

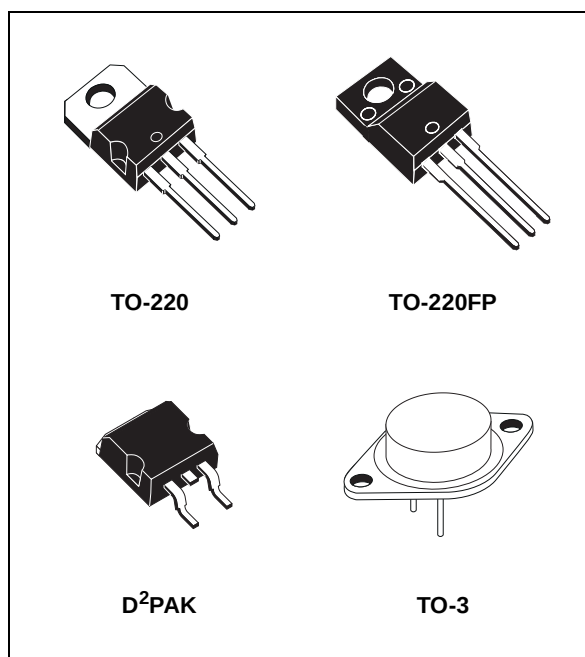
NEGATIVE VOLTAGE REGULATORS

- OUTPUT CURRENT UP TO 1.5A
- OUTPUT VOLTAGES OF -5; -5.2; -6; -8; -9; -12; -15; -18; -20; -22; -24V
- THERMAL OVERLOAD PROTECTION
- SHORT CIRCUIT PROTECTION
- OUTPUT TRANSITION SOA PROTECTION

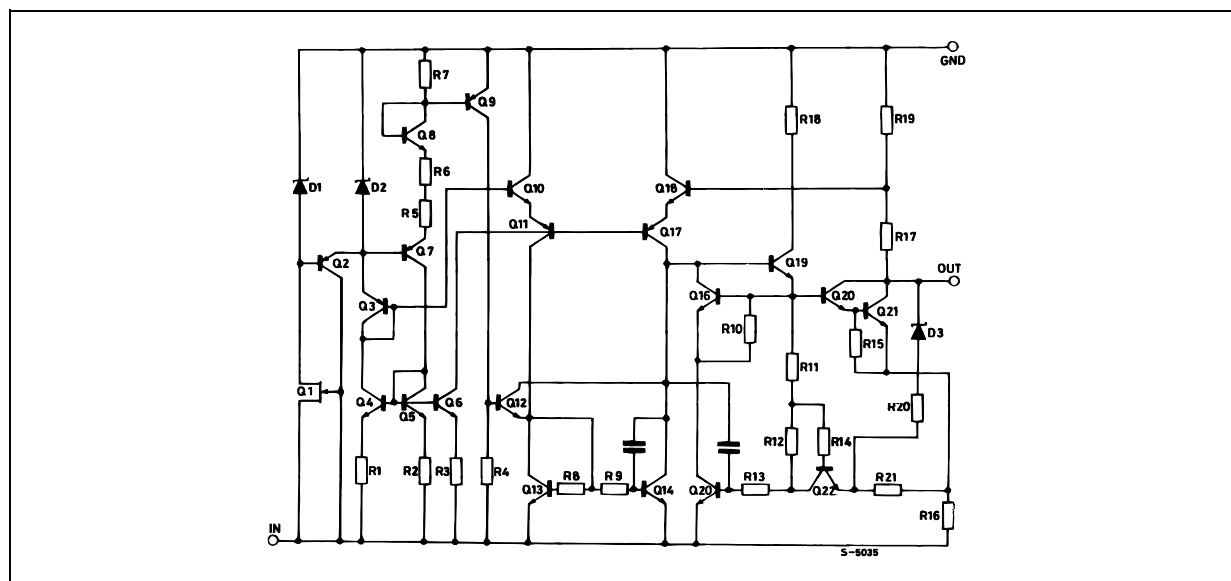
DESCRIPTION

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. In addition, the -5.2V is also available for ECL system. 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



L7900 SERIES

ABSOLUTE MAXIMUM RATINGS

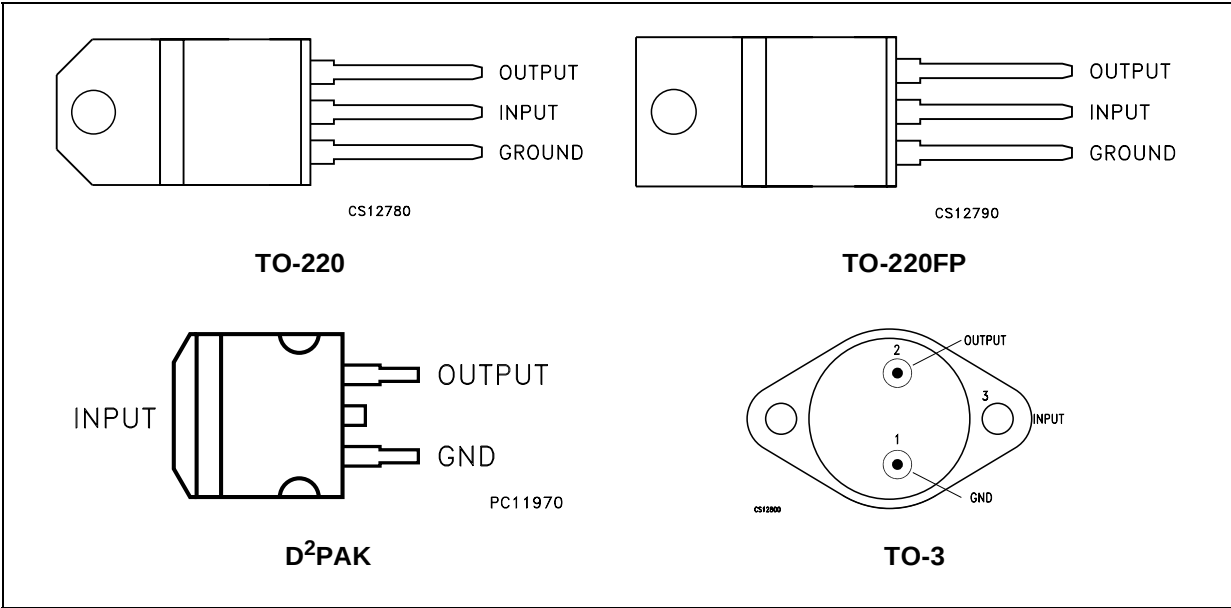
Symbol	Parameter ²		Value	Unit
V _I	DC Input Voltage	for V _O = 5 to 18V	-35	V
		for V _O = 20, 24V	-40	
I _O	Output Current		Internally Limited	
P _{tot}	Power Dissipation		Internally Limited	
T _{stg}	Storage Temperature Range		-65 to 150	°C
T _{op}	Operating Junction Temperature Range		0 to 150	°C

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

THERMAL DATA

Symbol	Parameter		D ² PAK	TO-220	TO-220FP	TO-3	Unit
R _{thj-case}	Thermal Resistance Junction-case	Max	3	3	5	4	°C/W
R _{thj-amb}	Thermal Resistance Junction-ambient	Max	62.5	50	60	35	°C/W

CONNECTION DIAGRAM (top view)

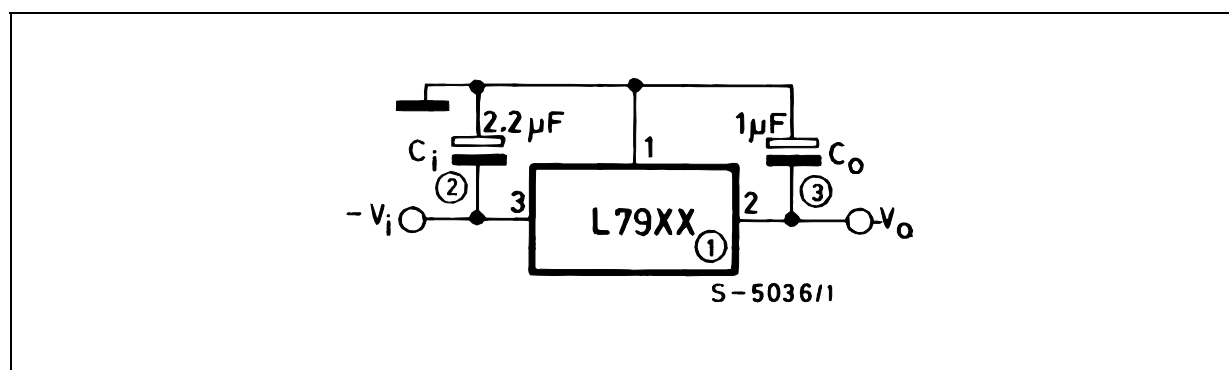


ORDERING CODES

TYPE	TO-220	D ² PAK (*)	TO-220FP	TO-3	OUTPUT VOLTAGE
L7905C	L7905CV	L7905ACD2T	L7905CP	L7905CT	-5 V
L7952C	L7952CV	L7952ACD2T		L7952CT	-5.2 V
L7906C	L7906CV	L7906ACD2T	L7906CP	L7906CT	-6 V
L7908C	L7908CV	L7908ACD2T	L7908CP	L7908CT	-8 V
L7912C	L7912CV	L7912ACD2T	L7912CP	L7912CT	-12 V
L7915C	L7915CV	L7915ACD2T	L7915CP	L7915CT	-15 V
L7918C	L7918CV	L7918ACD2T	L7918CP	L7918CT	-18 V
L7920C	L7920CV	L7920ACD2T	L7920CP	L7920CT	-20 V
L7922C	L7922CV	L7922ACD2T		L7922CT	-22 V
L7924C	L7924CV	L7924ACD2T	L7924CP	L7924CT	-24 V

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

TEST CIRCUIT



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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-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
ΔV_O (*)	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	
ΔV_O (*)	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

(*) 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.

L7900 SERIES

ELECTRICAL CHARACTERISTICS OF L7952C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -10\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\text{ }\mu\text{F}$, $C_O = 1\text{ }\mu\text{F}$ unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-5.0	-5.2	-5.4	V
V_O	Output Voltage	$I_O = -5\text{ mA to } -1\text{ A}$ $P_O \leq 15\text{ W}$ $V_I = -9\text{ to } -21\text{ V}$	-4.95	-5.2	-5.45	V
$\Delta V_{O(*)}$	Line Regulation	$V_I = -8\text{ to } -25\text{ V}$ $T_J = 25^\circ\text{C}$			105	mV
		$V_I = -9\text{ to } -12\text{ V}$ $T_J = 25^\circ\text{C}$			52	
$\Delta V_{O(*)}$	Load Regulation	$I_O = 5\text{ mA to } 1.5\text{ A}$ $T_J = 25^\circ\text{C}$			105	mV
		$I_O = 250\text{ to } 750\text{ mA}$ $T_J = 25^\circ\text{C}$			52	
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
		$V_I = -9\text{ to } -25\text{ V}$			1.3	
$\Delta V_O/\Delta T$	Output Voltage Drift	$I_O = 5\text{ mA}$		-0.5		mV/ $^\circ\text{C}$
eN	Output Noise Voltage	$B = 10\text{ Hz to } 100\text{ KHz}$ $T_J = 25^\circ\text{C}$		125		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

(*) 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.

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-5.75	-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
$\Delta V_{O(*)}$	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
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

(*) 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.

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-7.7	-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
$\Delta V_O(^*)$	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
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

(*) 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.

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-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
$\Delta V_O(^*)$	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
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

(*) 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.

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-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
$\Delta V_O(*)$	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
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

(*) 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.

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-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
$\Delta V_O(*)$	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
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

(*) 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.

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-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
$\Delta V_O(*)$	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
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

(*) 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.

ELECTRICAL CHARACTERISTICS OF L7922C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -31\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\text{ }\mu\text{F}$, $C_O = 1\text{ }\mu\text{F}$ unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-21.1	-22	-22.9	V
V_O	Output Voltage	$I_O = -5\text{ mA to }-1\text{ A}$ $P_O \leq 15\text{ W}$ $V_I = -26\text{ to }-37\text{ V}$	-20.9	-22	-23.1	V
$\Delta V_O(*)$	Line Regulation	$V_I = -25\text{ to }-37\text{ V}$ $T_J = 25^\circ\text{C}$			440	mV
		$V_I = -28\text{ to }-34\text{ V}$ $T_J = 25^\circ\text{C}$			220	
$\Delta V_O(*)$	Load Regulation	$I_O = 5\text{ mA to }1.5\text{ A}$ $T_J = 25^\circ\text{C}$			440	mV
		$I_O = 250\text{ to }750\text{ mA}$ $T_J = 25^\circ\text{C}$			220	
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
		$V_I = -26\text{ to }-37\text{ V}$			1	
$\Delta V_O/\Delta T$	Output Voltage Drift	$I_O = 5\text{ mA}$		-1.1		mV/ $^\circ\text{C}$
eN	Output Noise Voltage	$B = 10\text{ Hz to }100\text{ KHz}$ $T_J = 25^\circ\text{C}$		375		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

(*) 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.

L7900 SERIES

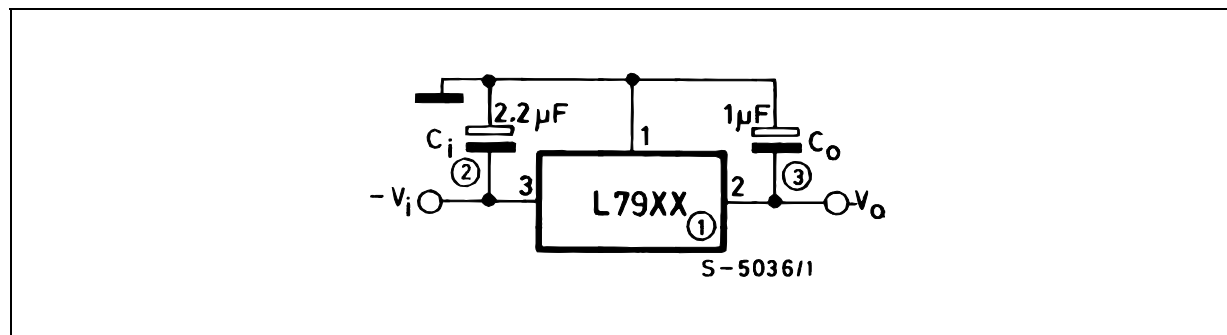
ELECTRICAL CHARACTERISTICS OF L7924C (refer to the test circuits, $T_J = 0$ to 125°C , $V_I = -33\text{V}$, $I_O = 500\text{ mA}$, $C_I = 2.2\text{ }\mu\text{F}$, $C_O = 1\text{ }\mu\text{F}$ unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	-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
$\Delta V_O(^*)$	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
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

(*) 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.

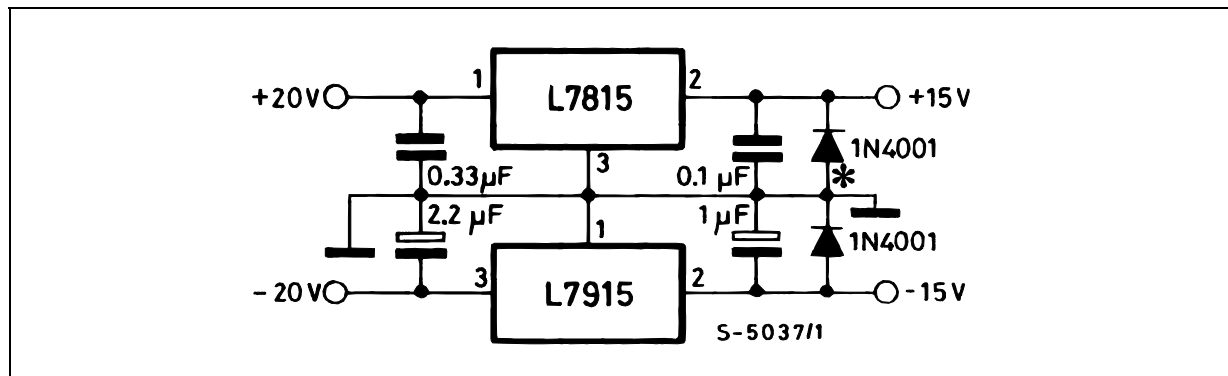
APPLICATIONS INFORMATION

Figure 1 : Fixed Output Regulator

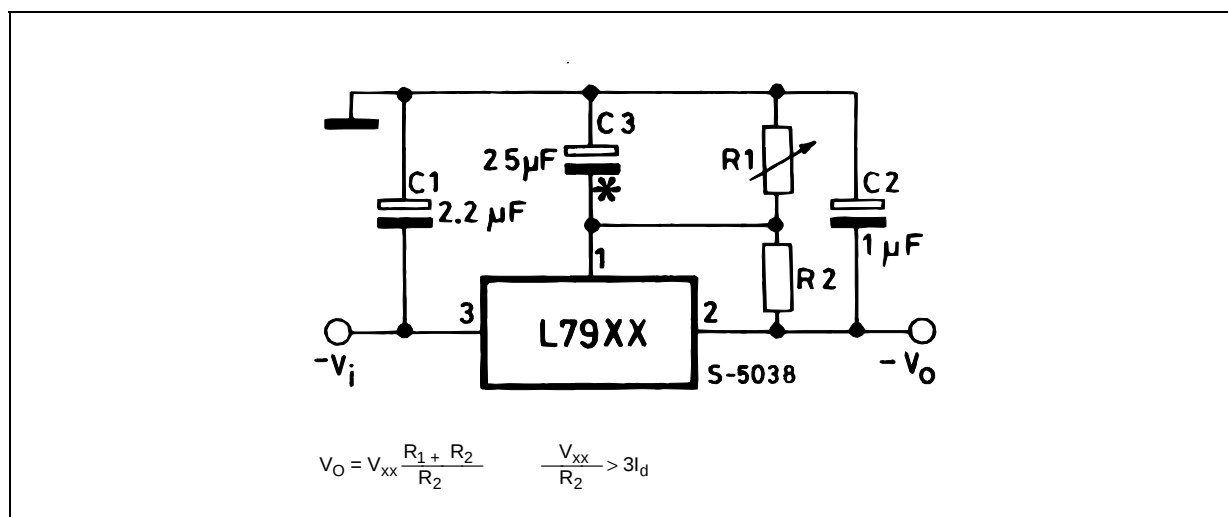


NOTE:

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. C_I 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 2 : Split Power Supply ($\pm 15\text{V}/1\text{A}$)

Against potential latch-up problems.

Figure 3 : Circuit for Increasing Output Voltage

C3 Optional for improved transient response and ripple rejection.

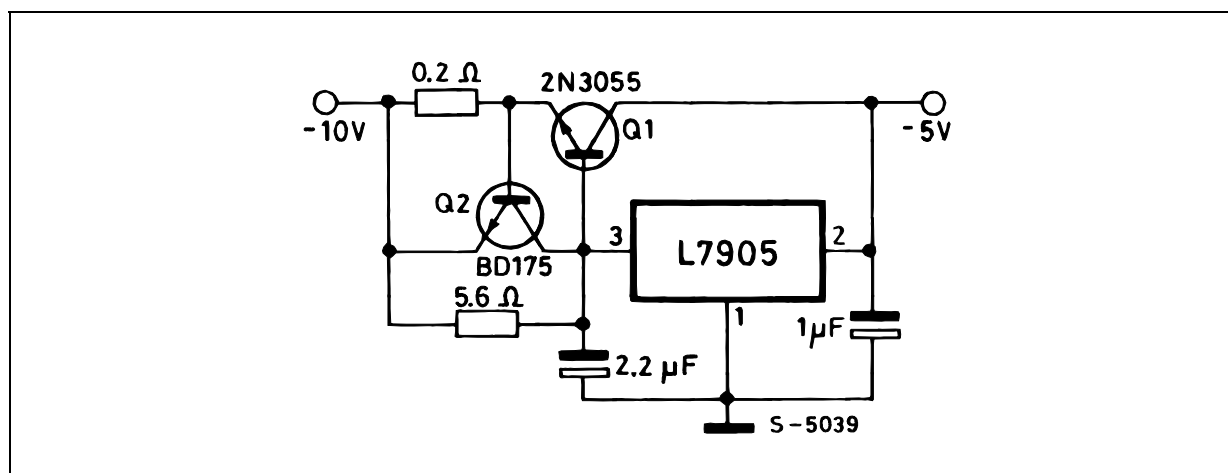
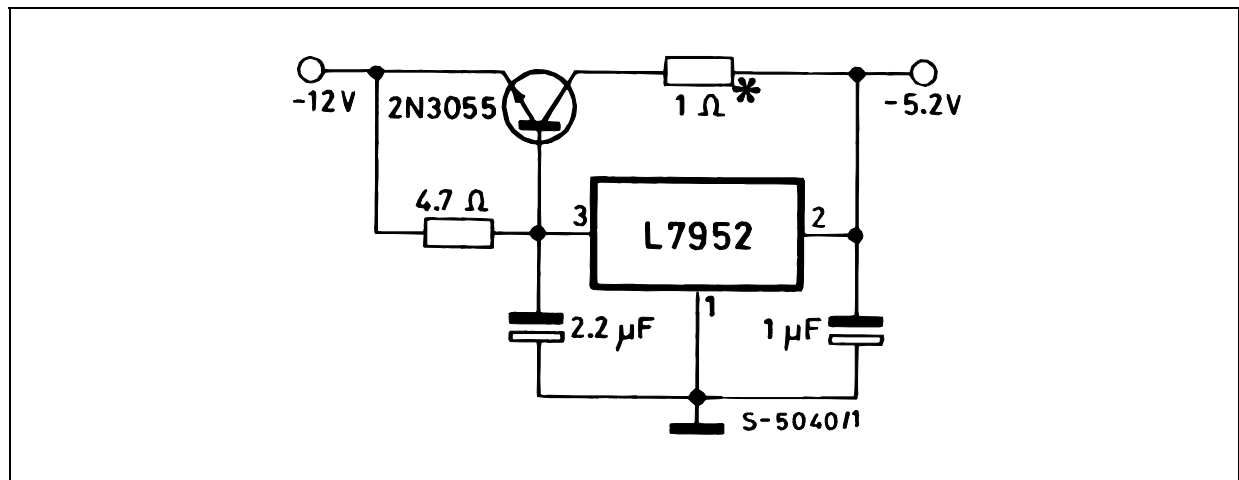
Figure 4 : High Current Negative Regulator ($-5\text{V}/4\text{A}$ with 5A current limiting)

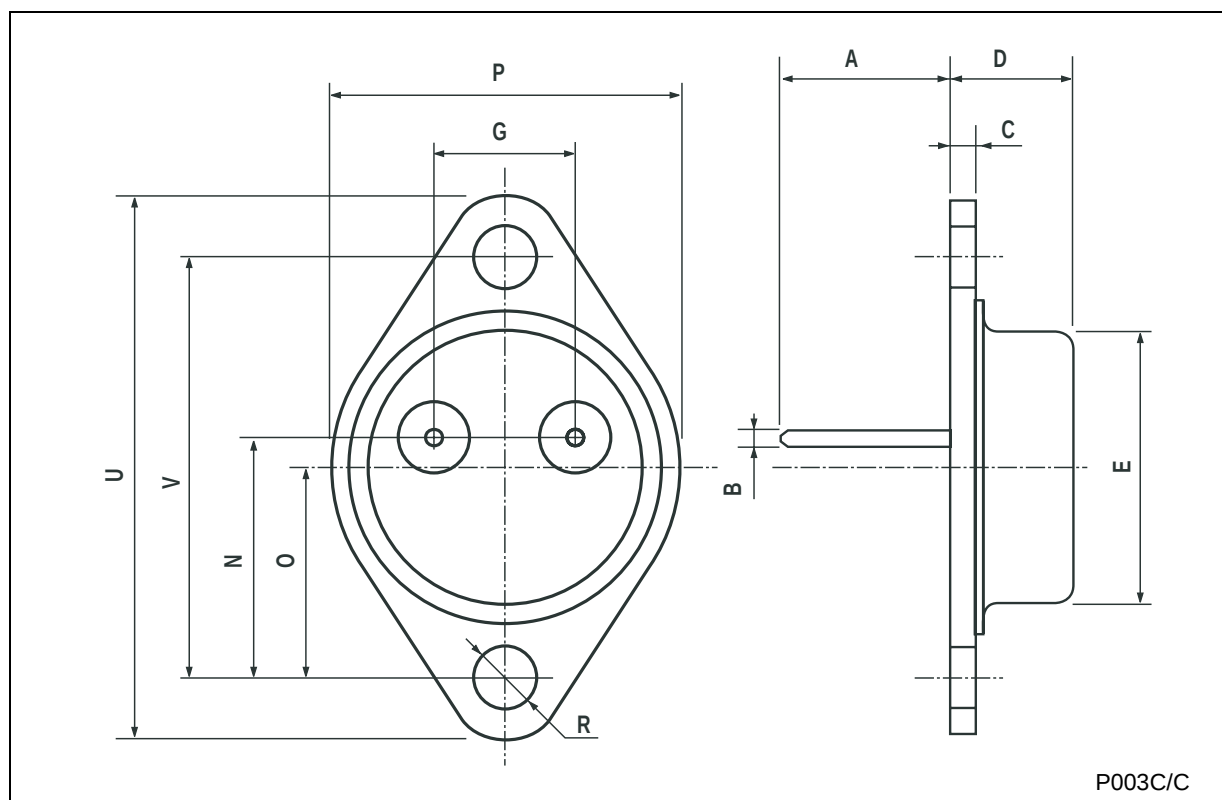
Figure 5 : Typical ECL System Power Supply (-5.2V/4A)



Optional dropping resistor to reduce the power dissipated in the boost transistor.

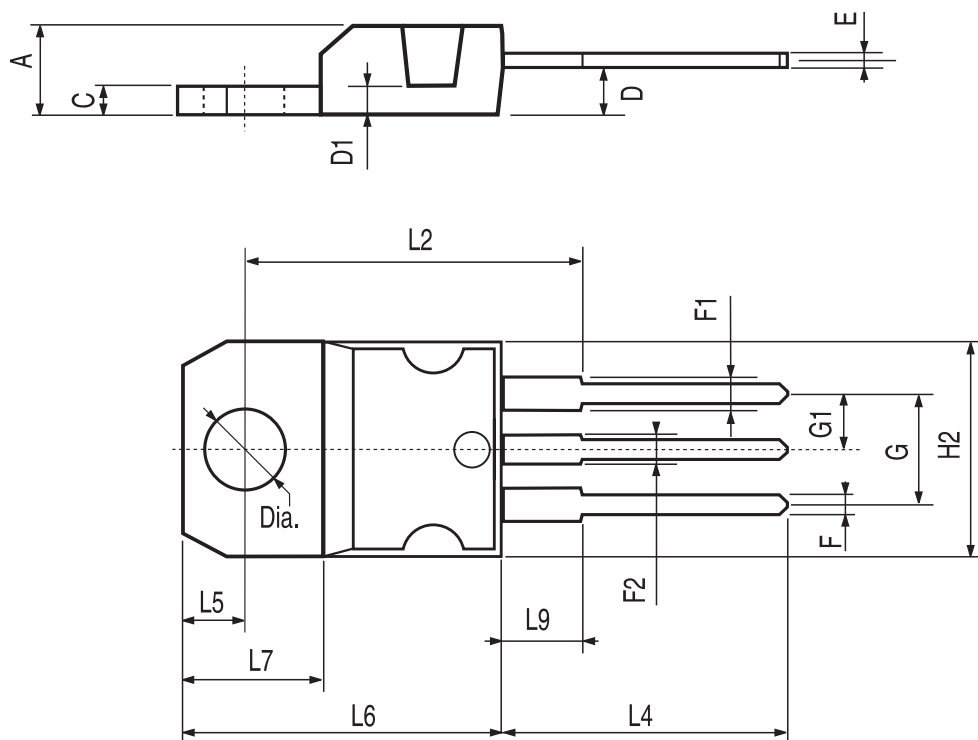
TO-3 MECHANICAL DATA

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 MECHANICAL DATA

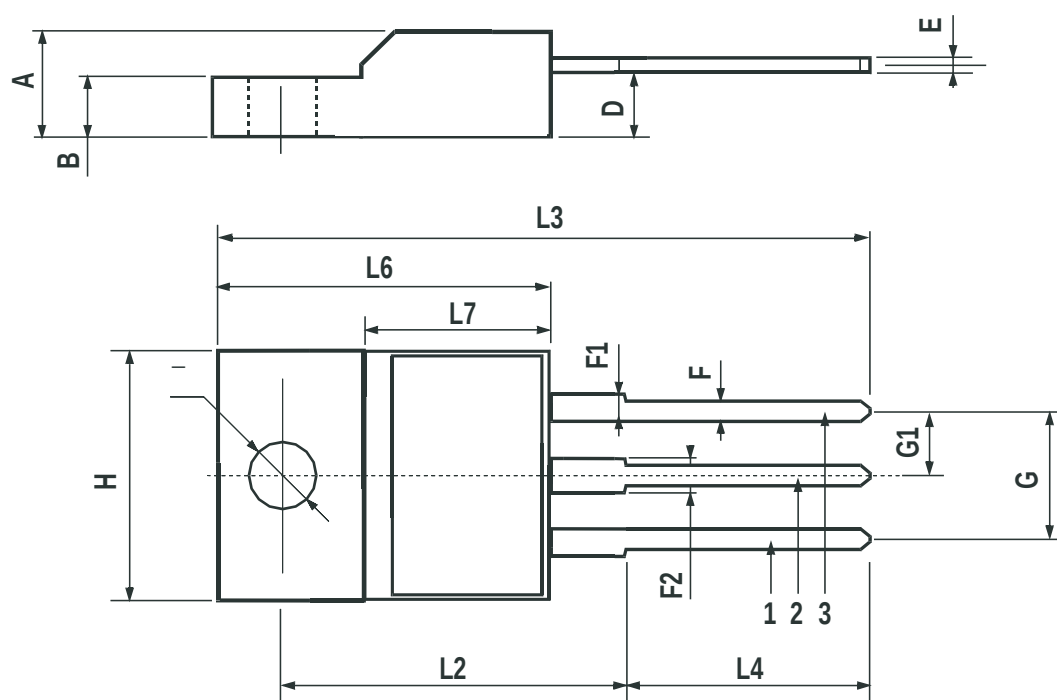
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106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

TO-220FP MECHANICAL DATA

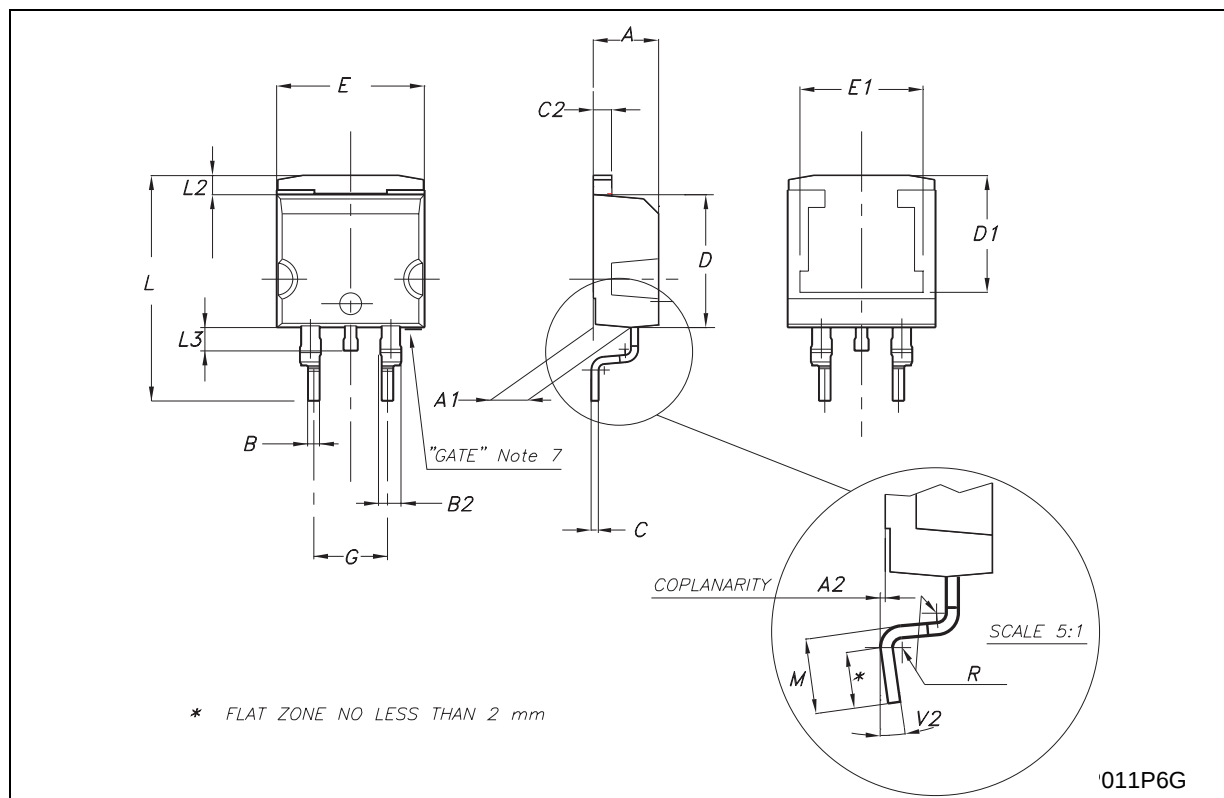
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.45		0.70	0.017		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.50	0.045		0.059
F2	1.15		1.50	0.045		0.059
G	4.95		5.2	0.194		0.204
G1	2.4		2.7	0.094		0.106
H	10.0		10.40	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
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



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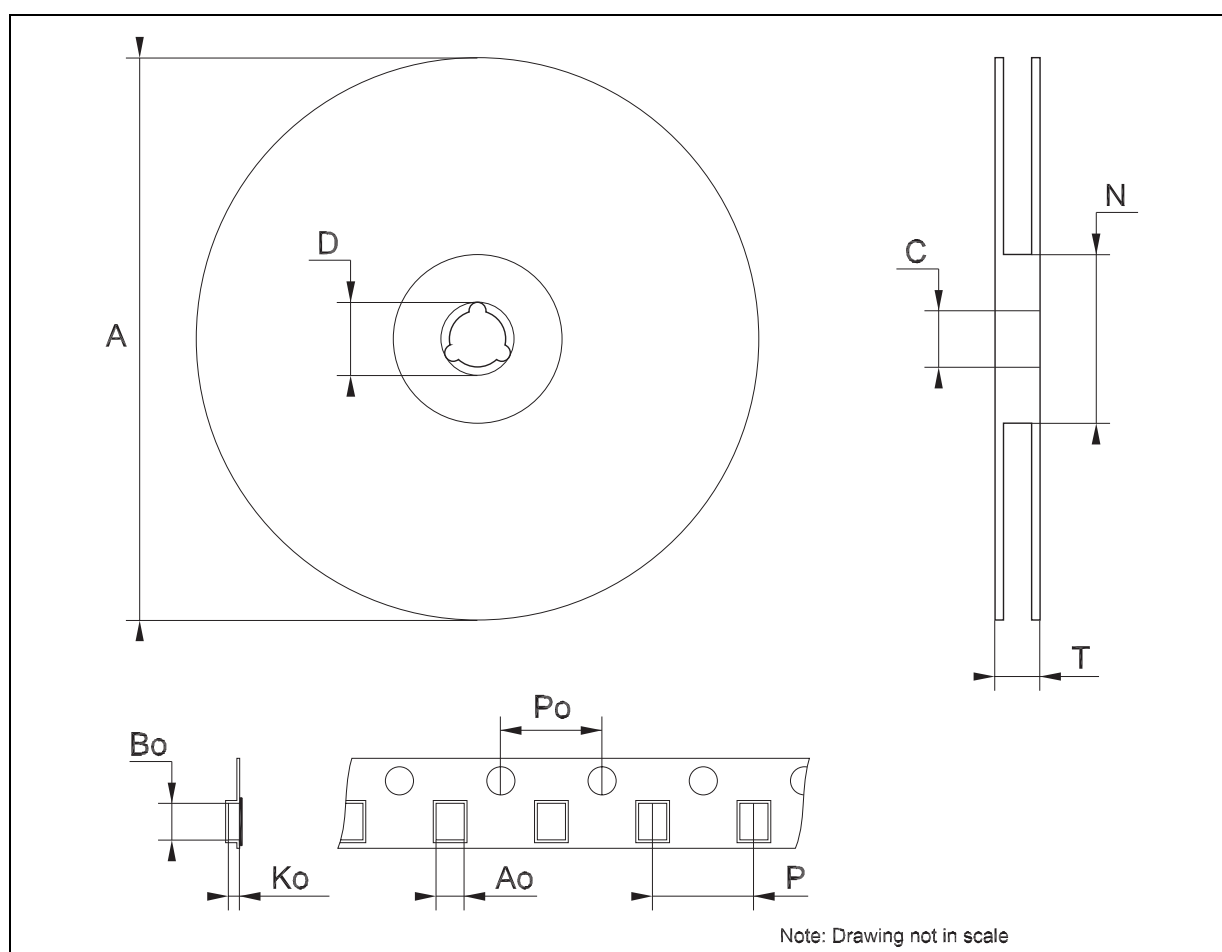
D²PAK MECHANICAL DATA

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°



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



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