

0.4A, 80V, 150KHz, Buck DC to DC Converter**Features**

- Operation Voltage From 5V to 80V
- Maximum Duty Cycle up to 90%
- Minimum Drop Out 2V
- Adjust VOUT from 1.25V to 20V
- Maximum 0.4A Output Current
- TTL Shutdown Capability
- Fixed 150KHz Switching Frequency
- Recommend Output Power less than 5W
- Internal Optimize HV Power Transistor
- High efficiency up to 85% .
- Excellent line and load regulation
- Built in thermal shutdown function
- Built in current limit function
- Built in output short Protection function
- SOP-8(EP)(Exposed PAD)

General Description

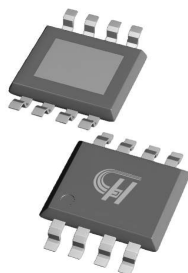
The HCR3443H is a 150KHz fixed frequency PWM buck (step-down) DC/DC converter, capable of driving a 0.4A load with high efficiency, low ripple and excellent line and load regulation.

Required a minimum number of external components, the regulator is simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The PWM control circuit is able to adjust the duty ratio linearly from 0 to 90%. An enable function, an over current protection function is built inside. When output short protection function happens, the operation frequency will be reduced from 150KHz to 45KHz. An internal compensation block is built in to minimize external component count.

Applications

- Ebike Controller Power Supply
- Telecom
- Networking Equipment

**SOP-8(EP)****Figure 1. Package Type of HCR3443H**

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Pin Configuration

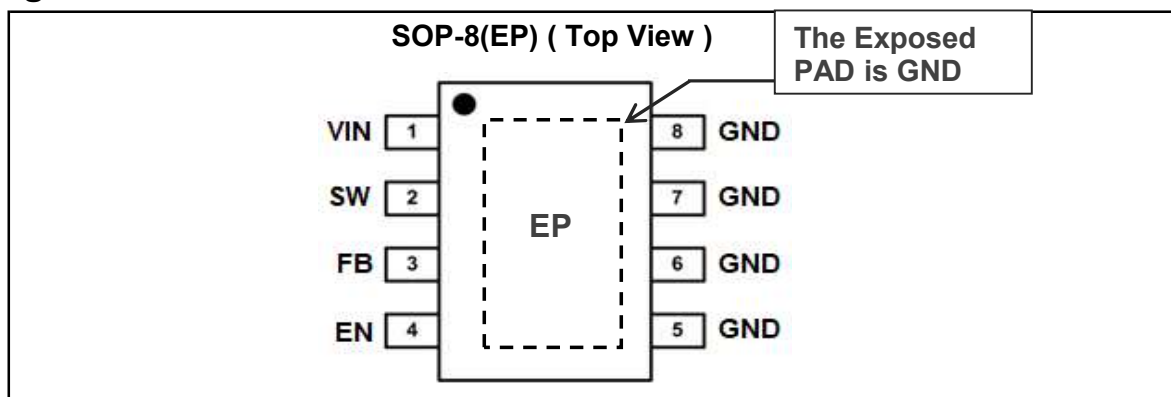
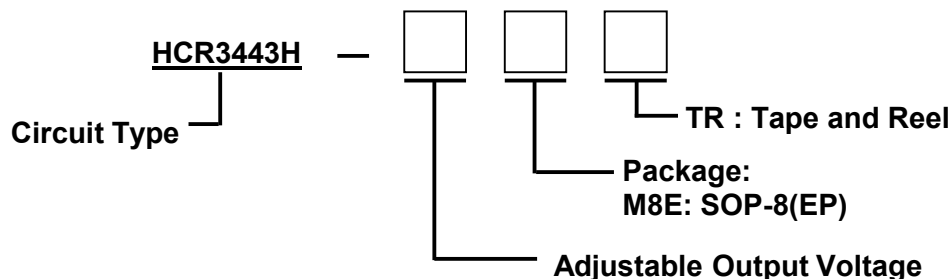


Figure 2. Pin Configuration of HCR3443H (Top View)

Pin Function Table

Pin Number	Pin Name	Function
1	VIN	Supply Voltage Input Pin. HCR3443H operates from 5V to 80V DC voltage. Bypass Vin to GND with a suitably large capacitor to eliminate noise on the input.
2	SW	Power Switch Output Pin (SW). Output is the switch node that supplies power to the output.
3	FB	Feedback Pin(FB). Through an external resistor divider network, Feedback senses the output voltage and regulates it. The feedback threshold voltage is 1.25V.
4	EN	Enable Pin. Drive EN pin low to turn on the device, drive it high to turn it off. Floating is default low.
5, 6, 7, 8	GND	Ground Pin. Care must be taken in layout. This pin should be placed outside of the Schottky Diode to output capacitor ground path to prevent switching current spikes from inducing voltage noise into HCR3443H. The exposed PAD is GND.

Ordering Information



Ordering Code

Part Number	Marking ^[1]	Temperature Range	Package	Package Type
HCR3443H-ADJM8ETR	HCR3443Hxx	-40'C to +85'C	SOP-8(EP)	4000pcs/Tape&Reel

Note 1. The "xx" is date code.

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Functional Block Diagram

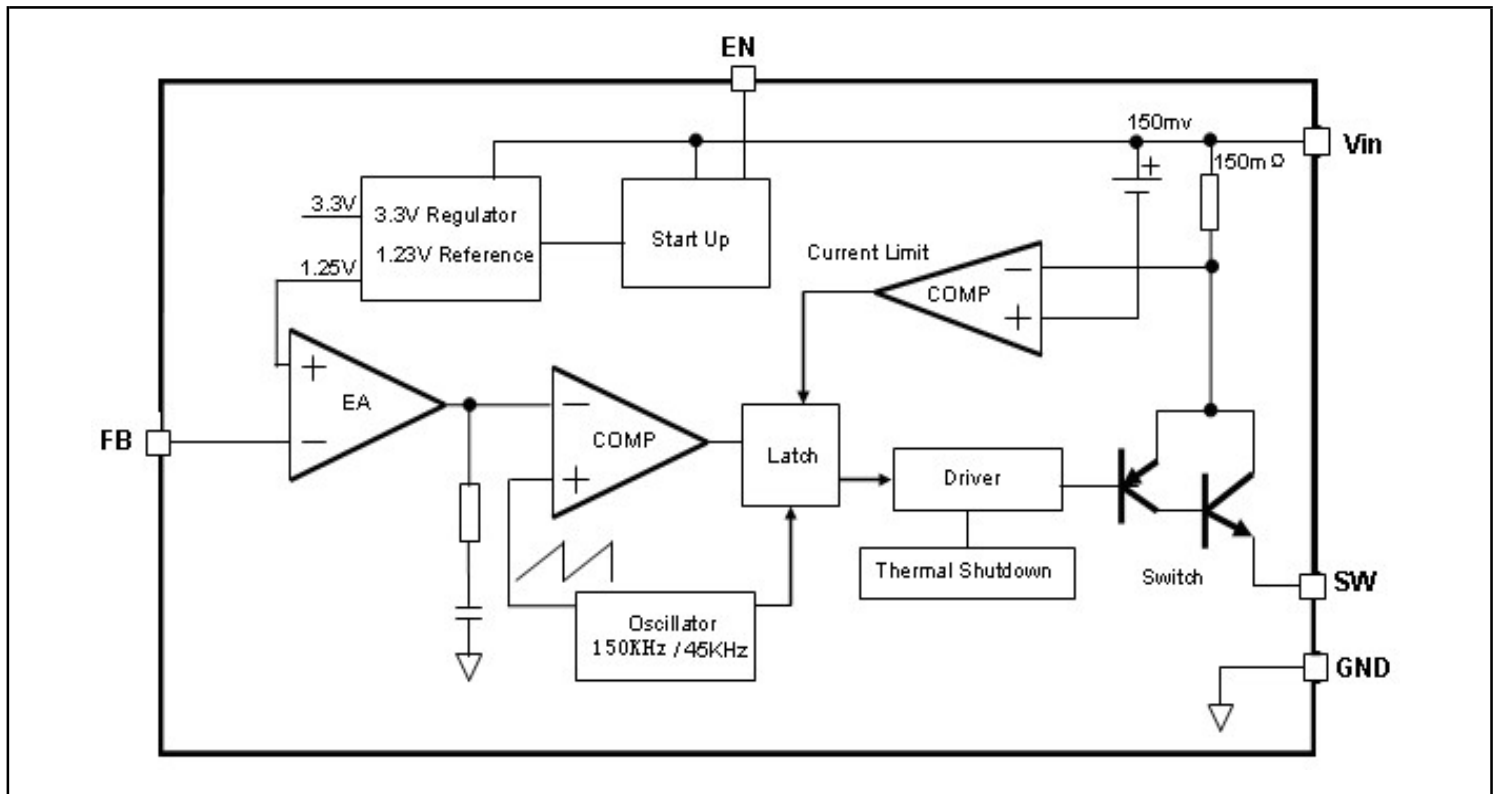


Figure 3. Functional Block Diagram of HCR3443H

Typical Application Circuit

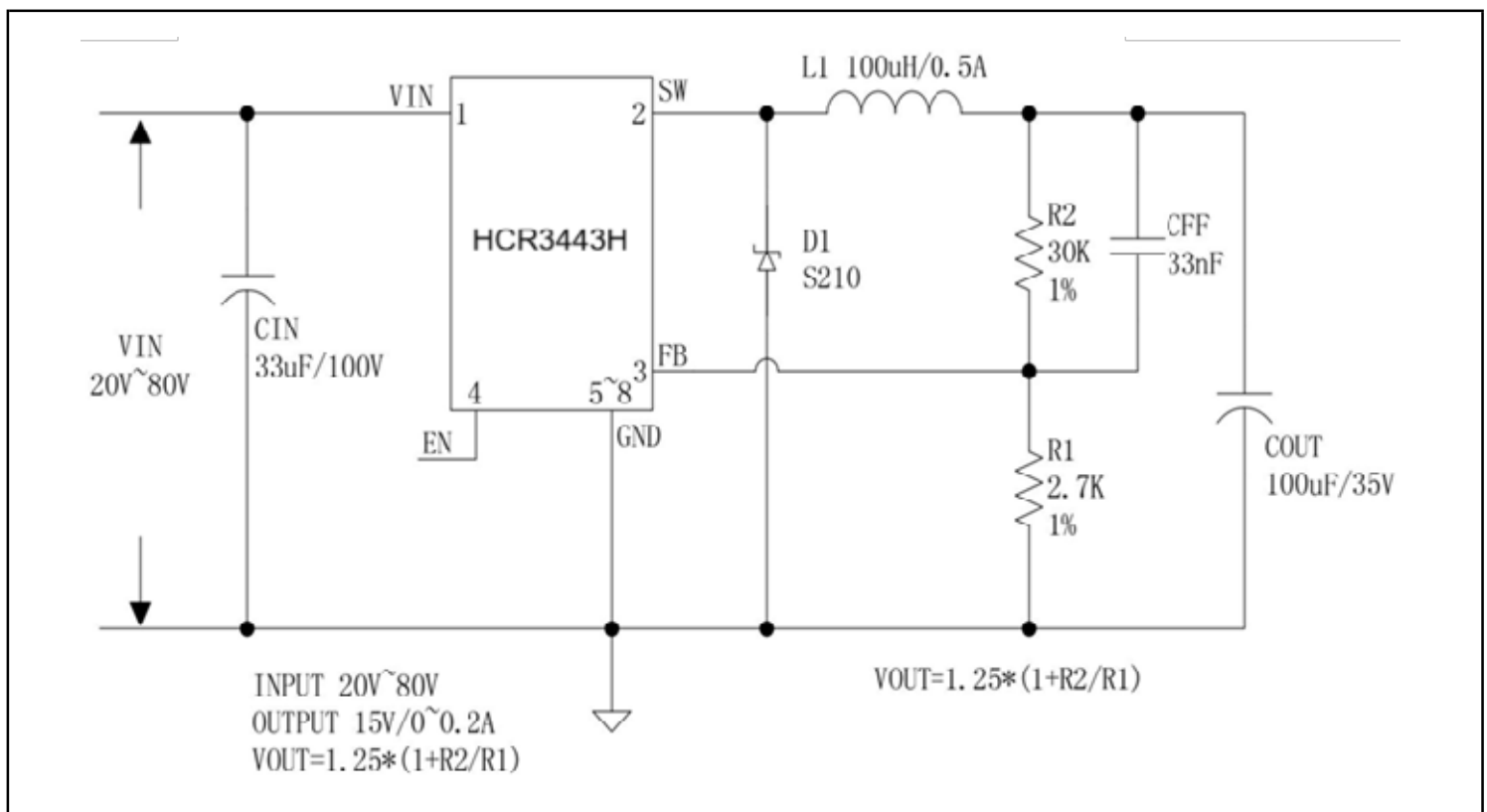


Figure 4. HCR3443H Typical Application Circuit

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Absolute Maximum Ratings Note 1

Parameter	Symbol	Value	Unit
VIN Input Voltage	V _{IN}	-0.3 to 85	V
Feedback (FB) Pin Voltage	V _{FB}	-0.3 to 7	V
EN Pin Voltage	V _{EN}	-0.3 to 7	V
Output Switch(SW) Pin Voltage	V _{SW}	-0.3 to VIN	V
Power Dissipation	P _D	Internally limited	mW
Thermal Resistance Junction to Ambient (No Heatsink, Free Air)	R _{θJA}	60	'C/W
Thermal Resistance Junction to Case	R _{θJC}	22	'C/W
Storage Temperature Range	T _{STG}	-65 to 150	'C
Operating Junction Temperature note1	T _J	-40 to 150	'C
Lead Temperature (Soldering, 10s)	T _{LEAD}	260	'C
Human Body Model ESD Protection	ESD HBM	> 3000	V

Note 1: Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

HCR3443H Electrical Characteristics(Ta=25'C; unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
System parameters test circuit figure-4						
Feedback(FB) Voltage	V _{FB}	V _{in} =20V to 80V, V _{out} =15V, I _{load} =0.1A to 0.2A	1.225	1.250	1.275	V
Efficiency	η	V _{in} =36V, V _{out} =15V I _{out} =0.2A	-	86	-	%
Efficiency	η	V _{in} =48V, V _{out} =15V I _{out} =0.2A	-	81	-	%
Efficiency	η	V _{in} =60V, V _{out} =15V I _{out} =0.2A	-	75	-	%

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Electrical Characteristics(DC Parameters)

$V_{in}=48V$, $GND=0V$, V_{in} & GND parallel connect a $33\mu F/100V$ capacitor; $I_{out}=0.2A$, $T_a=25^{\circ}C$;
the others floating unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Input Operation Voltage	V_{in}		5.0	-	80	V
Shutdown Supply Current	I_{STBY}	$V_{EN}=2V$	-	85	200	μA
Quiescent Supply Current	I_q	$V_{EN}=0V$, $V_{FB}=2V$	-	2.5	5	mA
Oscillator Frequency	F_{osc}		120	150	180	KHz
Switch Current Limit	I_L	$V_{FB}=0V$	-	0.5	-	A
EN Pin Threshold	V_{EN}	High(Regulator OFF)	-	1.6	-	V
		Low(Regulator ON)	-	0.8	-	
EN Pin Input Leakage Current	I_H	$V_{EN}=2.5V$ (OFF)	-	6	20	μA
	I_L	$V_{EN}=0.5V$ (ON)	-	1	10	
Output Saturation Voltage	V_{CE}	$V_{FB}=0V$, $I_{out}=0.4A$	-	0.87	-	V
Max. Duty Cycle	D_{MAX}	$V_{FB}=0V$	-	90	-	%

Typical System Application(Recommend output current safe work range)

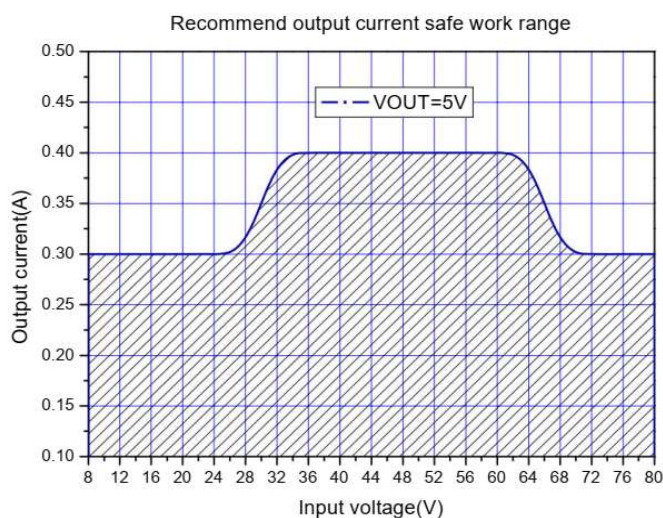


Figure 5. Max. Output Current($V_{OUT}=5V$)

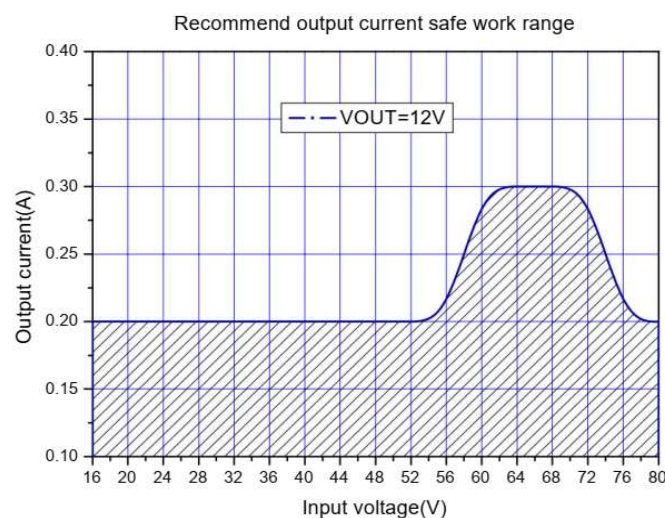


Figure 6. Max. Output Current($V_{OUT}=12V$)

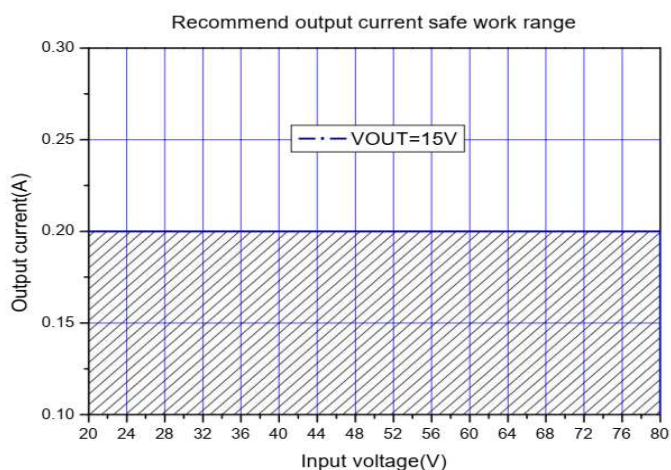


Figure 7. Max. Output Current($V_{OUT}=15V$)

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Typical Performance Characteristics

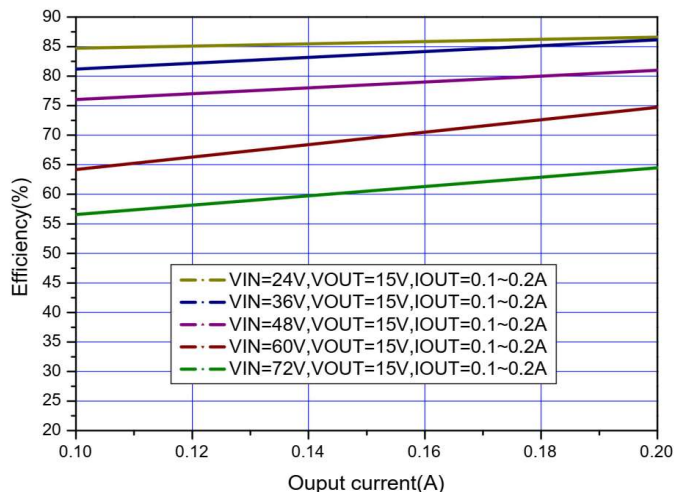


Figure 8. Efficiency Vs Output Current

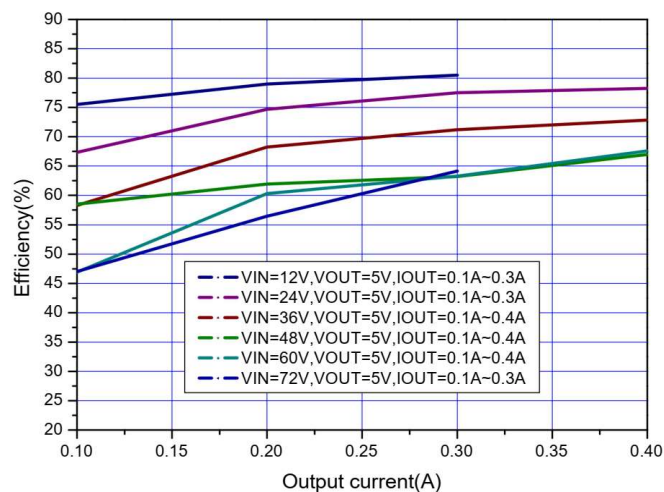


Figure 9. Efficiency Vs Output Current

Typical System Application(VOUT=15V/0.2A)

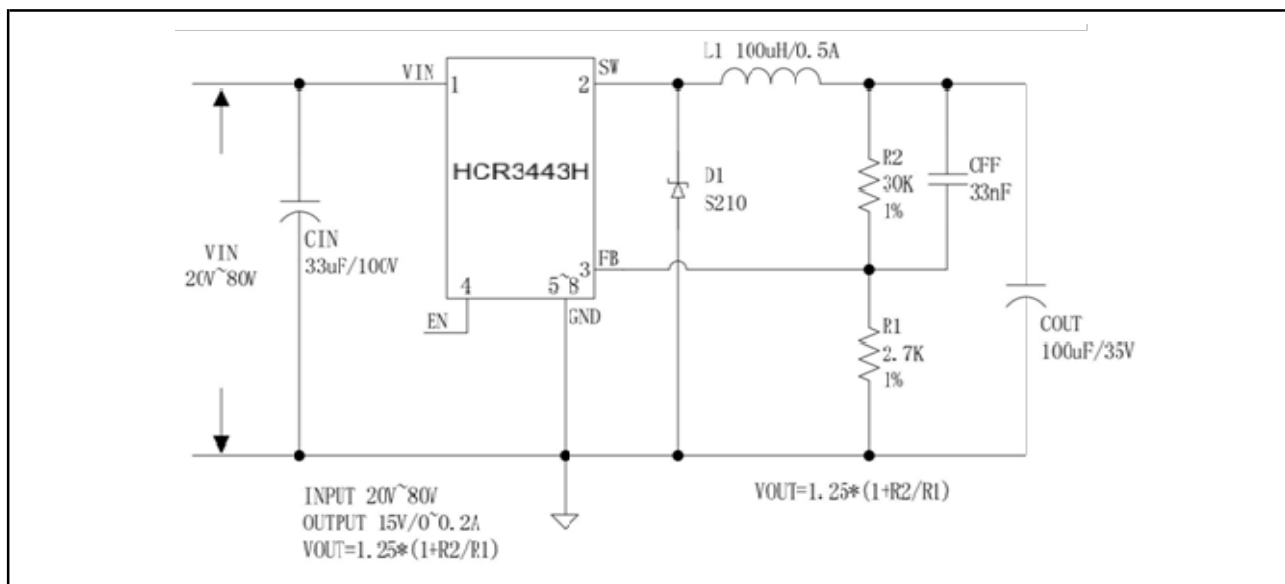


Figure 10. HCR3443H Aystem Application(VIN=20V~80V, VOUT=15V/0.2A)

Typical System Application(VOUT=5V/0.4A)

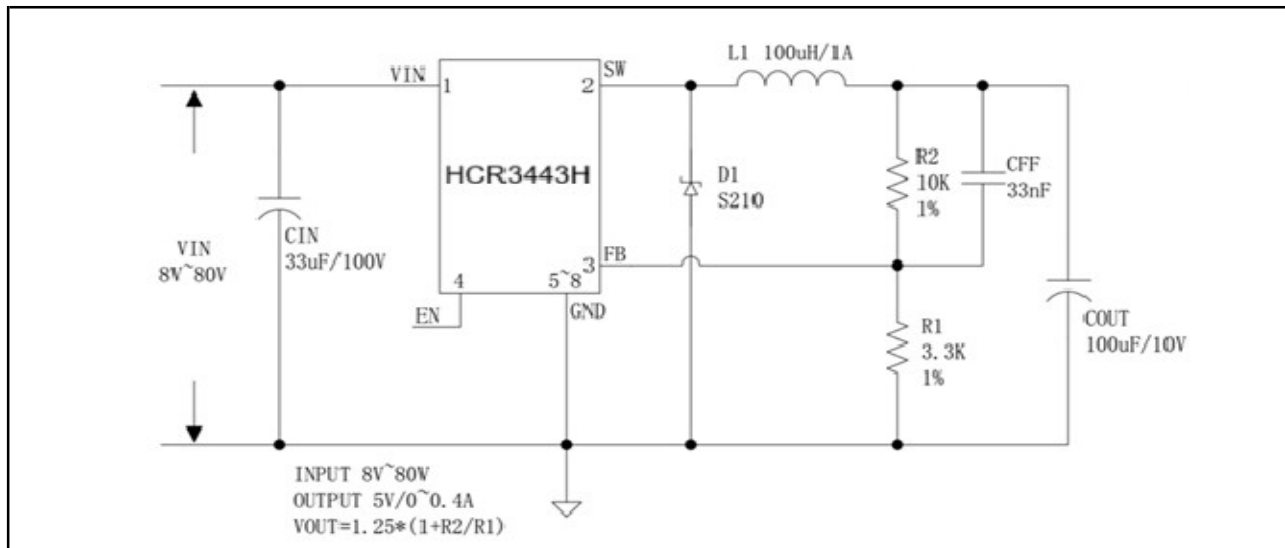
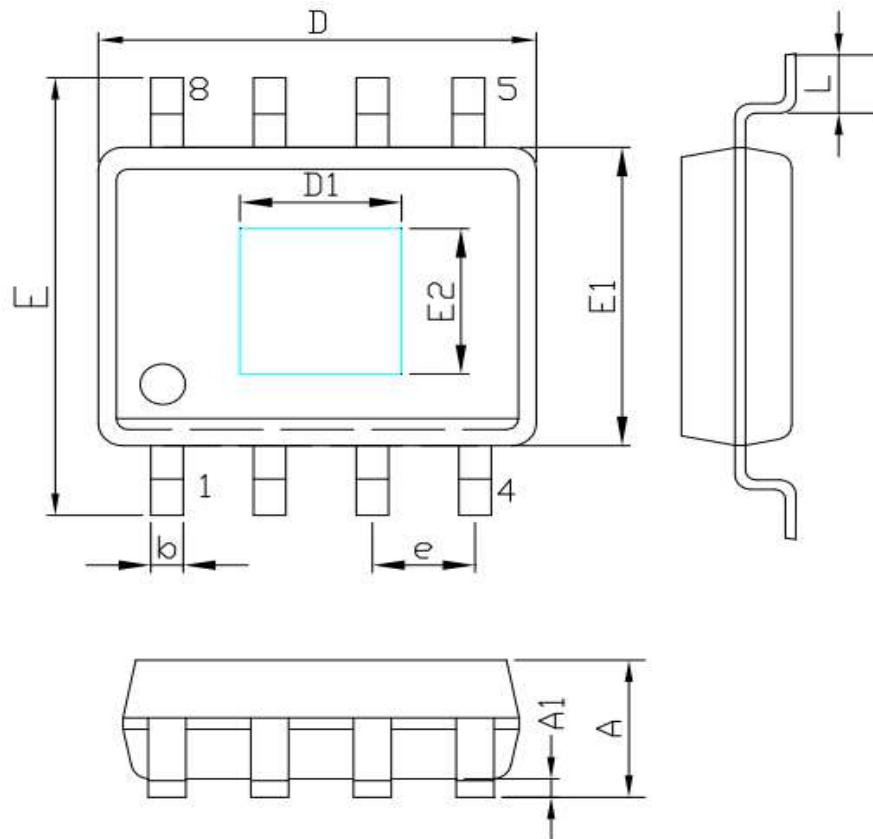


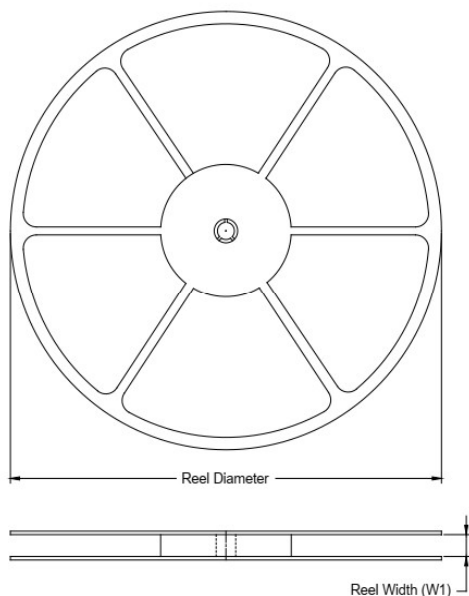
Figure 11. HCR3443H Aystem Application(VIN=8V~80V, VOUT=5V/0.4A)

0.4A, 80V, 150KHz, Buck DC to DC Converter
Mechanical Dimensions
PKG: SOP-8(EP) (M8E) Packages
Unit: mm


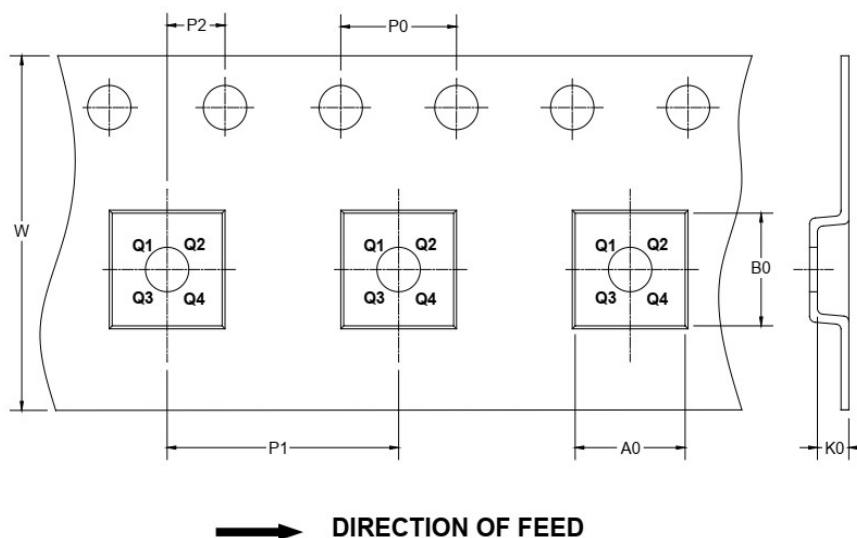
SYMBOLS	MILLIMETERS			INCHES		
	MIN.	Normal	MAX.	MIN.	Normal	MAX.
A	1.35	-	1.75	0.053	-	0.069
A1	0.00	-	0.25	0.000	-	0.010
D	4.80	4.90	5.00	0.189	0.193	0.197
E1	3.70	3.90	4.00	0.146	0.154	0.157
D1	2.67	2.97	3.50	0.105	0.117	0.138
E2	1.78	2.18	2.60	0.070	0.086	0.102
E	5.80	6.00	6.20	0.228	0.236	0.244
L	0.40	-	1.27	0.016	-	0.050
b	0.31	-	0.51	0.012	-	0.020
e	1.27 REF			0.050 REF		

TAPE AND REEL INFORMATION

REEL DIMENSIONS



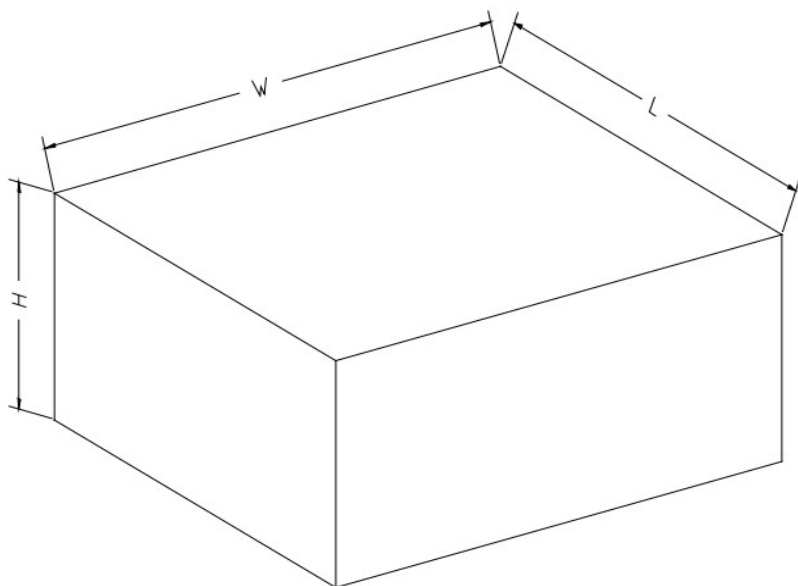
TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOP-8(EP)	13"	12.4	6.40	5.40	2.10	4.0	8.0	2.0	12.0	Q1

0.4A, 80V, 150KHz, Buck DC to DC Converter**CARTON BOX DIMENSIONS**

NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
13"	386	280	370	5