

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 μ 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.

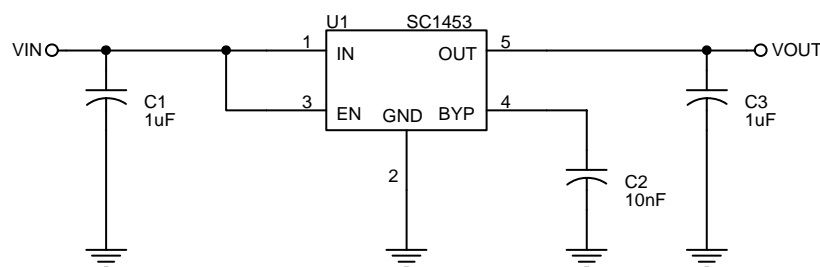
The SC1453 has a bandgap reference bypass pin for very low noise operation - a 10nF (typ.) capacitor is connected between this pin and ground. Other features include low powered shutdown, short circuit protection, thermal shutdown protection and reverse battery protection. The SC1453 comes in the tiny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


POWER MANAGEMENT
PRELIMINARY
Absolute Maximum Ratings

Parameter	Symbol	Maximum	Units
Input Supply Voltage	V_{IN}	-0.6 to +7	V
Thermal Resistance Junction to Ambient	θ_{JA}	256	°C/W
Thermal Resistance Junction to Case	θ_{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_{IN}		2.25		6.50	V
Supply Current	I_Q	$I_{OUT} = 0\text{ma to }150\text{mA}$		75	130	μA
		$V_{IN} = 6.5V, V_{EN} = 0V$		0.1	1.0	μA
					1.5	
OUT						
Output Voltage ⁽¹⁾	V_{OUT}	$I_{OUT} = 1\text{mA}$	-1.5%	V_{OUT}	+1.5%	V
		$0\text{mA} \leq I_{OUT} \leq 150\text{mA}, V_{OUT} + 1V \leq V_{IN} \leq 5.5V$	-3.0%		+3.0%	
Line Regulation ⁽¹⁾	$REG_{(LINE)}$	$(V_{OUT(NOM)} + 0.1V) \leq V_{IN} \leq 5.5V, I_{OUT} = 1\text{mA}$		2.5	10	mV
					12	
Load Regulation ⁽¹⁾	$REG_{(LOAD)}$	$I_{OUT} = 0.1\text{mA to }150\text{mA}$		-5	-20	mV
					-30	

POWER MANAGEMENT
PRELIMINARY
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
Out (Cont.)						
Current Limit	I_{LM}		400			mA
Dropout Voltage ⁽¹⁾⁽²⁾	V_D	$I_{OUT} = 1mA$		1		mV
		$I_{OUT} = 50mA$		50	70	mV
					90	
		$I_{OUT} = 100mA$		100	140	mV
					180	
$I_{OUT} = 150mA$		150	210	mV		
			270			
Output Voltage Noise	e_n	10Hz to 100kHz, $I_{OUT} = 1mA$ $C_{BYP} = 10nF$, $C_{OUT} = 1\mu F$		45		μV_{RMS}
		$C_{OUT} = 100\mu F$		25		
Power Supply Rejection Ratio	PSRR	$f = 120Hz$, $C_{BYP} = 10nF$		60		dB
EN						
Enable Input Threshold	V_{IH}		1.6			V
	V_{IL}				0.4	
Enable Input Bias Current ⁽³⁾	I_{EN}	$0V \leq V_{EN} \leq V_{IN}$	-0.5	0	+0.5	μA
Over Temperature Protection						
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.

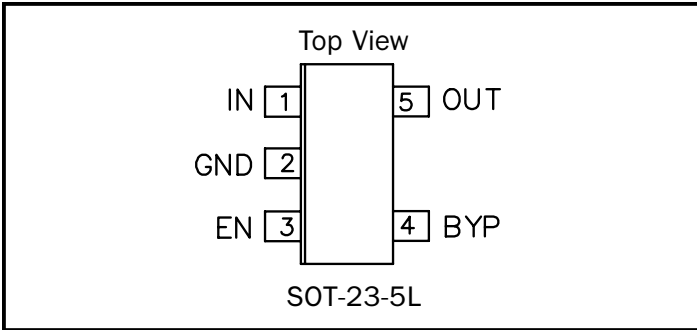
 (2) Defined as the input to output differential at which the output voltage drops 100mV below the value measured at a differential of 1V. Not measurable on 1.5V and 1.8V parts due to minimum V_{IN} constraints.

(3) Guaranteed by design.

POWER MANAGEMENT

PRELIMINARY

Pin Configuration



Ordering Information

Part Number	Package
SC1453-X.XISKTR ⁽¹⁾⁽²⁾	SOT-23-5

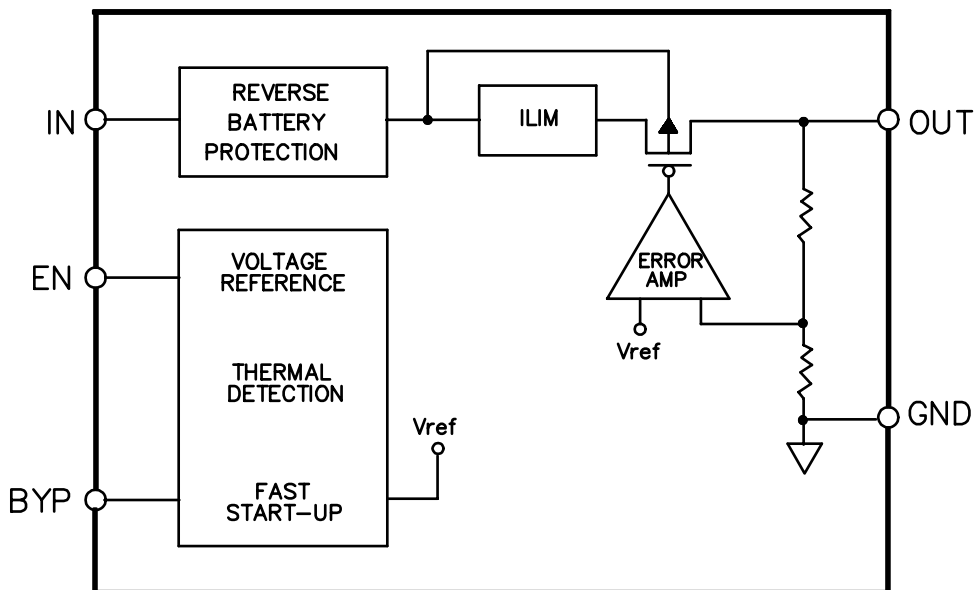
Notes:

- (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.

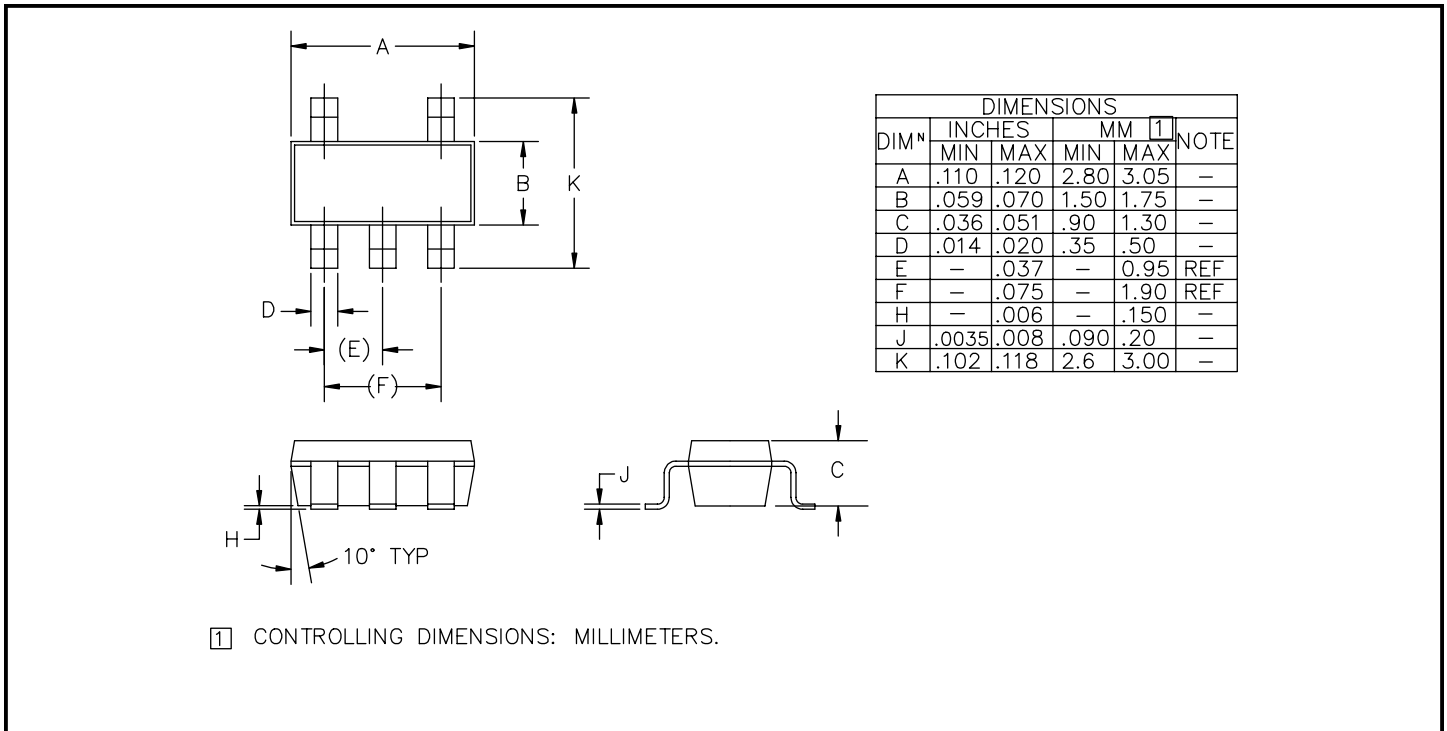
Pin Descriptions

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.

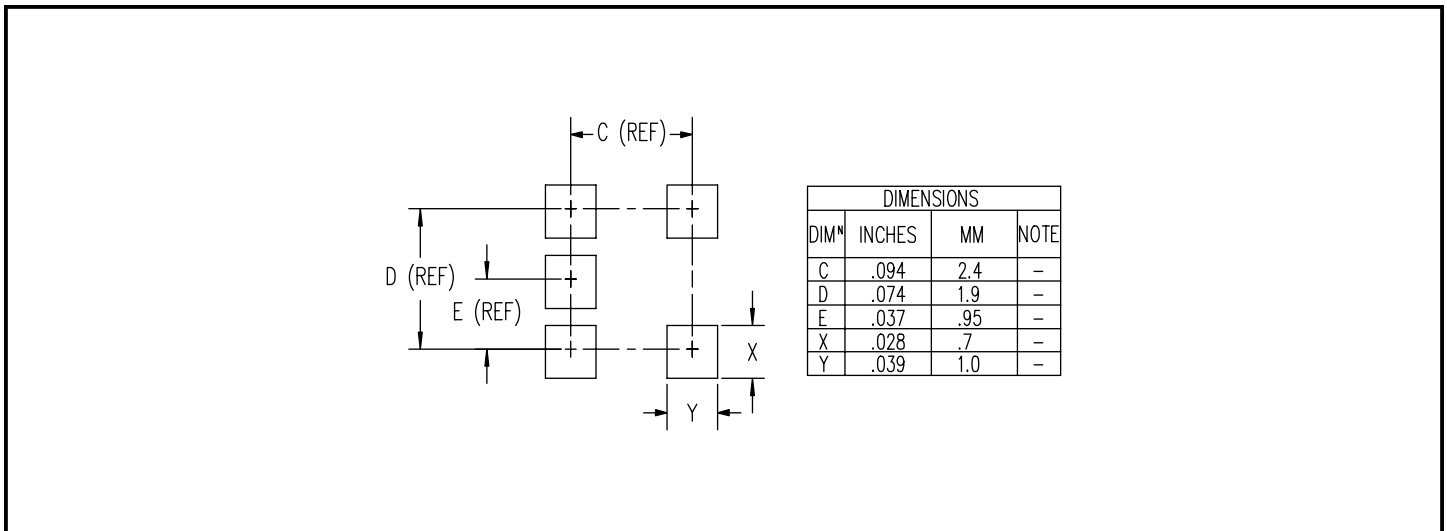
Block Diagram



Outline Drawing - SOT-23-5



Land Pattern - SOT-23-5



Contact Information

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