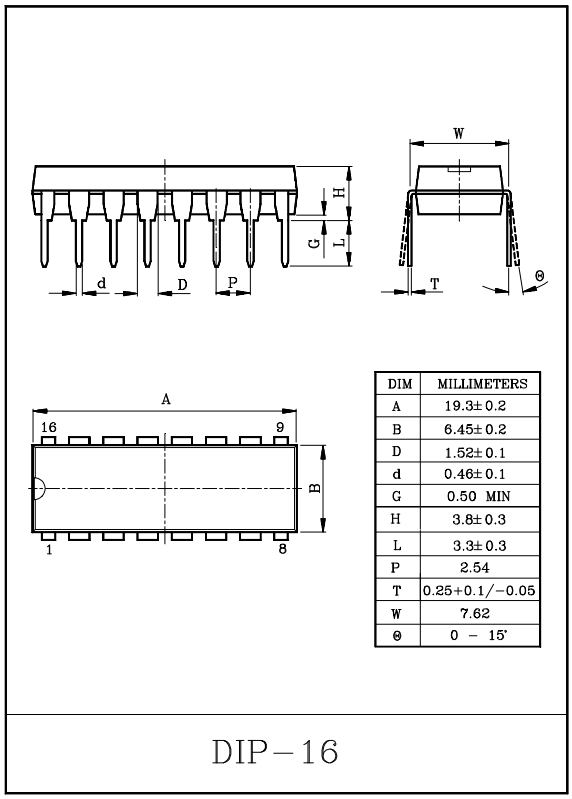
DUAL OPERATIONAL AMPLIFIER-DUAL COMPARATOR ADJUSTABLE VOLTAGE REFERENCE

The KIA7102AP/AF is a monolithic IC that includes two OP-Amps, two Comparators and a precision voltage reference. This device is offering space and cost saving in many applications like power supply management or data acquisition systems.

FEATURES

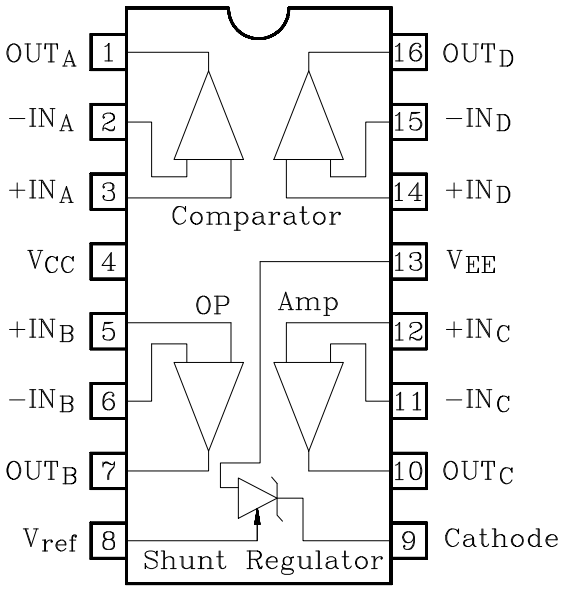
- Low Supply Current : I_{CC}=0.8㎃(Typ.)
- Low Input Offset Voltage : V_{IO}=2㎷(Typ.)
- Wide Common Mode Input Voltage : V_{CC}-1.5V(Typ.)
- Low Input Bias Current
  : I_I=45㎁/Typ. (OP-Amps Part)
  : I_I=25㎁/Typ. (Compators Part)
- Wide Supply Voltage (Single Supply/Dual Supply)
  : V_{CC}=3～36V (±1.5～±18V) (OP-Amps Part)
  : V_{CC}=2～36V (±1～±18V) (Compators Part)
- Programmable Output Voltage : V_{ref}～36V
- Voltage Reference Tolerance : V_{ref}±0.4%
- Sink Current Capability : I_K=1～100㎃
- Equivalent Full Range Temperature Coefficient
  : ΔV_{ref}=7㎷ (T_{opr} Range)

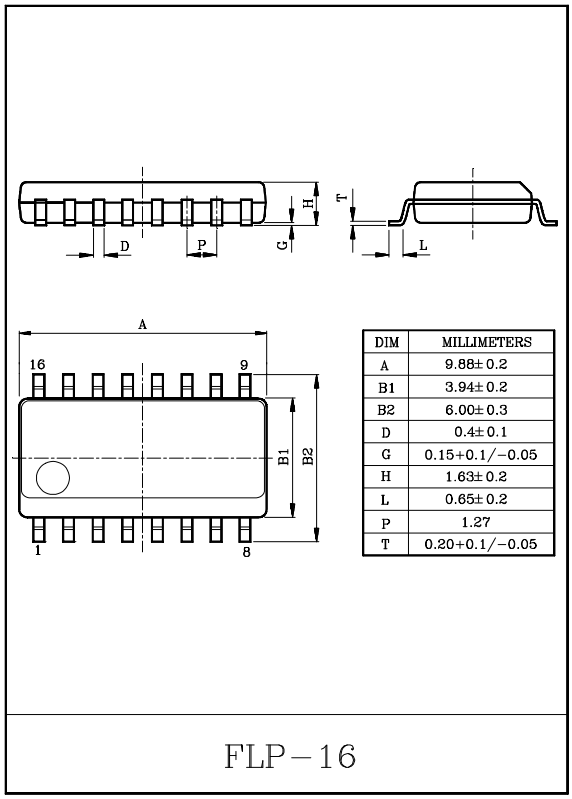


DIM	MILLIMETERS
A	19.3±0.2
B	6.45±0.2
D	1.52±0.1
d	0.46±0.1
G	0.50 MIN
H	3.8±0.3
L	3.3±0.3
P	2.54
T	0.25+0.1/−0.05
W	7.62
Θ	0 ~ 15°

DIP-16

PIN CONNECTION (TOP VIEW)





DIM	MILLIMETERS
A	9.88±0.2
B1	3.94±0.2
B2	6.00±0.3
D	0.4±0.1
G	0.15+0.1/−0.05
H	1.63±0.2
L	0.65±0.2
P	1.27
T	0.20+0.1/−0.05

FLP-16

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
OP-AMP & COMPARATOR PART				
Supply Voltage		V_{CC}	0~±18 (0~36)	V
Differential Input Voltage		DV_{IN}	0~±18 (0~36)	V
Common Mode Input Voltage		CMV_{IN}	-0.3~36	V
SHUNT REGULATOR PART				
Cathode to Anode Voltage		V_{KA}	37	V
Cathode Current Range, Continuos		I_K	-100~150	mA
Reference Input Current Range, Continuos		I_{REF}	-0.05~10	mA
TOTAL				
Power Dissipation	P	P_D	1.47	W
	F		0.54	
Operating Temperature		T_{opr}	-40~85	℃
Storage Temperature		T_{stg}	-55~125	℃

ELECTRICAL CHARACTERISTICS
OPERATIONAL AMPLIFIERS PART
(Unless otherwise specified : V_{CC}=5V, V_{EE}=GND)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	Rg≦10kΩ	-	2	7	mV
Input Offset Voltage Drift	$V_{IO}/\Delta T$	Rg≦10kΩ	-	10	-	μV/℃
Input Bias Current	I_I	-	-	45	150	nA
Input Offset Current	I_{IO}	-	-	5	30	nA
Voltage Gain	Gv	R_L≧2kΩ	86	100	-	dB
Supply Voltage Rejection Ratio	SVRR	Rg=10kΩ	60	100	-	dB
Common Mode Input Voltage	CMV_{IN}	Vcc=30V, V_{EE}=GND	0	-	Vcc-1.5	V
Common Mode Input Signal Rejection Ratio	CMRR	-	60	85	-	dB
Source Current	I_{SOURCE}	-IN=0V, +IN=1V	20	40	-	mA
Sink Current	I_{SINK}	-IN=1V, +IN=0V	10	20	-	mA
High Level Output Voltage	V_{OH}	R_L=10kΩ, Vcc=30V	27	28	-	V
Low Level Output Voltage	V_{OL}	R_L=10kΩ, Vcc=30V	-	0.1	0.15	V
Slew Rate	S/R	R_L=2kΩ	-	0.5	-	V/μs
Unity Gain Frequency	f_T	Gv=1	-	0.7	-	MHz
Total Harmonic Distortion	THD	-	-	0.05	-	%
Phase Margin	φm	Gv=1	-	45	-	Degress
Eqivalent Input Noise Voltage	V_{NI}	Rs=1kΩ, BW=Din Audio	-	2.5	-	μVrms
Channel Separation	CH_{SEP}	-	-	120	-	1dB

COMPARATORS PART

(Unless otherwise specified : V_{CC}=5V, V_{EE}=GND)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	-	-	2	5	mV
Input Bias Current	I_I	-	-	25	250	nA
Input Offset Current	I_{IO}	-	-	5	50	nA
Output Leak Current	I_{LEAK}	+IN=1V, -IN=0, Vcc=Vo=30V	-	0.1	-	nA
Low Level Output Voltage	V_{OL}	+IN=0, -IN=1V, I_{SINK}=4mA	-	0.2	0.4	V
Voltage Gain	Gv	R_L=15kΩ	-	200	-	V/mV
Output Sink Current	I_{SINK}	+IN=0, -IN=1V, V_{OL}=1.5V	6	16	-	mA
Common Mode Input Voltage	CMV_{IN}	-	0	-	Vcc-1.5	V
Differential Input Voltage	DV_{IN}	-	-	-	36	V
Response Time	t_{RSP1}	R_L=5.1kΩ, C_L=15pF	-	1.3	-	μs
Large Signal Response Time	t_{RSP2}	V_{ref}=1.4V, R_L=5.1kΩ, C_L=15pF	-	300	-	ns

VOLTAGE REFERENCE PART

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Input Voltage	V_{ref1}	$V_{KA}=V_{ref}$, I_K=10mA	2.490	2.500	2.510	V
Reference Input Voltage Deviation Over Temperature Range	ΔV_{ref}	$V_{KA}=V_{ref}$, I_K=10mA	-	7	30	mV
Temperature Coefficient of Reference Input Voltage	$\frac{\Delta V_{ref}}{\Delta T}$	$V_{KA}=V_{ref}$, I_K=10mA	-	±22	±100	ppm/℃
Ratio of Change in Reference Input Voltage to Change in Cathodeto Anode Voltage	$\frac{\Delta V_{ref}}{\Delta V_{KA}}$	I_K=10mA, ΔV_{KA}=36~3V	-	-1.1	-2	mV/V
Reference Input Current	I_{ref}	$V_{KA}=V_{ref}$, R_1=10kΩ	-	1.5	4.0	μA
Reference Input Current Deviation Over Temperature Range	ΔI_{ref}	$V_{KA}=V_{ref}$, R_1=10kΩ	-	0.8	2.5	μA
Minimum Cathode Current For Regulation	I_{min}	$V_{KA}=V_{ref}$	-	0.5	1	mA
Off Start Cathode Current	I_{off}	V_{KA}=36V, V_{ref}=0	-	2.6	500	nA

TOTAL

(Unless otherwise specified : V_{CC}=5V, V_{EE}=GND)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I_{CC}	-	-	0.8	1.5	mA