Pin Configuration

DN Package

(DFN-3×3-10)

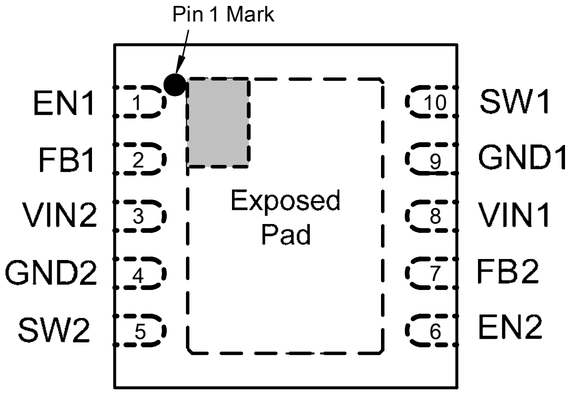


Figure 2. Pin Configuration of AP3422 (Top View)

Pin Description

Pin Number	Pin Name	Function
1	EN1	Channel 1 enable control input. Drive EN1 above 1.5V to turn on the Channel 1. Drive EN1 below 0.6V to turn it off (shutdown current < 0.1μA)
2	FB1	Channel 1 feedback input. Connect FB1 to the center point of the external resistor divider. The feedback voltage is 0.6V
3	VIN2	Channel 2 supply input. Bypass to GND with a 10μF or greater ceramic capacitor
4	GND2	Ground 2
5	SW2	Channel 2 power switch output. Inductor connection to drains of the internal PFET and NFET switches
6	EN2	Channel 2 Enable Control Input. Drive EN2 above 1.5V to turn on the Channel 2. Drive EN2 below 0.6V to turn it off (shutdown current < 0.1μA)
7	FB2	Channel 2 feedback input. Connect FB2 to the center point of the external resistor divider. The feedback voltage is 0.6V
8	VIN1	Channel 1 supply input. Bypass to GND with a 10μF or greater ceramic capacitor
9	GND1	Ground 1
10	SW1	Channel 1 power switch output. Inductor connection to drains of the internal PFET and NFET switches

Functional Block Diagram

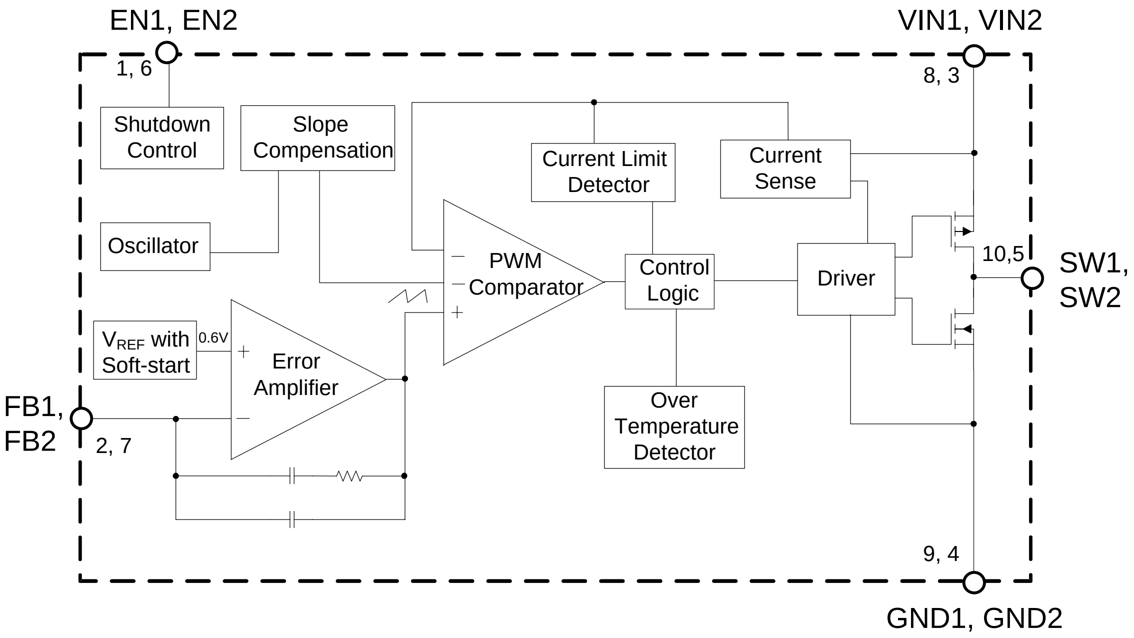
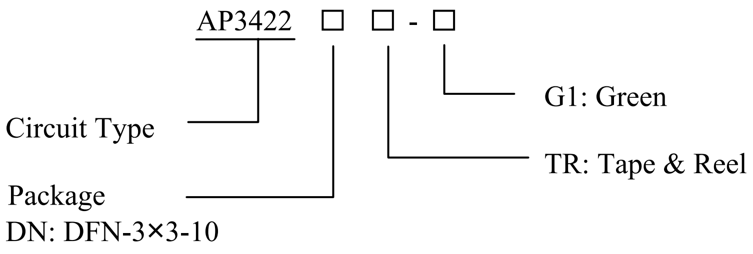


Figure 3. Functional Block Diagram of AP3422 (Diagram represents ½ of the AP3422)

Ordering Information



Package	Temperature Range	Part Number	Marking ID	Packing Type
DFN-3×3-10	-40 to 85 ºC	AP3422DNTR-G1	BDC	Tape & Reel

BCD Semiconductor's Pb-free products, as designated with "G1" suffix in the part number, are RoHS compliant and green.

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Input Voltage	V_{IN1}, V_{IN2}	-0.3 to 6	V
Feedback Voltage	V_{FB1}, V_{FB2}	-0.3 to V_{IN} +0.3	V
EN1, EN2 Pin Voltage	V_{EN1}, V_{IN2}	-0.3 to V_{IN}+0.3	V
SW1, SW2 Pin Voltage	V_{SW1}, V_{SW2}	-0.3 to V_{IN}+0.3	V
Thermal Resistance	θ_{JA}	50	ºC/W
Operating Junction Temperature	T_J	150	ºC
Storage Temperature	T_{STG}	-65 to 150	ºC
Lead Temperature (Soldering, 10sec)	T_{LEAD}	260	ºC

Note 1: Stresses greater than 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 under “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Input Voltage	V_{IN1}, V_{IN2}	2.5	5.5	V
Maximum Output Current	$I_{OUT1\ (MAX)}$, $I_{OUT2\ (MAX)}$	800		mA
Operating Ambient Temperature	T_A	-40	85	ºC

Electrical Characteristics

$V_{IN1}=V_{IN2}=V_{EN1}=V_{EN2}=3.6V$, $T_A=25$℃, unless otherwise specified. Specifications with **boldface type** apply over full operating temperature range from -40 to 85ºC.

Parameters	Symbol	Conditions	Min	Typ	Max	Unit
Supply Current on Each Converter	I_{CC}	V_{FB}=0.55V		400	600	μA
Shutdown Supply Current on Each Converter	I_{SHDN}	V_{EN}=0V, V_{IN}=5.5V		0.01	1	μA
Under Voltage Lockout Threshold	V_{UVLO}	Rising Edge		2.27		V
Under Voltage Lockout Hysteresis	V_{HUVLO}			200		mV
Feedback Bias Current	I_{FB}	V_{FB}=0.65V	-50	0.5	50	nA
Feedback Voltage	V_{FB}	I_{OUT}=100mA	0.588/**0.582**	0.600	0.612/**0.618**	V
Maximum Output Current	$I_{OUT\ (MAX)}$	V_{IN}=2.5V, V_{OUT}=0.9V	800			mA
		V_{IN}=3.6V, V_{OUT}=1.2V	800			
		V_{IN}=4.6V, V_{OUT}=3.3V	800			
Switch Current Limit	I_{LIM}	V_{FB}=0.55V	0.95	1.25		A
Oscillator Frequency	f_{OSC}		0.8	1.1	1.4	MHz
EN Pin Threshold	V_{ENL}				0.6	V
	V_{ENH}		1.5			
EN Pin Input Leakage Current	I_H	V_{EN}=3.6V	-0.1		0.1	μA
	I_L	V_{EN}=0V	-0.1		0.1	μA
Internal PFET On Resistance	R_{DSONP}	I_{SW}=100mA		0.44		Ω
Internal NFET On Resistance	R_{DSONN}	I_{SW}=-100mA		0.29		Ω
Maximum Duty Cycle	D_{MAX}	V_{FB}=0.55V		100		%
Soft-start Time	T_{SS}	V_{EN}=0V to V_{IN} I_{OUT}＝50mA		220		μs
Thermal Shutdown Threshold	T_{OTSD}			160		ºC
Thermal Shutdown Hysteresis	T_{HYS}			30		ºC

Typical Performance Characteristics

$L1=L2=10\mu H$, $C_{IN1}=C_{IN2}=C_{OUT1}=C_{OUT2}=10\mu F$, $T_A=25\ ^{\circ}C$, unless otherwise noted.

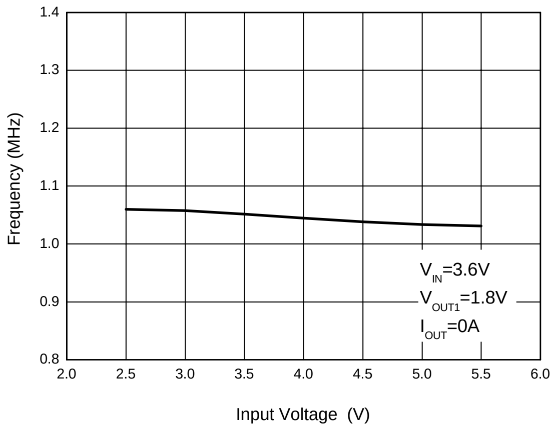


Figure 4. Frequency vs. Input Voltage

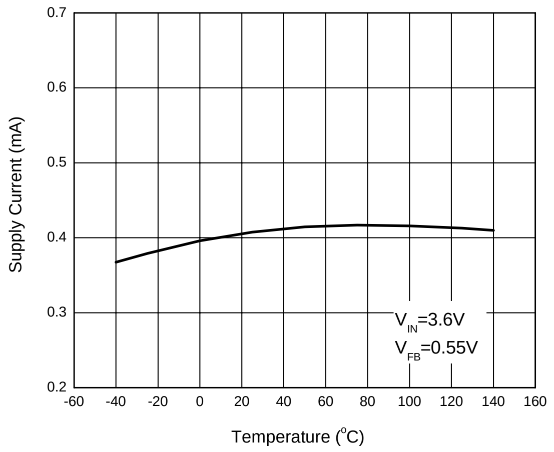


Figure 5. Supply Current vs. Temperature

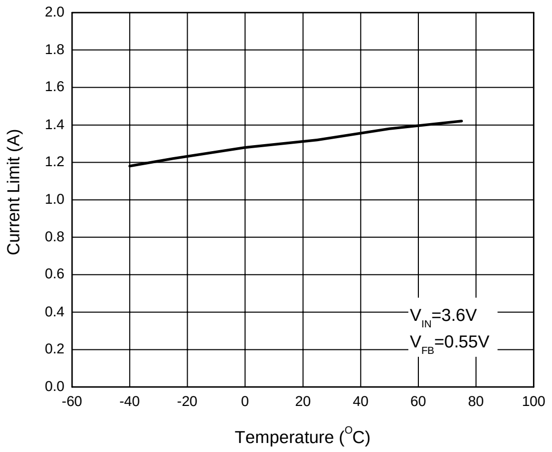


Figure 6. Current Limit vs. Temperature

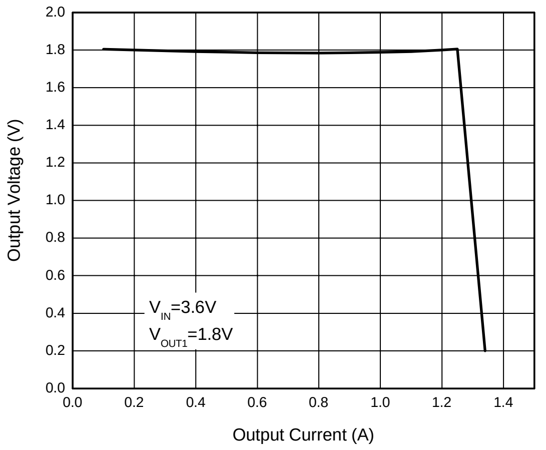


Figure 7. Output Voltage vs. Output Current

Typical Performance Characteristics (Continued)

L1=L2=10μH, C_{IN1}=C_{IN2}=C_{OUT1}=C_{OUT2}=10μF, T_A=25 ºC, unless otherwise noted.

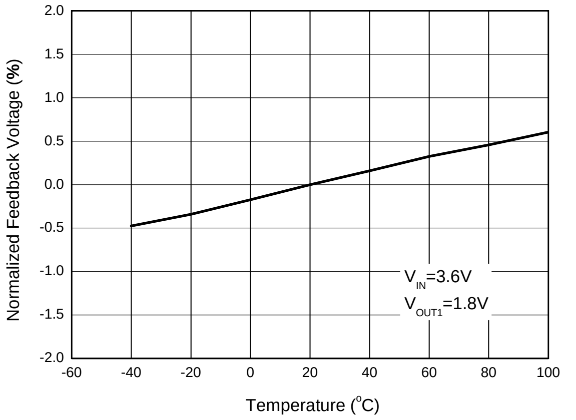


Figure 8. Normalized Feedback Voltage vs. Temperature

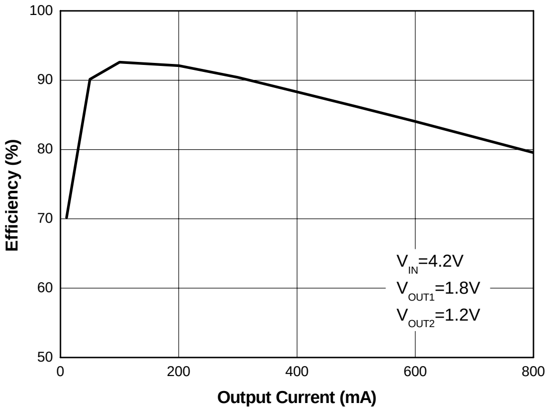


Figure 9. Efficiency vs. Output Current

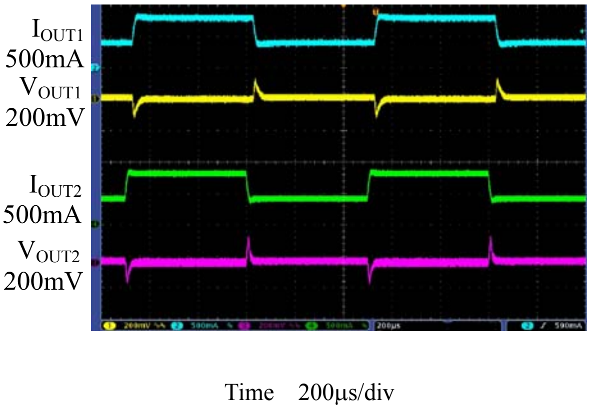


Figure 10. Load Transient (V_{IN}=4.2V, V_{OUT1}=1.8V, V_{OUT2}=1.2V, I_{OUT1}=400mA to 800mA, I_{OUT2}=400 to 800mA)

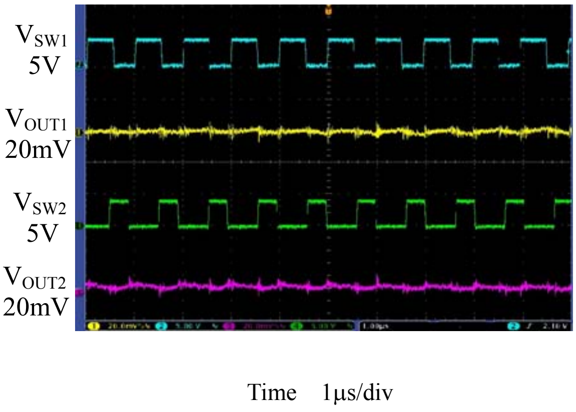


Figure 11. Heavy Load Operation (V_{IN}=4.2V, V_{OUT1}=1.8V, V_{OUT2}=1.2V, I_{OUT1}=I_{OUT2}=800mA)

Typical Performance Characteristics (Continued)

L1=L2=10μH, C_{IN1}=C_{IN2}=C_{OUT1}=C_{OUT2}=10μF, T_A=25 ºC, unless otherwise noted.

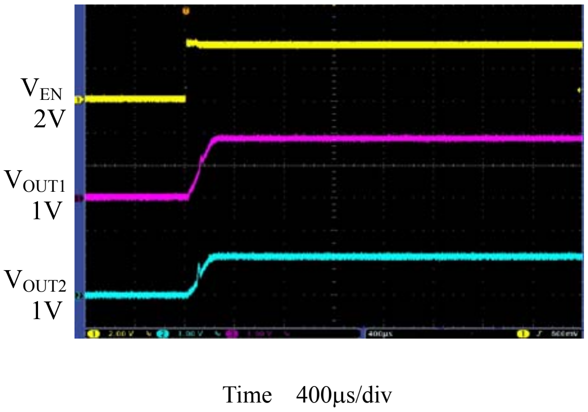


Figure 12. Start-up from Shutdown (V_{IN}=4.2V, V_{OUT1}=1.8V, V_{OUT2}=1.2V, V_{EN}=0 to 3.6V, I_{OUT1}=I_{OUT2}=400mA)

Typical Application

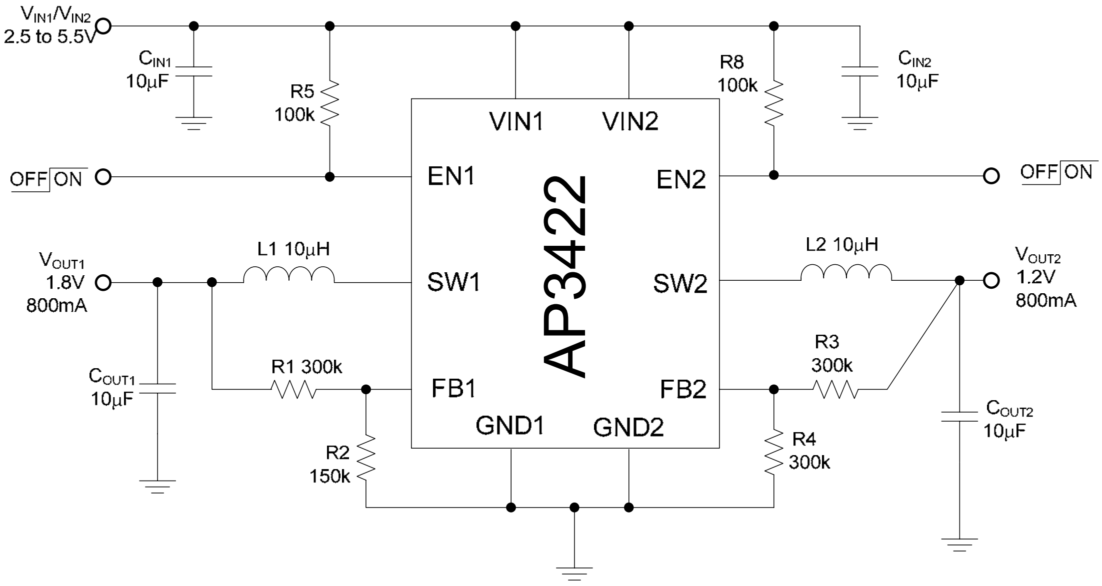
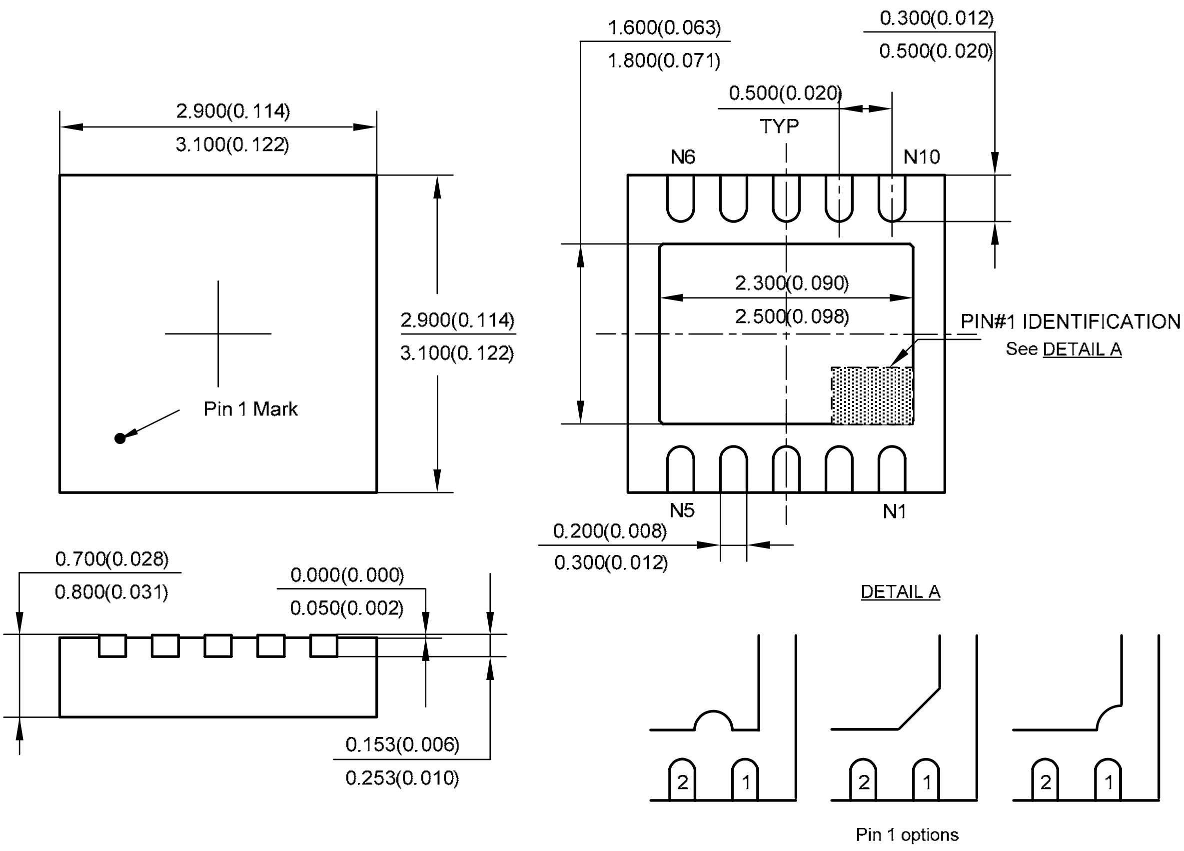


Figure 13. Typical Application of AP3422

Mechanical Dimensions

DFN-3×3-10 **Unit:mm(inch)**



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