

**GENERAL DESCRIPTION**

The N2596 Series switching voltage regulators (SVR) are monolithic integrated circuits that provide all the active functions for a step-down (buck) switching regulator. Both series are capable of driving 3 A load respectively with excellent line and load regulation.

The N2596 Series SVR include a switching regulator and compensation network all within the same package. Just add a choke, catch diode and two capacitors to obtain an efficient DC-to-DC converter. The output switch includes cycle-by-cycle current limiting, as well as thermal shutdown for full protection under fault conditions.

The N2596 Series SVR offer replacement for popular 3 terminal linear regulators by providing higher efficiency with reduced heat sink size. In many applications a heat sink will not be required.

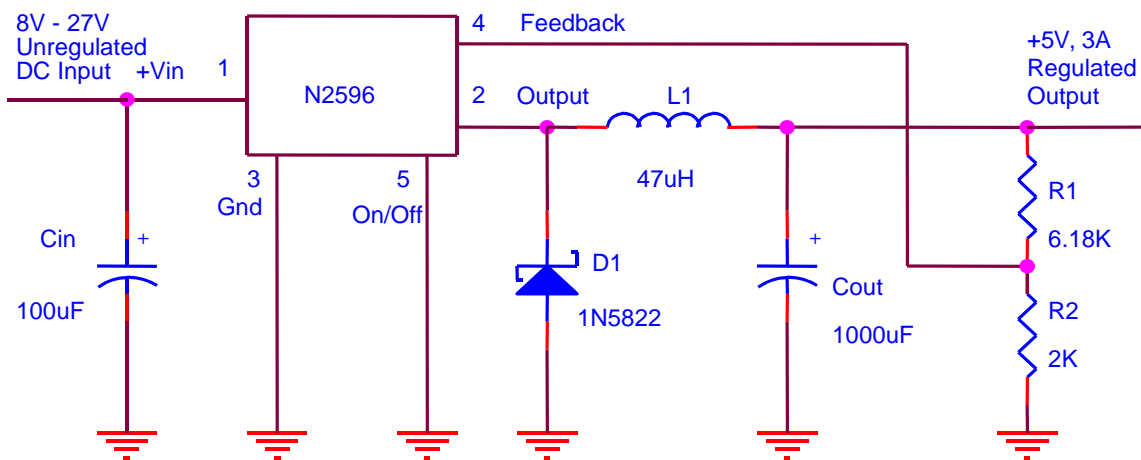
**FEATURES**

- Pin compatible with industry products of LM2596 Series
- Adjustable output versions
- Wide output voltage range, 1.23V to 27V for adjustable output version
- DC-to-DC buck converter requiring only 4 external parts
- 150 KHz fixed frequency internal oscillator
- TTL shutdown capability, low power stand-by mode
- High efficiency
- Uses readily available standard inductors

**APPLICATIONS**

- Simple high-efficiency step-down (buck) regulator
- Positive to negative converter (Inverting Buck-Boost)
- Isolated Fly back Converter using minimum number of external parts
- Powering portable instrument, Set-Top Box, LCD Monitor, Scanner, I.A, Easy PC
- SMPS Post-Regulator

**TYPICAL APPLICATION**



\*  $V_{OUT} = 1.23V ( 1 + R1 / R2 )$

**Adjustable Regulator in Fixed Output Application**

**ABSOLUTE MAXIMUM RATINGS**

- Maximum Supply Voltage 30V
- ON/OFF Pin Input Voltage  $-0.3 \leq V \leq +V_I$
- Output Voltage to Ground (Stead State) -1V
- Power Dissipation Internally Limited
- Thermal Resistance Junction to Case,  $\theta_{JC}$  2.0°C/W
- Thermal Resistance Junction to Ambient,  $\theta_{JA}$  TO-220 50°C/W  
TO-263 60°C/W
- Operating Junction Temperature Range -40 to 125°C
- Storage Temperature Range -65 to 150°C
- Lead Temperature (Soldering, 10 Seconds) 260°C

**ELECTRICAL CHARACTERISTICS** (Unless otherwise specified,  $T_A = 25^\circ\text{C}$ .)

Parameter	Symbol	Test Conditions	Typical	Limits
Feedback Voltage	$V_{OUT}$	$V_{IN} = 12V, V_{OUT} = 5V$ $I_{LOAD} = 0.5A$	1.230V	$1.217V_{Min}$ $1.243V_{Max}$
Feedback Voltage	$V_{OUT}$	$8V \leq V_{IN} \leq 27V$ $0.5A \leq I_{LOAD} \leq 3A$	1.230V	$1.193V_{Min}$ $1.267V_{Max}$
Efficiency		$V_{IN} = 12V, V_{OUT} = 5V$ $I_{OUT} = 3A$	77%	
Feedback Bias Current	$I_B$	$V_{OUT} = 5V$	50nA	100nA
Oscillator Frequency	$F_{OSC}$		150KHz	127KHz (Min) 173KHz (Max)
Saturation Voltage	$V_{SAT}$	$I_{OUT} = 3A$	1.4V	$1.8V_{Max}$
Current Limit	$I_{CL}$		6.0A	4.0A ~ 7.0A
ON/OFF Pin Logic Input Level	$V_{IH}$	$V_{OUT} = 0V$	1.4V	2.2V (Min)
	$V_{IL}$	$V_{OUT} = \text{Nominal Output Voltage}$	1.2V	1.0V (Max)
ON/OFF Pin Logic Input Current	$I_{IH}$	ON/OFF Pin = 5V (OFF)	12 $\mu$ A	30 $\mu$ A (Max)
	$I_{IL}$	ON/OFF Pin = 0V (ON)	0 $\mu$ A	10 $\mu$ A (Max)

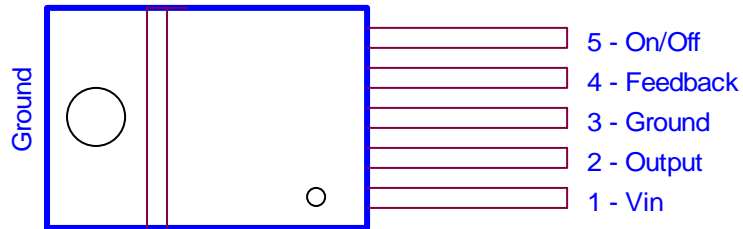
**REMARK:** Orders for parts with Lead-Free plating can be placed using the N2596XG parts name.

**DEVICE SELECTION GUIDE**

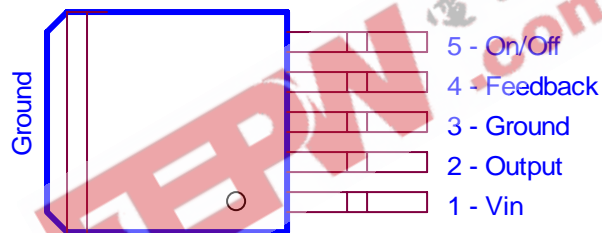
<b>Device</b>	N2596SG	N2596TG
<b>Voltage (V)</b>	ADJ	ADJ
<b>Current (A)</b>	3	
<b>Package</b>	TO-263	TO-220

**PIN CONFIGURATIONS**

5 -LEAD TO-220 (T)

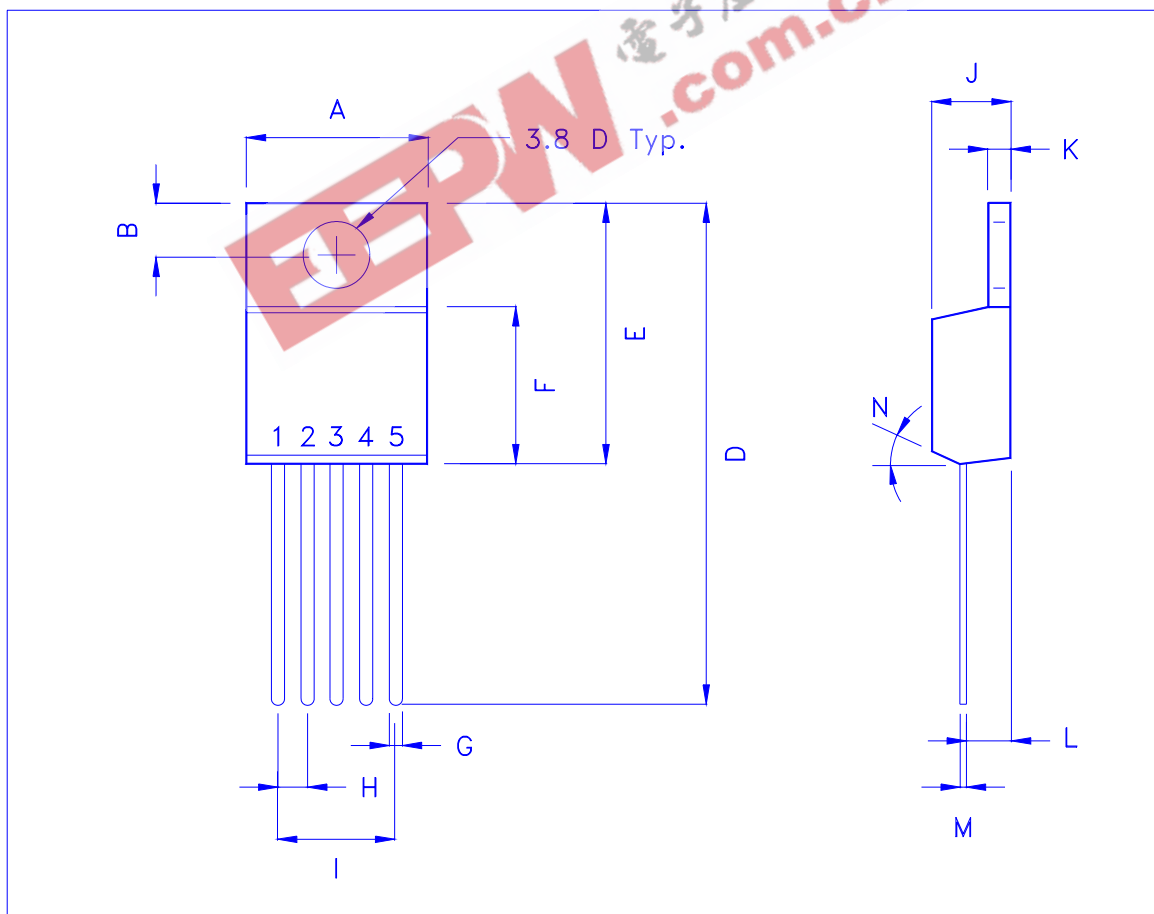


5 -LEAD TO-263 (S)



**TO-220 (5-Lead) MECHANICAL DATA**

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.78	10.16	10.54	H	1.57	1.7	1.83
B	2.61	2.74	2.87	I		6.81	
C				J	4.4	4.6	4.8
D	28.5	28.9	29.3	K	1.14	1.27	1.4
E	14.6	15.0	15.4	L	2.3	2.6	2.9
F	8.4	8.8	9.2	M	0.26	0.46	0.66
G	0.73	0.83	0.93	N		7°	



**TO-263 (D<sup>2</sup>PAK, 5-Lead) MECHANICAL DATA**

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	15.11		15.47	H	1.0		1.4
B	4.0		4.8	I	9.78		10.54
C	1.142		1.4	J	6.6		7.11
D		2.8		K		1.5	
E	0.356		0.639	L	0.762		1.01
F	-0.102		0.203	M	0.98		1.05
G	8.636	9	9.65	N			

