



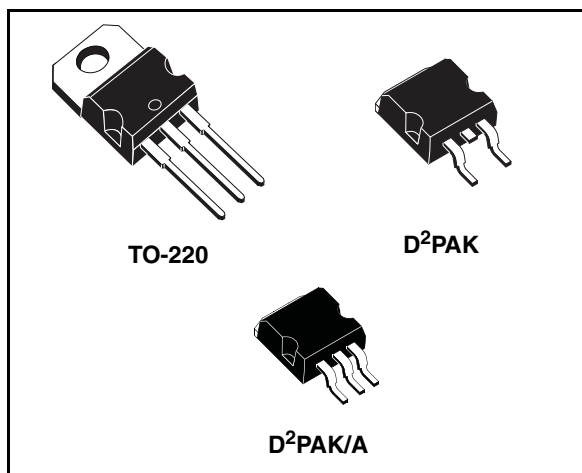
# THE DATASHEET OF LD1084V33



## 5A Low drop positive voltage regulator adjustable and fixed

### Feature summary

- Typical dropout 1.3V (at 5A)
- Three terminal adjustable or fixed output voltage 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 3.6V, 5V, 8V, 9V, 12V.
- Guaranteed output current up to 5A
- Output tolerance  $\pm 1\%$  at 25°C and  $\pm 2\%$  in full temperature range
- Internal power and thermal limit
- Wide operating temperature range -40°C to 125°C
- Package available: TO-220, D<sup>2</sup>PAK, D<sup>2</sup>PAK/A
- Pinout compatibility with standard adjustable VREG



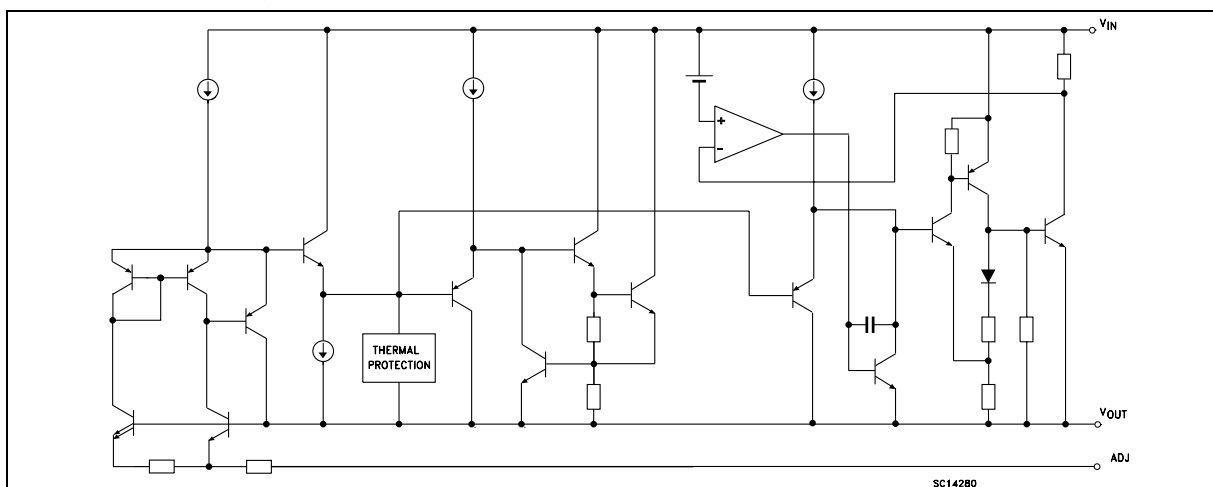
### Description

The LD1084 is a LOW DROP Voltage Regulator able to provide up to 5A of Output Current. Dropout is guaranteed at a maximum of 1.5V at the maximum output current, decreasing at lower loads. The LD1084 is pin to pin compatible with the older 3-terminal adjustable regulators, but has better performances in term of drop and output tolerance.

A 2.85V output version is suitable for SCSI-2 active termination. Unlike PNP regulators, where a part of the output current is wasted as quiescent current, the LD1084 quiescent current flows into the load, so increase efficiency. Only a 10 $\mu$ F minimum capacitor is need for stability.

The device is supplied in TO-220, D<sup>2</sup>PAK and D<sup>2</sup>PAK/A. On chip trimming allows the regulator to reach a very tight output voltage tolerance, within  $\pm 1\%$  at 25°C.

### Schematic diagram



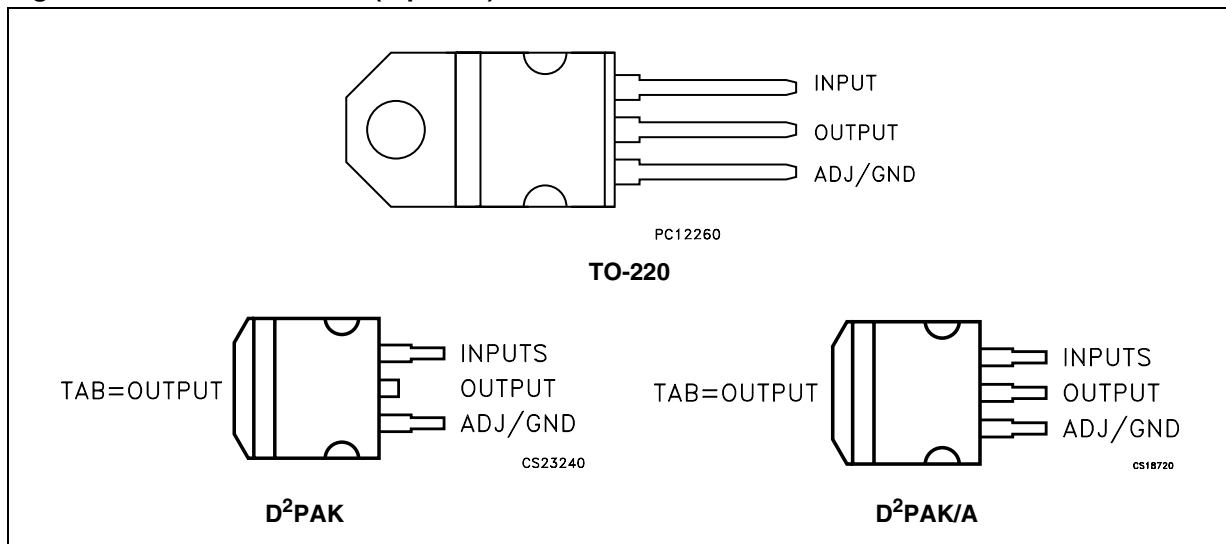
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## Contents

<b>1</b>	<b>Pin configuration</b> .....	<b>3</b>
<b>2</b>	<b>Maximum ratings</b> .....	<b>4</b>
<b>3</b>	<b>Schematic application</b> .....	<b>5</b>
<b>4</b>	<b>Electrical characteristics</b> .....	<b>6</b>
<b>5</b>	<b>Typical application</b> .....	<b>17</b>
<b>6</b>	<b>Package mechanical data</b> .....	<b>22</b>
<b>7</b>	<b>Order code</b> .....	<b>27</b>
<b>8</b>	<b>Revision history</b> .....	<b>28</b>

# 1 Pin configuration

Figure 1. Pin connections (top view)



## 2 Maximum ratings

**Table 1. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_I$	DC Input voltage	30	V
$I_O$	Output current	Internally Limited	mA
$P_D$	Power dissipation	Internally Limited	mW
$T_{STG}$	Storage temperature range	-55 to +150	°C
$T_{OP}$	Operating junction temperature range	-40 to +125	°C

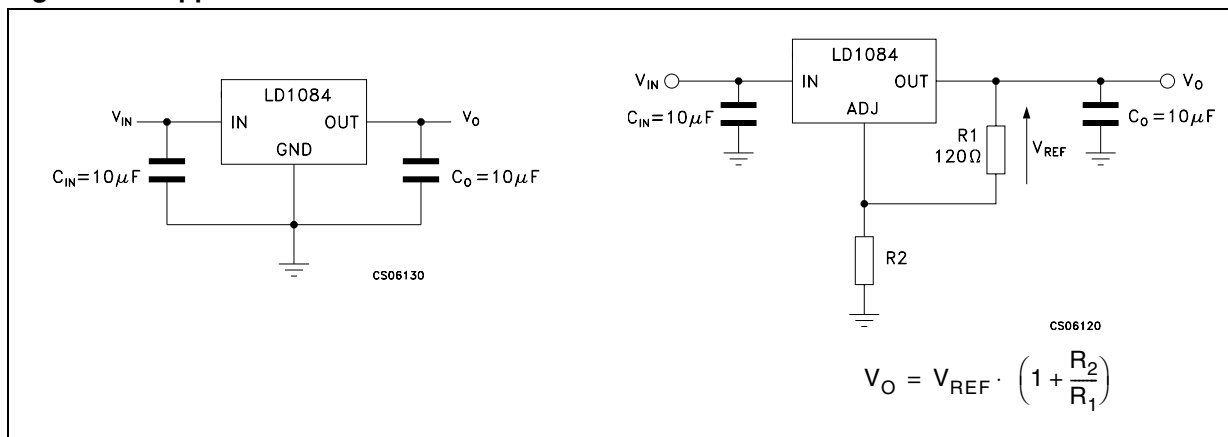
*Note: Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied*

**Table 2. Thermal Data**

Symbol	Parameter	TO-220	D <sup>2</sup> PAK	Unit
$R_{thJC}$	Thermal resistance junction-case	3	3	°C/W
$R_{thJA}$	Thermal resistance junction-ambient	50	62.5	°C/W

### 3 Schematic application

Figure 2. Application circuit



## 4 Electrical characteristics

**Table 3. Electrical characteristics of LD1084#15**  
( $V_I=4.5V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
$V_O$	Output voltage <sup>(1)</sup>	$I_O = 0$ mA, $T_J = 25^\circ C$	1.485	1.5	1.515	V
		$I_O = 0$ to 5A, $V_I = 3.1$ to 30V	1.47	1.5	1.53	V
$\Delta V_O$	Line Regulation	$I_O = 0$ mA, $V_I = 3.1$ to 18V, $T_J = 25^\circ C$		0.5	6	mV
		$I_O = 0$ mA, $V_I = 3.1$ to 15V		0.1	6	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to 5A, $T_J = 25^\circ C$		3	15	mV
		$I_O = 0$ to 5A		7	20	mV
$V_d$	Dropout Voltage	$I_O = 5$ A		1.3	1.5	V
$I_q$	Quiescent Current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short Circuit Current	$V_I - V_O = 5V$	5.5	6.5		A
		$V_I - V_O = 25V$	0.5	0.7		A
	Thermal Regulation	$T_A = 25^\circ C$ , 30ms pulse		0.003	0.015	%/W
SVR	Supply Voltage Rejection	$f = 120$ Hz, $C_O = 25\mu F$ , $I_O = 5A$ $V_I = 6.8 \pm 3V$	60	75		dB
eN	RMS Output Noise Voltage (% of $V_O$ )	$T_A = 25^\circ C$ , $f=10Hz$ to 10KHz		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	$T_A = 125^\circ C$ , 1000Hrs		0.5		%

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

**Table 4. Electrical characteristics of LD1084#18**(V<sub>I</sub>=4.8V, C<sub>I</sub> = C<sub>O</sub> =10μF, T<sub>A</sub> = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V <sub>O</sub>	Output voltage <sup>(1)</sup>	I <sub>O</sub> = 0 mA, T <sub>J</sub> = 25°C	1.782	1.8	1.818	V
		I <sub>O</sub> = 0 to 5A, V <sub>I</sub> = 3.4 to 30V	1.764	1.8	1.836	V
ΔV <sub>O</sub>	Line Regulation	I <sub>O</sub> = 0 mA, V <sub>I</sub> = 3.4 to 18V T <sub>J</sub> = 25°C		0.5	6	mV
		I <sub>O</sub> = 0 mA, V <sub>I</sub> = 3.4 to 15V		0.1	6	mV
ΔV <sub>O</sub>	Load Regulation	I <sub>O</sub> = 0 to 5A, T <sub>J</sub> = 25°C		3	15	mV
		I <sub>O</sub> = 0 to 35A		7	20	mV
V <sub>d</sub>	Dropout Voltage	I <sub>O</sub> = 5 A		1.3	1.5	V
I <sub>q</sub>	Quiescent Current	V <sub>I</sub> ≤30V		5	10	mA
I <sub>sc</sub>	Short Circuit Current	V <sub>I</sub> - V <sub>O</sub> = 5V	5.5	6.5		A
		V <sub>I</sub> - V <sub>O</sub> = 25V	0.5	0.7		A
	Thermal Regulation	T <sub>A</sub> = 25°C, 30ms pulse		0.003	0.015	%/W
SVR	Supply Voltage Rejection	f = 120 Hz, C <sub>O</sub> = 25μF, I <sub>O</sub> = 5A V <sub>I</sub> = 6.8 ± 3V	60	75		dB
eN	RMS Output Noise Voltage (% of V <sub>O</sub> )	T <sub>A</sub> = 25°C, f =10Hz to 10KHz		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	T <sub>A</sub> = 125°C, 1000Hrs		0.5		%

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

**Table 5. Electrical characteristics of LD1084#25**(V<sub>I</sub>=5.5V, C<sub>I</sub> = C<sub>O</sub> =10μF, T<sub>A</sub> = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V <sub>O</sub>	Output voltage <sup>(1)</sup>	I <sub>O</sub> = 0 mA, T <sub>J</sub> = 25°C	2.475	2.5	2.525	V
		I <sub>O</sub> = 0 to 5A, V <sub>I</sub> = 4.1 to 30V	2.45	2.5	2.55	V
ΔV <sub>O</sub>	Line regulation	I <sub>O</sub> = 0 mA, V <sub>I</sub> = 4.1 to 18V, T <sub>J</sub> = 25°C		0.5	6	mV
		I <sub>O</sub> = 0 mA, V <sub>I</sub> = 4.1 to 18V		0.1	6	mV
ΔV <sub>O</sub>	Load regulation	I <sub>O</sub> = 0 to 5A, T <sub>J</sub> = 25°C		3	15	mV
		I <sub>O</sub> = 0 to 5A		7	20	mV
V <sub>d</sub>	Dropout voltage	I <sub>O</sub> = 5A		1.3	1.5	V
I <sub>q</sub>	Quiescent current	V <sub>I</sub> ≤ 30V		5	10	mA
I <sub>sc</sub>	Short circuit current	V <sub>I</sub> - V <sub>O</sub> = 5V	5.5	6.5		A
		V <sub>I</sub> - V <sub>O</sub> = 25V	0.5	0.7		A
	Thermal regulation	T <sub>A</sub> = 25°C, 30ms pulse		0.003	0.015	%/W
SVR	Supply voltage rejection	f = 120 Hz, C <sub>O</sub> = 25μF, I <sub>O</sub> = 5A V <sub>I</sub> = 7.5 ± 3V	60	72		dB
eN	RMS Output noise voltage (% of V <sub>O</sub> )	T <sub>A</sub> = 25°C, f = 10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T <sub>A</sub> = 125°C, 1000Hrs		0.5		%

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

**Table 6. Electrical characteristics of LD1084#285**  
 ( $V_I=5.85V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
$V_O$	Output voltage <sup>(1)</sup>	$I_O = 0$ mA, $T_J = 25^\circ C$	2.821	2.85	2.879	V
		$I_O = 0$ to 5A, $V_I = 4.5$ to 30V	2.793	2.85	2.907	V
$\Delta V_O$	Line regulation	$I_O = 0$ mA, $V_I = 4.5$ to 18V, $T_J = 25^\circ C$		0.5	6	mV
		$I_O = 0$ mA, $V_I = 4.5$ to 18V		0.1	6	mV
$\Delta V_O$	Load regulation	$I_O = 0$ to 5A, $T_J = 25^\circ C$		3	15	mV
		$I_O = 0$ to 5A		7	20	mV
$V_d$	Dropout voltage	$I_O = 5A$		1.3	1.5	V
$I_q$	Quiescent current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short circuit current	$V_I - V_O = 5V$	5.5	6.5		A
		$V_I - V_O = 25V$	0.5	0.7		A
	Thermal regulation	$T_A = 25^\circ C$ , 30ms pulse		0.003	0.015	%/W
SVR	Supply voltage rejection	$f = 120$ Hz, $C_O = 25\mu F$ , $I_O = 5A$ $V_I = 7.85 \pm 3V$	60	72		dB
eN	RMS Output noise voltage (% of $V_O$ )	$T_A = 25^\circ C$ , $f = 10Hz$ to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	$T_A = 125^\circ C$ , 1000Hrs		0.5		%

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

**Table 7. Electrical characteristics of LD1084#33**(V<sub>I</sub>=6.3V, C<sub>I</sub> = C<sub>O</sub> =10μF, T<sub>A</sub> = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V <sub>O</sub>	Output voltage <sup>(1)</sup>	I <sub>O</sub> = 0 mA, T <sub>J</sub> = 25°C	3.267	3.3	3.333	V
		I <sub>O</sub> = 0 to 5A, V <sub>I</sub> = 4.9 to 30V	3.234	3.35	3.366	V
ΔV <sub>O</sub>	Line regulation	I <sub>O</sub> = 0 mA, V <sub>I</sub> = 4.9 to 18V, T <sub>J</sub> = 25°C		0.5	6	mV
		I <sub>O</sub> = 0 mA, V <sub>I</sub> = 4.9 to 18V		0.1	6	mV
ΔV <sub>O</sub>	Load regulation	I <sub>O</sub> = 0 to 5A, T <sub>J</sub> = 25°C		3	15	mV
		I <sub>O</sub> = 0 to 5A		7	20	mV
V <sub>d</sub>	Dropout voltage	I <sub>O</sub> = 5A		1.3	1.5	V
I <sub>q</sub>	Quiescent current	V <sub>I</sub> ≤ 30V		5	10	mA
I <sub>sc</sub>	Short circuit current	V <sub>I</sub> - V <sub>O</sub> = 5V	5.5	6.5		A
		V <sub>I</sub> - V <sub>O</sub> = 25V	0.5	0.7		A
	Thermal regulation	T <sub>A</sub> = 25°C, 30ms pulse		0.003	0.015	%/W
SVR	Supply voltage rejection	f = 120 Hz, C <sub>O</sub> = 25μF, I <sub>O</sub> = 5A V <sub>I</sub> = 8.3 ± 3V	60	72		dB
eN	RMS Output noise voltage (% of V <sub>O</sub> )	T <sub>A</sub> = 25°C, f = 10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T <sub>A</sub> = 125°C, 1000Hrs		0.5		%

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

**Table 8. Electrical characteristics of LD1084#36**(V<sub>I</sub>=6.6V, C<sub>I</sub> = C<sub>O</sub> =10μF, T<sub>A</sub> = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V <sub>O</sub>	Output voltage <sup>(1)</sup>	I <sub>O</sub> = 0 mA, T <sub>J</sub> = 25°C	3.564	3.6	3.636	V
		I <sub>O</sub> = 0 to 5A, V <sub>I</sub> = 5.2 to 30V	3.528	3.6	3.672	V
ΔV <sub>O</sub>	Line regulation	I <sub>O</sub> = 0 mA, V <sub>I</sub> = 5.2 to 18V, T <sub>J</sub> = 25°C		0.5	10	mV
		I <sub>O</sub> = 0 mA, V <sub>I</sub> = 5.2 to 18V		0.1	10	mV
ΔV <sub>O</sub>	Load regulation	I <sub>O</sub> = 0 to 5A, T <sub>J</sub> = 25°C		3	15	mV
		I <sub>O</sub> = 0 to 5A		7	20	mV
V <sub>d</sub>	Dropout voltage	I <sub>O</sub> = 5A		1.3	1.5	V
I <sub>q</sub>	Quiescent current	V <sub>I</sub> ≤ 30V		5	10	mA
I <sub>sc</sub>	Short circuit current	V <sub>I</sub> - V <sub>O</sub> = 5V	5.5	6.5		A
		V <sub>I</sub> - V <sub>O</sub> = 25V	0.5	0.7		A
	Thermal regulation	T <sub>A</sub> = 25°C, 30ms pulse		0.003	0.015	%/W
SVR	Supply voltage rejection	f = 120 Hz, C <sub>O</sub> = 25μF, I <sub>O</sub> = 5A V <sub>I</sub> = 8.6 ± 3V	60	72		dB
eN	RMS Output noise voltage (% of V <sub>O</sub> )	T <sub>A</sub> = 25°C, f = 10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T <sub>A</sub> = 125°C, 1000Hrs		0.5		%

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

**Table 9. Electrical characteristics of LD1084#5**  
 ( $V_I=8V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
$V_O$	Output voltage <sup>(1)</sup>	$I_O = 0$ mA, $T_J = 25^\circ C$	4.95	5	5.05	V
		$I_O = 0$ to 5A, $V_I = 6.6$ to 30V	4.9	5	5.1	V
$\Delta V_O$	Line regulation	$I_O = 0$ mA, $V_I = 6.6$ to 20V, $T_J = 25^\circ C$		0.5	10	mV
		$I_O = 0$ mA, $V_I = 6.6$ to 20V		1	10	mV
$\Delta V_O$	Load regulation	$I_O = 0$ to 5A, $T_J = 25^\circ C$		5	20	mV
		$I_O = 0$ to 5A		10	35	mV
$V_d$	Dropout voltage	$I_O = 5A$		1.3	1.5	V
$I_q$	Quiescent current	$V_I \leq 30V$		5	10	mA
$I_{sc}$	Short circuit current	$V_I - V_O = 5V$	5.5	6.5		A
		$V_I - V_O = 25V$	0.5	0.7		A
	Thermal regulation	$T_A = 25^\circ C$ , 30ms pulse		0.003	0.015	%/W
SVR	Supply voltage rejection	$f = 120$ Hz, $C_O = 25\mu F$ , $I_O = 5A$ $V_I = 10 \pm 3V$	60	72		dB
eN	RMS Output noise voltage (% of $V_O$ )	$T_A = 25^\circ C$ , $f = 10Hz$ to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	$T_A = 125^\circ C$ , 1000Hrs		0.5		%

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

**Table 10. Electrical characteristics of LD1084#8**(V<sub>I</sub>=11V, C<sub>I</sub> = C<sub>O</sub> =10μF, T<sub>A</sub> = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V <sub>O</sub>	Output voltage <sup>(1)</sup>	I <sub>O</sub> = 0 mA, T <sub>J</sub> = 25°C	7.92	8	8.08	V
		I <sub>O</sub> = 0 to 5A, V <sub>I</sub> = 9.6 to 30V	7.84	8	8.16	V
ΔV <sub>O</sub>	Line regulation	I <sub>O</sub> = 0 mA, V <sub>I</sub> = 9.6 to 20V, T <sub>J</sub> = 25°C		1	18	mV
		I <sub>O</sub> = 0 mA, V <sub>I</sub> = 9.6 to 20V		2	18	mV
ΔV <sub>O</sub>	Load regulation	I <sub>O</sub> = 0 to 5A, T <sub>J</sub> = 25°C		8	30	mV
		I <sub>O</sub> = 0 to 5A		12	60	mV
V <sub>d</sub>	Dropout voltage	I <sub>O</sub> = 5A		1.3	1.5	V
I <sub>q</sub>	Quiescent current	V <sub>I</sub> ≤ 30V		5	10	mA
I <sub>sc</sub>	Short circuit current	V <sub>I</sub> - V <sub>O</sub> = 5V	5.5	6.5		A
		V <sub>I</sub> - V <sub>O</sub> = 25V	0.5	0.7		A
	Thermal regulation	T <sub>A</sub> = 25°C, 30ms pulse		0.003	0.015	%/W
SVR	Supply voltage rejection	f = 120 Hz, C <sub>O</sub> = 25μF, I <sub>O</sub> = 5A V <sub>I</sub> = 13 ± 3V	54	71		dB
eN	RMS Output noise voltage (% of V <sub>O</sub> )	T <sub>A</sub> = 25°C, f = 10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T <sub>A</sub> = 125°C, 1000Hrs		0.5		%

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

**Table 11. Electrical characteristics of LD1084#9**(V<sub>I</sub>=12V, C<sub>I</sub> = C<sub>O</sub> =10μF, T<sub>A</sub> = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V <sub>O</sub>	Output voltage <sup>(1)</sup>	I <sub>O</sub> = 0 mA, T <sub>J</sub> = 25°C	8.91	9	9.09	V
		I <sub>O</sub> = 0 to 3A, V <sub>I</sub> = 10.6 to 30V	8.82	9	9.18	V
ΔV <sub>O</sub>	Line regulation	I <sub>O</sub> = 0 mA, V <sub>I</sub> = 10.6 to 20V, T <sub>J</sub> =25°C		1	20	mV
		I <sub>O</sub> = 0 mA, V <sub>I</sub> = 10.6 to 20V		2	20	mV
ΔV <sub>O</sub>	Load regulation	I <sub>O</sub> = 0 to 5A, T <sub>J</sub> = 25°C		8	30	mV
		I <sub>O</sub> = 0 to 5A		12	60	mV
V <sub>d</sub>	Dropout voltage	I <sub>O</sub> = 5A		1.3	1.5	V
I <sub>q</sub>	Quiescent current	V <sub>I</sub> ≤ 30V		5	10	mA
I <sub>sc</sub>	Short circuit current	V <sub>I</sub> - V <sub>O</sub> = 5V	5.5	6.5		A
		V <sub>I</sub> - V <sub>O</sub> = 25V	0.5	0.7		A
	Thermal regulation	T <sub>A</sub> = 25°C, 30ms pulse		0.003	0.015	%/W
SVR	Supply voltage rejection	f = 120 Hz, C <sub>O</sub> = 25μF, I <sub>O</sub> = 5A V <sub>I</sub> = 14 ± 3V	54	70		dB
eN	RMS Output noise voltage (% of V <sub>O</sub> )	T <sub>A</sub> = 25°C, f = 10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T <sub>A</sub> = 125°C, 1000Hrs		0.5		%

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

**Table 12. Electrical characteristics of LD1084#12**(V<sub>I</sub>=15V, C<sub>I</sub> = C<sub>O</sub> =10μF, T<sub>A</sub> = -40 to 125°C, unless otherwise specified).

Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V <sub>O</sub>	Output voltage <sup>(1)</sup>	I <sub>O</sub> = 0 mA, T <sub>J</sub> = 25°C	11.88	12	12.12	V
		I <sub>O</sub> = 0 to 5A, V <sub>I</sub> = 13.6 to 30V	11.76	12	12.24	V
ΔV <sub>O</sub>	Line regulation	I <sub>O</sub> = 0 mA, V <sub>I</sub> = 13.6 to 25V, T <sub>J</sub> = 25°C		2	25	mV
		I <sub>O</sub> = 0 mA, V <sub>I</sub> = 13.6 to 25V		4	25	mV
ΔV <sub>O</sub>	Load regulation	I <sub>O</sub> = 0 to 5A, T <sub>J</sub> = 25°C		12	36	mV
		I <sub>O</sub> = 0 to 5A		24	72	mV
V <sub>d</sub>	Dropout voltage	I <sub>O</sub> = 5A		1.3	1.5	V
I <sub>q</sub>	Quiescent current	V <sub>I</sub> ≤ 30V		5	10	mA
I <sub>sc</sub>	Short circuit current	V <sub>I</sub> - V <sub>O</sub> = 5V	5.5	6.5		A
		V <sub>I</sub> - V <sub>O</sub> = 25V	0.5	0.7		A
	Thermal regulation	T <sub>A</sub> = 25°C, 30ms pulse		0.003	0.015	%/W
SVR	Supply voltage rejection	f = 120 Hz, C <sub>O</sub> = 25μF, I <sub>O</sub> = 5A V <sub>I</sub> = 17 ± 3V	54	66		dB
eN	RMS Output noise voltage (% of V <sub>O</sub> )	T <sub>A</sub> = 25°C, f = 10Hz to 10KHz		0.003		%
S	Temperature stability			0.5		%
S	Long term stability	T <sub>A</sub> = 125°C, 1000Hrs		0.5		%

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

**Table 13. Electrical characteristics of LD1084**(V<sub>I</sub>=4.25V, C<sub>I</sub> = C<sub>O</sub> =10μF, T<sub>A</sub> = -40 to 125°C, unless otherwise specified).

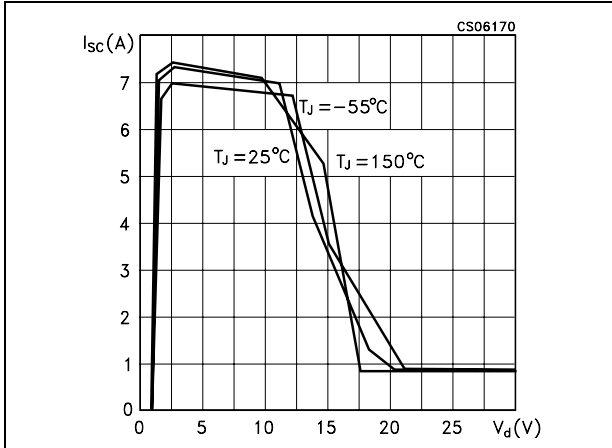
Symbol	Parameter	Test	Min.	Typ.	Max.	Unit
V <sub>O</sub>	Output voltage <sup>(1)</sup>	I <sub>O</sub> = 10mA T <sub>J</sub> = 25°C	1.237	1.25	1.263	V
		I <sub>O</sub> = 10mA to 3A, V <sub>I</sub> = 2.85 to 30V	1.225	1.25	1.275	V
ΔV <sub>O</sub>	Line Regulation	I <sub>O</sub> = 10mA, V <sub>I</sub> = 2.85 to 16.5V, T <sub>J</sub> = 25°C		0.015	0.2	%
		I <sub>O</sub> = 10mA, V <sub>I</sub> = 2.85 to 16.5V		0.035	0.2	%
ΔV <sub>O</sub>	Load Regulation	I <sub>O</sub> = 10mA to 5A, T <sub>J</sub> = 25°C		0.1	0.3	%
		I <sub>O</sub> = 0 to 5A		0.2	0.4	%
V <sub>d</sub>	Dropout Voltage	I <sub>O</sub> = 5A		1.3	1.5	V
I <sub>O(min)</sub>	Minimum Load Current	V <sub>I</sub> = 30V		3	10	mA
I <sub>sc</sub>	Short Circuit Current	V <sub>I</sub> - V <sub>O</sub> = 5V	5.5	6.5		A
		V <sub>I</sub> - V <sub>O</sub> = 25V	0.5	0.7		A
	Thermal Regulation	T <sub>A</sub> = 25°C, 30ms pulse		0.003	0.015	%/W
SVR	Supply Voltage Rejection	f = 120 Hz, C <sub>O</sub> = 25μF, C <sub>ADJ</sub> = 25 μF, I <sub>O</sub> = 5A, V <sub>I</sub> = 6.25 ± 3V	60	72		dB
I <sub>ADJ</sub>	Adjust Pin Current	V <sub>I</sub> = 4.25V, I <sub>O</sub> = 10 mA		55	120	μA
ΔI <sub>ADJ</sub>	Adjust Pin Current Change <sup>(1)</sup>	I <sub>O</sub> = 10mA to 5A, V <sub>I</sub> = 2.85 to 16.5V		0.2	5	μA
eN	RMS Output Noise Voltage (% of V <sub>O</sub> )	T <sub>A</sub> = 25°C, f = 10Hz to 10KHz		0.003		%
S	Temperature Stability			0.5		%
S	Long Term Stability	T <sub>A</sub> = 125°C, 1000Hrs		0.5		%

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

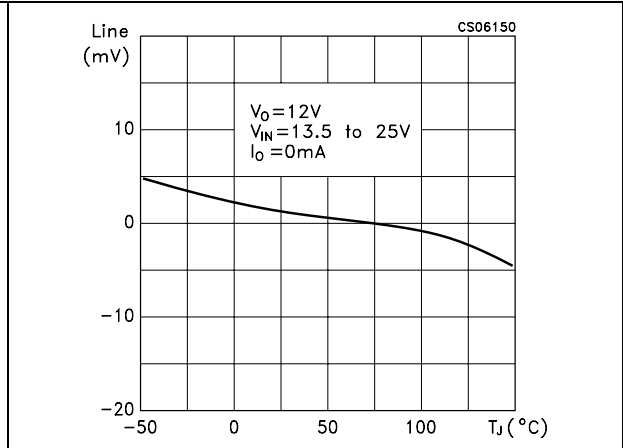
# 5 Typical application

Unless otherwise specified  $T_J = 25^\circ\text{C}$ ,  $C_1 = 10\mu\text{F}$  (tant.),  $C_O = 22\mu\text{F}$  (tant.)

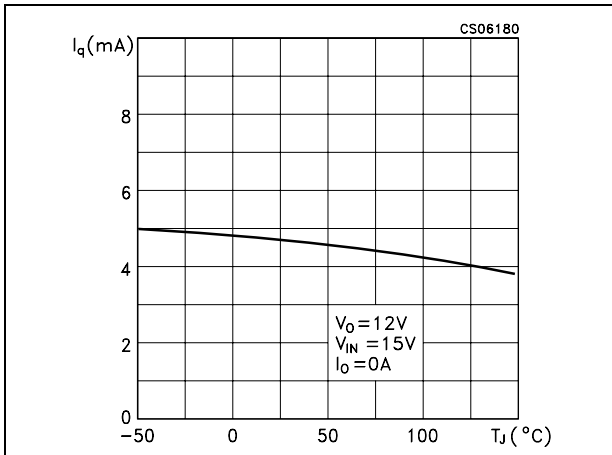
**Figure 3. Short circuit current vs dropout voltage**



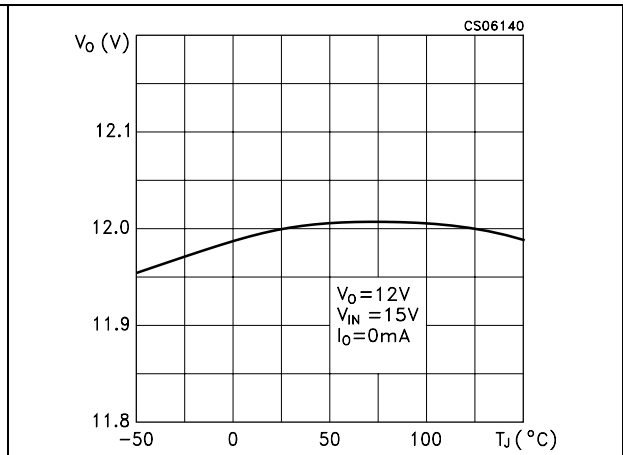
**Figure 4. Line regulation vs temperature**



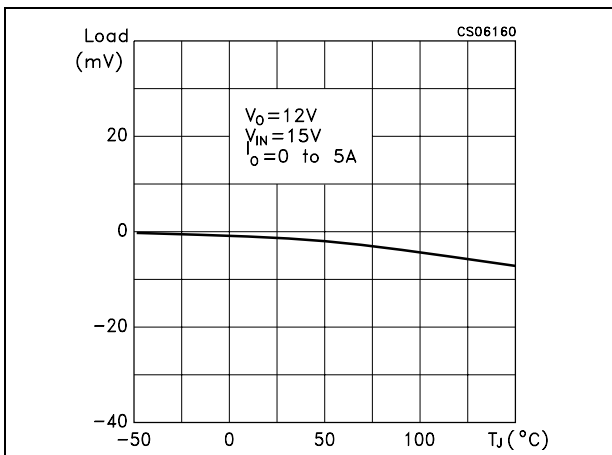
**Figure 5. Quiescent current vs temperature**



**Figure 6. Output voltage vs temperature**



**Figure 7. Load regulation vs temperature**



**Figure 8. Quiescent current vs output voltage**

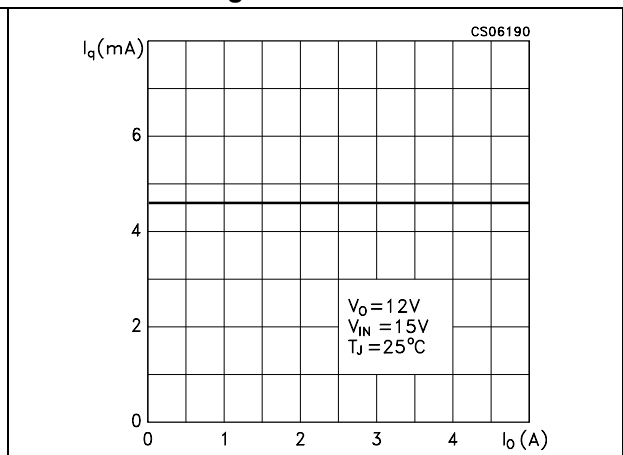


Figure 9. Quiescent current vs input voltage      Figure 10. Dropout voltage vs output current

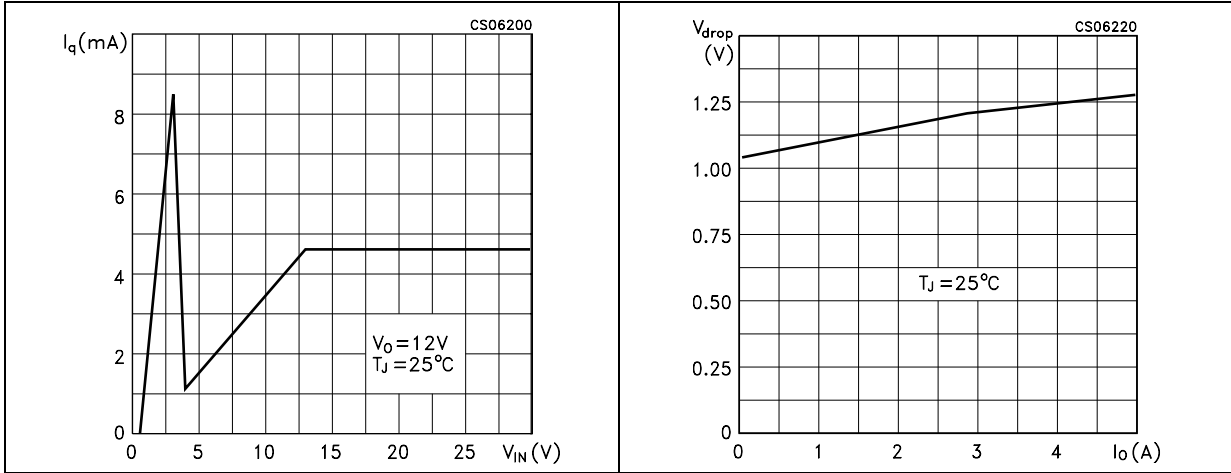


Figure 11. Supply voltage rejection vs output current      Figure 12. Dropout voltage vs temperature

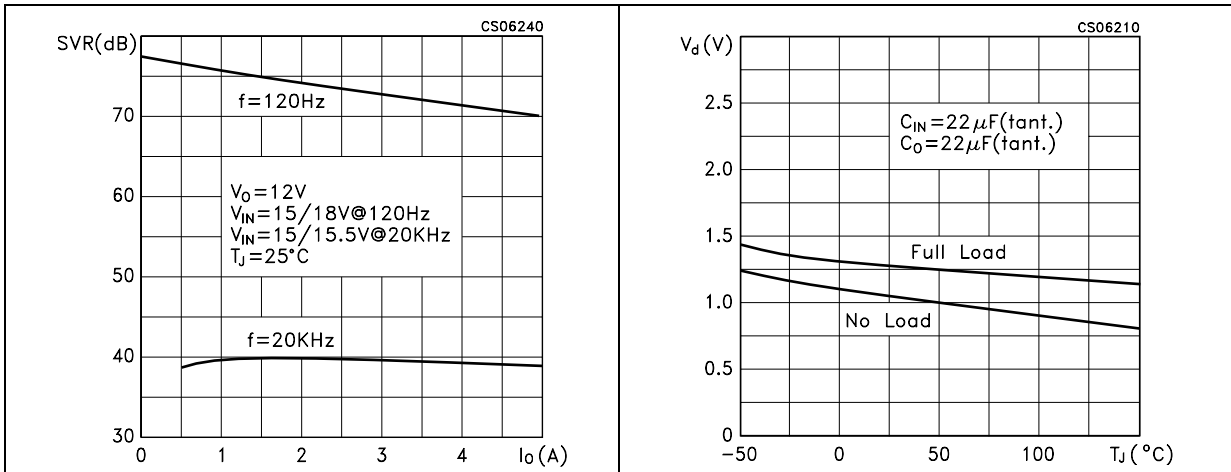


Figure 13. Supply voltage rejection vs temperature      Figure 14. Supply voltage rejection vs frequency

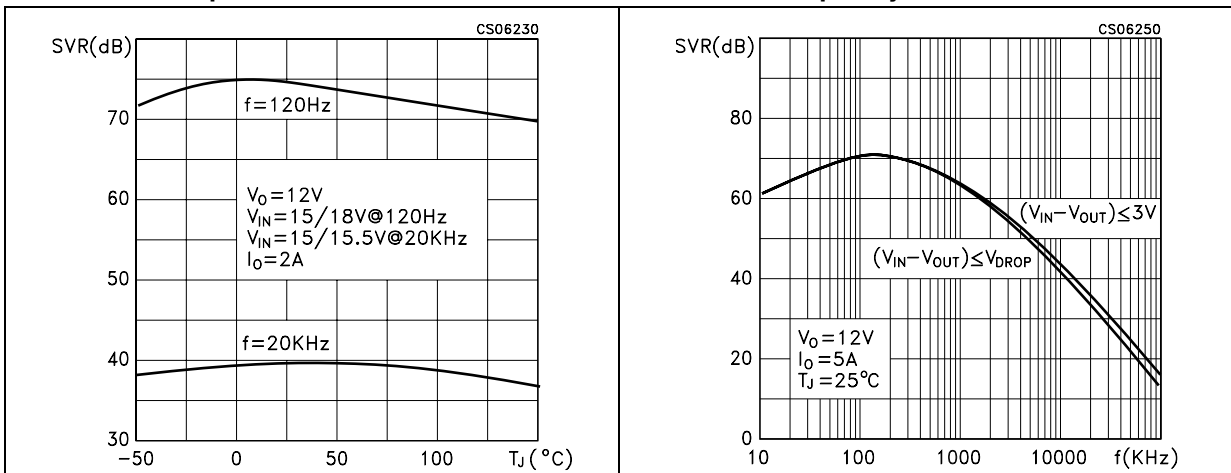


Figure 15. Adjust pin current vs output current

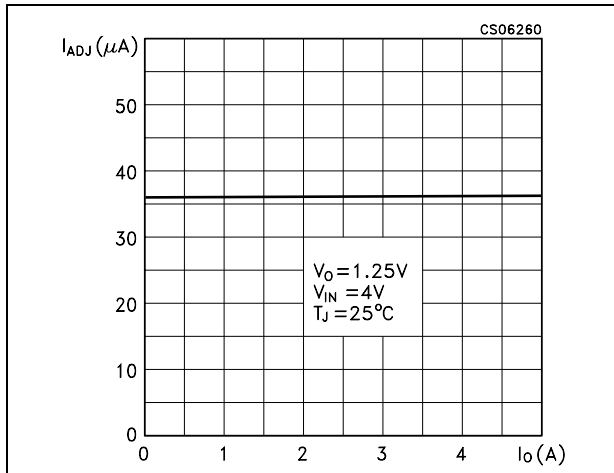


Figure 16. Reference voltage vs temperature

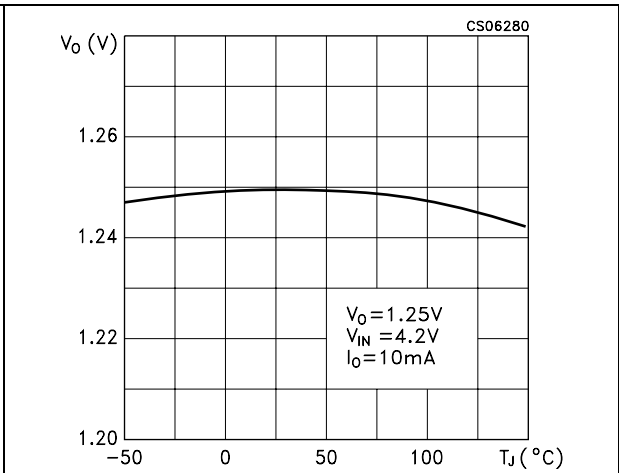


Figure 17. Load regulation vs temperature

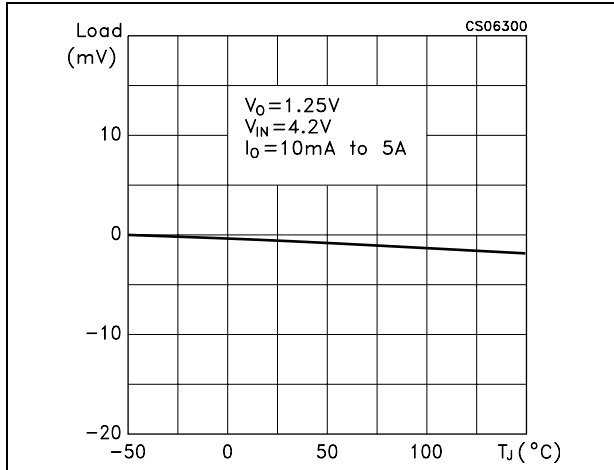


Figure 18. Adjust pin current vs temperature

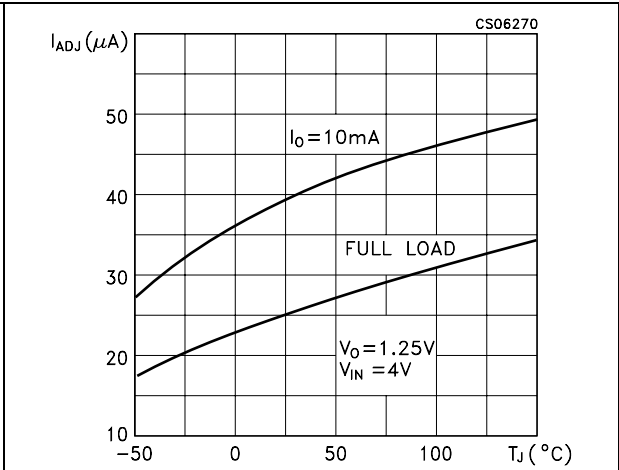


Figure 19. Line regulation vs temperature

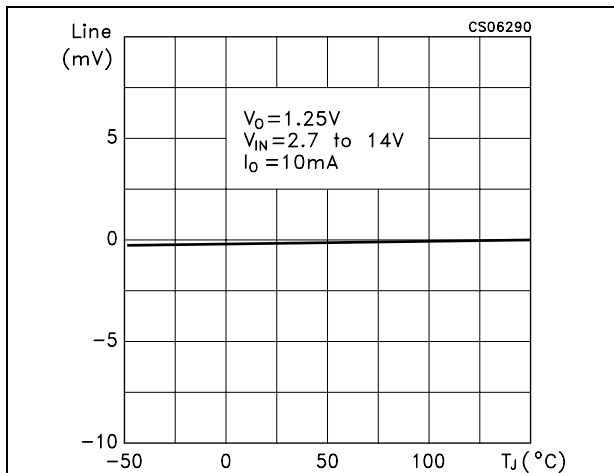


Figure 20. Minimum load current vs temperature

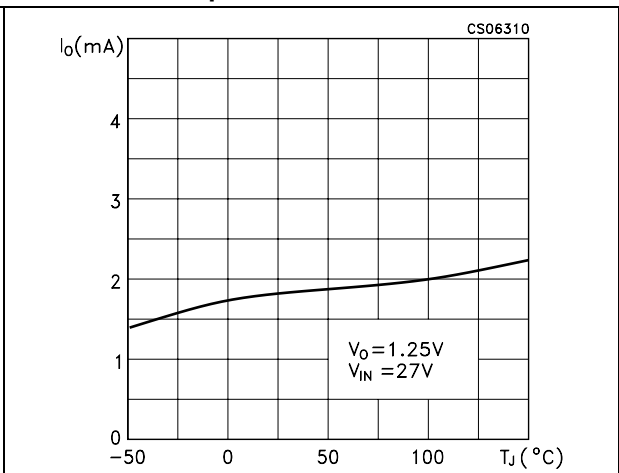


Figure 21. Supply voltage rejection vs temperature

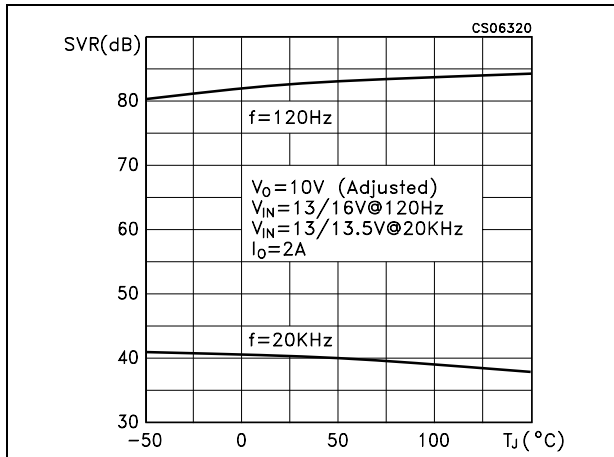


Figure 22. Supply voltage rejection vs frequency

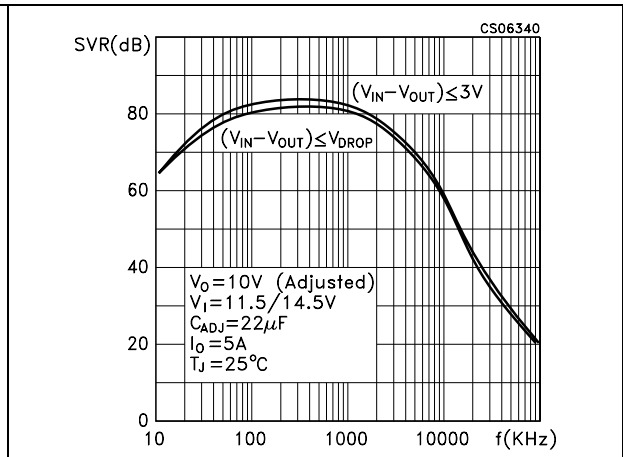


Figure 23. Stability

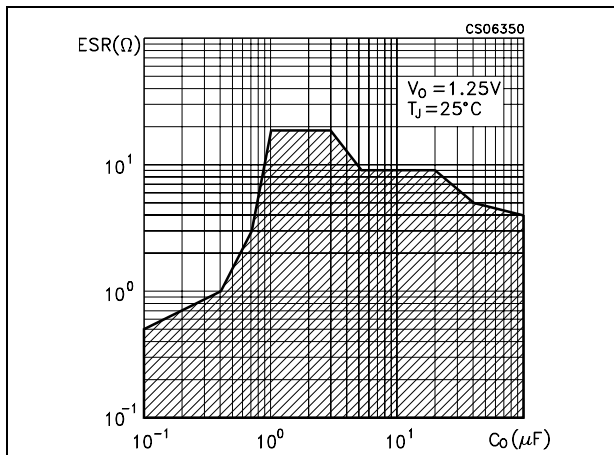


Figure 24. Supply voltage rejection vs output current

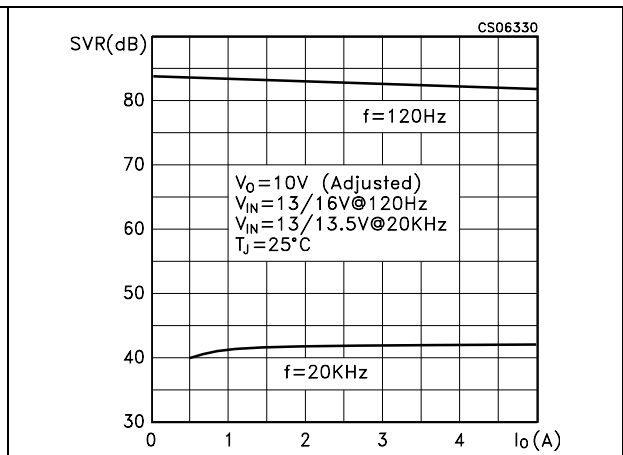


Figure 25. Stability

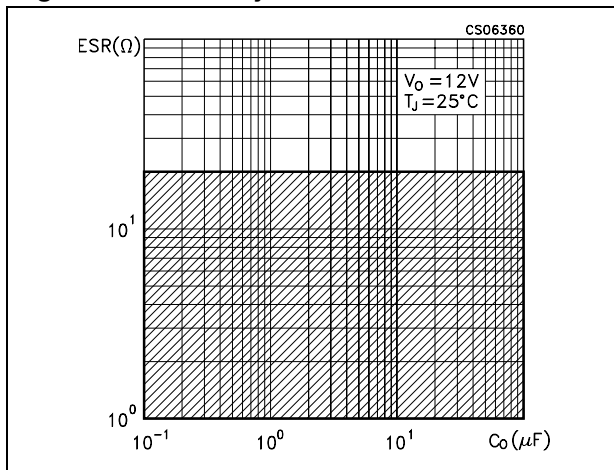


Figure 26. Line transient

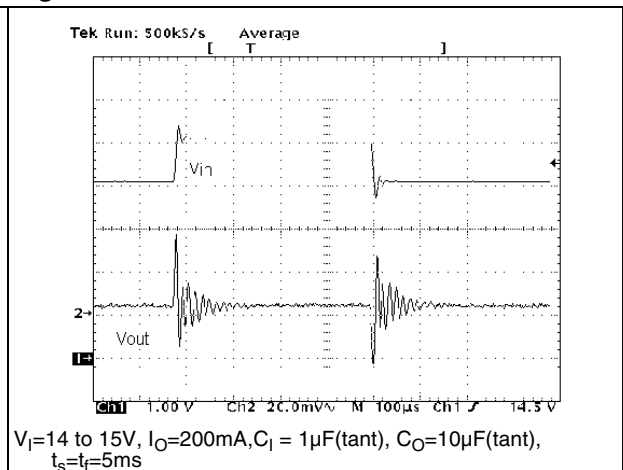


Figure 27. Line transient

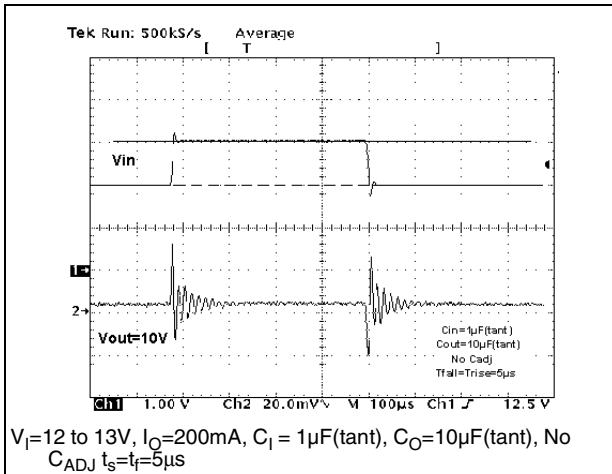


Figure 28. Load transient

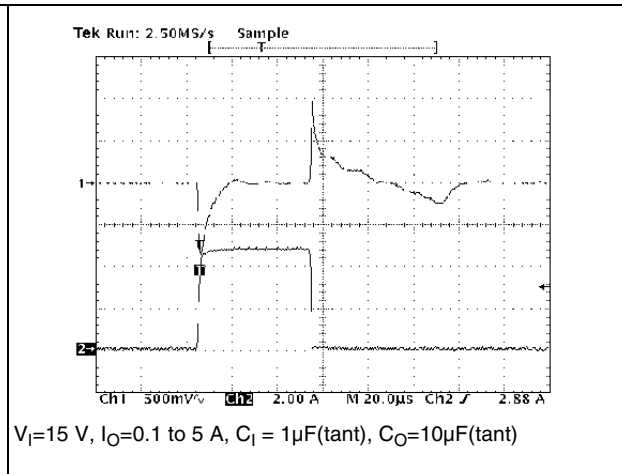


Figure 29. Load transient

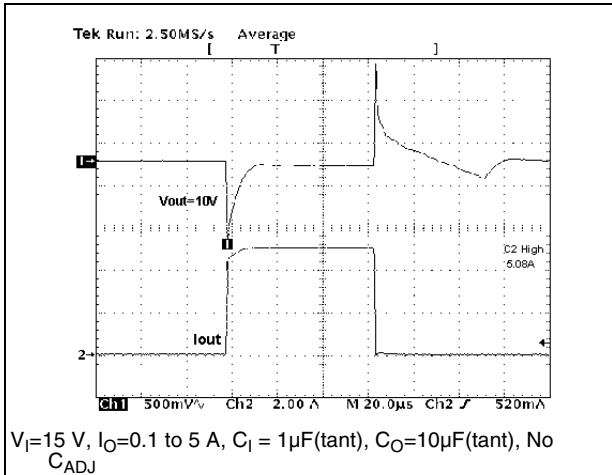


Figure 30. Line transient

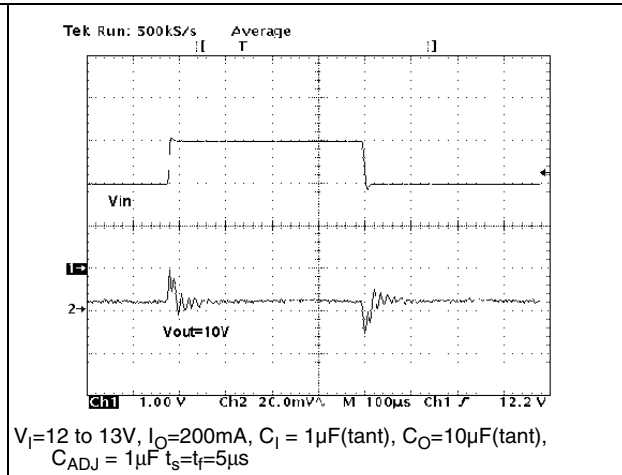
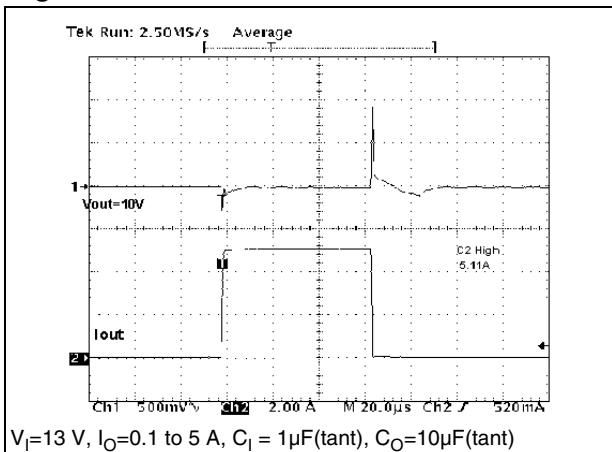


Figure 31. Load Transient

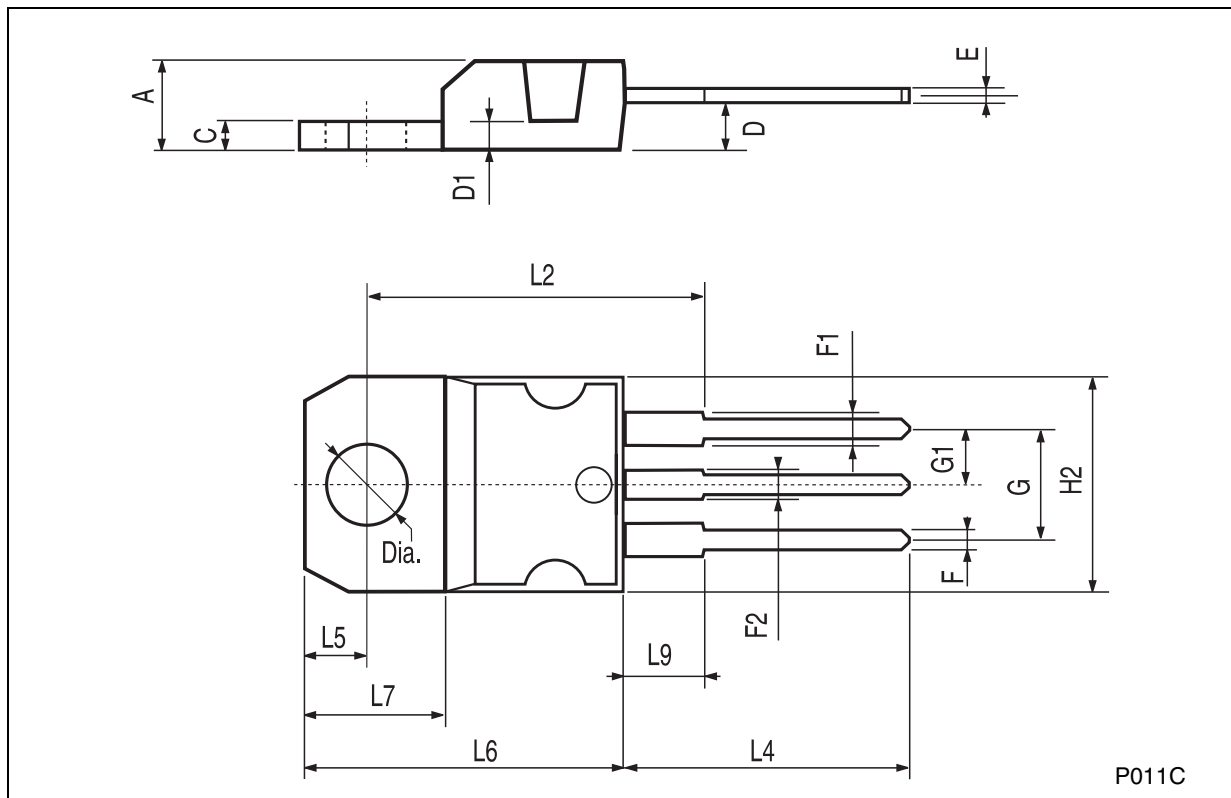


## 6 Package mechanical data

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](http://www.st.com).

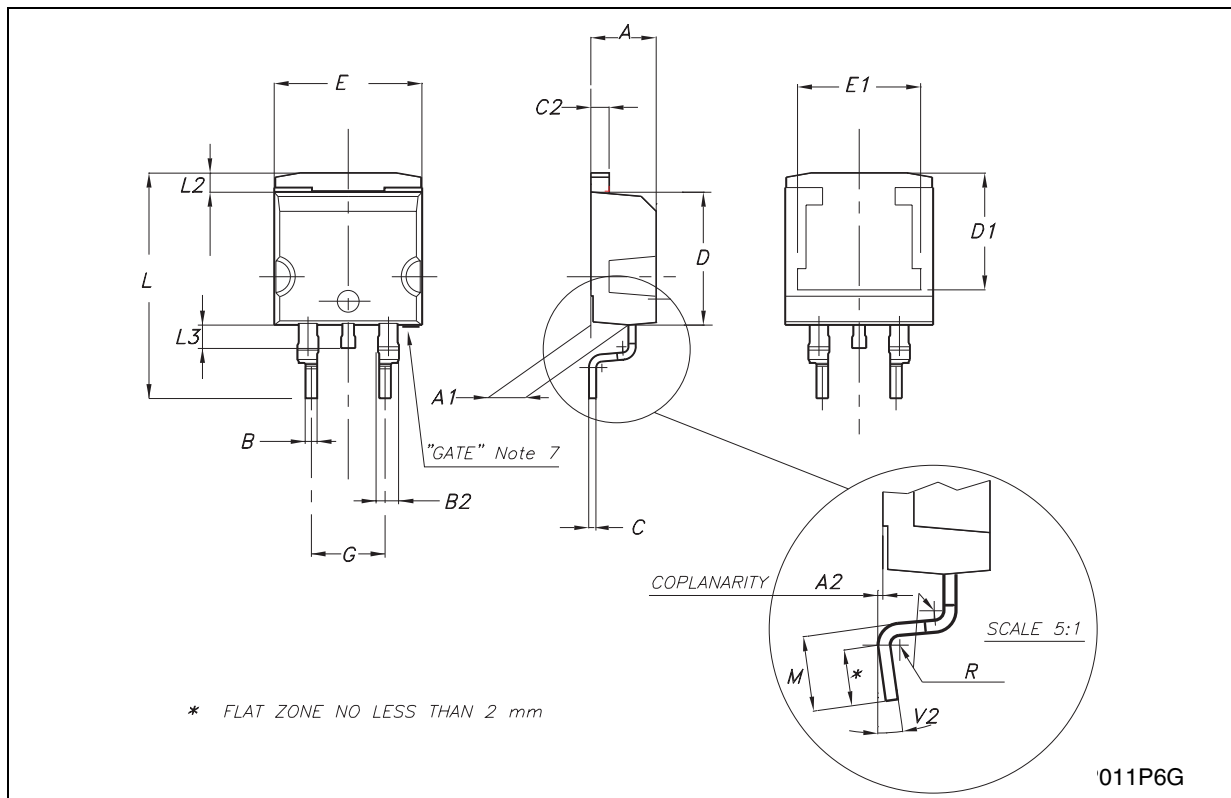
**TO-220 MECHANICAL DATA**

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	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



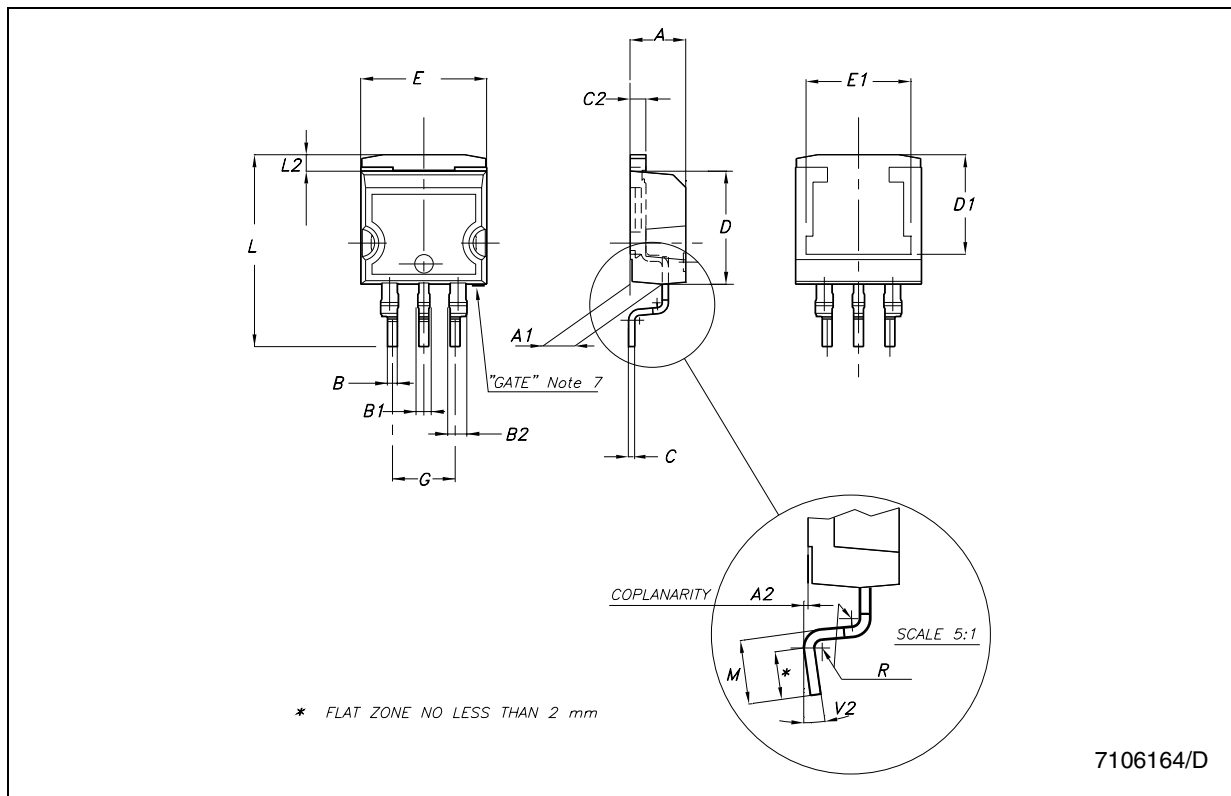
**D<sup>2</sup>PAK MECHANICAL DATA**

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.7		0.93	0.027		0.036
B2	1.14		1.7	0.044		0.067
C	0.45		0.6	0.017		0.023
C2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1		8			0.315	
E	10		10.4	0.393		0.409
E1		8.5			0.335	
G	4.88		5.28	0.192		0.208
L	15		15.85	0.590		0.624
L2	1.27		1.4	0.050		0.055
L3	1.4		1.75	0.055		0.068
M	2.4		3.2	0.094		0.126
R		0.4			0.016	
V2	0°		8°	0°		8°



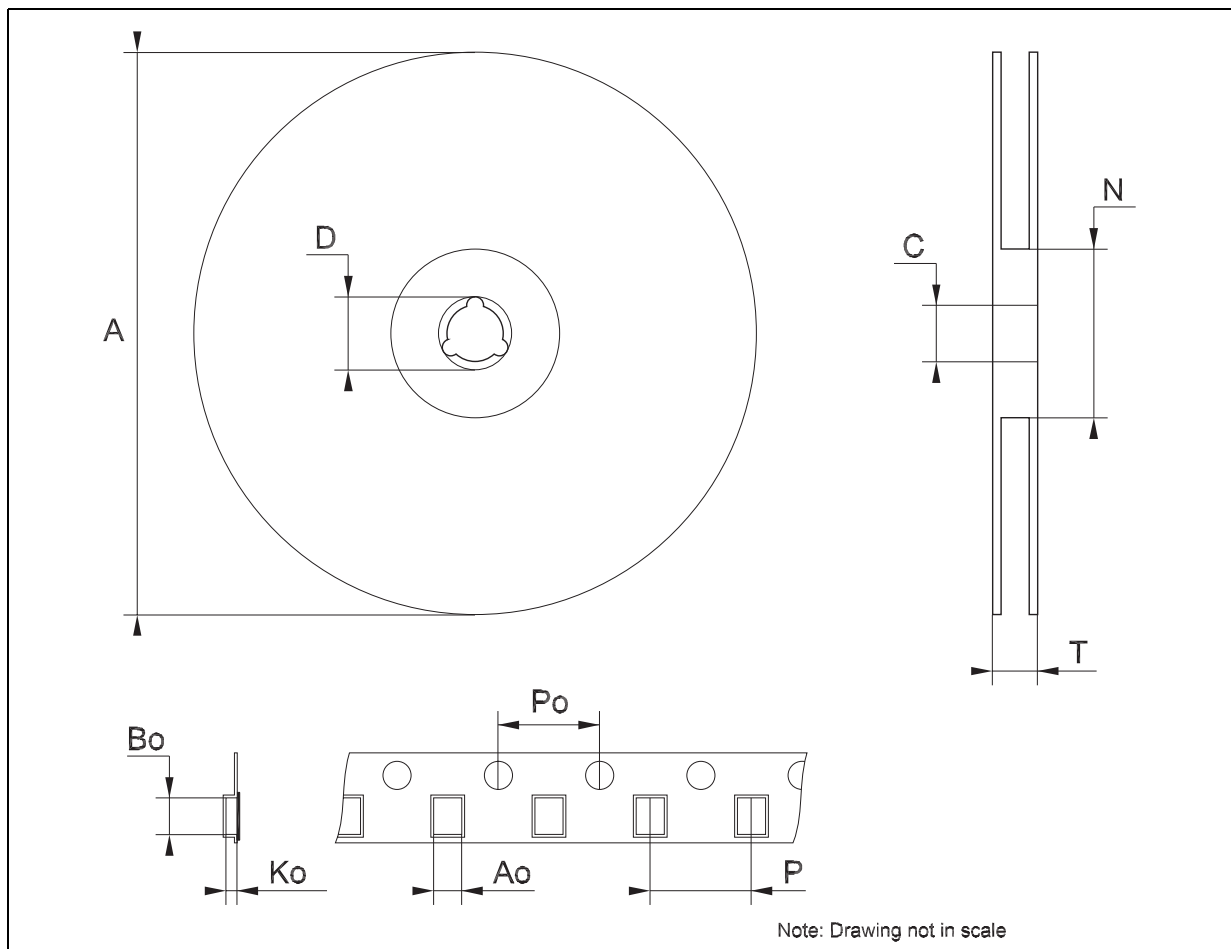
**D<sup>2</sup>PAK/A MECHANICAL DATA**

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.7		0.93	0.028		0.037
B1	0.8		1.3	0.031		0.051
B2	1.14		1.7	0.045		0.067
C	0.45		0.60	0.018		0.024
C2	1.23		1.36	0.048		0.054
D	8.95		9.35	0.352		0.368
D1		8			0.315	
E	10		10.4	0.394		0.409
E1		8.5			0.335	
G	4.88		5.28	0.192		0.208
L	15		15.85	0.591		0.624
L2	1.27		1.4	0.050		0.055
M	2.4		3.2	0.094		0.126
R		0.4			0.016	
V2	0°		8°	0°		8°



**Tape & Reel D<sup>2</sup>PAK-P<sup>2</sup>PAK-D<sup>2</sup>PAK/A-P<sup>2</sup>PAK/A MECHANICAL DATA**

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			180			7.086
C	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
T			14.4			0.567
Ao	10.50	10.6	10.70	0.413	0.417	0.421
Bo	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
Po	3.9	4.0	4.1	0.153	0.157	0.161
P	11.9	12.0	12.1	0.468	0.472	0.476



## 7 Order codes

Table 14. Order codes

Part numbers			
Packages			Output voltage
TO-220	D <sup>2</sup> PAK	D <sup>2</sup> PAK/A	
LD1084V15 <sup>(1)</sup>		LD1084D2M15R <sup>(1)</sup>	1.5 V
LD1084V18	LD1084D2T18R	LD1084D2M18R	1.8 V
LD1084V25	LD1084D2T25R	LD1084D2M25R	2.5 V
LD1084V28 <sup>(1)</sup>		LD1084D2M28R <sup>(1)</sup>	2.85 V
LD1084V33	LD1084D2T33R	LD1084D2M33R	3.3 V
LD1084V36	LD1084D2T36R	LD1084D2M36R	3.6 V
LD1084V50	LD1084D2T50R	LD1084D2M50R	5.0 V
LD1084V80	LD1084D2T80R	LD1084D2M80R	8.0 V
LD1084V90	LD1084D2T90R	LD1084D2M90R	9.0 V
LD1084V12	LD1084D2T12R	LD1084D2M12R	12.0 V
LD1084V	LD1084D2T-R	LD1084D2M-R	ADJ

1. Available on request.

## 8 Revision history

**Table 15. Revision history**

Date	Revision	Changes
07-Oct-2004	3	Mistake Order Codes - Table 1.
08-Feb-2005	4	Mistake U.M. Load Regulation - V ==> mV.
16-Jun-2005	5	Order Codes has been updated.
04-Apr-2007	6	Order Codes has been updated and the document has been reformatted.

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