VIDEO CAMERA AUTO-IRIS FUNCTION

■ GENERAL DESCRIPTION

The NJM2225 are bipolar integrated circuits of motor drive for video camera. The NJM2225 have function of auto iris by video-luminance signal and external information input to AGC circuit. They are composed of clipping circuit of video luminance signal, amplifier for driving motor and comparator for AGC circuits.

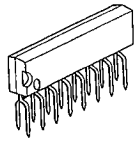
■ FEATURES

- Operating Voltage (+4.5V~+11V)
- Internal Auto Iris Circuit
- Package Outline DMP16, ZIP16, SSOP16
- Bipolar Technology

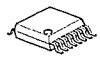
■ RECOMMENDED OPERATING CONDITION

- Operating Voltage 4.5~11V

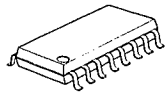
■ PACKAGE OUTLINE



NJM2225S

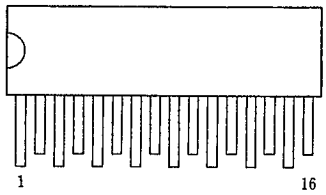


NJM2225V



NJM2225M

■ PIN CONFIGURATION



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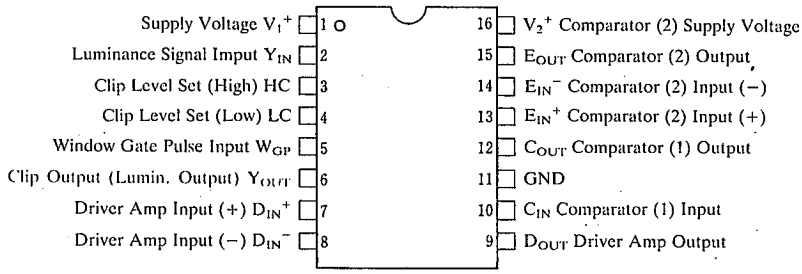

NJM2225M
NJM2225V

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■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

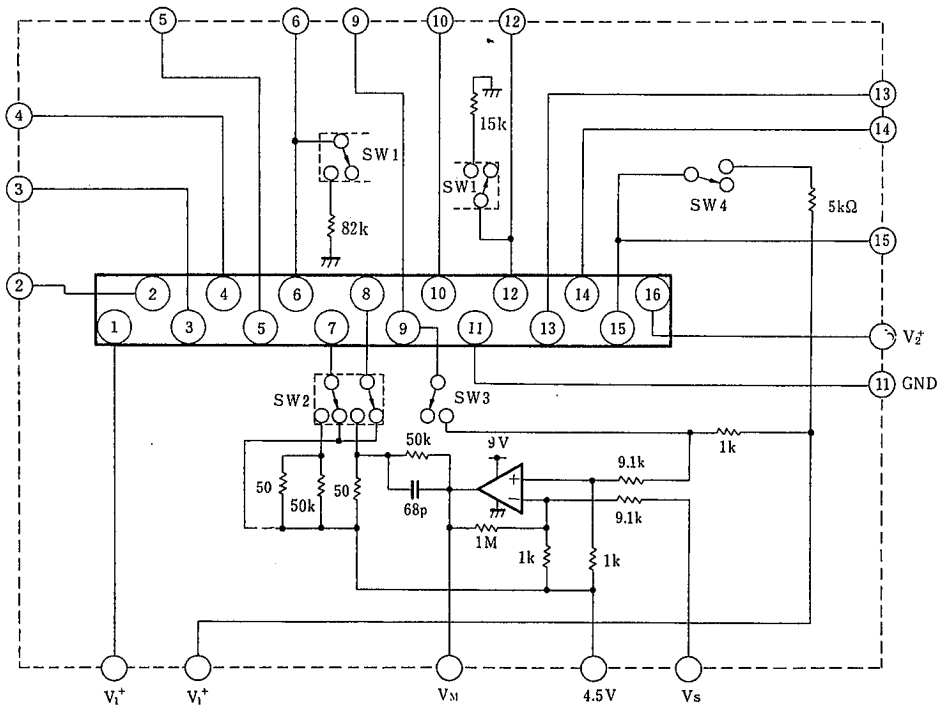
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	12	V
Motor Drive Current	Io	30	mA(PIN.9)
Power Dissipation	P_D	(ZIP16) 500	mW
		(DMP16) 350	mW
		(SSOP16) 350	mW
Operating Temperature Range	Topr	−20～+75	℃
Storage Temperature Range	Tstg	−40～+125	℃

■ ELECTRICAL CHARACTERISTICS

(Ta=25℃, V_1^+=9V, V_2^+=9V)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}		—	5.0	8.0	mA
Pin 3 Clip HIGH Level	V_{CLH}	V_5=5V	2.82	2.90	2.98	V
Pin 3 Clip LOW Level	V_{CLL}	V_5=0V	2.27	2.35	2.43	V
Pin 5 Threshold Level	V_{TH}		0.7	1.4	2.1	V
7-9 Open Loop Gain	G_0	R_{L1}=1kΩ (Pin 9−V^+)	80	90	—	dB
Pin 9 Output Operating Voltage	V_{9L}	R_{L1}=1kΩ (Pin 9−V^+)	1.4	1.5	1.6	V
Pin 10 DC Level	V_{10}		1.9	2.1	2.3	V
AGC Clip Level	V_{12CL}	R_{L2}=15kΩ	3.80	4.00	4.20	V
Pin 15 Saturation Level	V_{15L}	E_{IN}^+=2V, E_{IN}^-=2.1V, R_{L3}=5kΩ	—	0.2	0.4	V
Pin 15 OFF Level	V_{15H}	E_{IN}^+=2V, E_{IN}^-=1.9V, R_{L3}=5kΩ	8.9	9.0	—	V

■ TEST CIRCUIT



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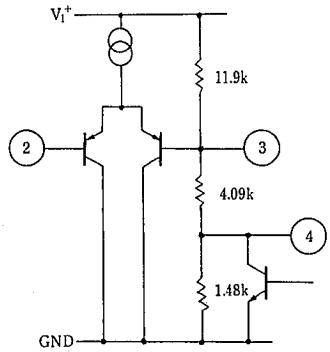
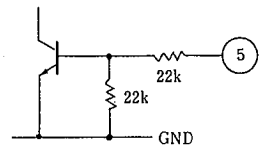
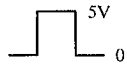
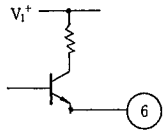
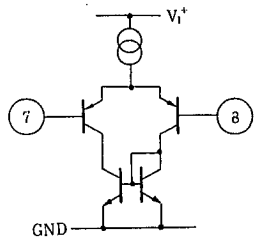
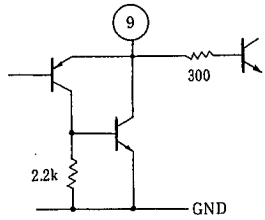
■ TEST CONDITION

PARAMETER	TEST CONDITION
Operating Current	$V_1^+=V_2^+=9V$ ⑤-GND, ⑬⑭-4.5V SW1~SW4-OFF Other Pins-OPEN
(Clip Circuit)	SW1~SW4-OFF
Pin 3 Clip HIGH Level	⑤-5V ③ Voltage Test
Pin 3 Clip LOW Level	⑤-0V ③ Voltage Test
Pin 5 Threshold Level	⑤-0.8V ③ Voltage Test Clip Level 1 ⑤-2.0V ③ Voltage Test Clip Level 2
(Driver-Amp Circuit)	SW2, SW3-ON
7-9 Open Loop Gain	Vs-6V, VM Value; A Vs-3V, VM Value; B O.L.Gain=20LOG [3000/(A-B)]
Pin 9 Output Operating Voltage	Vs-0.5V ⑨ Voltage Test SW3-ON
(Comparator Circuit)	
Pin 10 DC Level	⑩ Voltage Test
AGC Clip Level	SW1~SW3-ON Vs-8V ⑫ Voltage Test
(External Comparator Circuit)	
Pin 15 Saturation Level	SW4-ON ⑬-2V ⑭-2.1V ⑮ Voltage Test
Pin 15 OFF Level	⑬-2V ⑭-1.9V ⑮ Voltage Test

■ TERMINAL FUNCTION

(V_1^+=9V, V_2^+=9V)

PIN NO.	PIN SYMBOL	EQUIVALENT CIRCUITS	PIN VOLTAGE[V]	PIN DESCRIPTION
1	V_1^+	———	9.0	Operating Voltage
2	Y_{IN}		2.38	Luminance signal input. Lum. sig. level: 0.5Vp-p.
3	HC		2.35	Setting clip level (High). No connect at V^+=9V.
4	LC		0.6	Setting clip level (Low). No connect at V^+=9V.
5	W_{GP}		0	Input window gate pulse. The pulse: 
6	Y_{OUT}		2.35	Clipped luminance signal Output.
7	D_{IN}^+		—	Input driver amp signal (+) of luminance converted to DC level.
8	D_{IN}^-		—	Input driver amp signal (−) of iris motor threshold voltage.
9	D_{OUT}		—	Driver amp output which drive driver coil of iris motor.

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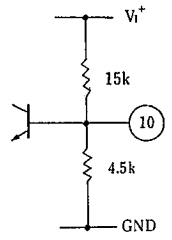
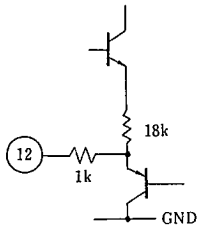
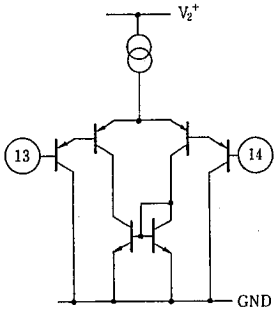
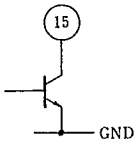
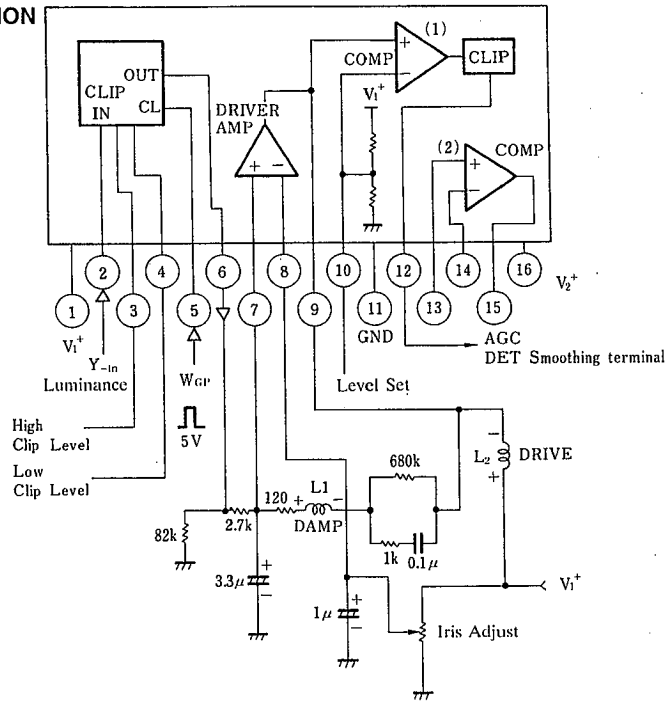
■ TERMINAL FUNCTION

(V_1^+=9V, V_2^+=9V)

PIN NO.	PIN SYMBOL	EQUIVALENT CIRCUITS	PIN VOLTAGE[V]	PIN DESCRIPTION
10	C_{IN}^-		2.09	Level set of COMP (1) which judges on-off condition of iris. No connect at V^+=9V.
11	GND	———	0	GND
12	C_{OUT}		0	Comparator (1) output which is signal to AGC circuit. Can drive TTL with 15kΩ load (4V/0V).
13	E_{IN}^+		—	Comparator (2) input (+)
14	E_{IN}^-		—	Comparator (2) input (−)
15	E_{OUT}		—	Comparator (2) output
16	V_2^+	———	9.0	Supply terminal to comparator (2)

■ TYPICAL APPLICATION



■ BRIEF OPERATION PRINCIPLE

Input luminance signal to clip circuit. (Pin 2)	Luminance signal clamped at 1.9V.
↓	
Clip with Pin 3 level, and output to. (Pin 6)	Pin 3 level LOW → 2.35V HIGH → 2.90V
↓	
Integration with external R,C. X → DC level conversion	Ext. circuit R : 2.7kΩ C : 3.3μF
↓	
Input to driver amp.	
↓ (Pin 7) ↓	Adjust Pin 8 level with external variable resistor. (Iris threshold)
Pin 8 level > X DAMP (L1) OFF DRIVER (L2) ON Iris Open	Pin 8 level < X DAMP (L1) ON DRIVER (L2) OFF Iris Close
	DAMP (L1) DRIVER(L2) Iris Motor
↓	↓
To comparator (1) AGC output LOW → 0V	To comparator (1) AGC output HIGH → 4V
(Pin 12)	AGC Output level: LOW 0V HIGH 4V (at 15kΩ load)

■ EXTERNAL CIRCUIT

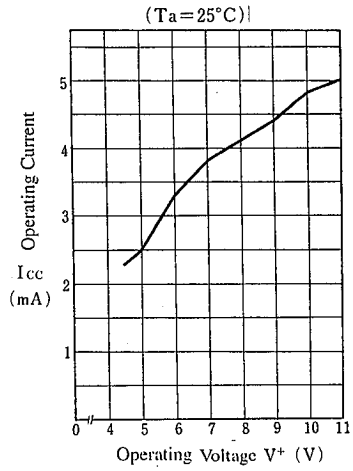
EXTERNAL DEVICE	OPERATION DESCRIPTION
Pin6–Pin7 resistor 2.7kΩ Pin7-GND capacitor 3.3μF	Integrating video luminance signal, and convert to DC level.
Pin7-L1 resistor 120Ω	Control iris motor speed.
Pin8 –Pin9 RC 680kΩ, 1kΩ, 0.1μF	To prevent miss operation of motor by vertical synchronous signal, low-pass filter acts as negative feedback circuit.
Pin8-GND capacitor 1μF	AC ground
V_1^+-GND Variable resistor	Set threshold value of iris-motor start.

■ NOTE

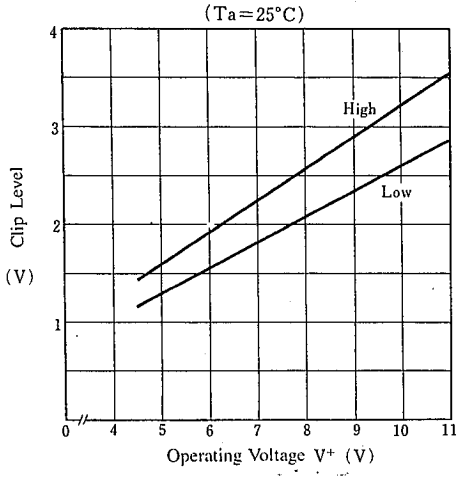
- When used at $V_1^+ = 9V$, not connect pin3, pin4, pin10.

■ TYPICAL CHARACTERISTICS

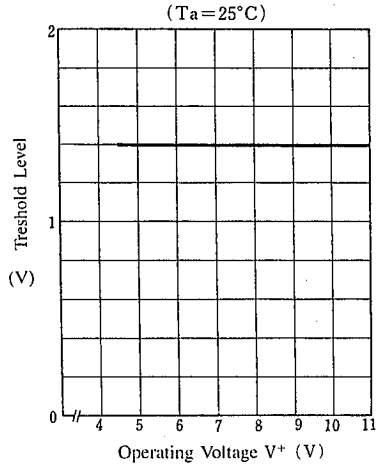
Operating Current



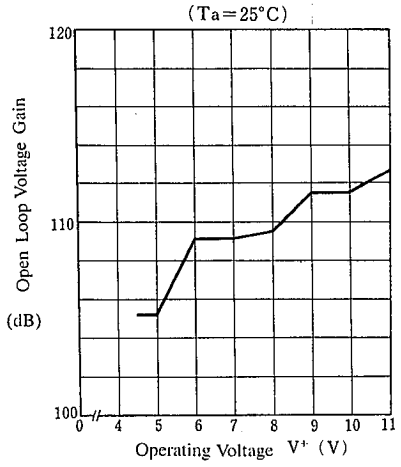
Clip Level (Pin 3)



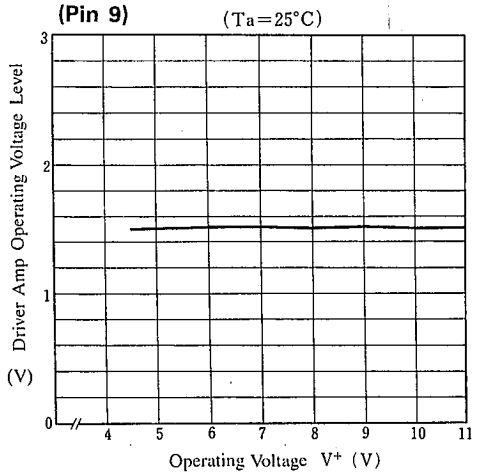
Treshold Level (Pin 5)



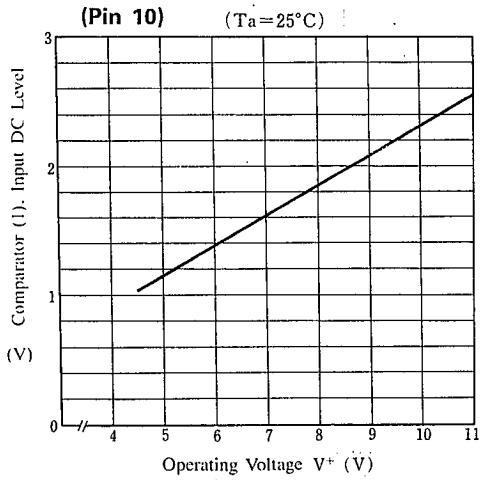
Open Loop Gain (Pin 7-Pin 9)



Driver Amp Operating Voltage Level (Pin 9)

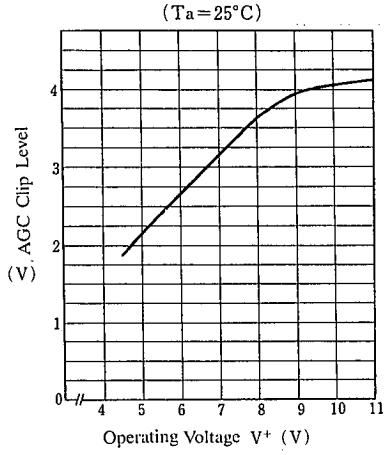


Comparator (1) Input DC Level (Pin 10)

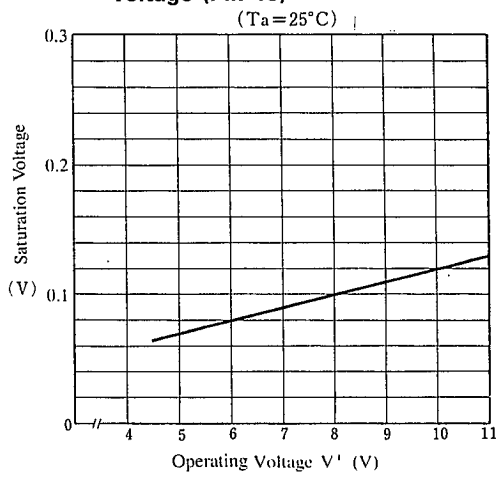


■ TYPICAL CHARACTERISTICS

AGC Clip Level



Comparator Output Saturation Voltage (Pin 15)



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MEMO