

AN8000MS

Ripple filter IC for cellular phones

■ Overview

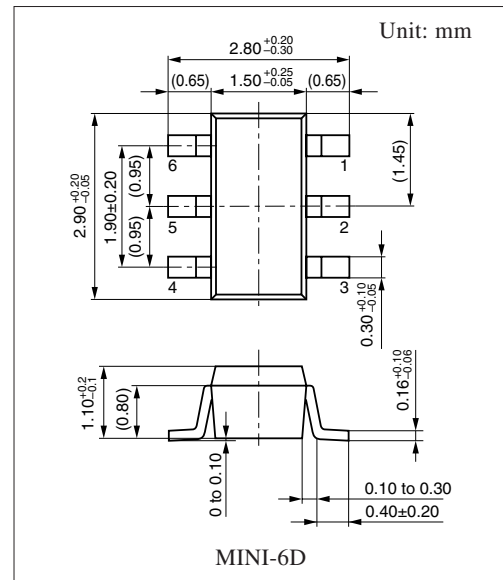
The AN8000MS is a ripple filter IC that rejects the ripple component superimposed on the regulator output. Use for the VCO bias of cellular phones improves C/N and S/N and makes the high-quality telephone communication possible. Furthermore, by decreasing the difference between I/O voltages, drop in the power supply voltage of VCO is reduced.

■ Features

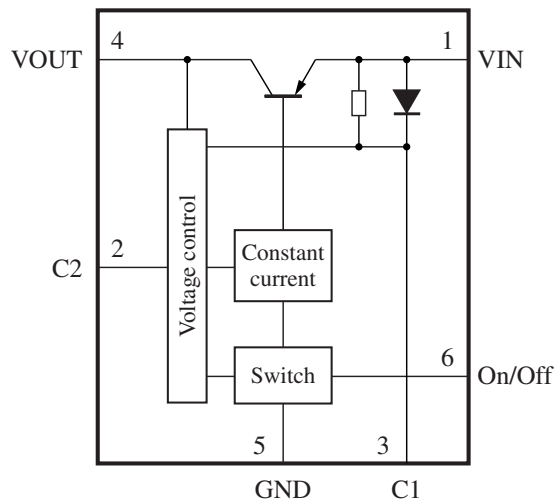
- The I/O drop voltage is reduced to 0.3 V (A PNP transistor is used for the pass transistor)
- The mounting area is reduced by adopting the mini-type 6-pin package

■ Applications

- Cellular phones and others



■ Block Diagram



■ Pin Descriptions

Pin No.	Symbol	Description
1	VIN	Input pin
2	C2	Capacitor connection pin 2
3	C1	Capacitor connection pin 1
4	VOUT	Output pin
5	GND	Ground pin
6	On/Off	Control pin

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{IN}	7.0	V
Supply current	I_{IN}	20	mA
Output current	I_O	-15	mA
Allowable application voltage for on/off pin	$V_{ON/OFF}$	V_{IN}	V
Allowable maximum capacitance for C1 pin	C_1	100	μ F
Allowable maximum capacitance for C2 pin	C_2	10	μ F
Power dissipation *2	P_D	60	mW
Operating ambient temperature *1	T_{opr}	-25 to +75	$^{\circ}$ C
Storage temperature *1	T_{stg}	-40 to +125	$^{\circ}$ C

Note) *1: Except for the operating ambient temperature and storage temperature, all ratings are for $T_a = 25^{\circ}$ C.

*2: The power dissipation shown is the value for $T_a = 75^{\circ}$ C.

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	2.5 to 6.5	V

■ Electrical Characteristics at $T_a = 25^{\circ}$ C

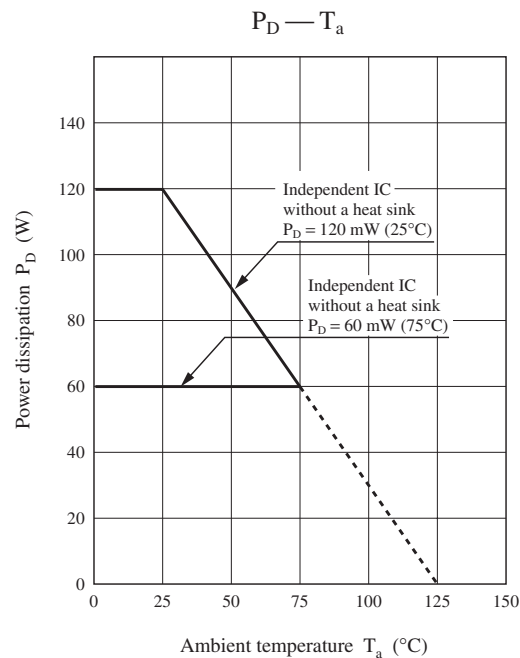
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output voltage 1	V_{O1}	$V_{IN} = 2.5$ V, $I_{OUT} = -1$ μ A	2.10	2.27	—	V
Output voltage 2	V_{O2}	$V_{IN} = 2.5$ V, $I_{OUT} = -15$ mA	1.95	2.14	—	V
Output voltage 3	V_{O3}	$V_{IN} = 3.0$ V, $I_{OUT} = -1$ μ A	2.60	2.79	—	V
Output voltage 4	V_{O4}	$V_{IN} = 3.0$ V, $I_{OUT} = -15$ mA	2.60	2.66	—	V
Output voltage 5	V_{O5}	$V_{IN} = 7.0$ V, $I_{OUT} = -1$ μ A	6.70	6.87	—	V
Output voltage 6	V_{O6}	$V_{IN} = 7.0$ V, $I_{OUT} = -15$ mA	6.60	6.74	—	V

■ Electrical Characteristics at $T_a = 25^\circ\text{C}$ (continued)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Consumption current 1	I_{O1}	$V_{IN} = 2.5\text{ V}, I_{OUT} = -1\ \mu\text{A}$	-420	-322	—	μA
Consumption current 2	I_{O2}	$V_{IN} = 2.5\text{ V}, I_{OUT} = -15\text{ mA}$	-400	-304	—	μA
Consumption current 3	I_{O3}	$V_{IN} = 3.0\text{ V}, I_{OUT} = -1\ \mu\text{A}$	-600	-490	—	μA
Consumption current 4	I_{O4}	$V_{IN} = 3.0\text{ V}, I_{OUT} = -15\text{ mA}$	-550	-450	—	μA
Consumption current 5	I_{O5}	$V_{IN} = 7.0\text{ V}, I_{OUT} = -1\ \mu\text{A}$	-2.0	-1.5	—	mA
Consumption current 6	I_{O6}	$V_{IN} = 7.0\text{ V}, I_{OUT} = -15\text{ mA}$	-2.0	-1.7	—	mA
Load regulation 1	REG_{L1}	$V_{IN} = 2.5\text{ V}, I_{OUT} = -1\ \mu\text{A}$ to -15 mA	0	134	200	mV
Load regulation 2	REG_{L2}	$V_{IN} = 3.0\text{ V}, I_{OUT} = -1\ \mu\text{A}$ to -15 mA	0	122	200	mV
Load regulation 3	REG_{L3}	$V_{IN} = 7.0\text{ V}, I_{OUT} = -1\ \mu\text{A}$ to -15 mA	0	126	200	mV
Consumption current against load change 1	$I_{\text{REG}1}$	$V_{IN} = 2.5\text{ V}, I_{OUT} = -1\ \mu\text{A}$ to -15 mA	-100	-18	100	μA
Consumption current against load change 2	$I_{\text{REG}2}$	$V_{IN} = 3.0\text{ V}, I_{OUT} = -1\ \mu\text{A}$ to -15 mA	-100	-18	100	μA
Consumption current against load change 3	$I_{\text{REG}3}$	$V_{IN} = 7.0\text{ V}, I_{OUT} = -1\ \mu\text{A}$ to -15 mA	-150	-5	150	μA
Ripple rejection ratio 1	RR_1	$V_{IN} = 3\text{ V} \pm 0.15\text{ V}, I_{OUT} = -15\text{ mA},$ $f = 1\text{ kHz}$	20	23	—	dB
Ripple rejection ratio 2	RR_2	$V_{IN} = 3\text{ V} \pm 0.15\text{ V}, I_{OUT} = -15\text{ mA},$ $f = 25\text{ kHz}$	35	40	—	dB
Ripple rejection ratio 3	RR_3	$V_{IN} = 3\text{ V} \pm 0.15\text{ V}, I_{OUT} = -15\text{ mA},$ $f = 100\text{ kHz}$	30	36	—	dB

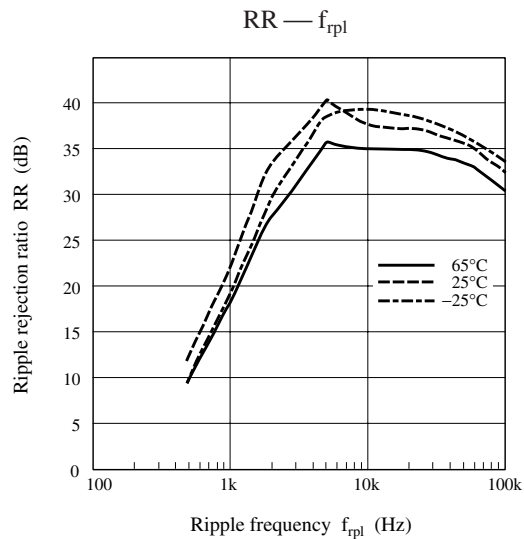
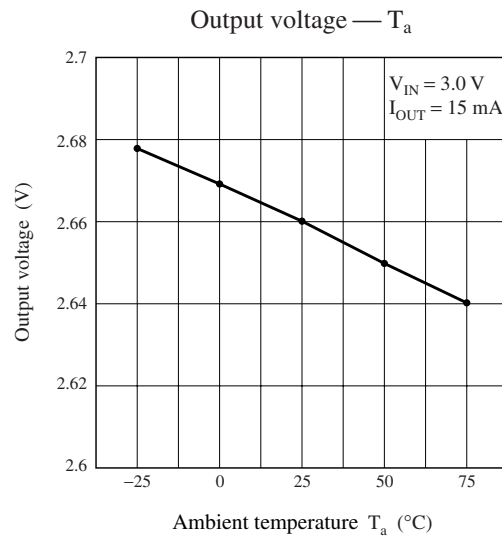
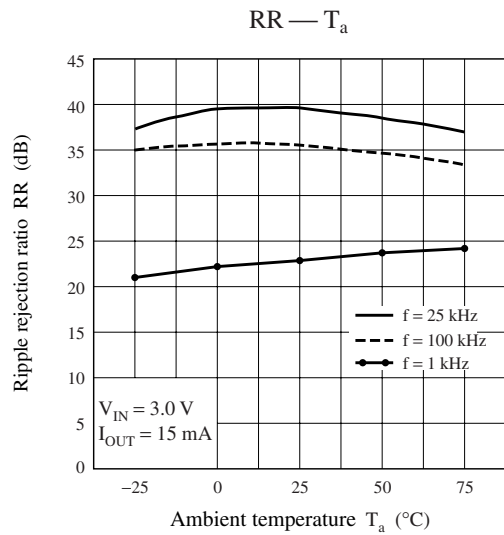
■ Application Notes

1. $P_D - T_a$ curves of MINI-6D package



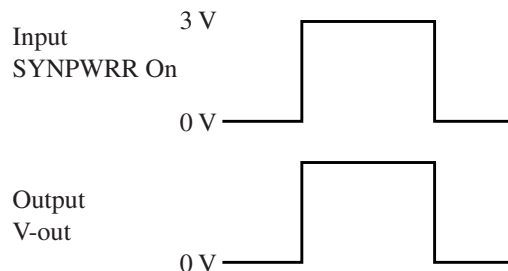
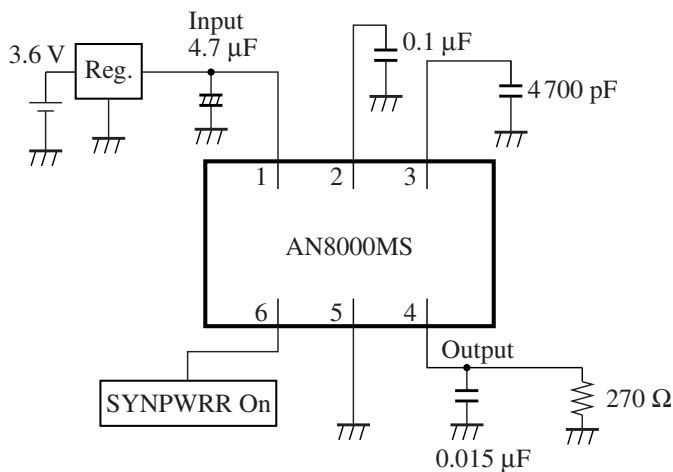
■ Application Notes (continued)

2. Main characteristics



3. Transient response

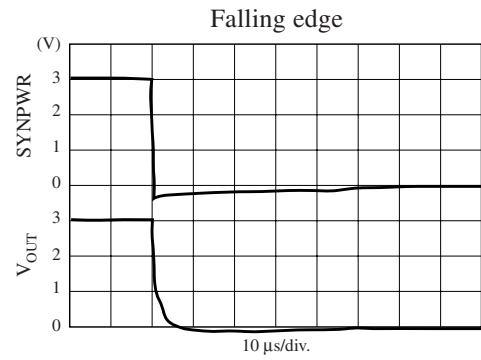
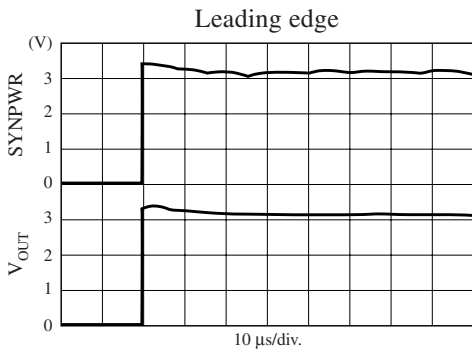
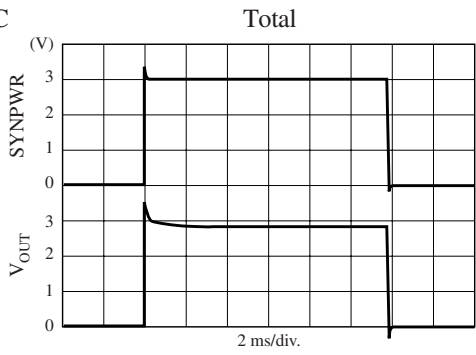
1) Test circuit and conditions



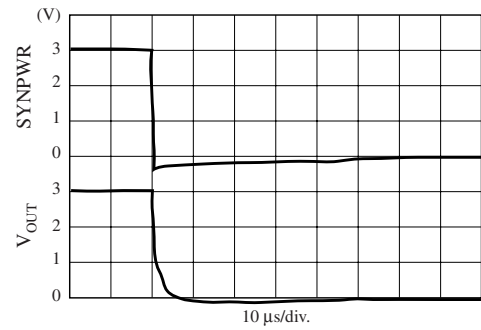
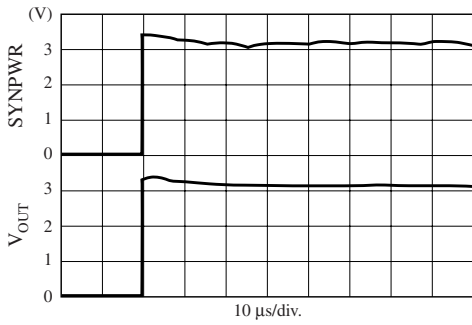
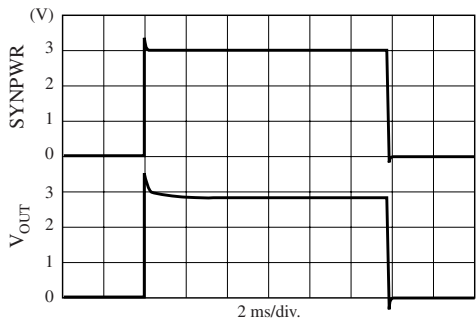
■ Application Notes (continued)
3. Transient response (continued)

2) Transient characteristics (SYNPWR, V_{OUT})

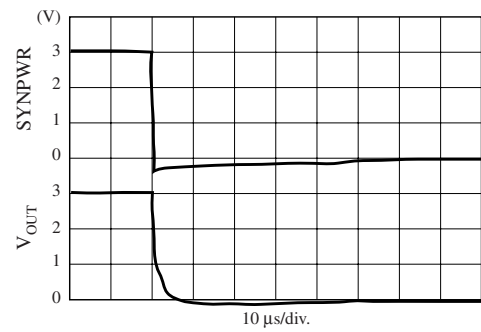
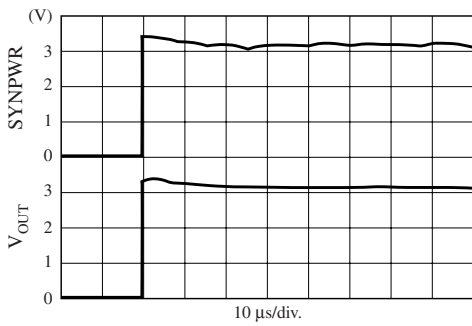
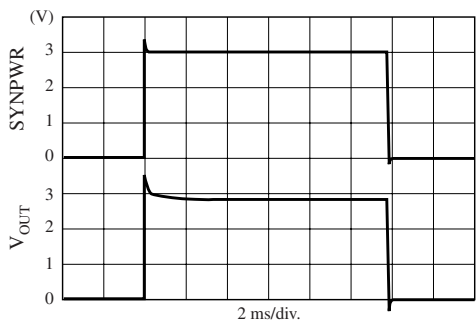
$T_a = -25^\circ\text{C}$



$T_a = 25^\circ\text{C}$

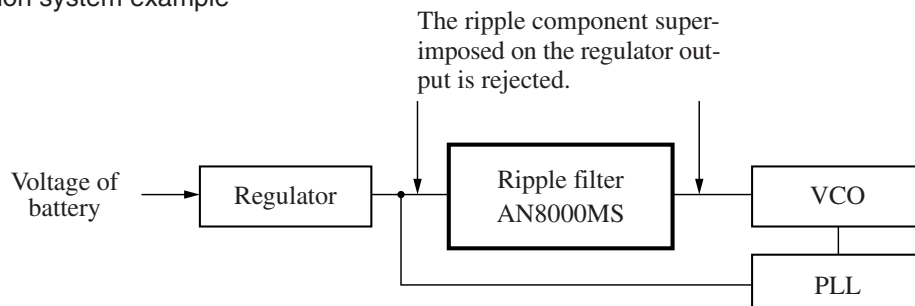


$T_a = 65^\circ\text{C}$

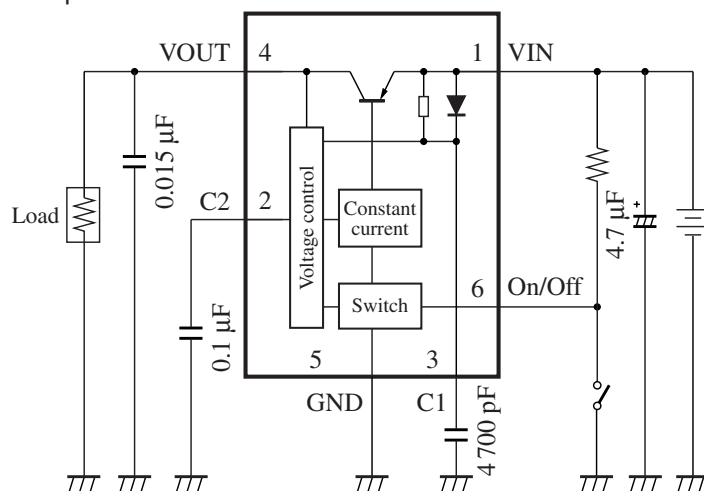


■ Application Circuit Examples

1. Application system example



2. Application circuit example



3. PCB pattern

AN8000MS

