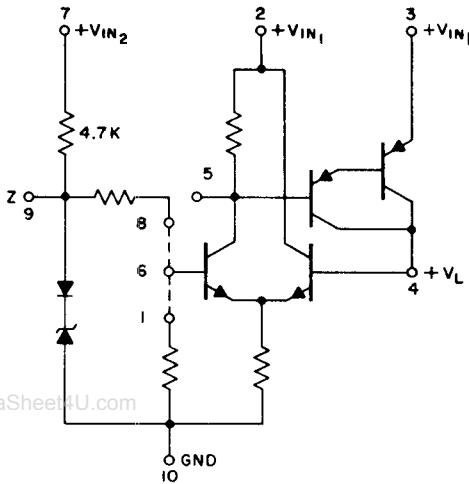


# +5 VOLT HIGH EFFICIENCY VOLTAGE REGULATOR NC 520

## CIRCUIT DIAGRAM (Case 54) 10 pin low profile TO-5



NOTE: SHORT PINS 1, 6 & 8 AND 2 & 3 FOR 5.0 VOLT SERVICE.

## DESCRIPTION

The NC520 is a self-contained, voltage regulator factory preset to 5 Volts. Although no external components are necessary for normal operation, these units are designed so that, with minor additions, other output voltages and overload protection may be implemented. Performance advantages include:

## CIRCUIT PERFORMANCE RATINGS

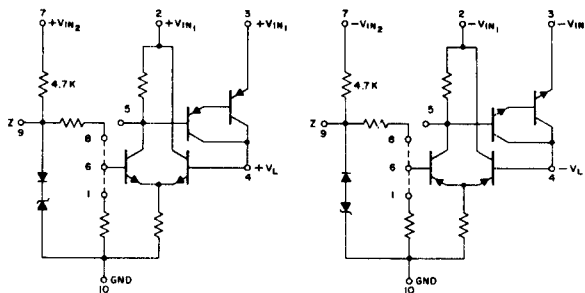
$T_A = 25^\circ\text{C}$ ,  $V_{in1} = 6.5\text{V}$ ,  $V_{in2} = 12\text{V}$ ,  $I_L = 50\text{mA}$   
(unless otherwise specified)

CHARACTERISTICS	MIN	TYP	MAX	UNITS
Input Voltage Range	—	—	40	Volts
Internally Set Output Voltage	4.90	5.0	5.10	Volts
Externally Set Output Voltage	1.0	—	7.0*	Volts
Input-Output Voltage Differential	1.5	—	—	Volts
Line Regulation ( $V_{in1} = 6.5\text{V}$ to $40\text{V}$ )	—	0.01	0.04	$\%V_o/V_{in}$
Load Regulation ( $I_L = 10\text{mA}$ to $100\text{mA}$ )	—	0.0008	0.0025	$\%V_o/m\text{A}$
Ripple Rejection ( $V_{in1} = 10\text{V}$ , $V_{in2} = 12\text{V}$ )	—	66	—	dB
Output Impedance (DC—100kHz)	—	0.05	—	Ohms
Average Temperature Coefficient	—	0.0005	0.02	$\%V_o/^\circ\text{C}$
Output Noise Voltage (unbypassed)	—	0.2	—	mV RMS
$V_{in2}$ Current Drain	—	1.0	—	mA

\*Regulated Output Voltages greater than 7 Volts may be attained with an external reference voltage.

# $\pm 6$ VOLT HIGH EFFICIENCY VOLTAGE REGULATORS NC 521 (+6V) / NC 523 (-6V)

## CIRCUIT DIAGRAMS (Case 54) 10 pin low profile TO-5



NC521

NC523

NOTE: SHORT PINS 1, 6 & 8 AND 2 & 3 FOR 6.0 VOLT SERVICE.

## DESCRIPTION

The NC521 (+6V) and NC523 (-6V) are self-contained, complementary voltage regulators factory preset to 6 volts. Although no external components are necessary for normal operation, these units are designed so that, with minor additions, other output voltages and currents and overload protection may be implemented. Performance advantages include:

## CIRCUIT PERFORMANCE RATINGS

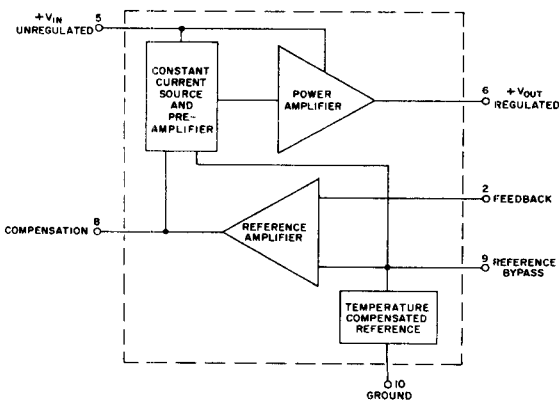
$T_A = 25^\circ\text{C}$ ,  $V_{in1} = 7.5\text{V}$ ,  $V_{in2} = 12\text{V}$ ,  $I_L = 50\text{mA}$   
(unless otherwise specified)

CHARACTERISTICS	MIN	TYP	MAX	UNITS
Input Voltage Range	—	—	40	Volts
Internally Set Output Voltage	5.9	6.0	6.1	Volts
Externally Set Output Voltage	1.0	—	7.0*	Volts
Input-Output Voltage Differential	1.5	—	—	Volts
Line Regulation ( $V_{in1} = 7.5\text{V}$ to $40\text{V}$ )	—	0.01	0.04	$\%V_o/V_{in}$
Load Regulation ( $I_L = 10\text{mA}$ to $100\text{mA}$ )	—	0.0008	0.0025	$\%V_o/m\text{A}$
Ripple Rejection ( $V_{in1} = 10\text{V}$ , $V_{in2} = 12\text{V}$ )	—	66	—	dB
Output Impedance (DC—100kHz)	—	0.05	—	Ohms
Average Temperature Coefficient	—	0.0005	0.02	$\%V_o/^\circ\text{C}$
Output Noise Voltage (unbypassed)	—	0.2	—	mV RMS
$V_{in2}$ Current Drain	—	1.0	—	mA

\*Regulated Output Voltages greater than 7 Volts may be attained with an external reference voltage.

# UNIVERSAL VOLTAGE REGULATOR NC 530

## CIRCUIT DIAGRAM (Case 54) 10 pin low profile TO-5



## DESCRIPTION

The NC530 is a high performance Universal Hybrid Voltage Regulator designed to be used alone or as a building block for higher voltage and current applications. Although processed to exacting military/aerospace requirements, the NC530 offers economy comparable with units manufactured to less exacting quality standards and lower temperature ratings.

## CIRCUIT PERFORMANCE RATINGS

$+V_{IN} = 20\text{V}$ ,  $I_{OUT} = 10\text{mA}$ ,  $V_{OUT} = +15\text{V}$ ,  $T_A = 25^\circ\text{C}$   
(unless otherwise specified)

CHARACTERISTICS	MIN	TYP	MAX	UNITS
Input Voltage Range (Output Voltage = +8V)	10	—	40	Volts
Output Voltage Range	8.0	—	38	Volts
Input-Output Voltage Differential	2.0	—	—	Volts
Line Regulation ( $V_{IN} = +20\text{V}$ to $40\text{V}$ )	—	0.06	0.1	$\%V_o/V_{IN}$
Load Regulation ( $I_L = 0$ to $100\text{mA}$ )	—	0.001	0.0025	$\%V_o/m\text{A}$
Ripple Rejection (10Hz to 100kHz)	—	40	—	dB
Output Impedance (10Hz to 100kHz)	—	0.05	—	Ohms
Average Temperature Stability	—	0.005	0.01	$\%V_o/^\circ\text{C}$
Stand-by Current Drain ( $V_{IN} = +10\text{V}$ , $V_{OUT} = +8\text{V}$ , $R_L = \infty$ )	—	0.4	1.0	mA

NC530	NC531	NC562	NC562B	NC572	NC573	NC581	NC583
MIL	MIL	MIL	MIL	MIL	MIL	MIL	MIL
Not Preset	+15 ±0.1V	+12 ±0.025V	+12 ±0.025V	+15 and -15 with ±0.1V Tolerance	+15 and -15 with ±0.1V Tolerance	+15 ±0.1V	-15 ±0.1V
+8 to +38	+8 to +38	+10 to +20	+10 to +20	±13 to ±38	±12 to ±37	+12 to +38	-12 to -38
<p>Load current is limited only by power dissipation and ambient temperature considerations. Since internal dissipation is virtually negligible, the <math>I_{load/max.}</math> is essentially equal to the maximum power rating divided by the voltage drop across the regulator. This current can be extended with external transistors.</p>							
TO-5	TO-5	0.5 in. TO-8	0.5 in. TO-8	0.6 in. TO-8	0.6 in. TO-8	0.6 in. TO-8	0.6 in. TO-8
500	500	1250	1250	1800	1800	1800	1800
350	350	870	870	1260	1260	1260	1260
165	165	415	415	600	600	600	600
—	—	—	—	—	—	—	—
+40	+40	+30	+30	±40	±40	+40	-40
2	2	1.5	1.5	1.5V & 2.0V	±3	2	2
0.1	0.1	0.005	0.005	0.005	0.002	0.005	0.005
0.0025	0.0025	0.0001	0.0001	0.001	0.007(% $V_o$ )	0.0001	0.0001
0.01	0.01	0.001 (See Data Sheet)	0.001 (See Data Sheet)	0.01	0.005	0.005	0.005
40	40	90	90	86	80	80	80
No	No	No	No	No	Yes	No	No
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
—	—	Premium Performance Low TC	TC Falloff of NC562	Dual Comple- mentary Reg.	Dual Comple- mentary Reg.	High Current Drive	High Current Drive

are also available in flat pack option.)

NOTE 3:  $V_{DROp(min)}$  refers to the minimum differential voltage ( $V_{IN}-V_{OUT}$ ) across the regulator in order to sustain proper operation. Add one volt for any/every external pass transistor.