

DC-Series Voltage Regulators

High Voltage, Low Power Voltage Regulators

Features:

- Input Voltage to 36VDC (Max Rating 45VDC)
- 5.0V and 3.3V Regulated Output
- Reverse Battery Protection
- Excellent Immunity to Transients and ESD
- High Temperature Operation
- Small, Low-Profile Surface Mount Package

Applications:

- Industrial Sensors and Controls
- Automotive Sensors and Controls

Description:

The DC series voltage regulator ICs are designed for use in harsh, noisy environments where immunity to large voltage transients and acceptance of high input voltages are required. These regulators protect the sensitive electronic components downstream, while providing a stable regulated supply voltage. They are rated for high temperature operation, up to +170°C. The low-profile small footprint package features an exposed die attach pad, for direct heat sinking to the circuit board.

Specifications

Electrical characteristics (-40°C to +175°C, unless otherwise noted)

Parameter	Min	Typ	Max	Units
Input Voltage (DC001-10)	4.5		36	Volts
Output Voltage (DC001-10)	3.0	3.3	3.6	Volts
Input Voltage (DC002-10)	6.2		36	Volts
Output Voltage (DC002-10)	4.5	5.0	5.5	Volts
Output Current			20	Milliamps
Bias Current at Zero Output Current			900	Microamps

Absolute maximum ratings*	
Parameter	Limit
Input Voltage	45V
Reverse Battery Voltage	-60V
Output Current	25mA
Junction Temperature Range, T _j	-40°C to +170°C
Storage Temperature Range	-65 °C to +170°C

*Stresses beyond those listed under “Absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Electrical characteristics” is not implied.

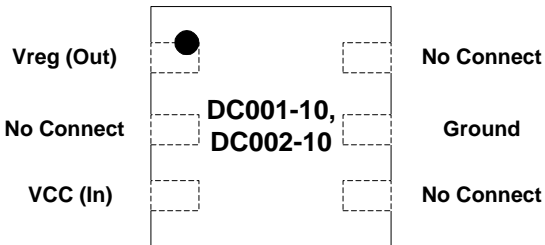
Notes:

1. Power dissipation rating for TDFN6 package in free air is 320°C/Watt. Soldering the package to a PCB, including the die attach paddle, improves temperature performance substantially. The input voltage and output current are limited by thermal power dissipation at the package.
2. Due to package size, TDFN6 package has a three-letter code to designate part type.

Package:

Please see the package drawing section in the Appendix for dimensions of the TDFN6 package.

Pin Configuration

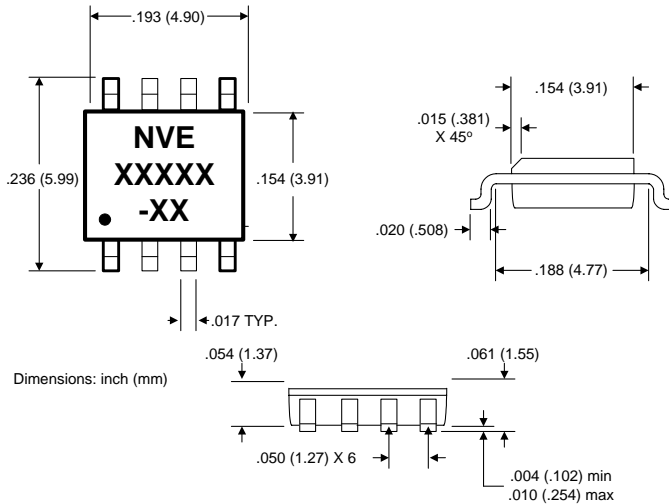


Note: The die attach pad is exposed on the back of this package. NVE recommends that it be connected to the ground pin and the PCB for improved temperature performance.

Appendix

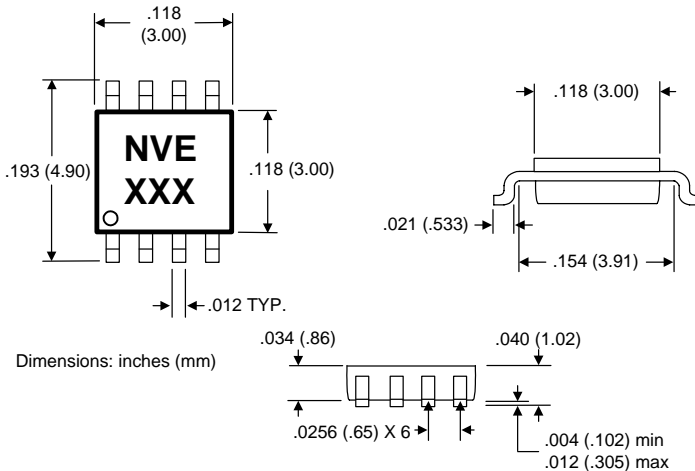
Package Drawings and Specifications

Package Drawing – SOIC8



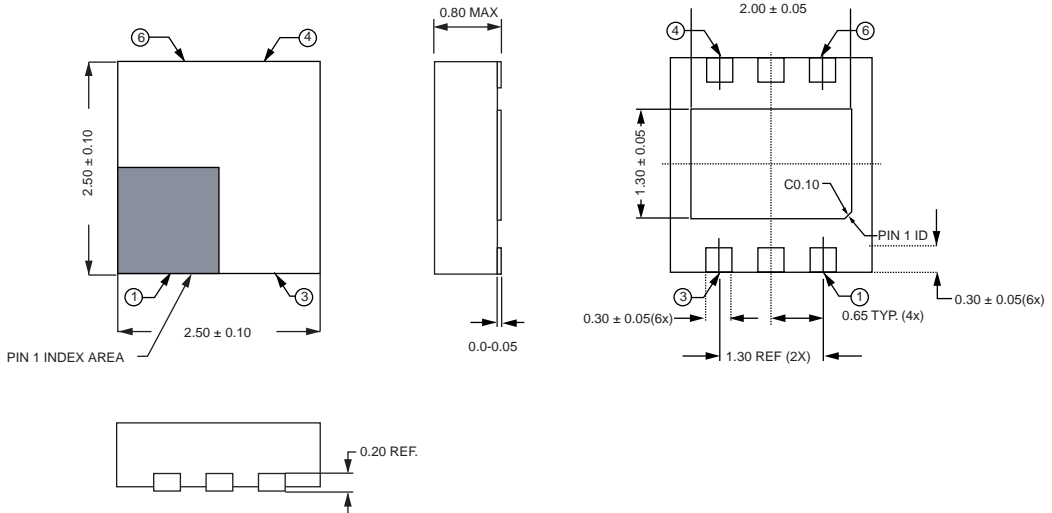
Note: SOIC8 Package has thermal power dissipation of 240°C/Watt in free air. Attaching the package to a circuit board improves thermal performance.

Package Drawing – MSOP8



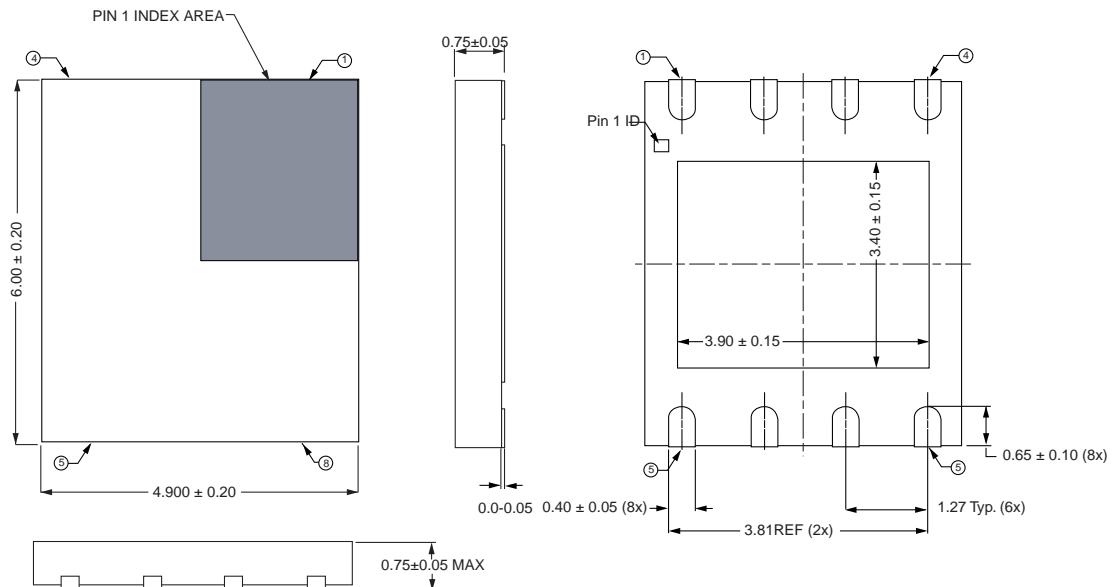
Note: MSOP8 Package has thermal power dissipation of 320°C/Watt in free air. Attaching the package to a circuit board improves thermal performance.

Package Drawing – TDFN6 2.5 mm x 2.5 mm



Note: Dimensions in mm. TDFN6 package has thermal power dissipation of 320°C/Watt in free air. Attaching the package to a circuit board improves thermal performance.

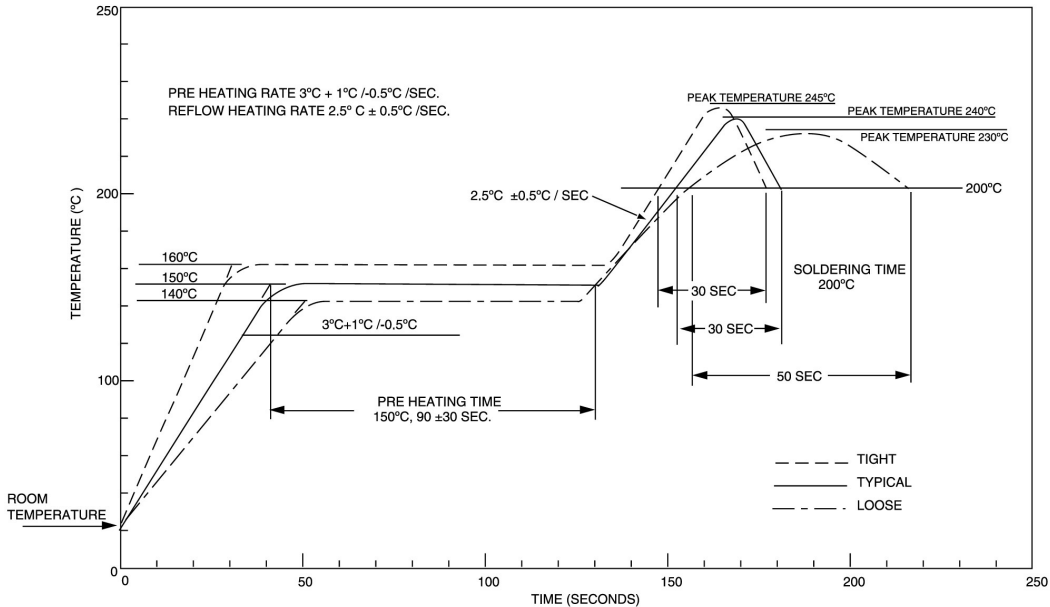
Package Drawing – TDFN SO8



Note: Dimensions in mm. TDFN SO8 Package has thermal power dissipation of 240°C/Watt in free air. Attaching the package to a circuit board improves thermal performance.

Recommended Solder Reflow Profile

NVE recommends that our customers use the following soldering profile when mounting our IC products on a PCB:



Increasing the peak temperature value shown in this profile (up to 260°C) is allowed for lead-free parts. However, exceeding 265°C at peak or the time at peak temperature shown in this profile can damage the parts. Specifically:

1. NVE's AA and AD-Series sensors are rated at 150°C maximum storage temperature. They can withstand the solder profile shown above with no harmful effects. However, temperatures over 265°C for even a brief period or extended periods over 160°C can cause degradation of the GMR sensor element.
2. NVE's AKL and DD-Series parts contain an on-chip EEPROM. Exposing the EEPROM to temperatures in excess of 265°C can cause corruption of the data stored in the EEPROM's memory. This will cause the parts to fall out of the specification.

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