

### 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.

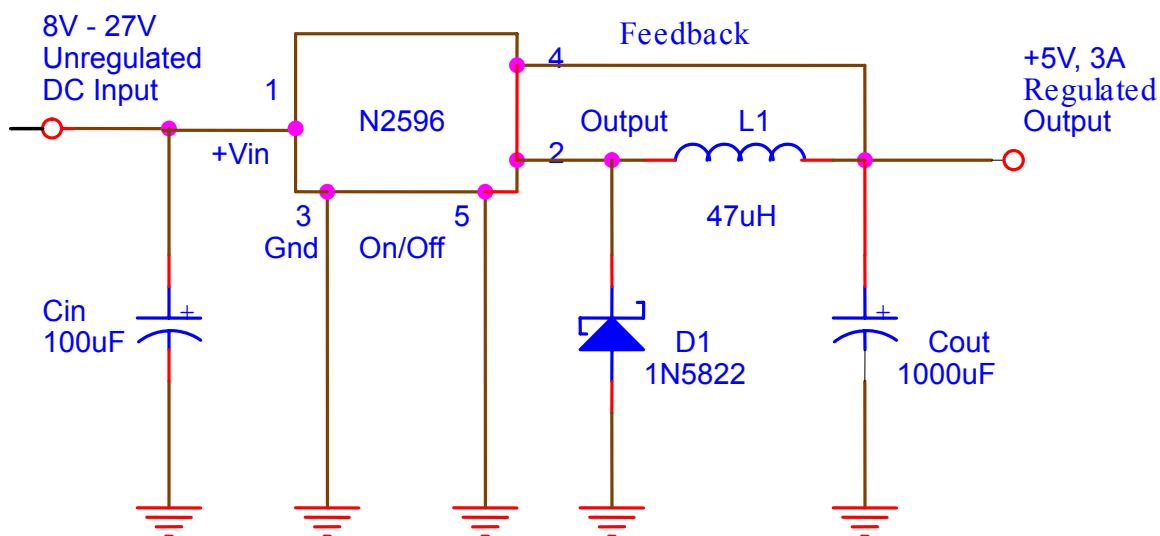
### FEATURES

- Pin compatible with industry products of LM2596 Series
- Fixed 5V output version
- 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



**ABSOLUTE MAXIMUM RATINGS**

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

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

Parameter	Symbol	Test Conditions	Typical	Limits
Output Voltage	$V_{OUT}$	$V_{IN} = 12V$ $I_{LOAD} = 0.5A$	5V	4.9V <sub>Min</sub> 5.1V <sub>Max</sub>
Output Voltage	$V_{OUT}$	$8V \leq V_{IN} \leq 27V$ $0.5A \leq I_{LOAD} \leq 3A$	5V	4.8V <sub>Min</sub> 5.2V <sub>Max</sub>
Efficiency	$\eta$	$V_{IN} = 12V, V_{OUT} = 5V$ $I_{OUT} = 3A$	77%	
Oscillator Frequency	$F_{OSC}$		150KHz	127 KHz (Min) 173 KHz (Max)
Saturation Voltage	$V_{SAT}$	$I_{OUT} = 3A$	1.4V	1.8V <sub>Max</sub>
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)

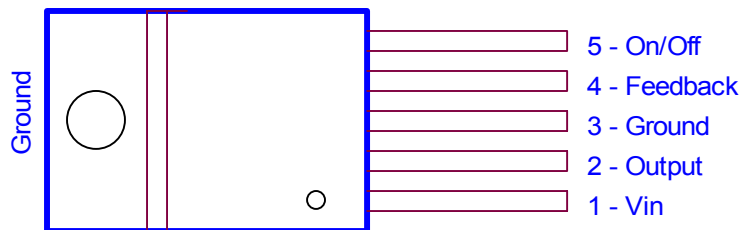
**REMARK:** Orders for parts with Lead-Free plating can be placed using the N2596XG-5 parts name.

**DEVICE SELECTION GUIDE**

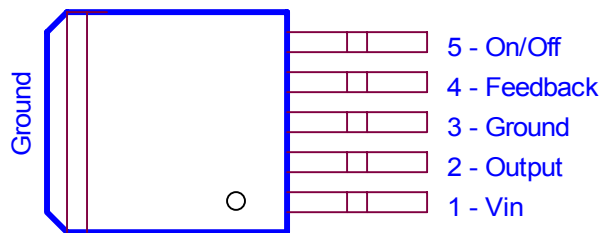
<b>Device</b>	N2596SG-5	N2596TG-5
<b>Voltage (V)</b>	5	5
<b>Current (A)</b>	3	
<b>Package</b>	TO-263	TO-220
<b>Marking</b>	N2596SG-5	N2596TG-5

**PIN CONFIGURATIONS**

**5 -LEAD TO-220 (T)**

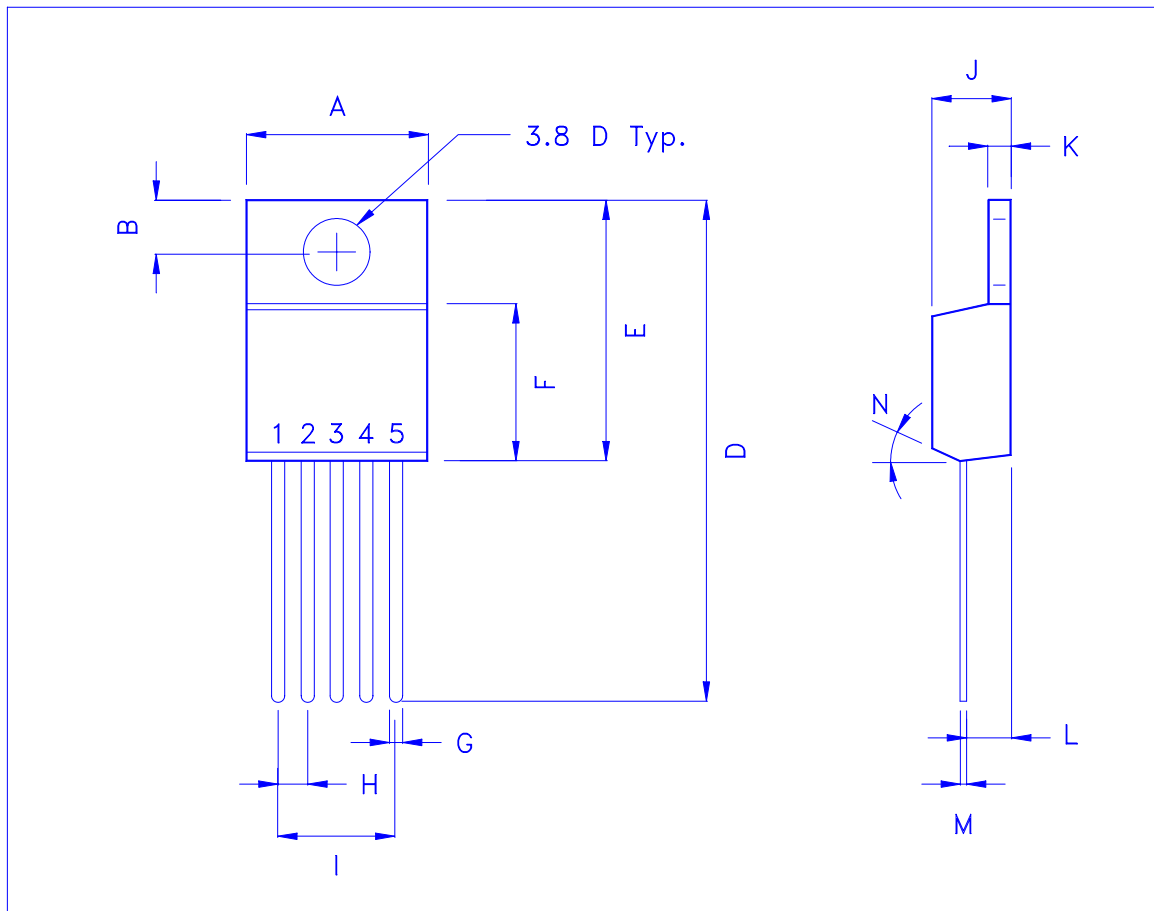


**5 -LEAD TO-263 (S)**



**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	14.5	15	15.8	H	1.0	1.5	1.8
B	4.2		4.7	I	9.8		10.3
C	1.20		1.35	J		6.5	
D		2.8		K		1.5	
E	0.3	0.4	0.5	L	0.7	0.85	1.0
F	-0.102		0.203	M	1.57	1.7	1.83
G	8.5	9	9.5	N			

