1A Low Dropout Regulator

Features

- **Adjustable Output Low to 0.5V**
- **Input Voltage as Low as 1.0V at V_{PP} 5V**
- **260mV Dropout @ 1A, V_{PP} 3.3V**
- **Over Current and Over Temperature Protection**
- **Enable Pin**
- **Low Reverse Leakage (Output to Input)**
- **SOP-8 (FD) Packages with Thermal Pad**
- **±2% Output Voltage**
- **VO Pull Low Resistance when Disable**

Applications

- **Motherboards**
- **Peripheral Cards**
- **Network Cards**
- **Set Top Boxes**
- **Notebook Computers**

General Description

The G942 is a high performance positive voltage regulator designed for use in applications requiring very low Input voltage and very low dropout voltage at up to 1 amps. It operates with a V_{IN} as low as 1V and V_{PP} voltage 5V with output voltage programmable as low as 0.5V. The G942 features ultra low dropout, ideal for applications where V_{OUT} is very close to V_{IN}. Additionally, the G942 has an enable pin to further reduce power dissipation while shutdown. The G942 provides excellent regulation over variations in line, load and temperature.

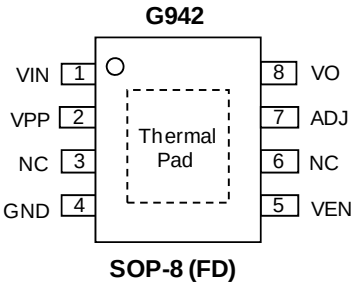
The G942 is available in the SOP-8 (FD) package. It is available with outputs that are adjustable using external resistors.

Ordering Information

ORDER NUMBER	MARKING	TEMP. RANGE	PACKAGE (Green)
G942F11U	G942	-40°C~+85°C	SOP-8 (FD)

Note: F1: SOP-8 (FD)
1: Bonding Code
U: Tape & Reel
Green : Lead Free / Halogen Free

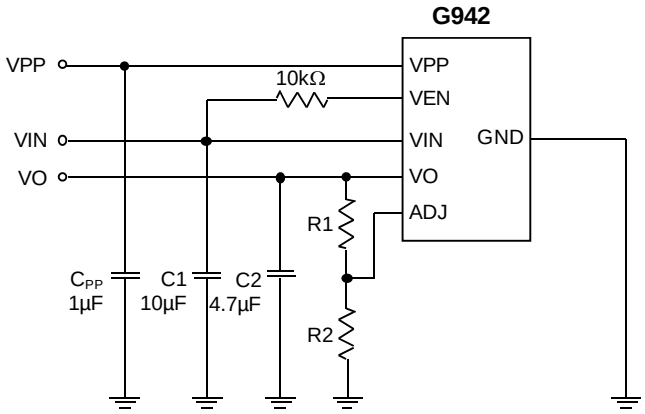
Pin Configuration



SOP-8 (FD)

Note: Recommend connecting the Thermal Pad to the Ground for excellent power dissipation.

Typical Application Circuit



$$VO = \frac{0.5\,(R1+R2)}{R2}\ \text{Volts}$$

R2<120kΩ is recommended

Absolute Maximum Ratings (Note 1)

V_{PP}, V_{IN}, Input Voltage 7V
Power Dissipation Internally Limited (Note 2)
Maximum Junction Temperature . . . . . .150°C
Storage Temperature Range . . . . .-65°C ≤T_J ≤ +150°C
Reflow Temperature (soldering, 10sec) . . . . . 260°C
Thermal Resistance Junction to Ambient, (θ_{JA})*
SOP-8 (FD). . . . . .130°C/W
Continuous Power Dissipation (T_A = +25°C)*
SOP-8 (FD). 0.95W
Thermal Resistance Junction to Case, (θ_{JC})
SOP-8 (FD) . . . . . 12°C/W
ESD (HM) 2kV

Operation Conditions

V_{IN} Voltage . . . . . 1V ~5.5V
V_{PP} Voltage . . . . . 2.7V~5.5V
Temperature Range . . . . . -40°C ≤T_A ≤ +85°C

* Please refer to Minimum Footprint PCB Layout Section.

Electrical Characteristic

V_{PP}=3.6V, V_{IN} =1.5V, V_O=1.2V, V_{EN}=V_{PP}, I_O=10mA, C_{IN}=10µF, C_{OUT} =4.7µF, T_A=T_J=25°C.

The device is not guaranteed to function outside its operating conditions. Parameters with MIN and/or MAX limits are 100% tested at +25°C, unless otherwise specified.

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
VIN						
Input Voltage Range	V_{IN}	V_O=0.8V	1.0	---	5.5	V
		V_O=0.7V	0.9	---	5.5	V
Quiescent Current (Ground Current)	I_Q	V_O=1.2V	---	---	20	µA
VPP						
V_{PP} Voltage Range	V_{PP}		2.7	---	5.5	V
V_{PP} Current	I_{PP}	I_O=10µA, V_O=1.2V	---	---	300	µA
VO						
Output Voltage	V_O	V_O=V_{ADJ}=0.5V,1mA to 1000mA	0.49	0.5	0.51	V
		V_O=V_{ADJ} =0.5V,-40oC to +85°C	0.487	0.5	0.512	V
Line Regulation, V_{IN}		V_{IN}=1V to 5.5V, V_{PP} =3.6V, Io=1mA, Vo=0.5V	---	0.002	---	%/V
Line Regulation, V_{PP}		V_{IN}=1.5V, V_{PP} =2.7V to 5.5V, Io=100mA, V_O =0.5V	---	0.04	---	%/V
Load Regulation		I_O=1mA to 1000mA	---	0.0015	---	%/mA
Dropout Voltage	V_D	V_{PP}=3.3V, I_O=1A , Vo=0.9V	---	---	260	mV
ADJ						
Adjust Pin Current	I_{ADJ}		---	20	100	nA
VEN						
V_{EN} Pin Voltage High	V_{ENH}	V_{PP}=3.6V	1.3	---	---	V
V_{EN} Pin Voltage Low	V_{ENL}	V_{PP}=3.6V	---	---	0.8	V
V_{EN} Pin Bias Current	I_{ENL}	V_{EN}=1.2	-1	---	+1	µA
Over Temperature Protection						
Over Temperature	T_{OT}		---	155	---	°C
Over Temperature Hysteresis	T_{OTHY}		---	30	---	°C

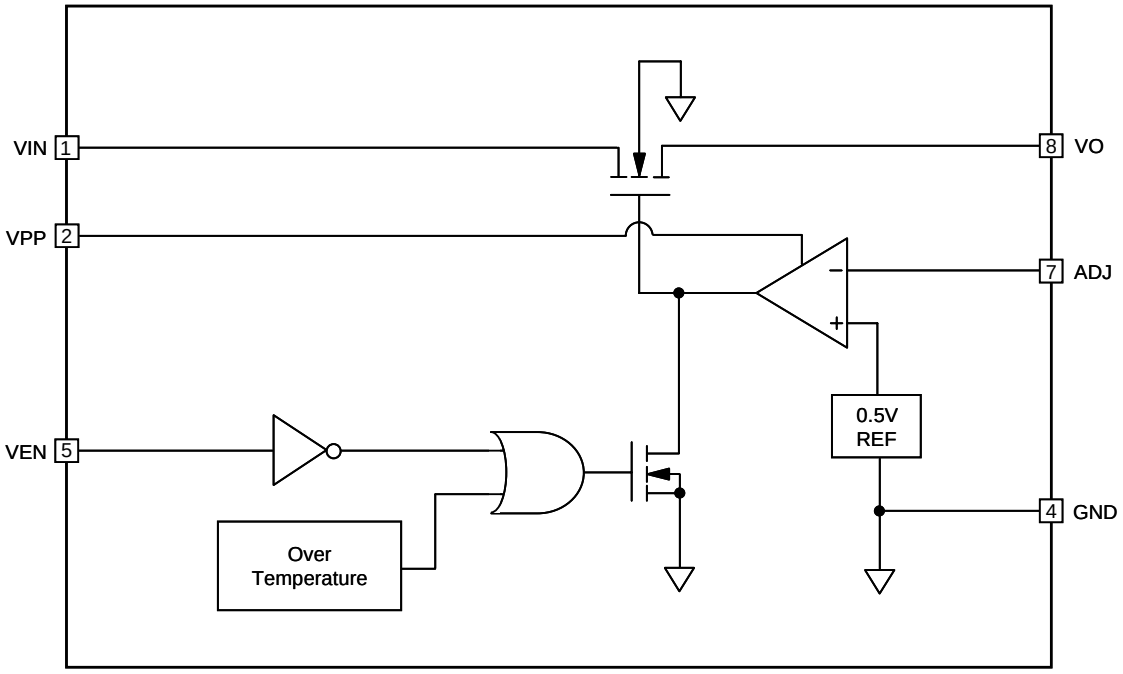
Note 1: Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Conditions are conditions under which the device functions but the specifications might not be guaranteed. For guaranteed specifications and test conditions see the Electrical Characteristics.

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.

Pin Description

PIN	NAME	FUNCTION
1	VIN	Input voltage. Large bulk capacitance should be placed closely to this pin. A 10µF ceramic capacitor is recommended at this pin.
2	VPP	Input voltage for controlling circuit.
3,6	NC	Not connected.
4	GND	Reference ground.
5	VEN	Enable Input. Pulling this pin below 0.8V turns the regulator off, reducing the quiescent current to a fraction of its operating value.
7	ADJ	This pin, when grounded, sets the output voltage by the internal feedback resistors. If external feedback resistors are used, the output voltage will be VO = 0.5(R1+R2)/R2 Volts.
8	VO	The power output of the device.

Block Diagram



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.

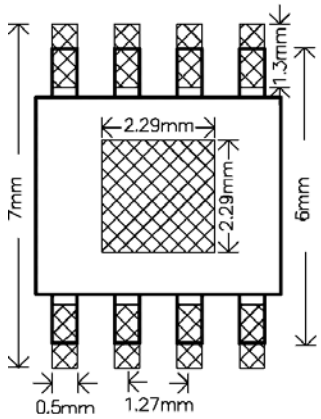
Load Regulation
The change in output voltage for a change in load current at constant chip temperature. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

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

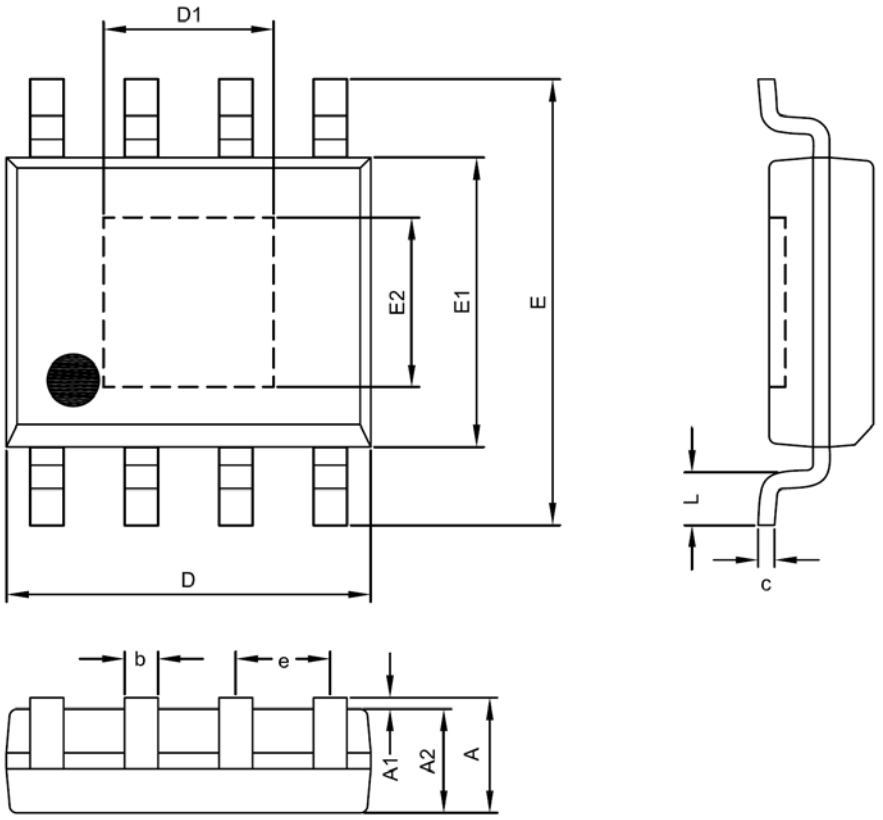
Quiescent Bias Current
Current which is used to operate the regulator chip and is not delivered to the load.

Minimum Footprint PCB Layout Section

SOP-8 (FD)



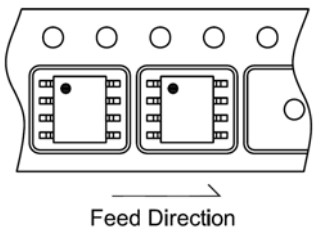
Package Information



SOP- 8 (FD) Package

Symbol	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	1.35	1.55	1.70	0.053	0.061	0.067
A1	0.00	---	0.10	0.000	---	0.004
A2	1.15	1.35	1.60	0.045	0.053	0.063
D	4.80	4.90	5.00	0.189	0.192	0.197
D1		2.29 BSC			0.090 BSC	
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.153	0.157
E2		2.29 BSC			0.090 BSC	
c		0.20 REF			0.008 REF	
b	0.33	0.43	0.53	0.013	0.017	0.021
e		1.27 BSC			0.050 BSC	
L	0.40	0.70	1.27	0.016	0.028	0.050

Taping Specification



PACKAGE	Q'TY/REEL
SOP-8 (FD)	2,500 ea