HA118059, HA118099

T-77-07-05

3-circuit, 2-point Video Switch

HA118099/HA118099FP are 3-circuit, 2-point switches designed to prevent HA118059/HA118059FP switching noise. They are recommended for use in applications that require high-speed switching.

Features

- 5V single supply operation
- Applicable as a 75Ω driver
- Wide output dynamic range (2Vpp/150Ω)
- Frequency characteristics for application as an S-VHS switch
- High-speed switching for application in line phase switching, etc.
- Circuit configuration results in small I/O DC offset
- Low power consumption (90mW Typ)
- Reference voltage circuit (Vref) with bandgap circuit

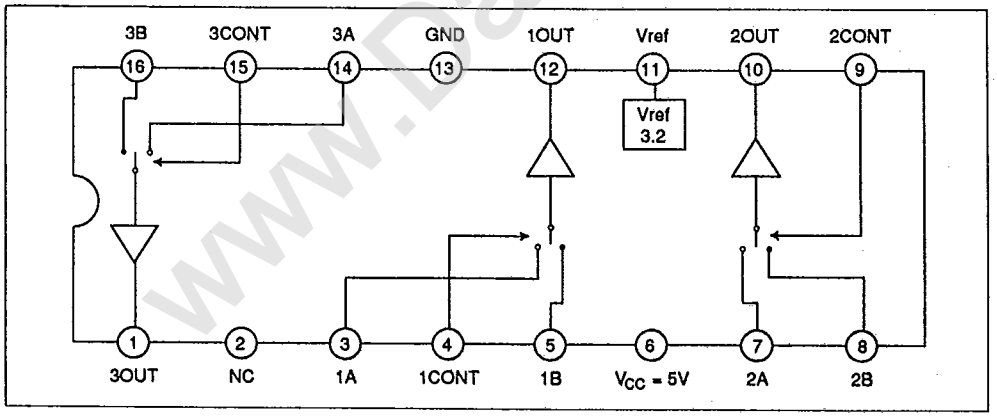
Ordering Information

Type No.	Package
HA118059	300mil 16-pin plastic DIP
HA118059FP	300mil 16-pin plastic SOP
HA118099	300mil 16-pin plastic DIP
HA118099FP	300mil 16-pin plastic SOP

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	HA118059 HA118099	HA118059FP HA118099FP	Unit
Supply Voltage	V_{CC}	7.0	7.0	V
Input Terminal Voltage	V_{in}	0 to V_{CC}	0 to V_{CC}	V
Power Dissipation*	P_T	555	400	mW
Operating Temperature	T_{opr}	−10 to +75	−10 to +75	°C
Storage Temperature	T_{stg}	−40 to +125	−40 to +125	°C
Recommended Operating Voltage	V_{opr}	4.7 to 5.3	4.7 to 5.3	V

* Value at Ta = 75°C.



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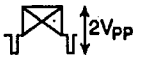
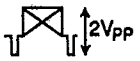
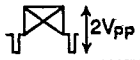
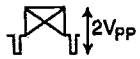
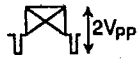
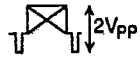
Pin Functions

Pin No.	Function Name	Standard DC Voltage	Signal Type	Signal Level	I/O Format (Impedance Ω)
1	OUT3	2.5	Audio, video signal		Push-pull output
2	NC				
3	A1	2.5	Audio, video signal		20kΩ
4	CONT1	5.0/0	Input switch signal		20kΩ (10kΩ)*1
5	B1	2.5	Audio, video signal		20kΩ
6	V_{CC}	5.0			
7	A2	2.5	Audio, video signal		20kΩ
8	B2	2.5	Audio, video signal		20kΩ
9	CONT2	5.0/0	Input switch signal		20kΩ (10kΩ)*1
10	OUT2	2.5	Audio, video signal		Push-pull output
11	V_{ref}	3.2	DC		
12	OUT1	2.5	Audio, video signal		Push-pull output
13	GND	0			
14	A3	2.5	Audio, video signal		20kΩ
15	CONT3	5.0/0	Input switch signal		20kΩ (10kΩ)*1
16	B3	2.5	Audio, video signal		20kΩ

Note: The values given in this table are for reference only, and are not guaranteed.

*1 HA118059/HA118059FP only

Electrical Characteristics (V_{CC} = 5V, Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Condition	Applicable Terminal
Supply Current	I_{cc}	10	17	22	mA	No signal input Pins (4),(9), and (15) OPEN	6
Reference Voltage	V_{ref}	2.95	3.15	3.35	V	OPEN terminal voltage	11
CONT 1 Input Voltage L Level	V_{1L}	–	–	2.0	V		12
CONT 1 Input Voltage H Level	V_{1H}	3.0	–	–	V		12
SW1 A Input Voltage Gain 1	G_v 1A1	−1	0	+1	dB	V(3) = 7MHz, $2V_{pp}$ V(4) = H $R_L = \infty$	12
SW1 A Input Voltage Gain 2	G_v 1A2	−1.2	−0.2	+0.8	dB	V(3) = 7MHz, $2V_{pp}$ V(4) = H R_L = 150Ω	12
SW1 B Input Voltage Gain 1	G_v 1B1	−1	0	+1	dB	V(5) = 7MHz, $2V_{pp}$ V(4) = L $R_L = \infty$	12
SW1 B Input Voltage Gain 2	G_v 1B2	−1.2	−0.2	+0.8	dB	V(5) = 7MHz, $2V_{pp}$ V(4) = L R_L = 150Ω	12
SW1 1A →1B Crosstalk	CR 1A →1B	40	60	–	dB	V(3) = 3.58MHz, $2V_{pp}$ V (4) = L $R_L = \infty$	12
SW1 1B→ 1A Crosstalk	CR 1B →1A	40	60	–	dB	V(5) = 3.58MHz, $2V_{pp}$ V(4) = H $R_L = \infty$	12

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Item	Symbol	Min	Typ	Max	Unit	Test Condition	Applicable Terminal
Input 1A Total Harmonic Distortion	THD 1A	–	0.1	0.5	%	V(3) = 1kHz, $2V_{pp}$ V(4) = H $R_L = \infty$	12
Input 1B Total Harmonic Distortion	THD 1B	–	0.1	0.5	%	V(5) = 1kHz, $2V_{pp}$ V(4) = L $R_L = \infty$	12
CONT 1 Switching Speed 1A →1B	SS_1 1A →1B	–	50 (40)*1	150 (100)*1	ns		12
CONT 1 Switching Speed 1B →1A	SS_1 1B →1A	–	50 (40)*1	150 (100)*1	ns		12
CONT 2 Input Voltage L Level	V_{2L}	–	–	2.0	V		10
CONT 2 Input Voltage H Level	V_{2H}	3.0	–	–	V		10
SW2 A Input Voltage Gain 1	G_v 2A1	−1	0	+1	dB	V(7) = 7MHz, $2V_{pp}$ V(9) = H $R_L = \infty$	10
SW2 A Input Voltage Gain 2	G_v 2A2	−1.2	−0.2	+0.8	dB	V(7) = 7MHz, $2V_{pp}$ V(9) = H $R_L = 150\Omega$	10
SW2 B Input Voltage Gain 1	G_v 2B1	−1	0	+1	dB	V(8) = 7MHz, $2V_{pp}$ V(9) = L $R_L = \infty$	10
SW2 B Input Voltage Gain 2	G_v 2B2	−1.2	−0.2	+0.8	dB	V(8) = 7MHz, $2V_{pp}$ V(9) = L $R_L = 150\Omega$	10

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Item	Symbol	Min	Typ	Max	Unit	Test Condition	Applicable Terminal
SW2 2A →2B Crosstalk	CR 2A →2B	40	60	–	dB	V7 = 3.58MHz, $2V_{pp}$ V9 = L $R_L = \infty$	10
SW2 2B→ 2A Crosstalk	CR 2B →2A	40	60	–	dB	V8 = 3.58MHz, $2V_{pp}$ V9 = H $R_L = \infty$	10
Input 2A Total Harmonic Distortion	THD 2A	–	0.1	0.5	%	V7 = 1kHz, $2V_{pp}$ V9 = H $R_L = \infty$	10
Input 2B Total Harmonic Distortion	THD 2B	–	0.1	0.5	%	V8 = 1kHz, $2V_{pp}$ V9 = L $R_L = \infty$	10
CONT 2 Switching Speed 2A →2B	SS_2 2A →2B	–	50 (40)*1	150 (100)*1	ns		10
CONT 2 Switching Speed 2B →2A	SS_2 2B →2A	–	50 (40)*1	150 (100)*1	ns		10
CONT 3 Input Voltage L Level	V_{3L}	–	–	2.0	V		1
CONT 3 Input Voltage H Level	V_{3H}	3.0	–	–	V		1
SW3A Input Voltage Gain 1	G_v 3A1	–1	0	+1	dB	V14 = 7MHz, $2V_{pp}$ V15 = H $R_L = \infty$	1
SW3A Input Voltage Gain 2	G_v 3A2	–1.2	–0.2	+0.8	dB	V14 = 7MHz, $2V_{pp}$ V15 = H $R_L = 150\Omega$	1

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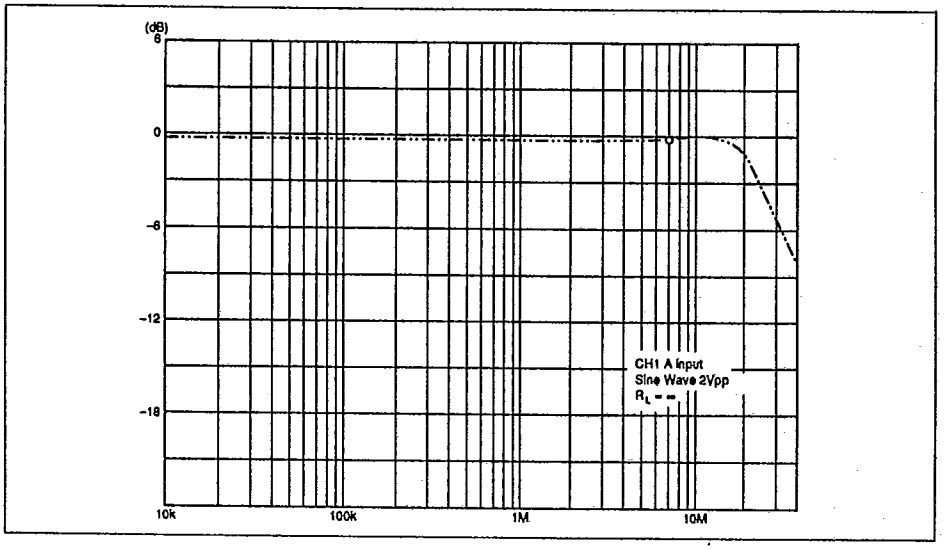
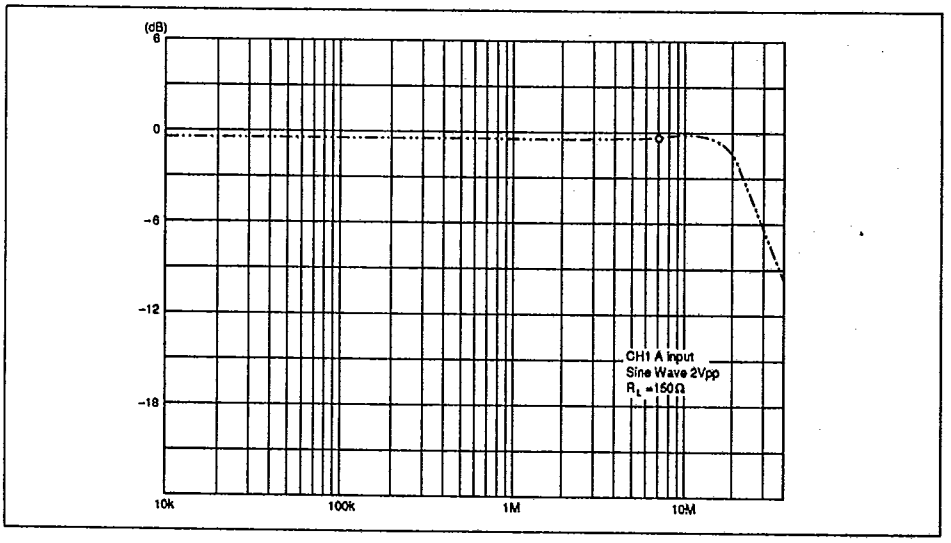
Item	Symbol	Min	Typ	Max	Unit	Test Condition	Applicable Terminal
SW3B Input Voltage Gain 1	G_v 3B1	−1	0	+1	dB	V16 = 7MHz, $2V_{pp}$ V15 = L $R_L = \infty$	1
SW3B Input Voltage Gain 2	G_v 3B2	−1.2	−0.2	+0.8	dB	V16 = 7MHz, $2V_{pp}$ V15 = L $R_L = 150\Omega$	1
SW3 3A → 3B Crosstalk	CR 3A →3B	40	60	–	dB	V14 = 3.58MHz, $2V_{pp}$ V15 = L $R_L = \infty$	1
SW3 3B → 3A Crosstalk	CR 3B →3A	40	60	–	dB	V16 = 3.58MHz, $2V_{pp}$ V15 = H $R_L = \infty$	1
Input 3A Total Harmonic Distortion	THD 3A	–	0.1	0.5	%	V14 = 1kHz, $2V_{pp}$ V15 = H $R_L = \infty$	1
Input 3B Total Harmonic Distortion	THD 3B	–	0.1	0.5	%	V16 = 1kHz, $2V_{pp}$ V15 = L $R_L = \infty$	1
CONT 3 Switching Speed 3A → 3B	SS_3 3A → 3B	–	50 (40)*1	150 (100)*1	ns		1
CONT 3 Switching Speed 3B → 3A	SS_3 3B → 3A	–	50 (40)*1	150 (100)*1	ns		1



Frequency Characteristics ($R_L = \infty$)



Frequency Characteristics ($R_L = 150$)

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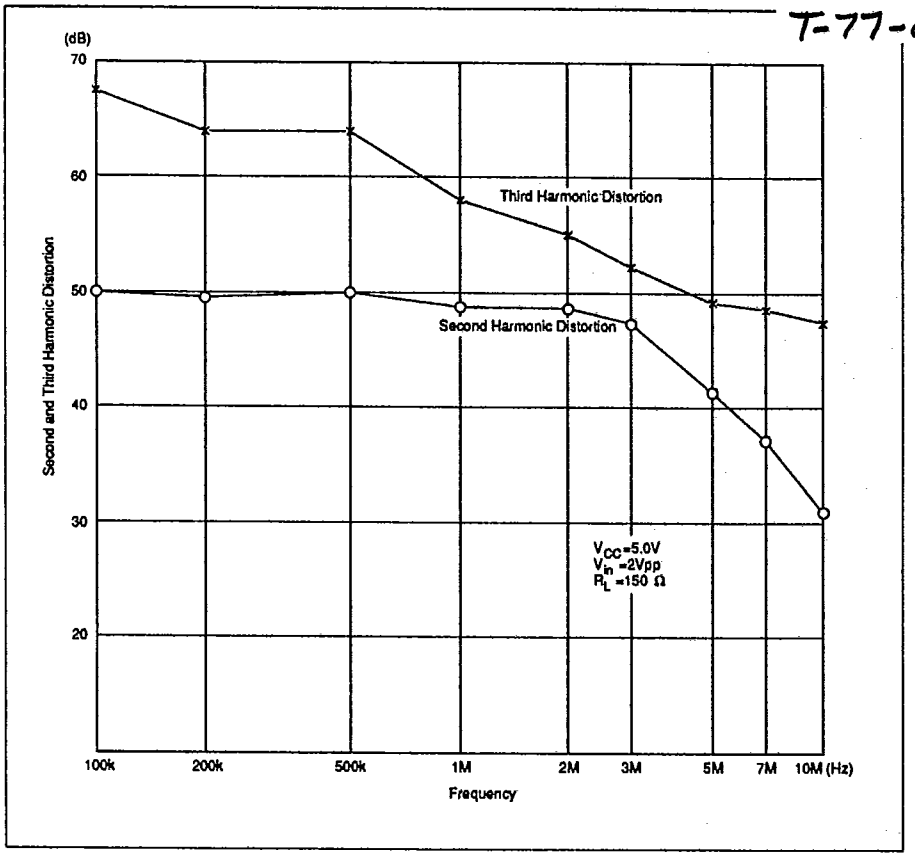
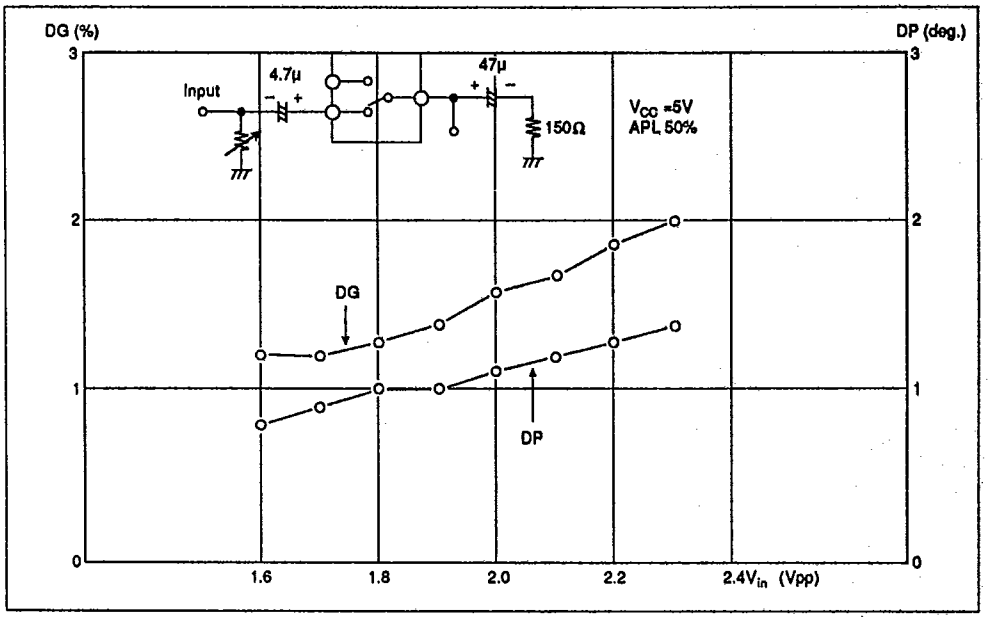
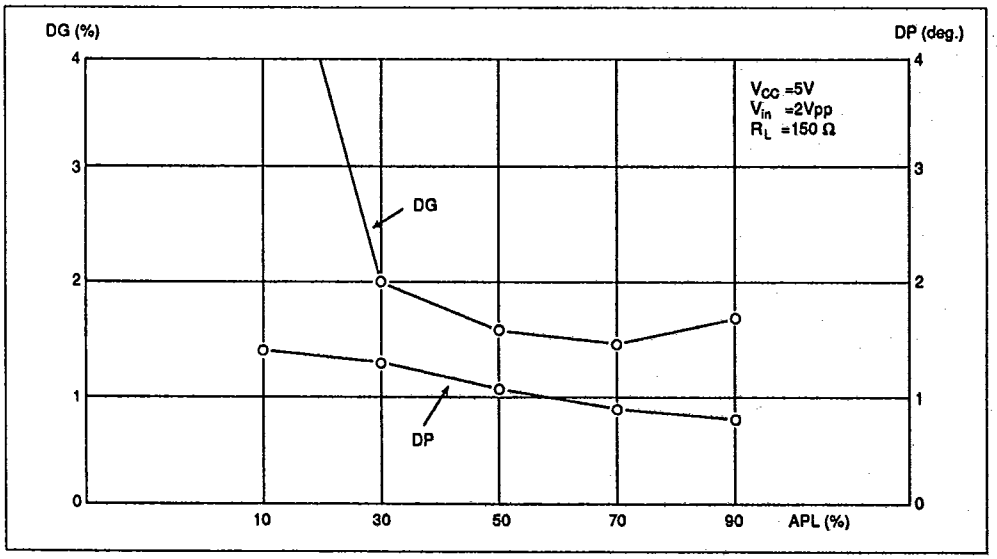


Second and Third Harmonic Distortion



DG and DP for Input Signal Level



DG and DP for Average Picture Level

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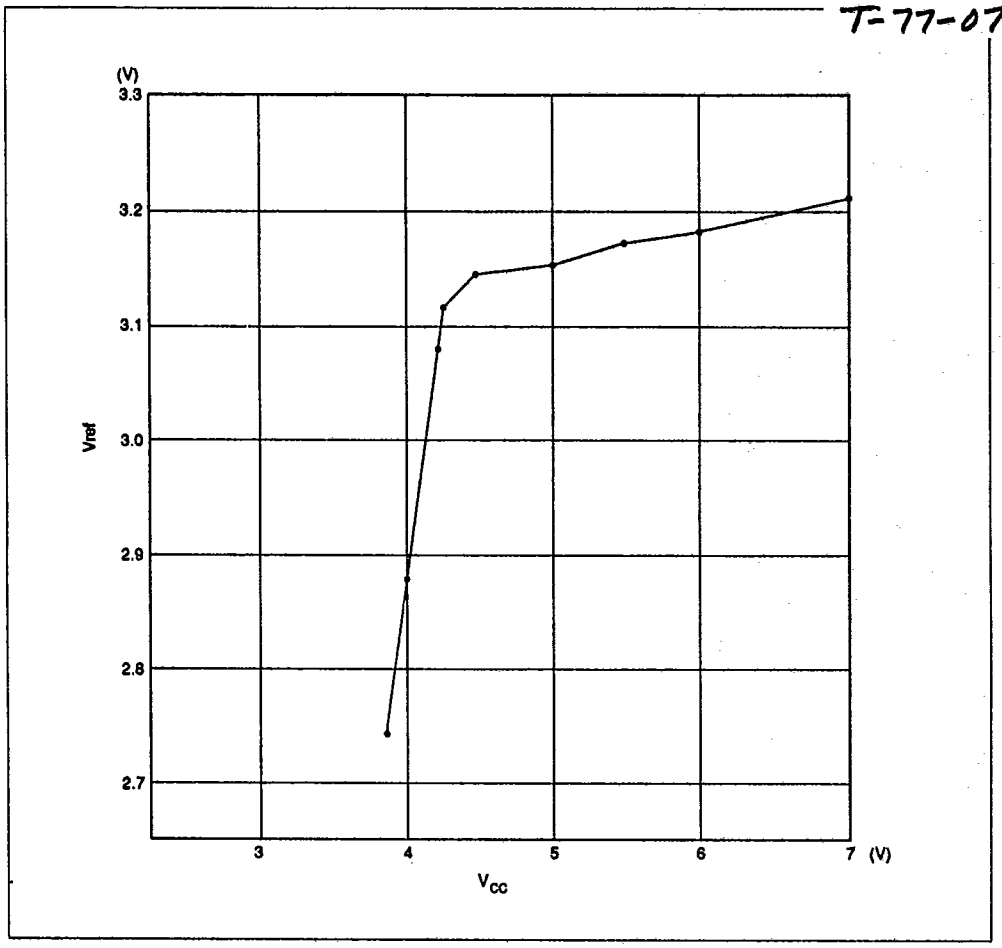

Dependence of Reference Voltage on Supply Voltage