2A Low Dropout Regulator with Enable

Features

- **Adjustable Output from 1.2V to 4.8V Using External Resistors**
- **1.5V, 1.8V and 2.5V options by Setting ADJ Pin Below 0.2V**
- **Over current and over temperature protection**
- **500mV dropout @2A**
- **Enable pin**
- **10μA quiescent current in shutdown**
- **Output recovery mode in OTP**
- **Connect ADJ to GND for fixed output mode**
- **TO-252-5 Package**

Applications

- **Battery powered systems**
- **Motherboards**
- **Peripheral cards**
- **Set Top Boxes**
- **Notebook Computers**

General Description

The G962 is a high performance positive voltage regulator designed for use in applications requiring very low dropout voltage at up to 2 Amps. Since it has superior dropout characteristics compared to regular LDOs, it can be used to supply 2.5V on motherboards or 1.5V, 1.8V on peripheral cards from the 3.3V supply thus allowing the elimination of costly heatsinks. An enable pin further reduces power dissipation while shut down. The G962 provides excellent regulation over variations in line, load and temperature.

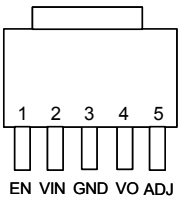
The TO-252-5 is available with 1.5V, 1.8V and 2.5V internally preset outputs that are also adjustable using external resistors.

Ordering Information

ORDER NUMBER	ORDER NUMBER (Pb free)	MARKING	TEMP. RANGE	PACKAGE
G962-15ADJTJU	G962-15ADJTJUf	G962-15	-40°C ~ +85°C	TO-252-5
G962-18ADJTJU	G962-18ADJTJUf	G962-18	-40°C ~ +85°C	TO-252-5
G962-25ADJTJU	G962-25ADJTJUf	G962-25	-40°C ~ +85°C	TO-252-5

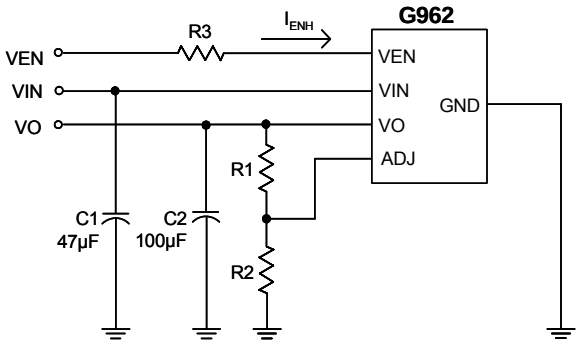
Note: TJ:TO-252-5
U : Tape & Reel
e.g. 18 denotes the 1.8V output voltage.

Pin Configuration



TO-252-5

Typical Application Circuit



$$VO = \frac{1.2\ (R1+R2)}{R2}\ \text{Volts}$$

R2=12kΩ is recommended
R3 should be connected for current I_{ENH} restriction as $V_{EN} > V_{IN}+0.3V$

Absolute Maximum Ratings (Note 1)

Input Voltage……7V
V_{EN} Voltage……V_{IN}+0.3V
Power Dissipation Internally Limited (Note 2)
Maximum Junction Temperature……150°C
Storage Temperature Range……-65°C ≤T_J ≤ +150°C
Reflow Temperature (Soldering, 10 sec)……260°C
Thermal Resistance Junction to Ambient, (θ_{JA})
TO-252-5……95°C/W
Thermal Resistance Junction to Case, (θ_{JC})
TO-252-5……8°C/W
ESD Rating (Human Body Model)……2kV

Operation Conditions (Note 1)

Input Voltage……2.2V ~7V
Temperature Range……-40°C ≤T_A ≤ +85°C

Electrical Characteristics

V_{EN}=V_{IN}, V_{IN} =5V, I_O = 0.5A, C_{IN} = 4.7μF, C_{OUT} =10μF, T_A = T_J = 25°C unless otherwise specified (Note 3)

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Output Voltage	V_O	V_{IN}=V_O +0.7V, I_O=10mA	-2	V_O	2	%
Line Regulation		V_O+0.7V ≤ V_{IN} ≤ 5.5V, I_O=10mA	---	0.2	2	%
Load Regulation		10mA ≤ I_O ≤ 2A	---	0.8	2	%
Quiescent Current	I_Q	V_{IN}=3.3V,V_{EN}=V_{IN}	---	1.7	2.5	mA
		V_{IN}=3.3V,V_{EN}=0V	---	16	35	μA
Ripple Rejection		fi=120Hz, 1V_{P-P}, I_O=100mA	---	55	---	dB
Dropout Voltage	V_D	I_O=2A	---	0.7	0.85	V
Short Circuit Current			---	0.8	---	A
Over Temperature		(Note 4)	---	150	---	°C
V_{EN} Voltage High	V_{ENH}	Output Active	1.6	---	---	V
V_{EN} Voltage Low	V_{ENL}	Output Disabled	---	---	0.4	V
V_{EN} Bias Current Low	I_{ENL}	V_{EN}=0.4V	---	---	20	μA
ADJ Reference Voltage	V_{REF}	V_{IN}=2.2V, V_{ADJ}=V_{OUT}, I_O=10mA	1.176	1.2	1.224	V
ADJ Pin Threshold			---	0.2	---	V

Note 1: Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Conditions are conditions under which the device functions but the specifications might not be guaranteed. For guaranteed specifications and test conditions see the Electrical Characteristics.

Note2: The maximum power dissipation is a function of the maximum junction temperature, T_{Jmax}; total thermal resistance, θ_{JA}, and ambient temperature T_A. The maximum allowable power dissipation at any ambient temperature is (T_{jmax}-T_A) / θ_{JA}. If this dissipation is exceeded, the die temperature will rise above 150°C and IC will go into thermal shutdown.

Note3: Low duty pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

Note4: The over temperature point is guarantee by design.

Definitions

Dropout Voltage

The input/output voltage differential at which the regulator output no longer maintains regulation against further reductions in input voltage. Measured when the output drops 2% below its nominal value, dropout voltage is affected by junction temperature, load current and minimum input supply requirements.

Line Regulation

The change in output voltage for a change in input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

Load Regulation

The change in output voltage for a change in load current at constant chip temperature. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

Maximum Power Dissipation

The maximum total device dissipation for which the regulator will operate within specifications.

Quiescent Bias Current

Current which is used to operate the regulator chip and is not delivered to the load.

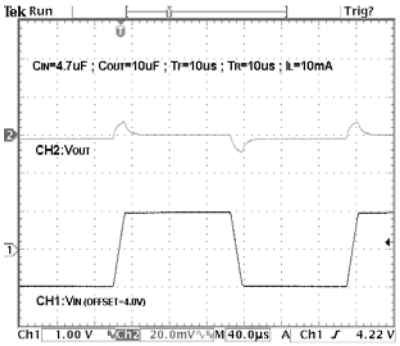
Output Capacitor for Stable Condition

The G962 can be stable for X5R MLCC capacitor larger than 10μF or POSCAP capacitor larger than 47μF.

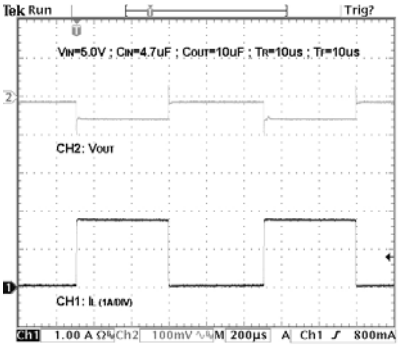
Typical Characteristics

V_{EN}=V_{IN}, =5V, I_O = 0.5A, C_{IN} = 4.7µF, C_{OUT} =10µF, T_A = T_J = 25°C
(V_{OUT}=1.8V)

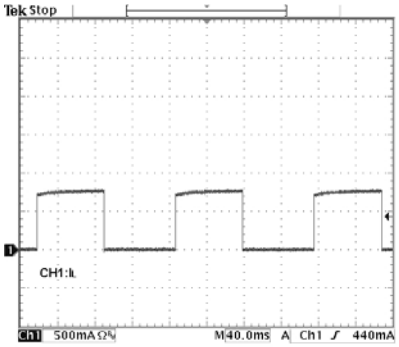
Line Transient



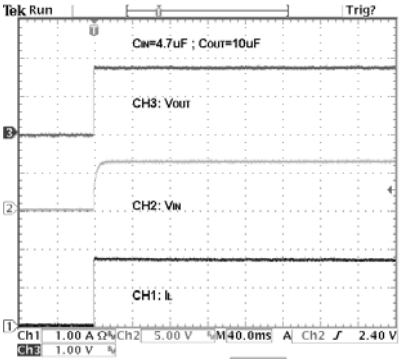
Load Transient



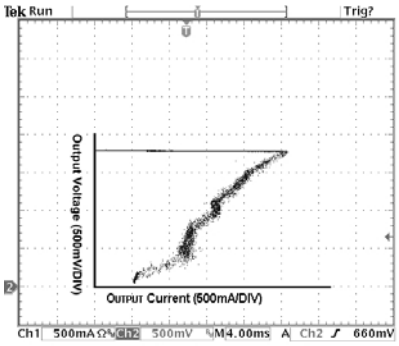
Short Circuit Current



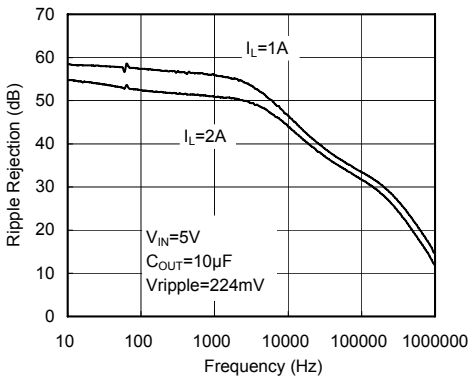
Start-UP



Overcurrent Protection Characteristics

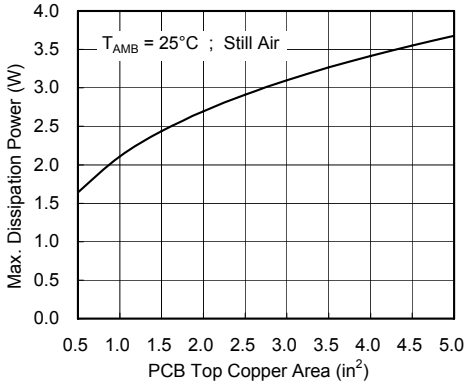


Ripple Rejection

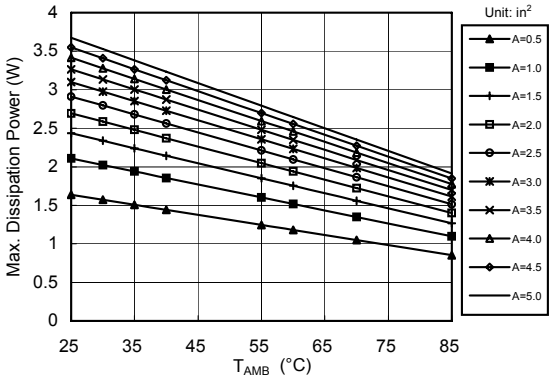


Typical Characteristics (continued)

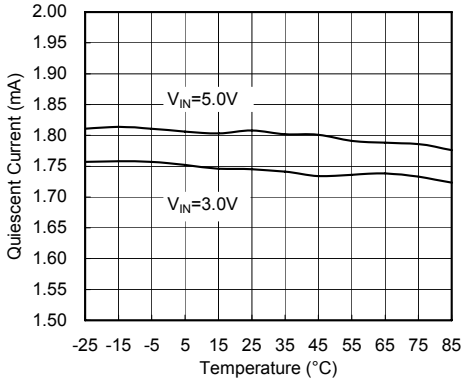
Max. Power Dissipation vs. PCB Top Copper Area



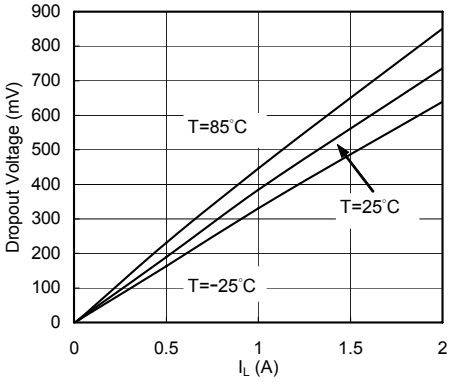
Max. Power Dissipation vs. T_{AMB} (still air) (Different PCB Top Copper Area)



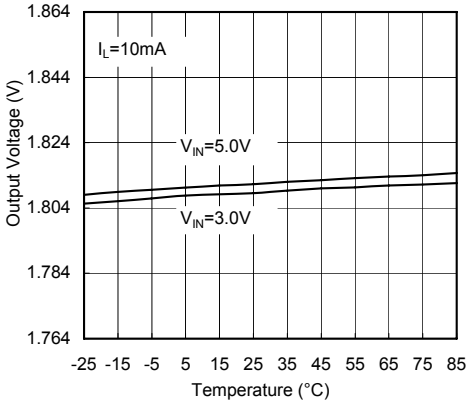
Quiescent Current vs. Temperature



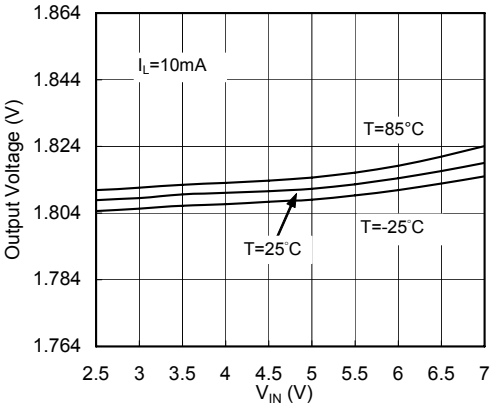
Dropout Voltage vs. Temperature



Output Voltage vs. Temperature

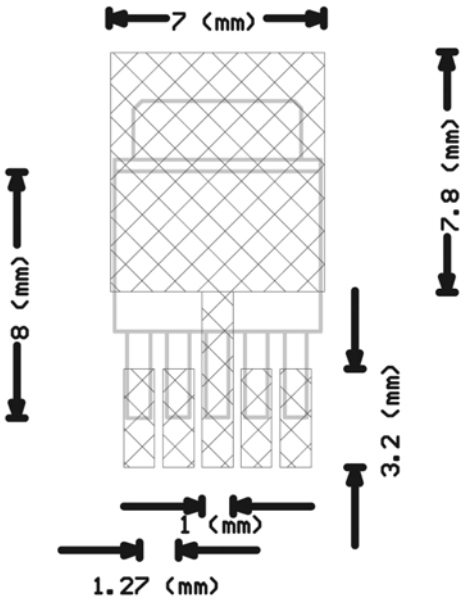


Output Voltage vs. V_{IN}

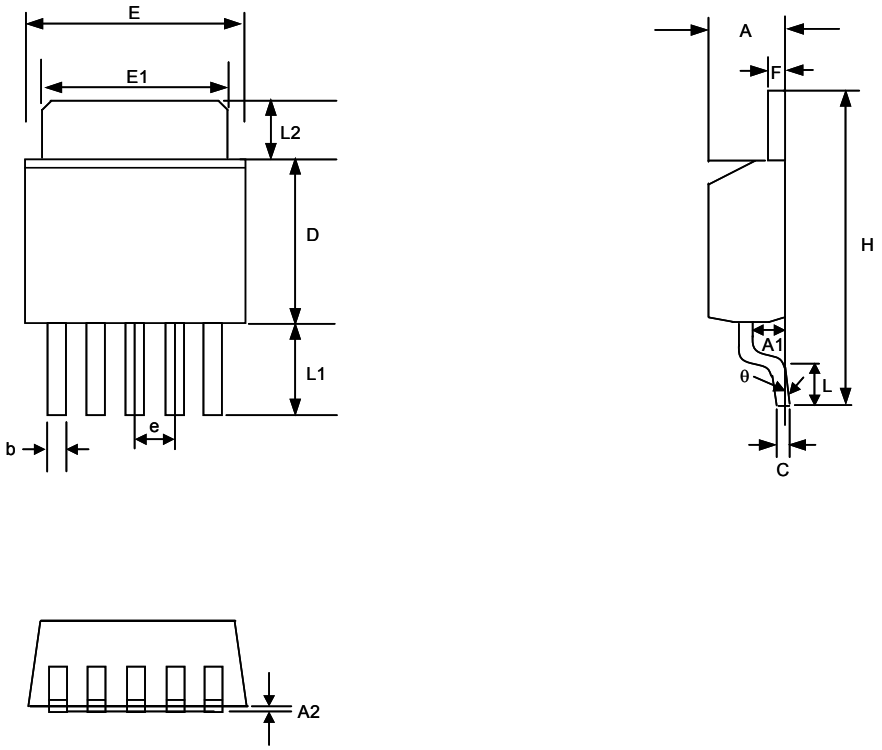


Recommend Minimum Footprint

TO-252-5



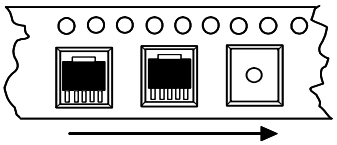
Package Information



TO-252-5 (TJ) Package

SYMBOL	MILLIMETER		INCH	
	MIN.	MAX.	MIN.	MAX.
A	2.19	2.38	0.086	0.094
A1	0.89	1.27	0.035	0.050
b	0.64	0.89	0.025	0.035
C	0.46	0.58	0.018	0.023
D	5.36	5.61	0.211	0.221
E	6.35	6.73	0.250	0.265
E1	5.21	5.46	0.205	0.215
e	1.27BSC		0.050BSC	
F	0.46	0.58	0.018	0.023
L	1.40	1.78	0.055	0.070
L1	2.20	2.80	0.087	0.110
L2	1.52	2.03	0.060	0.080
H	9.40	10.40	0.370	0.410
θ	0°	4°	0°	4°

Taping Specification



Feed Direction
TO-252-5 Package Orientation

PACKAGE	Q'TY/REEL
TO-252-5	2,500 ea