

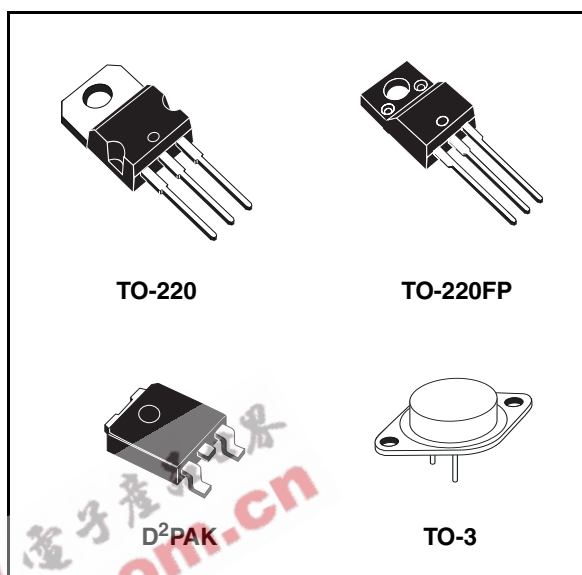
Negative voltage regulators

Feature summary

- Output current up to 1.5A
- Output voltages of -5; -6; -8; -12; -15; -18; -20; -24V
- Thermal overload protection
- Short circuit protection
- Output transition SOA protection

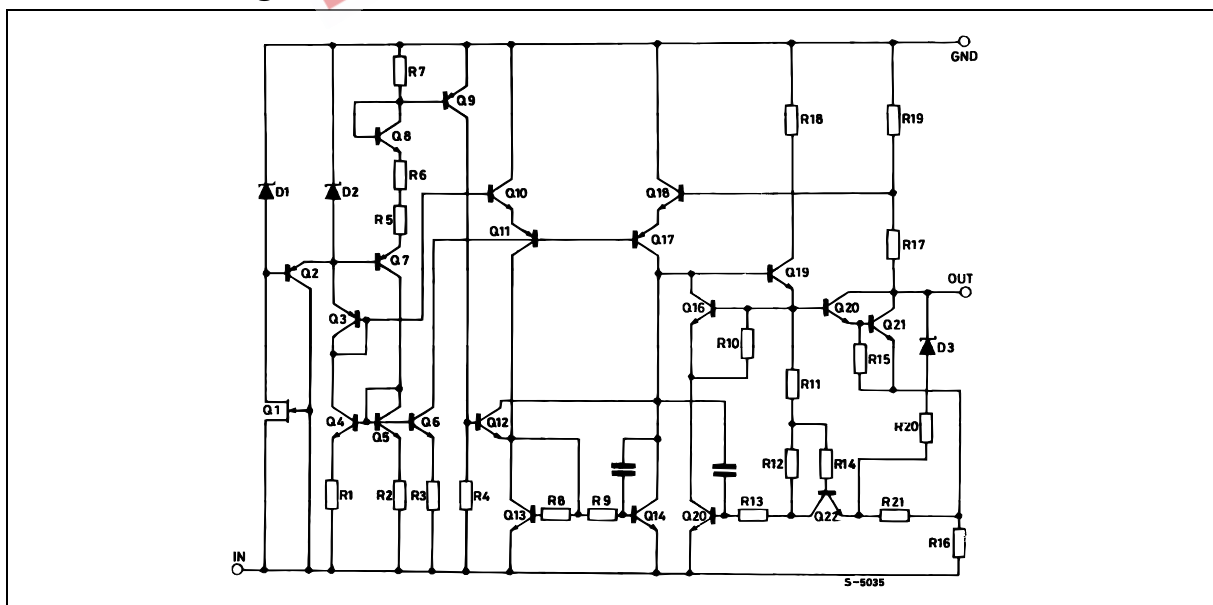
Description

The L7900 series of three-terminal negative regulators is available in TO-220, TO-220FP, TO-3 and D²PAK packages and several fixed output voltages, making it useful in a wide range of applications. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation; furthermore, having the same voltage option as the L7800 positive standard series, they are particularly suited for split power supplies. If adequate heat sinking is provided, they can deliver over 1.5A output current.



Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

Schematic diagram



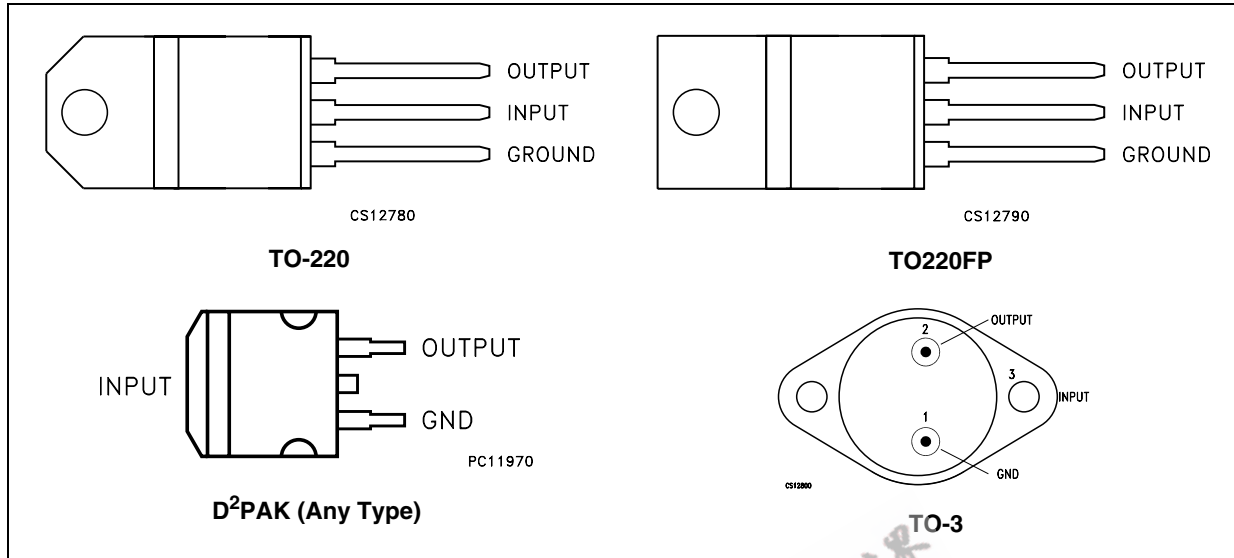
Contents

1	Pin configuration	3
2	Maximum ratings	4
3	Test circuit	5
4	Electrical characteristics	6
5	Application information	11
6	Package mechanical data	13
7	Order code	22
8	Revision history	23

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1 Pin configuration

Figure 1. Pin connections (top view)



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2 Maximum ratings

Table 1. Absolute maximum ratings

Symbol	Parameter		Value	Unit
V _I	DC Input voltage	for V _O = 5 to 18V	-35	V
		for V _O = 20, 24V	-40	
I _O	Output current		Internally Limited	
P _D	Power dissipation		Internally Limited	
T _{STG}	Storage temperature range		-65 to 150	°C
T _{OP}	Operating junction temperature range		0 to 150	°C

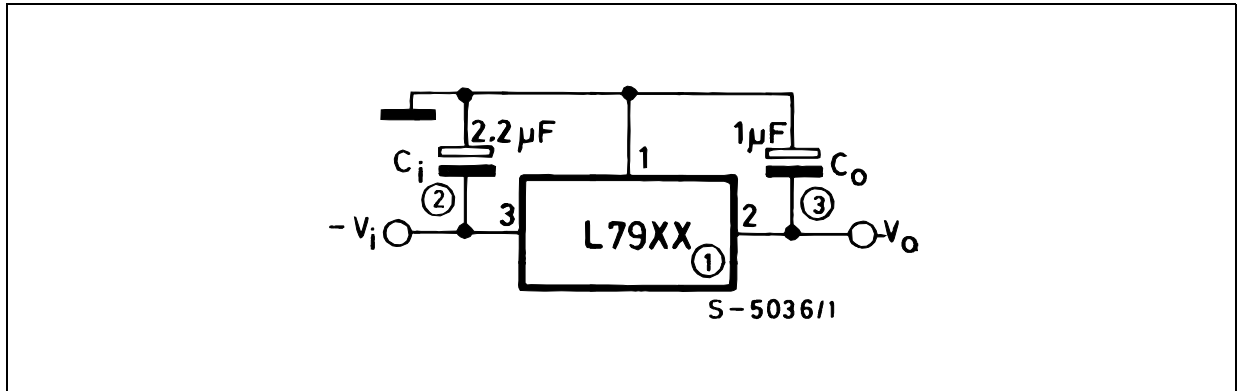
Note: Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied

Table 2. Thermal Data

Symbol	Parameter	D ² PAK	TO-220	TO-220FP	TO-3	Unit
R _{thJC}	Thermal resistance junction-case	3	3	5	4	°C/W
R _{thJA}	Thermal resistance junction-ambient	62.5	50	60	35	°C/W

3 Test circuit

Figure 2. Test circuit



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4 Electrical characteristics

Table 3. Electrical characteristics of L7905C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -10\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\ \mu\text{F}$, $C_O = 1\ \mu\text{F}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_O	Output voltage	$T_J = 25^\circ\text{C}$	-4.8	-5	-5.2	V
V_O	Output voltage	$I_O = -5\text{ mA to } -1\text{ A}$, $P_O \leq 15\text{ W}$ $V_I = -8\text{ to } -20\text{ V}$	-4.75	-5	-5.25	V
$\Delta V_O^{(1)}$	Line regulation	$V_I = -7\text{ to } -25\text{ V}$, $T_J = 25^\circ\text{C}$			100	mV
		$V_I = -8\text{ to } -12\text{ V}$, $T_J = 25^\circ\text{C}$			50	
$\Delta V_O^{(1)}$	Load regulation	$I_O = 5\text{ mA to } 1.5\text{ A}$, $T_J = 25^\circ\text{C}$			100	mV
		$I_O = 250\text{ to } 750\text{ mA}$, $T_J = 25^\circ\text{C}$			50	
I_d	Quiescent current	$T_J = 25^\circ\text{C}$			3	mA
ΔI_d	Quiescent current change	$I_O = 5\text{ mA to } 1\text{ A}$			0.5	mA
		$V_I = -8\text{ to } -25\text{ V}$			1.3	
$\Delta V_O/\Delta T$	Output voltage drift	$I_O = 5\text{ mA}$		-0.4		mV/ $^\circ\text{C}$
eN	Output noise voltage	$B = 10\text{ Hz to } 100\text{ kHz}$, $T_J = 25^\circ\text{C}$		100		μV
SVR	Supply voltage rejection	$\Delta V_I = 10\text{ V}$, $f = 120\text{ Hz}$	54	60		dB
V_d	Dropout voltage	$I_O = 1\text{ A}$, $T_J = 25^\circ\text{C}$, $\Delta V_O = 100\text{ mV}$		1.4		V
I_{sc}	Short circuit current			2.1		A

1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

Table 4. Electrical characteristics of L7906C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -11\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\ \mu\text{F}$, $C_O = 1\ \mu\text{F}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_O	Output voltage	$T_J = 25^\circ\text{C}$	-5.75	-6	-6.25	V
V_O	Output voltage	$I_O = -5\text{ mA to } -1\text{ A}$, $P_O \leq 15\text{ W}$ $V_I = -9.5\text{ to } -21.5\text{ V}$	-5.7	-6	-6.3	V
$\Delta V_O^{(1)}$	Line regulation	$V_I = -8.5\text{ to } -25\text{ V}$, $T_J = 25^\circ\text{C}$			120	mV
		$V_I = -9\text{ to } -15\text{ V}$, $T_J = 25^\circ\text{C}$			60	
$\Delta V_O^{(1)}$	Load regulation	$I_O = 5\text{ mA to } 1.5\text{ A}$, $T_J = 25^\circ\text{C}$			120	mV
		$I_O = 250\text{ to } 750\text{ mA}$, $T_J = 25^\circ\text{C}$			60	
I_d	Quiescent current	$T_J = 25^\circ\text{C}$			3	mA
ΔI_d	Quiescent current change	$I_O = 5\text{ mA to } 1\text{ A}$			0.5	mA
		$V_I = -9.5\text{ to } -25\text{ V}$			1.3	
$\Delta V_O/\Delta T$	Output voltage drift	$I_O = 5\text{ mA}$		-0.6		mV/ $^\circ\text{C}$
eN	Output noise voltage	$B = 10\text{ Hz to } 100\text{ kHz}$, $T_J = 25^\circ\text{C}$		144		μV
SVR	Supply voltage rejection	$\Delta V_I = 10\text{ V}$, $f = 120\text{ Hz}$	54	60		dB
V_d	Dropout voltage	$I_O = 1\text{ A}$, $T_J = 25^\circ\text{C}$, $\Delta V_O = 100\text{ mV}$		1.4		V
I_{sc}	Short circuit current			2		A

1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

Table 5. Electrical characteristics of L7908C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -14\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\ \mu\text{F}$, $C_O = 1\ \mu\text{F}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_O	Output voltage	$T_J = 25^\circ\text{C}$	-7.7	-8	-8.3	V
V_O	Output voltage	$I_O = -5\text{ mA to } -1\text{ A}$, $P_O \leq 15\text{ W}$ $V_I = -11.5\text{ to } -23\text{ V}$	-7.6	-8	-8.4	V
$\Delta V_O^{(1)}$	Line regulation	$V_I = -10.5\text{ to } -25\text{ V}$, $T_J = 25^\circ\text{C}$			160	mV
		$V_I = -11\text{ to } -17\text{ V}$, $T_J = 25^\circ\text{C}$			80	
$\Delta V_O^{(1)}$	Load regulation	$I_O = 5\text{ mA to } 1.5\text{ A}$, $T_J = 25^\circ\text{C}$			160	mV
		$I_O = 250\text{ to } 750\text{ mA}$, $T_J = 25^\circ\text{C}$			80	
I_d	Quiescent current	$T_J = 25^\circ\text{C}$			3	mA
ΔI_d	Quiescent current change	$I_O = 5\text{ mA to } 1\text{ A}$			0.5	mA
		$V_I = -11.5\text{ to } -25\text{ V}$			1	
$\Delta V_O/\Delta T$	Output voltage drift	$I_O = 5\text{ mA}$		-0.6		mV/ $^\circ\text{C}$
eN	Output noise voltage	$B = 10\text{ Hz to } 100\text{ kHz}$, $T_J = 25^\circ\text{C}$		175		μV
SVR	Supply voltage rejection	$\Delta V_I = 10\text{ V}$, $f = 120\text{ Hz}$	54	60		dB
V_d	Dropout voltage	$I_O = 1\text{ A}$, $T_J = 25^\circ\text{C}$, $\Delta V_O = 100\text{ mV}$		1.1		V
I_{sc}	Short circuit current			1.5		A

1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

Table 6. Electrical characteristics of L7912C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -19\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\ \mu\text{F}$, $C_O = 1\ \mu\text{F}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_O	Output voltage	$T_J = 25^\circ\text{C}$	-11.5	-12	-12.5	V
V_O	Output voltage	$I_O = -5\text{ mA to } -1\text{ A}$, $P_O \leq 15\text{ W}$ $V_I = -15.5\text{ to } -27\text{ V}$	-11.4	-12	-12.6	V
$\Delta V_O^{(1)}$	Line regulation	$V_I = -14.5\text{ to } -30\text{ V}$, $T_J = 25^\circ\text{C}$			240	mV
		$V_I = -16\text{ to } -22\text{ V}$, $T_J = 25^\circ\text{C}$			120	
$\Delta V_O^{(1)}$	Load regulation	$I_O = 5\text{ mA to } 1.5\text{ A}$, $T_J = 25^\circ\text{C}$			240	mV
		$I_O = 250\text{ to } 750\text{ mA}$, $T_J = 25^\circ\text{C}$			120	
I_d	Quiescent current	$T_J = 25^\circ\text{C}$			3	mA
ΔI_d	Quiescent current change	$I_O = 5\text{ mA to } 1\text{ A}$			0.5	mA
		$V_I = -15\text{ to } -30\text{ V}$			1	
$\Delta V_O/\Delta T$	Output voltage drift	$I_O = 5\text{ mA}$		-0.8		mV/ $^\circ\text{C}$
eN	Output noise voltage	$B = 10\text{ Hz to } 100\text{ kHz}$, $T_J = 25^\circ\text{C}$		200		μV
SVR	Supply voltage rejection	$\Delta V_I = 10\text{ V}$, $f = 120\text{ Hz}$	54	60		dB
V_d	Dropout voltage	$I_O = 1\text{ A}$, $T_J = 25^\circ\text{C}$, $\Delta V_O = 100\text{ mV}$		1.1		V
I_{sc}	Short circuit current			1.5		A

1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

Table 7. Electrical characteristics of L7915C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -23\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\ \mu\text{F}$, $C_O = 1\ \mu\text{F}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_O	Output voltage	$T_J = 25^\circ\text{C}$	-14.4	-15	-15.6	V
V_O	Output voltage	$I_O = -5\text{ mA to } -1\text{ A}$, $P_O \leq 15\text{ W}$ $V_I = -18.5\text{ to } -30\text{ V}$	-14.3	-15	-15.7	V
$\Delta V_O^{(1)}$	Line regulation	$V_I = -17.5\text{ to } -30\text{ V}$, $T_J = 25^\circ\text{C}$			300	mV
		$V_I = -20\text{ to } -26\text{ V}$, $T_J = 25^\circ\text{C}$			150	
$\Delta V_O^{(1)}$	Load regulation	$I_O = 5\text{ mA to } 1.5\text{ A}$, $T_J = 25^\circ\text{C}$			300	mV
		$I_O = 250\text{ to } 750\text{ mA}$, $T_J = 25^\circ\text{C}$			150	
I_d	Quiescent current	$T_J = 25^\circ\text{C}$			3	mA
ΔI_d	Quiescent current change	$I_O = 5\text{ mA to } 1\text{ A}$			0.5	mA
		$V_I = -18.5\text{ to } -30\text{ V}$			1	
$\Delta V_O/\Delta T$	Output voltage drift	$I_O = 5\text{ mA}$		-0.9		mV/ $^\circ\text{C}$
eN	Output noise voltage	$B = 10\text{ Hz to } 100\text{ kHz}$, $T_J = 25^\circ\text{C}$		250		μV
SVR	Supply voltage rejection	$\Delta V_I = 10\text{ V}$, $f = 120\text{ Hz}$	54	60		dB
V_d	Dropout voltage	$I_O = 1\text{ A}$, $T_J = 25^\circ\text{C}$, $\Delta V_O = 100\text{ mV}$		1.1		V
I_{sc}	Short circuit current			1.3		A

1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

Table 8. Electrical characteristics of L7918C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -27\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\ \mu\text{F}$, $C_O = 1\ \mu\text{F}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_O	Output voltage	$T_J = 25^\circ\text{C}$	-17.3	-18	-18.7	V
V_O	Output voltage	$I_O = -5\text{ mA to } -1\text{ A}$, $P_O \leq 15\text{ W}$ $V_I = -22\text{ to } -33\text{ V}$	-17.1	-18	-18.9	V
$\Delta V_O^{(1)}$	Line regulation	$V_I = -21\text{ to } -33\text{ V}$, $T_J = 25^\circ\text{C}$			360	mV
		$V_I = -24\text{ to } -30\text{ V}$, $T_J = 25^\circ\text{C}$			180	
$\Delta V_O^{(1)}$	Load regulation	$I_O = 5\text{ mA to } 1.5\text{ A}$, $T_J = 25^\circ\text{C}$			360	mV
		$I_O = 250\text{ to } 750\text{ mA}$, $T_J = 25^\circ\text{C}$			180	
I_d	Quiescent current	$T_J = 25^\circ\text{C}$			3	mA
ΔI_d	Quiescent current change	$I_O = 5\text{ mA to } 1\text{ A}$			0.5	mA
		$V_I = -22\text{ to } -33\text{ V}$			1	
$\Delta V_O/\Delta T$	Output voltage drift	$I_O = 5\text{ mA}$		-1		mV/ $^\circ\text{C}$
eN	Output noise voltage	$B = 10\text{ Hz to } 100\text{ kHz}$, $T_J = 25^\circ\text{C}$		300		μV
SVR	Supply voltage rejection	$\Delta V_I = 10\text{ V}$, $f = 120\text{ Hz}$	54	60		dB
V_d	Dropout voltage	$I_O = 1\text{ A}$, $T_J = 25^\circ\text{C}$, $\Delta V_O = 100\text{ mV}$		1.1		V
I_{sc}	Short circuit current			1.1		A

1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

Table 9. Electrical characteristics of L7920C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -29\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\ \mu\text{F}$, $C_O = 1\ \mu\text{F}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_O	Output voltage	$T_J = 25^\circ\text{C}$	-19.2	-20	-20.8	V
V_O	Output voltage	$I_O = -5\text{ mA to } -1\text{ A}$, $P_O \leq 15\text{ W}$ $V_I = -24\text{ to } -35\text{ V}$	-19	-20	-21	V
$\Delta V_O^{(1)}$	Line regulation	$V_I = -23\text{ to } -35\text{ V}$, $T_J = 25^\circ\text{C}$			400	mV
		$V_I = -26\text{ to } -32\text{ V}$, $T_J = 25^\circ\text{C}$			200	
$\Delta V_O^{(1)}$	Load regulation	$I_O = 5\text{ mA to } 1.5\text{ A}$, $T_J = 25^\circ\text{C}$			400	mV
		$I_O = 250\text{ to } 750\text{ mA}$, $T_J = 25^\circ\text{C}$			200	
I_d	Quiescent current	$T_J = 25^\circ\text{C}$			3	mA
ΔI_d	Quiescent current change	$I_O = 5\text{ mA to } 1\text{ A}$			0.5	mA
		$V_I = -24\text{ to } -35\text{ V}$			1	
$\Delta V_O/\Delta T$	Output voltage drift	$I_O = 5\text{ mA}$		-1.1		mV/ $^\circ\text{C}$
eN	Output noise voltage	$B = 10\text{ Hz to } 100\text{ kHz}$, $T_J = 25^\circ\text{C}$		350		μV
SVR	Supply voltage rejection	$\Delta V_I = 10\text{ V}$, $f = 120\text{ Hz}$	54	60		dB
V_d	Dropout voltage	$I_O = 1\text{ A}$, $T_J = 25^\circ\text{C}$, $\Delta V_O = 100\text{ mV}$		1.1		V
I_{sc}	Short circuit current			0.9		A

1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

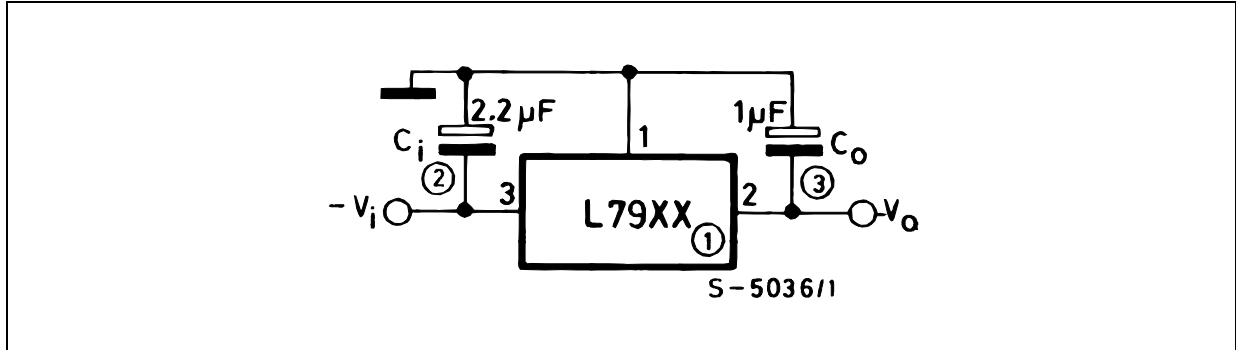
Table 10. Electrical characteristics of L7924C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -33\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\ \mu\text{F}$, $C_O = 1\ \mu\text{F}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_O	Output voltage	$T_J = 25^\circ\text{C}$	-23	-24	-24.5	V
V_O	Output voltage	$I_O = -5\text{ mA to } -1\text{ A}$, $P_O \leq 15\text{ W}$ $V_I = -27\text{ to } -38\text{ V}$	-22.8	-24	-25.2	V
$\Delta V_O^{(1)}$	Line regulation	$V_I = -27\text{ to } -38\text{ V}$, $T_J = 25^\circ\text{C}$			480	mV
		$V_I = -30\text{ to } -36\text{ V}$, $T_J = 25^\circ\text{C}$			240	
$\Delta V_O^{(1)}$	Load regulation	$I_O = 5\text{ mA to } 1.5\text{ A}$, $T_J = 25^\circ\text{C}$			480	mV
		$I_O = 250\text{ to } 750\text{ mA}$, $T_J = 25^\circ\text{C}$			240	
I_d	Quiescent current	$T_J = 25^\circ\text{C}$			3	mA
ΔI_d	Quiescent current change	$I_O = 5\text{ mA to } 1\text{ A}$			0.5	mA
		$V_I = -27\text{ to } -38\text{ V}$			1	
$\Delta V_O/\Delta T$	Output voltage drift	$I_O = 5\text{ mA}$		-1		mV/ $^\circ\text{C}$
eN	Output noise voltage	$B = 10\text{Hz to } 100\text{kHz}$, $T_J = 25^\circ\text{C}$		400		μV
SVR	Supply voltage rejection	$\Delta V_I = 10\text{ V}$, $f = 120\text{Hz}$	54	60		dB
V_d	Dropout voltage	$I_O = 1\text{ A}$, $T_J = 25^\circ\text{C}$, $\Delta V_O = 100\text{ mV}$		1.1		V
I_{sc}	Short circuit current			1.1		A

1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

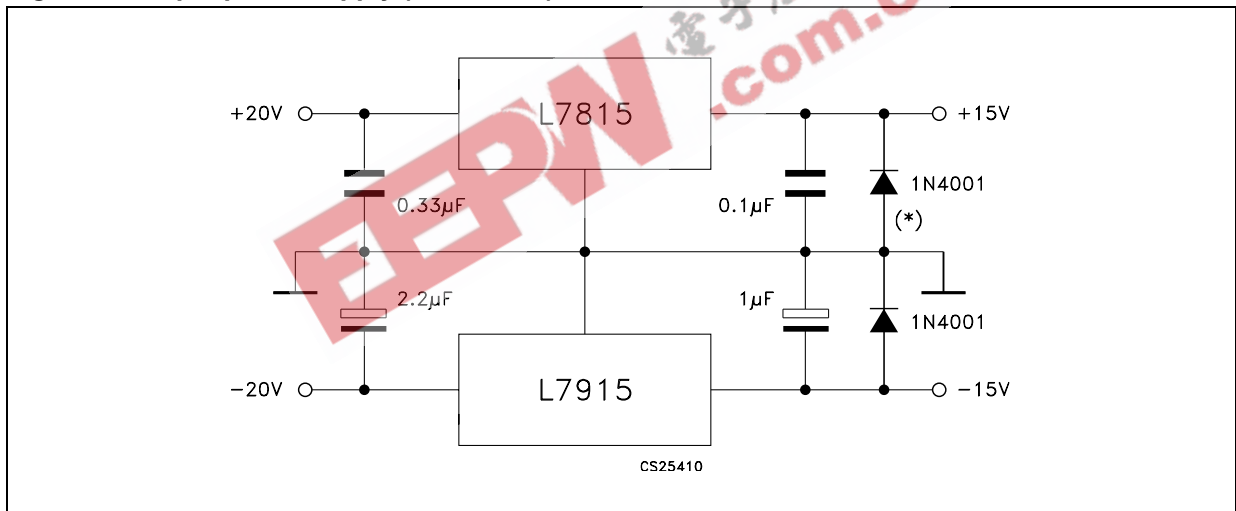
5 Application information

Figure 3. Fixed output regulator



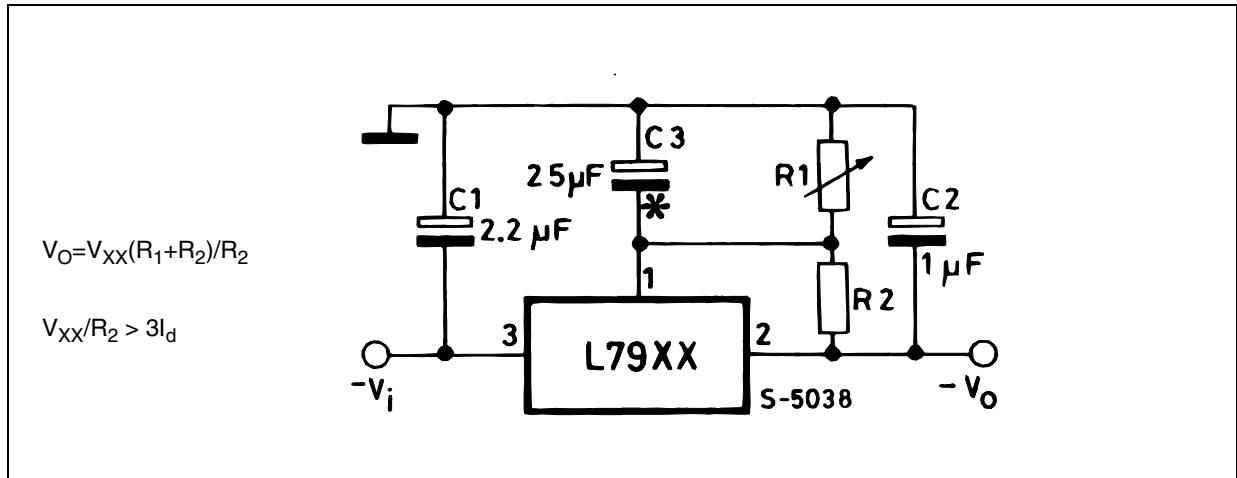
1. To specify an output voltage, substitute voltage value for "XX".
2. Required for stability. For value given, capacitor must be solid tantalum. If aluminium electrolytics are used, at least ten times value should be selected. C1 is required if regulator is located an appreciable distance from power supply filter.
3. To improve transient response. If large capacitors are used, a high current diode from input to output (1N4001 or similar) should be introduced to protect the device from momentary input short circuit.

Figure 4. Split power supply ($\pm 15V - 1A$)



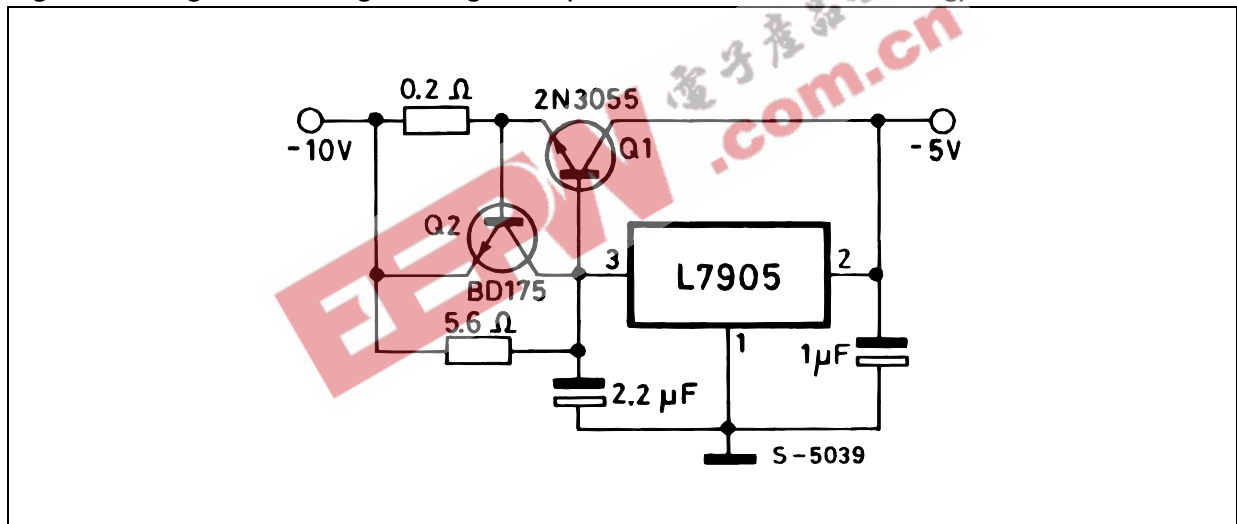
(*) Against potential latch-up problems.

Figure 5. Circuit for increasing output voltage



C3 Optional for improved transient response and ripple rejection.

Figure 6. High current negative regulator (-5V/4A with 5A current limiting)



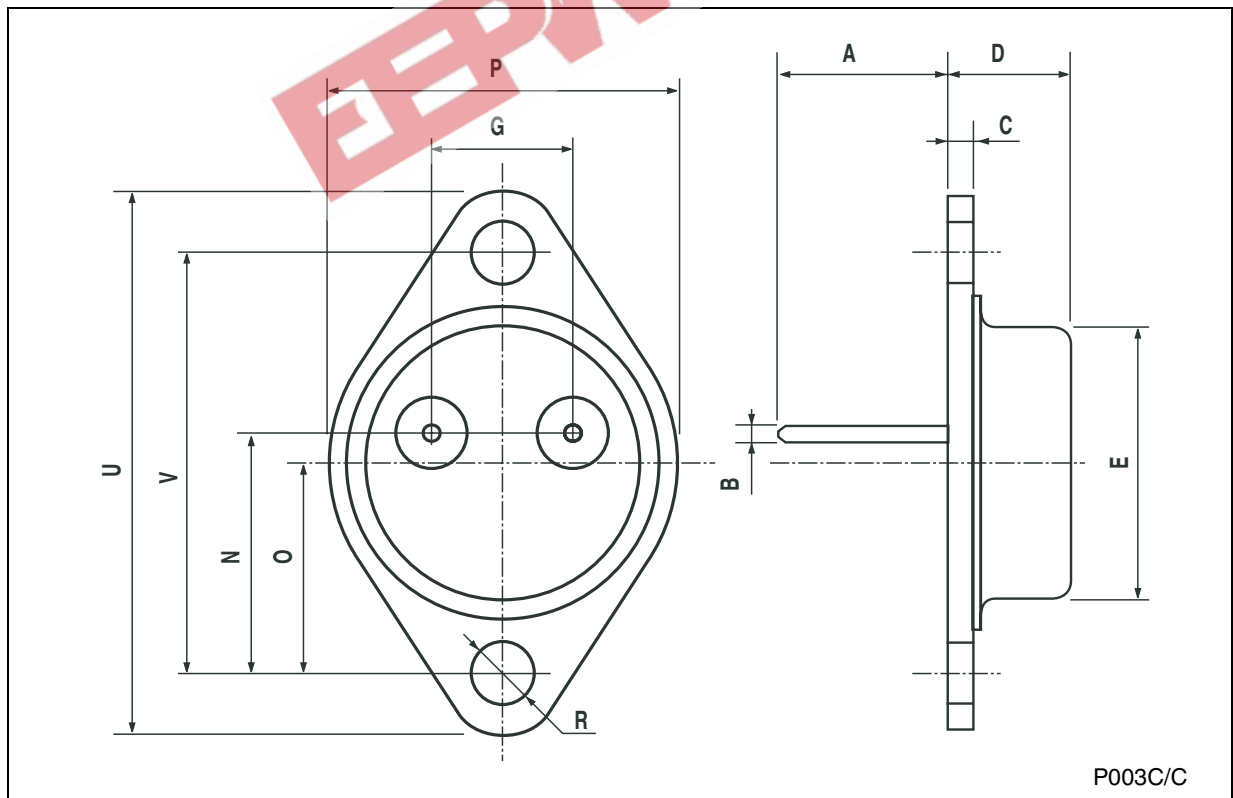
6 Package mechanical data

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.

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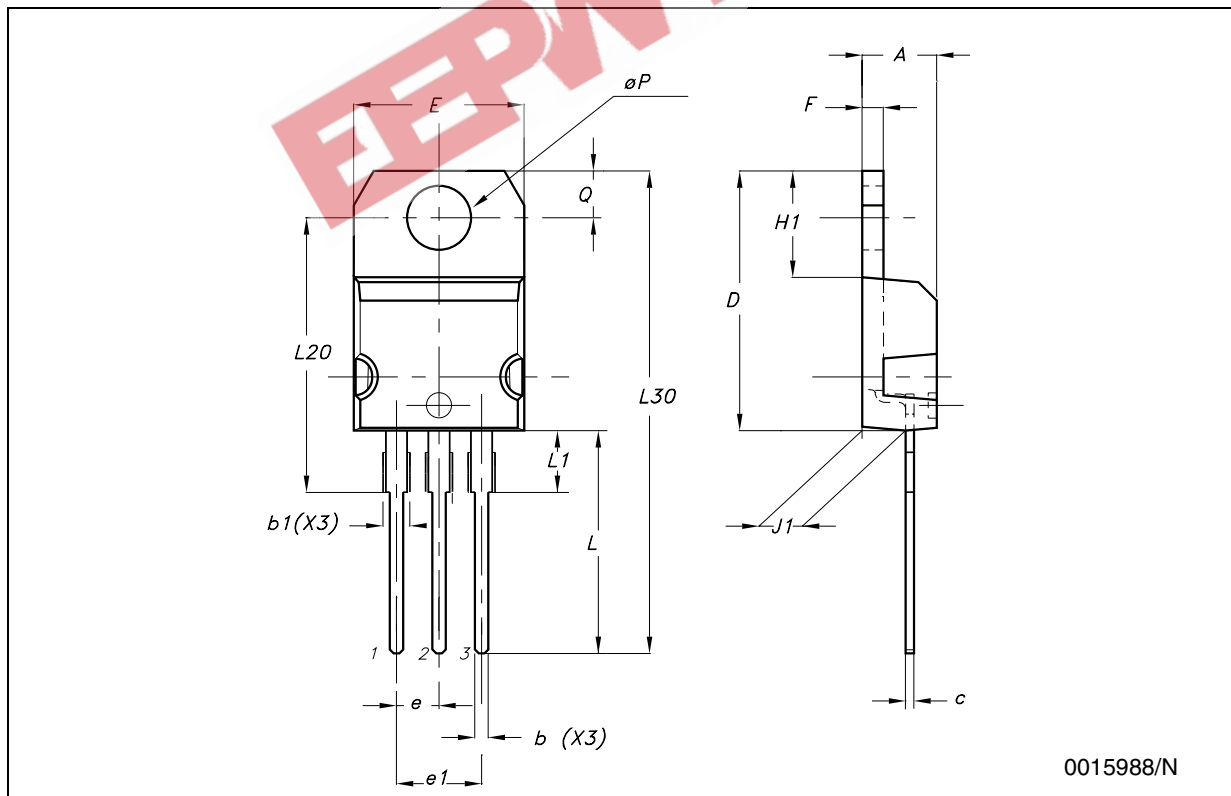
TO-3 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A		11.85			0.466	
B	0.96	1.05	1.10	0.037	0.041	0.043
C			1.70			0.066
D			8.7			0.342
E			20.0			0.787
G		10.9			0.429	
N		16.9			0.665	
P			26.2			1.031
R	3.88		4.09	0.152		0.161
U			39.5			1.555
V		30.10			1.185	



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		0.034
b1	1.15		1.70	0.045		0.067
c	0.49		0.70	0.019		0.027
D	15.25		15.75	0.600		0.620
E	10.0		10.40	0.393		0.409
e	2.4		2.7	0.094		0.106
e1	4.95		5.15	0.194		0.203
F	1.23		1.32	0.048		0.051
H1	6.2		6.6	0.244		0.260
J1	2.40		2.72	0.094		0.107
L	13.0		14.0	0.511		0.551
L1	3.5		3.93	0.137		0.154
L20		16.4			0.645	
L30		28.9			1.138	
φP	3.75		3.85	0.147		0.151
Q	2.65		2.95	0.104		0.116



0015988/N

TO-220FP MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.45		0.70	0.017		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.50	0.045		0.059
F2	1.15		1.50	0.045		0.059
G	4.95		5.2	0.194		0.204
G1	2.4		2.7	0.094		0.106
H	10.0		10.40	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L5	2.9		3.6	0.114		0.142
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
DIA.	3		3.2	0.118		0.126

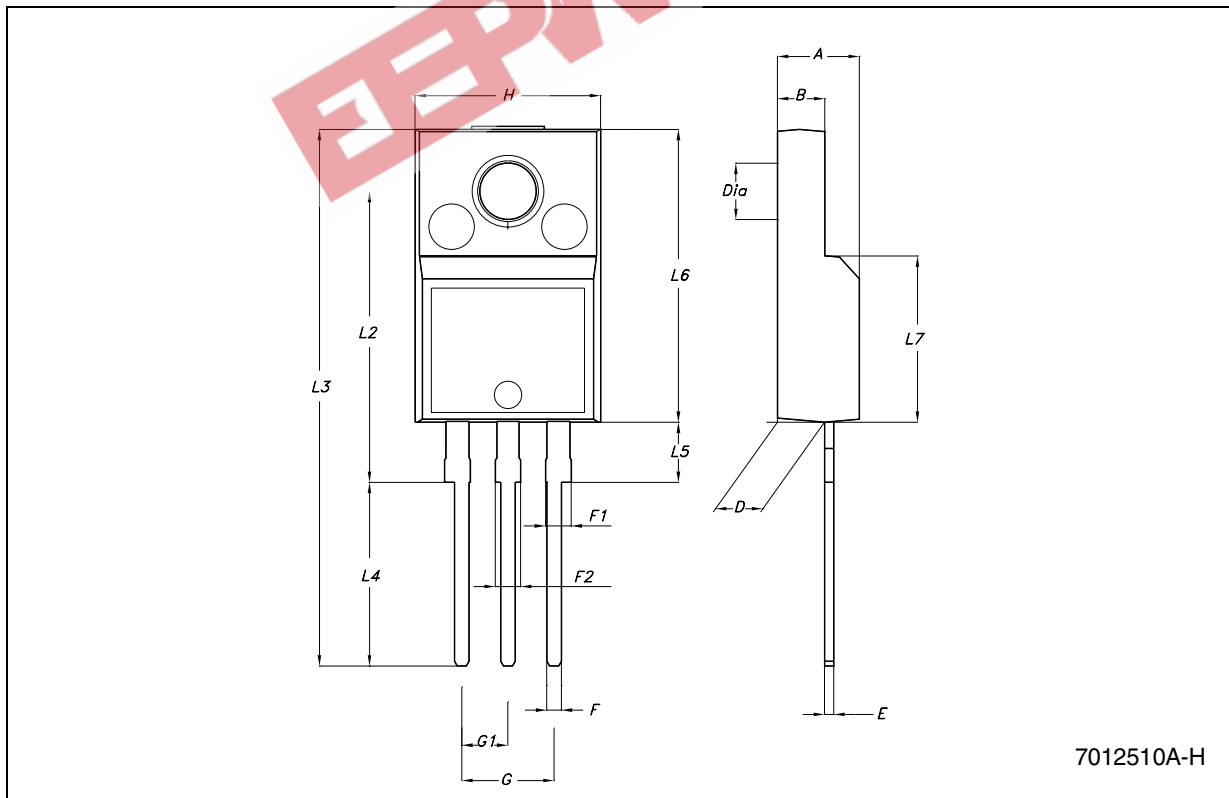


Figure 7. DRAWING DIMENSION D²PAK (TYPE STD-ST)

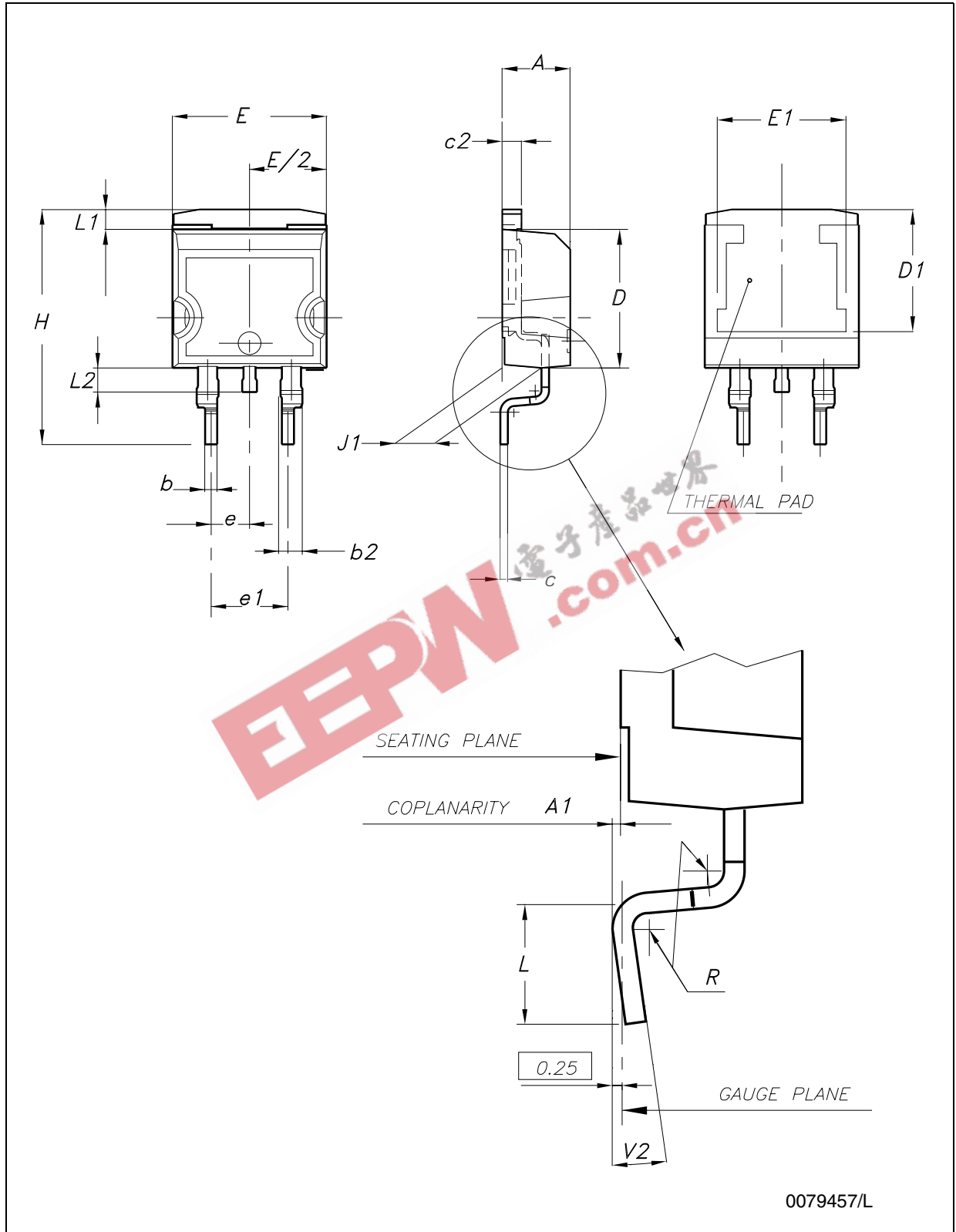


Figure 8. DRAWING DIMENSION D²PAK (TYPE WOOSEOK-SUBCON.)

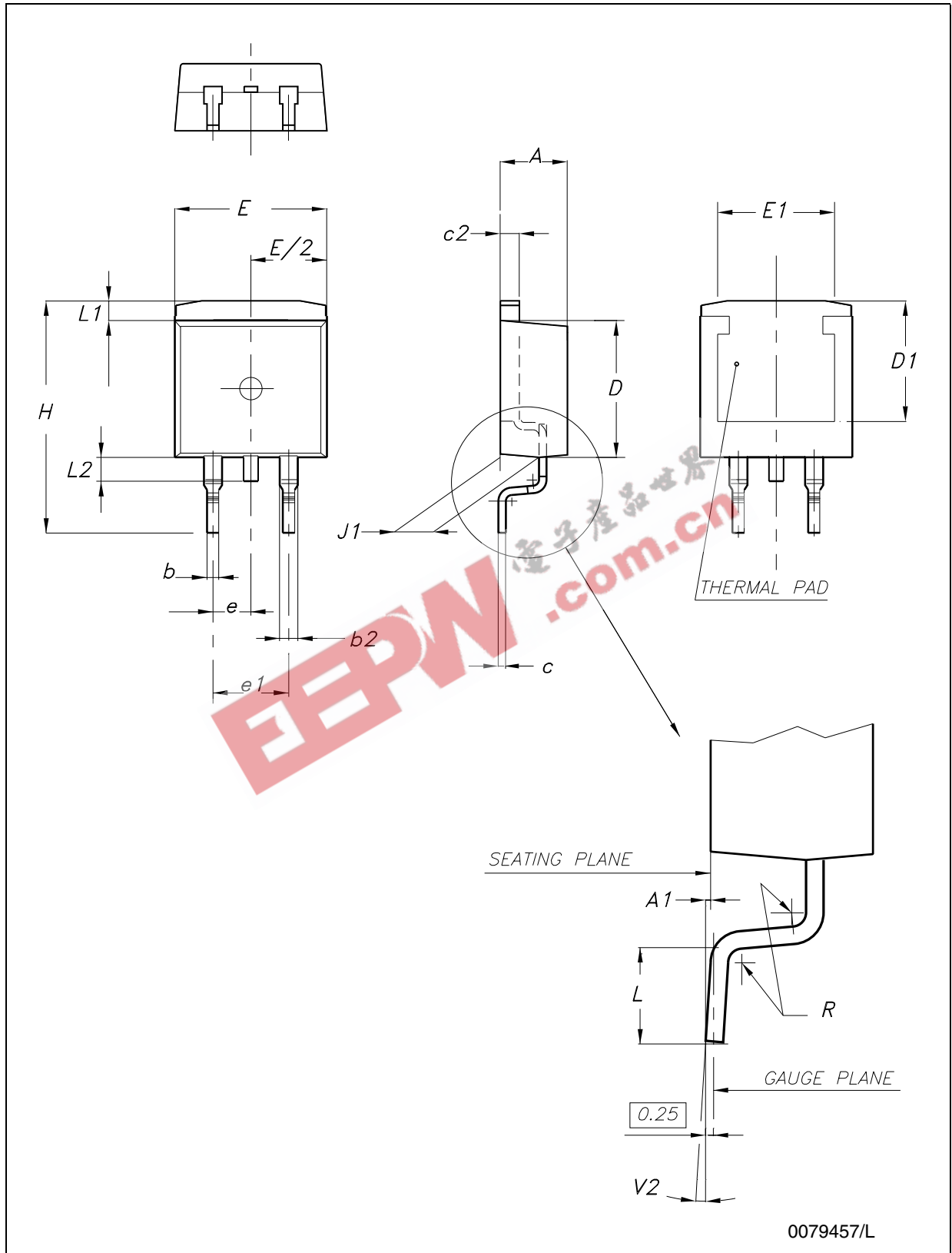


Table 11. D²PAK MECHANICAL DATA

DIM.	TYPE STD-ST			TYPE WOOSEOK-SUBCON.		
	mm.			mm.		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	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
c	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		
e		2.54			2.54	
e1	4.88		5.28		5.08	
H	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 9. D²PAK FOOTPRINT RECOMMENDED DATA

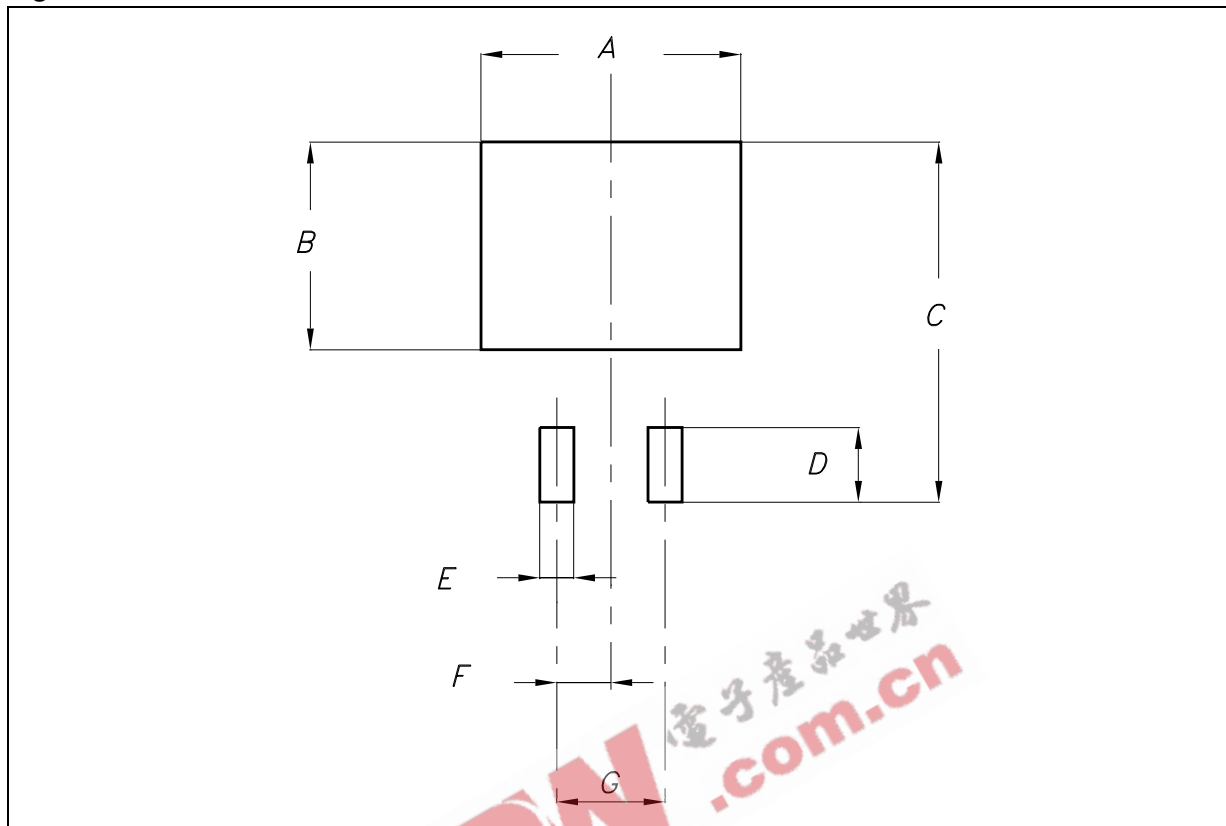
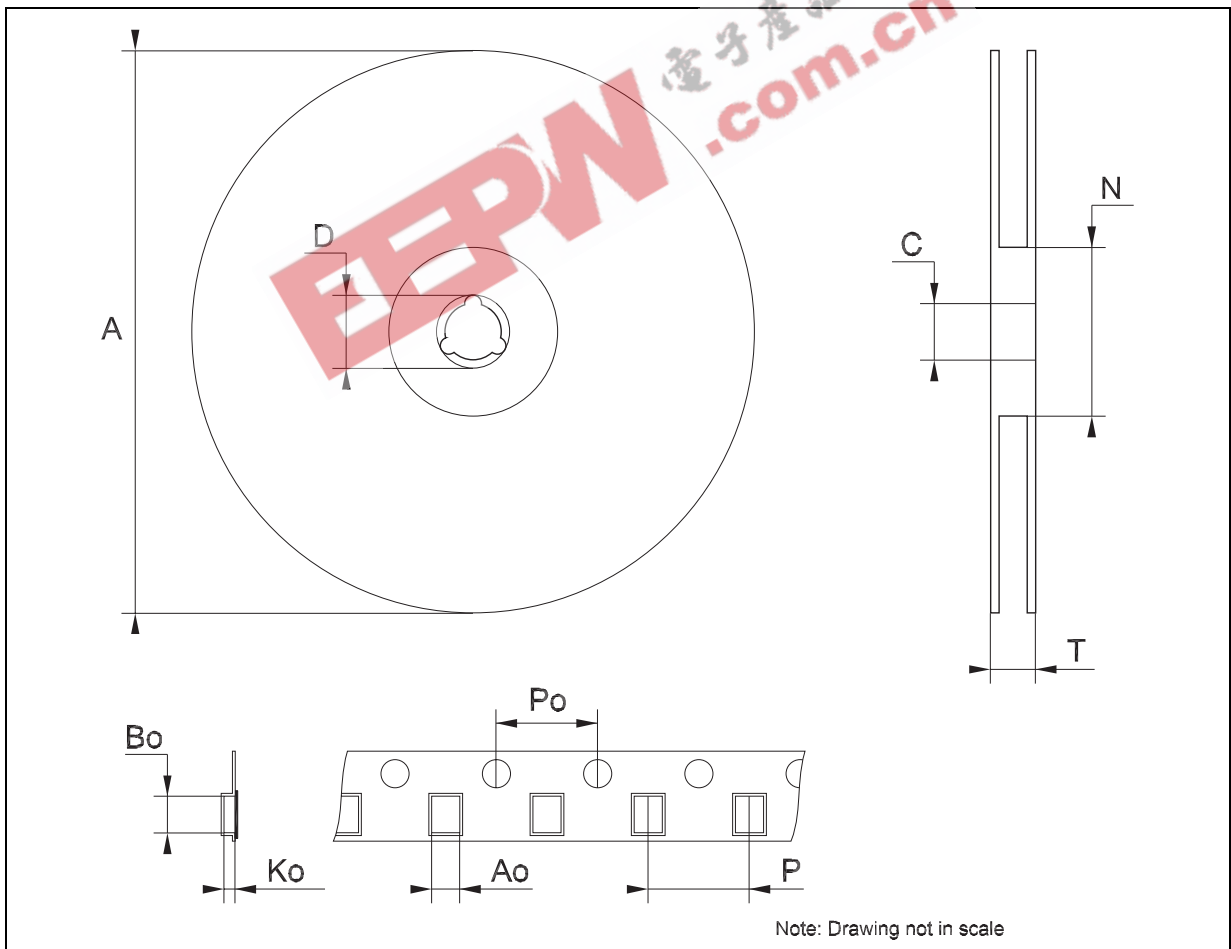


Table 12. FOOTPRINT DATA

	VALUES	
	mm.	inch.
A	12.20	0.480
B	9.75	0.384
C	16.90	0.665
D	3.50	0.138
E	1.60	0.063
F	2.54	0.100
G	5.08	0.200

Tape & Reel D²PAK-P²PAK-D²PAK/A-P²PAK/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 code

Table 13. Order code

Part numbers	Packaging				
	TO-220 (A Type)	D ² PAK	TO-220FP	TO-3	OUT. VOLT.
L7905C	L7905CV	L7905CD2T-TR	L7905CP	L7905CT ⁽¹⁾	-5 V
L7906C	L7906CV	L7906CD2T-TR	L7906CP ⁽¹⁾	L7906CT ⁽¹⁾	-6 V
L7908C	L7908CV	L7908CD2T-TR	L7908CP ⁽¹⁾	L7908CT ⁽¹⁾	-8 V
L7912C	L7912CV	L7912CD2T-TR	L7912CP	L7912CT ⁽¹⁾	-12 V
L7915C	L7915CV	L7915CD2T-TR	L7915CP	L7915CT	-15 V
L7918C	L7918CV	L7918CD2T-TR ⁽¹⁾	L7918CP ⁽¹⁾	L7918CT ⁽¹⁾	-18 V
L7920C	L7920CV	L7920CD2T-TR ⁽¹⁾	L7920CP ⁽¹⁾	L7920CT ⁽¹⁾	-20 V
L7924C	L7924CV	L7924CD2T-TR ⁽¹⁾	L7924CP ⁽¹⁾	L7924CT	-24 V

1. Available on Request.

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8 Revision history

Table 14. Revision history

Date	Revision	Changes
22-Jun-2004	9	Ordering Codes updated Table 3, pag. 3.
31-Aug-2005	10	Add new order codes (TO-220 E Type) on Table 3, pag. 3.
19-Jan-2007	11	D ² PAK mechanical data has been updated, add footprint data and the document has been reformatted.

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