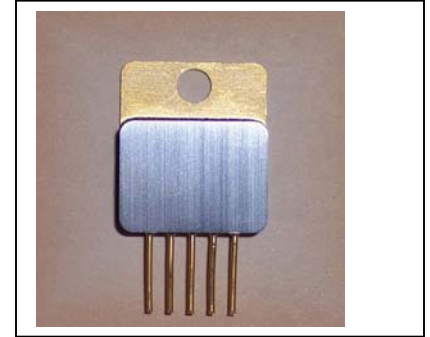


**Point-of-Load Switching Regulator**  
**4.5Vdc - 6Vdc Input, 1.21Vdc - 5.0Vdc Output, 3.5A**  
**(Preliminary)**

**FEATURES**

- Input Range 4.5V to 6V
- Adjustable or Fixed Output Voltage
- Up to 3.7A Output Current
- Integrated Input Capacitors
- Variable Frequency Operation (note 1)
- Remote-Sense operation
- Internal Soft Start
- Efficiencies up to 85%
- Thermal Resistance ( $\theta_{jc}$ ) 4°C/W



**DESCRIPTION**

The SAT8565 is a non-isolated PowerPac module designed for high reliability and full military point of load applications. Fully integrated, the SAT8565 includes buck controller, inductor, and input/output capacitors integrated in a single package. The SAT8565 operates from an input voltage of +4.5V to +6V providing step down power conversion to any output voltage from 1.21V to 5.0V. Operating features include output voltage adjust, output current limit, shutdown, external synchronization and soft start. Careful design and layout ensure excellent stability, transient response, and low noise operation. Packaged in a compact 5 Pin MO-078 package, the SAT8565 is manufactured in a facility certified to MIL-PRF-38534 Class-H and operates over the full -55°C to +125°C temperature range. This product is offered in a variety of screening levels. See p/n guide (last page) for all variations.

**ABSOLUTE MAXIMUM RATINGS**

(Exceeding maximum ratings may damage the device)

Table.1

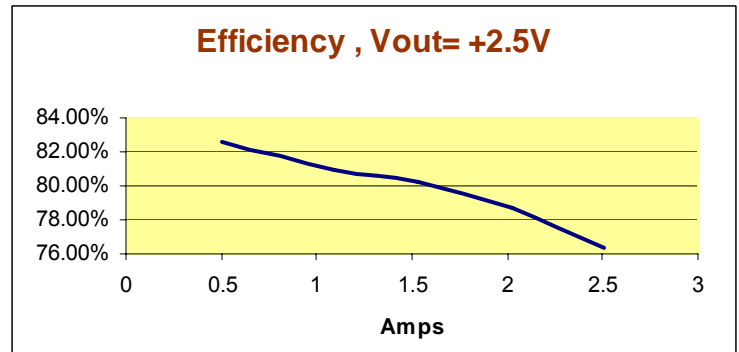
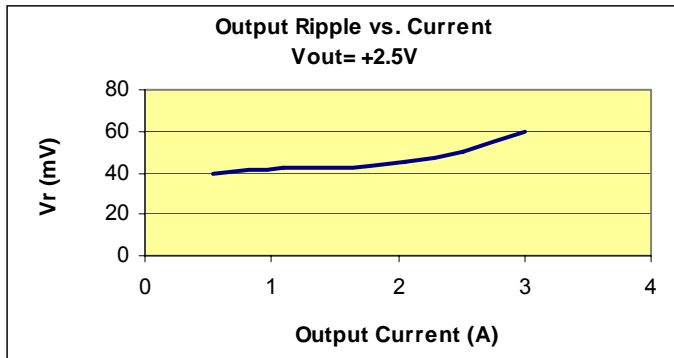
Symbol	Parameter	Value	Unit
Vin	DC input Voltage Vin-Vground	12.0	V
Io	Output Current	3.7	A
Pd	Power Dissipation Tcase=25deg.C	25	W
Rthjc	Thermal Resistance, Junction to Case	2.5	°C/W
Vshdn	Shutdown Pin Voltage	7.0	V
Vsync	Sync Pin Voltage	7.0	V
Tstg	Storage Temperature	-65 to +150	°C
Tj	Operating Temperature Range	-55 to +125	°C
Tsold	Maximum Soldering Temperature, 10sec	300	°C

## ELECTRICAL CHARACTERISTICS @ Ta=-55deg.C to +125deg.C

(Unless Otherwise Specified)

Symbol	Parameter	Test Conditions	Value			Units
			Min	Typ	Max	
Vout	Output Voltage accuracy	Vin=5.0V, Iout=2.0A, Vo= Vref		1.0	2.0	%
Kvi	Line Regulation	+4.5V ≤ Vin ≤ +6.0V, Iout = 3A		.1		%
Kvo	Load regulation	Vin = 5V, 1A ≤ Iout ≤ 3A		1.0		%
Vin	Input Voltage Range	Iout=2.5A	4.5		6	V
Vsync	Sync Input Voltage			1.5	2.2	V
Isc	Short-circuit current Limit	Vin=5.0V,		6.0		A
Ishdn	Shutdown Source Current	Vin=6.0V; Vshdn=0, Vsw=0			75	uA
Fsync	Synchronizing Range <sup>1</sup>		580		1000	KHz
Vshdn	Shutdown Input Voltage <sup>2,3</sup>	Vin=5.0, Vout < 0.5V	0.4			V

### Typical Performance Characteristics



Notes:

1. Frequency of operation can be adjusted when using the Sync input, (table 1). This input should be grounded when not in use.
2. Output Inhibit guaranteed @ Vshdn < 0.4V.
3. Shut-down pin may be pulled up to Vin (Rpullup ≤ 5KΩ), when not in use.

## Application Circuits

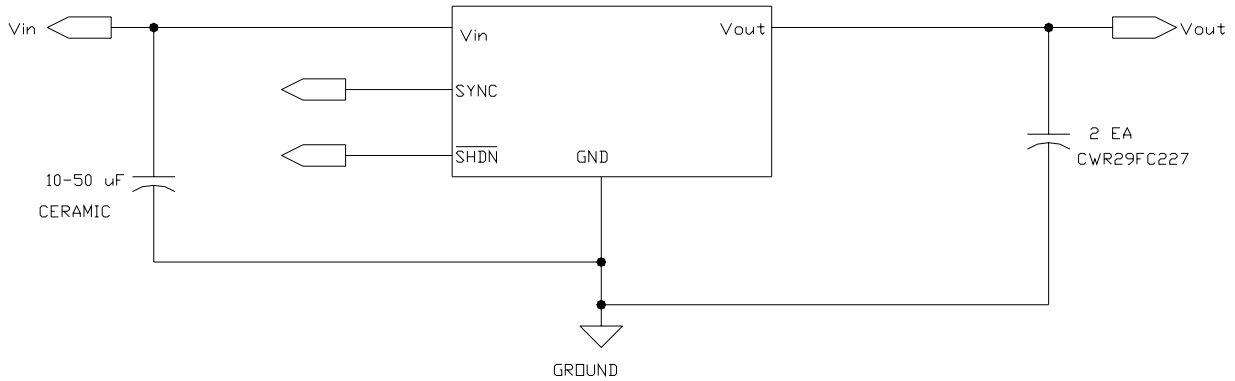


Figure 1.- Basic Fixed Regulator Version<sup>1</sup>

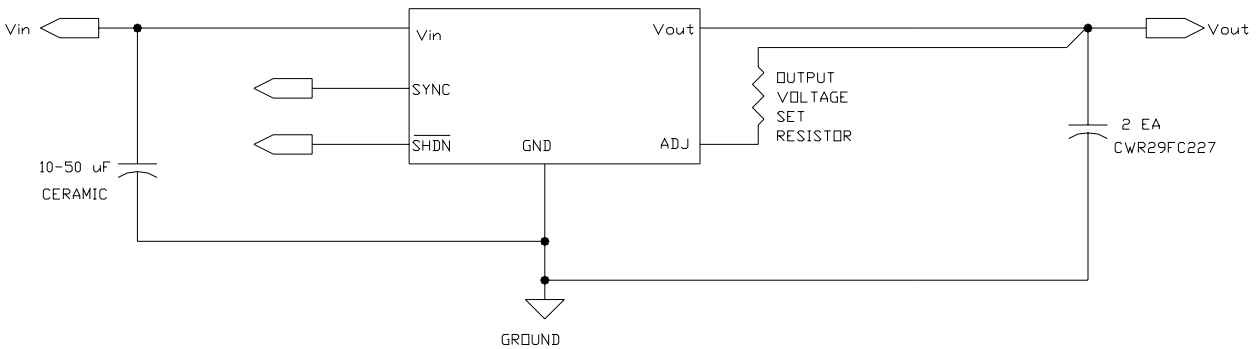


Figure 2.- Adjustable Regulator Version<sup>1</sup>

$$V_{out} = V_{ref} \times (1 + R_{adj}/2490), \text{ with } V_{ref} \sim 1.21 \text{ Volts}$$

Table 4.- Commonly Available 1% resistor values for various output Voltages

$V_{out}$ (V)	$R_{adj}$ ( $\Omega$ )	$V_{out}$ (V)	$R_{adj}$ ( $\Omega$ )
1.21	0	2.8	3240
1.5	590	3.0	3650
1.8	1210	3.3	4320
2.0	1620	3.5	4750
2.2	2050	3.8	5360
2.5	2670	4.0	5760

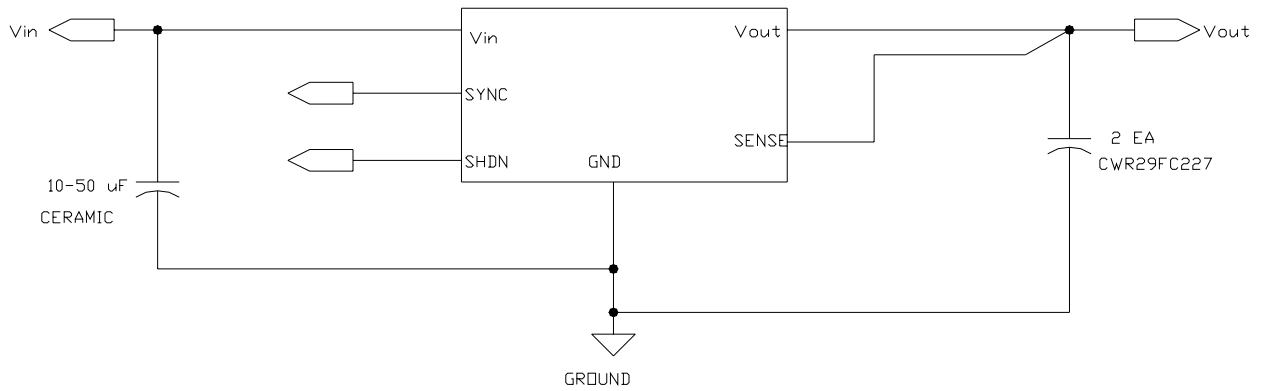
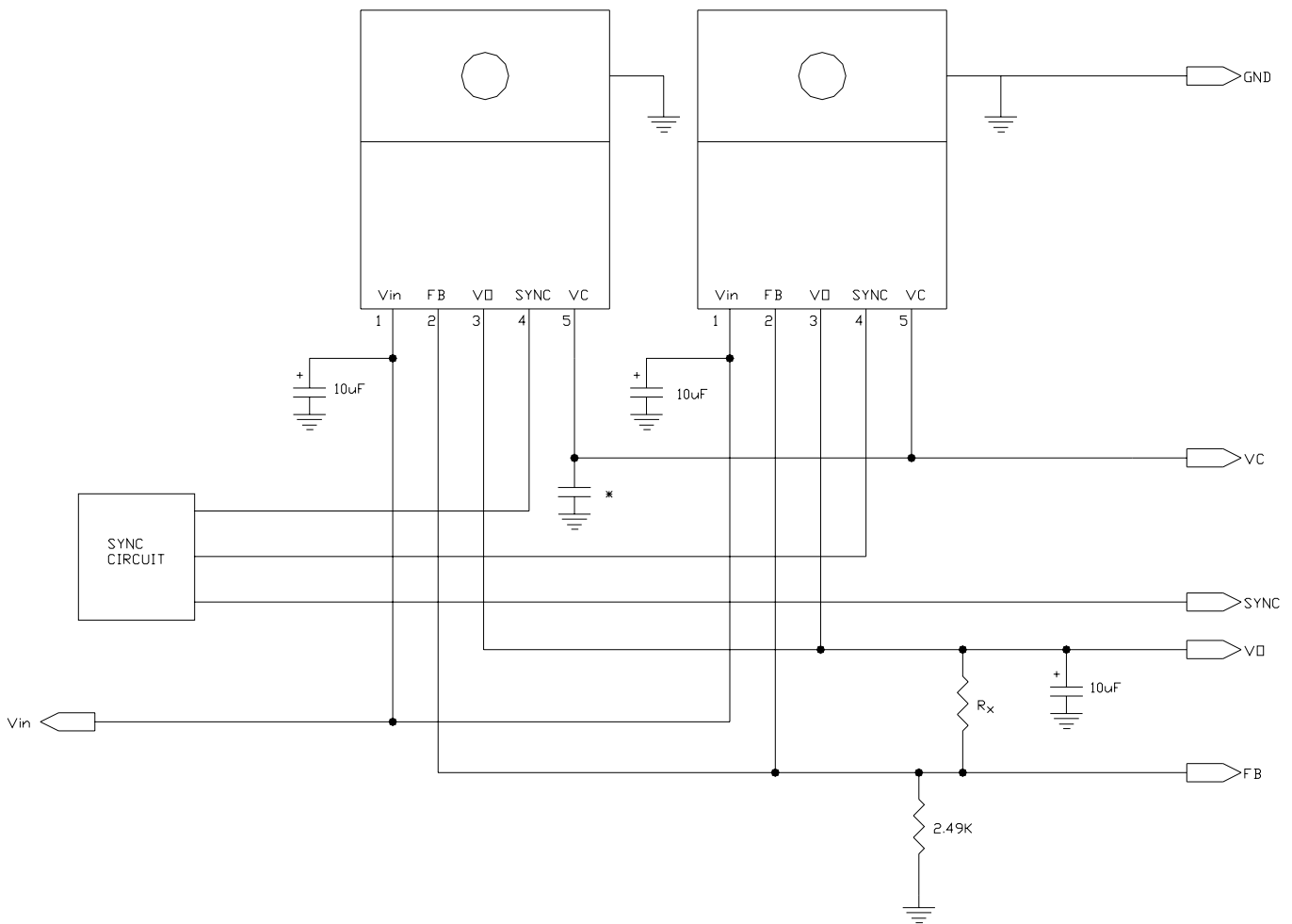


Figure 3.- Remote Sense Version<sup>1</sup>



\*  $\sim 1.5\text{nF}$  times the number of paralleled units if using electrolytic output capacitors,  $22\text{nF}$  times if using ceramic output capacitors.

Figure 4.- Parallel Operation

## PACKAGE OUTLINE

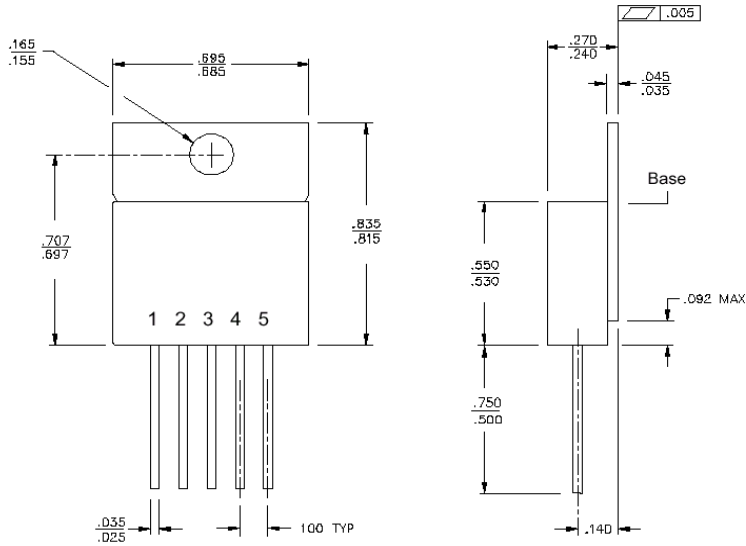


Table 4a- Pin Assignments (For SAT8565R/F/A units)

Pin No	Pin Name	Pin Description
1	Vin	Input Voltage
2	GND	Ground
3	Vout	Output Voltage
4	SHDN	Shutdown Pin. Output reset occurs when Vshdn < 0.4V
5	Adjust/ Remote/Synch	Adjust pin for Adjustable Output (SAT8565A) ; Remote Sense for SAT8565R; Synch input for SAT8565F

Table 4b- Pin assignments for parallel configuration, (SAT8565P).

Pin No	Pin Name	Pin Description
1	Vin	Input Voltage
2	FB	Feedback Pin
3	Vout	Output Voltage
4	Synch	Sync Pin.
5	Vc	Compensation Pin

### ORDERING INFORMATION:

**SAT8565A**  
Product Number

**-3**  
Current Designation

**H**  
Screening Level

**T**  
Package Type

**-Adj**  
Output Voltage

R= Remote Sense Version

- 3 = 3A Version

T = MO-078

- 1.3 = 1.3V Fixed

P= Parallel Version

H = Class-H Compliant (MIL-PRF-38534)

- 1.8 = 1.8V Fixed

F= Fixed Version

Blank = SatCon Commercial screening

- 2.5 = 2.5V Fixed

A= Adjustable Version

EM = Eng. Model

- 3.3 = 3.3V Fixed

- 5.0 = 5.0V Fixed

-ADJ = Adjustable Version