

Voltage Regulator

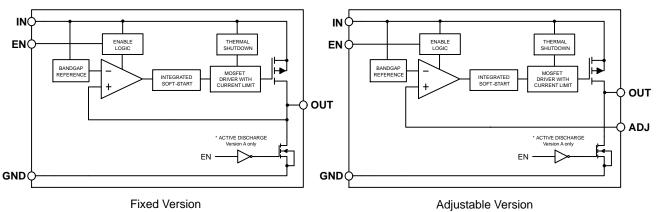


Figure 2. Simplified Block Diagram

Table 1. PIN FUNCTION DESCRIPTION

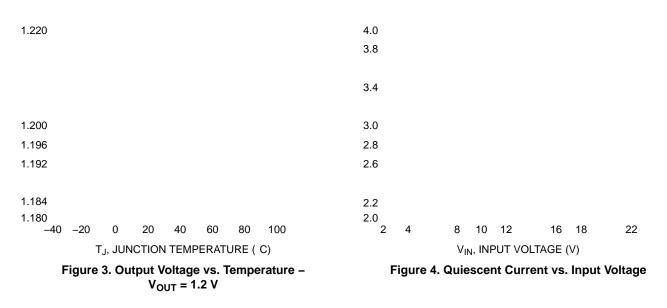
Pin No. (WDFN6)	Pin No. (TSOT-23-5)	Pin Name	Description			
6	1	IN	Input pin. A small capacitor is needed from this pin to ground to assure stability.			
3, EXP	2	GND	Power supply ground.			
4	3	EN	Enable pin. Driving this pin high turns on the regulator. Driving EN pin low puts the regulator into shutdown mode.			
2	4	NC / ADJ	Fixed Version: No connection. This pin can be tied to ground to improve thermal dissipation or left disconnected. Adjustable Version: Feedback pin for set–up output voltage. Use resistor divider for voltage selection.			

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NCP718

NCP718

TYPICAL CHARACTERISTICS



T_J, JUNCTION TEMPERATURE (C)

Figure 5. Disable Current vs. Temperature

TJ

Figure 6. Current to Enable Pin vs. Temperature

NCP718

TYPICAL CHARACTERISTICS

 $\mathsf{V}_{\mathsf{DIF}}$

Figure 9. SOA Current Limit vs. Differential Voltage Figure 10. Dropout Voltage vs. Output Current – V_{OUT} = 2.5 V

NCP718

APPLICATIONS INFORMATION

The NCP718 is the member of new family of Wide Input Voltage Range Low Dropout Regulators which delivers Ultra Low Ground Current consumption, Good Noise and Power Supply Rejection Ratio Performance. The NCP718 incorporates EN pin and soft-start feature for simple controlling by microprocessor or logic.

Input Decoupling (CIN)

It is recommended to connect at least 1 μ F ceramic X5R or X7R capacitor between IN and GND pin of the device. This capacitor will provide a low impedance path for any unwanted AC signals or noise superimposed onto constant input voltage. The good input capacitor will limit the influence of input trace inductances and source resistance during sudden load current changes.

Higher capacitance and lower ESR capacitors will improve the overall line transient response.

Output Decoupling (COUT)

The NCP718 does not require a minimum Equivalent Series Resistance (ESR) for the output capacitor. The device is designed to be stable with standard ceramics capacitors with values of 1 μ F or greater. The X5R and X7R types have the lowest capacitance variations over temperature thus they are recommended.

Power Dissipation and Heat Sinking

The maximum power dissipation supported by the device is dependent upon board design and layout. Mounting pad configuration on the PCB, the board material, and the ambient temperature affect the rate of junction temperature rise for the part. For reliable operation junction temperature should be limited to +125 C. The maximum power dissipation the NCP718 can handle is given by:

$$P_{D(MAX)} = \frac{\left[T_{J(MAX)} - T_{A}\right]}{R_{\theta JA}}$$
 (eq. 1)

The power dissipated by the NCP718 for given application conditions can be calculated from the following equations:

$$\mathsf{P}_\mathsf{D} \approx \mathsf{V}_\mathsf{IN} \big(\mathsf{I}_\mathsf{GND} (\mathsf{I}_\mathsf{OUT}) \big) + \mathsf{I}_\mathsf{OUT} \big(\mathsf{V}_\mathsf{IN} - \mathsf{V}_\mathsf{OUT} \big) \quad \text{ (eq. 2)}$$

or

$$V_{IN(MAX)} \approx \frac{P_{D(MAX)} + (V_{OUT} \times I_{OUT})}{I_{OUT} + I_{GND}}$$
 (eq. 3)

Hints

VIN and GND printed circuit board traces should be as wide as possible. When the impedance of these traces is high, there is a chance to pick up noise or cause the regulator to malfunction. Place external components, especially the output capacitor, as close as possible to the NCP718, and make traces as short as possible.

ADJUSTABLE VERSION

The output voltage can be set by using a resistor divider as shown in Figure 15 with a range of 1.2 V to 5 V. The appropriate resistor divider can be found by solving the equation below, while $V_{REF} = 1.2$ V

$$V_{OUT} = V_{REF} \cdot \frac{(R1 + R2)}{R1} = V_{REF} \cdot \left(1 + \frac{R2}{R1}\right) \quad (eq. 4)$$

Value of R1 and R2 is recommended to keep below 100 k Ω for R1 and below 1 M Ω for R2 to avoid influence of current I_{ADJ} variation over temperature range.

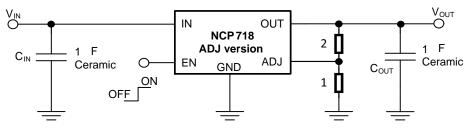


Figure 15. Adjustable Version Connection Schematic

Please note that output noise is amplified by V_{OUT} / V_{ADJ} ratio. For simplified calculation, output noise is equal to

30 $V_{RMS} * V_{OUT}$. Do not operate the device at output voltage about 5.2 V, as device can be damaged.

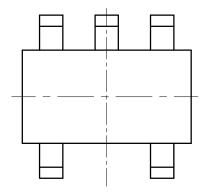
ORDERING INFORMATION

Device Part No.	Voltage Option	Marking	Option	Package	Shipping [†]
NCP718AMTADJTBG	Adj.	GA			
NCP718AMT120TBG	1.2 V	GN			
NCP718AMT180TBG	1.8 V	GP			
NCP718AMT250TBG	2.5 V	GD With Active Output Discharge			
NCP718AMT300TBG	3.0 V	GQ		WDFN6 (Pb–Free)	3000 / Tape & Reel
NCP718AMT330TBG	3.3 V	GR			
NCP718AMT500TBG	5.0 V	GM			
NCP718BMTADJTBG	Adj.	GC			
NCP718BMT180TBG	1.8 V	GU			
NCP718BMT300TBG	3.0 V	GV	Without Active Output Discharge		
NCP718BMT330TAG	3.3 V	GW			
NCP718BMT330TBG	3.3 V	GW			
NCP718BMT500TBG	5.0 V	GE			
NCP718ASNADJT1G	Adj.	GAA	With Active Output	TSOT-23-5 (Pb-Free)	3000 / Tape & Reel
NCP718ASN120T1G	1.2 V	GAE			
NCP718ASN150T1G	1.5 V	GAF			
NCP718ASN180T1G	1.8 V	GAD			
NCP718ASN250T1G	2.5 V	GAG	Discharge		
NCP718ASN300T1G	3.0 V	GAH			
NCP718ASN330T1G	3.3 V	GAJ			
NCP718ASN500T1G	5.0 V	GAK			
NCP718BSNADJT1G	Adj.	GAC			
NCP718BSN120T1G	1.2 V	GCA			
NCP718BSN150T1G	1.5 V	GCC			
NCP718BSN180T1G	1.8 V	GCD	Without Active Output		
NCP718BSN250T1G	2.5 V	GCF	Discharge		
NCP718BSN300T1G	3.0 V	GCG			
NCP718BSN330T1G	3.3 V	GCH			
NCP718BSN500T1G	5.0 V	GCE			

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

TSOT-23, 5 LEAD CASE 419AE-01 ISSUE O

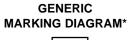
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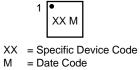




DATE 01 DEC 2021

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*This information is generic. Please refer to device data sheet for actual part marking. Pb–Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

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