

# FAN1538

## Dual Channel 1A Low Dropout Linear Regulator with UVLO and Soft-start

### Features

- Two independent outputs
- Load regulation: 0.05% typical
- Under-voltage lockout and softstart
- Over Temperature protection
- T0-252 DPAK, 5-lead SPAK packages
- Fixed 3.3V and adjustable or fixed 2.5V output

### Applications

- Hard Disk Drives, CD-Roms
- Set-top Boxes
- ADSL line cards
- Motherboards with multiple supplies

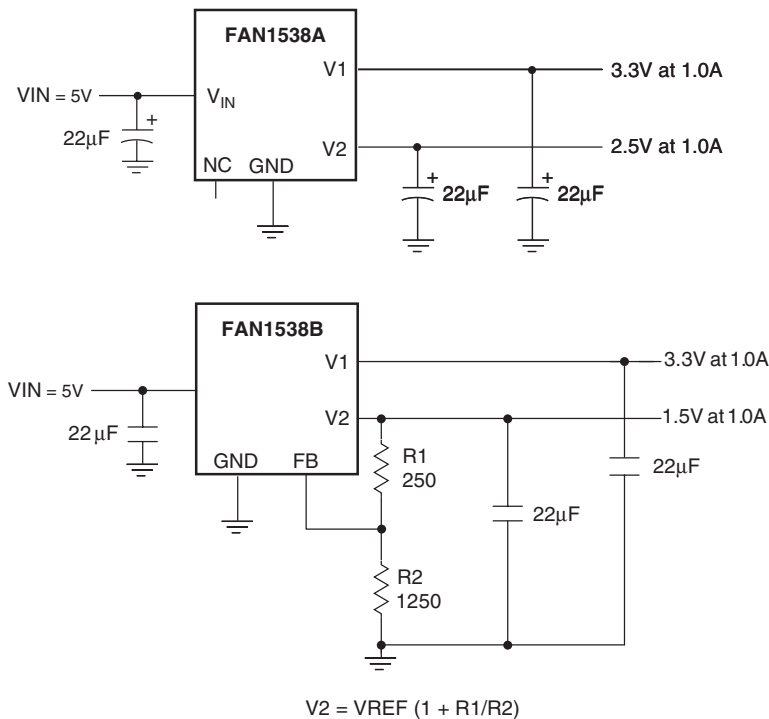
### General Description

The FAN1538 provides two output voltages: a fixed 3.3V output and either a fixed 2.5V or adjustable output with 1A output current capability. Refer to Ordering Information for details.

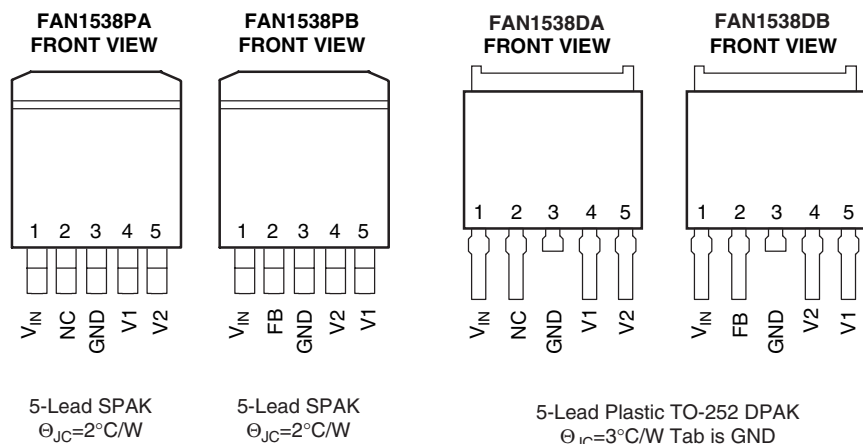
Current limit protects against short circuit currents and on chip over temperature circuitry limits the maximum die temperature.

Under voltage lockout and softstart circuitry protects against unregulated output voltages when the input voltage is below specification.

### Block Diagram



## Pin Assignments



## Pin Descriptions

Pin Name	SPAK DPAK	Pin Function
$V_{IN}$	1	Input supply voltage
NC/FB	2	For V2 fixed, no connect. For V2 adjustable, feedback voltage.
V1	4/5	Output #1
V2	5/4	Output #2
GND	3	Ground

## Absolute Maximum Ratings

Parameter	Min.	Max.	Units
$V_{IN}$		10	V
Storage Temperature Range	-65	150	$^{\circ}\text{C}$
Lead Soldering Temperature, 10 seconds		300	$^{\circ}\text{C}$

## Recommended Operating Conditions

Parameter	Conditions	Min.	Typ.	Max.	Units
$V_{IN}$	$V_{in}$ to GND	4.75	5	5.25	V
Ambient Operating Temperature ( $T_A$ )		0		125	$^{\circ}\text{C}$

## Electrical Specifications

(Operating Conditions: VIN = 5V, TJ=25°C unless otherwise specified)

The • denotes specifications which apply over the full operating temperature range.

Parameter	Conditions		Min.	Typ.	Max.	Units
V1 Output Voltage	10mA ≤ Iout ≤ 1A 4.50V ≤ VIN ≤ 7V	•	3.234 3.200	3.300 3.300	3.366 3.400	V
V2 Output Voltage (FAN1538A)	10mA ≤ Iout ≤ 1A 4.50V ≤ VIN ≤ 7V	•	2.450 2.420	2.500 2.500	2.550 2.580	V
V2 Minimum Output Voltage (FAN1538B)	10mA ≤ Iout ≤ 1A 4.50V ≤ VIN ≤ 7V	•	1.400			V
Reference Voltage (FAN1538B) (FB)	10mA < Iout < 1A 4.50V ≤ VIN ≤ 7V	•	1.225 1.210	1.250 1.250	1.275 1.290	V
FB Pin Bias Current		•			1	µA
Line Regulation (Both Outputs)	4.50V ≤ VIN ≤ 7V Iout = 10mA	•		0.005	0.5	%
Load Regulation (Both Outputs)	VIN=5.0V 10mA ≤ Iout ≤ 1A	•		0.05	0.5	%
Current Limit (Both Outputs)	VIN = 5V		1.1	1.5		A
Minimum Load Current (Both Outputs)	4.50V ≤ VIN ≤ 7V	•	10			mA
Quiescent Current	VIN = 5V	•		6	15	mA
Ripple Rejection (Both Outputs)	F = 60Hz, Cout = 22µF VIN = 5V, Iout = 100mA		60			dB
<b>Under-Voltage Lockout (See Diagram1)</b>						
VIN Rising threshold		•	3.4	3.8	4.2	V
VIN Falling threshold		•	3.0	3.3	3.6	V
V1 & V2 delay start time	VIN > UVLO Rising Threshold			150		µs
V1 softstart slew rate				250		µs/V
V2 softstart slew rate	R1 = 1250 & R2 = 250 ohms			550		µs/V
V1 & V2	VIN < 3.4	•			0.5	V
<b>Thermal Shutdown</b>						
Shut down Temperature				165		°C
Thermal hysteresis				40		°C

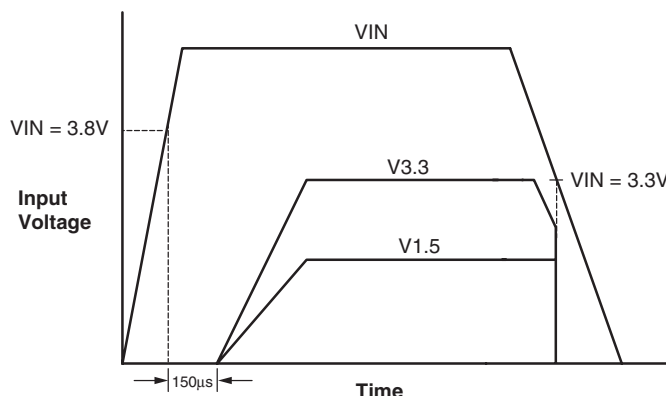
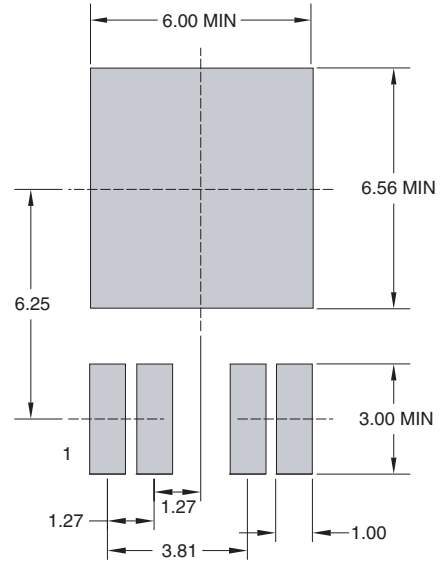
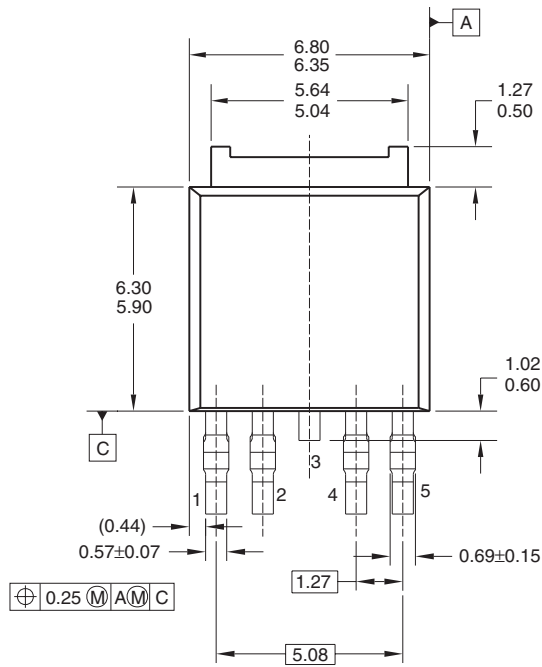


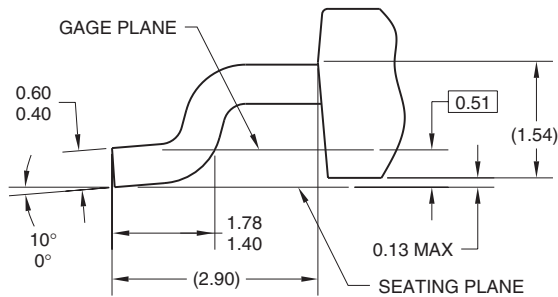
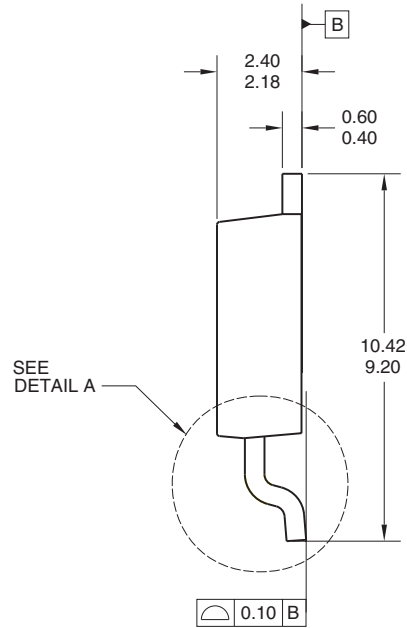
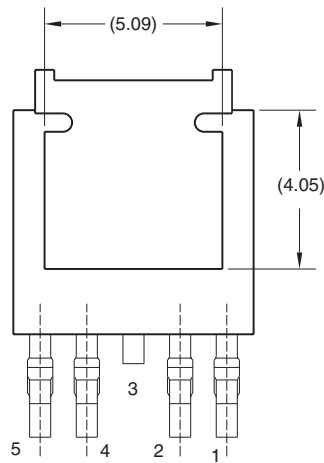
Diagram 1: UVLO and Softstart Timing

# Mechanical Dimensions

## TO-252 DPAK Package



LAND PATTERN RECOMMENDATION



**DETAIL A**  
(ROTATED 90°)  
SCALE: 2X

- NOTES: UNLESS OTHERWISE SPECIFIED
- A) ALL DIMENSIONS ARE IN MILLIMETERS.
  - B) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE C, VARIATION AA, DATED NOV. 1999.

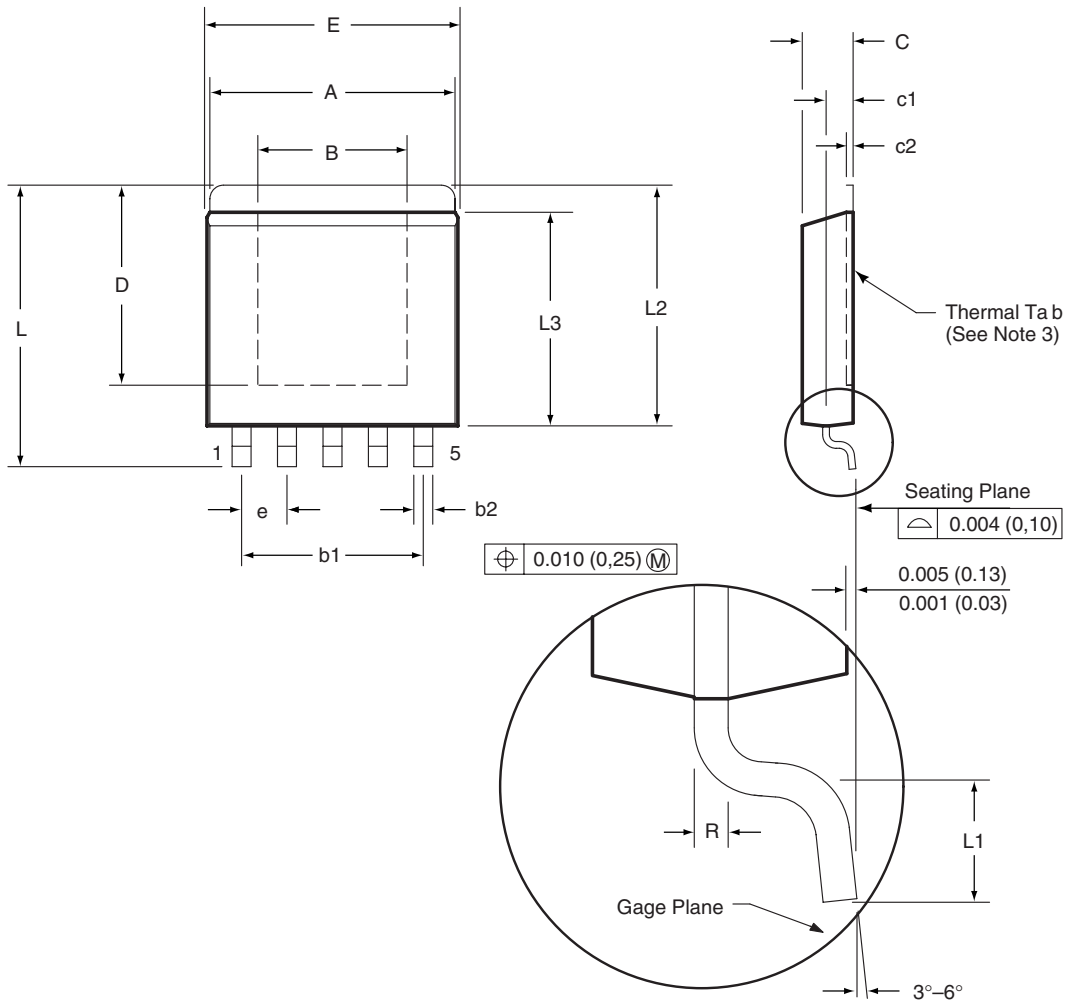
# Mechanical Dimensions (continued)

## 5-Lead SPAK

Symbol	Inches		Millimeters		Notes
	Min.	Max.	Min.	Max.	
A	0.350	0.360	8.89	9.14	
B	0.220 NOM		5.59 NOM		
b1	0.268		6.81		
b2	0.025	0.031	0.63	0.79	
C	0.070	0.080	1.78	2.03	
c1	0.040	0.050	1.02	1.27	
c2	0.010 NOM		0.25 NOM		
D	0.295 NOM		7.49 NOM		
E	0.365	0.375	9.27	9.52	
e	0.067		1.72		
L	0.410	0.420	10.41	10.67	
L1	0.031	0.041	0.79	1.04	
L2	0.350	0.360	8.89	9.14	
L3	0.310	0.320	7.87	8.13	
R	0.010 NOM		0.25 NOM		
$\alpha$	0°	8°	0°	8°	

**Notes:**

1. All linear dimensions are in inches (millimeters).
2. This drawing is subject to change without notice.
3. The center lead is in electrical contact with the thermal tab.
4. Dimensions do not include mold protrusions, not to exceed 0.006 (0,15).



## Ordering Information

Part Number	Voltage Option	Package
FAN1538DBX	V1 = 3.3V, V2 = adj	5-Lead DPAK in Tape and Reel
FAN1538PBX	V1 = 3.3V, V2 = adj	5-Lead SPAK in Tape and Reel
FAN1538DAX	V1 = 3.3V, V2 = 2.5V	5-Lead DPAK in Tape and Reel
FAN1538PAX	V1 = 3.3V, V2 = 2.5V	5-Lead SPAK in Tape and Reel

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.