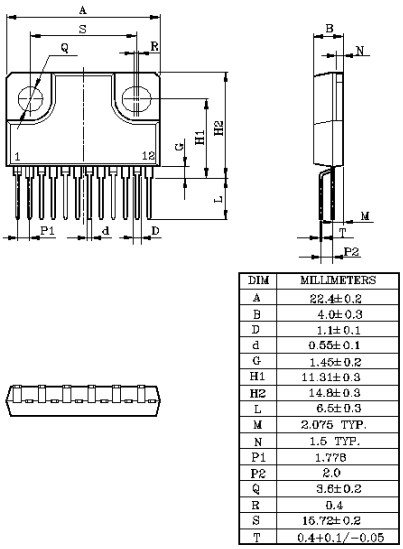
MULTI OUTPUT VOLTAGE REGULATOR FOR CD PLAYER.

The KIA8224H is voltage regulator IC, designed for compact displayer use, built in 3 outputs and reset circuit. In addition, protection of over voltage, output to GND short and thermal shut down are involved.



DIM	MILLIMETERS
A	22.4±0.2
B	4.0±0.3
D	1.1±0.1
d	0.55±0.1
G	1.45±0.2
H1	11.31±0.3
H2	14.8±0.3
L	6.5±0.3
M	2.075 TYP.
N	1.5 TYP.
P1	1.778
P2	2.0
Q	3.6±0.2
R	0.4
S	15.72±0.2
T	0.4+0.1/−0.05

CPP−12

FEATURES

- 3 Regulated voltage outputs
  - $V_{OUT(1)}$ (for μ-com system)
    - : Fixed voltage output
    - : V_{OUT1}=5V(Typ.) / 100mA(Max.)
  - $V_{OUT(2)}$ (for servo system)
    - : Fixed voltage output
    - : V_{OUT2}=5V(Typ.) / 300mA(Max.)
  - $V_{OUT(3)}$ (for driver)
    - : Adjustable voltage output
    - : V_{OUT3}=8V(Typ.) / 1.2A(Max.)
- Built-in reset circuit : 2 input, 1 output
  - : Reset sense voltage V_R=3.6V (Ta=25℃)
- Built-in stand-by circuit
  - : Servo system, driver
    Power→ON/OFF STB 2 : (③ pin)
  - : μ-com system, servo system,
    Driver power→ON/OFF STB 1 : (① pin)
- Built-in various protection circuits
  - : Over voltage, output to GND short, thermal shut down.
- Operating voltage (Ta=25℃)
  - : $V_{IN(opr)}$=7.5~20V : (Operating for Vout $_{1,2,3}$)
  - : $V_{IN(opr)}$=7.5~24V : (Operating for Vout $_1$ only)

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Input Voltage	V_{CC}	30	V
Power Dissipation	P_D (Note)	25	W
Operating Temperature	T_{opr}	-25~75	℃
Storage Temperature	T_{stg}	-55~150	℃

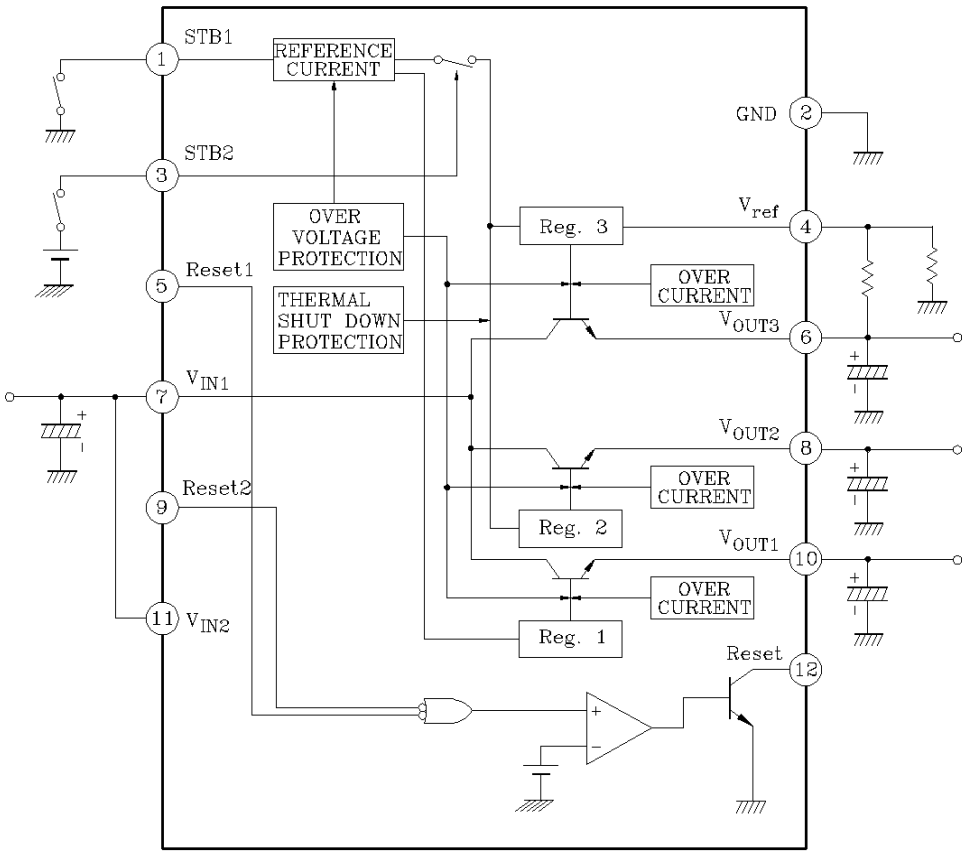
Note) Derated above Ta=25℃ in the proportion 200mW/℃

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, V_{IN}=12V, I_{OUT1}=100mA, I_{OUT2}=300mA, I_{OUT3}=300mA, Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	-	-		4.8	5.0	5.3	V
	V_{OUT2}	-	-		4.8	5.0	5.3	
	V_{OUT3}	-	R_1=18kΩ, R_2=39kΩ		7.7	8.0	8.3	
Line Regulation	Reg1. line	-	7.5V≦V_{IN}≦24V		-	20	100	mV
	Reg2. line	-	7.5V≦V_{IN}≦20V		-	20	100	
	Reg3. line	-	10.3V≦V_{IN}≦20V		-	20	150	
Load Regulation	Reg1. load	-	0mA≦I_{OUT1}≦100mA		-	20	100	mV
	Reg2. load	-	5mA≦I_{OUT2}≦300mA		-	20	100	
	Reg3. load	-	5mA≦I_{OUT3}≦300mA		-	20	100	
			5mA≦I_{OUT3}≦1.2A		-	50	-	
Ripple Rejection Ratio	R.R. 1	-	V_{IN}=1V_{rms} f=120Hz	10V≦V_{IN}≦24V	60	70	-	dB
	R.R. 2	-		11V≦V_{IN}≦20V	60	70	-	
	R.R. 3	-		12V≦V_{IN}≦20V	52	64	-	
Drop Voltage	V_{D1}	-	V_{IN}=6V		-	1.8	-	V
	V_{D2}	-	V_{IN}=6V		-	1.8	-	
	V_{D3}	-	V_{IN}=8V		-	1.5	-	
Maximum Output Current	I_{MAX1}	-	-		100	200	-	mA
	I_{MAX2}	-			300	400	-	
	I_{MAX3}	-			1.2	1.5	-	A
Output Short Current	I_{SC1}	-	-		-	250	-	mA
	I_{SC2}	-			-	400	-	
	I_{SC3}	-			-	1.0	-	A
Output Noise Voltage	V_{NO1}	-	-		-	180	-	μV
	V_{NO2}	-			-	230	-	
	V_{NO3}	-			-	260	-	
Output Voltage Temperature Coefficient	T_{CVO1}	-	-		-	0.5	-	mV/℃
	T_{CVO2}	-			-	-1.1	-	
	T_{CVO3}	-			-	-1.2	-	
Bias Current	I_B	-	I_{OUT1}-0mA, $V_{OUT2, 3}$-OFF		-	0.6	1.2	mA
Reset Sense Voltage	V_R	-	-		3.4	-	3.75	V
Hysteresis Voltage	ΔV_H	-	-		-	60	-	mV
Output Saturation Voltage	Vsat	-	R_3=510Ω		-	0.3	1.0	V
Sensing Voltage Temperature Coefficient	Tc VO4	-	-		-	0.5	-	mV/℃
Stand-by Current	I_{Istb}	-	V_1=0V, $V_{OUT2, 3}$-OFF		-	180	300	μV
Threshold Voltage	V_{Sstb2}	-	-		1.2	-	3.0	V

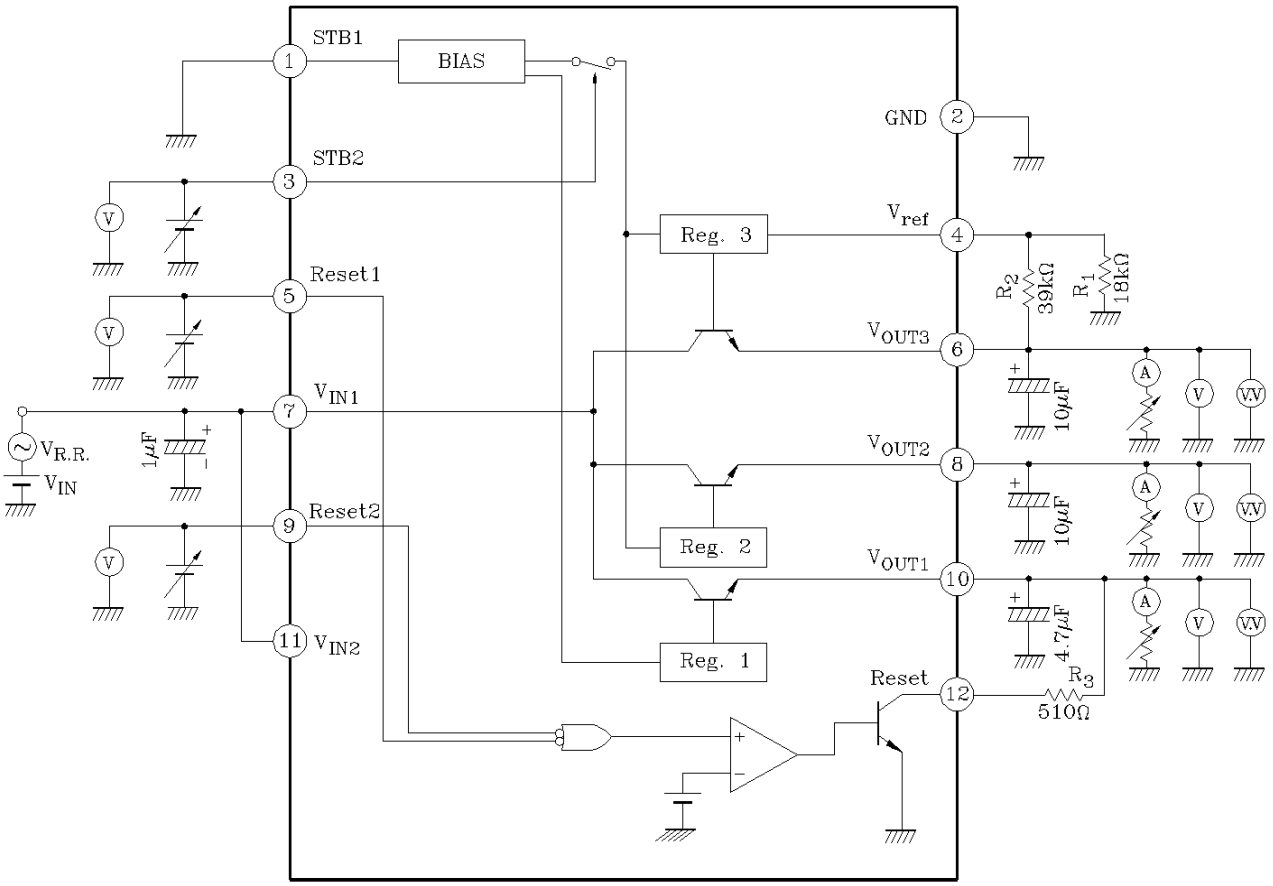
BLOCK DIAGRAM



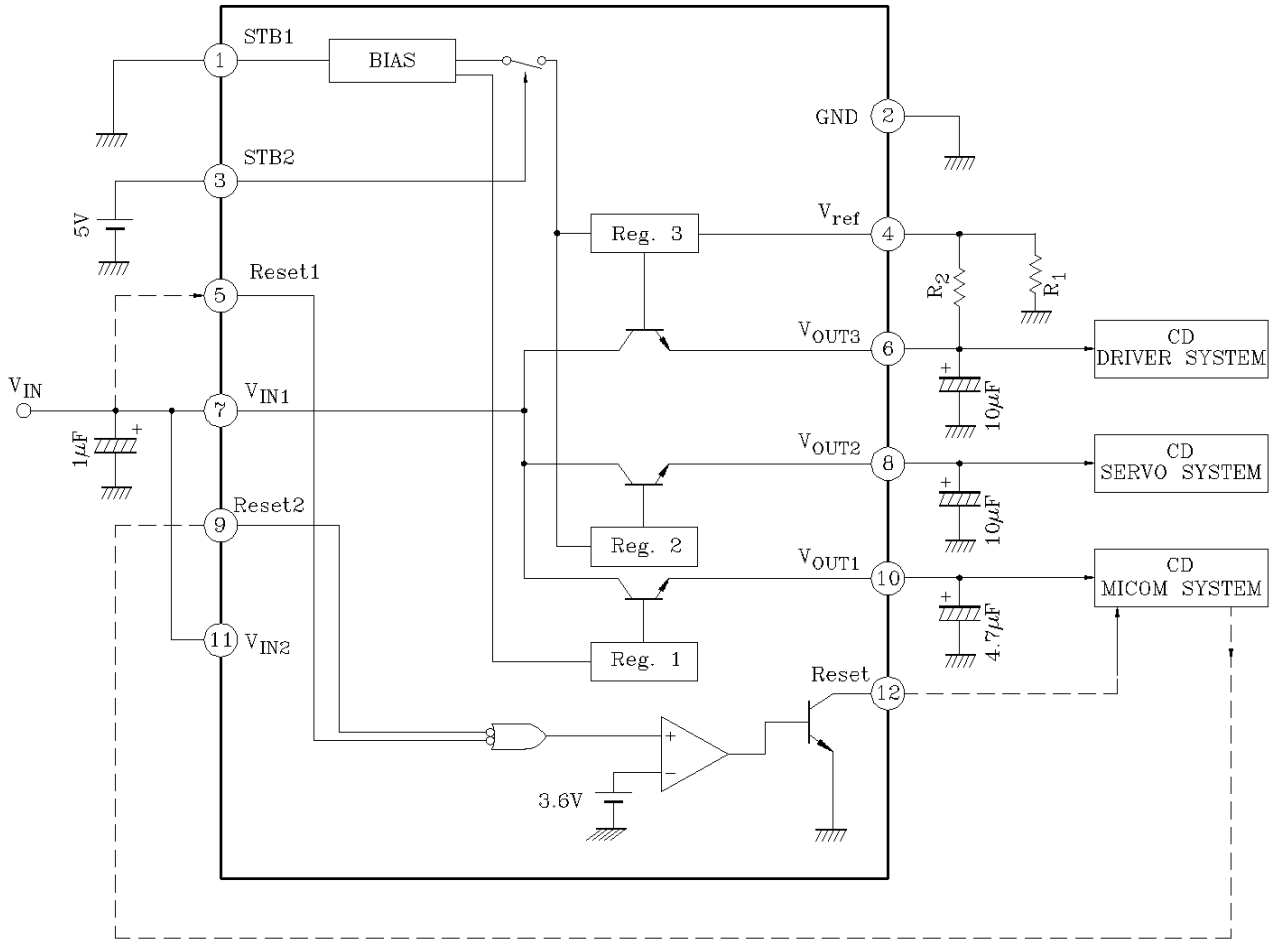
EXPLANATION FOR EACH TERMINAL

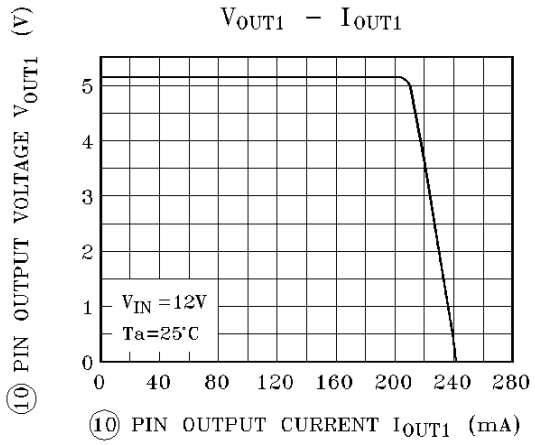
PIN NO.	SYMBOL	FUNCTION	REMARKS
1	STB1	Stand-by switch for Vout $_{1,2,3}$	GND terminal for bias circuit ①→GND : Power ON ①→OPEN : Power OFF
2	GND	GND	-
3	STB2	Stand-by switch for Vout $_{2,3}$	V_S $STB_2 \geqq 3.0V$: $V_{OUT2,\ 3}$ ON $\leqq 1.2V$: $V_{OUT2,\ 3}$ OFF
4	V_{ref}	Reference for $Vout_3$	-
5	Reset1	Reset input 1	$V_{R1} \leqq 3.4V$: Reset , ΔV_H=60mV (Typ.)
6	V_{OUT3}	Adjustable voltage output	Adjustable by External Resistor R_1 and R_2
7	V_{IN1}	Input terminal 1	Driver stage supply terminal
8	V_{OUT2}	Output for servo system	5V Output
9	Reset2	Reset input 2	$V_{R2} \leqq 3.4V$: Reset, ΔV_H=60mV (Typ.)
10	V_{OUT1}	Output for μ-com system	5V Output
11	V_{IN2}	Input 2	-
12	Reset	Reset Output	Open collector output

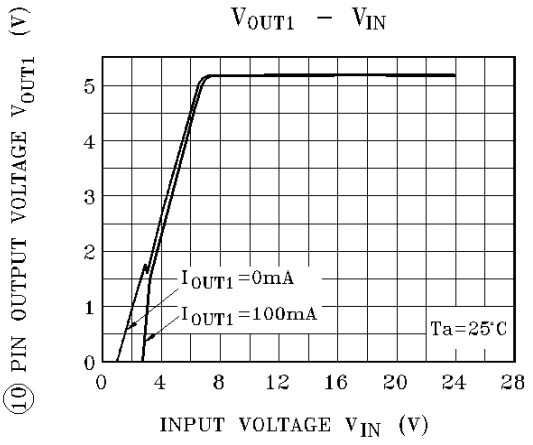
TEST CIRCUIT

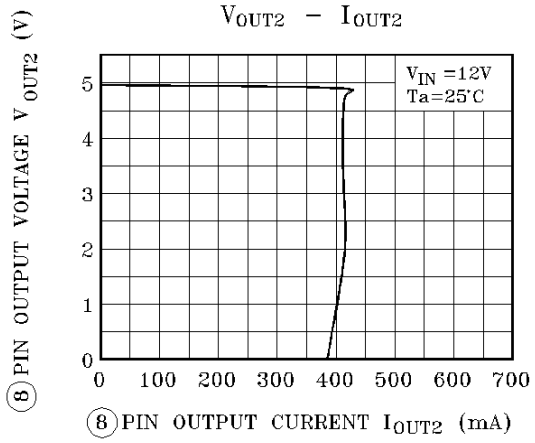


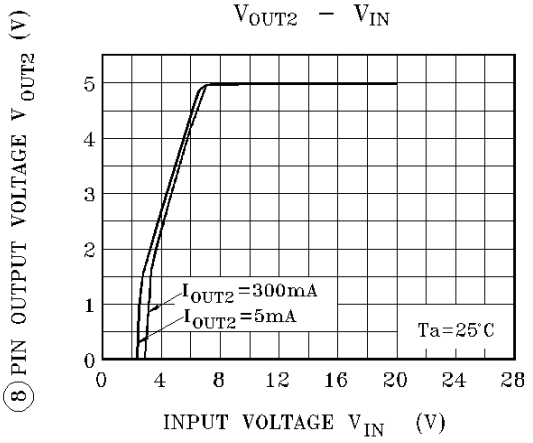
APPLICATION CIRCUIT

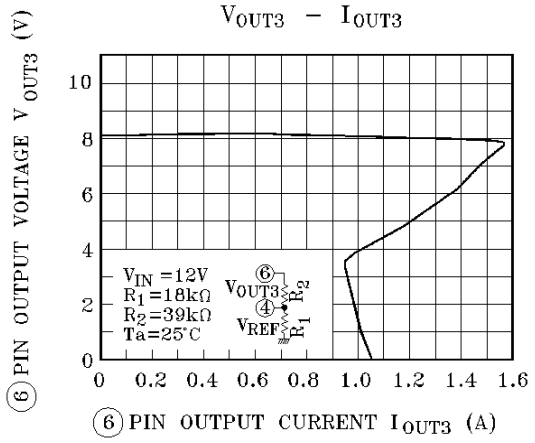


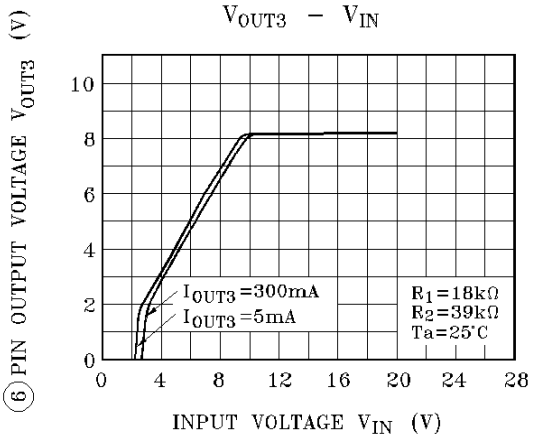

VOUT1 – IOUT1
⑩ PIN OUTPUT VOLTAGE VOUT1 (V)
VIN =12V
Ta=25°C
⑩ PIN OUTPUT CURRENT IOUT1 (mA)


VOUT1 – VIN
⑩ PIN OUTPUT VOLTAGE VOUT1 (V)
IOUT1 =0mA
IOUT1 =100mA
Ta=25°C
INPUT VOLTAGE VIN (V)

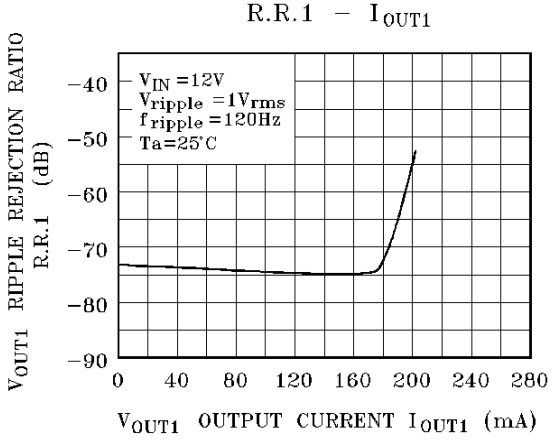

VOUT2 – IOUT2
⑧ PIN OUTPUT VOLTAGE VOUT2 (V)
VIN =12V
Ta=25°C
⑧ PIN OUTPUT CURRENT IOUT2 (mA)


VOUT2 – VIN
⑧ PIN OUTPUT VOLTAGE VOUT2 (V)
IOUT2 =300mA
IOUT2 =5mA
Ta=25°C
INPUT VOLTAGE VIN (V)

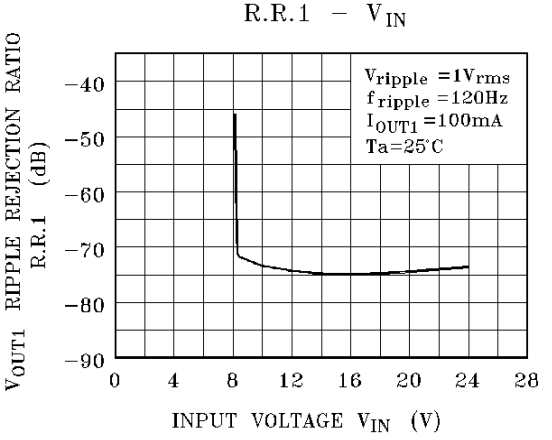

VOUT3 – IOUT3
⑥ PIN OUTPUT VOLTAGE VOUT3 (V)
VIN =12V
R1 =18kΩ
R2 =39kΩ
Ta=25°C
⑥ PIN OUTPUT CURRENT IOUT3 (A)


VOUT3 – VIN
⑥ PIN OUTPUT VOLTAGE VOUT3 (V)
IOUT3 =300mA
IOUT3 =5mA
R1 =18kΩ
R2 =39kΩ
Ta=25°C
INPUT VOLTAGE VIN (V)

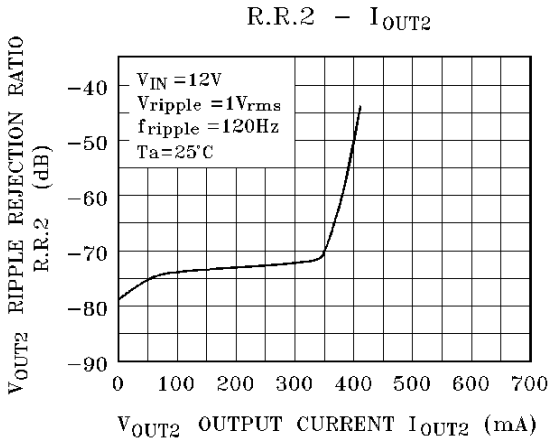
R.R.1 – I_{OUT1}



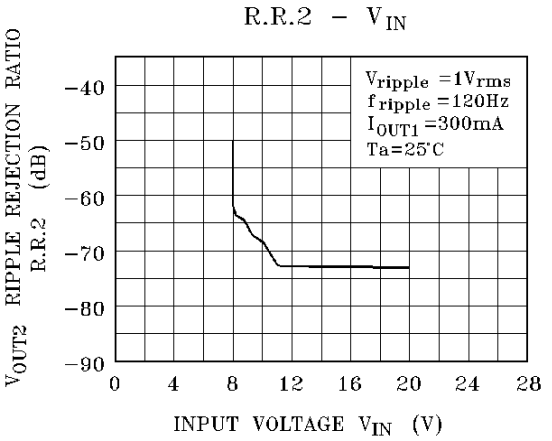
R.R.1 – V_{IN}



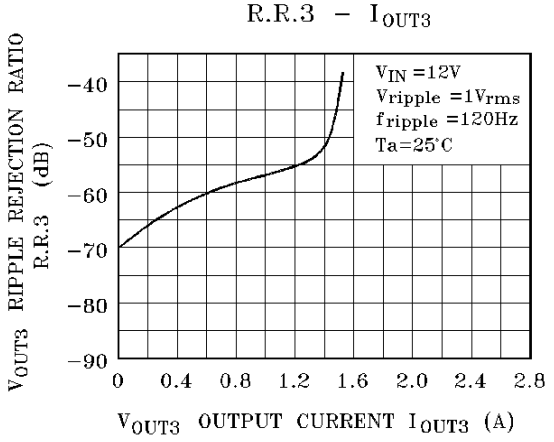
R.R.2 – I_{OUT2}



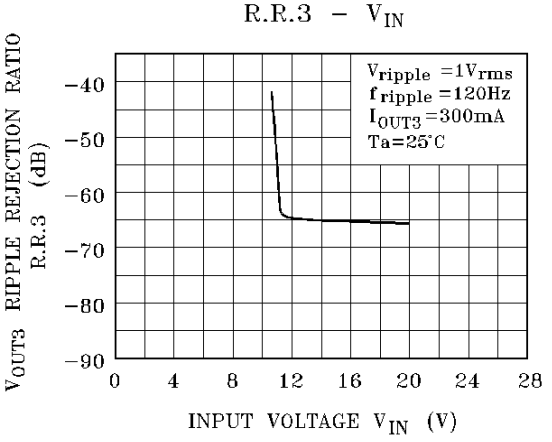
R.R.2 – V_{IN}



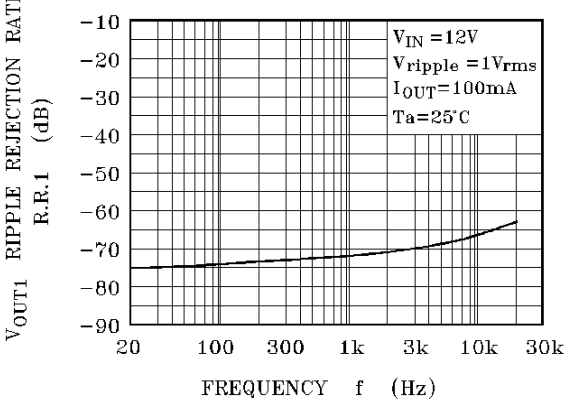
R.R.3 – I_{OUT3}



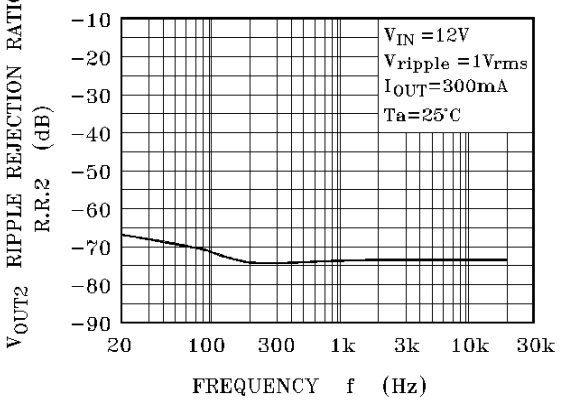
R.R.3 – V_{IN}



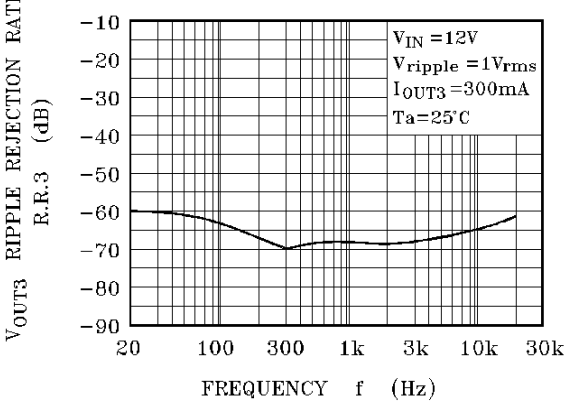
R.R.1 – f



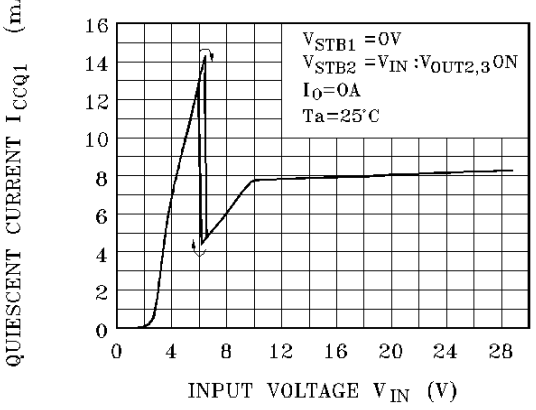
R.R.2 – f



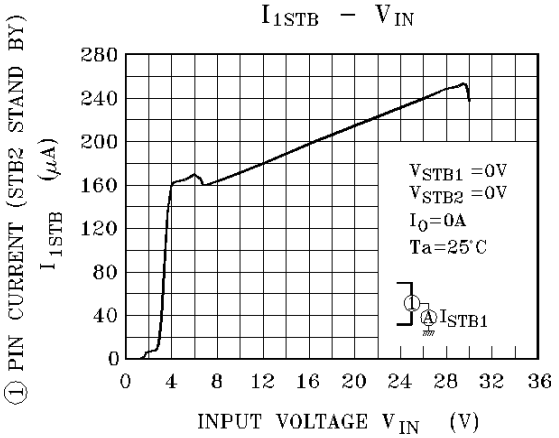
R.R.3 – f



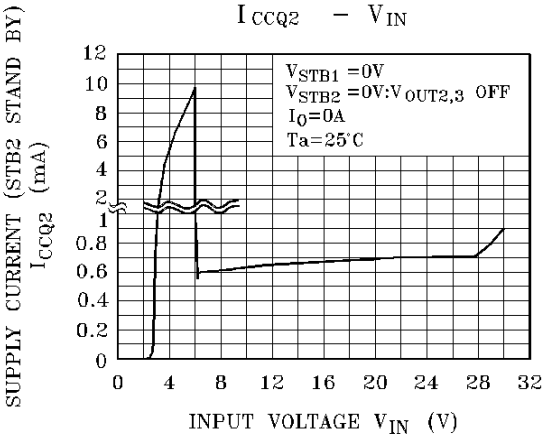
I_{CCQ1} – V_{IN}



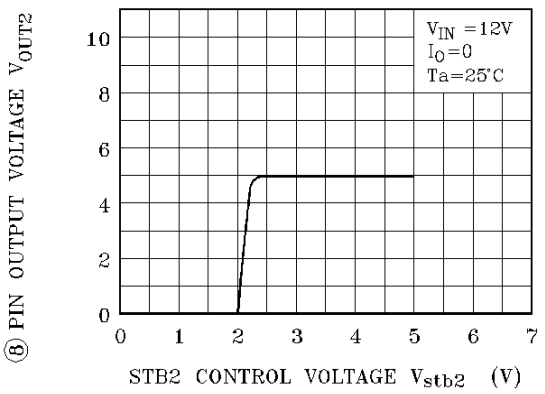
I_{1STB} – V_{IN}



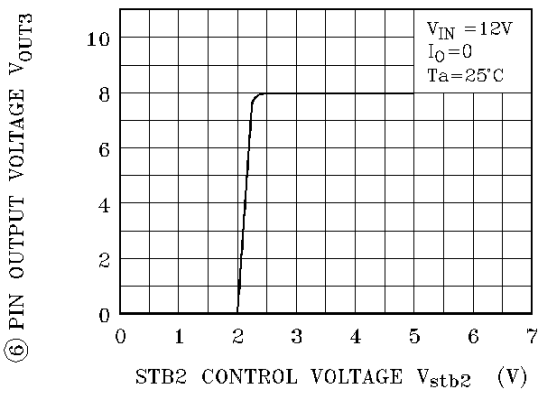
I_{CCQ2} – V_{IN}



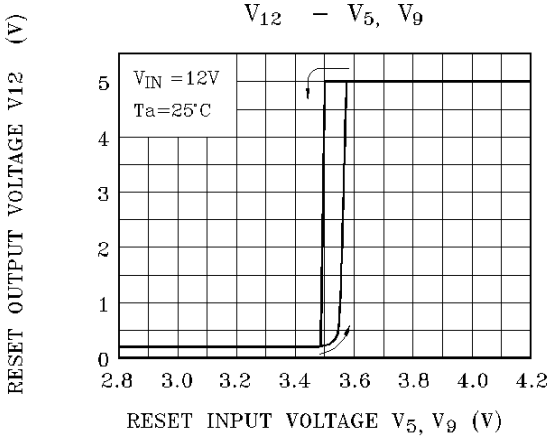
V_{OUT2} – V_{stb2}



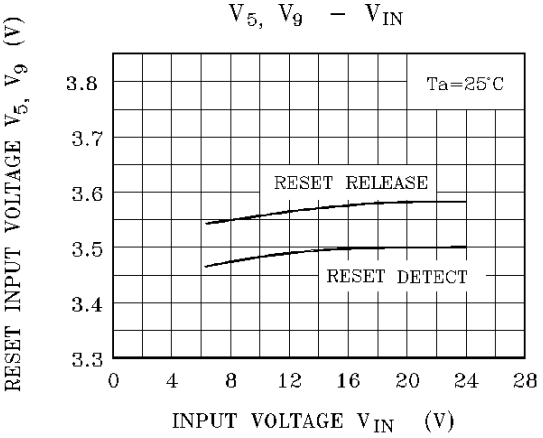
V_{OUT3} – V_{stb2}



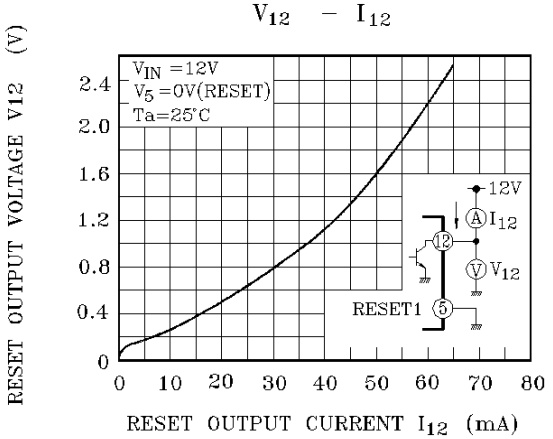
V_{12} – V_5, V_9



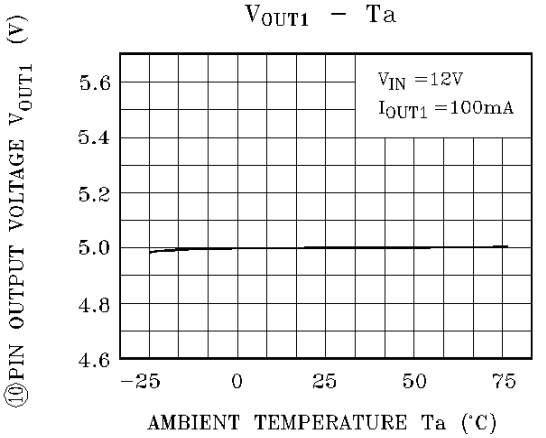
V_5, V_9 – V_{IN}

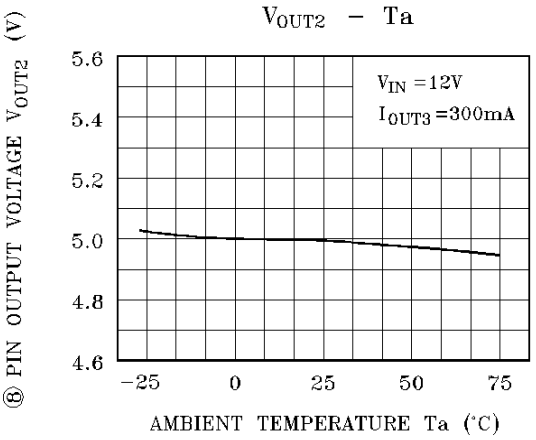


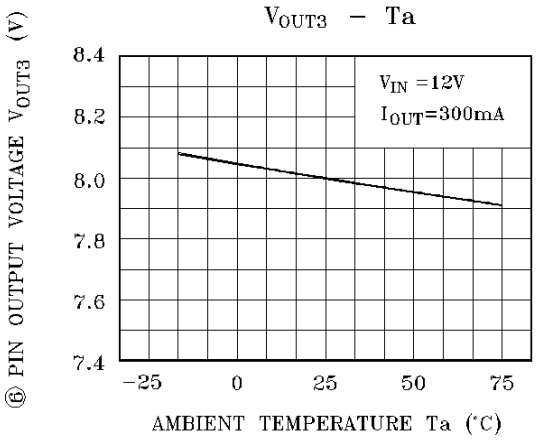
V_{12} – I_{12}

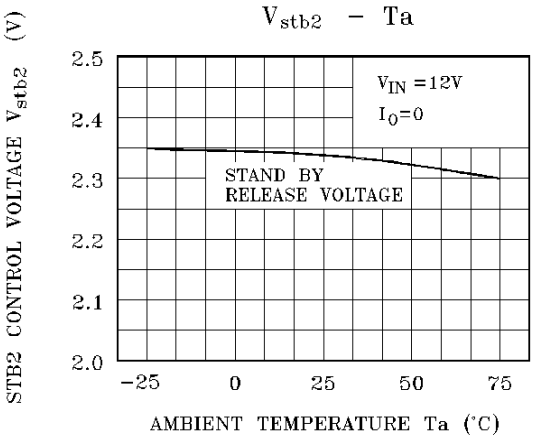


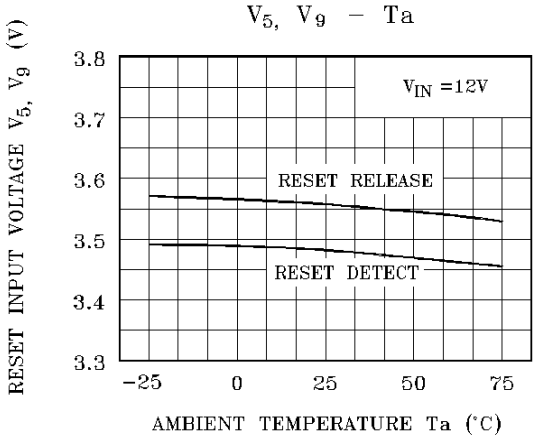
V_{OUT1} – Ta




V_{OUT2} – Ta
⑧ PIN OUTPUT VOLTAGE V_{OUT2} (V)
5.6
5.4
5.2
5.0
4.8
4.6
V_{IN} =12V
I_{OUT3} =300mA
–25
0
25
50
75
AMBIENT TEMPERATURE Ta (°C)


V_{OUT3} – Ta
⑥ PIN OUTPUT VOLTAGE V_{OUT3} (V)
8.4
8.2
8.0
7.8
7.6
7.4
V_{IN} =12V
I_{OUT}=300mA
–25
0
25
50
75
AMBIENT TEMPERATURE Ta (°C)


V_{stb2} – Ta
STB2 CONTROL VOLTAGE V_{stb2} (V)
2.5
2.4
2.3
2.2
2.1
2.0
V_{IN} =12V
I_O=0
STAND BY
RELEASE VOLTAGE
–25
0
25
50
75
AMBIENT TEMPERATURE Ta (°C)


V_5, V_9 – Ta
RESET INPUT VOLTAGE V_5, V_9 (V)
3.8
3.7
3.6
3.5
3.4
3.3
V_{IN} =12V
RESET RELEASE
RESET DETECT
–25
0
25
50
75
AMBIENT TEMPERATURE Ta (°C)