DESCRIPTION

The A7336 is a complex power management, which can provide two roads of low-noise high-speed LDOs and high efficiency reached 95% of the DC-DC buck. As the use of CMOS process realization of the work of the chip consumes very little current, the internal use of low-resistance, makes the LDO's output current of up to 300mA, DC-DC load current of up to 600mA.

A built-in low on-resistance transistor provides a low dropout voltage and large output current, a built-in overcurrent protector prevents the load current from exceeding the current capacitance of the output transistor, and a built-in thermal shutdown circuit prevents damage caused by the heat.

The A7336 is available in DFN10 (3x3) package.

ORDERING INFORMAITON

Package Type	Part Number	
DFN10 (3x3)	J10	A7336J10R-X
		A7336J10VR- X
Note	X: See output voltage portfolio V: Halogen free Package R : Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

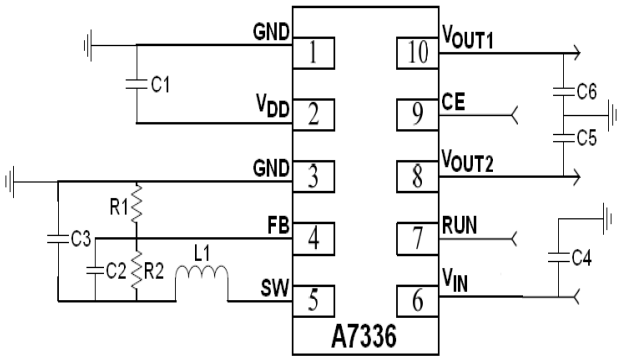
FEATURES

- Highly Accurate : LDO : ± 2%, DC-DC :± 2.5%
- Output current Range : LDO:300mA
  DC-DC:800mA
- High Ripple Rejection 70dB@(1KHz,50mA)
- Low Power Consumption 150μA (TYP.)
- Shutdown Current less than 0.1μA
- Internal protector current limiter、short protector and thermal shutdown protector
- Available in DFN10(3x3) package

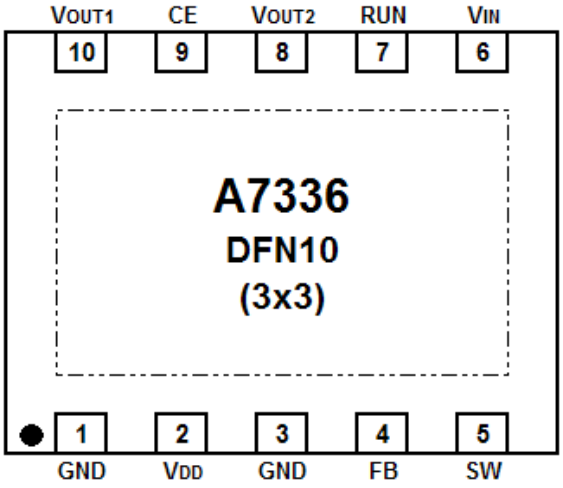
APPLICATIONS

- mobile phones and other handheld electronic products
- DVD
- Battery powered equipment

TYPICAL APPLICATION



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	LGND	Ground of LDO
2	V_{DD}	Supply Power of LDO
3	DGND	Ground of DC-DC
4	FB	Feedback of DC-DC
5	SW	Output of DC-DC
6	V_{IN}	Input of DC-DC
7	RUN	Enable of DC-DC, high active
8	V_{OUT2}	Output of LDO2(high output voltage terminal)
9	CE	Enable of LDO, high active
10	V_{OUT1}	Output of LDO1(Low output voltage terminal)

OUTPUT VOLTAGE PORTFOLIO

Code	Output Voltage		Part Number		Code	Output Voltage		Part Number	
	OUT1	OUT2	Pb Free	GREEN		OUT1	OUT2	Pb Free	GREEN
B	1.5	2.8	A7336J10R-B	A7336J10VR-B	K	2.5	1.8	A7336J10R-K	A7336J10VR-K
C	1.5	3.0	A7336J10R-C	A7336J10VR-C	M	2.8	1.8	A7336J10R-M	A7336J10VR-M
D	1.5	3.3	A7336J10R-D	A7336J10VR-D	O	2.8	2.8	A7336J10R-O	A7336J10VR-O
E	1.5	4.0	A7336J10R-E	A7336J10VR-E	P	2.8	3.0	A7336J10R-P	A7336J10VR-P
G	1.8	2.5	A7336J10R-G	A7336J10VR-G	Q	3.0	2.5	A7336J10R-Q	A7336J10VR-Q
H	1.8	2.8	A7336J10R-H	A7336J10VR-H	R	3.0	3.0	A7336J10R-R	A7336J10VR-R
I	1.8	3.0	A7336J10R-I	A7336J10VR-I	S	3.0	3.3	A7336J10R-S	A7336J10VR-S
J	1.8	3.3	A7336J10R-J	A7336J10VR-J	T	3.3	1.8	A7336J10R-T	A7336J10VR-T

ABSOLUTE MAXIMUM RATINGS

V_{IN}, Input Voltage		V_{SS}-0.3V ~ V_{SS}+6V
$V_{ON/OFF}$, Input Voltage		V_{SS}-0.3V ~ V_{IN}+0.3V
V_{OUT}, Output Voltage		V_{SS}-0.3V ~ V_{IN}+0.3V
P_D, Power Dissipation	DFN10(3x3)	1.2W
T_{OPR}, Operating Ambient Temperature		-40°C ~ + 85°C
T_{STG}, Storage Temperature		-40°C ~ + 125°C

Stresses above 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 in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typ.	Max	Units	Test Circuits
LDO ELECTRICAL CHARACTERISTICS							
Output Voltage	$V_{OUT(E)}$	V_{IN} = $V_{OUT(S)}$ + 1.0V, I_{OUT} = 30mA	$V_{OUT(S)}$ × 0.98	$V_{OUT(S)}$	$V_{OUT(S)}$ × 1.02	V	1
Output Current	I_{OUT}	V_{IN} ≥ $V_{OUT(S)}$ + 1.0V	300	-	-	mA	
Dropout Voltage	V_{DROP}	I_{OUT} = 50mA	-	0.06	0.10	V	
		I_{OUT} = 100mA	-	0.15	0.20		
Line Regulations	ΔV_{OUT1} / $\Delta V_{IN} \times V_{OUT}$	$V_{OUT(S)}$ + 0.5V ≤ V_{IN} ≤ 6V, I_{OUT} = 10mA	-	0.01	0.2	%/V	
Load Regulation	ΔV_{OUT2}	V_{IN} = $V_{OUT(S)}$ + 1.0V, 1.0mA ≤ I_{OUT} ≤ 100mA	-	15	50	mV	
Output Voltage Temperature Characteristics	ΔV_{OUT} / $\Delta T_A \times V_{OUT}$	V_{IN} = $V_{OUT(S)}$ + 1.0V, I_{OUT} = 10mA, -40°C ≤ T_A ≤ 85°C	-	±100	-	ppm/°C	
Supply Current	I_{SS1}	V_{IN} = $V_{OUT(S)}$ + 1.0V	-	70	110	μA	
Shutdown current	I_{STB}	V_{IN} = V_{EN} = $V_{OUT(T)}$ + 1V, V_{EN} = V_{SS}	-	0.01	1	μA	
Input Voltage	V_{IN}		2.0	-	6	V	-
Ripple-Rejection	|PSRR|	V_{IN} = $V_{OUT(S)}$ + 1.0V, f = 1kHz, V_{RIP}=0.5Vrms, I_{OUT}=30mA	-	70	-	dB	2
Short-circuit Current	I_{SHORT}	V_{IN} = $V_{OUT(S)}$ + 1.0V, V_{CE} on, V_{OUT} = GND	-	30	-	mA	1
Current limit	I_{LIM}	V_{IN} = V_{EN} = $V_{OUT(T)}$ + 1V	-	400	-	mA	
CE "High" Voltage	V_{CEH}		1.3	-	V_{IN}	V	
CE "Low" Voltage	V_{CEH}		-	-	0.25	V	
CE "High" Current	I_{CEH}	V_{IN} = V_{CE} = $V_{OUT(T)}$ + 1.0V	-0.1	-	0.1	uA	
CE "Low" Current	I_{CEH}	V_{IN} = $V_{OUT(T)}$ + 1.0V, V_{CE}=V_{SS}	-0.1	-	0.1	uA	

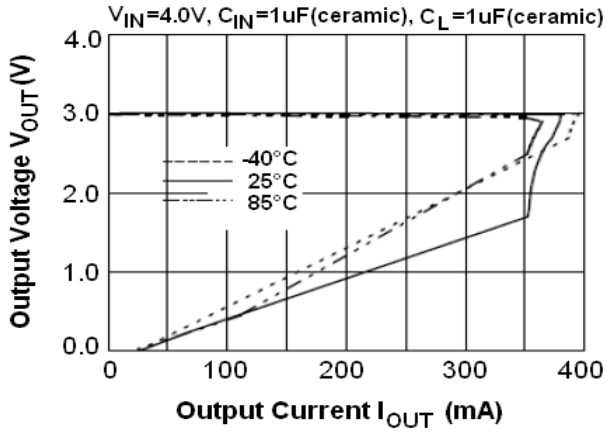
V_{IN} = 3.6V, C_{IN} = 4.7uF, CL = 10uF, L = 3.3uH (T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ.	Max	Units	Test Circuits
DC-DC ELECTRICAL CHARACTERISTICS							
Feedback Voltage	V_{FB}		0.59	0.6	0.61	V	1
Input Voltage	V_{IN}		2	-	6		
Output Voltage	ΔV_{OUT}	IL_{MAX} = 600mA	-	5		mV	
Efficiency	E_{FFI}	V_{IN} = 2.7V; I_L = 60mA	-	92	-	%	
Minimum CE	V_{CEH}		0.8	1	-	V	
Shutdown Current	I_{STB}	V_{CE} = 0V, V_{IN} = 3.6V	0	-	1	uA	2
Supply Current	I_{DD1}	V_{FB} = 0.6V x 0.9	-	150	-	uA	
Quiescent Current	I_{DD2}	V_{FB} = 0.6V x 1.1	-	40	-		
Output Current Limit	I_{LIM}		-	1200	-	mA	
PFM switching	I_L		-	40	-	mA	
Oscillation	FOSC		-	1.2	-	MHz	
Maximum Duty Circle	MAXDTY		100	-	-	%	

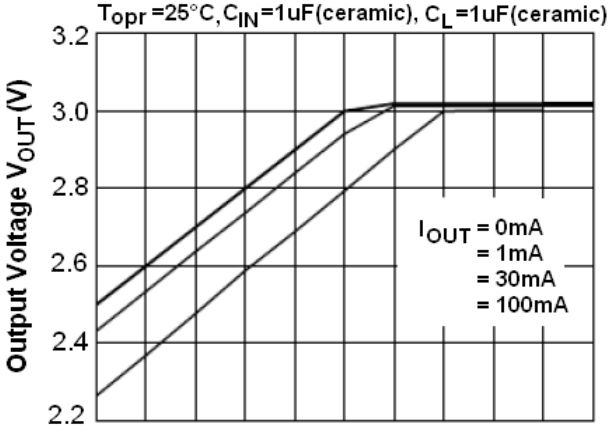
TYPICAL PERFORMANCE CHARACTERISTICS

LDO ELECTRICAL CHARACTERISTICS

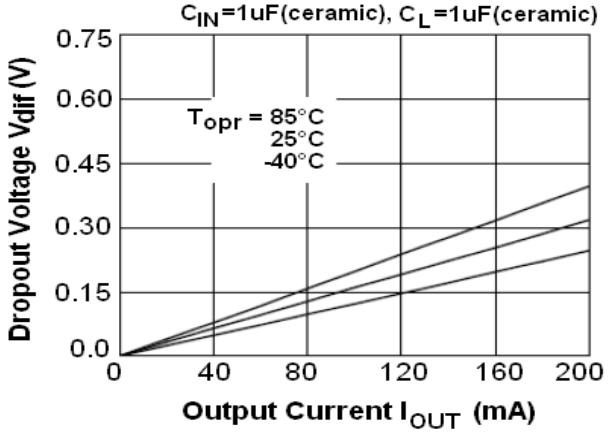
1. Output Voltage-Output Current



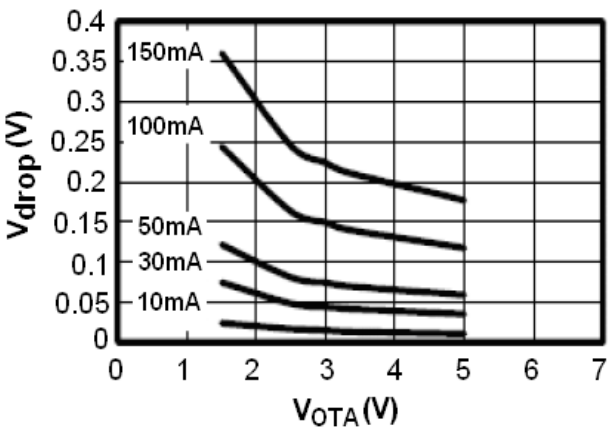
2. Input Voltage-Output Voltage



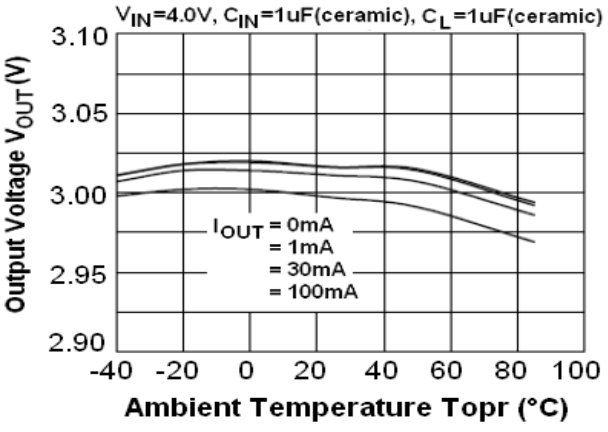
3. Dropout voltage and output current



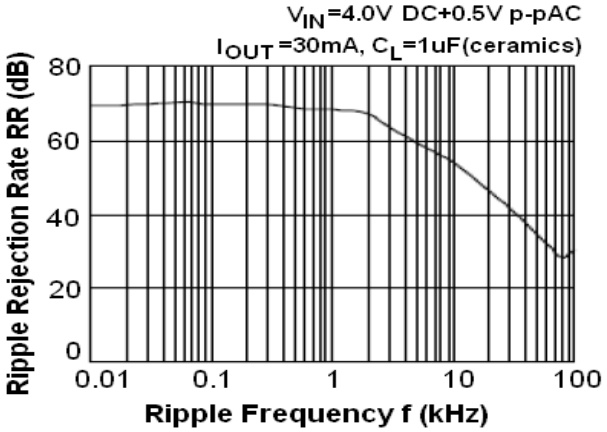
4. Dropout voltage and output voltage



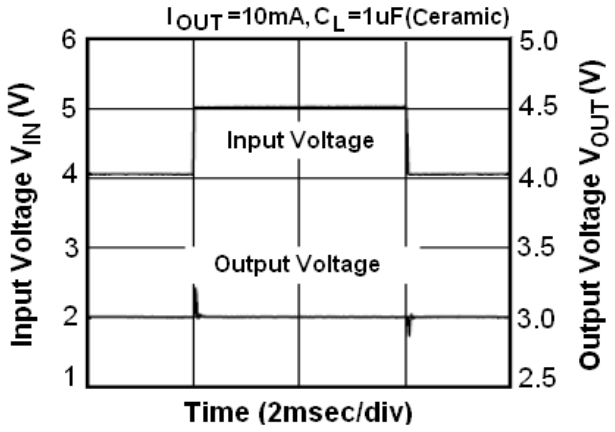
5. Output voltage and temperature



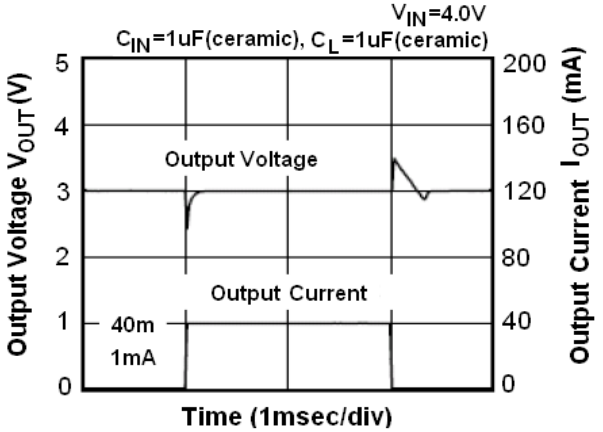
6. PSRR



7. Input transient response characteristics

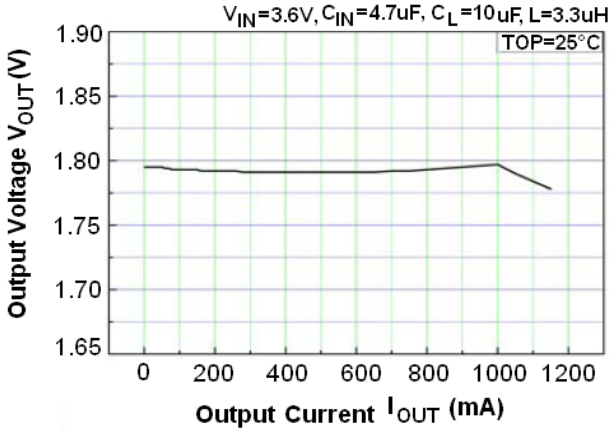


8. Load-response characteristics of the transitional type

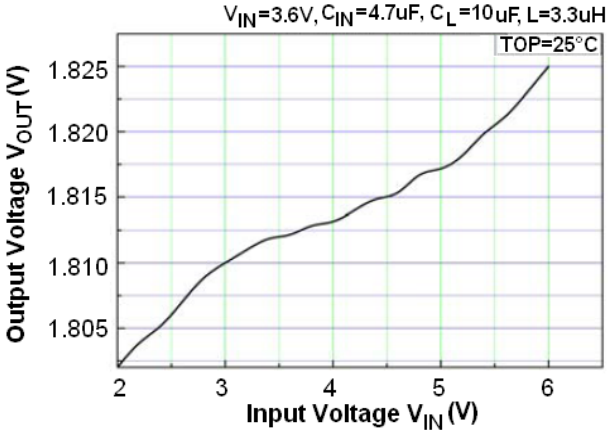


DC-DC ELECTRICAL CHARACTERISTICS

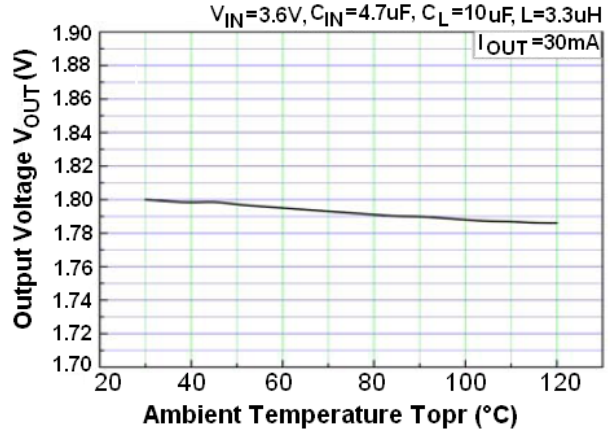
9. Output Voltage-Output Current



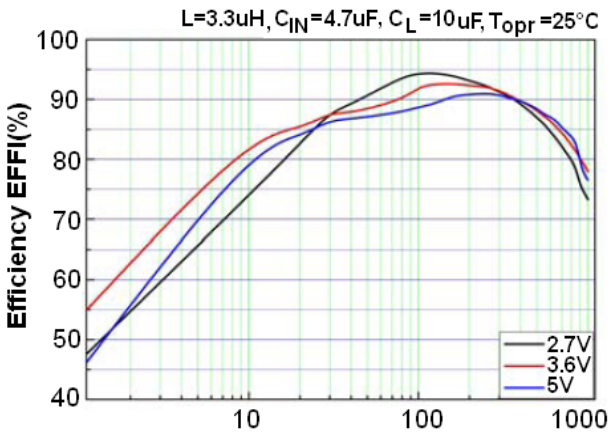
10. Input Voltage-Output Voltage



11. Temperature Characteristics

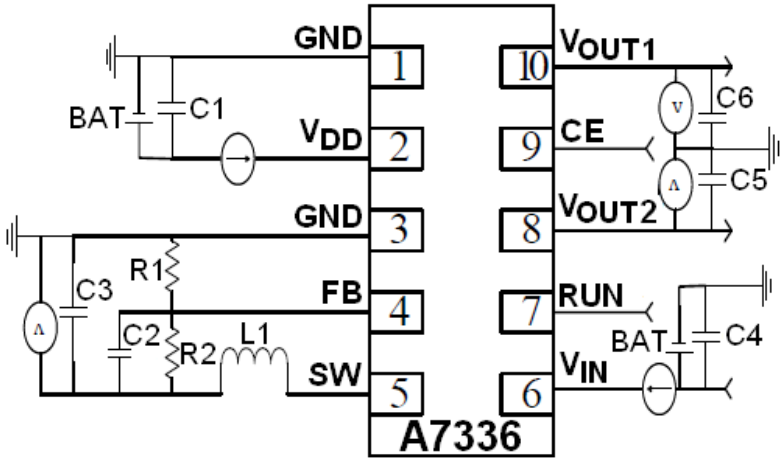


12. Efficiency

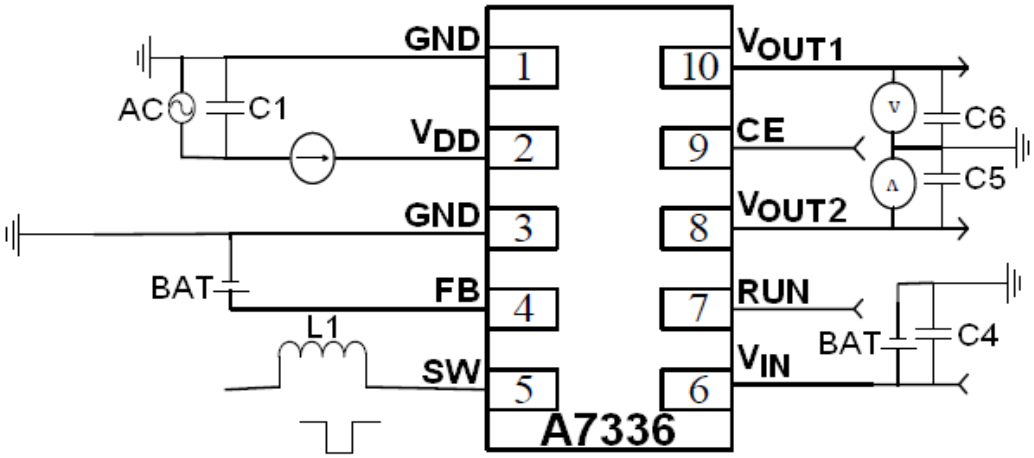


TEST CIRCUIT

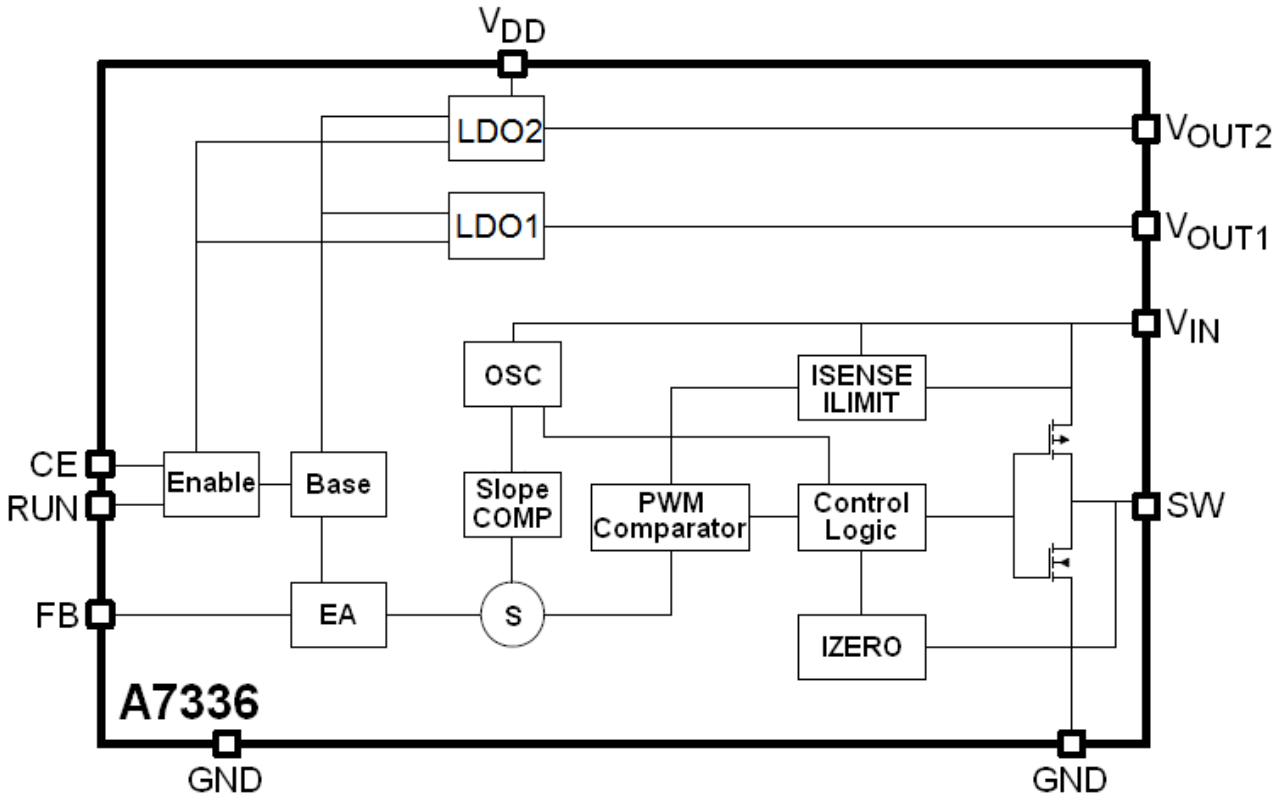
1. Circuit 1



2. Circuit 2

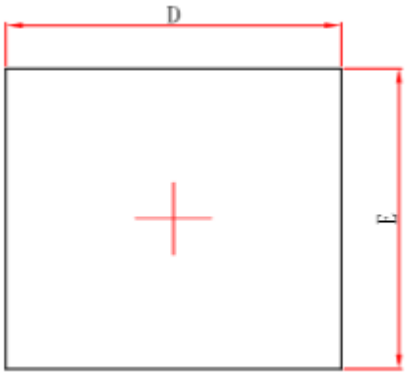


BLOCK DIAGRAM

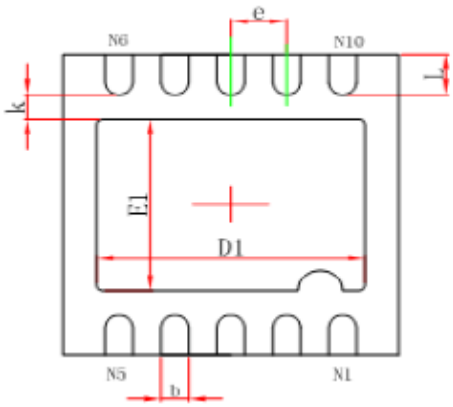


PACKAGE INFORMATION

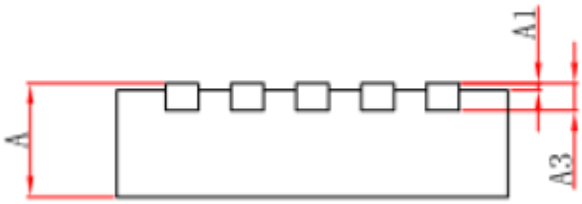
Dimension in DFN10 (3x3) (Unit: mm)



Top View



Bottom View



Side View

Symbol	Min	Max
A	0.700/0.800	0.800/0.900
A1	0.000	0.050
A3	0.203REF	
D	2.900	3.100
E	2.900	3.100
D1	2.300	2.500
E1	1.600	1.800
k	0.200MIN	
b	0.180	0.300
e	0.500TYP	
L	0.300	0.500

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