



# BCT2160

## 300mA, Ultra Low Noise and High PSRR LDO Regulators for RF and Analog circuits

### BCT2160

### Ultra Low Noise and High PSRR Linear Regulators

#### GENERAL DESCRIPTION

The BCT2160 series is a high PSRR Linear regulators capable of supplying 300mA output current. Designed to meet the requirements of RF and analog circuits, the BCT2160 provides ultra low noise, high PSRR, low quiescent current and very good load/line transients. The device is designed to work with a 1 $\mu$ F input and a 1 $\mu$ F output ceramic capacitors.

These devices feature a shutdown function and are offered in active low with auto discharge.

The BCT2160 is available in Green SOT23-5 , DFNFC1x1-4L packages. It operates over an ambient temperature range of -40°C to +85°C.

#### FEATURES

- Operating Input Voltage Range: 1.8V to 5.5V
- Accuracy  $\pm 2\%$
- Ultra Low Quiescent Current: 14 $\mu$ A
- Shutdown Current: 0.1 $\mu$ A
- Low Dropout Voltage
- Output current limit: 530mA
- Output short to GND Protection: 220mA
- Over Temperature Protection: +160°C
- Fixed Outputs of 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V, 4.2V, 5.0V
- Stable with a 1 $\mu$ F Small Case Size Ceramic Capacitor
- -40°C to 85°C Operating Temperature Range
- Available in Green SOT23-5 and DFNFC1x1-4L Packages.

#### APPLICATIONS

Battery-Powered Equipment  
Wireless LAN Devices  
DVR and Set Top Box  
Smartphones and Tablets  
Cameras ,Camcorders,



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### ORDERING INFORMATION

Order Number	V <sub>OUT</sub> (V)	Package Type	Temperature Range	Marking	QTY/Reel
BCT2160EUK12-TR	1.2	SOT23-5	-40°C to +85°C	T2XX	3000
BCT2160EUK15-TR	1.5	SOT23-5	-40°C to +85°C	T5XX	3000
BCT2160EUK18-TR	1.8	SOT23-5	-40°C to +85°C	T8XX	3000
BCT2160EUK25-TR	2.5	SOT23-5	-40°C to +85°C	T5XX	3000
BCT2160EUK28-TR	2.8	SOT23-5	-40°C to +85°C	T8XX	3000
BCT2160EUK30-TR	3.0	SOT23-5	-40°C to +85°C	T0XX	3000
BCT2160EUK33-TR	3.3	SOT23-5	-40°C to +85°C	T3XX	3000
BCT2160EUK42-TR	4.2	SOT23-5	-40°C to +85°C	T2XX	3000
BCT2160EUK50-TR	5.0	SOT23-5	-40°C to +85°C	T0XX	3000
BCT2160ELS12-TR	1.2	DFNFC1x1-4L	-40°C to +85°C	T2X	10000
BCT2160ELS15-TR	1.5	DFNFC1x1-4L	-40°C to +85°C	T5X	10000
BCT2160ELS18-TR	1.8	DFNFC1x1-4L	-40°C to +85°C	T8X	10000
BCT2160ELS25-TR	2.5	DFNFC1x1-4L	-40°C to +85°C	T5X	10000
BCT2160ELS28-TR	2.8	DFNFC1x1-4L	-40°C to +85°C	T8X	10000
BCT2160ELS30-TR	3.0	DFNFC1x1-4L	-40°C to +85°C	T0X	10000
BCT2160ELS33-TR	3.3	DFNFC1x1-4L	-40°C to +85°C	T3X	10000
BCT2160ELS42-TR	4.2	DFNFC1x1-4L	-40°C to +85°C	T2X	10000
BCT2160ELS50-TR	5.0	DFNFC1x1-4L	-40°C to +85°C	T0X	10000

#### Note:

"T" in Marking is product short code for BCT2160

"XX" or "X" in Marking will be appeared as the batch code.



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### ABSOLUTE MAXIMUM RATINGS

IN to GND.....	-0.3V to 6.0V
EN to GND.....	-0.3V to 6.0V
OUT to GND.....	-0.3V to $V_{in}+0.3V$ , max 6.0V
Output Short-Circuit Duration.....	Infinite
Power Dissipation, $P_D$ @ $T_A=25^{\circ}C$	
SOT23-5.....	0.48W
DFNFC1x1-4L.....	0.78W
Package Thermal Resistance	
SOT23-5, $\theta_{JA}$ .....	260 $^{\circ}C/W$
DFNFC1x1-4L, $\theta_{JA}$ .....	160 $^{\circ}C/W$
Junction Temperature.....	150 $^{\circ}C$
Storage Temperature Range.....	-65 $^{\circ}C$ to 150 $^{\circ}C$
Lead Temperature (Soldering, 10 sec).....	260 $^{\circ}C$
ESD Susceptibility	
HBM.....	4000V

### RECOMMENDED OPERATING CONDITIONS

Operating Voltage Range.....	1.8V to 5.5V
Operating Temperature Range .....	-40 $^{\circ}C$ to +85 $^{\circ}C$

### OVERSTRESS CAUTION

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

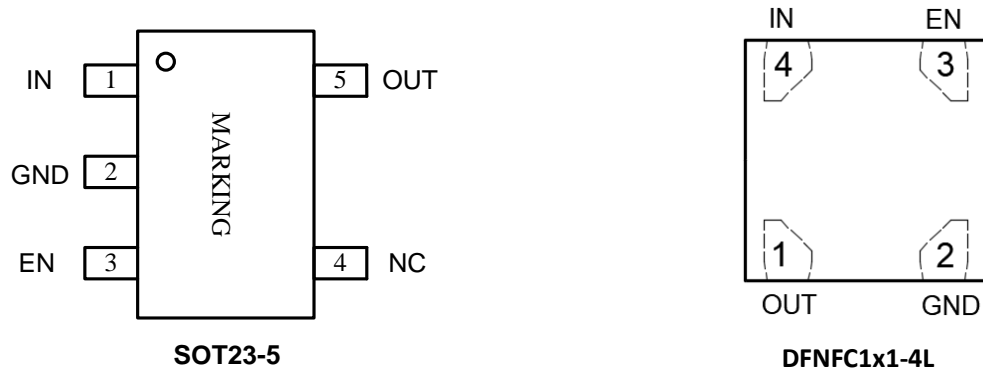
### ESD SENSITIVITY CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. Broadchip recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

### DISCLAIMER

Broadchip reserves the right to make any change in circuit design, specification or other related things if necessary without notice at any time. Please contact Broadchip sales office to get the latest datasheet.

### PIN CONFIGURATION (TOP VIEW)



### PIN DESCRIPTION

PIN		NAME	FUNCTION
SOT23-5	DFNFC1x1-4L		
1	4	IN	Regulator Input. Supply voltage can range from 2.5V to 5.5V. Bypass with a 1uF capacitor to GND.
2	2	GND	Ground.
3	3	EN	Shutdown Input. A logic low reduces the supply current to 0.1uA. Connect to IN for normal operation.
4	-	NC	No Connect
5	1	OUT	Regulator Output.



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### ELECTRICAL CHARACTERISTICS

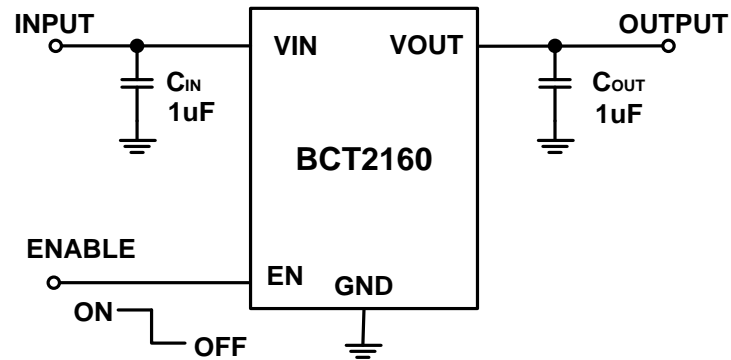
( $V_{IN} = V_{OUT(NOMINAL)} + 1V$ ,  $I_{OUT} = 1mA$ ,  $C_{IN} = C_{OUT} = 1\mu F$ ,  $T_A = -40^\circ C$  to  $+85^\circ C$ , typical values are at  $T_A = +25^\circ C$ , unless otherwise specified.)

PARAMETER	SYM	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage	$V_{IN}$		1.8		5.5	V
Output Voltage Accuracy			-2.0		2.0	%
Line Regulation	$\Delta V_{LNR}$	$V_{OUT} + 1V \leq V_{IN} \leq 5.5V$		0.02		%/V
Load Regulation	$\Delta V_{LDR}$	$I_{OUT} = 1mA$ to $300mA$ ,		15		mV
Dropout Voltage <sup>(1)</sup>	$V_{DROP}$	$I_{OUT} = 300mA$		210		mV
		$V_{out} = 1.8V$		140		mV
		$V_{out} = 2.8V$		130		mV
Current Limit	$I_{LIM}$	$V_{OUT} = 90\% V_{OUT(NOM)}$		530		mA
Short-Circuit Current	$I_{SHORT}$	$V_{OUT} = 0V$		220		mA
Quiescent Current	$I_Q$	No load		14		uA
Power Supply Rejection Ratio	PSRR	$I_{OUT} = 20mA$	$f = 100Hz$	84		dB
			$f = 1kHz$	94		
			$f = 10kHz$	73		
			$f = 100kHz$	33		
Output Voltage Noise	$e_n$	$f = 10Hz$ to $100kHz$	$I_{OUT} = 1mA$	26		$\mu V_{RMS}$
			$I_{OUT} = 300mA$	20		
Output Discharge Resistance	$R_{DISCH}$	$V_{EN} = 0V$ , $V_{IN} = 5V$ , $V_{out} = 1.8V$		220		$\Omega$
<b>SHUTDWON</b>						
EN Input Threshold	$V_{IH}$	$V_{IN} = V_{OUT(NOMINAL)} + 1V$ to $5.5V$ ,	1.7			V
	$V_{IL}$				0.3	
EN Pull-Down Current	$I_{EN}$	$EN = 5.5V$		0.2		uA
Shutdown Current	$I_{SHDN}$	$V_{EN} = 0V$ , $V_{IN} = 5.5V$		0.1		uA
Turn-On Time	$t_{ON}$	From assertion of $V_{EN}$ to $V_{OUT} = 90\% V_{OUT(NOM)}$		170		us
<b>THERMAL PROTECTION</b>						
Thermal Shutdown Temperature	$T_{SHDN}$			160		$^\circ C$
Thermal Shutdown Hysteresis	$\Delta T_{SHDN}$			20		$^\circ C$

NOTES:

1. The dropout voltage is defined as  $V_{IN} - V_{OUT}$ , when  $V_{OUT}$  is 100mV below the value of nominal  $V_{OUT}$

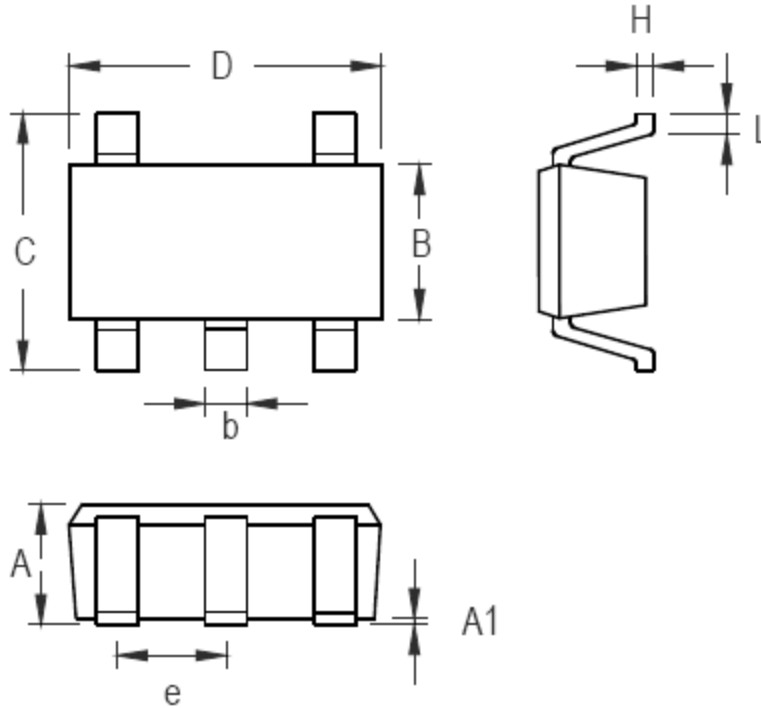
**TYPICAL APPLICATION CIRCUIT**



NOTES: The input/output capacitors should be placed as close as possible to the IC, Especially The distance of output capacitors to the chip must be less than 1 centimeters.

## PACKAGE OUTLINE DIMENSIONS

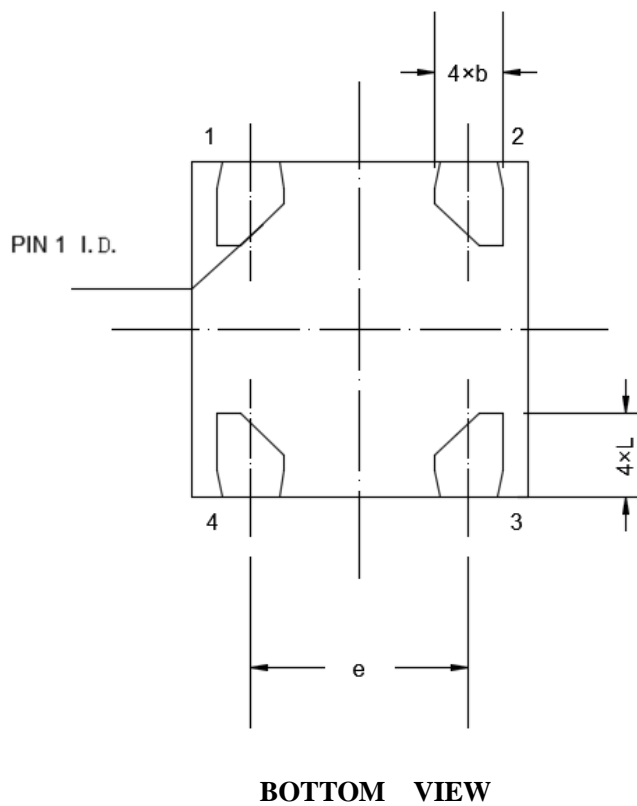
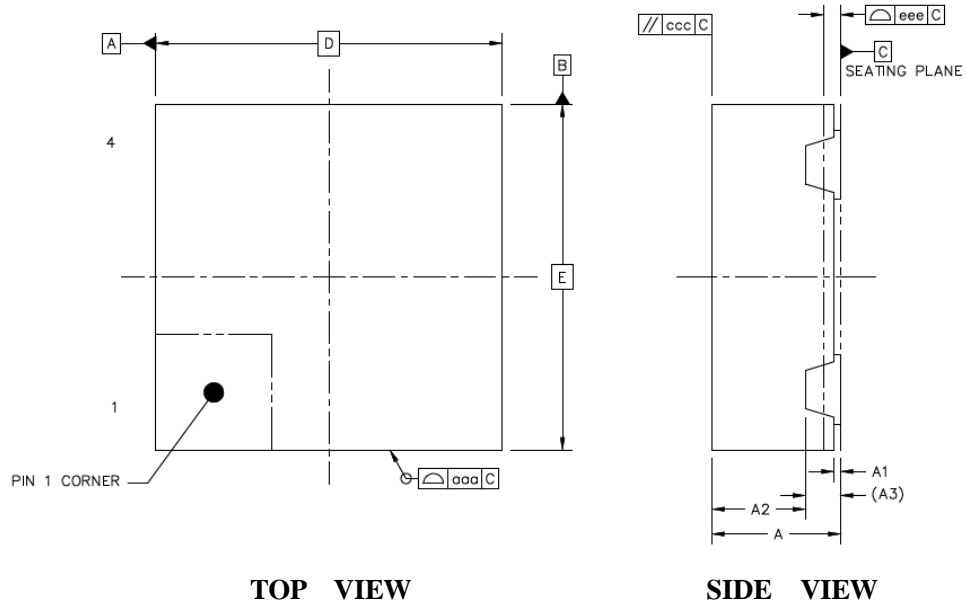
### SOT23-5



Symbol	Dimensions In Millimeters	
	Min	Max
A	1.05	1.15
A1	0.03	0.15
B	1.5	1.7
b	0.28	0.45
C	2.75	3.05
D	2.82	3.02
e	0.95(BSC)	
H	0.12	0.23
L	0.35	0.55

SOT23-5 Surface Mount Package

### DFNFC1x1-4L



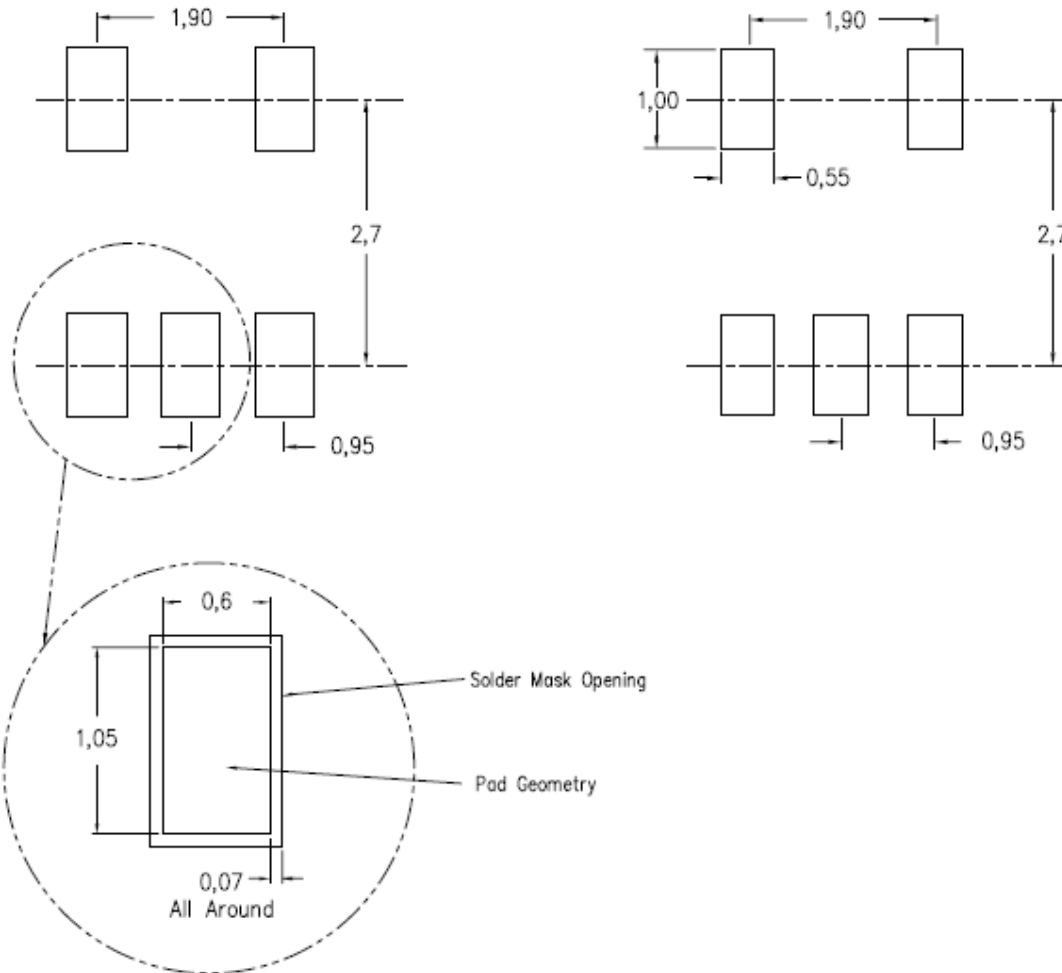


Symbol	Dimensions In Millimeters		
	Min	Nom	Max
<b>A</b>	0.32	0.37	0.40
<b>A1</b>	0.00	0.02	0.05
<b>A2</b>	-	0.27	-
<b>A3</b>	0.102 REF		
<b>b</b>	0.15	0.20	0.25
<b>D</b>	1(BSC)		
<b>E</b>	1(BSC)		
<b>e</b>	0.65(BSC)		
<b>L</b>	0.15	0.25	0.35
<b>aaa</b>	0.10		
<b>ccc</b>	0.10		
<b>eee</b>	0.05		
<b>bbb</b>	0.10		
<b>ddd</b>	0.05		

DFNFC1x1-4L Surface Mount Package

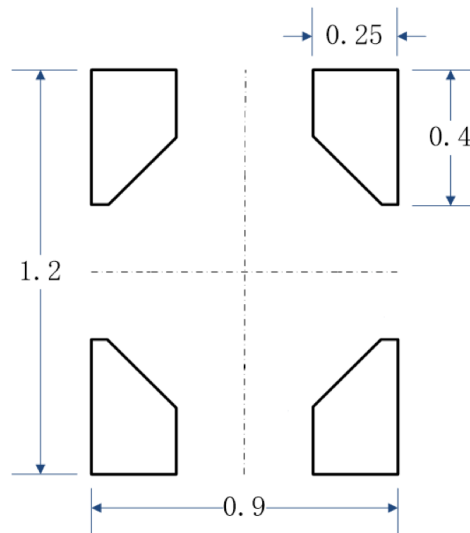
## LAND PATTERN DATA

### SOT23-5



**RECOMMENDED PCB LAYOUT PATTERN** (Unit: mm)

DFNFC1x1-4L



**RECOMMENDED PCB LAYOUT PATTERN** (Unit: mm)