

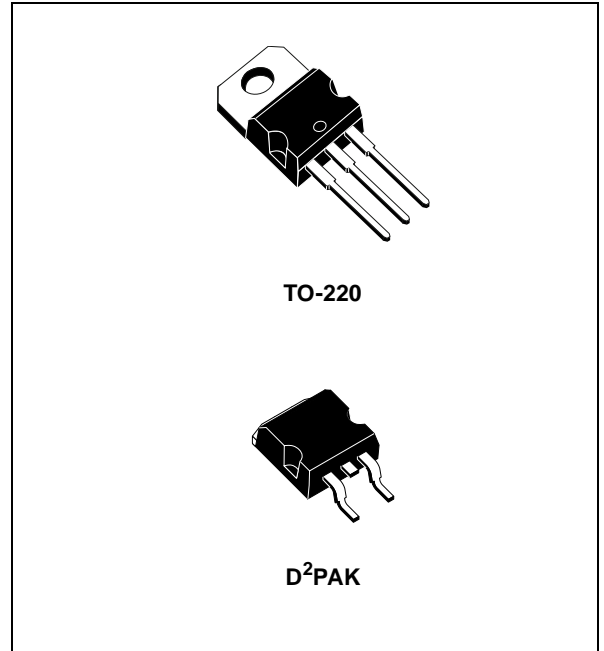
## 2% NEGATIVE VOLTAGE REGULATORS

- OUTPUT CURRENT TO 1.5A
- OUTPUT VOLTAGES OF -5; -6; -8; -12; -15; -18; -20; -24V
- THERMAL OVERLOAD PROTECTION
- SHORT CIRCUIT PROTECTION
- OUTPUT TRANSITION SOA PROTECTION

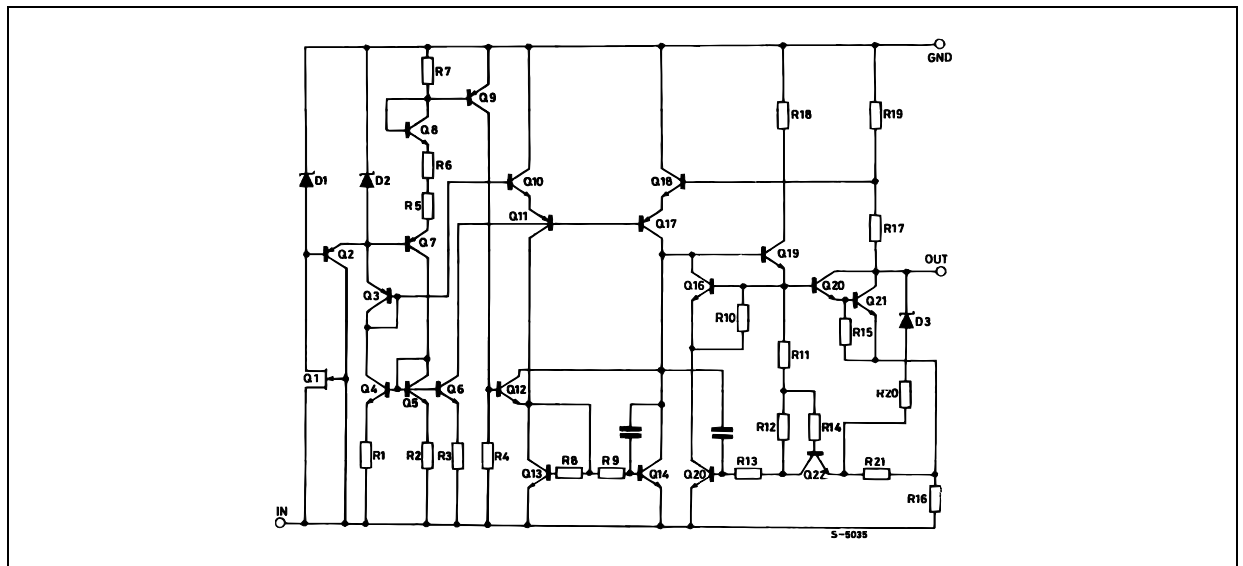
### DESCRIPTION

The L7900AC series of three-terminal negative regulators is available in TO-220 and D<sup>2</sup>PAK packages and several fixed output voltages. 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 L7800A 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



**Table 1: Absolute Maximum Ratings**

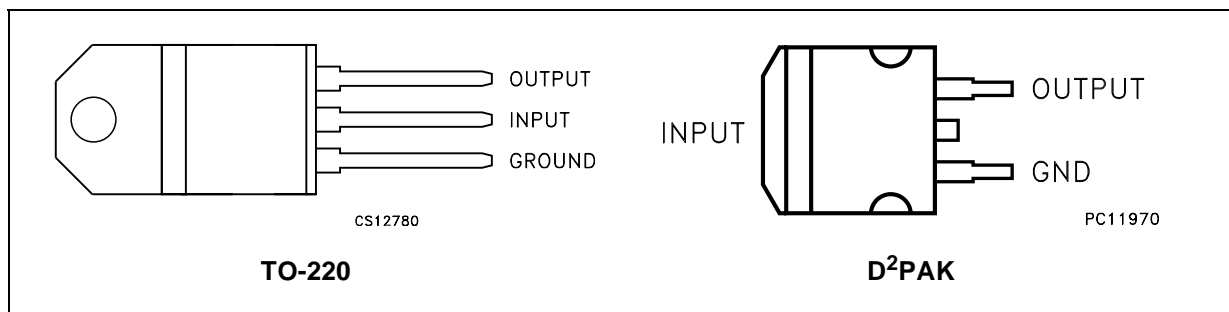
Symbol	Parameter		Value	Unit
$V_I$	DC Input Voltage	for $V_O = -5$ to $-18V$	-35	V
		for $V_O = -20, -24V$	-40	
$I_O$	Output Current		Internally Limited	
$P_{tot}$	Power Dissipation		Internally Limited	
$T_{stg}$	Storage Temperature Range		-65 to 150	°C
$T_{op}$	Operating Junction Temperature Range		0 to 125	°C

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 <sup>2</sup> PAK	TO-220	Unit
$R_{thj-case}$	Thermal Resistance Junction-case	Max	3	3	°C/W
$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	62.5	50	°C/W

**Figure 1: Connection Diagram (top view)**



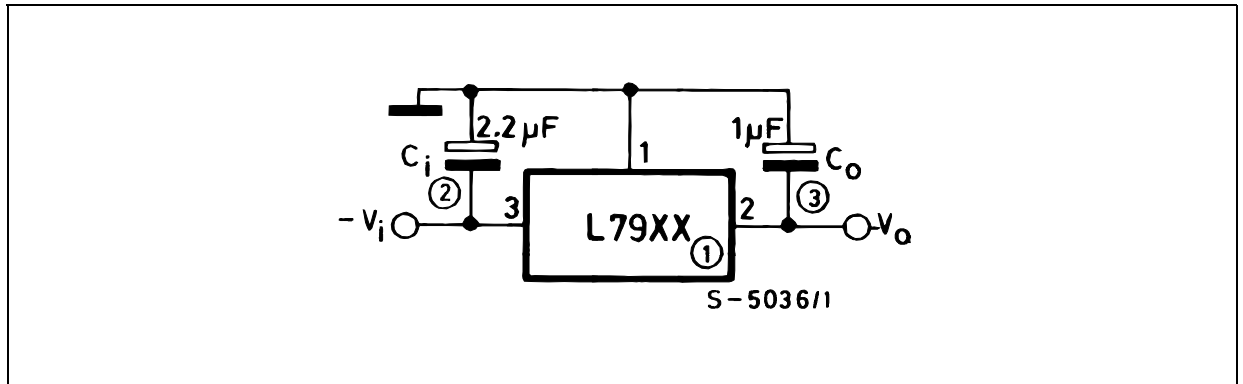
**Table 3: Ordering Codes**

TYPE	TO-220	D <sup>2</sup> PAK (*)	OUTPUT VOLTAGE
L7905AC	L7905ACV	L7905ACD2T	-5 V
L7906AC	L7906ACV (**)	L7906ACD2T (**)	-6 V
L7908AC	L7908ACV	L7908ACD2T	-8 V
L7912AC	L7912ACV	L7912ACD2T	-12 V
L7915AC	L7915ACV	L7915ACD2T (**)	-15 V
L7918AC	L7918ACV (**)	L7918ACD2T (**)	-18 V
L7920AC	L7920ACV	L7920ACD2T (**)	-20 V
L7924AC	L7924ACV	L7924ACD2T (**)	-24 V

(\*) Available in Tape & Reel with the suffix "-TR".

(\*\*) Available on Request.

Figure 2: Application Circuits



**Table 4: Electrical Characteristics Of L7905A** (refer to the test circuits,  $T_J = 0$  to  $125^\circ\text{C}$ ,  $V_I = -10\text{V}$ ,  $I_O = 500$  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	$T_J = 25^\circ\text{C}$	-4.9	-5	-5.1	V
$V_O$	Output Voltage	$I_O = -5$ mA to $-1$ A $P_O \leq 15\text{W}$ $V_I = 8$ to $20$ V	-4.8	-5	-5.2	V
$\Delta V_O^*$	Line Regulation	$V_I = -7$ to $-25$ V $T_J = 25^\circ\text{C}$			100	mV
		$V_I = -8$ to $-12$ V $T_J = 25^\circ\text{C}$			50	
$\Delta V_O^*$	Load Regulation	$I_O = 5$ mA to $1.5$ A $T_J = 25^\circ\text{C}$			100	mV
		$I_O = 250$ to $750$ mA $T_J = 25^\circ\text{C}$			50	
$I_d$	Quiescent Current	$T_J = 25^\circ\text{C}$			3	mA
$\Delta I_d$	Quiescent Current Change	$I_O = 5$ mA to $1$ A			0.5	mA
		$V_I = -8$ to $-25$ V			1.3	
$\Delta V_O/\Delta T$	Output Voltage Drift	$I_O = 5$ 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		$\mu\text{V}$
SVR	Supply Voltage Rejection	$\Delta V_I = 10$ V $f = 120\text{Hz}$	54	60		dB
$V_d$	Dropout Voltage	$I_O = 1$ A $T_J = 25^\circ\text{C}$ $\Delta V_O = 100$ mV		1.4		V
$I_{sc}$	Short Circuit Current			2.1		A
$I_{scp}$	Short Circuit Peak Current	$T_J = 25^\circ\text{C}$		2.5		A

(\*) 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 L7906A** (refer to the test circuits,  $T_J = 0$  to  $125^\circ\text{C}$ ,  $V_I = -11\text{V}$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 2.2\text{ }\mu\text{F}$ ,  $C_O = 1\text{ }\mu\text{F}$  unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage	$T_J = 25^\circ\text{C}$	-5.88	-6	-6.12	V
$V_O$	Output Voltage	$I_O = -5\text{ mA to } -1\text{ A}$ $P_O \leq 15\text{W}$ $V_I = -9.5\text{ to } -21.5\text{ V}$	-5.76	-6	-6.24	V
$\Delta V_O$ (*)	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	
$\Delta V_O$ (*)	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
$\Delta I_d$	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		$\mu\text{V}$
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
$I_{scp}$	Short Circuit Peak Current	$T_J = 25^\circ\text{C}$		2.5		A

(\*) 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 L7908A** (refer to the test circuits,  $T_J = 0$  to  $125^\circ\text{C}$ ,  $V_I = -14\text{V}$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 2.2\text{ }\mu\text{F}$ ,  $C_O = 1\text{ }\mu\text{F}$  unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage	$T_J = 25^\circ\text{C}$	-7.84	-8	-8.16	V
$V_O$	Output Voltage	$I_O = -5\text{ mA to } -1\text{ A}$ $P_O \leq 15\text{W}$ $V_I = -11.5\text{ to } -23\text{ V}$	-7.68	-8	-8.32	V
$\Delta V_O$ (*)	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	
$\Delta V_O$ (*)	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
$\Delta I_d$	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		$\mu\text{V}$
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
$I_{scp}$	Short Circuit Peak Current	$T_J = 25^\circ\text{C}$		2.5		A

(\*) 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 L7912A** (refer to the test circuits,  $T_J = 0$  to  $125^\circ\text{C}$ ,  $V_I = -19\text{V}$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 2.2\ \mu\text{F}$ ,  $C_O = 1\ \mu\text{F}$  unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage	$T_J = 25^\circ\text{C}$	-11.75	-12	-12.25	V
$V_O$	Output Voltage	$I_O = -5\text{ mA to } -1\text{ A}$ $P_O \leq 15\text{W}$ $V_I = -15.5\text{ to } -27\text{ V}$	-11.5	-12	-12.5	V
$\Delta V_{O(*)}$	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	
$\Delta V_{O(*)}$	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
$\Delta I_d$	Quiescent Current Change	$I_O = 5\text{ mA to } 1\text{ A}$			0.5	mA
		$V_I = -15\text{ to } -25\text{ V}$			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		$\mu\text{V}$
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
$I_{scp}$	Short Circuit Peak Current	$T_J = 25^\circ\text{C}$		2.5		A

(\*) 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 L7915A** (refer to the test circuits,  $T_J = 0$  to  $125^\circ\text{C}$ ,  $V_I = -23\text{V}$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 2.2\ \mu\text{F}$ ,  $C_O = 1\ \mu\text{F}$  unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage	$T_J = 25^\circ\text{C}$	-14.7	-15	-15.3	V
$V_O$	Output Voltage	$I_O = -5\text{ mA to } -1\text{ A}$ $P_O \leq 15\text{W}$ $V_I = -18.5\text{ to } -30\text{ V}$	-14.4	-15	-15.6	V
$\Delta V_{O(*)}$	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	
$\Delta V_{O(*)}$	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
$\Delta I_d$	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		$\mu\text{V}$
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
$I_{scp}$	Short Circuit Peak Current	$T_J = 25^\circ\text{C}$		2.3		A

(\*) 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 L7918A** (refer to the test circuits,  $T_J = 0$  to  $125^\circ\text{C}$ ,  $V_I = -27\text{V}$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 2.2\ \mu\text{F}$ ,  $C_O = 1\ \mu\text{F}$  unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage	$T_J = 25^\circ\text{C}$	-17.64	-18	-18.36	V
$V_O$	Output Voltage	$I_O = -5\text{ mA to } -1\text{ A}$ $P_O \leq 15\text{W}$ $V_I = -22\text{ to } -33\text{ V}$	-17.3	-18	-18.7	V
$\Delta V_{O(*)}$	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	
$\Delta V_{O(*)}$	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
$\Delta I_d$	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		$\mu\text{V}$
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
$I_{scp}$	Short Circuit Peak Current	$T_J = 25^\circ\text{C}$		2.2		A

(\*) 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 L7920A** (refer to the test circuits,  $T_J = 0$  to  $125^\circ\text{C}$ ,  $V_I = -29\text{V}$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 2.2\ \mu\text{F}$ ,  $C_O = 1\ \mu\text{F}$  unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage	$T_J = 25^\circ\text{C}$	-19.6	-20	-20.4	V
$V_O$	Output Voltage	$I_O = -5\text{ mA to } -1\text{ A}$ $P_O \leq 15\text{W}$ $V_I = -24\text{ to } -35\text{ V}$	-19.2	-20	-20.8	V
$\Delta V_{O(*)}$	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	
$\Delta V_{O(*)}$	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
$\Delta I_d$	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		$\mu\text{V}$
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
$I_{scp}$	Short Circuit Peak Current	$T_J = 25^\circ\text{C}$		2.2		A

(\*) 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.

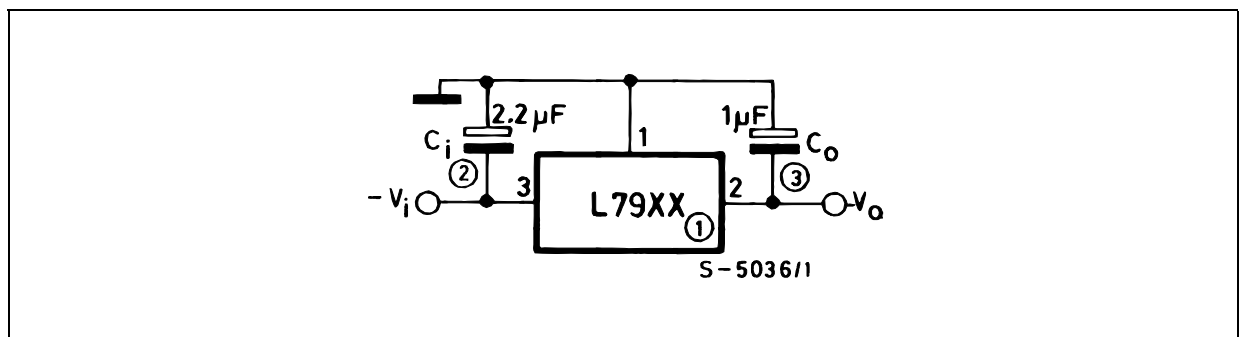
**Table 11: Electrical Characteristics Of L7924A** (refer to the test circuits,  $T_J = 0$  to  $125^\circ\text{C}$ ,  $V_I = -33\text{V}$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 2.2\ \mu\text{F}$ ,  $C_O = 1\ \mu\text{F}$  unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage	$T_J = 25^\circ\text{C}$	-23.5	-24	-24.5	V
$V_O$	Output Voltage	$I_O = -5\text{ mA to } -1\text{ A}$ $P_O \leq 15\text{W}$ $V_I = -27\text{ to } -38\text{ V}$	-23	-24	-25	V
$\Delta V_{O(*)}$	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	
$\Delta V_{O(*)}$	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
$\Delta I_d$	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		$\mu\text{V}$
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
$I_{scp}$	Short Circuit Peak Current	$T_J = 25^\circ\text{C}$		2.2		A

(\*) 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.

## APPLICATIONS INFORMATION

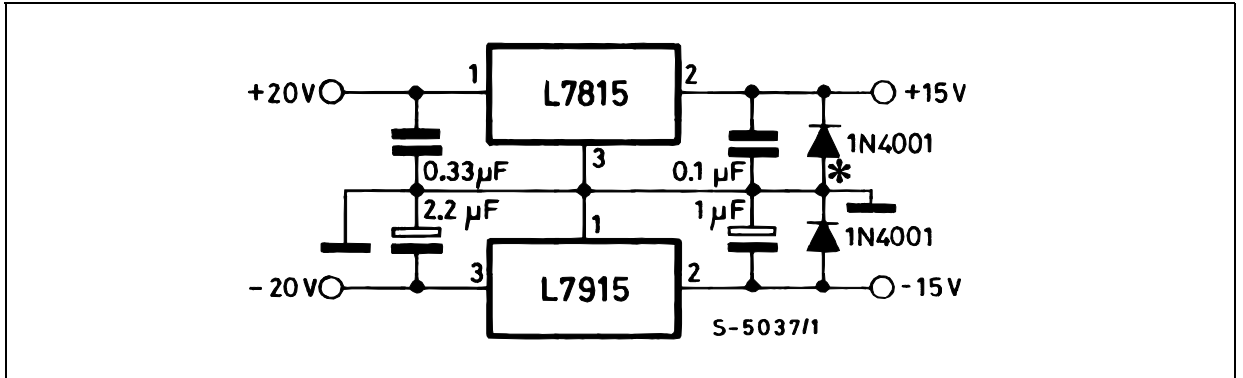
**Figure 3: Fixed Output Regulator**



### NOTE:

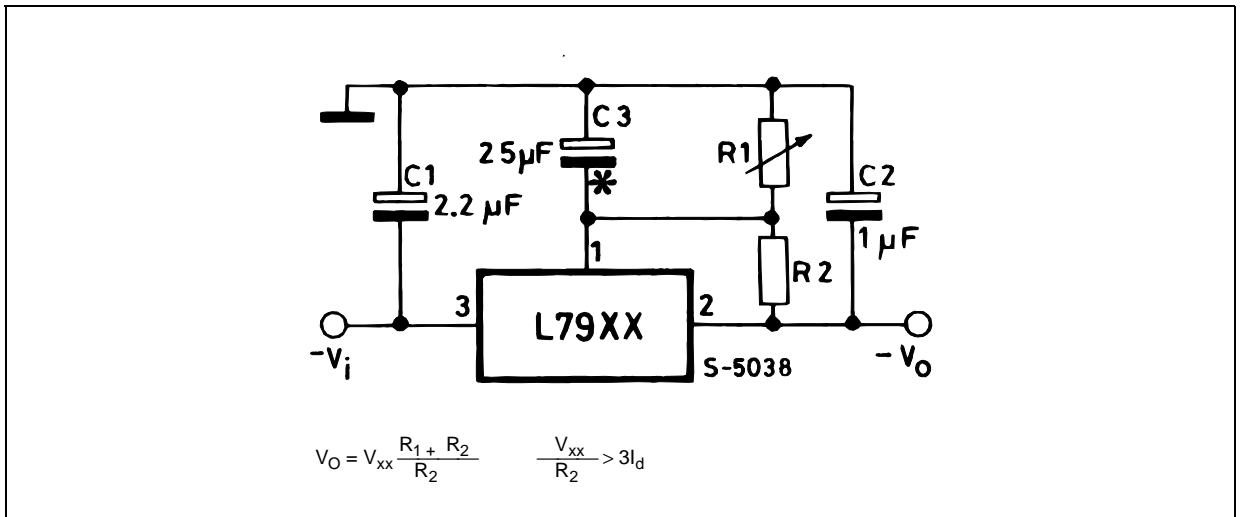
1. To specify an output voltage, substitute voltage value for "XX".
2. Required for stability. For value given, capacitor must be solid tantalum. If aluminium electrolytics are used, at least ten times value should be selected. C1 is required if regulator is located an appreciable distance from power 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 ( $\pm 15V/1A$ )



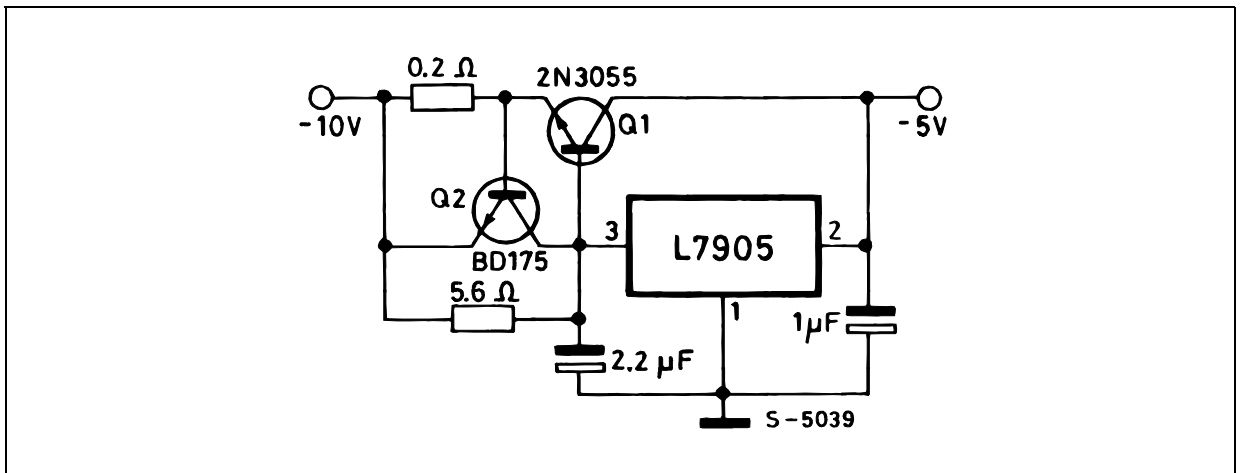
Against potential latch-up problems.

Figure 5: Circuit for Increasing Output Voltage



C3 Optional for improved transient response and ripple rejection.

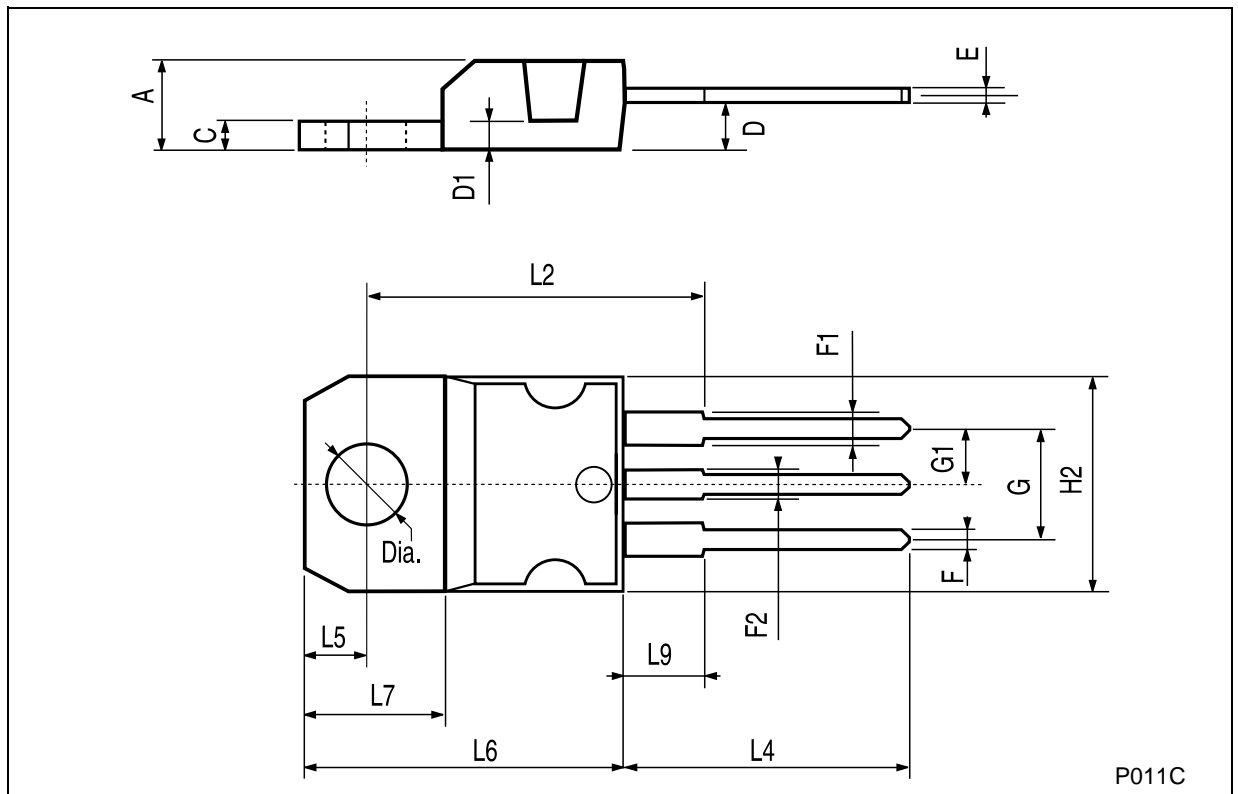
Figure 6: High Current Negative Regulator ( $-5V/4A$  with 5A current limiting)





## TO-220 MECHANICAL DATA

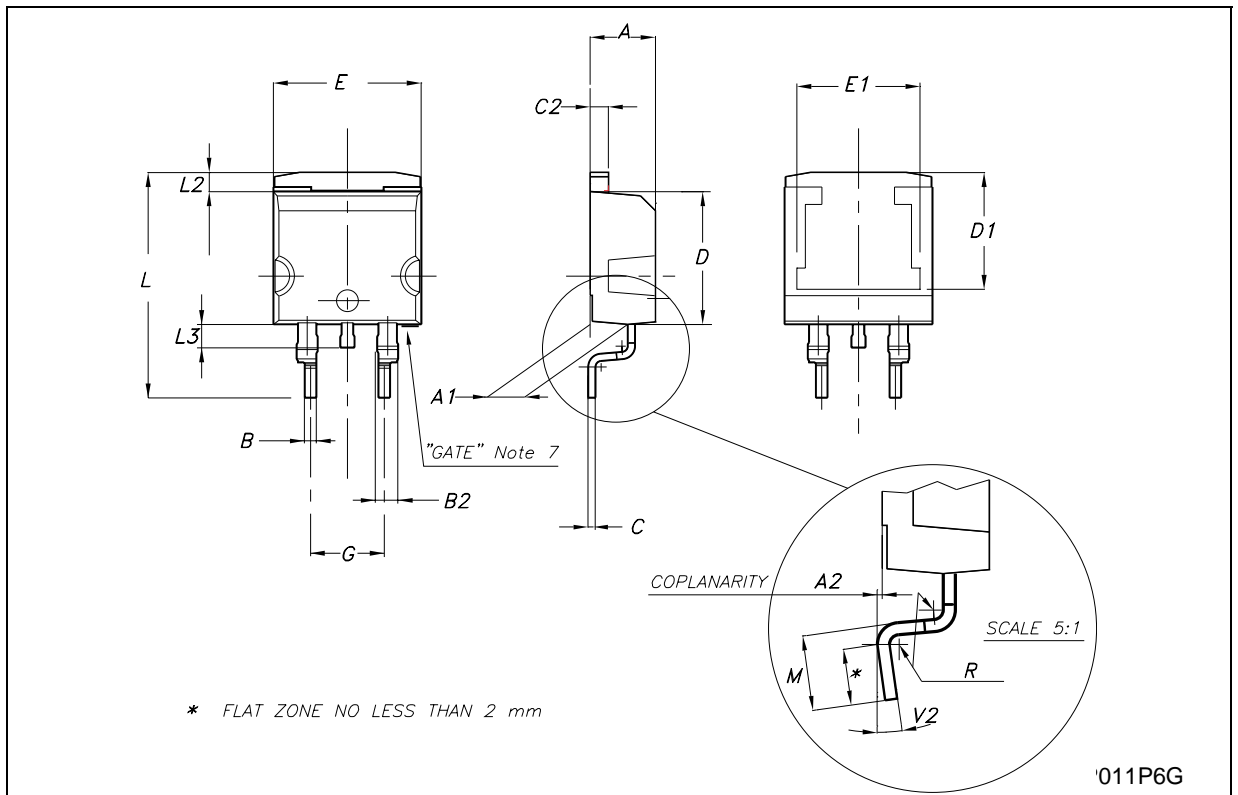
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
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



P011C

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

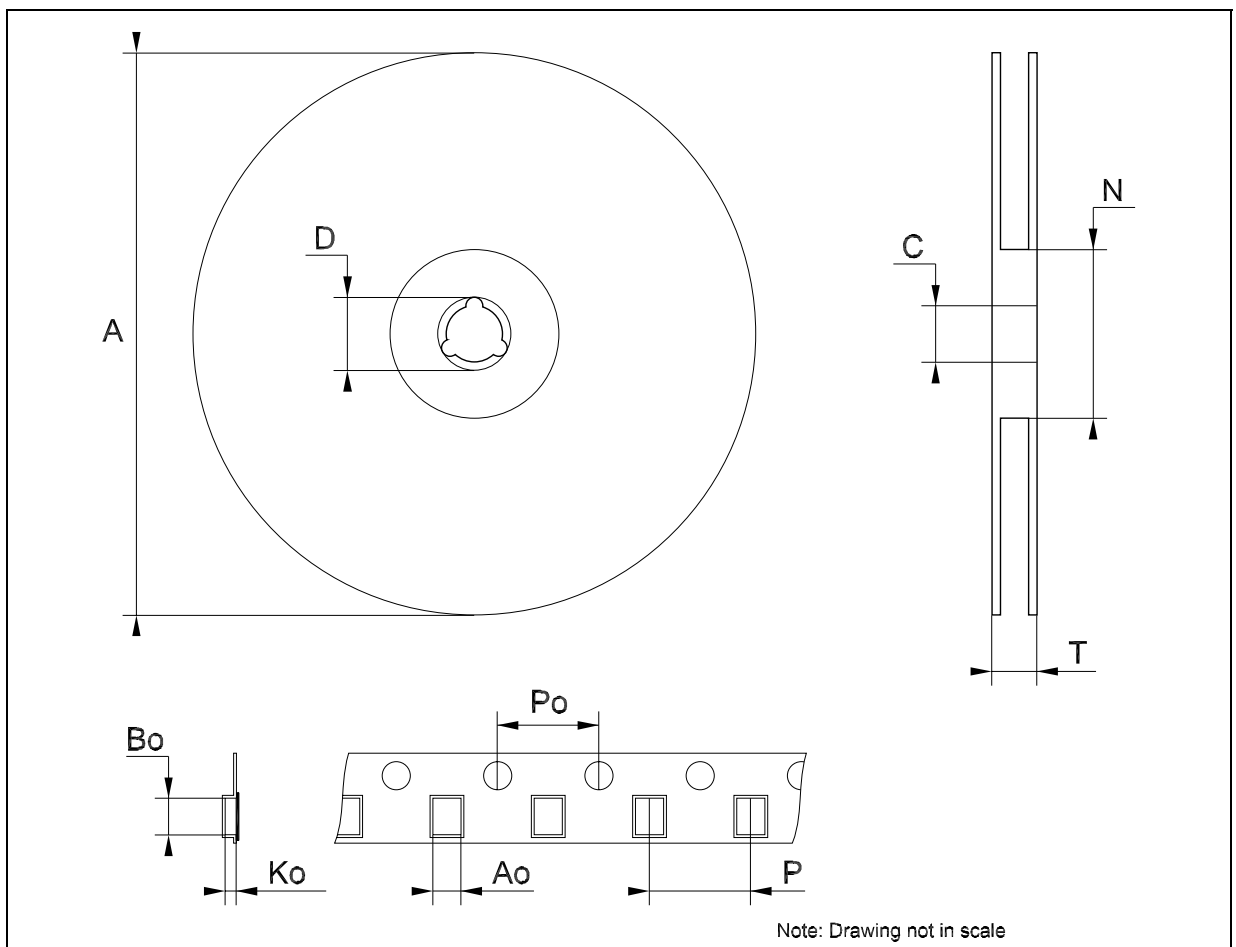
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.7		0.93	0.027		0.036
B2	1.14		1.7	0.044		0.067
C	0.45		0.6	0.017		0.023
C2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1		8			0.315	
E	10		10.4	0.393		0.409
E1		8.5			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°



'011P6G

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



**Table 12: Revision History**

Date	Revision	Description of Changes
22-Jun-2004	7	Ordering Codes updated Table 3, pag. 2.

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