

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.

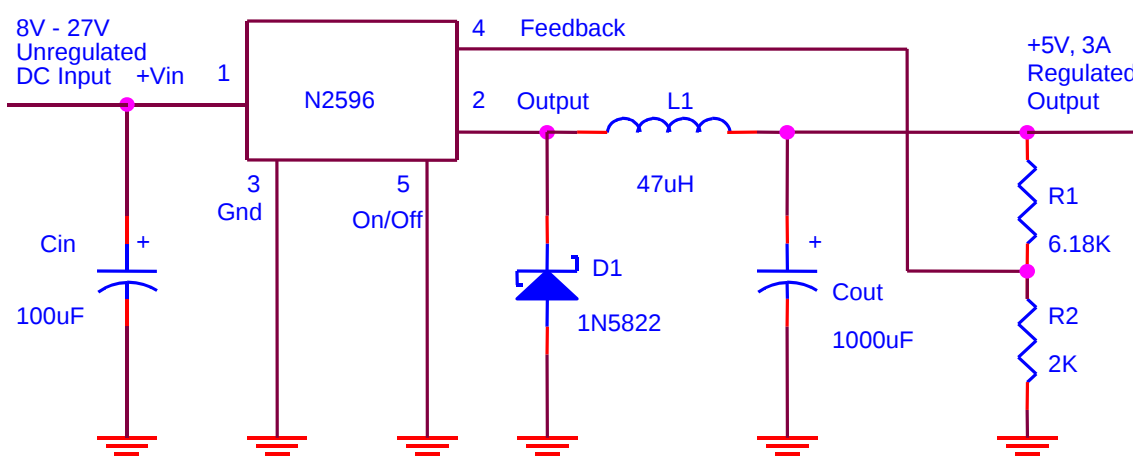
FEATURES

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

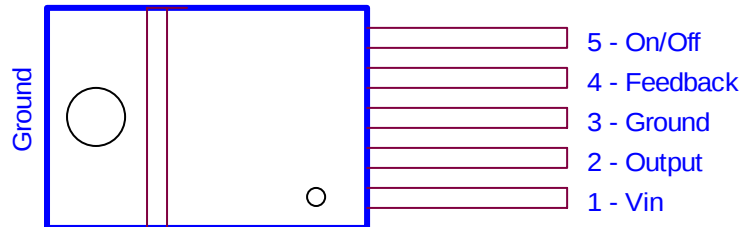
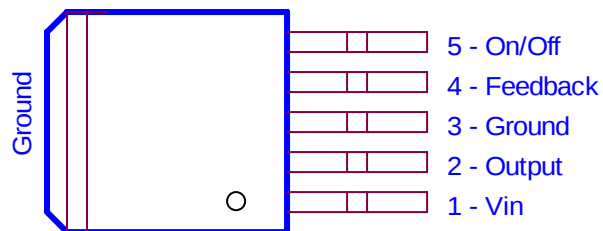
ELECTRICAL CHARACTERISTICS (Unless otherwise specified, $T_A = 25^\circ\text{C}$.)

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	η	$V_{IN} = 12V, V_{OUT} = 5V$ $I_{OUT} = 3A$	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 μ A	30 μ A (Max)
	I_{IL}	ON/OFF Pin = 0V (ON)	0 μ A	10 μ A (Max)

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

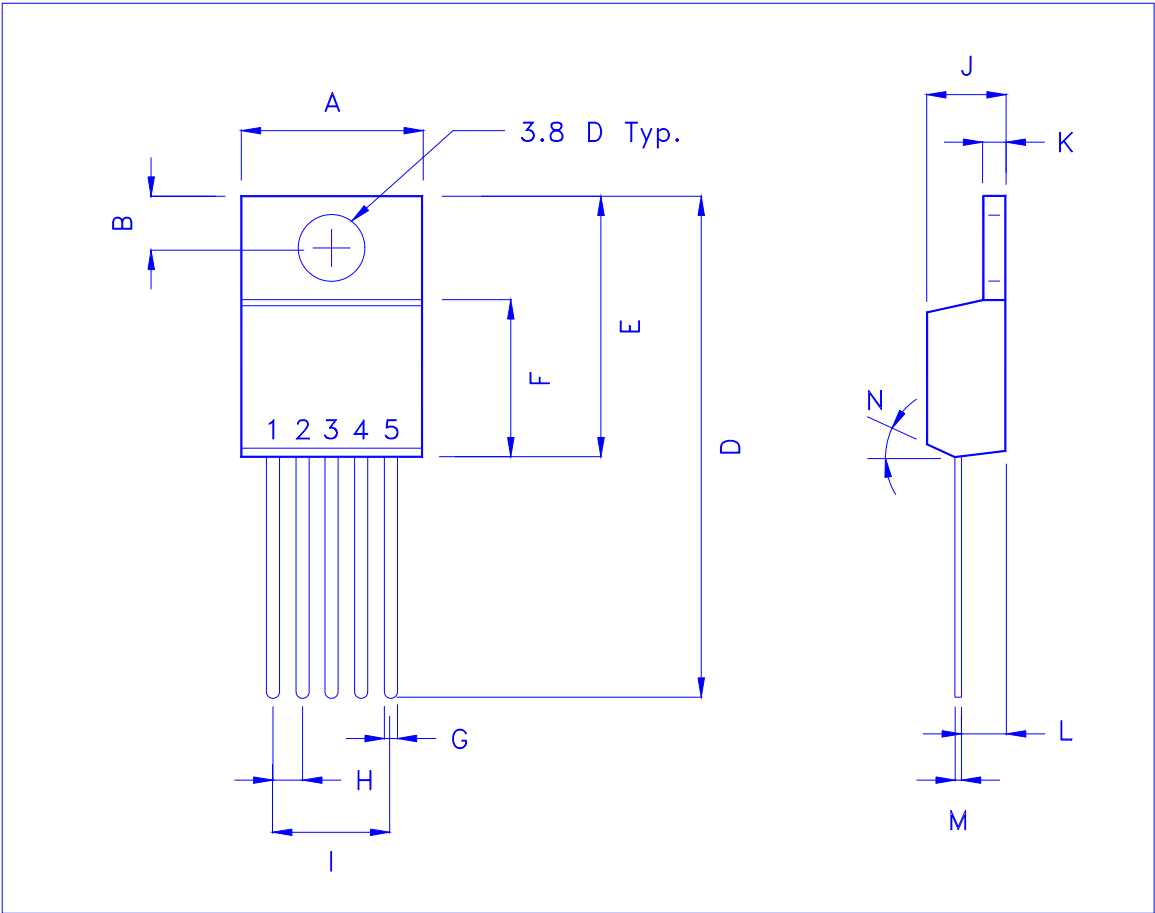
DEVICE SELECTION GUIDE

Device	N2596SG	N2596TG
Voltage (V)	ADJ	ADJ
Current (A)	3	
Package	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 (D²PAK, 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			

