

### POWER MANAGEMENT

### PRELIMINARY

#### Description

The SC1453 is a low dropout linear regulator that operates from a +2.5V to +6.5V input range and delivers up to 150mA. A PMOS pass transistor allows the low 75 $\mu$ A supply current to remain independent of load, making these devices ideal for battery operated portable equipment such as cellular phones, cordless phones and personal digital assistants.

The SC1453 has a bandgap reference bypass pin for very low noise operation - a 10nF (typ.) capacitor is connected between this pin and ground. Other features include low powered shutdown, short circuit protection, thermal shutdown protection and reverse battery protection. The SC1453 comes in the tiny 5 lead SOT-23 package.

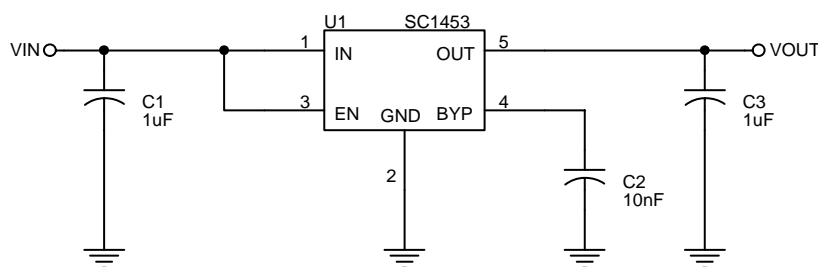
#### Features

- ◆ "2982/5205" compatible pinout
- ◆ Guaranteed 150 mA output current
- ◆ Very small external components - designed to work with ceramic capacitors
- ◆ Low 25 $\mu$ V<sub>RMS</sub> output noise
- ◆ Very low supply current
- ◆ Thermal overload protection
- ◆ Reverse battery protection
- ◆ Low power shutdown
- ◆ Full industrial temperature range
- ◆ Surface mount packaging (5 pin SOT-23)

#### Applications

- ◆ Battery Powered Systems
- ◆ Cellular Telephones
- ◆ Cordless Telephones
- ◆ Personal Digital Assistants
- ◆ Portable Instrumentation
- ◆ Modems
- ◆ PCMCIA cards

#### Typical Application Circuit



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**Absolute Maximum Ratings**

Parameter	Symbol	Maximum	Units
Input Supply Voltage	$V_{IN}$	-0.6 to +7	V
Thermal Resistance Junction to Ambient	$\theta_{JA}$	256	°C/W
Thermal Resistance Junction to Case	$\theta_{JC}$	81	°C/W
Operating Ambient Temperature Range	$T_A$	-40 to +85	°C
Operating Junction Temperature Range	$T_J$	-40 to +125	°C
Storage Temperature Range	$T_{STG}$	-65 to 150	°C
Lead Temperature (Soldering) 10 Sec.	$T_{LEAD}$	300	°C
ESD Rating	ESD	2	kV

**Electrical Characteristics**

Unless specified:  $V_{IN} = V_{OUT} + 1V$ ,  $V_{EN} = V_{IN}$ ,  $I_{OUT} = 100\mu A$ ,  $T_A = 25^\circ C$ . Values in **bold** apply over full operating ambient temperature range.

Parameter	Symbol	Conditions	Min	Typ	Max	Units
IN						
Supply Voltage Range	V <sub>IN</sub>		2.25		6.50	V
Supply Current	I <sub>Q</sub>	I <sub>OUT</sub> = 0ma to150mA		75	130	μA
					160	
		V <sub>IN</sub> = 6.5V, V <sub>EN</sub> = 0V		0.1	1.0	μA
					1.5	
OUT						
Output Voltage <sup>(1)</sup>	V <sub>OUT</sub>	I <sub>OUT</sub> = 1mA	-1.5%	V <sub>OUT</sub>	+1.5%	V
		0mA ≤ I <sub>OUT</sub> ≤ 150mA, V <sub>OUT</sub> +1V ≤ V <sub>IN</sub> ≤ 5.5V	-3.0%		+3.0%	
Line Regulation <sup>(1)</sup>	REG <sub>(LINE)</sub>	(V <sub>OUT(NOM)</sub> + 0.1V) ≤ V <sub>IN</sub> ≤ 5.5V, I <sub>OUT</sub> = 1mA		2.5	10	mV
					12	
Load Regulation <sup>(1)</sup>	REG <sub>(LOAD)</sub>	I <sub>OUT</sub> = 0.1mA to 150mA		-5	-20	mV
					-30	

## POWER MANAGEMENT

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## Electrical Characteristics (Cont.)

Unless specified:  $V_{IN} = V_{OUT} + 1V$ ,  $V_{EN} = V_{IN}$ ,  $I_{OUT} = 100\mu A$ ,  $T_A = 25^\circ C$ . Values in **bold** apply over full operating ambient temperature range.

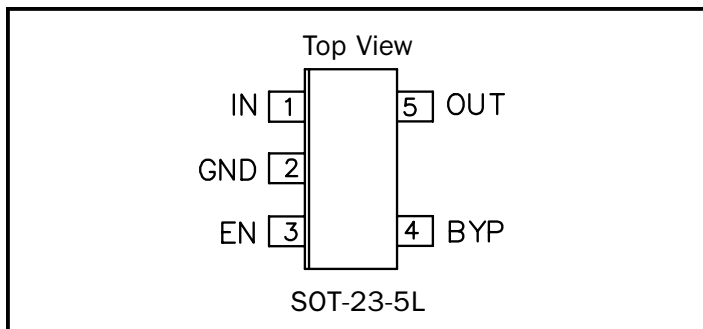
Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Out (Cont.)</b>						
Current Limit	$I_{LM}$		<b>400</b>			mA
Dropout Voltage <sup>(1)(2)</sup>	$V_D$	$I_{OUT} = 1mA$		1		mV
		$I_{OUT} = 50mA$		50	70	mV
					<b>90</b>	
		$I_{OUT} = 100mA$		100	140	mV
					<b>180</b>	
		$I_{OUT} = 150mA$		150	210	mV
					<b>270</b>	
Output Voltage Noise	$e_n$	10Hz to 100kHz, $I_{OUT} = 1mA$ $C_{BYP} = 10nF$ , $C_{OUT} = 1\mu F$		45		$\mu V_{RMS}$
		$C_{OUT} = 100\mu F$		25		
Power Supply Rejection Ratio	PSRR	$f = 120Hz$ , $C_{BYP} = 10nF$		60		dB
<b>EN</b>						
Enable Input Threshold	$V_{IH}$		<b>1.6</b>			V
	$V_{IL}$				<b>0.4</b>	
Enable Input Bias Current <sup>(3)</sup>	$I_{EN}$	$0V \leq V_{EN} \leq V_{IN}$	<b>-0.5</b>	0	<b>+0.5</b>	$\mu A$
<b>Over Temperature Protection</b>						
High Trip Level	$T_{HI}$			150		$^\circ C$
Hysteresis	$T_{HYST}$			20		$^\circ C$

## NOTES:

(1) Low duty cycle pulse testing with Kelvin connections required.

(2) Defined as the input to output differential at which the output voltage drops 100mV below the value measured at a differential of 1V. Not measurable on 1.5V and 1.8V parts due to minimum  $V_{IN}$  constraints.

(3) Guaranteed by design.

**POWER MANAGEMENT**
**PRELIMINARY**
**Pin Configuration**

**Ordering Information**

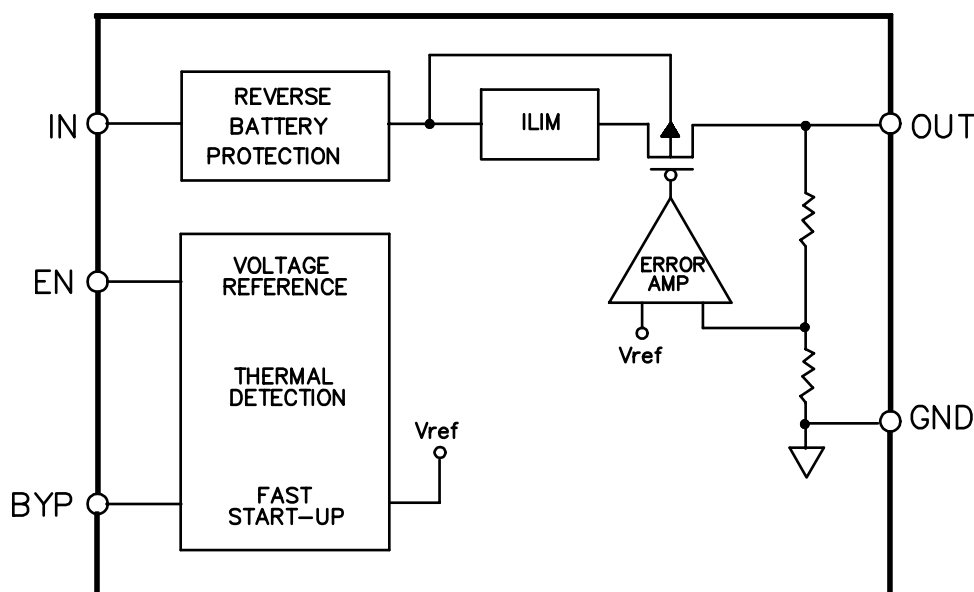
Part Number	Package
SC1453-X.XISKTR <sup>(1)(2)</sup>	SOT-23-5

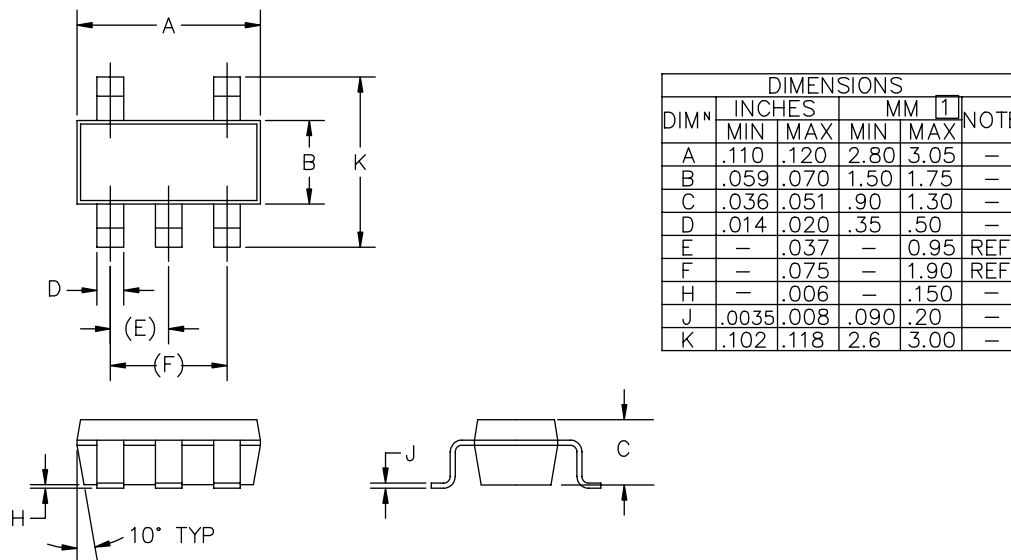
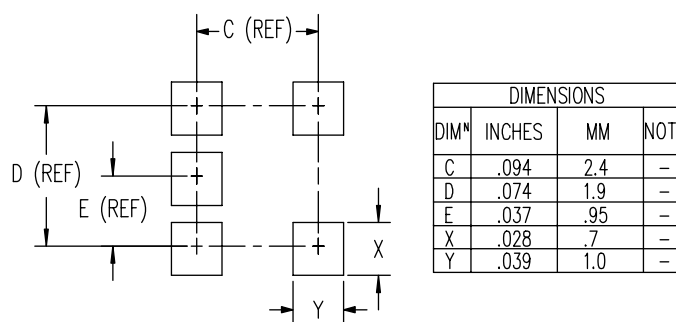
**Notes:**

- (1) Where -X.X denotes voltage options. Available voltages are: 1.5V, 1.8V, 2.5V, 2.7V, 2.8V, 3.0V and 3.3V.
- (2) Only available in tape and reel packaging. A reel contains 3000 devices.

**Pin Descriptions**

Pin #	Pin Name	Pin Function
1	IN	Input pin.
2	GND	Ground pin. Can be used for heatsinking if needed.
3	EN	Active high enable pin. Connect to IN if not being used.
4	BYP	Reference bypass. Connect a 10nF capacitor (typical, 1nF minimum) between this pin and GND to reduce output noise.
5	OUT	Regulator output, sourcing up to 150mA.

**Block Diagram**



**Land Pattern - SOT-23-5**

**Contact Information**

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