DESCRIPTION

The A7523 is a compact, high efficiency, and low voltage step-up DC/DC converter with an Adaptive Current Mode PWM control loop, includes an error amplifier, ramp generator, comparator, switch pass element and driver in which providing a stable and high efficient operation over a wide range of load currents. It operates in stable waveforms without external compensation.

The low start-up input voltage below 1V makes A7523 suitable for 1 to 4 battery cells applications of providing up to 600mA output current. Besides, the 14μA low quiescent current together with high efficiency maintains long battery lifetime. The output voltage is set with two external resistors. Both internal 2A switch and driver for driving external power devices (NMOS or NPN) are provided.

The A7523 is available in SOT-26 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-26	E6	A7523E6R-ADJ
		A7523E6VR- ADJ
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

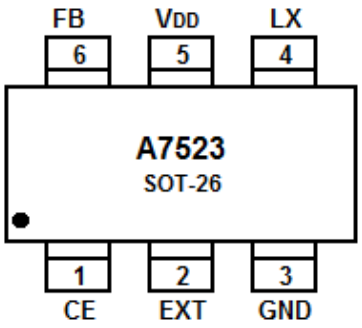
FEATURES

- 0.8V (Iout=1mA) Low Start-up Input Voltage
- 500kHz Fixed Switching Frequency
- 90% Efficiency
- High Supply Capability to Deliver 3.3V 300mA with1 Alkaline Cell or Deliver 5V 800mA with 1 Li-ion Cell
- 14μA Quiescent (Switch-off) Supply Current
- 0.01μA Shutdown Mode Supply Current
- Providing Flexibility for Using Internal and External Power Switches
- Output voltage: Settable to between 2.0V to 6.0V ,accuracy of 2%
- Available in SOT-26 package.

APPLICATION

- MP3
- PDA
- DSC
- LCD Panel
- RF-Tags
- Portable Instrument
- Wireless Equipment

PIN DESCIPTION



TOP VIEW

Pin #	Symbol	Functions
1	CE	Chip enable
2	EXT	Output pin for driving external NMOS
3	GND	Ground
4	LX	Pin for switching
5	V_{DD}	Input positive power pin of A7523
6	FB	Feedback input pin

ABSOLUTE MAXIMUM RATINGS

V_{DD}, Input voltage	Vss-0.3V ~ Vss+7V
V_{OUT}, Output voltage	Vss-0.3V ~ Vss+7V
V_{LX}, Output voltage	Vss-0.3V ~ Vss+7V
I_{EXT}, EXT pin Driver Current	200mA
I_{LX}, LX pin Switch Current	2.5A
P_D, Power dissipation	150mW
T_{OPR}, Operating ambient temperature	-40℃ ~ + 80℃
T_{STG}, Storage ambient temperature	-40℃ ~ + 125℃

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

ELECTRICAL CHARACTERISTICS

T_A=25℃ unless otherwise specified

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Operation start voltage	V_{ST}	I_{OUT}=1mA		0.8	1.05	V
V_{DD} supply voltage	V_{DD}	V_{DD} pin voltage	2		6	V
Shut down current	I_{OFF}	CE=0,V_{IN}=4.5V		0.01	1	μA
Switch-off Current	Iswitch-off	V_{IN}=6V		14	25	μA
Continuous Switching Current	Iswitch	V_{IN}=CE=3.3V,V_{FB}=GND	180	250	450	mA
No load Current	Ino-load	V_{IN}=1.5V,V_{OUT}=3.3V		56		μA
Feedback Reference Voltage	Vref	Close Loop V_{DD}=3.3V	1.225	1.25	1.275	V
Switching Frequency	Fs	V_{DD}=3.3V	425	500	575	KHz
Maximum Duty	Dmax	V_{DD}=3.3V	85	95		%
LX on resistance		V_{DD}=3.3V		0.2	1.0	Ω
Current Limit Setting	Ilimit	V_{DD}=3.3V	1.0	1.5	2.0	A
EXT on resistance to V_{DD}		V_{DD}=3.3V		4	8.0	Ω
EXT on resistance to GND		V_{DD}=3.3V		2.15	8.0	Ω
Line Regulation	ΔVline	V_{IN}=3.5~6V,I_L=1mA		0.25	5	mV/V
Load Regulation	ΔVload	V_{IN}=2.5V,I_L=1~100mA		0.5		mV/mA
CE pin Trip level		V_{DD}=3.3V	0.4	0.8	1.2	V
Temperature Stability for V_{OUT}	Ts			50		Ppm/℃
Thermal Shut down Hysterises	ΔTsd			10		℃

TYPICAL PERFORMANCE CHARACTERISTICS

Figure 1.Efficiency vs. Output Current

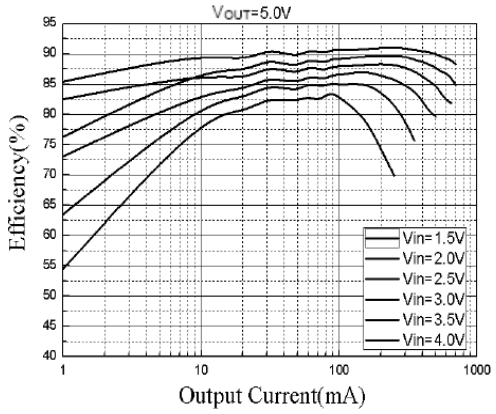


Figure 2. Input current vs. Output current

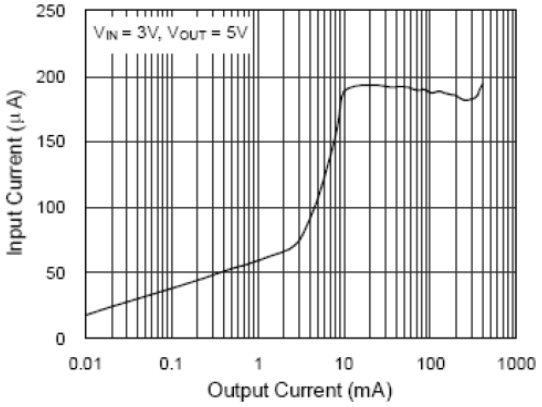


Figure3.Input Current vs. Input Voltage

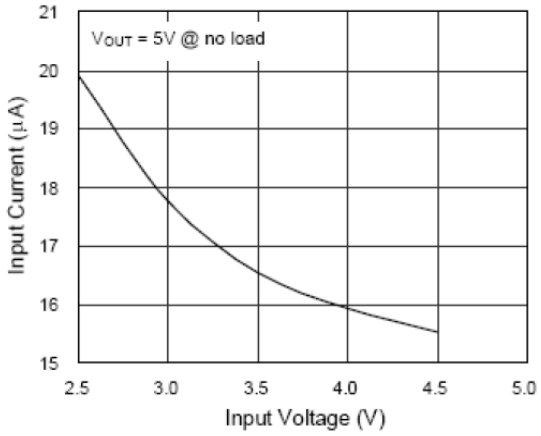


Figure4.Supply Current I(V_{IN}) vs. Input Voltage

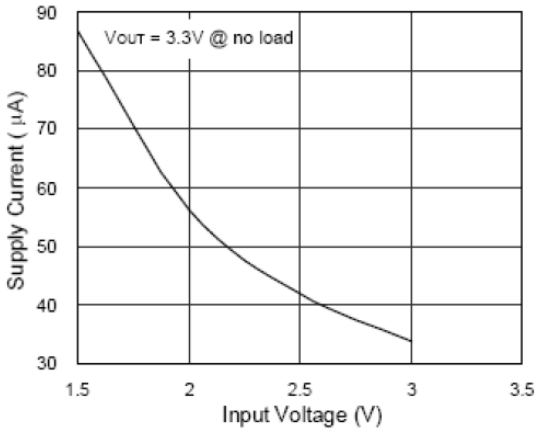


Figure5 ． Switching Frequency vs. V_{DD} pin Voltage

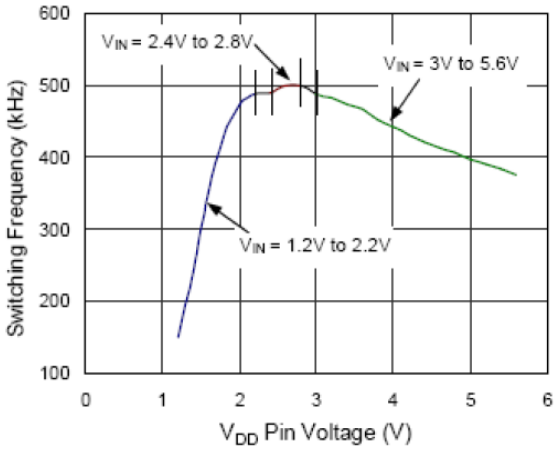


Figure 6. Start up voltage vs. Output Current

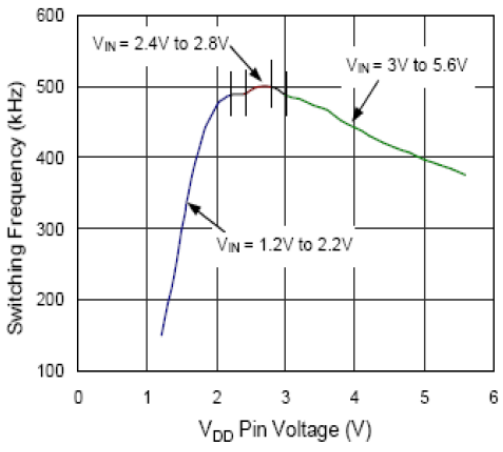


Figure7.LX pin wave form & Output Ripple

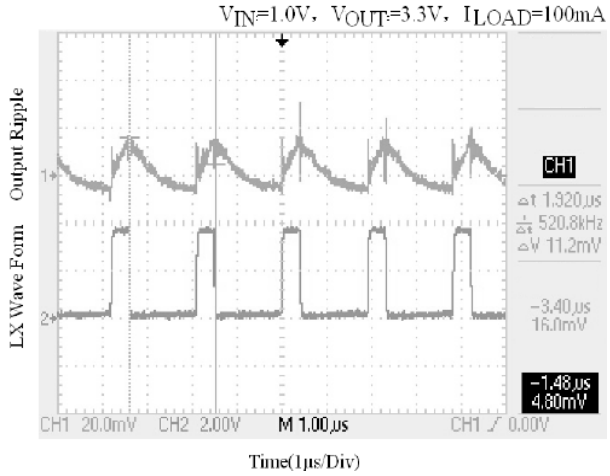


Figure8.Transient Response

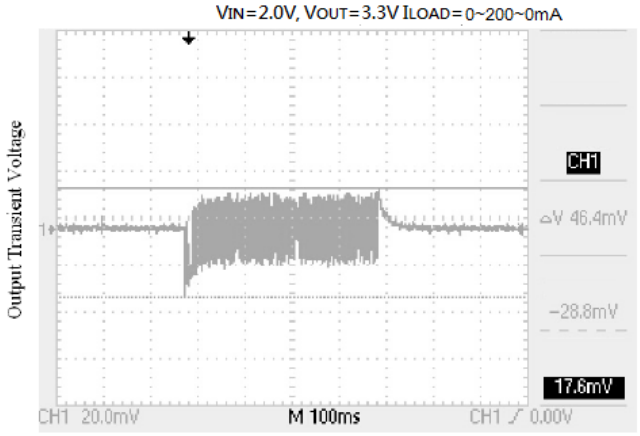
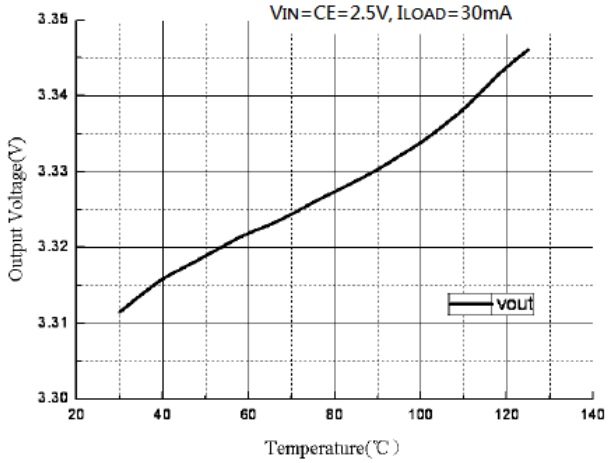


Figure9 . Output Voltage vs. Temperature



TEST CIRCUITS

Figure 10.

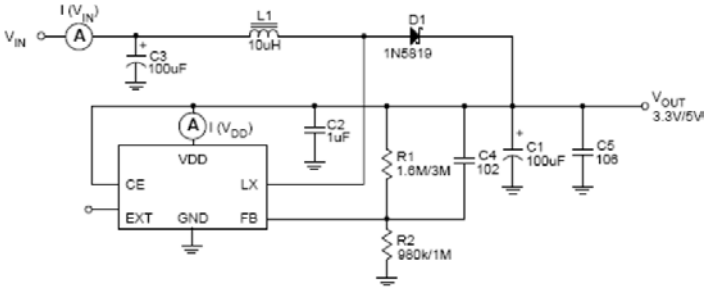


Figure 11. Typical Application for Portable Instruments

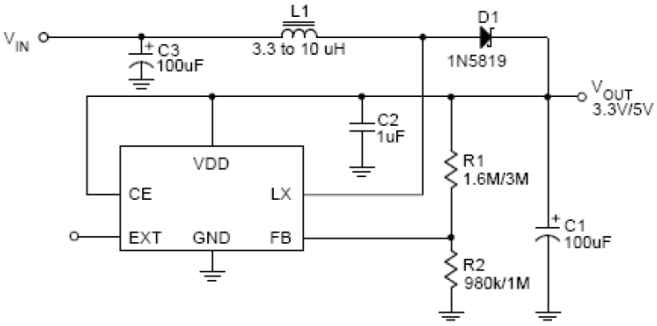


Figure 12. High Voltage Application

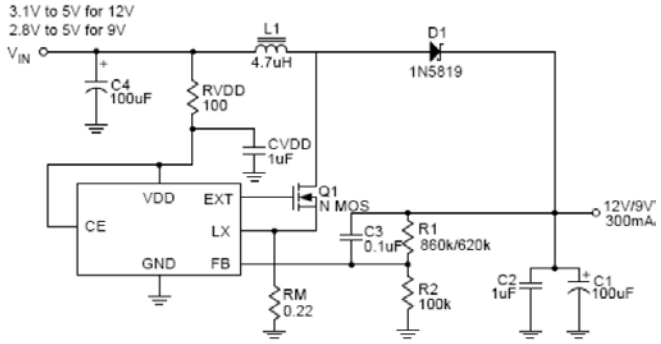


Figure 13. Higher Current Application

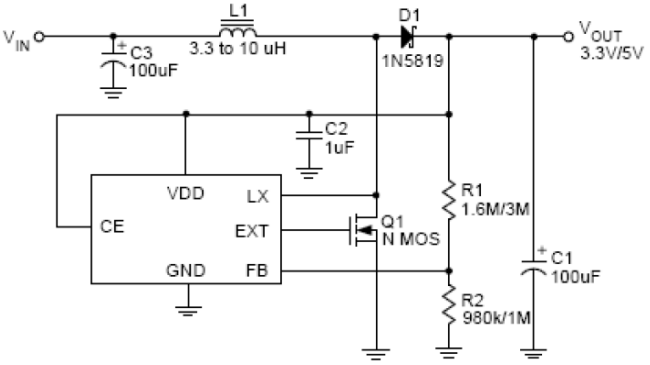
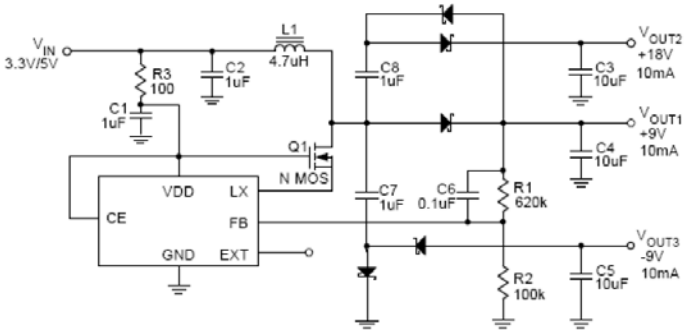
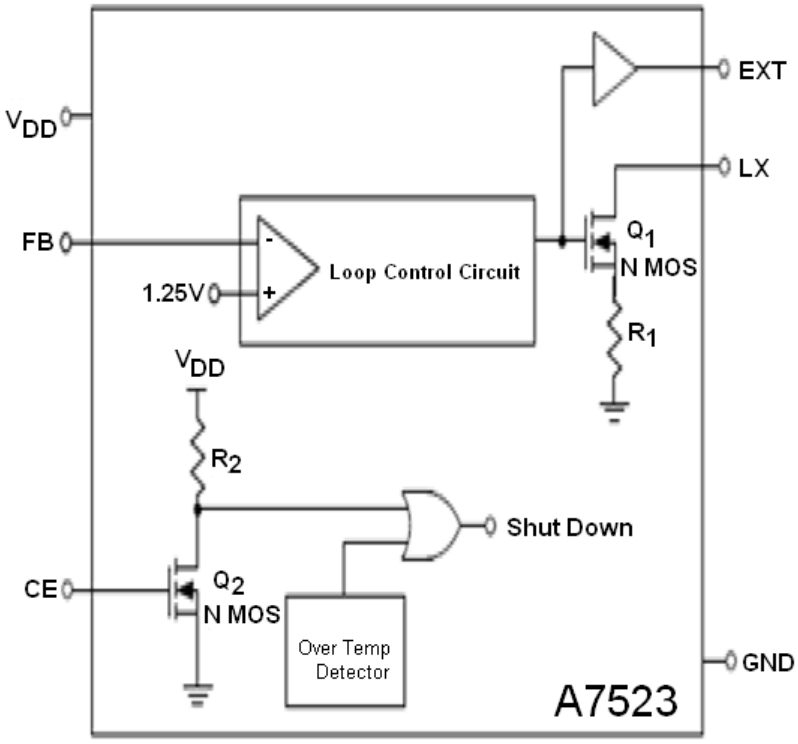


Figure 14. Multi-Output Application

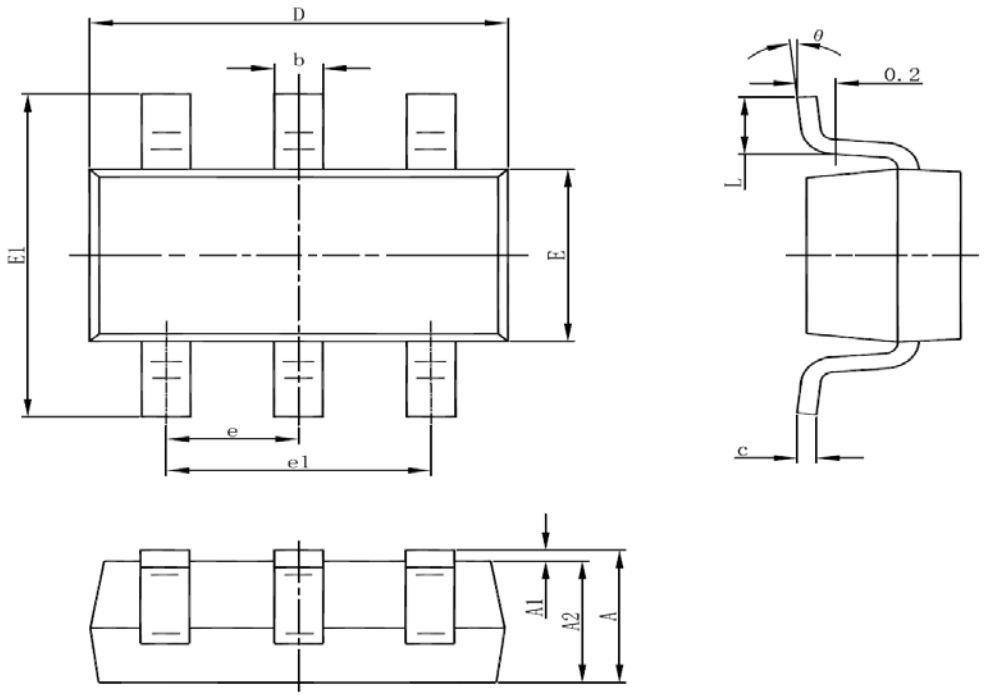


BLOCK DIAGRAM



PACKAGE INFORMATION

Dimension in SOT-26 Package (Unit: mm)



SYMBOL	MIN	MAX
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°

IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc.'s integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or servere property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.