V
Iq	Quiescent current	$V_1 \le 30V$		5	10	mA
	Short circuit current	$V_I - V_O = 5V$	1.5	2		Α
I _{sc}	Short circuit current	$V_I - V_O = 25V$	0.05	0.2		Α
	Thermal regulation	T _A = 25°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	$f = 120 \text{ Hz}, C_O = 25 \mu\text{F}, I_O = 1.5\text{A} \ V_I = 10 \pm 3\text{V}$	60	75		dB
eN	RMS Output noise voltage (% of V_O)	T _A = 25°C, f =10Hz to 10kHz		0.003	_	%
S	Temperature stability			0.5		%
S	Long term stability	T _A = 125°C, 1000Hrs		0.5		%

^{1.} See short-circuit current curve for available output current at fixed dropout.

Electrical characteristics LD1086xx

 V_I = 15 V, C_I = C_O =10 $\mu F,\, T_A$ = -40 to 125 $^{\circ}C,$ unless otherwise specified.

Table 9. Electrical characteristics of LD1086#12

Symbol	Parameter	Test condition	Min.	Тур.	Max.	Unit
V	Output voltage ⁽¹⁾	$I_{O} = 0 \text{ mA}, T_{J} = 25^{\circ}\text{C}$	11.88	12	12.12	V
V _O	Output voltage V	$I_O = 0$ to 1.5A, $V_I = 13.8$ to 30V	11.76	12	12.24	V
ΔV _O	Line regulation	$I_O = 0$ mA, $V_I = 13.8$ to 25V, $T_J = 25$ °C		1	25	mV
		$I_O = 0 \text{ mA}, V_I = 13.8 \text{ to } 25\text{V}$		2	25	mV
41/	Lood regulation	I _O = 0 to 1.5A, T _J = 25°C		12	36	mV
ΔV _O	Load regulation	I _O = 0 to 1.5A		24	72	mV
V _d	Dropout voltage	I _O = 1.5A		1.3	1.5	V
Iq	Quiescent current	$V_1 \le 30V$		5	10	mA
	Short circuit current	$V_I - V_O = 5V$	1.5	2		Α
I _{sc}	Short circuit current	V _I - V _O = 25V	0.05	0.2		Α
	Thermal regulation	T _A = 25°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection	$f = 120 \text{ Hz}, C_O = 25 \mu\text{F}, I_O = 1.5\text{A}$ $V_I = 17 \pm 3\text{V}$	54	66		dB
eN	RMS Output noise voltage (% of V_O)	T _A = 25°C, f =10Hz to 10kHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T _A = 125°C, 1000Hrs		0.5		%

^{1.} See short-circuit current curve for available output current at fixed dropout.

 V_I = 4.25 V, C_I = C_O =10 $\mu F,\, T_A$ = -40 to 125 $^{\circ} C,$ unless otherwise specified.

Table 10. Electrical characteristics of LD1086#

Symbol	Parameter	Test condition	Min.	Тур.	Max.	Unit
V	Output voltage (1)	I _O = 10mA T _J = 25°C	1.237	1.25	1.263	V
Vo	Output voltage (7)	$I_O = 10$ mA to 1.5A, $V_I = 2.85$ to 30V	1.225	1.25	1.275	V
ΔV _O	Line Regulation	$I_O = 10$ mA, $V_I = 2.8$ to 16.5V, $T_J = 25$ °C		0.015	0.2	%
		I _O = 10mA, V _I = 2.8 to 16.5V		0.035	0.2	%
۸۱/	Load Regulation	$I_{O} = 10$ mA to 1.5A, $T_{J} = 25$ °C		0.1	0.3	%
ΔV _O	Load Regulation	I _O = 0 to 1.5A		0.2	0.4	%
V _d	Dropout Voltage	I _O = 1.5A		1.3	1.5	V
I _{O(min)}	Minimum Load Current	$V_I = 30V$		3	10	mA
	Short Circuit Current	$V_I - V_O = 5V$	1.5	2.3		Α
I _{sc}	Short Circuit Current	V _I - V _O = 25V	0.05	0.2		Α
	Thermal Regulation	T _A = 25°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply Voltage Rejection	$ f = 120 \; Hz, \; C_O = 25 \; \mu F, \\ C_{ADJ} = 25 \; \mu F, \\ I_O = 1.5A, \; V_I = 6.25 \pm 3V $	60	88		dB
I _{ADJ}	Adjust Pin Current	V _I = 4.25V, I _O = 10 mA		40	120	μΑ
ΔI_{ADJ}	Adjust Pin Current Change (1)	$I_O = 10$ mA to 1.5A, $V_I = 2.8$ to 16.5V		0.2	5	μΑ
eN	RMS Output Noise Voltage (% of V_O)	T _A = 25°C, f =10Hz to 10kHz		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	T _A = 125°C, 1000Hrs		0.5		%

^{1.} See short-circuit current curve for available output current at fixed dropout.

Electrical characteristics LD1086xx

 V_I = 4.25 V, C_I = C_O =10 $\mu F,\, T_A$ = -40 to 125 $^{\circ} C,$ unless otherwise specified.

Table 11. Electrical characteristics of LD1086DTTRY and LD1086VY (Automotive Grade)

Symbol	Parameter	Test condition	Min.	Тур.	Max.	Unit
V	Output voltage ⁽¹⁾	I _O = 10 mA T _A = 25°C	1.237	1.25	1.263	V
Vo	Output voitage (**)	I_{O} = 10 mA to 1.5 A, V_{I} = 2.85 to 30 V	1.225	1.25	1.275	V
ΔV _O	Line regulation	$I_O = 10 \text{ mA}, V_I = 2.8 \text{ to } 16.5 \text{ V}$		0.035	0.2	%
ΔV _O	Load regulation	I _O = 0 to 1.5 A		0.2	0.4	%
V _d	Dropout voltage	I _O = 1.5 A		1.3	1.5	V
I _{O(min)}	Minimum load current	V _I = 30 V		3	10	mA
	I _{sc} Short circuit current	$V_1 - V_0 = 5 \text{ V}, T_A = 25^{\circ}\text{C}$	1.5	2.3		Α
'sc		V _I - V _O = 25 V, T _A = 25°C	0.05	0.2		Α
	Thermal regulation	T _A = 25°C, 30ms pulse		0.01	0.04	%/W
SVR	Supply voltage rejection		60	88		dB
I _{ADJ}	Adjust pin current	V _I = 4.25 V, I _O = 10 mA		40	120	μΑ
ΔI_{ADJ}	Adjust pin current change (1)	$I_O = 10 \text{ mA to } 1.5 \text{ A}, V_I = 2.8 \text{ to } 16.5 \text{ V}$		0.2	5	μΑ
eN	RMS output noise voltage (% of V_O)	T _A = 25°C, f =10 Hz to 10 kHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T _A = 125°C, 1000 Hrs		0.5		%

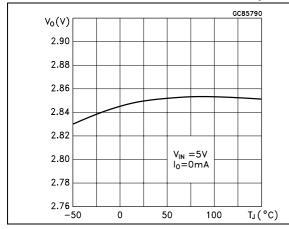
^{1.} See short-circuit current curve for available output current at fixed dropout.

LD1086xx Typical application

6 Typical application

Unless otherwise specified $T_J = 25$ °C, $C_I = C_O = 10 \mu F$.

Figure 4. Output voltage vs. temp. $(V_1 = 5 \text{ V})$ Figure 5. Output voltage vs. temp. $(V_1 = 15 \text{ V})$



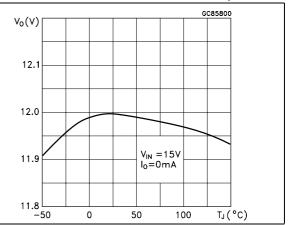
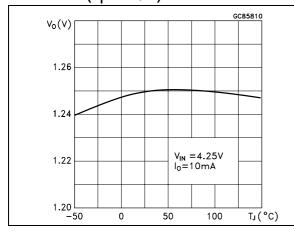


Figure 6. Output voltage vs. temperature $(V_I = 4.25 \text{ V})$

Figure 7. Short circuit current vs. dropout voltage



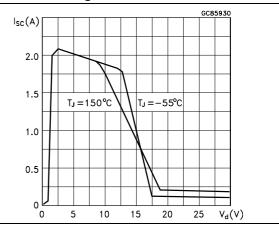
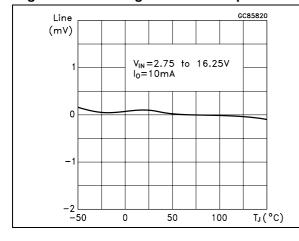
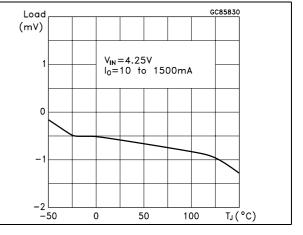


Figure 8. Line regulation vs. temperature

Figure 9. Load regulation vs. temperature

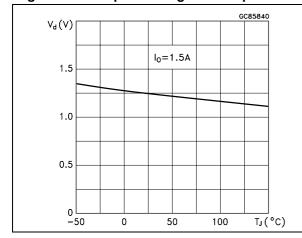




Typical application LD1086xx

Figure 10. Dropout voltage vs. temperature

Figure 11. Dropout voltage vs. output current



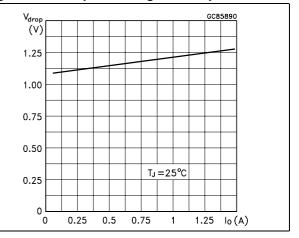
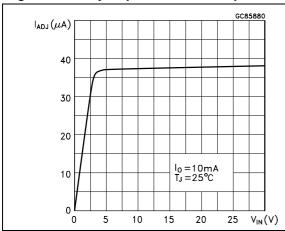


Figure 12. Adjust pin current vs. input voltage Figure 13. Adjust pin current vs. temperature



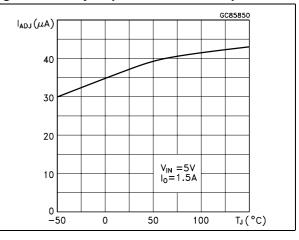
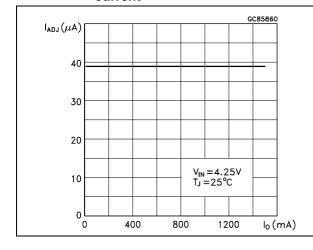
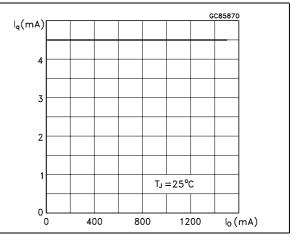


Figure 14. Adjust pin current vs. output current

Figure 15. Quiescent current vs. output current





LD1086xx Typical application

Figure 16. Quiescent current vs. input voltage Figure 17. Supply voltage rejection vs. output current

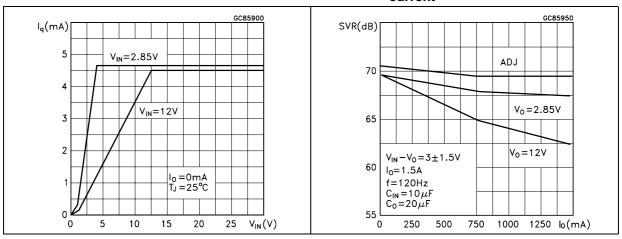


Figure 18. Supply voltage rejection vs. frequency

Figure 19. Supply voltage rejection vs. temperature

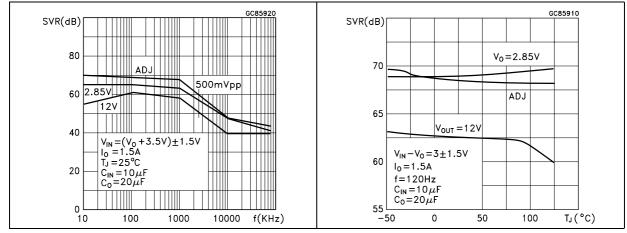
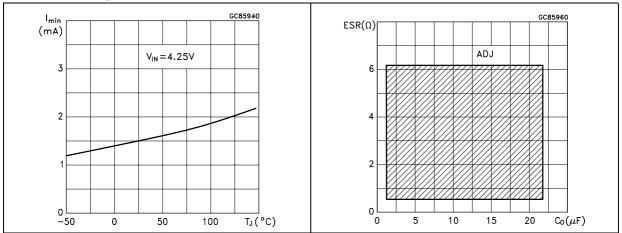


Figure 20. Minimum load current vs. temperature

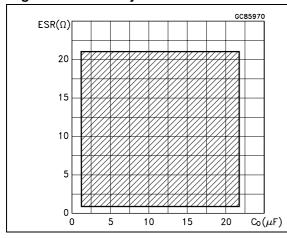
Figure 21. Stability for adjustable



Typical application LD1086xx

Figure 22. Stability for 2.85 V

Figure 23. Stability for 12 V



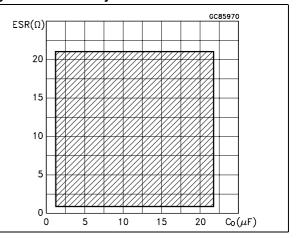
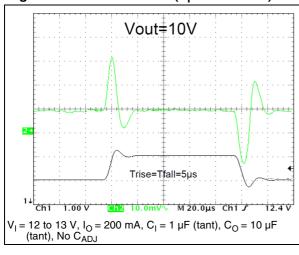


Figure 24. Line transient $(V_I = 12 \text{ to } 13 \text{ V})$

Figure 25. Line transient $(I_0 = 200 \text{ mA})$



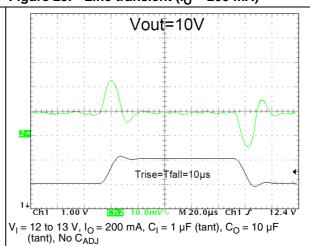
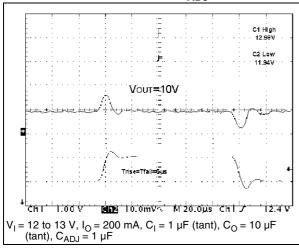


Figure 26. Line transient ($C_{ADJ} = 1 \mu F$)

Figure 27. Load transient



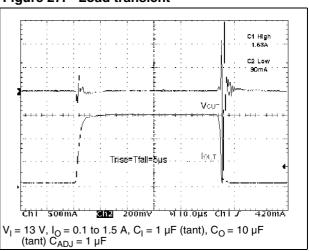
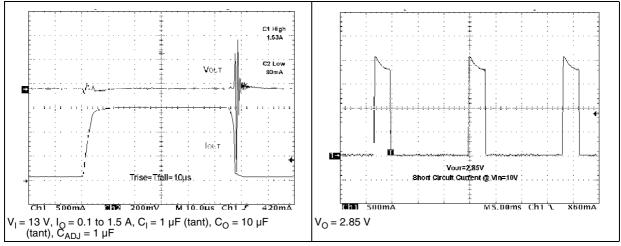


Figure 28. Load transient ($T_{rise} = T_{fall} = 10 \mu s$) Figure 29. Thermal protection



7 Package mechanical data

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

Table 12. TO-220 mechanical data

	Type STD - ST Dual Gauge			Type STD - ST Single Gauge				
Dim.		mm.			mm.			
	Min.	Тур.	Max.	Min.	Тур.	Max.		
Α	4.40		4.60	4.40		4.60		
b	0.61		0.88	0.61		0.88		
b1	1.14		1.70	1.14		1.70		
С	0.48		0.70	0.48		0.70		
D	15.25		15.75	15.25		15.75		
D1		1.27						
Е	10.00		10.40	10.00		10.40		
е	2.40		2.70	2.40		2.70		
e1	4.95		5.15	4.95		5.15		
F	1.23		1.32	0.51		0.60		
H1	6.20		6.60	6.20		6.60		
J1	2.40		2.72	2.40		2.72		
L	13.00		14.00	13.00		14.00		
L1	3.50		3.93	3.50		3.93		
L20		16.40			16.40			
L30		28.90			28.90			
ØP	3.75		3.85	3.75		3.85		
Q	2.65		2.95	2.65		2.95		

In spite of some difference in tolerances, the packages are compatible.

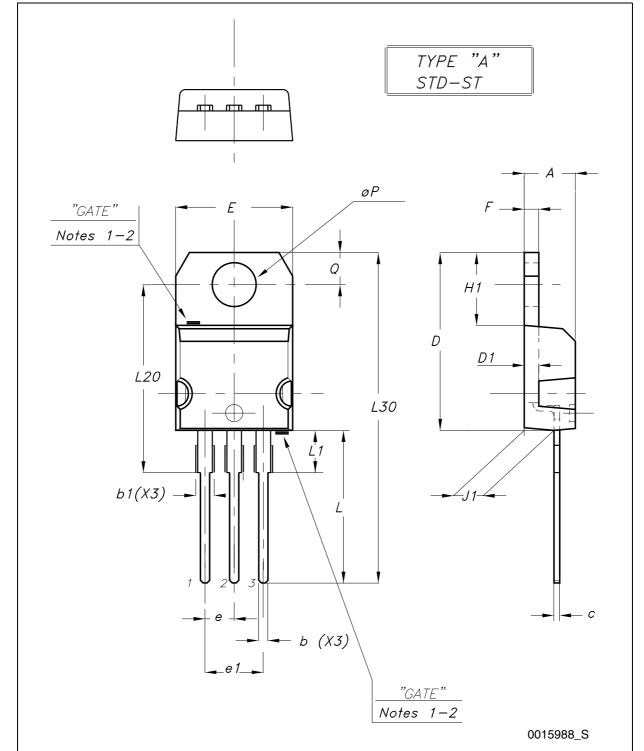


Figure 30. Drawing dimension TO-220 (type STD-ST Dual Gauge)

Note: 1 Maximum resin gate protrusion: 0.5 mm.

2 Resin gate position is accepted in each of the two positions shown on the drawing, or their symmetrical.

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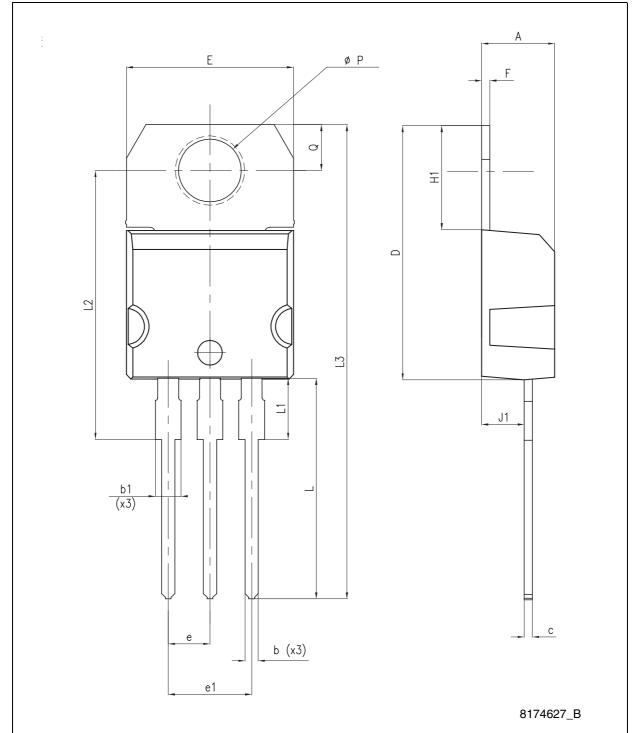
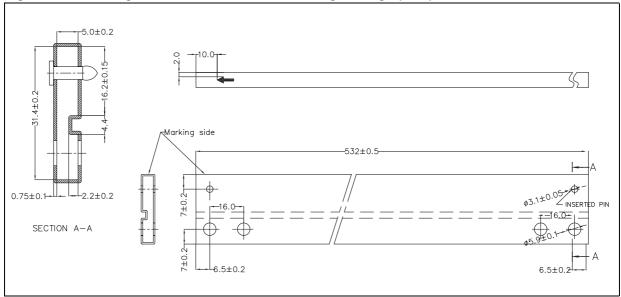


Figure 31. Drawing dimension TO-220 (type STD-ST Single Gauge)

** SECTION A-A

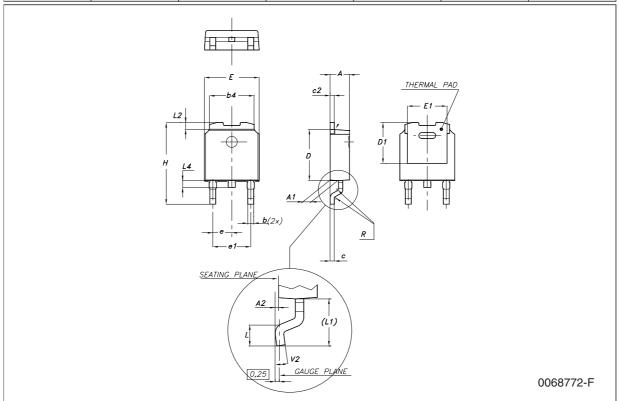
Figure 32. Drawing dimension tube for TO-220 Dual Gauge (mm.)





DPAK mechanical data

Dim.	mm.			inch.		
	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	
Е	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°



E1 c2-L1 D1 b_{-} THERMAL PAD b2 SEATING PLANE A 1 COPLANARITY R 0.25 GAUGE PLANE V2_ 0079457/L

Figure 34. Drawing dimension D²PAK (type STD-ST)

– E1 —**→** c2-L1 D1 D *L2* THERMAL PAD b2 _e1_**_** SEATING PLANE A1→ GAUGE PLANE 0.25 V2. 0079457/L

Figure 35. Drawing dimension D²PAK (type WOOSEOK-SUBCON.)

Table 13. D2PAK mechanical data

	Type STD-ST mm.			Type WOOSEOK-Subcon. mm.			
Dim.							
	Min.	Тур.	Max.	Min.	Тур.	Max.	
Α	4.40		4.60	4.30		4.70	
A1	0.03		0.23	0		0.20	
b	0.70		0.93	0.70		0.90	
b2	1.14		1.70	1.17		1.37	
С	0.45		0.60	0.45	0.50	0.60	
c2	1.23		1.36	1.25	1.30	1.40	
D	8.95		9.35	9	9.20	9.40	
D1	7.50			7.50			
Е	10		10.40	9.80		10.20	
E1	8.50			7.50			
е		2.54			2.54		
e1	4.88		5.28		5.08		
Н	15		15.85	15	15.30	15.60	
J1	2.49		2.69	2.20		2.60	
L	2.29		2.79	1.79		2.79	
L1	1.27		1.40	1		1.40	
L2	1.30		1.75	1.20		1.60	
R		0.4			0.30		
V2	0°		8°	0°		3°	

Note: The D²PAK package coming from the subcontractor Wooseok is fully compatible with the ST's package suggested footprint.

Figure 36. D²PAK footprint recommended data

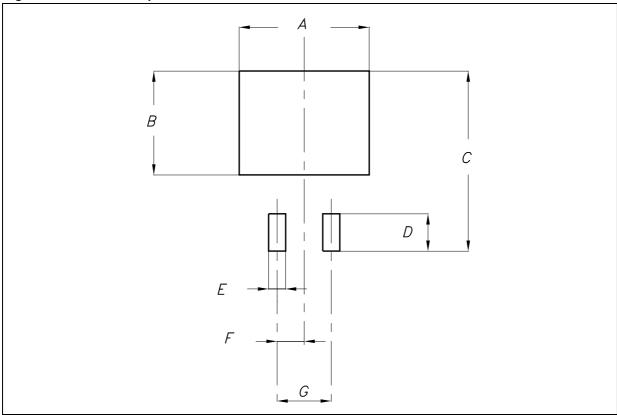


Table 14. Footprint data

Values						
	mm.	inch.				
Α	12.20	0.480				
В	9.75	0.384				
С	16.90	0.665				
D	3.50	0.138				
Е	1.60	0.063				
F	2.54	0.100				
G	5.08	0.200				

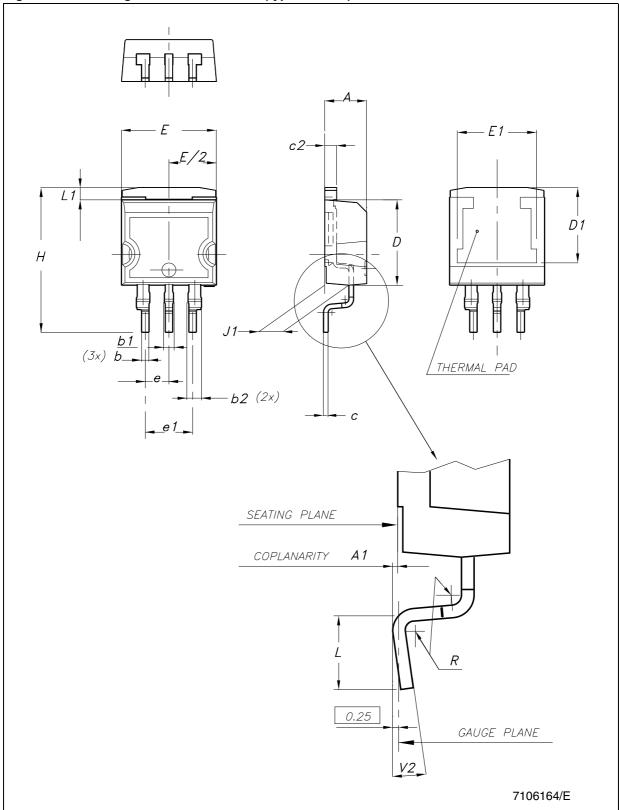


Figure 37. Drawing dimension D²PAK/A (type STD-ST)

– E1 – c2-D1 D (3x) b_ THERMAL PAD -b2 SEATING PLANE A1-GAUGE PLANE 0.25 *V2* 7106164/E

Figure 38. Drawing dimension D²PAK/A (type WOOSEOK-Subcon.)

Table 15. D2PAK/A mechanical data

		Type STD-ST		Туре	WOOSEOK-Su	bcon.
Dim.		mm.		mm.		
	Min.	Тур.	Max.	Min.	Тур.	Max.
Α	4.40		4.60	4.30		4.70
A1	0.03		0.23	0		0.20
b	0.70		0.93	0.70		0.90
b1	0.80		1.30			
b2	1.14		1.70	1.17		1.37
С	0.45		0.60	0.45	0.50	0.60
c2	1.23		1.36	1.25	1.30	1.40
D	8.95		9.35	9	9.20	9.40
D1	7.50			7.50		
E	10		10.40	9.80		10.20
E1	8.50			7.50		
е		2.54			2.54	
e1	4.88		5.28		5.08	
Н	15		15.85	15	15.30	15.60
J1	2.49		2.69	2.20		2.60
L	2.29		2.79	1.79		2.79
L1	1.27		1.40	1		1.40
R		0.4			0.30	
V2	0°		8°	0°		3°

Note: The D²PAK/A package coming from the subcontractor Wooseok is fully compatible with the ST's package suggested footprint.

Figure 39. D2PAK/A footprint recommended data

Table 16. Footprint data

Values						
	mm.	inch.				
А	12.20	0.480				
В	9.75	0.384				
С	16.90	0.665				
D	3.50	0.138				
E	1.60	0.063				
F	2.54	0.100				
G	5.08	0.200				

G

Table 17. DFN8L (4x4 mm.) mechanical data

Dim.		mm.					
Dilli.	Min.	Тур.	Max.				
А	0.80	0.90	1				
A1	0	0.02	0.05				
A3		0,20					
b	0.23	0.30	0.38				
D	3.90	4	4.10				
D2	2.82	3	3.23				
E	3.90	4	4.10				
E2	2.05	2.20	2.30				
е		0.80					
L	0.40	0.50	0.60				

BOTTOM VIEW D2 — EXPOSED PAD PIN 1 ID -2 E2 L 8x - b 8x e/2 \perp e \downarrow ___ // 0.1 C -*A3* SEATING PLANE C0.08 C LEADS COPLANARITY PIN 1 ID -_D/2→ TOP VIEW 7869653_B D-

Figure 40. DFN8L package outline

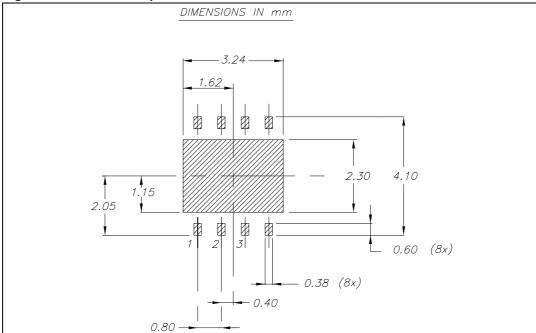


Figure 41. DFN8L footprint - recommended data

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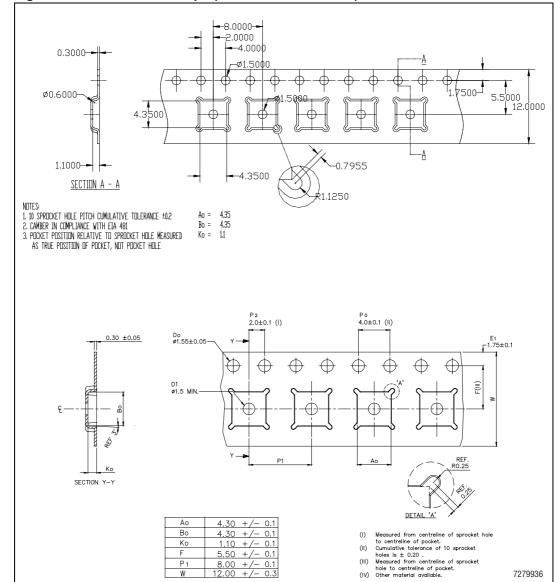


Figure 42. DFN8L carrier tape (dimension are in mm.)

Figure 43. Reel DFN8L drawing

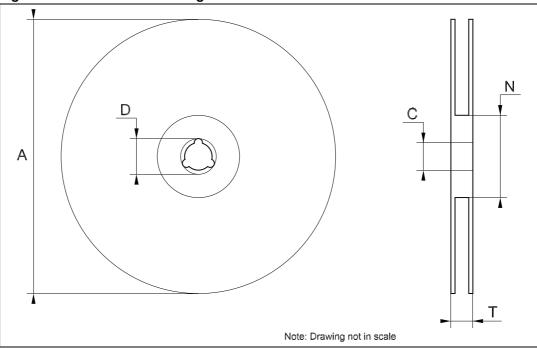
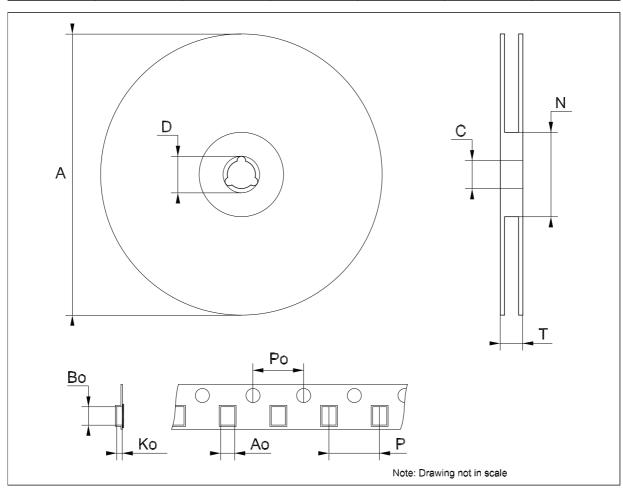


Table 18. Reel DFN8L dimensions

Dim.		mm.			inch.		
	Min.	Тур.	Max.	Min.	Тур.	Max.	
Α			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	

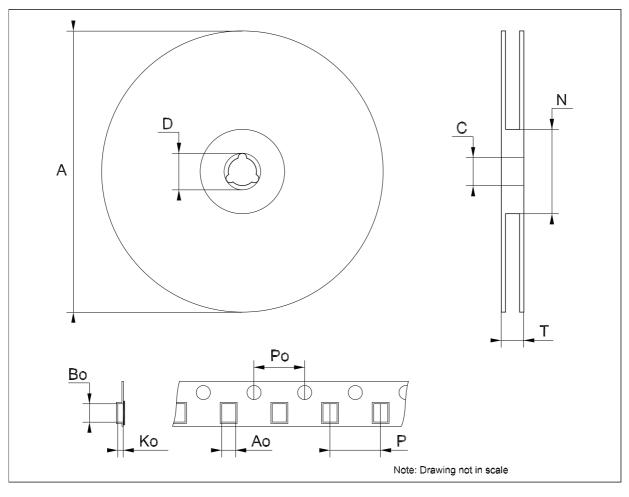
Tape & reel	DPAK-PPAK mechanical	data
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Dim.	mm.			inch.		
Dilli.	Min.	Тур.	Max.	Min.	Тур.	Max.
А			330			12.992
С	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
Т			22.4			0.882
Ao	6.80	6.90	7.00	0.268	0.272	0.2.76
Во	10.40	10.50	10.60	0.409	0.413	0.417
Ko	2.55	2.65	2.75	0.100	0.104	0.105
Ро	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 D²PAK-P²PAK/A-P²PAK/A mechanical data

Dim.	mm.			inch.		
	Min.	Тур.	Max.	Min.	Тур.	Max.
А			180			7.086
С	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
Т			14.4			0.567
Ao	10.50	10.6	10.70	0.413	0.417	0.421
Во	15.70	15.80	15.90	0.618	0.622	0.626
Ko	4.80	4.90	5.00	0.189	0.193	0.197
Ро	3.9	4.0	4.1	0.153	0.157	0.161
Р	11.9	12.0	12.1	0.468	0.472	0.476



Order codes LD1086xx

8 Order codes

Table 19. Order codes

Packages							
TO-220	D²PAK	D²PAK/A	DPAK DFN8		Output voltages		
LD1086V18	LD1086D2T18TR		LD1086DT18TR		1.8 V		
	LD1086D2T25TR		LD1086DT25TR		2.5 V		
LD1086V33	LD1086D2T33TR	LD1086D2M33TR	LD1086DT33TR		3.3 V		
	LD1086D2T50TR		LD1086DT50TR		5.0 V		
	LD1086D2T12TR				12.0 V		
LD1086V	LD1086D2TTR	LD1086D2MTR	LD1086DTTR	LD1086PUR	ADJ		
LD1086V-DG ⁽¹⁾					ADJ		
LD1086VY ⁽²⁾			LD1086DTTRY (2)		ADJ		

^{1.} TO-220 Dual Gauge frame.

^{2.} Automotive Grade products.

LD1086xx Revision history

9 Revision history

Table 20. Document revision history

Date	Revision	Changes	
16-May-2006	14	Order codes updated and new template.	
19-Jan-2007	15	D²PAK mechanical data updated and add footprint data.	
05-Apr-2007	16	Order codes updated.	
07-Jun-2007	17	Order codes updated.	
19-Jul-2007	18	Add note on Figure 2.	
03-Dec-2007	19	Modified: Table 19.	
31-Jan-2008	20	Added new order codes for Automotive grade products.	
18-Feb-2008	21	Modified: Table 19 on page 42.	
14-Jul-2008	22	Modified: Table 1 on page 1 and Table 19 on page 42.	
10-Mar-2010	23	Added: Table 12 on page 22, Figure 30 on page 23, Figure 31 on page 24, Figure 32 and Figure 33 on page 25.	
15-Nov-2010	24	Modified: R _{thJC} value for TO-220 <i>Table 3 on page 7</i> .	
11-Jul-2011	25	Modified: Figure 24, Figure 25 on page 20 and Table 19 on page 42.	
10-Feb-2012	26	Added: order code LD1086V-DG Table 19 on page 42.	
15-Mar-2012	27	Added: new order code LD1086PUR Table 19 on page 42 and new packag mechanical data DFN8 (4x4 mm) Table 17 on page 35, Figure 40 on page Figure 41 on page 37, Figure 42 on page 38 and Figure 43 on page 39.	

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