

0.6A 150KHz 90V Buck DC to DC Converter**Features**

- Operation Voltage From 12V to 100V
- Maximum Duty Cycle up to 100%
- Minimum Drop Out 0.5V
- Adjust VOUT from 1.25V to 20V
- Maximum IOUT=0.6A at VOUT=5V
- Maximum IOUT=0.3A at VOUT=12V or 15V
- Fixed 150KHz Switching Frequency
- Maximum Output Power less than 5W
- Internal Optimize HV Power MOSFET
- High efficiency up to 85% .
- Excellent line and load regulation
- Built in current limit function
- Built in output short shutdown function

General Description

The HCR3452H is a 150KHz fixed frequency PWM buck (step-down) DC/DC converter, capable of driving a 0.6A load with high efficiency, low ripple and excellent line and load regulation.

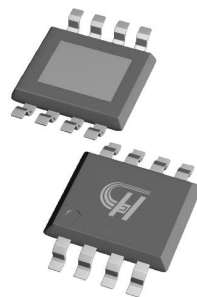
Required a minimum number of external components, the regulator is simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The PWM control circuit is able to adjust the duty ratio linearly from 0 to 100%.

The device is available in a low-profile SOP-8(EP) (Exposed PAD) package.

Applications

- Ebike Controller Power Supply
- Telecom
- Networking Equipment



SOP-8(EP)

Figure 1. Package Type of HCR3452H

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Pin Configuration

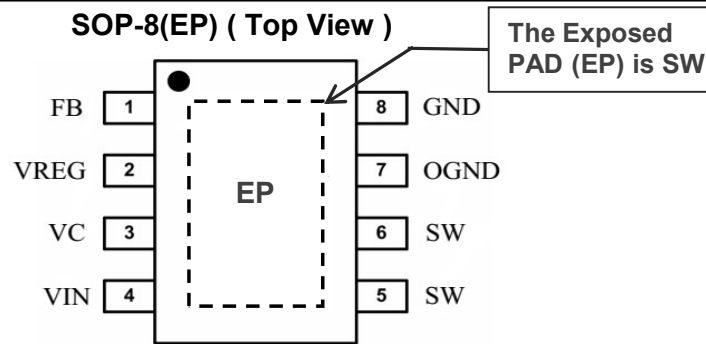
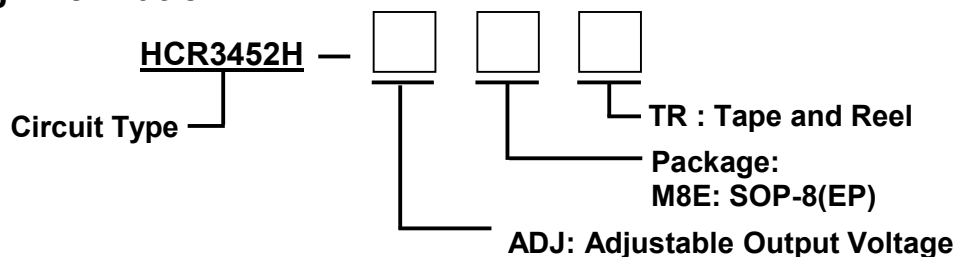


Figure 2. Pin Configuration of HCR3452H (Top View)

Pin Function Table

Pin Number	Pin Name	Function
1	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.
2	VREG	Supply Voltage Input Pin. A 10uF ceramic decoupling capacitor is required. An external voltage between 7V and 9V can be applied to this pin to reduce internal power dissipation.
3	VC	Internal Voltage Regulator Bypass Capacity. In typical system application, The VC pin connect a 1uF capacity to VIN.
4	VIN	Supply Voltage Input Pin. HCR3452H operates from 12V to 90V DC voltage. Bypass Vin to GND with a suitably large capacitor to eliminate noise on the input.
5,6	SW	Power Switch Output Pin (SW). Output is the switch node that supplies power to the output. The exposed PAD(EP) is SW.
7	OGND	Output Ground Pin.
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 HCR3452H.

Ordering Information



Ordering Code

Part Number	Marking ^[2]	Temperature Range	Package	Package Type
HCR3452H-ADJM8ETR	HCR3452H xxyy	-40°C to +85°C	SOP-8(EP)	2500pcs/Tape&Reel

Note 2. The "HCR3452H" is product type and the "xxyy" is date code and number code.

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Functional Block Diagram

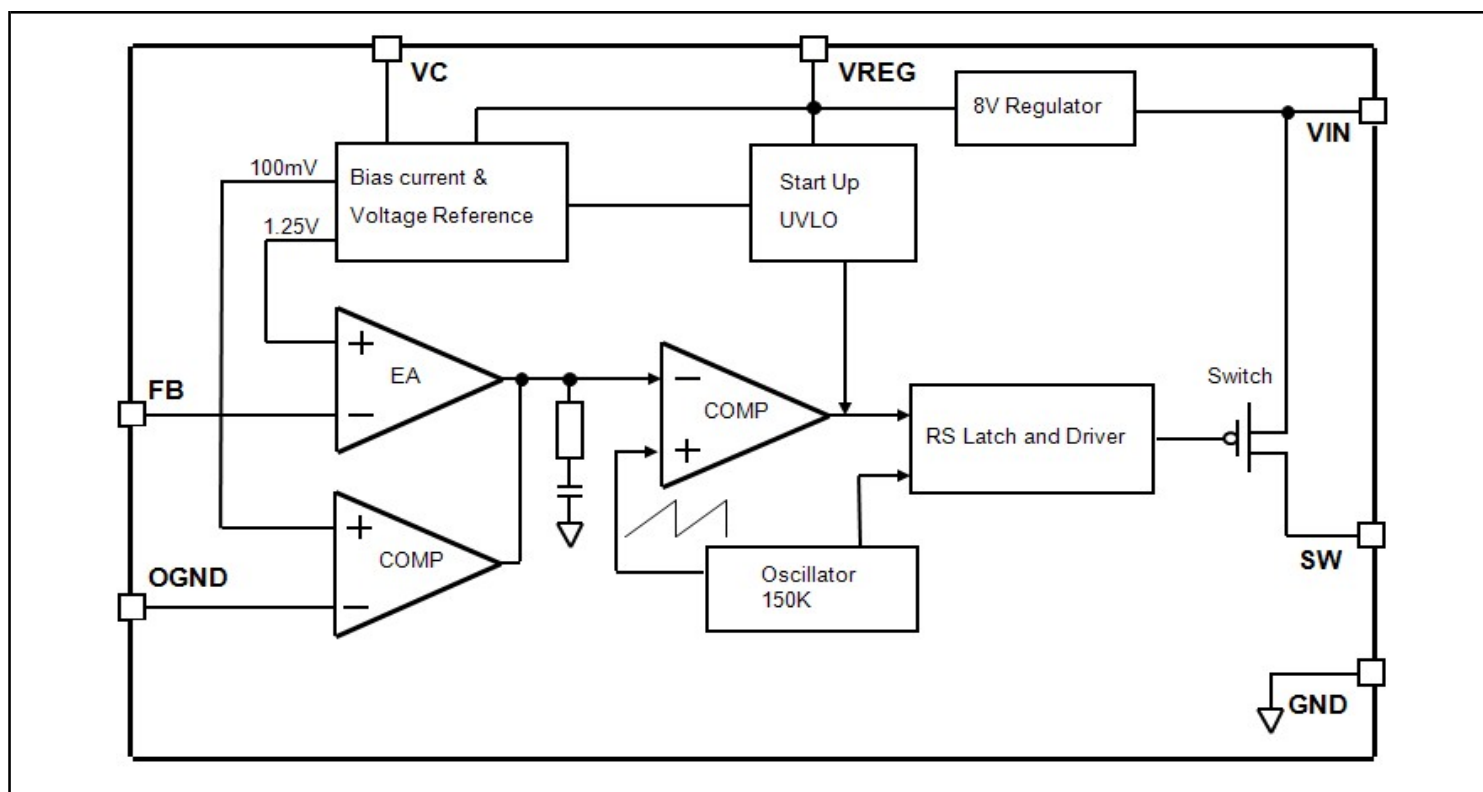


Figure 3. Functional Block Diagram of HCR3452H

Typical Application Circuit ^[3]

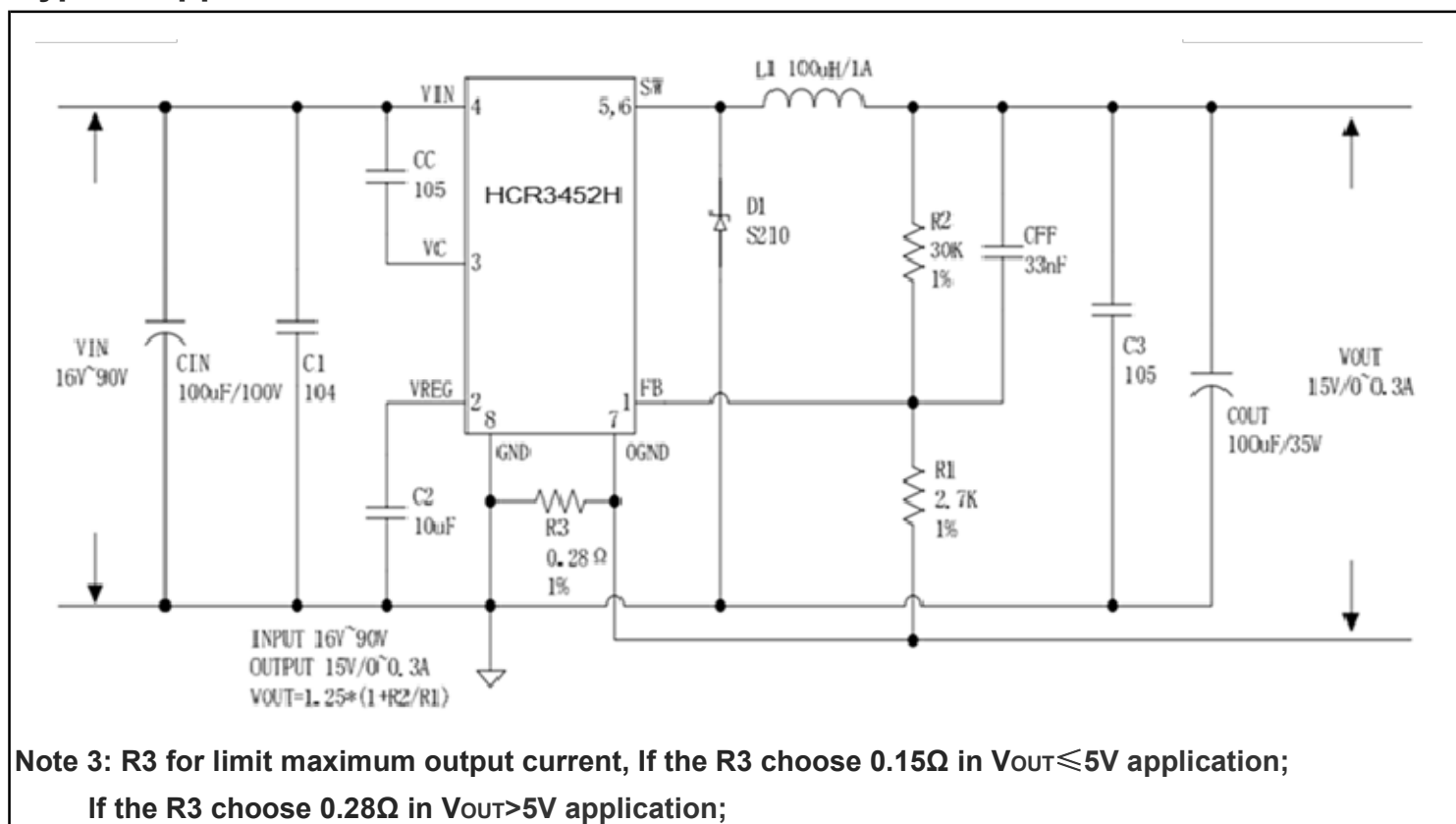


Figure 4. HCR3452H Typical Application Circuit (VIN=16V~90V, VOUT=15V/0A~0.3A)

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Absolute Maximum Ratings ^{Note 4}

Parameter	Symbol	Value	Unit
VIN Input Voltage	VIN	-0.3 to 100	V
Feedback (FB) Pin Voltage	VFB	-0.3 to VIN	V
Output Switch(SW) Pin Voltage	VSW	-0.3 to VIN	V
Power Dissipation	PD	Internally limited	mW
Thermal Resistance Junction to Ambient (No Heatsink, Free Air)	RθJA	60	'C/W
Thermal Resistance Junction to Case	RθJC	22	'C/W
Storage Temperature Range	TSTG	-65 to 150	'C
Operating Junction Temperature ^{note4}	TJ	-40 to 150	'C
Lead Temperature (Soldering, 10s)	TLEAD	260	'C
Human Body Model ESD Protection	ESD HBM	> 3000	V

Note 4: 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.

HCR3452H 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	VFB	Vin=20V to 90V, Vout=15V, Iload=0.1A to 0.3A	1.225	1.250	1.275	V
Efficiency	η	Vin=24V, Vout=15V Iout=0.3A	-	93	-	%
Efficiency	η	Vin=36V, Vout=15V Iout=0.3A	-	88	-	%
Efficiency	η	Vin=48V, Vout=15V Iout=0.3A	-	85	-	%
Efficiency	η	Vin=60V, Vout=15V Iout=0.3A	-	80	-	%

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Electrical Characteristics(DC Parameters)

$V_{in}=48V$, $GND=0V$, V_{in} & GND parallel connect a 33uF/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}		12	-	90	V
VIN UVLO	V_{in_UVLO}		-	10	11	V
VREG Voltage	V_{REG}		-	8	-	V
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	$V_{FB}=0$, $R_3=0.15\Omega$	-	0.667	-	A
Output Power PMOS	R_{dson}	$V_{in}=48V$, $I_{sw}=0.3A$	-	180	210	m Ω
Max. Duty Cycle	$DMAX$	$V_{FB}=0V$	-	100	-	%

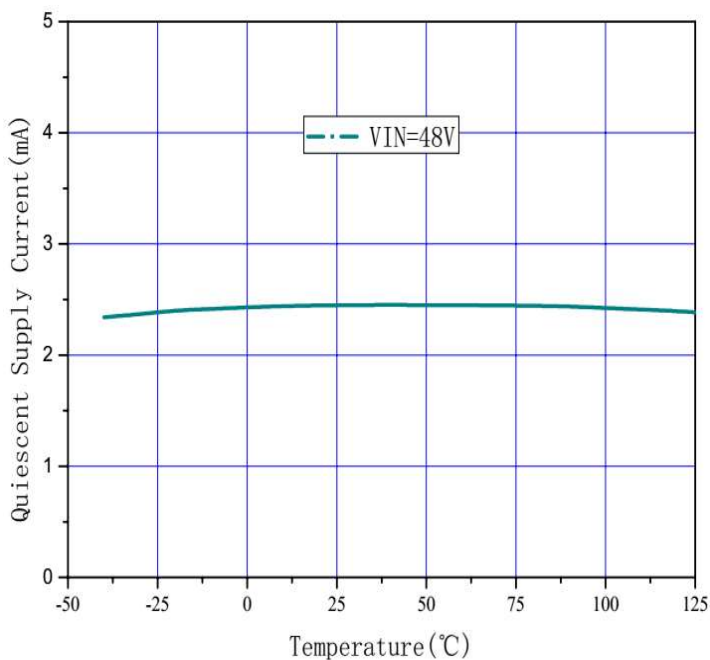
Typical Performance Characteristics


Figure 5. Quiescent Supply Current VS Temperature

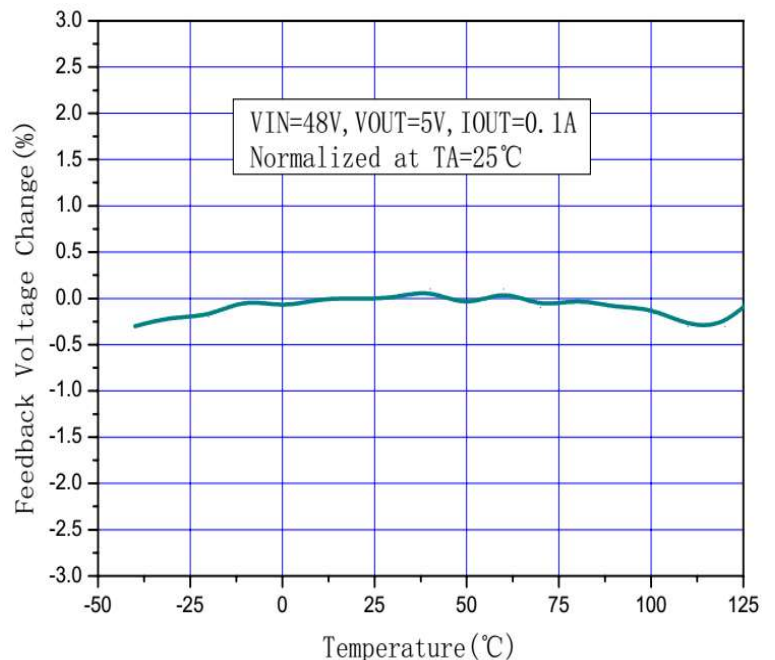


Figure 6. Feedback Voltage Change VS Temperature

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Typical Performance Characteristics (Con.)

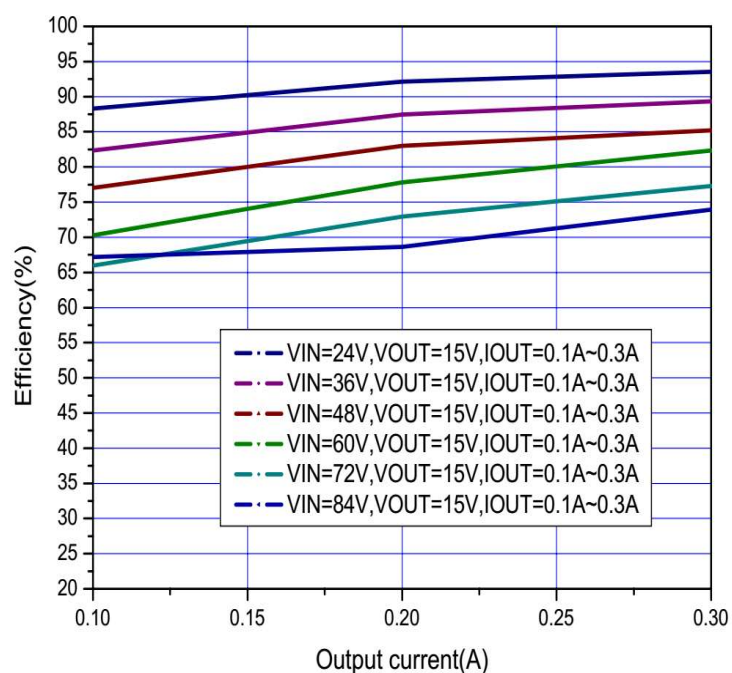


Figure 7. Efficiency VS Output Current
at VIN=16V~90V, VOUT=15V, IOUT=0A~0.3A

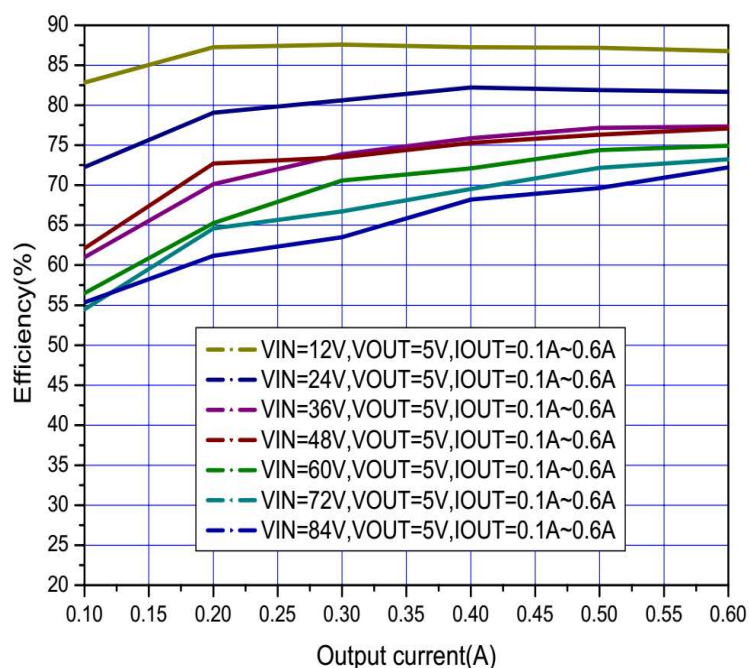


Figure 8. Efficiency VS Output Current
at VIN=12V~90V, VOUT=5V, IOUT=0A~0.6A

Typical System Application (VOUT=15V, IOUT=0~0.3A)

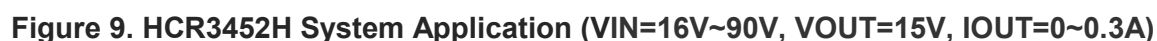


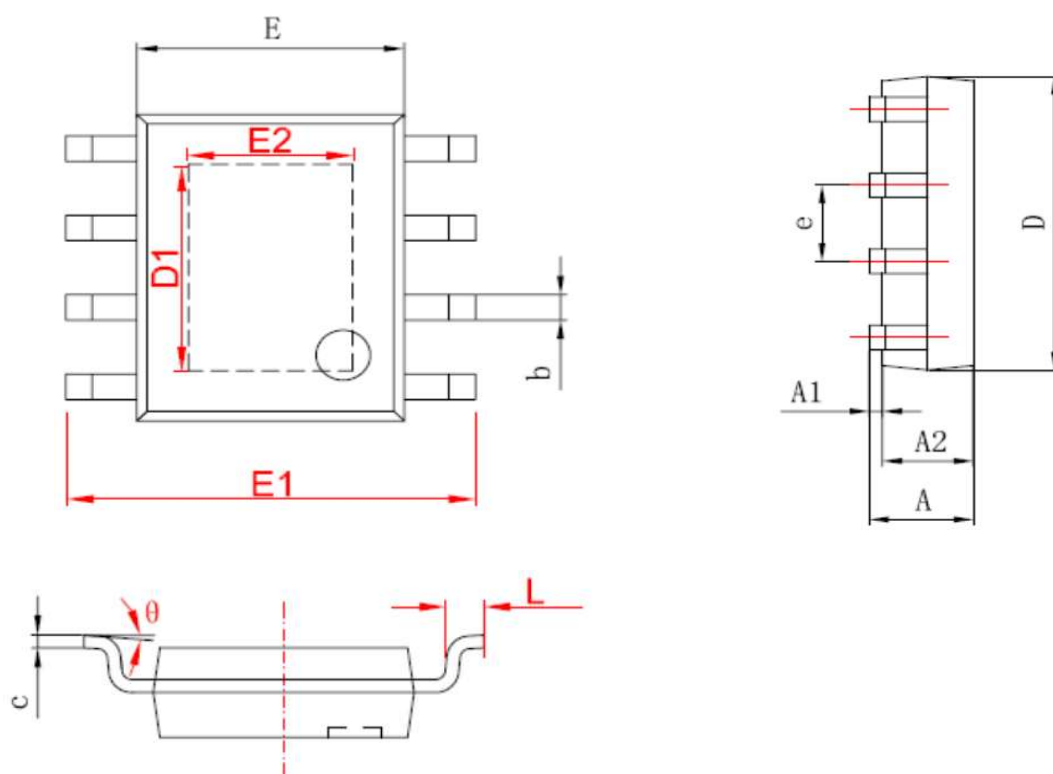
Figure 10. HCR3452H ON/OFF Mode Application (VIN=12V~90V, VOUT=5V, IOU=0~0.6A)

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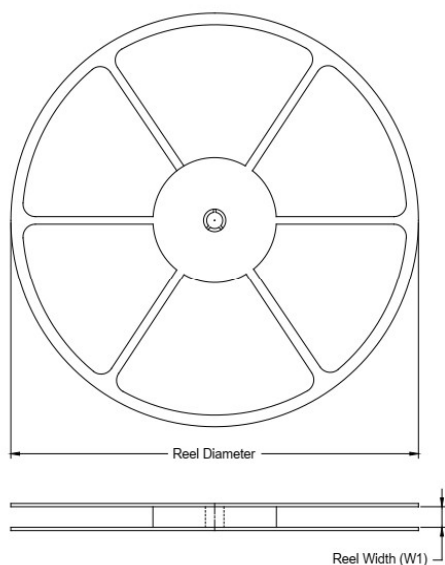
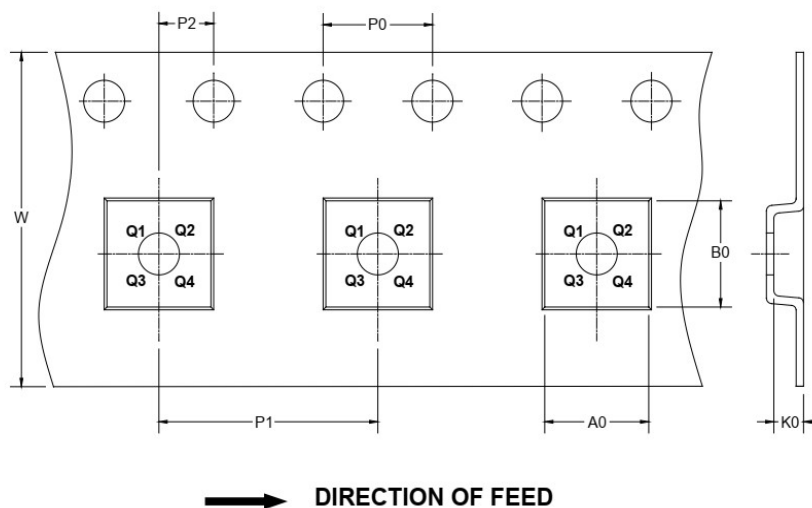
Mechanical Dimensions

PKG: SOP-8(EP) (M8E) Packages

Unit: mm



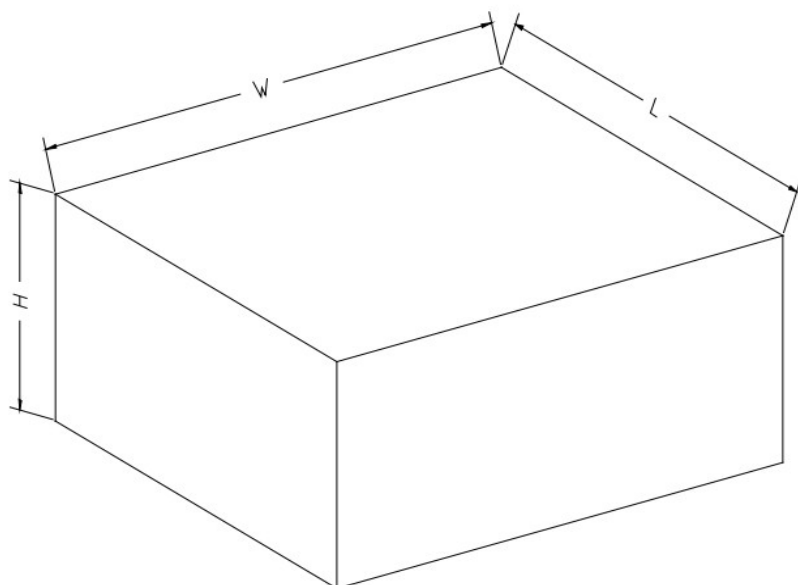
Item	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.050	0.150	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
D1	3.202	3.402	0.126	0.134
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E2	2.313	2.513	0.091	0.099
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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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

0.6A 150KHz 90V 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