



**THE DATASHEET OF  
LD29300D2M18R**



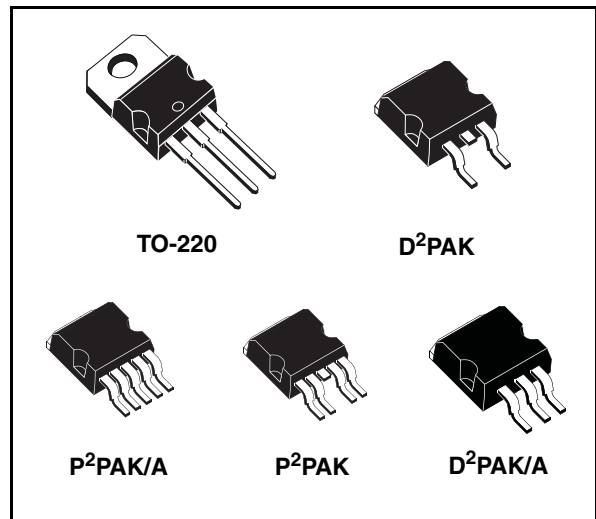
## 3 A, very low drop voltage regulators

### Features

- Very low dropout voltage (Typ. 0.4 at 3 A)
- Guaranteed output current up to 3 A
- Fixed voltage with  $\pm 1\%$  tolerance at 25 °C
- Internal current and thermal limit
- Logic controlled electronic shutdown available in PPAK

### Description

The LD29300xx is a high current, high accuracy, low-dropout voltage regulator series. These regulators feature 400 mV dropout voltage and very low ground current. Designed for high current loads, these devices are also used in lower current, extremely low dropout-critical systems, where their tiny dropout voltage and ground current values are important attributes. Typical applications are in power supply switching post regulation, Series power supply for monitors, Series power supply for VCRs and TVs, Computer systems and Battery powered systems.



**Table 1. Device summary**

Part numbers	Output voltages
LD29300XX15	1.5 V
LD29300XX18	1.8 V
LD29300XX25	2.5 V
LD29300XX33	3.3 V
LD29300XX50	5.0 V
LD29300XX80	8.0 V
LD29300XX	ADJ

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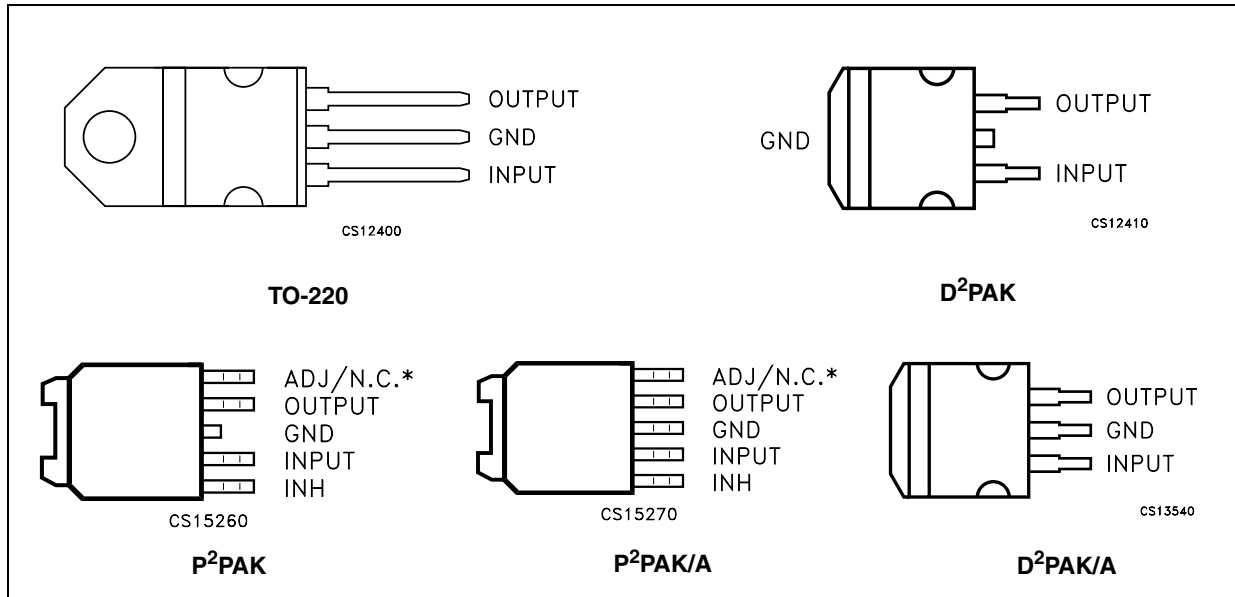
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## 2 Pin configuration

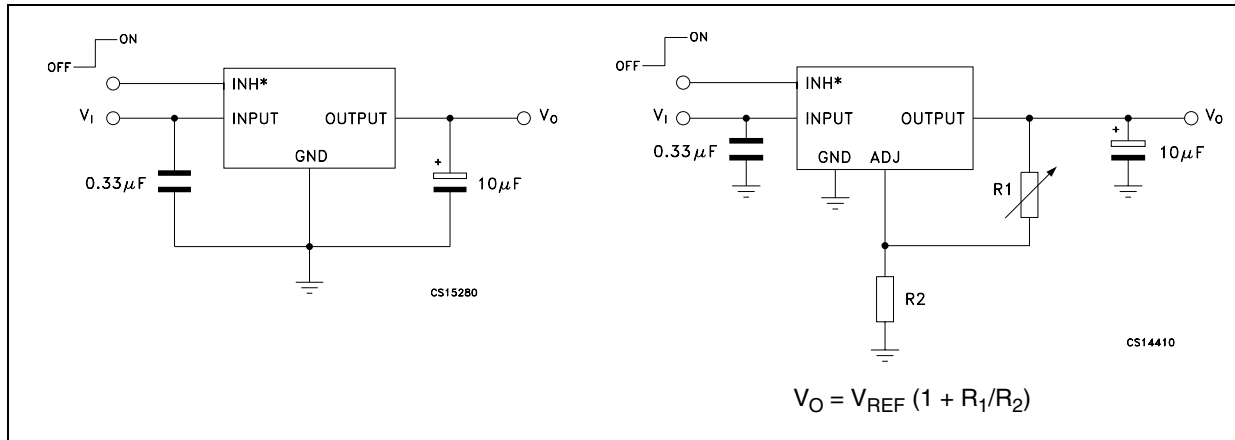
Figure 3. Pin connections (top view)



\* Not connected for fixed version.

### 3 Typical application

Figure 4. Application circuit



\* Only for version with inhibit function.

## 4 Maximum ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_I$	DC input voltage	30 <sup>(1)</sup>	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

1. Above 14 V the device is automatically in shut-down.

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

**Table 3. Thermal data**

Symbol	Parameter	TO-220	D <sup>2</sup> PAK-P <sup>2</sup> PAK-D <sup>2</sup> PAK/A-P <sup>2</sup> PAK/A	Unit
$R_{thJA}$	Thermal resistance junction-ambient	50	60	°C/W
$R_{thJC}$	Thermal resistance junction-case	3	3	°C/W

## 5 Electrical characteristics

**Table 4. Electrical characteristics of LD29300#15**  
( $I_O = 10\text{ mA}$ ,  $T_J = 25\text{ °C}$ ,  $V_I = 3.5\text{ V}$ ,  $V_{INH} = 2\text{ V}$  <sup>(1)</sup>,  $C_I = 330\text{ nF}$ ,  $C_O = 10\text{ }\mu\text{F}$ , unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_I$	Minimum operating input voltage	$I_O = 10\text{ mA}$ to $3\text{ A}$ , $T_J = -40$ to $125\text{ °C}$	2.5			V
$V_O$	Output voltage	$I_O = 10\text{ mA}$ to $3\text{ A}$ , $V_I = 3$ to $7\text{ V}$ $T_J = -40$ to $125\text{ °C}$	1.485	1.5	1.515	V
			1.47		1.53	
$\Delta V_O$	Load regulation	$I_O = 10\text{ mA}$ to $3\text{ A}$		0.2	1.0	%
$\Delta V_O$	Line regulation	$V_I = 3$ to $13\text{ V}$		0.06	0.5	%
SVR	Supply voltage rejection	$f = 120\text{ Hz}$ , $V_I = 3.5 \pm 1\text{ V}$ , $I_O = 1.5\text{ A}$ <sup>(2)</sup>	65	75		dB
$I_q$	Quiescent current	$I_O = 1.5\text{ A}$ , $T_J = -40$ to $125\text{ °C}$		20	50	mA
		$I_O = 3\text{ A}$ , $T_J = -40$ to $125\text{ °C}$		45	100	
		$V_I = 13\text{ V}$ , $V_{INH} = \text{GND}$ , $T_J = -40$ to $125\text{ °C}$		130	180	$\mu\text{A}$
$I_{sc}$	Short circuit current	$V_I - V_O = 5.5\text{ V}$		4.5		A
$V_{IL}$	Control input logic low	OFF MODE <sup>(1)</sup> , $T_J = -40$ to $125\text{ °C}$			0.8	V
$V_{IH}$	Control input logic high	ON MODE <sup>(1)</sup> , $T_J = -40$ to $125\text{ °C}$	2			V
$I_{INH}$	Control input current	$T_J = -40$ to $125\text{ °C}$ , $V_{INH} = 13\text{ V}$		5	10	$\mu\text{A}$
eN	Output noise voltage	$B_p = 10\text{ Hz}$ to $100\text{ kHz}$ , $I_O = 100\text{ mA}$		60		$\mu\text{V}_{RMS}$

1. Only for version with Inhibit function.

2. Guaranteed by design

**Table 5. Electrical characteristics of LD29300#18**

( $I_O = 10 \text{ mA}$ ,  $T_J = 25 \text{ °C}$ ,  $V_I = 3.8 \text{ V}$ ,  $V_{INH} = 2 \text{ V}$  <sup>(1)</sup>,  $C_I = 330 \text{ nF}$ ,  $C_O = 10 \text{ }\mu\text{F}$ , unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 10\text{mA to } 3\text{A}$ , $V_I = 3 \text{ to } 7.3\text{V}$ $T_J = -40 \text{ to } 125\text{°C}$	1.782	1.8	1.818	V
			1.764		1.836	
$\Delta V_O$	Load regulation	$I_O = 10\text{mA to } 3\text{A}$		0.2	1.0	%
$\Delta V_O$	Line regulation	$V_I = 3 \text{ to } 13\text{V}$		0.06	0.5	%
SVR	Supply voltage rejection	$f = 120 \text{ Hz}$ , $V_I = 3.8 \pm 1\text{V}$ , $I_O = 1.5\text{A}$ <sup>(2)</sup>	62	72		dB
$V_{DROPO}$	Dropout voltage	$I_O = 500\text{mA}$ , $T_J = -40 \text{ to } 125\text{°C}$ <sup>(3)</sup>		0.1		V
		$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125\text{°C}$ <sup>(3)</sup>		0.2		
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125\text{°C}$ <sup>(3)</sup>		0.4	0.7	
$I_q$	Quiescent current	$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125\text{°C}$		20	50	mA
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125\text{°C}$		45	100	
		$V_I = 13\text{V}$ , $V_{INH} = \text{GND}$ , $T_J = -40 \text{ to } 125\text{°C}$		130	180	$\mu\text{A}$
$I_{sc}$	Short circuit current	$V_I - V_O = 5.5\text{V}$		4.5		A
$V_{IL}$	Control input logic low	OFF MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125\text{°C}$			0.8	V
$V_{IH}$	Control input logic high	ON MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125\text{°C}$	2			V
$I_{INH}$	Control input current	$T_J = -40 \text{ to } 125\text{°C}$ , $V_{INH} = 13\text{V}$		5	10	$\mu\text{A}$
eN	Output noise voltage	$B_p = 10\text{Hz to } 100\text{kHz}$ , $I_O = 100\text{mA}$		60		$\mu\text{V}_{RMS}$

1. Only for version with Inhibit function.

2. Guaranteed by design.

3. Dropout voltage is defined as the input-to-output differential when the output voltage drops to 99 % of its nominal value with  $V_O + 1 \text{ V}$  applied to  $V_I$ .

**Table 6. Electrical characteristics of LD29300#25**

( $I_O = 10 \text{ mA}$ ,  $T_J = 25 \text{ }^\circ\text{C}$ ,  $V_I = 4.5 \text{ V}$ ,  $V_{INH} = 2 \text{ V}$  <sup>(1)</sup>,  $C_I = 330 \text{ nF}$ ,  $C_O = 10 \text{ } \mu\text{F}$ , unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 10\text{mA to } 3\text{A}$ , $V_I = 3.5 \text{ to } 8\text{V}$ $T_J = -40 \text{ to } 125^\circ\text{C}$	2.475	2.5	2.525	V
			2.45		2.55	
$\Delta V_O$	Load regulation	$I_O = 10\text{mA to } 3\text{A}$		0.2	1.0	%
$\Delta V_O$	Line regulation	$V_I = 3 \text{ to } 13\text{V}$		0.06	0.5	%
SVR	Supply voltage rejection	$f = 120 \text{ Hz}$ , $V_I = 4.5 \pm 1\text{V}$ , $I_O = 1.5\text{A}$ <sup>(2)</sup>	55	70		dB
$V_{DROPO}$	Dropout voltage	$I_O = 500\text{mA}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$ <sup>(3)</sup>		0.1		V
		$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$ <sup>(3)</sup>		0.2		
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$ <sup>(3)</sup>		0.4	0.7	
$I_q$	Quiescent current	$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		20	50	mA
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		45	100	
		$V_I = 13\text{V}$ , $V_{INH} = \text{GND}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		130	180	$\mu\text{A}$
$I_{sc}$	Short circuit current	$V_I - V_O = 5.5\text{V}$		4.5		A
$V_{IL}$	Control input logic low	OFF MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125^\circ\text{C}$			0.8	V
$V_{IH}$	Control input logic high	ON MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125^\circ\text{C}$	2			V
$I_{INH}$	Control input current	$T_J = -40 \text{ to } 125^\circ\text{C}$ , $V_{INH} = 13\text{V}$		5	10	$\mu\text{A}$
eN	Output noise voltage	$B_p = 10\text{Hz to } 100\text{kHz}$ , $I_O = 100\text{mA}$		100		$\mu\text{V}_{RMS}$

1. Only for version with Inhibit function.
2. Guaranteed by design.
3. Dropout voltage is defined as the input-to-output differential when the output voltage drops to 99 % of its nominal value with  $V_O + 1 \text{ V}$  applied to  $V_I$ .

**Table 7. Electrical characteristics of LD29300#33**

( $I_O = 10 \text{ mA}$ ,  $T_J = 25 \text{ }^\circ\text{C}$ ,  $V_I = 5.3 \text{ V}$ ,  $V_{INH} = 2 \text{ V}$ <sup>(1)</sup>,  $C_I = 330 \text{ nF}$ ,  $C_O = 10 \text{ } \mu\text{F}$ , unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 10\text{mA to } 3\text{A}$ , $V_I = 4.3 \text{ to } 8.8\text{V}$ $T_J = -40 \text{ to } 125^\circ\text{C}$	3.267	3.3	3.333	V
			3.234		3.366	
$\Delta V_O$	Load regulation	$I_O = 10\text{mA to } 3\text{A}$		0.2	1.0	%
$\Delta V_O$	Line regulation	$V_I = 4.3 \text{ to } 13\text{V}$		0.06	0.5	%
SVR	Supply voltage rejection	$f = 120 \text{ Hz}$ , $V_I = 5.3 \pm 1\text{V}$ , $I_O = 1.5\text{A}$ <sup>(2)</sup>	52	67		dB
$V_{DROPO}$	Dropout voltage	$I_O = 500\text{mA}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$ <sup>(3)</sup>		0.1		V
		$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$ <sup>(3)</sup>		0.2		
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$ <sup>(3)</sup>		0.4	0.7	
$I_q$	Quiescent current	$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		20	50	mA
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		45	100	
		$V_I = 13\text{V}$ , $V_{INH} = \text{GND}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		130	180	$\mu\text{A}$
$I_{sc}$	Short circuit current	$V_I - V_O = 5.5\text{V}$		4.5		A
$V_{IL}$	Control input logic low	OFF MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125^\circ\text{C}$			0.8	V
$V_{IH}$	Control input logic high	ON MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125^\circ\text{C}$	2			V
$I_{INH}$	Control input current	$T_J = -40 \text{ to } 125^\circ\text{C}$ , $V_{INH} = 13\text{V}$		5	10	$\mu\text{A}$
eN	Output noise voltage	$B_P = 10\text{Hz to } 100\text{kHz}$ , $I_O = 100\text{mA}$		132		$\mu\text{V}_{RMS}$

1. Only for version with Inhibit function.
2. Guaranteed by design.
3. Dropout voltage is defined as the input-to-output differential when the output voltage drops to 99 % of its nominal value with  $V_O + 1 \text{ V}$  applied to  $V_I$ .

**Table 8. Electrical characteristics of LD29300#50**

( $I_O = 10 \text{ mA}$ ,  $T_J = 25 \text{ }^\circ\text{C}$ ,  $V_I = 7 \text{ V}$ ,  $V_{INH} = 2 \text{ V}$  <sup>(1)</sup>,  $C_I = 330 \text{ nF}$ ,  $C_O = 10 \text{ } \mu\text{F}$ , unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 10\text{mA to } 3\text{A}$ , $V_I = 6 \text{ to } 10.5\text{V}$ $T_J = -40 \text{ to } 125^\circ\text{C}$	4.95	5	5.05	V
			4.9		5.1	
$\Delta V_O$	Load regulation	$I_O = 10\text{mA to } 3\text{A}$		0.2	1.0	%
$\Delta V_O$	Line regulation	$V_I = 6 \text{ to } 13\text{V}$		0.06	0.5	%
SVR	Supply voltage rejection	$f = 120 \text{ Hz}$ , $V_I = 7 \pm 1\text{V}$ , $I_O = 1.5\text{A}$ <sup>(2)</sup>	49	64		dB
$V_{DROPO}$	Dropout voltage	$I_O = 500\text{mA}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$ <sup>(3)</sup>		0.1		V
		$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$ <sup>(3)</sup>		0.2		
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$ <sup>(3)</sup>		0.4	0.7	
$I_q$	Quiescent current	$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		20	50	mA
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		45	100	
		$V_I = 13\text{V}$ , $V_{INH} = \text{GND}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		130	180	$\mu\text{A}$
$I_{sc}$	Short circuit current	$V_I - V_O = 5.5\text{V}$		4.5		A
$V_{IL}$	Control input logic low	OFF MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125^\circ\text{C}$			0.8	V
$V_{IH}$	Control input logic high	ON MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125^\circ\text{C}$	2			V
$I_{INH}$	Control input current	$T_J = -40 \text{ to } 125^\circ\text{C}$ , $V_{INH} = 13\text{V}$		5	10	$\mu\text{A}$
eN	Output noise voltage	$B_p = 10\text{Hz to } 100\text{kHz}$ , $I_O = 100\text{mA}$		200		$\mu\text{V}_{RMS}$

1. Only for version with Inhibit function.

2. Guaranteed by design.

3. Dropout voltage is defined as the input-to-output differential when the output voltage drops to 99 % of its nominal value with  $V_O + 1 \text{ V}$  applied to  $V_I$ .

**Table 9. Electrical characteristics of LD29300#80**

( $I_O = 10 \text{ mA}$ ,  $T_J = 25 \text{ }^\circ\text{C}$ ,  $V_I = 10 \text{ V}$ ,  $V_{INH} = 2 \text{ V}^{(1)}$ ,  $C_I = 330 \text{ nF}$ ,  $C_O = 10 \text{ } \mu\text{F}$ , unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_O$	Output voltage	$I_O = 10\text{mA to } 3\text{A}$ , $V_I = 9 \text{ to } 13\text{V}$ $T_J = -40 \text{ to } 125^\circ\text{C}$	7.92	8	8.08	V
			7.84		8.16	
$\Delta V_O$	Load regulation	$I_O = 10\text{mA to } 3\text{A}$		0.2	1.0	%
$\Delta V_O$	Line regulation	$V_I = 9 \text{ to } 13\text{V}$		0.06	0.5	%
SVR	Supply voltage rejection	$f = 120 \text{ Hz}$ , $V_I = 9 \pm 1\text{V}$ , $I_O = 1.5\text{A}^{(2)}$	45	59		dB
$V_{DROPO}$	Dropout voltage	$I_O = 500\text{mA}$ , $T_J = -40 \text{ to } 125^\circ\text{C}^{(3)}$		0.1		V
		$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}^{(3)}$		0.2		
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}^{(3)}$		0.4	0.7	
$I_q$	Quiescent current	$I_O = 1.5\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		20	50	mA
		$I_O = 3\text{A}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		45	100	
		$V_I = 13\text{V}$ , $V_{INH} = \text{GND}$ , $T_J = -40 \text{ to } 125^\circ\text{C}$		130	180	$\mu\text{A}$
$I_{sc}$	Short circuit current	$V_I - V_O = 5.5\text{V}$		4.5		A
$V_{IL}$	Control input logic low	OFF MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125^\circ\text{C}$			0.8	V
$V_{IH}$	Control input logic high	ON MODE <sup>(1)</sup> , $T_J = -40 \text{ to } 125^\circ\text{C}$	2			V
$I_{INH}$	Control input current	$T_J = -40 \text{ to } 125^\circ\text{C}$ , $V_{INH} = 13\text{V}$		5	10	$\mu\text{A}$
eN	Output noise voltage	$B_P = 10\text{Hz to } 100\text{kHz}$ , $I_O = 100\text{mA}$		320		$\mu\text{V}_{RMS}$

1. Only for version with Inhibit function.
2. Guaranteed by design.
3. Dropout voltage is defined as the input-to-output differential when the output voltage drops to 99 % of its nominal value with  $V_O + 1 \text{ V}$  applied to  $V_I$ .

**Table 10. Electrical characteristics of LD29300#ADJ**

( $I_O = 10 \text{ mA}$ ,  $T_J = 25 \text{ }^\circ\text{C}$ ,  $V_I = 3.23 \text{ V}$ ,  $V_{INH} = 2 \text{ V}^{(1)}$ ,  $C_I = 330 \text{ nF}$ ,  $C_O = 10 \text{ } \mu\text{F}$  adjust pin tied to output pin)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_I$	Minimum operating input voltage	$I_O = 10\text{mA}$ to $3\text{A}$ , $T_J = -40$ to $125^\circ\text{C}$	2.5			V
$\Delta V_O$	Load regulation	$I_O = 10\text{mA}$ to $3\text{A}$		0.2	1.0	%
$\Delta V_O$	Line regulation	$V_I = 2.5 \text{ V}$ to $13\text{V}$		0.06	0.5	%
$V_{REF}$	Reference voltage	$I_O = 10\text{mA}$ to $3\text{A}$ , $V_I = 2.5$ to $4.5\text{V}$ $T_J = -40$ to $125^\circ\text{C}^{(2)}$	-1%	1.23	+1%	V
			-2%		+2%	
SVR	Supply voltage rejection	$f = 120 \text{ Hz}$ , $V_I = 3.23 \pm 1\text{V}$ , $I_O = 1.5\text{A}^{(3)}$	65	75		dB
$I_q$	Quiescent current	$I_O = 1.5\text{A}$ , $T_J = -40$ to $125^\circ\text{C}$		20	50	mA
		$I_O = 3\text{A}$ , $T_J = -40$ to $125^\circ\text{C}$		45	100	
		$V_I = 13\text{V}$ , $V_{INH} = \text{GND}$ , $T_J = -40$ to $125^\circ\text{C}$		130	180	$\mu\text{A}$
$I_{ADJ}$	Adjust pin current	$T_J = -40$ to $125^\circ\text{C}^{(3)}$			1	$\mu\text{A}$
$I_{sc}$	Short circuit current	$V_I - V_O = 5.5\text{V}$		4.5		A
$V_{IL}$	Control input logic low	OFF MODE <sup>(1)</sup> , $T_J = -40$ to $125^\circ\text{C}$			0.8	V
$V_{IH}$	Control input logic high	ON MODE <sup>(1)</sup> , $T_J = -40$ to $125^\circ\text{C}$	2			V
$I_{INH}$	Control input current	$T_J = -40$ to $125^\circ\text{C}$ , $V_{INH} = 13\text{V}$		5	10	$\mu\text{A}$
eN	Output noise voltage	$B_P = 10\text{Hz}$ to $100\text{kHz}$ , $I_O = 100\text{mA}$		50		$\mu\text{V}_{RMS}$

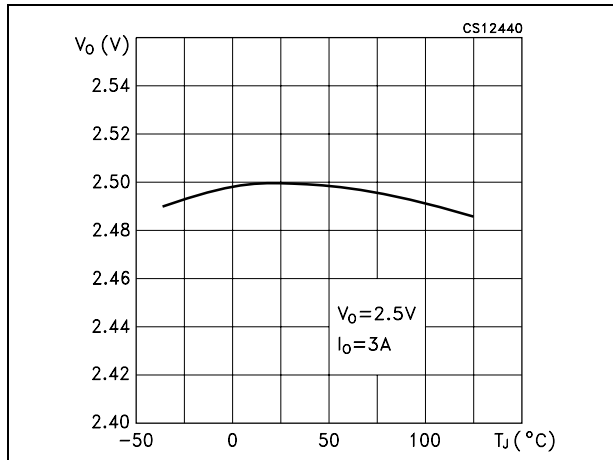
1. Only for version with Inhibit function.

2. Reference voltage is measured between output and GND pin, with ADJ PIN tied to  $V_{OUT}$ .

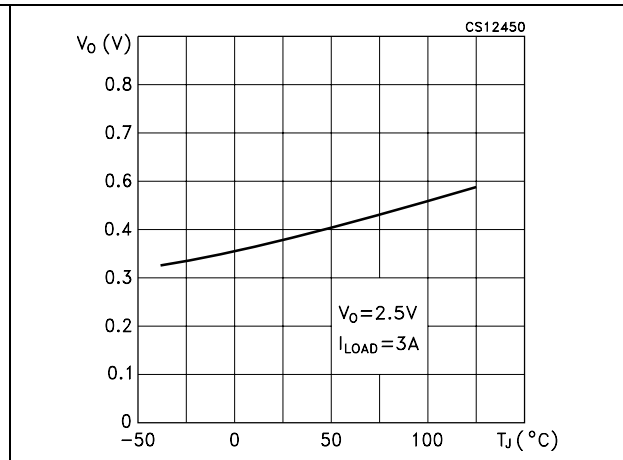
3. Guaranteed by design.

# 6 Typical characteristics

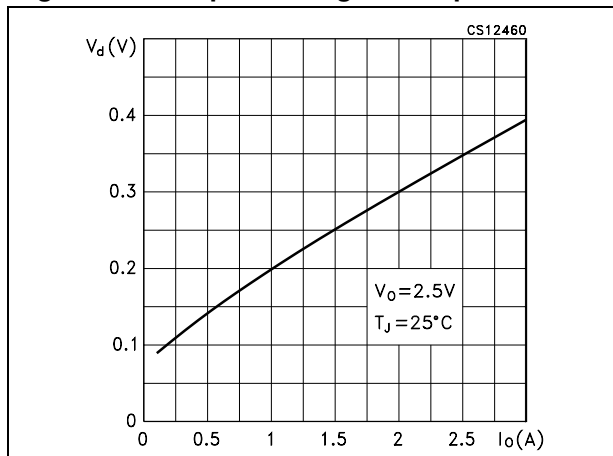
**Figure 5. Output voltage vs temperature**



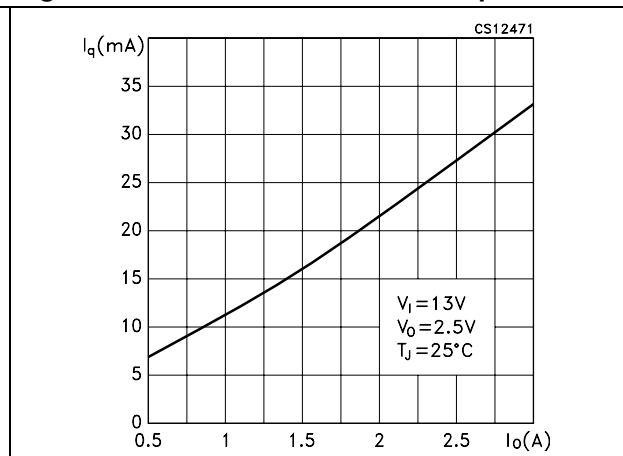
**Figure 6. Dropout voltage vs temperature**



**Figure 7. Dropout voltage vs output current**



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



**Figure 9. Quiescent current vs output current** **Figure 10. Quiescent current vs supply voltage**

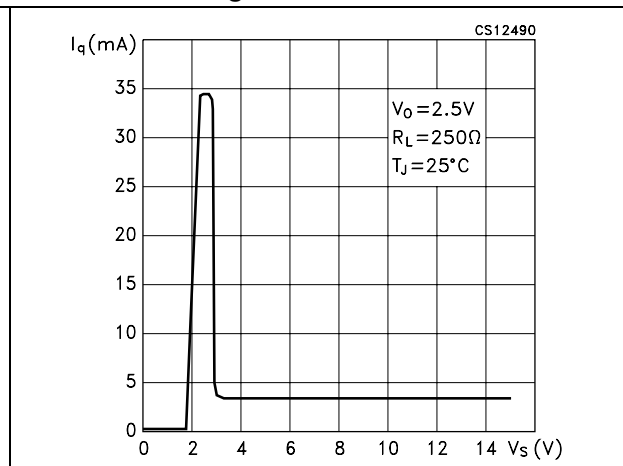
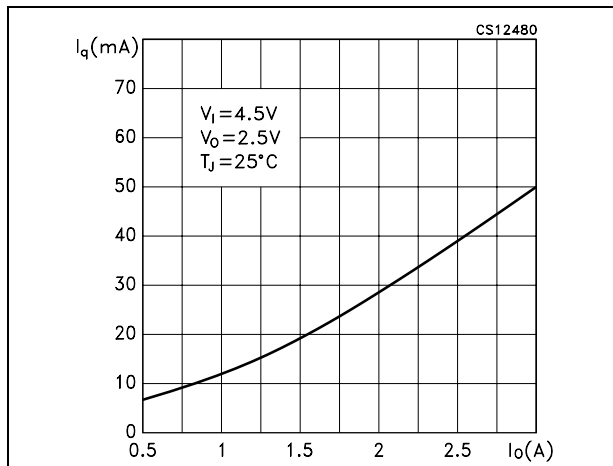


Figure 11. Quiescent current vs temperature

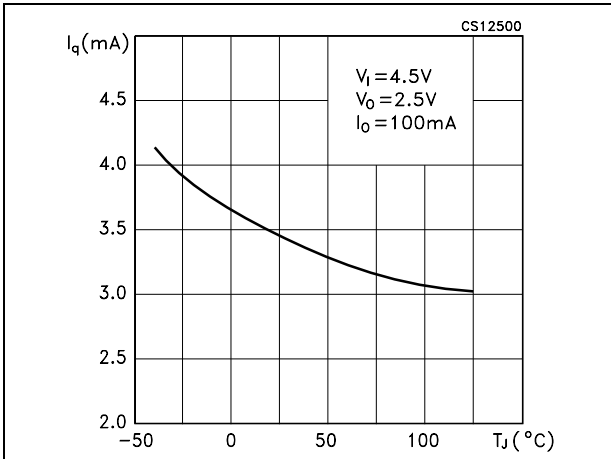


Figure 12. Quiescent current vs temperature

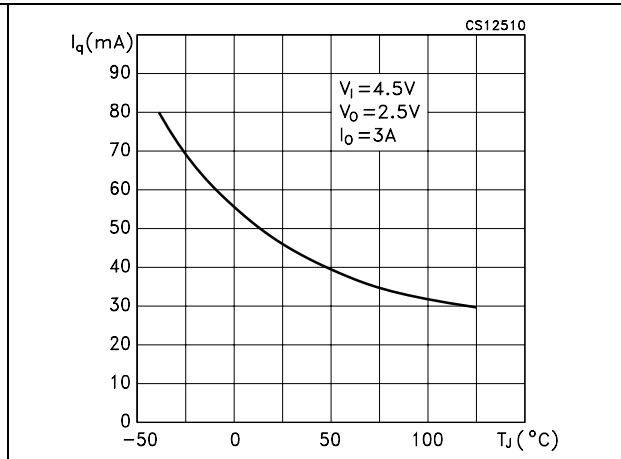


Figure 13. Short circuit current vs temperature

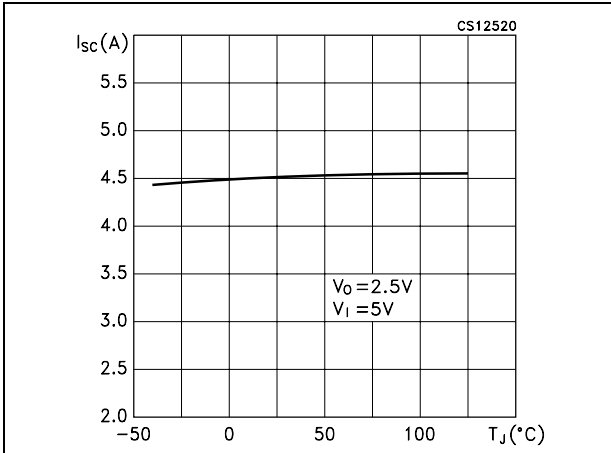


Figure 14. Supply voltage rejection vs temperature

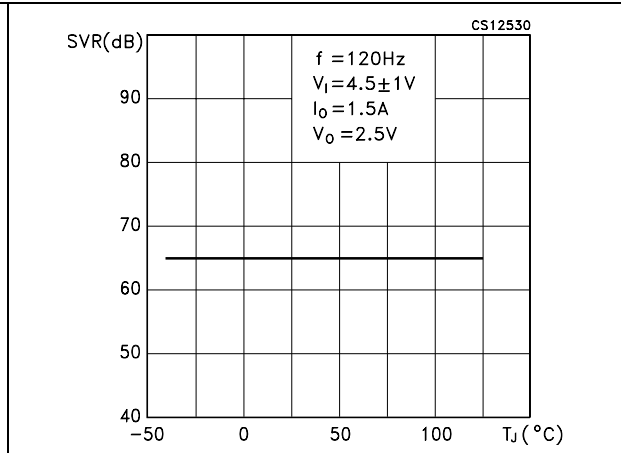


Figure 15. Stability vs Co

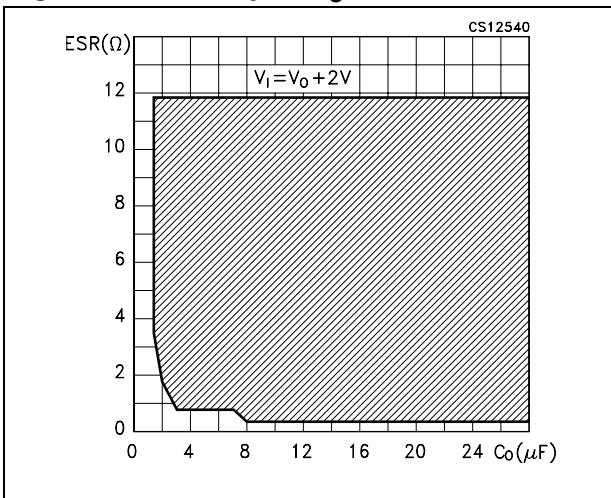


Figure 16. Line transient

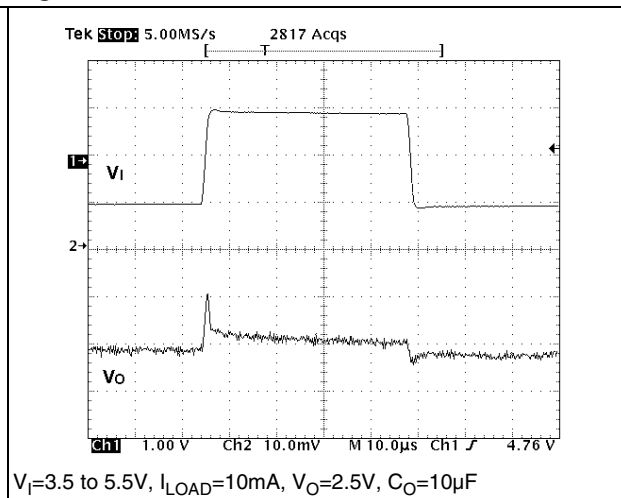
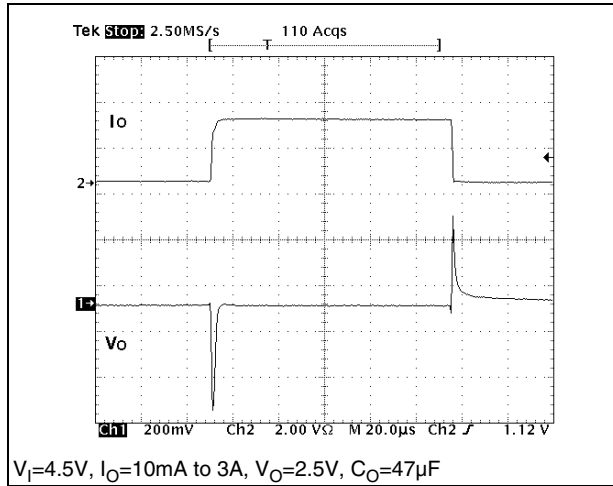


Figure 17. Load transient

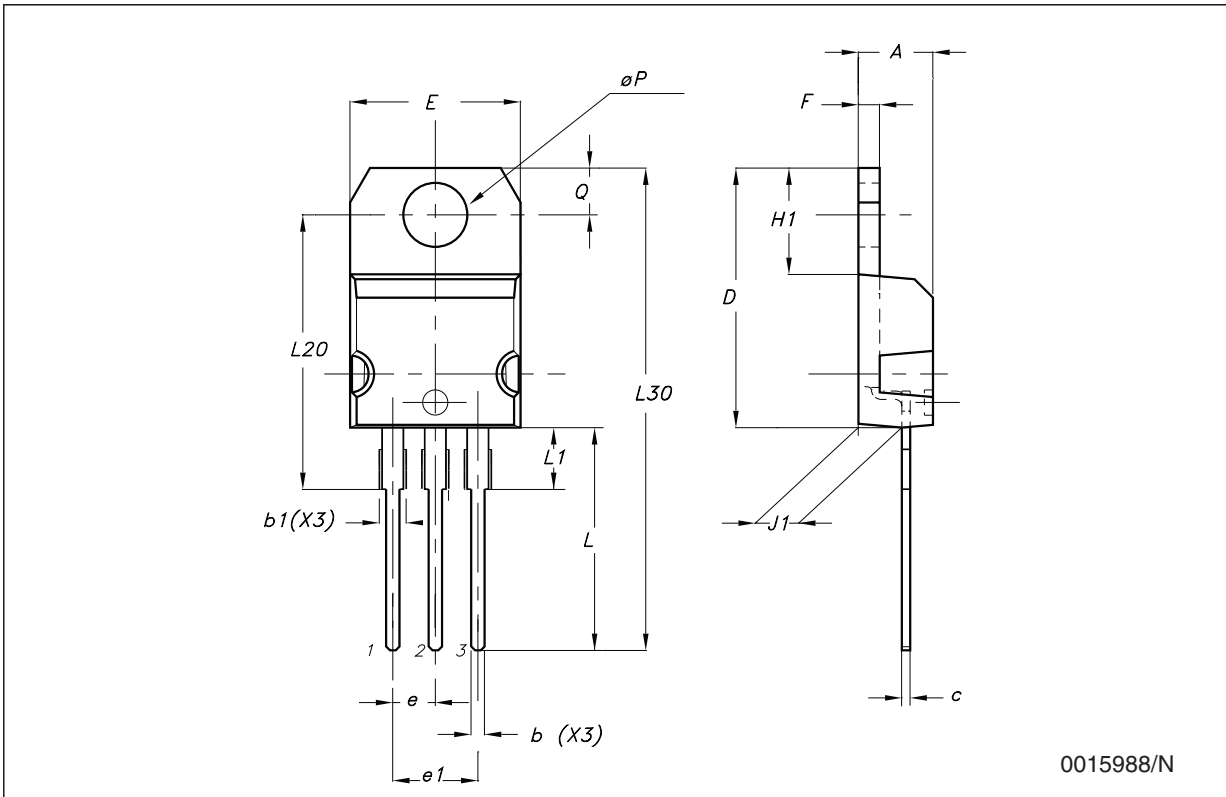


## 7 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK<sup>®</sup> 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 (A type) mechanical data**

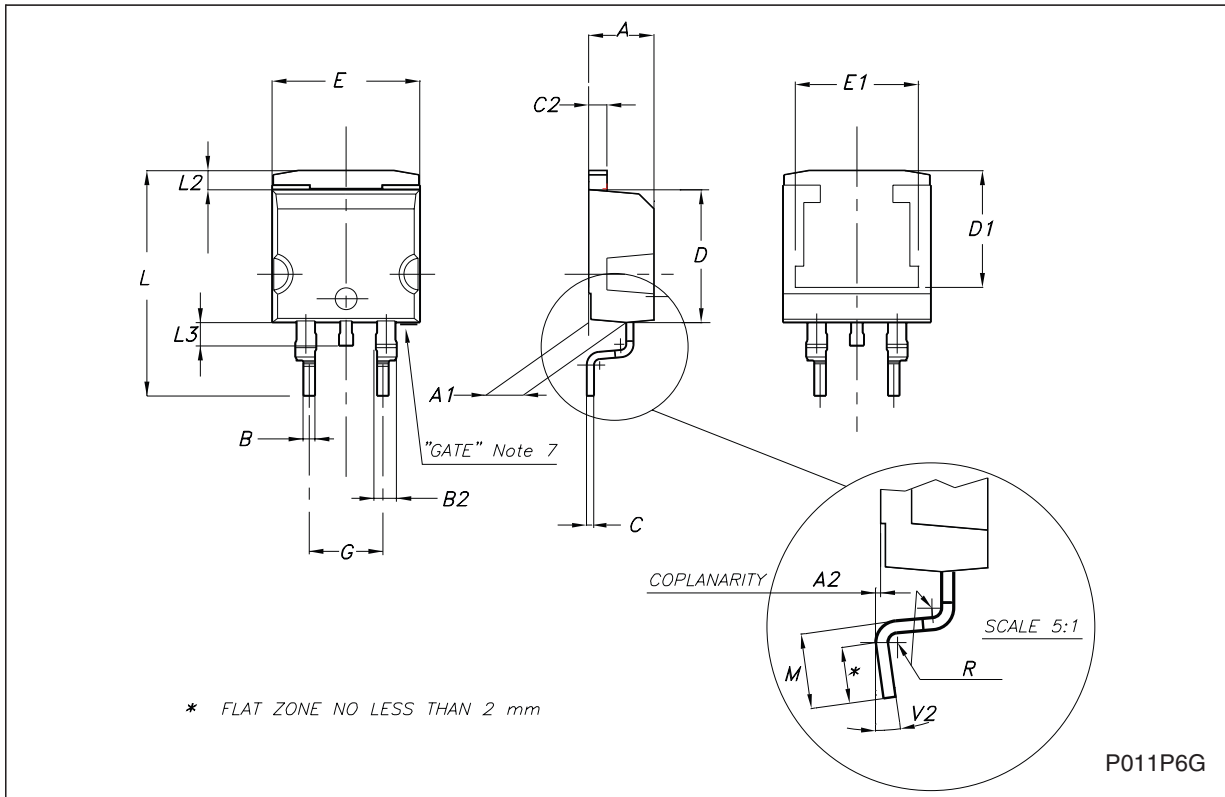
Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
b	0.61		0.88	0.024		0.035
b1	1.15		1.70	0.045		0.067
c	0.49		0.70	0.019		0.028
D	15.25		15.75	0.600		0.620
E	10.0		10.40	0.394		0.409
e	2.4		2.7	0.094		0.106
e1	4.95		5.15	0.195		0.203
F	1.23		1.32	0.048		0.052
H1	6.2		6.6	0.244		0.260
J1	2.40		2.72	0.094		0.107
L	13.0		14.0	0.512		0.551
L1	3.5		3.93	0.138		0.155
L20		16.4			0.646	
L30		28.9			1.138	
φP	3.75		3.85	0.148		0.152
Q	2.65		2.95	0.104		0.116



0015988/N

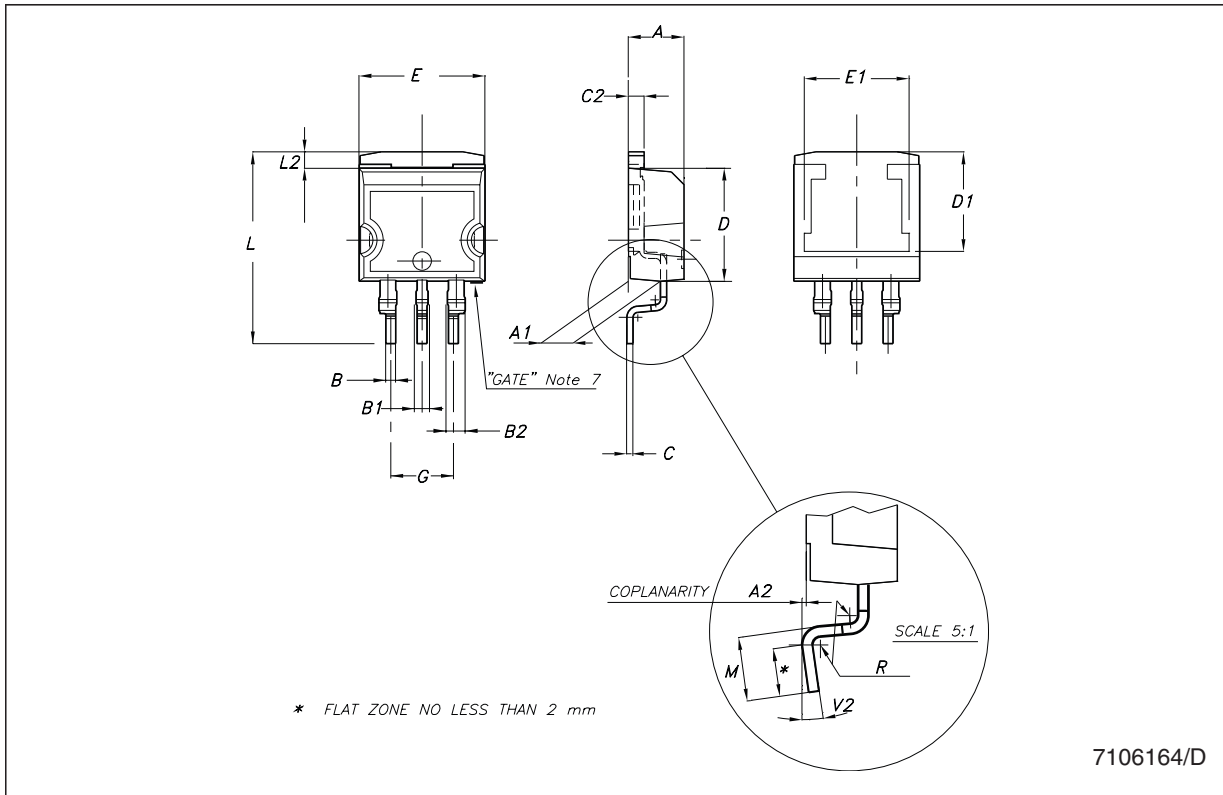
**D<sup>2</sup>PAK mechanical data**

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°



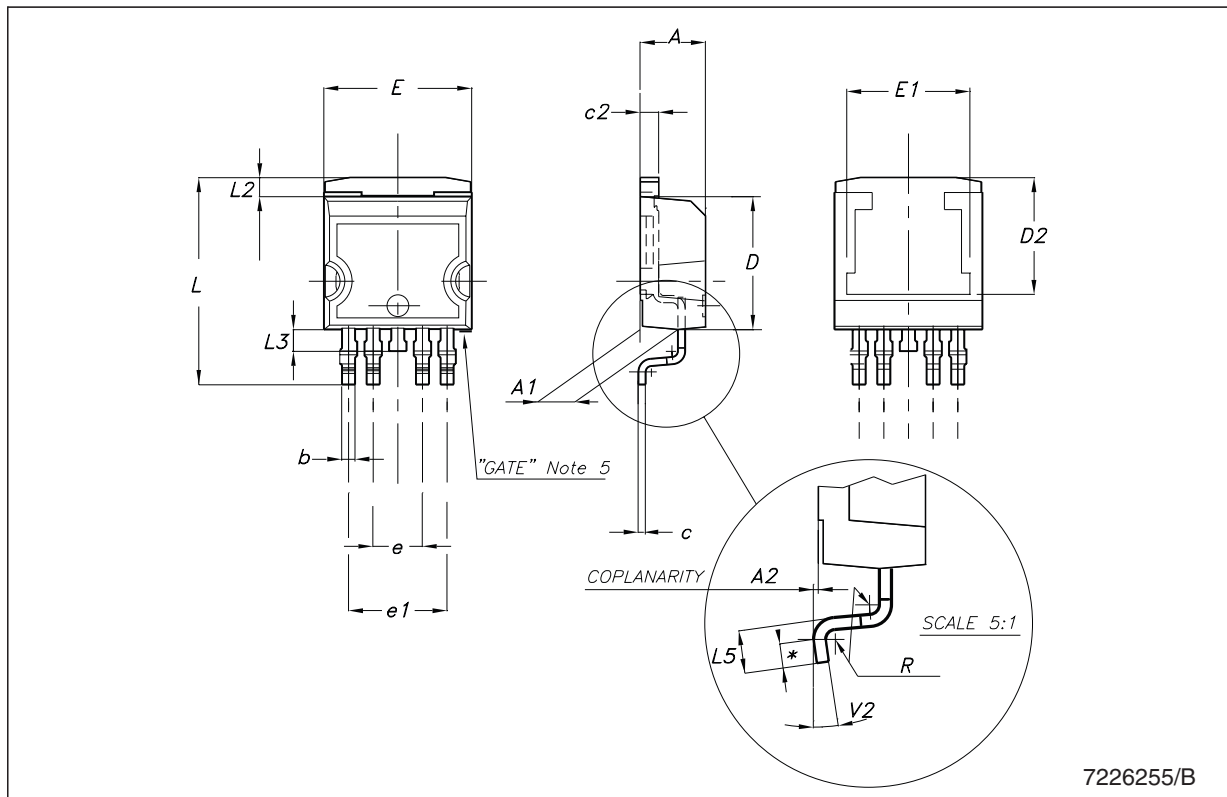
**D<sup>2</sup>PAK/A mechanical data**

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°



**P<sup>2</sup>PAK mechanical data**

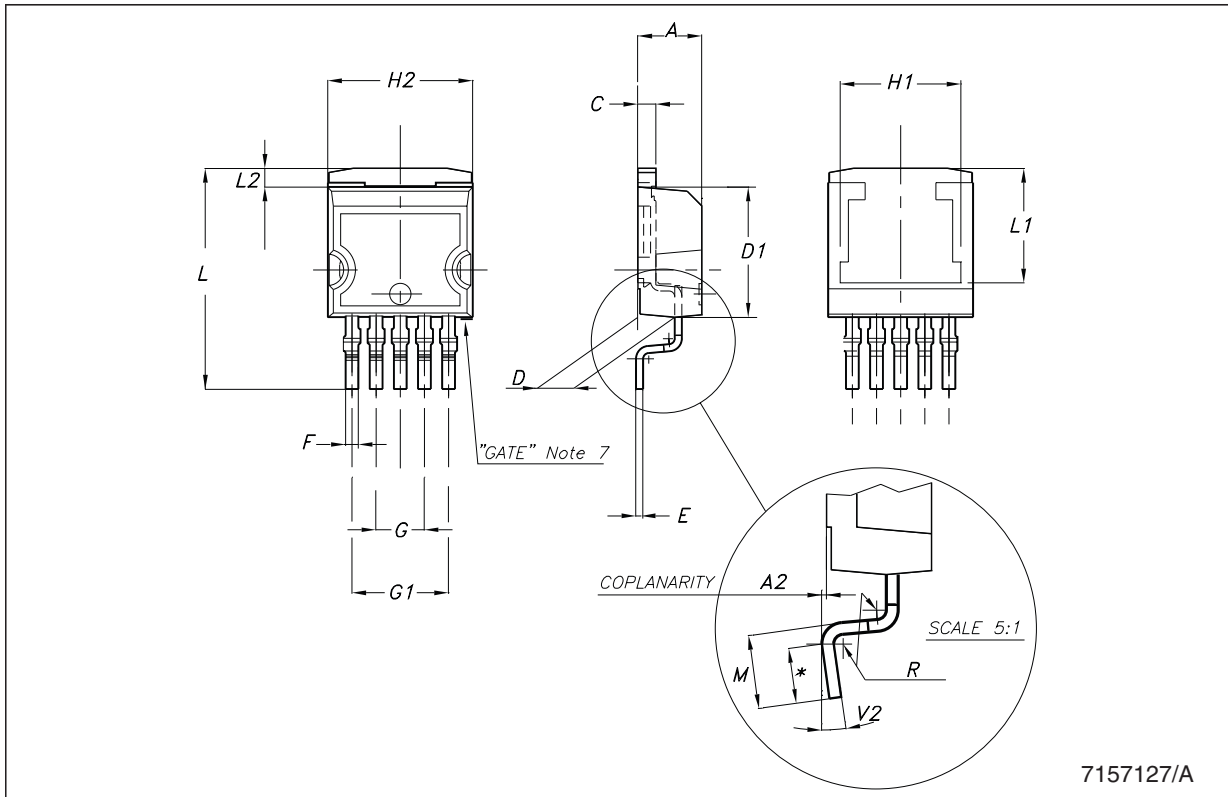
Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.80	0.169		0.188
A1	2.40		2.80	0.094		0.110
A2	0.03		0.23	0.001		0.009
b	0.80		1.05	0.031		0.041
c	0.45		0.60	0.017		0.023
c2	1.17		1.37	0.046		0.053
D	8.95		9.35	0.352		0.368
D2		8			0.315	
E	10.00		10.40	0.393		0.409
E1		8.5			0.334	0.409
e	3.20		3.60	0.126		0.142
e1	6.60		7.00	0.260		0.275
L	13.70		14.50	0.539		0.571
L2	1.25		1.40	0.049		0.055
L3	0.90		1.70	0.035		0.067
L5	1.55		2.40	0.061		0.094
R		0.40			0.016	
V2	0°		8°	0°		8°



7226255/B

**P<sup>2</sup>PAK/A mechanical data**

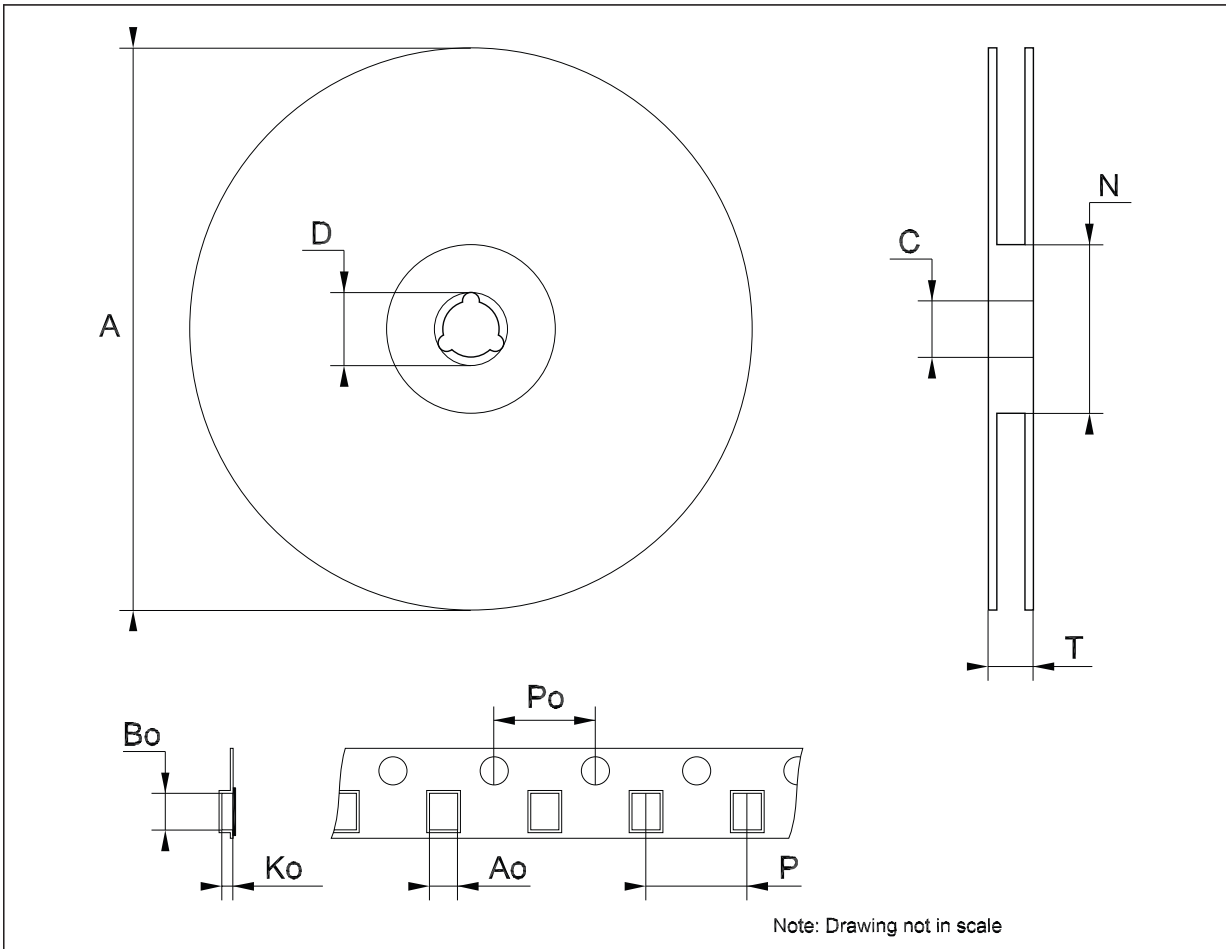
Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.80	0.169		0.188
A2	0.03		0.23	0.001		0.009
C	1.17		1.37	0.046		0.053
D	2.40		2.80	0.094		0.110
D1	8.95		9.35	0.352		0.368
E	0.45		0.60	0.017		0.023
F	0.80		1.05	0.031		0.041
G	3.20		3.60	0.126		0.142
G1	6.60		7.00	0.260		0.275
H1		8.5			0.334	0.409
H2	10.00		10.40	0.393		0.409
L	15		15.85	0.590		0.624
L1		8			0.315	
L2	1.27		1.40	0.050		0.055
M	2.4		3.2	0.094		0.126
R		0.40			0.016	
V2	0°		8°	0°		8°



7157127/A

**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



## 8 Order codes

Table 11. Order codes

Packages					Output voltage
TO-220	D <sup>2</sup> PAK	D <sup>2</sup> PAK/A	P <sup>2</sup> PAK <sup>(1)</sup>	P <sup>2</sup> PAK/A	
			LD29300P2T15R		1.5 V
	LD29300D2T18R	LD29300D2M18R	LD29300P2T18R	LD29300P2M18R	1.8 V
		LD29300D2M25R			2.5 V
LD29300V33		LD29300D2M33R	LD29300P2T33R	LD29300P2M33R	3.3 V
LD29300V50	LD29300D2T50R <sup>(1)</sup>	LD29300D2M50R	LD29300P2T50R	LD29300P2M50R	5.0 V
			LD29300P2T80R		8.0 V
			LD29300P2TR	LD29300P2MTR <sup>(1)</sup>	ADJ

1. Available on request

## 9 Revision history

**Table 12. Document revision history**

Date	Revision	Changes
21-Oct-2005	7	Order codes updated.
10-Apr-2007	8	Order codes updated.
11-May-2007	9	Order codes updated.
08-Jun-2007	10	Order codes updated.
03-Apr-2008	11	Modified: <a href="#">Table 11 on page 24.</a>
11-Jul-2008	12	Modified: <a href="#">Table 11 on page 24.</a>

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