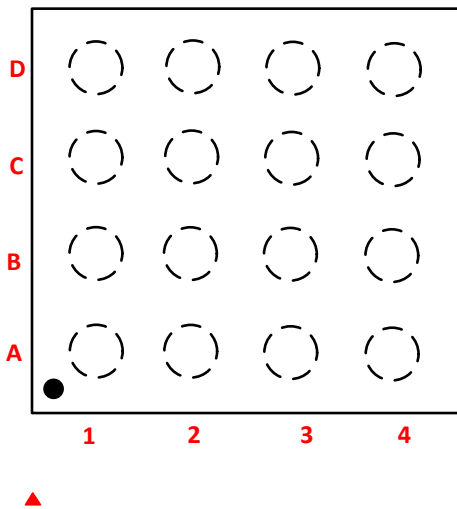


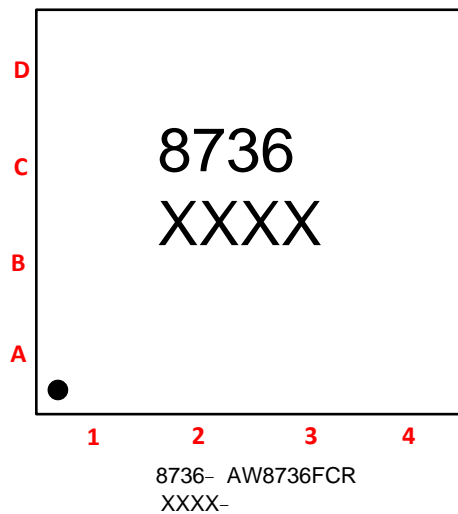
K

◆		K-Chargepump	AW8736		
◆		92%			K
◆		75%			
◆		0.02%	K-Chargepump		92%
◆				75%	
◆		0.8W 1W 1.2W	0.02%		
◆					
◆	TDD-Noise		AW8736	K-Chargepump	
◆	EMI				
◆				3.3V-4.35V	
◆	PSRR -65dB 217Hz				
◆	2mm×2mm FC-16		AW8736	0.8W 1W 1.2W	
				0.7W	
			AW8736		TDD-Noise
◆			EMI		TDD-Noise EMI
			AW8736		
					AW8736
					2mm× 2mm FC-16

AW8736FCR TOP VIEW



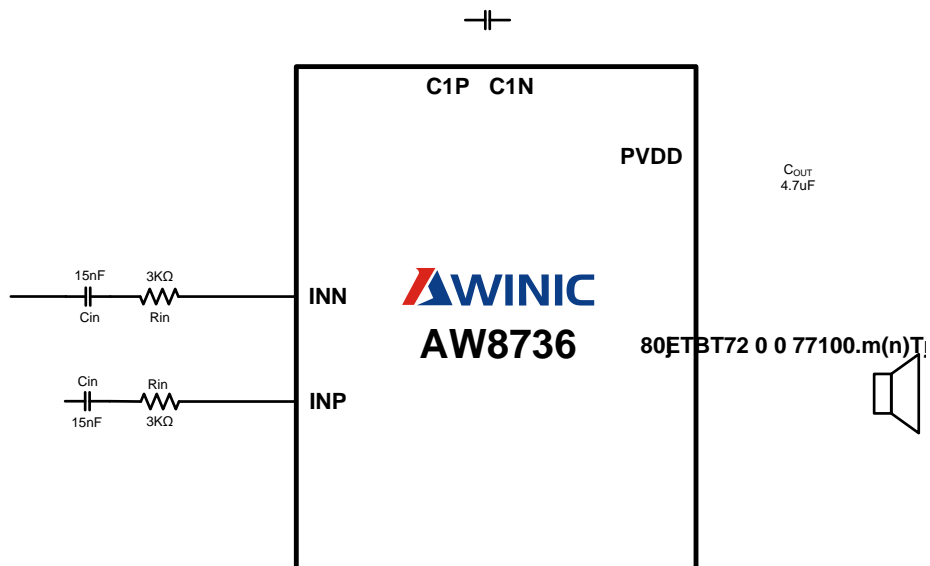
AW8736FCR MARKING



1 AW8736FCR

K

A1	INP		
A2	INN		
A3	VDD		
A4	SHDN		
B1	C2N	Flying	C2
B2			
B3			
B4	VOP		
C1	C1N	Flying	C1
C2	GND		
C3			
C4			
D1	C2P	Flying	C2
D2	C1P	Flying	C1
D3	PVDD		
D4	VON		



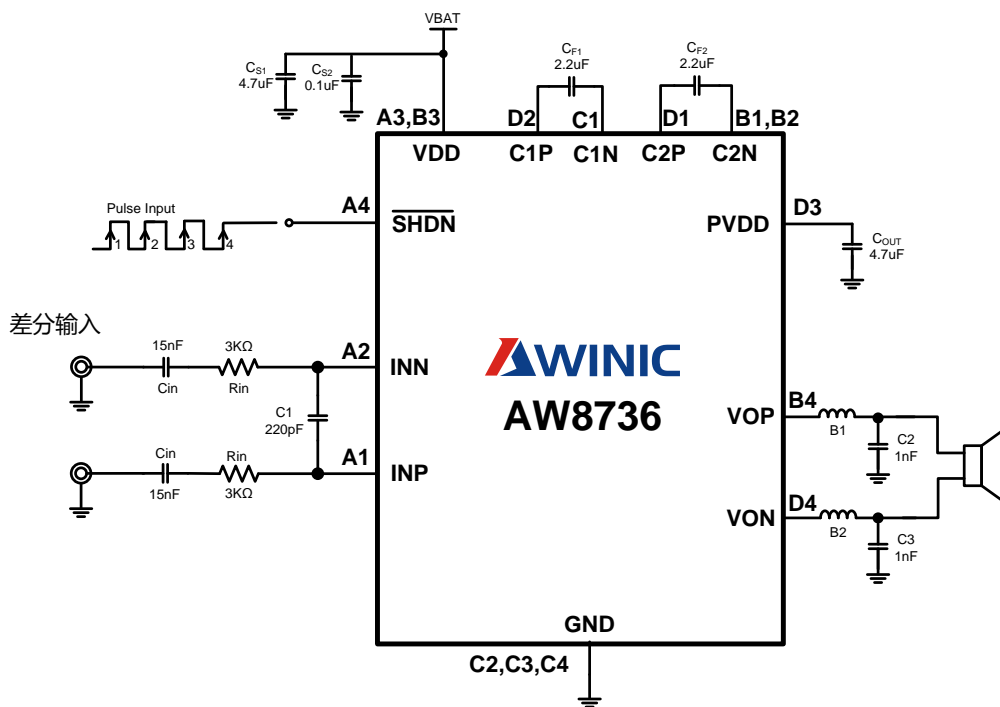
2 AW8736

(1)

1: INN INP

K

Cs X7R/X5R VDD 1uF



3 AW8736

K

(2)

V _{DD}		
INP INN		
JA		
T _{JMAX}		
T _{STG}		
10		
ESD	3	
HBM		±6KV
Latch-up		
JEDEC STANDARD NO.78B DECEMBER 2008		+IT 450mA -IT -450mA

2:

3: HBM





100pF

MIL-STD-883G Method 3015.7

AW8736 C_{in} R_{in} 16.5K
320K/(R_{in}+16.5K)

1 C_{in}=15nF R_{in}=3K 16.3V/V

2 C_{in}=15nF R_{in}=10K 12V/V

		V/V		NCN		W	NCN
				RL=8Ω	RL=4Ω		
1		16.3	12	1.2	2.25		
2		16.3	12	1	2		
3		16.3	12	0.8	1.6		
4		16.3	12	1.65W@THD=1%	2.15W@THD=1%		

K

T_A=25

V _{DD}			3.0		5.0	V
V _{IH}	$\overline{\text{SHDN}}$		1.3		V _{DD}	V
V _{IL}	$\overline{\text{SHDN}}$		0		0.35	V
V _{OS}		V _{DD} =3.0V to 5.0V	-30	0	30	mV
I _{SD}		V _{DD} =3.6V $\overline{\text{SHDN}}$ =0V			1	
T _{TG}	Thermal AGC			150		
T _{TGR}	Thermal AGC			130		
T _{SD}				160		
T _{SDR}				130		
T _{ON}				40		ms
K-Chargepump						
PVDD		V _{DD} =3.0V to 3.8V		1.5*		V
		V _{DD} >3.8V		5.8		V
V _{hys}	OVP	V _{DD} >3.8V		50		mV
F _{CP}		V _{DD} =3.0V to 5.0V	0.8	1.06	1.33	MHz
CP		V _{DD} =4.2V I _{load} =200mA		92		%
T _{ST}		COU _T =4.7uF	1	1.2	1.4	ms
I _L	PVDD			350		mA
K 1-4						
I _q		V _{DD} =3.6V		9.5		mA
		V _{DD} =4.2V P _o =1.2W R _L		75		%
F _{osc}		V _{DD} =3.0V to 5.0V	600	800	1000	kHz
A _v				16.3		V/V
R _{ini}				16.5		
P _{ncn}	1 NCN	V _{DD} =4.2V R _L		1.2		W
		V _{DD} =4.2V R _L =4		2.25		W
	2 NCN	V _{DD} =4.2V R _L		1		W
		V _{DD} =4.2V R _L =4		2		W
	3 NCN	V _{DD} =4.2V R _L		0.8		W
		V _{DD} =4.2V R _L =4		1.6		W
PSRR		V _{DD} =4.2V V _{p-p_sin} =200mV	217Hz	-53	-65	dB
			1kHz	-53	-65	dB
SNR		V _{DD} =4.2V P _o =0.8W R _L		84.5		dB

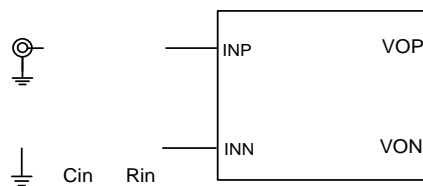
K

		$V_{DD}=4.2V$ $P_o=1.65W$ R_L		87.5		dB
V_n		$V_{DD}=4.2V$ $f=20Hz$ to $20kHz$ input ac grounded	A-weighting	155		μV_{rms}
THD+N	+	$V_{DD}=4.2V, P_o=1W, R_L$, $f=1kHz, Mode1$		0.02		%
		$V_{DD}=4.2V, P_o=1.2W, R_L$, $f=1kHz, Mode4$		0.02		%
P_o	4	THD+N=10% $f=1kHz$ R_L $V_{DD}=4.2V$		2.0		W
		THD+N=1% $f=1kHz$ R_L $V_{DD}=4.2V$		1.65		W
		THD+N=10% $f=1kHz$ R_L $V_{DD}=3.6V$		1.5		W
		THD+N=1% $f=1kHz$ R_L $V_{DD}=3.6V$		1.23		W
		THD+N=10% $f=1kHz$ $R_L=4$ $V_{DD}=4.2V$		2.58		W
		THD+N=1% $f=1kHz$ $R_L=4$ $V_{DD}=4.2V$		2.15		W
		THD+N=10% $f=1kHz$ $R_L=4$ $V_{DD}=3.6V$		1.85		W
		THD+N=1% $f=1kHz$ $R_L=4$ $V_{DD}=3.6V$		1.55		W
T_H	\overline{SHDN}	$V_{DD}=3.0V$ to $5.0V$		0.75	2	10 us
T_L	\overline{SHDN}	$V_{DD}=3.0V$ to $5.0V$		0.75	2	10 us
T_{LATCH}	\overline{SHDN}	$V_{DD}=3.0V$ to $5.0V$		150		500 us
T_{OFF}	\overline{SHDN}	$V_{DD}=3.0V$ to $5.0V$		150		500 us
NCN 4						
T_{AT}	(13.5dB)			40		ms
T_{RL}	13.5dB			1.2		s
A_{MAX}				-13.5		dB

4: 13.5dB 13.5dB

AW8736

4



4 AW8736

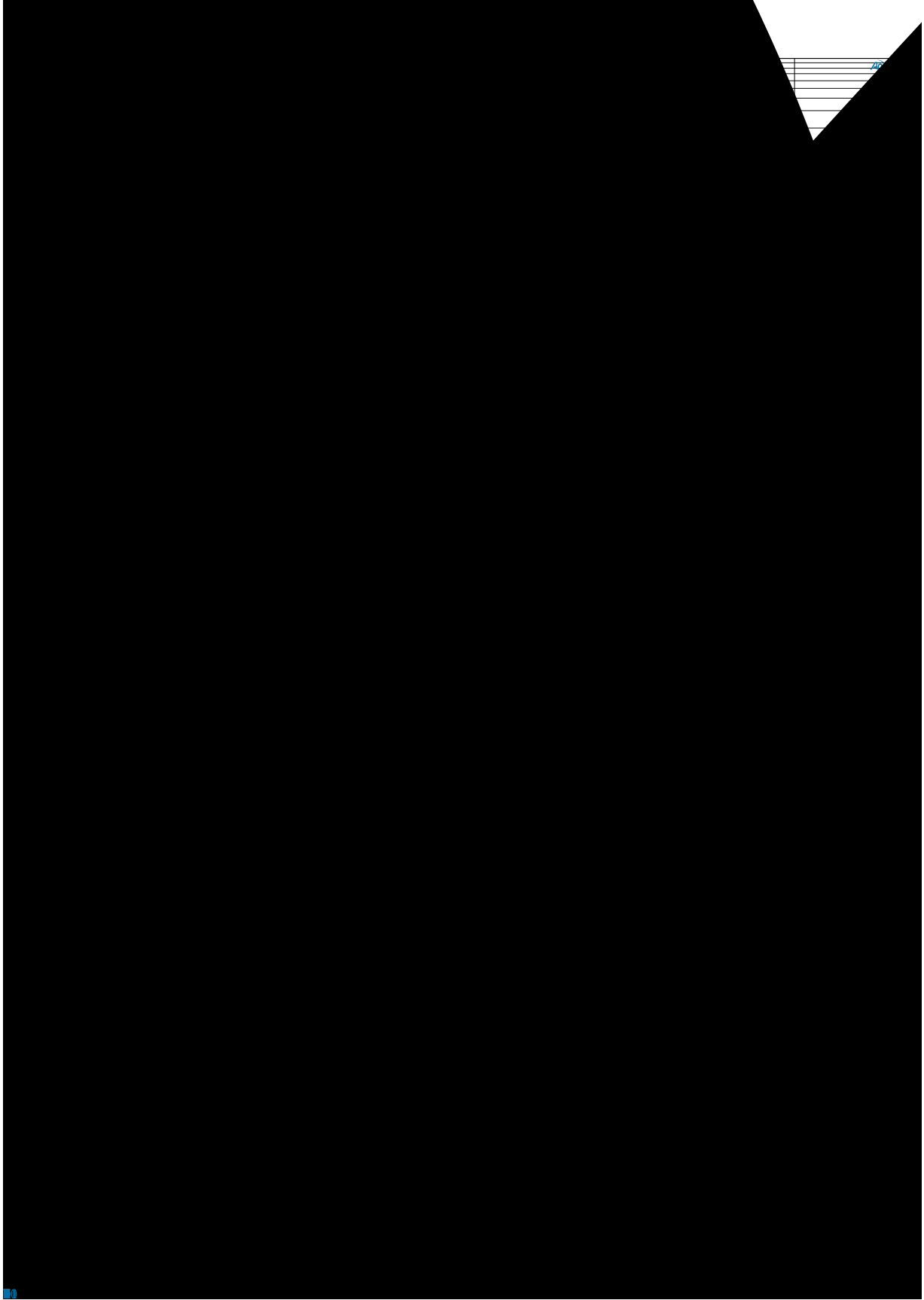
K

1

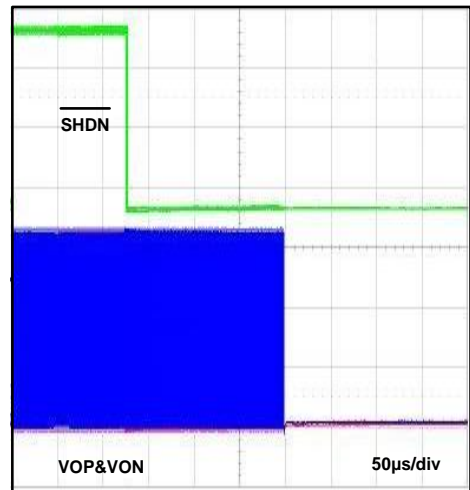
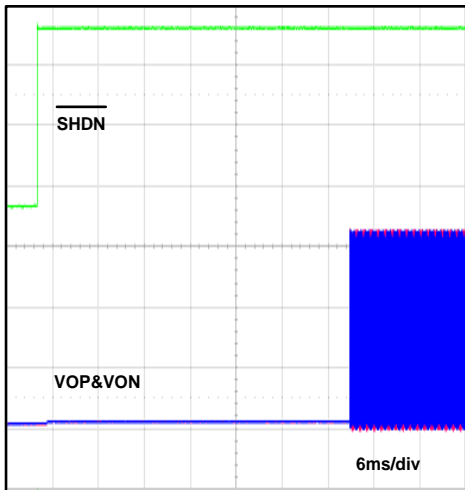
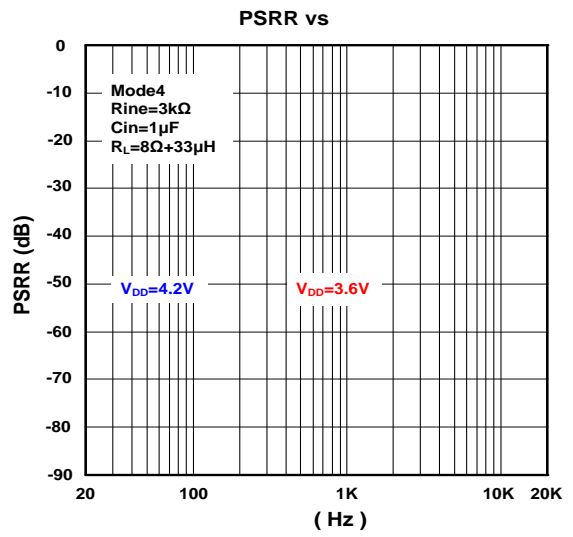
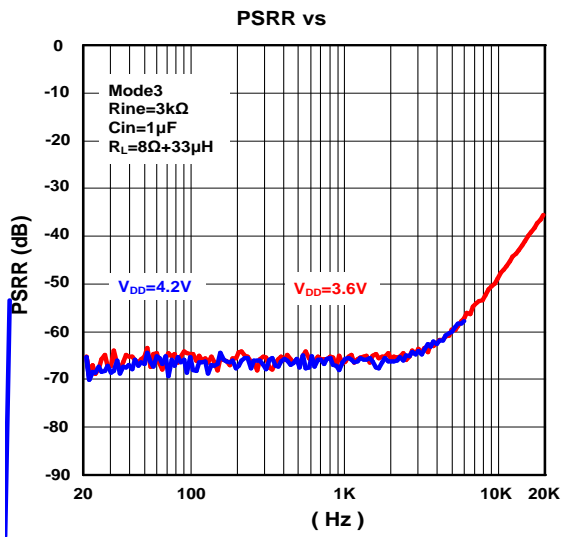
500	10nF	32kHz
1k	4.7nF	

K

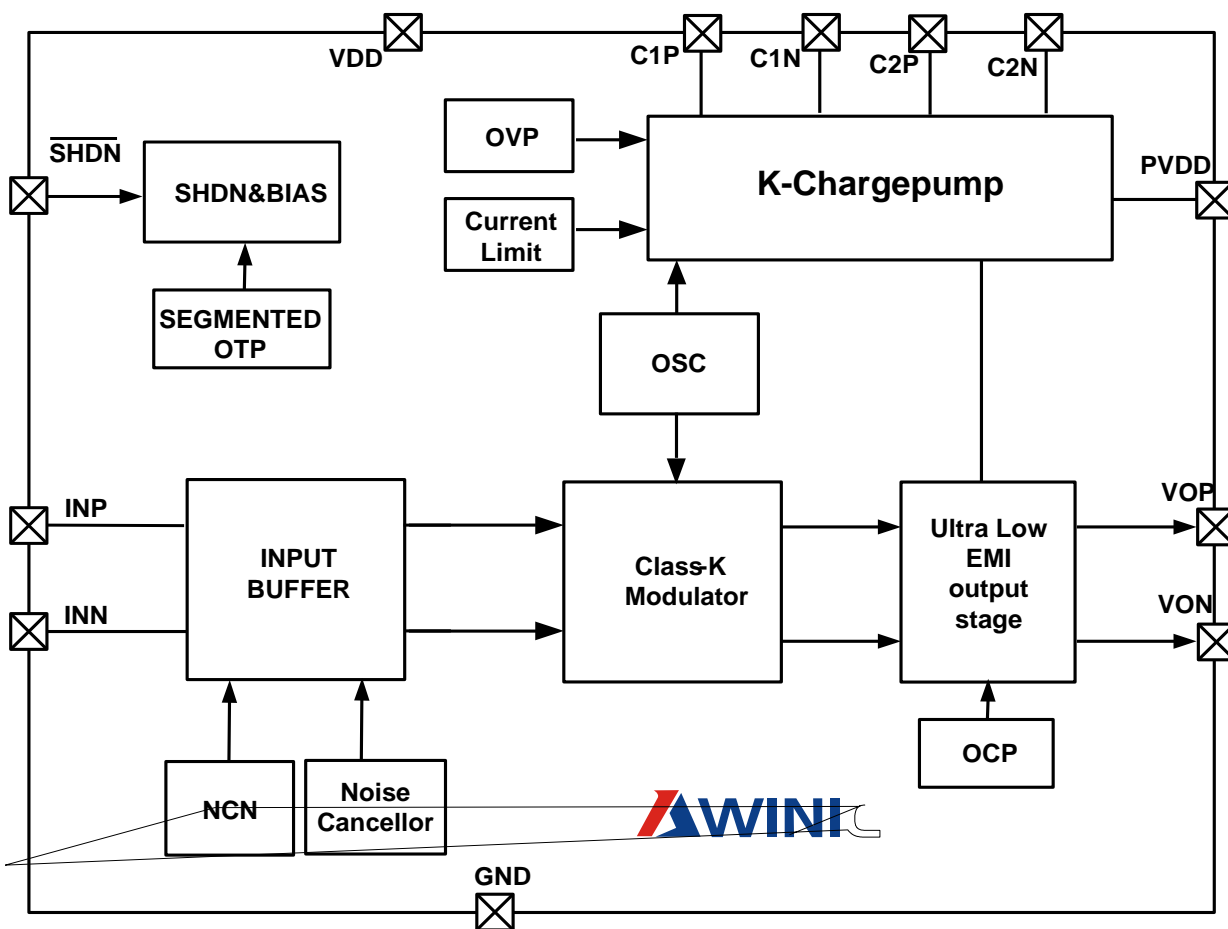
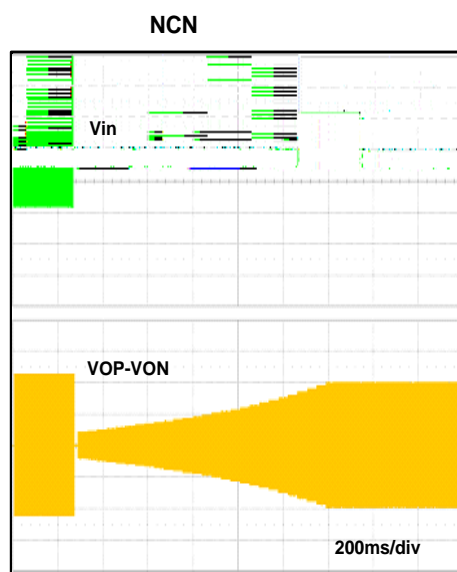
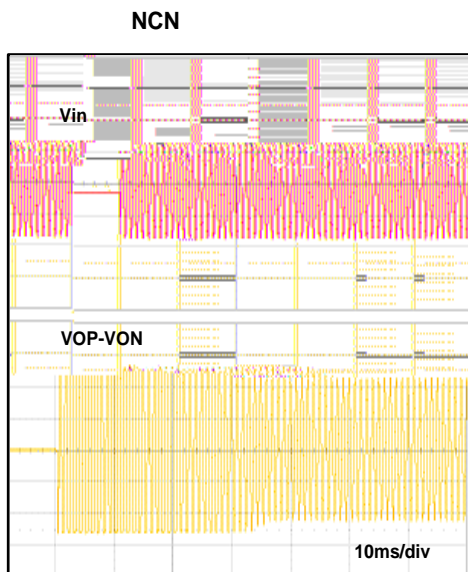
K



K



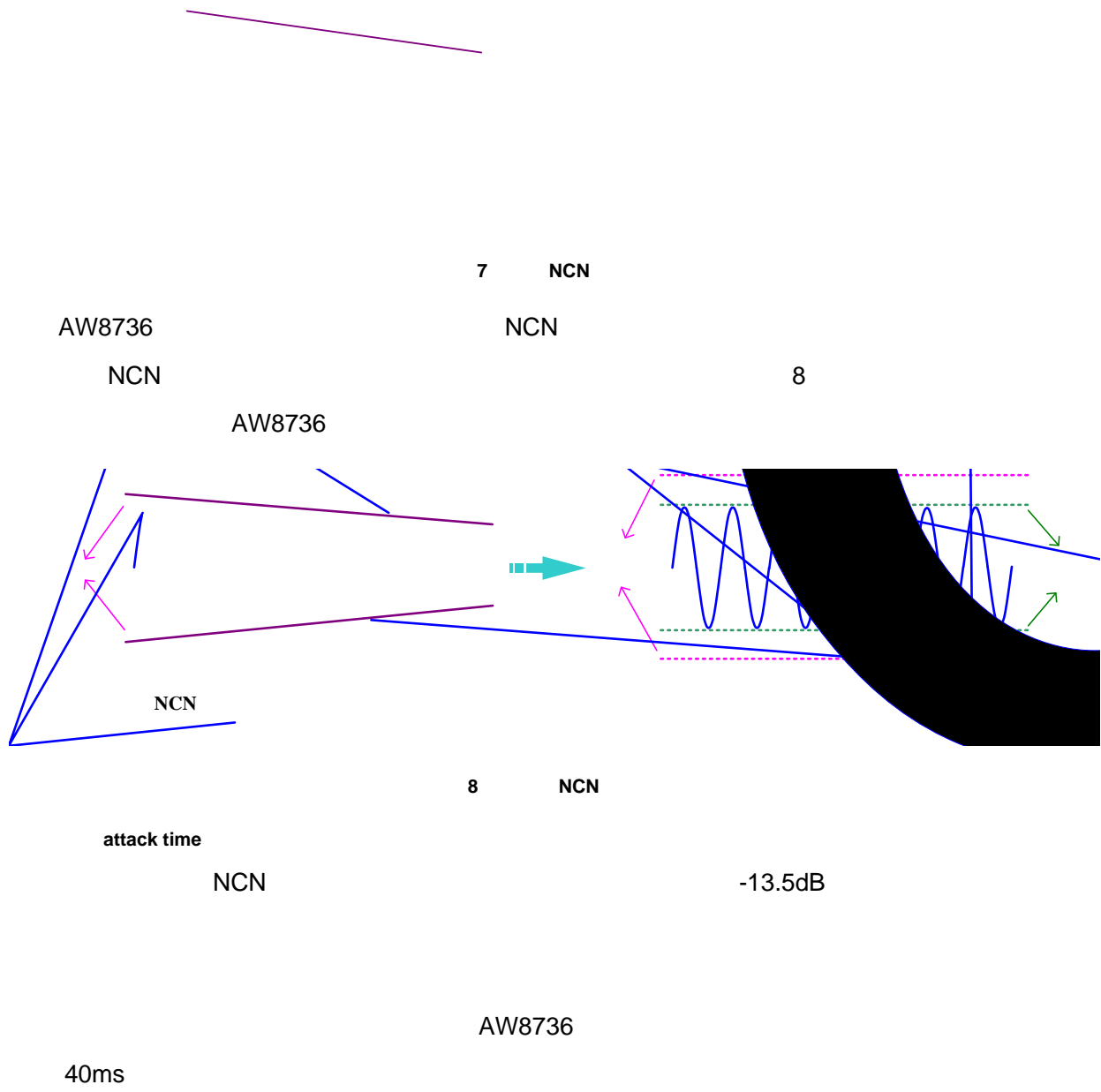
K



K

AW8736									K
			K-Chargepump						(OVP)
	92%		75%			0.02%			
AW8736			K-Chargepump						
	3.3V-4.35V						AW8736	0.8W	1W
1.2W				0.7W					
AW8736			TDD-Noise		EMI		TDD-Noise		EMI
AW8736							AW8736		2mmx2mm
FC-16			-40		85				
			NCN						
AW8736			NCN			3.3V~4.35V			NCN
									AW8736
				AW8736	4				NCN
	1.2W	1W	0.8W						
NCN(Non-Crack-Noise)									
									NCN
									NCN
									7

K



K

release time

NCN

AW8736

1.2s

K-Chargepump

AW8736 K-chargepump

1.1MHz,

AW8736 K-chargepump PVDD VDD 1.5
100% K-chargepump

$$\eta = \frac{P_{OUT}}{P_{IN}} * 100\%$$

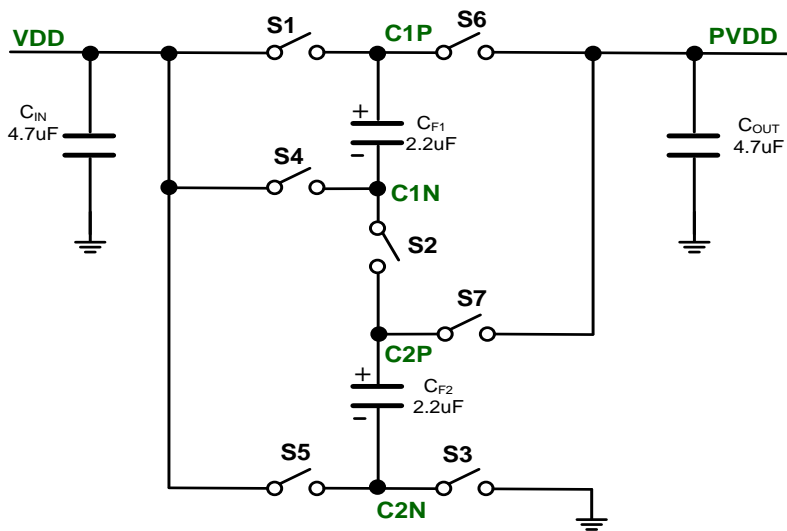
M K-chargepump I_{IN} I_{OUT} M

$$\eta = \frac{P_{OUT}}{P_{IN}} * 100\% = \frac{V_{OUT} * I_{OUT}}{V_{IN} * M * I_{OUT}} * 100\% = \frac{V_{OUT}}{M * V_{IN}} * 100\%$$

M (1.5), V_{OUT} V_{IN} I_{OUT}
K-chargepump 1.5 100%
IC 92% K-chargepump

9 AW8736 7 7
PVDD VDD 1.5

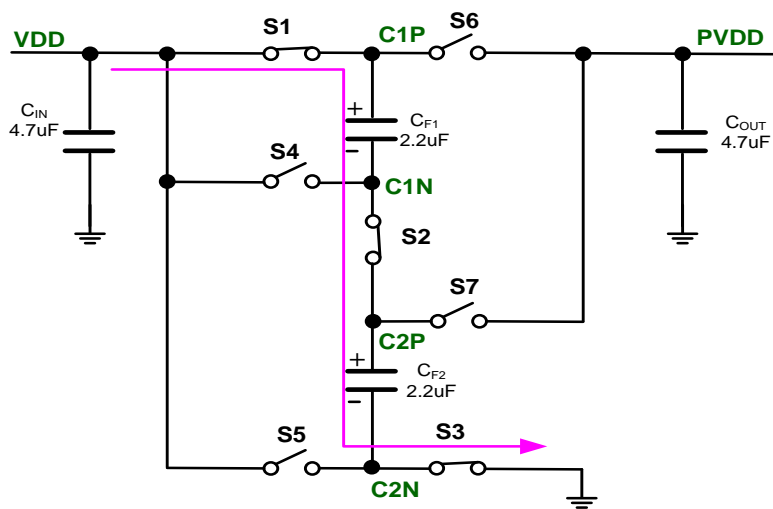
K



9

10 S1 S2 S3 VDD Flying

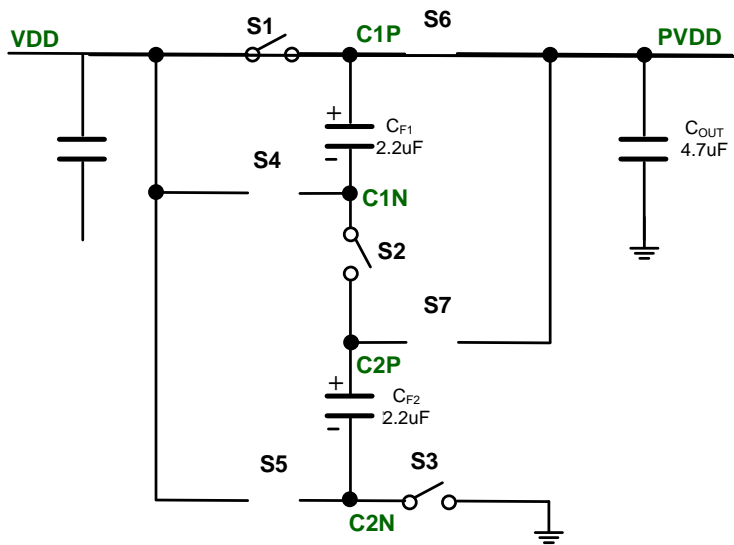
C_{F1} C_{F2}



10 Φ1 Flying

11 S1 S2 S3 S4 S5 S6 S7
Flying C_{F1} C_{F2} VDD PVDD

K



11 Φ2 Flying

C_{OUT}

K-chargepump

350mA

1.2ms

K-chargepump

1.5A

(OVP)

K-chargepump

PVDD

VDD

1.5

K

K-chargepump

VDD

3.8V

PVDD

VDD

PVDD

5.8V

50mV

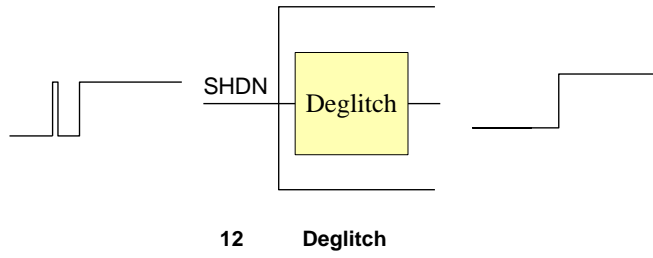
GPIO

GPIO

Deglitch

12

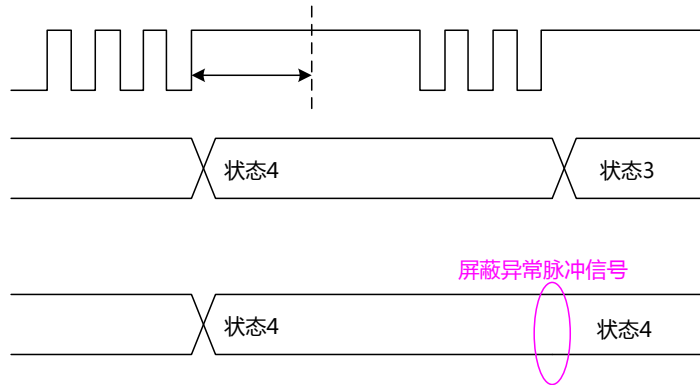
K



BB

AW8736

13



13

AW8736

SHDN

14

SHDN

AW8736

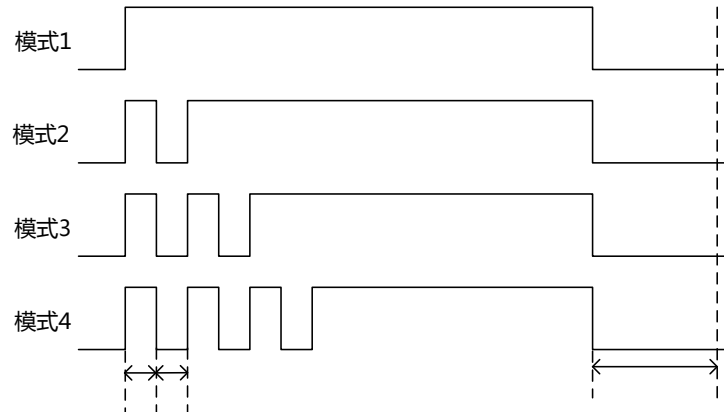
1 SHDN

AW8736

AW8736 4

4

K



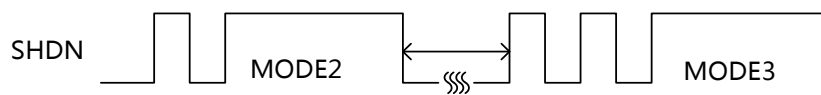
14

SHDN

1ms

T_{OFF}

15



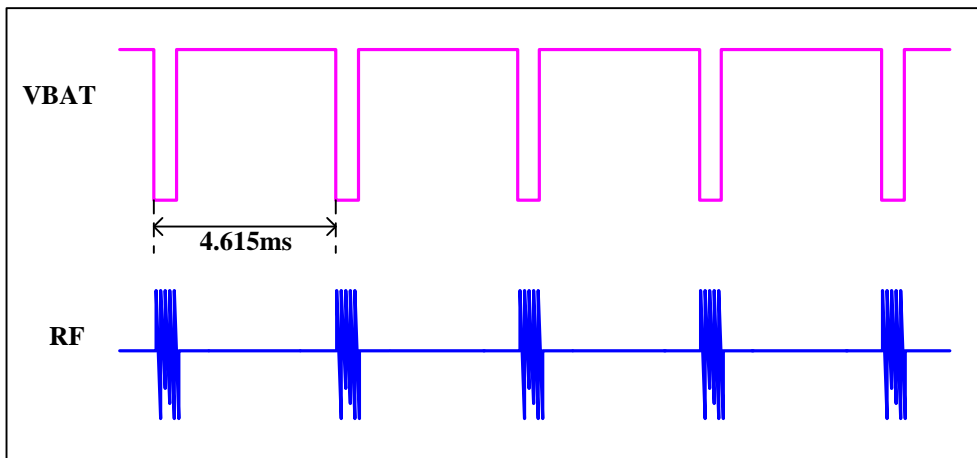
15

RNS(RF TDD Noise Suppression)

TDD Noise

GSM	TDMA	Time Division Multiple Access()		
			TDMA	8
				4.615ms
				0.577ms
GSM	RF		4.615ms	217Hz
	Burst		Burst	217Hz
1800MHz	RF	217Hz	217Hz	900MHz
		217Hz		
	TDD Noise	217Hz	217Hz	

K



16 GSM

RF

RNS

TDD

Noise

RF

217Hz

217Hz

PSRR

$$PSRR = 20 \log \left(\frac{v_{out_{ac}}}{v_{dd_{ac}}} \right)$$

PSRR

-60dB -60dB

1000

500mVp

0.5mV

PSRR

-60dB

-80dB

TDD Noise

Rin

Cin

PSRR

24

1%

PSRR

-46dB

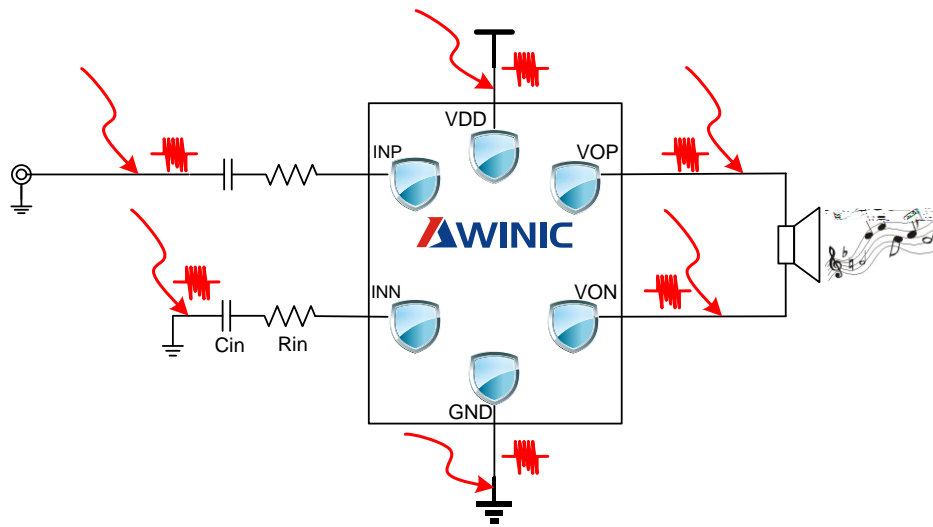
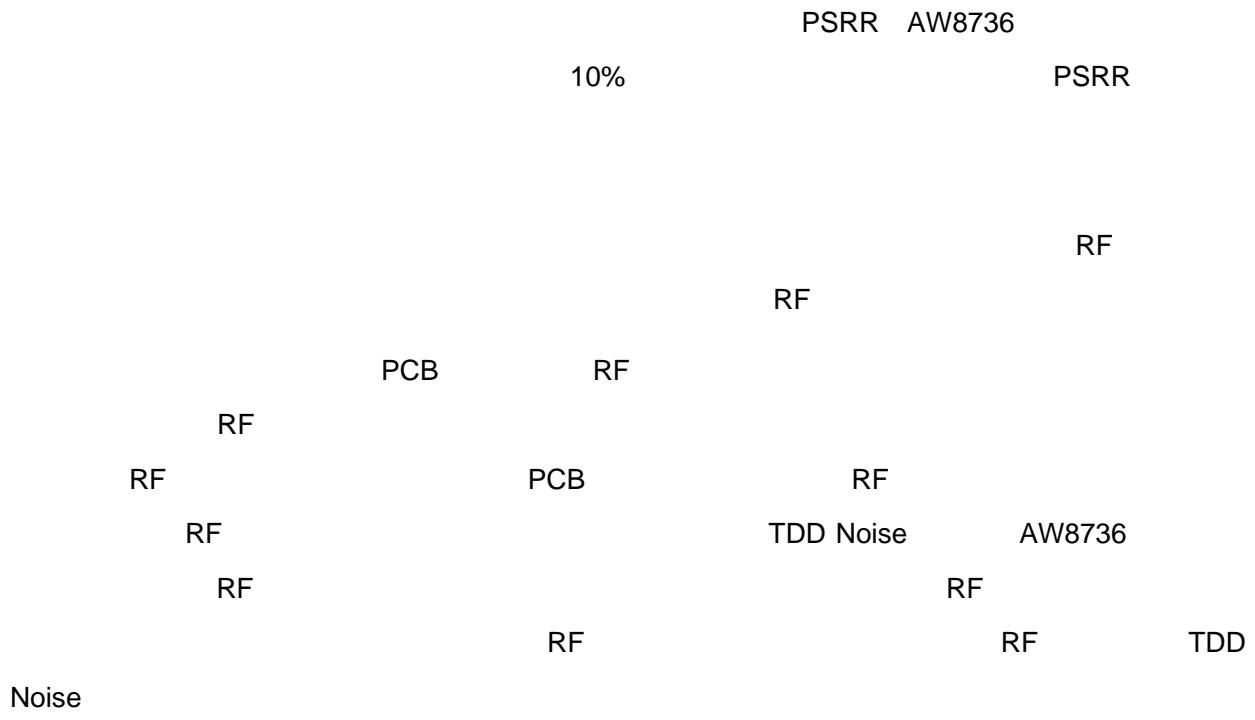
10%

PSRR

-28dB

TDD Noise

K



17 RF



K

AW8736

D

LC

VOP VON

VOP

VON

EEE

AW8736

EEE

EMI

FCC CLASS B

Pop-Click

Pop-Click

AW8736

Pop-Click

Thermal AGC/

AW8736

Thermal AGC

AW8736

Thermal AGC

150

130

160

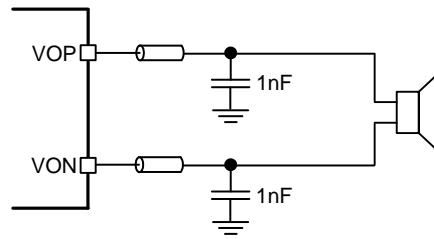
130

AW8736

AW8736

AW8736

K



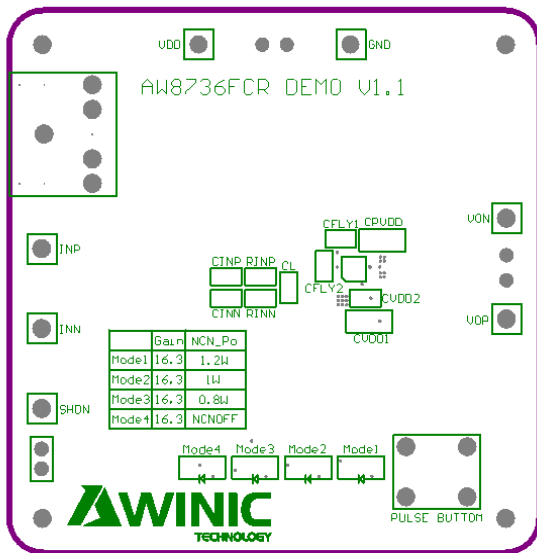
18

Sunlord	UPZ1608U221-2R2TF	0603	$I_{max}=2.2A; Z@100MHz=220 \Omega; DCR=0.05$	8Ω
---------	-------------------	------	---	------------

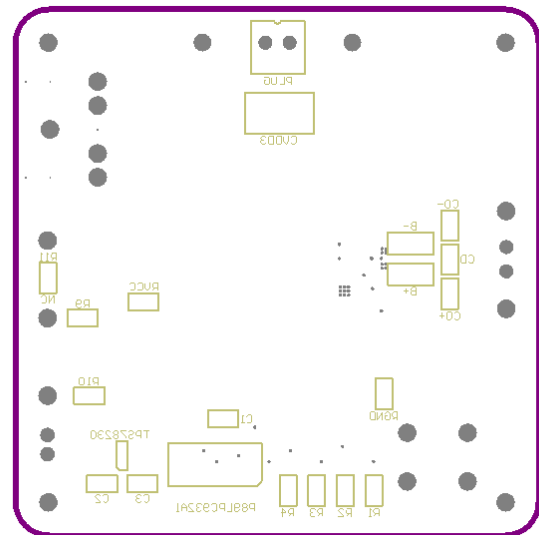
K

1nF

PCB



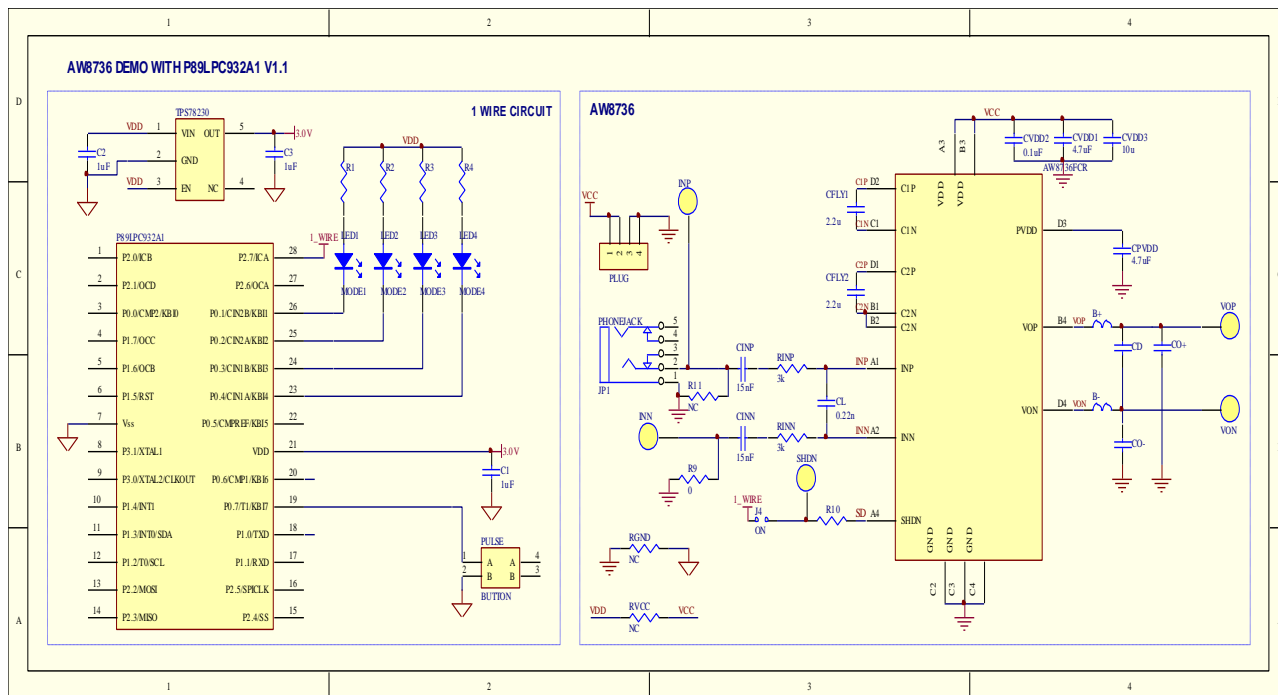
Top Layer



Bottom Layer

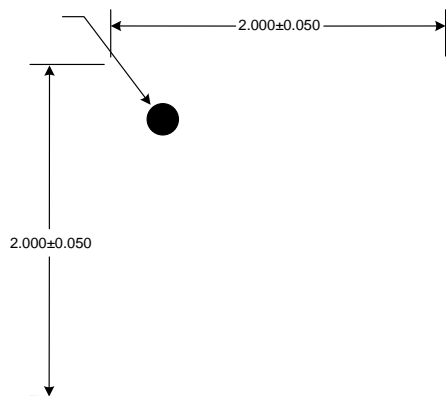
K

Demo

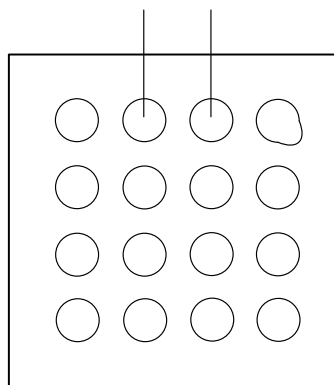


K

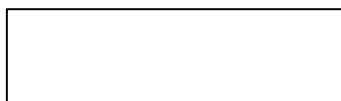
TOP VIEW



BOTTOM VIEW



SIDE VIEW



K

V0.9	AW8736FCR		2012-10-31
V1.0	AW8736FCR		2012-11-30
V1.1	SNR		2013-01-05
V1.2	12 4ohm		2013-02-22
V1.3			2013-03-29
V1.4	1 CH 10V X5R X7R 2 3 4 3.3V~4.35V 5 12 6 NCN No-Crack-Noise Non-Crack-Noise 7 13 8 K-ChargePump " PVDD VDD 1.5 2 "		2013-04-19
V1.5	AW8736		2013-05-21