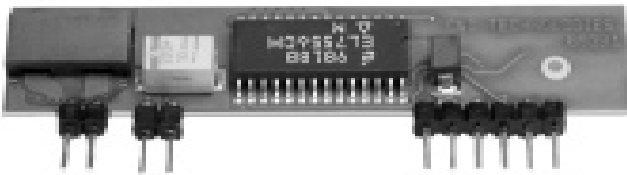


**OBSOLETE PRODUCT**  
Contact factory for replacement model

## 5 V<sub>DC</sub> INPUT, 3.3 V<sub>DC</sub> OUTPUT DC/DC CONVERTER

### SuperSIP™



#### Description

The SuperSIP™ DC/DC converter accepts a regulated 5V input ( $\pm 10\%$ ) and provides 1.8Vdc to 3.6Vdc at 6A. The circuit is optimized for high efficiency and fast load transient response needed by telecom, DSP, and microprocessor applications. Advanced thermal design, monolithic power circuitry, planar magnetics, and synchronous rectification result in outstanding performance and value. Pins are staked for wave solderability. Multiple programming, power good and on/off options allow superior flexibility and drop in compatibility for most existing designs.

#### Features

- Non isolated DC/DC Converter designed to operate from a regulated 5V bus
- Output voltage Range: 1.8V - 3.6V
- Easy resistive programming for desired output
- No resistive programming gives 3.3 Vdc output
- Wave solderable

## Electrical Specifications

Unless otherwise specified, operating conditions are as follows:  $V_{in}=5V$ ,  $V_o=3.3V$ ,  $I_o=6A$ ,  $T_A=25^{\circ}C$ ,  $C_{in}=100\mu F$ ,  $C_o=0F$ .

Parameters	Conditions	Min.	Typ.	Max.	Units
<b>Input</b>					
Input Voltage	$V_{in}$	4.5	5.0	5.5	$V_{DC}$
Input Current Ripple			200		$mA_{RMS}$
Required Capacitance	$C_{in}$	<i>Note 1</i>	100		$\mu F$
<b>Output</b>					
Output Voltage	$V_o$	Nominal	3.25	3.3	$V_{DC}$
Output Program Range		<i>Note 2</i>	1.8	3.6	$V_{DC}$
Output Current	$I_o$	$T_A=25^{\circ}C$	0	6	Amps
Output Ripple		20 Mhz BW		15	mVp-p
Output Rise time	T		700	50	$\mu S$
Output Capacitance Range	$C_o$		0	5000	$\mu F$
Line Regulation			$\pm 0.5$		%
Load Regulation		$I_o$ min- $I_o$ max	$\pm 1.0$		%
Temperature Coefficient	$T_c$		0.01		$\%/^{\circ}C$
Combined variation		$V_{in}$ min-max $I_o$ min-max $T_A=25^{\circ}C-85^{\circ}C$	-2	+2	%
Current Limit	$I_{limit}$	$V_{in} = 4.75Vdc$	6.5	9	A
<b>General</b>					
Switching Frequency			800		kHz
<b>Dynamic Response</b> $\Delta I_o/\Delta t = 1A/10msec$ , $V_i = 5.0V$ , $T_A = 25^{\circ}C$ Load Change from $I_o = 0\%$ to $I_o = 100\%$					
Peak Deviation			30		mV
Settling time ( $V_o < 10\%$ Peak Deviation)			100		$\mu sec$
Load change from $I_o = 100\%$ to $I_o = 0\%$					
Peak Deviation			30		mV
Settling time ( $V_o < 10\%$ Peak Deviation)			100		$\mu sec$
<b>Temperature</b>					
Operating Temperature		<i>Note 3</i>	0	+60	$^{\circ}C$
Storage Temperature			-40	+125	$^{\circ}C$

### Notes

1. Input source <3" from SuperSIP™, Load transient <3A per SIP. 100 $\mu F$  low ESR capacitor for load transients >3A.
2. Optional programming 1.8 - 3.6 or  $\pm 10\%$  available. See Table.
3. 100 lfm air,  $V_o=3.3V$ ,  $I_o=6A$ . See Thermal Design Guide for other conditions.

## Programming

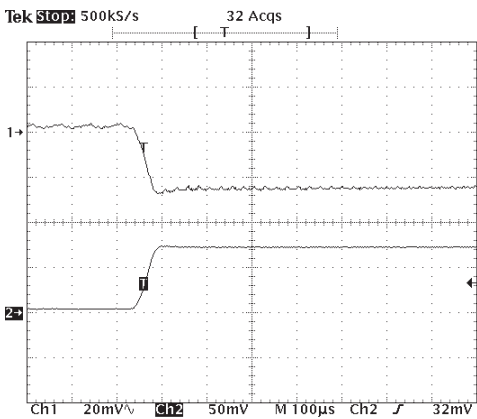
To program the SuperSIP™ for  $V_{out} < 3.3$ , connect resistor across pins 8 (TRIM) and 1 ( $V_o$ ). For  $V_{out} > 3.3$ , resistor is connected across pins 8 and 4 (Gnd).

**Table 2**

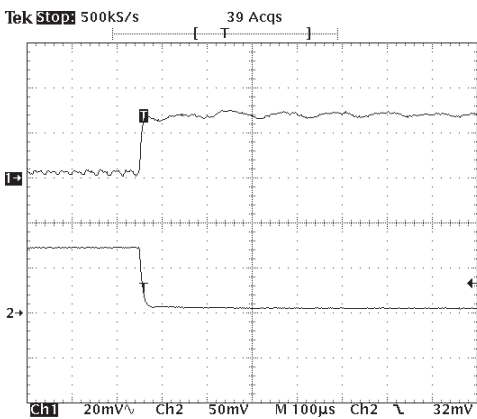
$V_{out}$	Resistor Value	$V_{out}$	Resistor Value
1.8	576Ω	2.8	18.2k
1.9	1.21k	2.9	24.3k
2.0	1.96k	3.0	34.8k
2.1	2.8k	3.1	54.9k
2.2	3.83k	3.2	110.0k
2.3	4.99k	3.3	OPEN
2.4	6.49k	3.4	66.5k
2.5	8.25k	3.5	29.4k
2.6	10.7k	3.6	18.2k
2.7	13.7k		

## Transient Response

Operating conditions are as follows:  $V_{in}=5V$ ,  $V_o=3.3V$ , Load change from  $I_o=0\%$  to  $I_o=100\%$ ,  $T_A=25^\circ C$ ,  $C_{in}=0F$ ,



Operating conditions are as follows:  $V_{in}=5V$ ,  $V_o=3.3V$ , Load change from  $I_o=100\%$  to  $I_o=0\%$ ,  $T_A=25^\circ C$ ,  $C_{in}=0F$ ,  $C_o=\mu F$ .

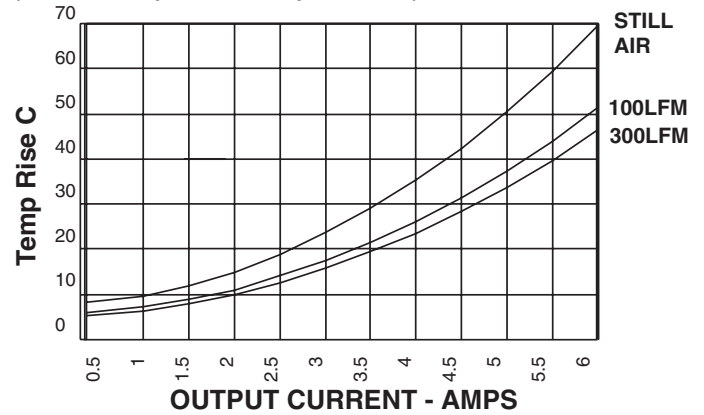


## Thermal Design Guide

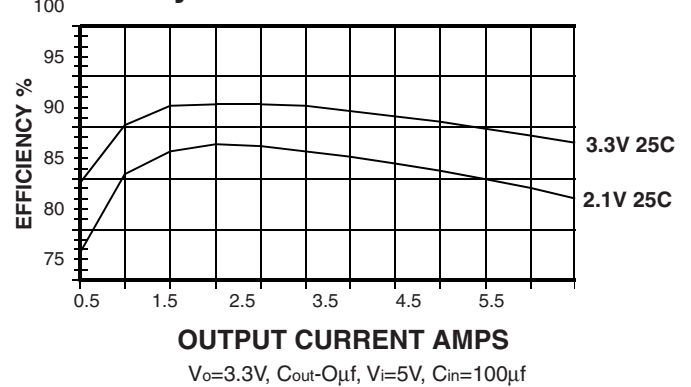
Locate your operating current, read the junction temp rise from the graph and add to your maximum ambient.  $135^\circ C$  is the maximum allowable operating junction temperature. Test conditions: Device soldered into 4" x 4" PCB, 2 sided with power and ground planes for heat conduction. Due to the difficulty in predicting the thermal effects of airflow velocity and direction, and thermal conduction through ground planes it is important that the SuperSIP™ be evaluated thermally in each application. For high ambient temperature/high current application please request our Application Note 35-118-01, "Accurate Measurements of SuperSIP™ Junction Temperature", for further assistance.

### $T_j$ Rise vs. $I_o$

(Junction Temp Rise vs. Output Current)



### Efficiency



# Ordering Information

Typical examples:

SS 25 - A - A - A

Standard configuration 5V to 3.3V with 1.8V-3.6V trim range

SS 25 - B - A - A

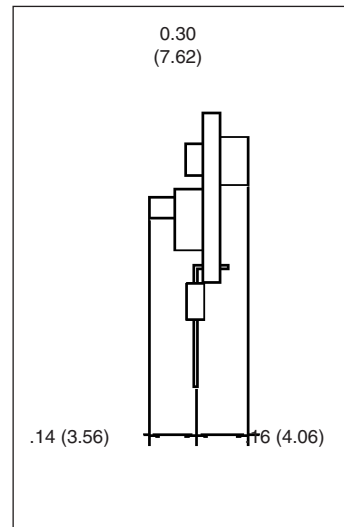
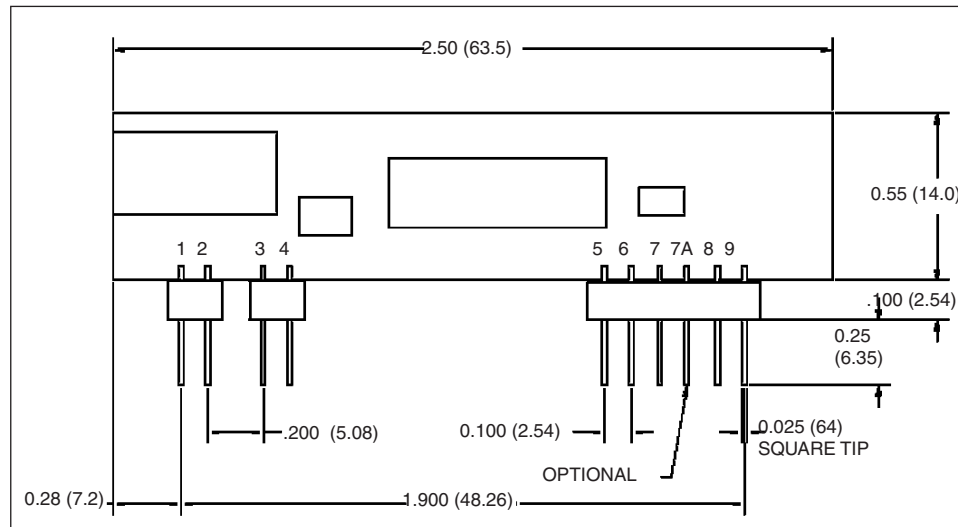
Power Good	Enable	Programming (See Table 2)
<b>A</b> = Pin 7A installed for Power Good option <b>B</b> = Pin omitted (industry standard)	<b>A</b> = logic1 or open = ON logic 0 or gnd = OFF <b>B</b> = logic 0 or gnd = ON logic 1 = OFF	<b>A</b> = Standard 3.3V with Pin 8 open or program per Table 2.

## Pin Out

Pin	Function	Description
1	V <sub>o</sub>	Output Voltage
2	V <sub>o</sub>	Output Voltage
3	V <sub>o</sub>	Output Voltage
4	GND	Ground
5	GND	Ground
6	V <sub>IN</sub>	Input Voltage
7	V <sub>IN</sub>	Input Voltage
7A	P <sub>good</sub>	Power Good Option
8	Trim	Output Voltage Adjust
9	Enable	Enable Option

**TOLERANCES**  
 ±.008" for 3 place decimals  
 ±.02" for 2 place decimals  
 ±.002" for pin diameter

## Mechanical



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