

POWER MANAGEMENT

PRELIMINARY

Description

The SC1540 and SC1540A are high performance low dropout positive voltage regulators designed for use in applications where power management is critical, such as battery powered systems. Additionally, the SC1540(A) provides excellent regulation over variations in line, load and temperature. The SC1540A device is rated for 500mA output current, while the SC1540 is rated for 300mA.

Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device. A very low quiescent current of 10 μ A in shutdown mode reduces power dissipation.

With three voltage options available, the SC1540(A) comes in the popular SO-8 surface mount package.

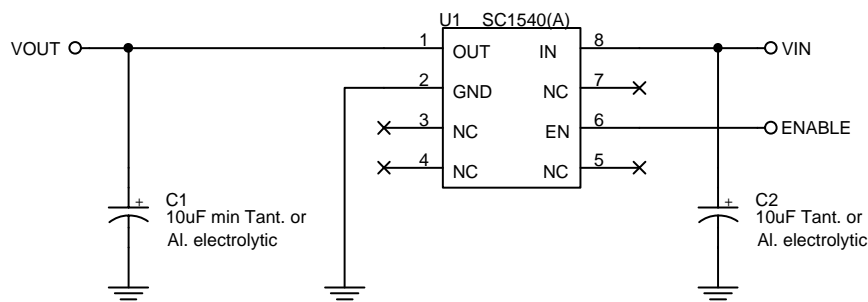
Features

- ◆ Low dropout performance, 1.3V max
- ◆ Full current rating over line and temperature
- ◆ Fast transient response
- ◆ $\pm 2\%$ total output regulation over line, load and temperature
- ◆ 10 μ A max. quiescent current in shutdown
- ◆ Three fixed output voltages
- ◆ Line regulation 0.2% max.
- ◆ Load regulation 0.4% max.
- ◆ SO-8 package

Applications

- ◆ Low voltage microcontrollers
- ◆ Switching power supply post-regulation
- ◆ Instantly available circuits
- ◆ Peripheral cards

Typical Application Circuit



NOTES:

- (1) Input and output capacitors should be located close to the device.
- (2) Connect all pins to PCB for optimal thermal characteristics.
- (3) Increasing the output capacitor value will improve the overall transient response.
- (4) The device is enabled when $EN = V_{IN}$, and shut down when EN is pulled to ground. EN should not be taken higher than V_{IN} . A CMOS signal referenced to V_{IN} would be ideal for switching the SC1540(A) on and off.

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Absolute Maximum Rating

Parameter	Symbol	Maximum	Units
Maximum Input Pin Voltage	V_{IN}, V_{EN}	7	V
Power Dissipation	P_D	Internally Limited	W
Thermal Resistance Junction to Case	θ_{JC}	47	°C/W
Thermal Resistance Junction to Ambient ⁽¹⁾	θ_{JA}	65	°C/W
Operating Junction Temperature Range	T_J	0 to 125	°C
Storage Temperature Range	T_{STG}	-65 to 150	°C
Lead Temperature (Soldering) 10 Sec	T_{LEAD}	300	°C

Note:

(1) 2 inches square of 1/16" FR-4, double sided, 1 oz. minimum copper weight.

Electrical Characteristics

Unless otherwise specified: $I_{OUT} = 0mA$ to 300mA (500mA for SC1540A), $V_{EN} = V_{IN}$; 1.8V Option: $V_{IN} = 3.2V$ to 7.0V, 2.5 Option: $V_{IN} = 3.9V$ to 7.0V, 3.3V Option: $V_{IN} = 4.7V$ to 7.0V. Values in **bold** apply over full operating temperature range.

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage ⁽¹⁾	V_{OUT}	$V_{IN} = 5V, I_{OUT} = 0mA$	-1%	V_{OUT}	+1%	V
			-2%		+2%	
Line Regulation ⁽¹⁾	$REG_{(LINE)}$	$I_{OUT} = 10mA$		0.035	0.2	%
Load Regulation ⁽¹⁾	$REG_{(LOAD)}$	$V_{IN} = 5V$		0.2	0.4	%
Dropout Voltage ⁽¹⁾⁽²⁾ SC1540 SC1540A	V_D	$I_{OUT} = 300mA$ $I_{OUT} = 500mA$		1.10	1.30	V
Current Limit ⁽¹⁾ SC1540 SC1540A	I_{CL}		330 550			mA
Quiescent Current	I_Q	$V_{IN} = V_{EN} = 5V$		5	7	mA
					10	
		$V_{IN} = 5V, V_{EN} < 0.25V$		6	8	μA
					10	
Enable Input Voltage	V_{IL}	Device OFF	0.25	0.45		V
	V_{IH}	Device ON		(VO+0.5)	(VO+0.8)	
Enable Input Bias Current	I_{EN}	$V_{EN} = 0V, V_{IN} = 5V$ (OFF)		0.1	1.0	μA
		$V_{EN} = V_{IN} = 5V$ (ON)		15	25	
Temperature Coefficient	T_C			0.005		%/°C

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Electrical Characteristics (Cont.)

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Parameter	Symbol	Conditions	Min	Typ	Max	Units
Temperature Stability	T_S			0.5		%
RMS Output Noise ⁽³⁾	V_N			0.003		% V_{OUT}
Ripple Rejection Ratio ⁽⁴⁾	R_A	$V_{IN} = 5\text{V}$	60	72		dB

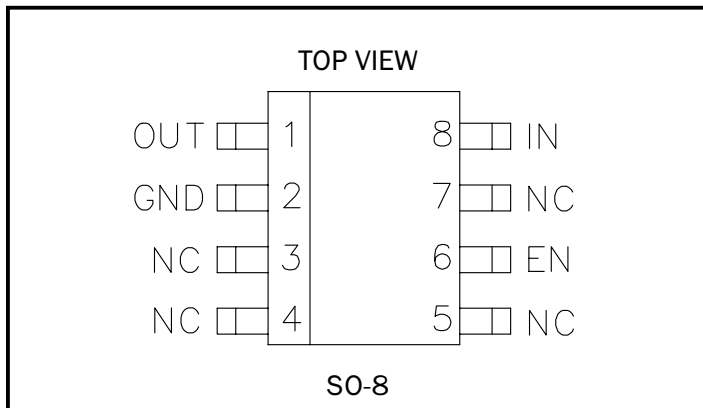
NOTES:

- (1) Low duty cycle pulse testing with Kelvin connections required.
- (2) ΔV_{OUT} , $\Delta V_{REF} = 1\%$
- (3) Bandwidth of 10 Hz to 10kHz.
- (4) 120Hz input ripple.

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Pin Configuration



Ordering Information

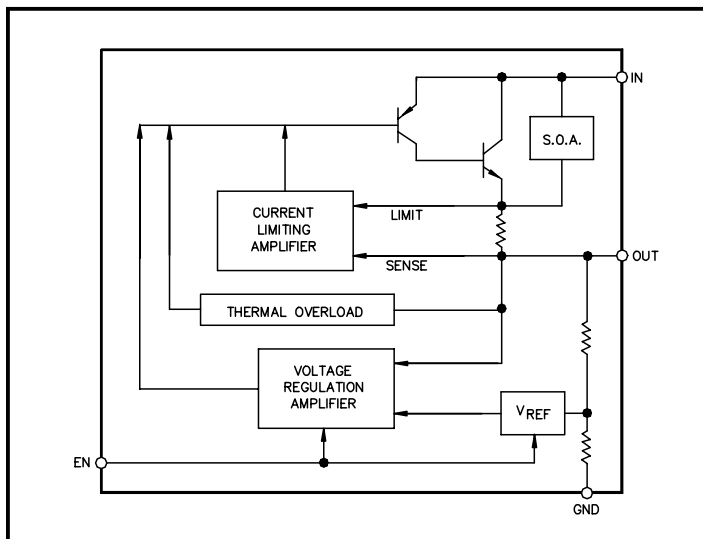
Device ⁽¹⁾⁽²⁾	Output Current	Package
SC1540CS-X.X.TR	300mA	SO-8
SC1540ACS-X.X.TR	500mA	SO-8

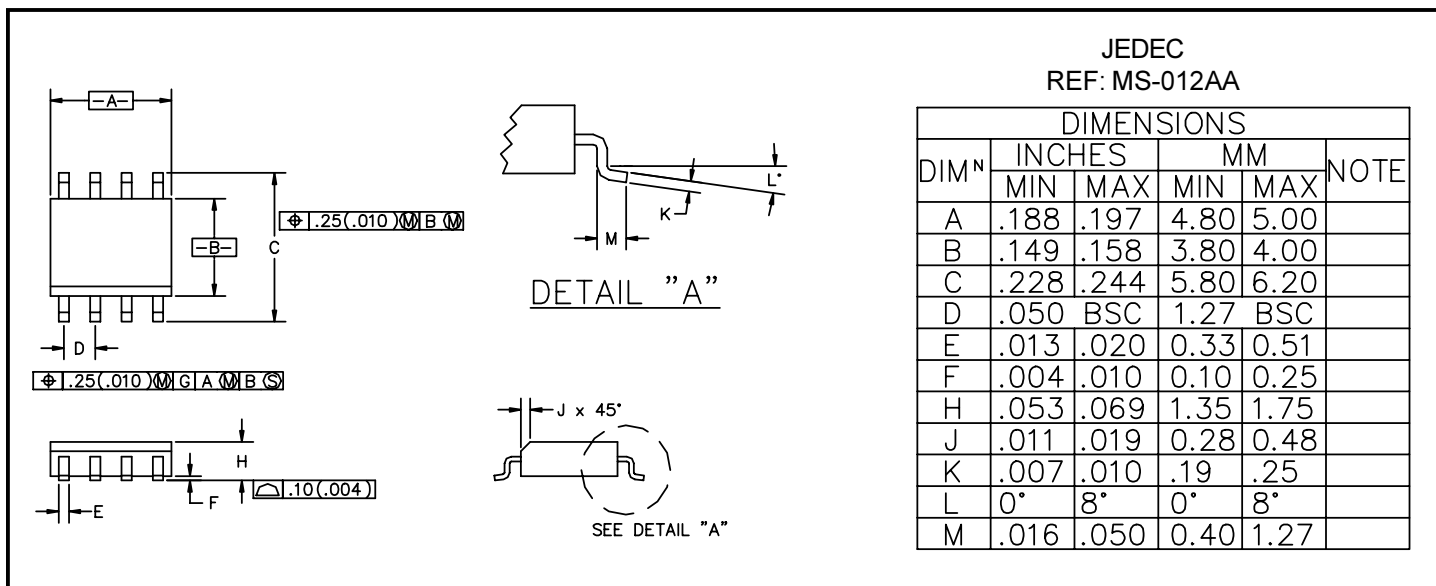
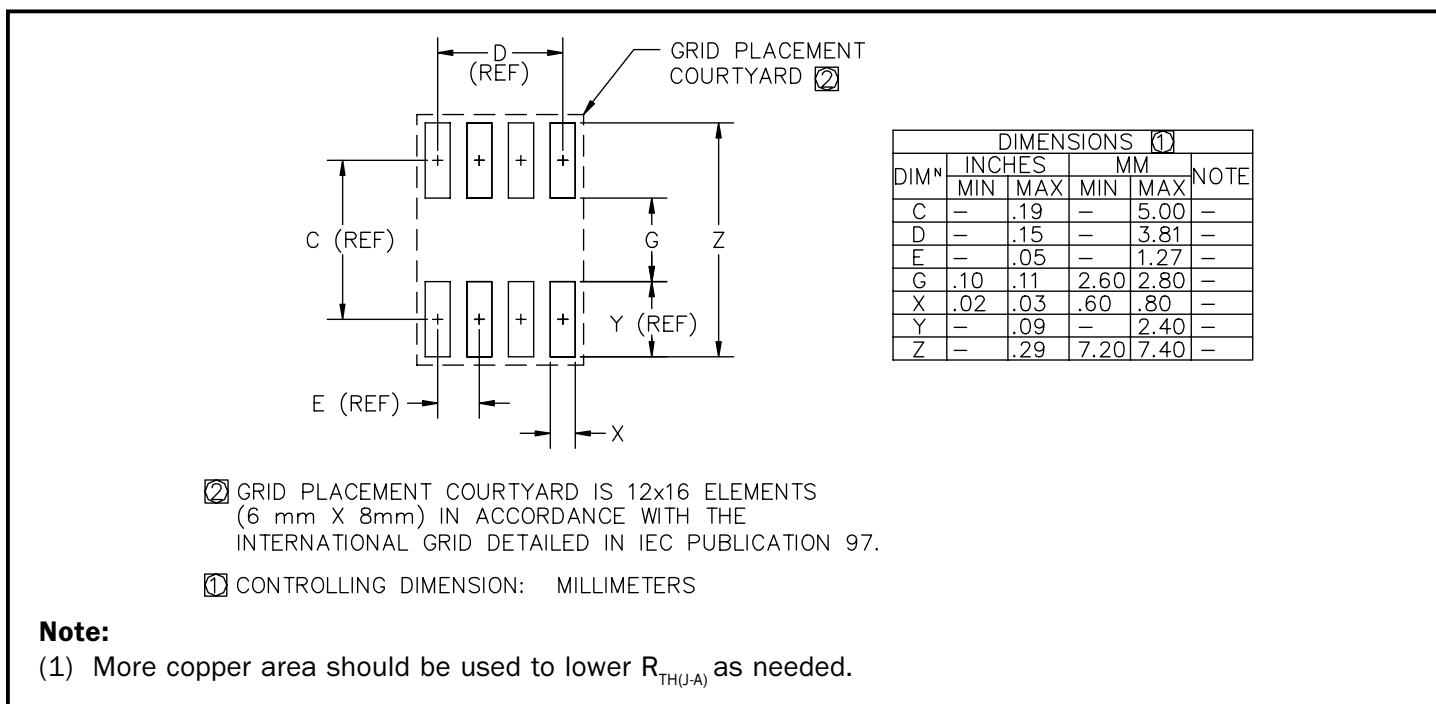
Notes:

(1) Where X.X denotes voltage options. Available voltages are: 1.8V, 2.5V and 3.3V. Contact factory for additional voltage options.

(2) Only available in tape and reel packaging. A reel contains 2500 devices.

Block Diagram



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Outline Drawing - SO-8

Land Pattern - SO-8⁽¹⁾

Contact Information

Semtech Corporation
 Power Management Products Division
 652 Mitchell Rd., Newbury Park, CA 91320
 Phone: (805)498-2111 FAX (805)498-3804