



ACE723A

3A 1.5MHz 5.5V Synchronous Buck Converter

Description

The ACE723A is a high efficiency synchronous, buck DC/DC converter. Its input voltage range is from 2.6V to 6V and provides an adjustable regulated output voltage from 0.8V to 5.5V while delivering up to 3A of output current.

The internal synchronous switches efficiency and eliminate the need for an external Schottky diode. The switching frequency is set by an external resistor or can be synchronized to an external clock. The 100% duty cycle provides low dropout operation extending battery life in portable systems.

The ACE723A is operated in PFM/PWM auto-switch mode which enhance the efficiency at light-load.

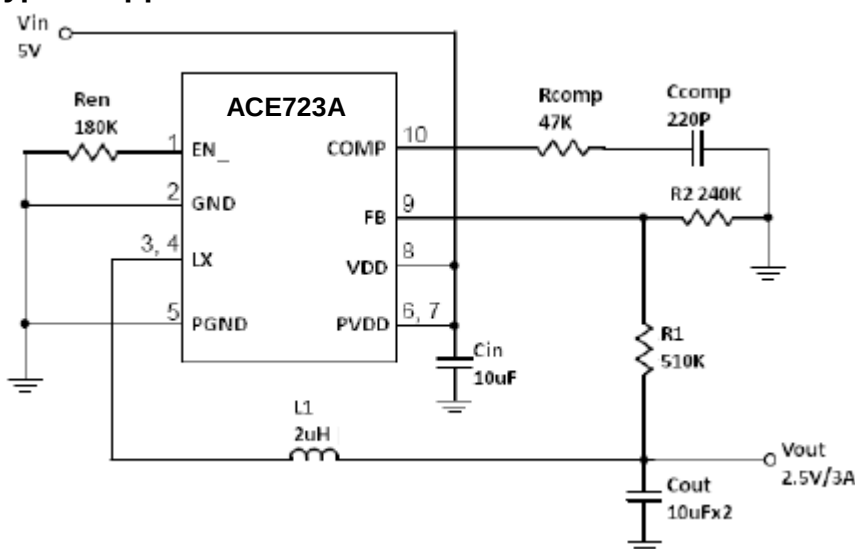
Features

- Adjustable Output Voltage, $V_{fb}=0.8V$
- Maximum output current is 3A
- Range of operation input voltage: Max 6V
- Standby current: 0.5mA (typ.)
- Line Regulation: 0.1%/V (typ.)
- Load Regulation: 10mV (typ.)
- High efficiency, up to 96%
- Environment Temperature: $-20^{\circ}C \sim 85^{\circ}C$

Application

- Power Management for 3G modem
- 3W LED driver from Li-ion battery
- LCD Monitor and LCD TV
- DVD Decode Board
- ADSL Modem
- Post Regulators for Switching Supplies

Typical Application





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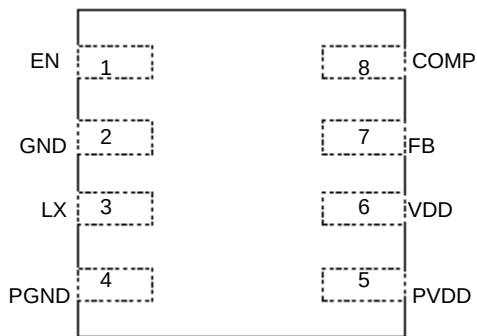
Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Input voltage	V_{IN}	6	V
Operating Junction Temperature	T_J	125	°C
Ambient Temperature	T_A	-20 ~ 85	°C
Package Thermal Resistance DFN 2*2-8		25	°C/W
Storage temperature	T_S	- 40 ~ 150	°C
ESD (HBM)		>2000	V

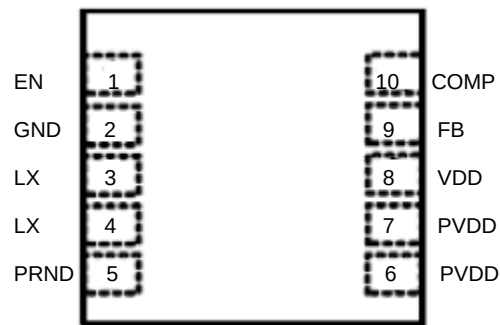
Note: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.

Packaging Type

DFN2*2-8

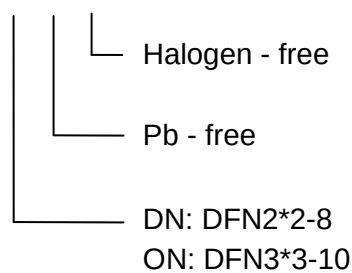


DFN3*3-10



Ordering information

ACE723A XX + H



Recommended Work Conditions

Item	Min	Max	Unit
Input Voltage Range		6	V
Operating Junction Temperature (T_J)	-20	+125	°C



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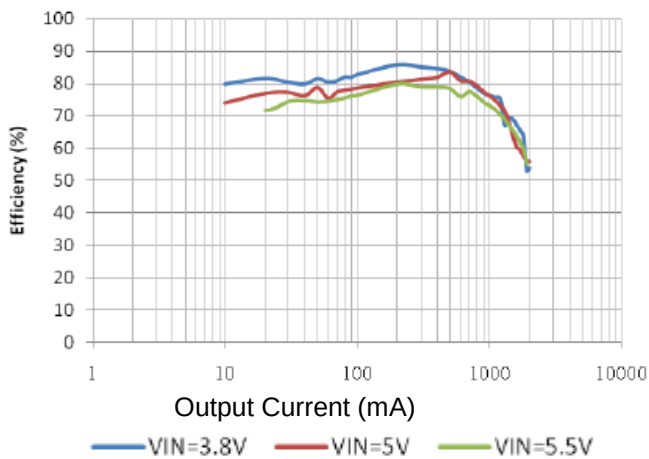
Electrical Characteristics

($V_{DD}=5V, T_A=25^{\circ}C$)

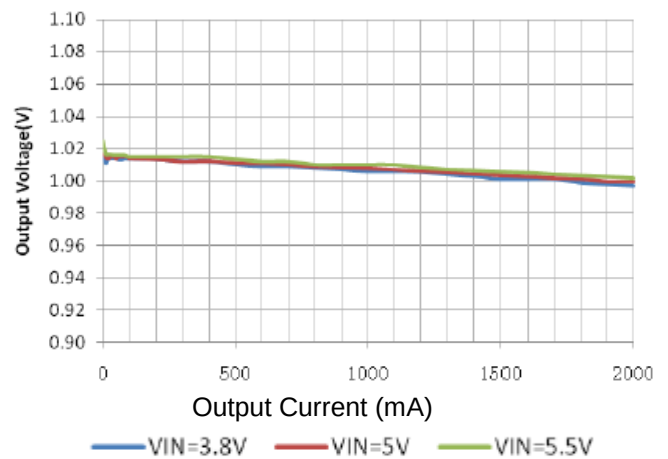
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input Voltage Range	V_{DD}		2.6		5.5	V
Feedback Voltage	V_{ref}		0.784	0.8	0.816	V
Feedback Leakage current	I_{fb}			0.1	0.4	μA
Quiescent Current	I_q	Active, $V_{fb}=0.78$, No Switching		450		μA
		Shutdown		1		μA
Line Regulation	$LnReg$	$V_{in}=4V$ to $5.5V$		0.1		%/V
Load Regulation	$LdReg$	$I_{out}=1$ to $3A$		0.02		%/A
EA Transconductance	G_m			600		μs
Switching Frequency	F_{soc}	$R_{en_}=180K$		1.35		MHz
PMOS R_{dson}	R_{dsonP}			150		Ω
NMOS R_{dson}	R_{dsonN}			130		Ω
Peak Current Limit	$Llimit$			3.8		A
EN_Shutdown Voltage	$V_{en_}$		$V_{in}-0.7V$		V_{in}	

Typical Performance Characteristics

Efficiency vs. Output Current
($V_{out}=1.0V$)



Load Regulation
($V_{out}=1.0V$)

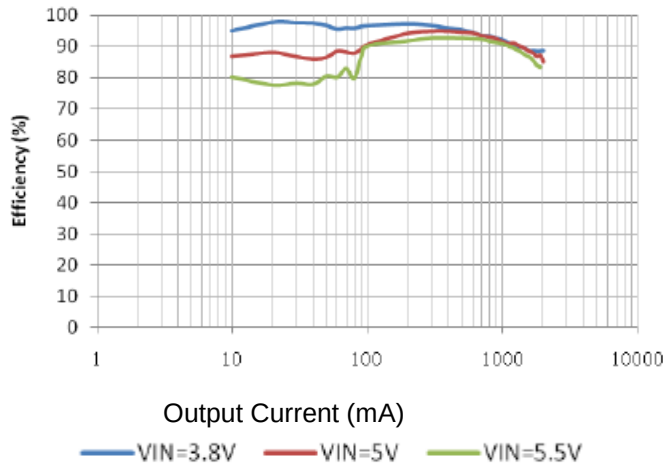




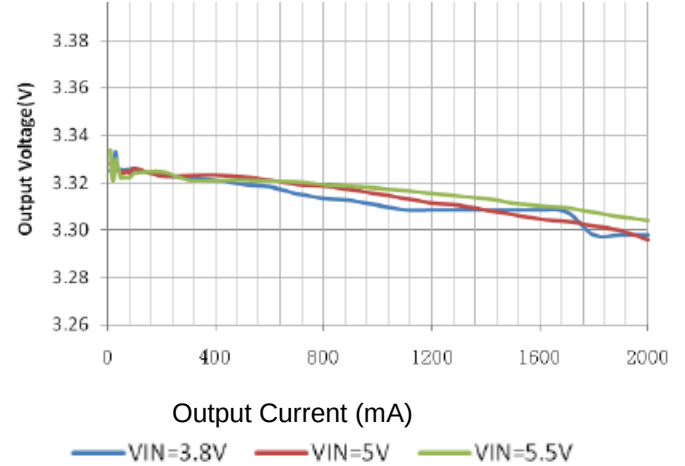
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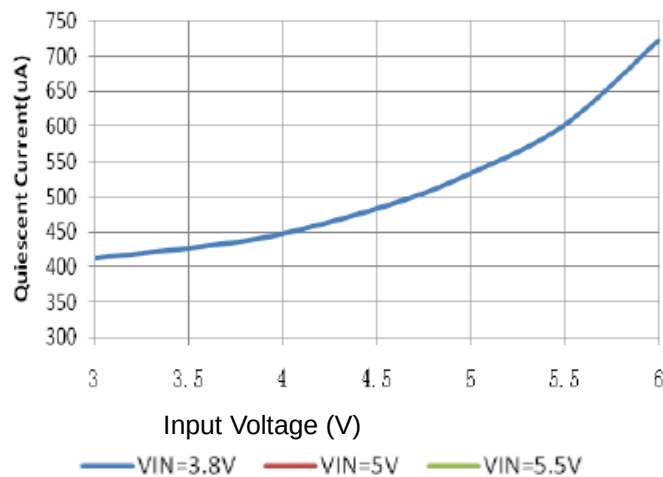
Efficiency vs. Output Current
($V_{out}=3.3V$)



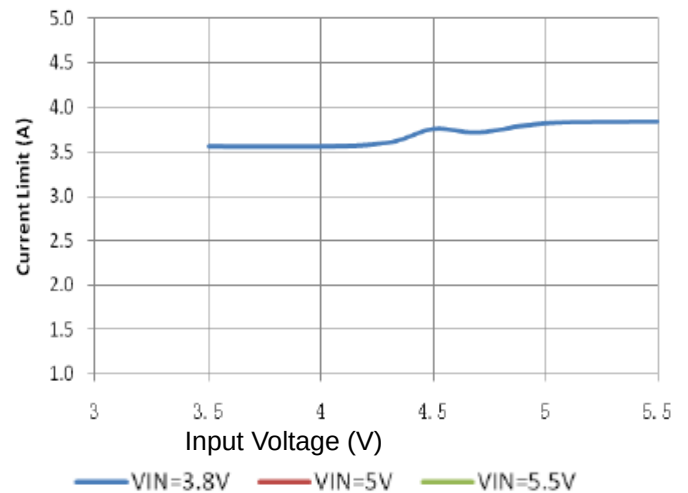
Load Regulation
($V_{out}=3.3V$)



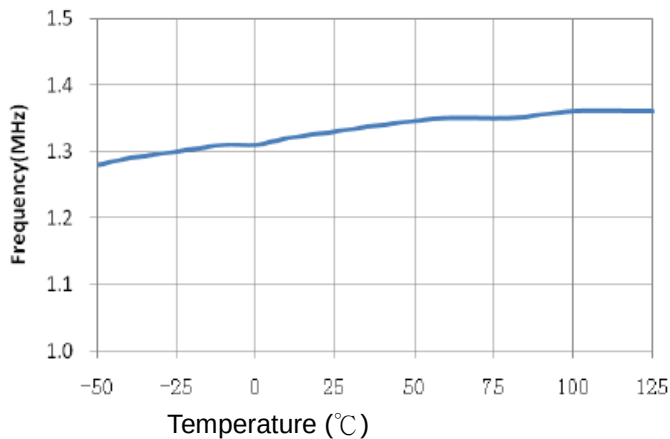
Quiescent Current vs. Input Voltage



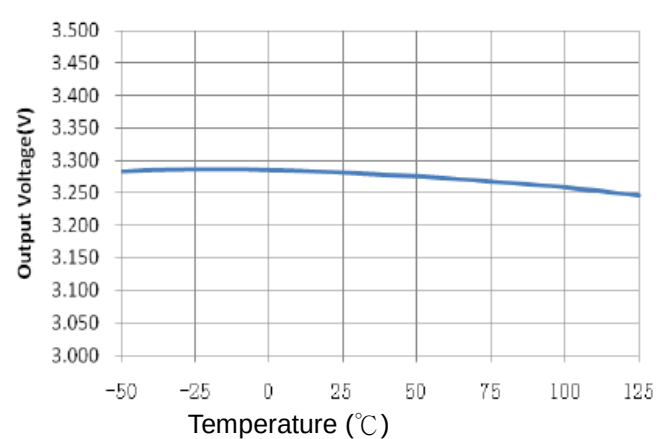
Current Limit vs. Input Voltage



Frequency vs. Temperature
($V_{in}=5V$)



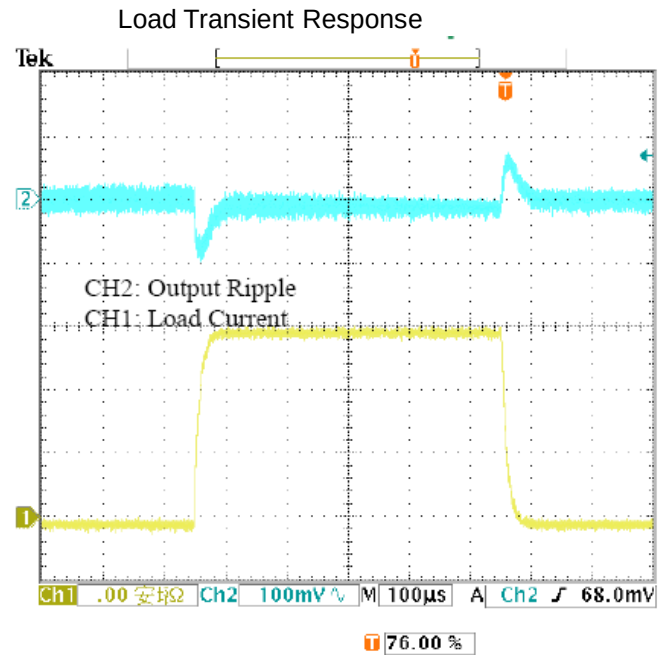
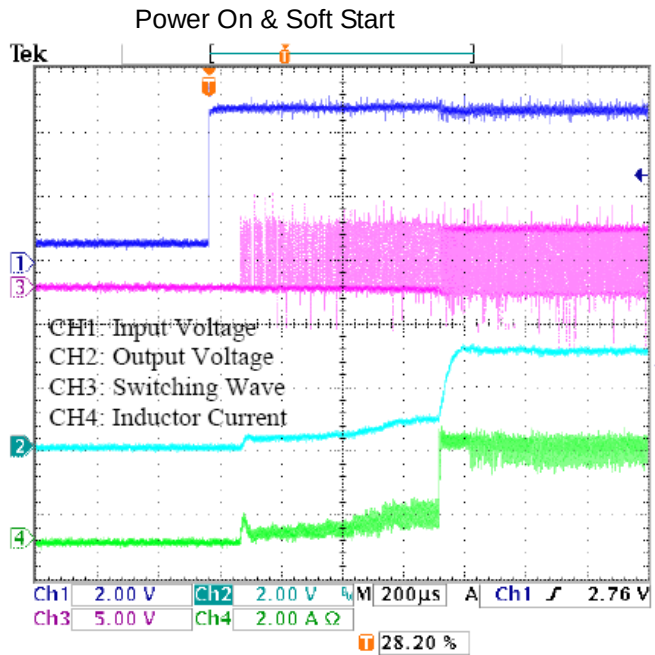
Output Voltage vs. Temperature
($V_{in}=5V$)





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Detailed description

ACE723A is a 3A synchronous buck, with frequency adjusted by Ren_. It can achieve conversion efficiency up to 95%. It also support 100% duty cycle which will maximize the battery usage. Only a inductor and a few R & C need for peripheral. The PCB size can be very small

Please note that EN_ pin has to be pull high if one wants to shutdown the chip. And release it (with a Ren_ connected to GND) to have it work. One can also switch off ACE723A by connect enable signal with at least 1mA driving capability to VDD pin (pin 6 of DFN2x2 and pin 8 of DFN3x3 package).



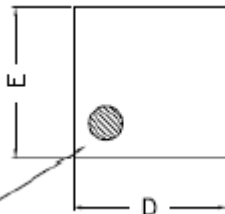
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Packing Information

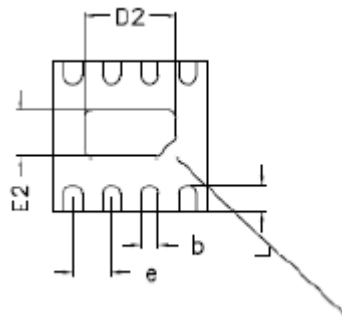
DFN2*2-8

TOP VIEW



Pin 1 dot by marking

BOTTOM VIEW



Pin #1 identification chamfer

Side view



Common Dimensions (mm)			
PKG.	W:very very thin		
REF.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
A1	0.00	-	0.05
A3	0.2 REF.		
D	1.95	2.00	2.05
E	1.95	2.00	2.05
B	0.18	0.23	0.30
L	0.25	0.35	0.45
D2	1.05	1.20	1.30
E2	0.45	0.60	0.70
e	0.50 BSC		

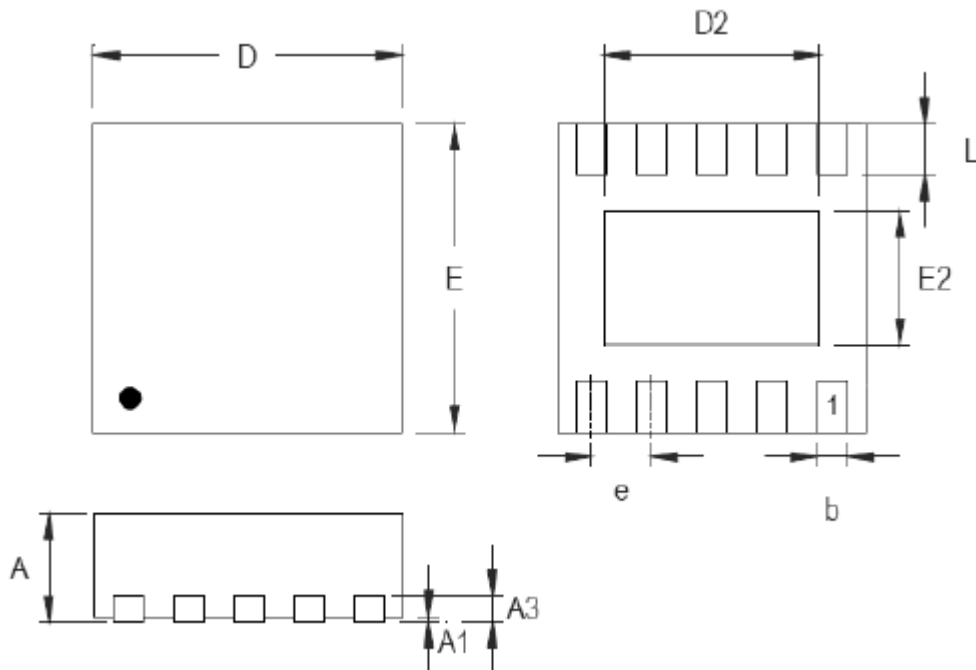


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Packing Information

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Symbol	Dimensions in millimeters	
	MIN.	MAX.
A	0.700	0.800
A1	0.000	0.050
A3	0.175	0.250
b	0.180	0.300
D	2.950	3.050
D2	2.300	2.650
E	2.950	3.050
E2	1.500	1.750
e	0.500	
L	0.350	0.450



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Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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