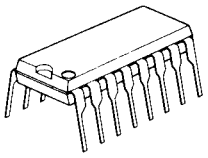
SYNCHRONOUS SEPARATOR WITH AFC

■ GENERAL DESCRIPTION

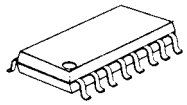
The **NJM2257** excutes Horizontal and Vertical synchronous signal separation, and odd / even field signal detection, from composit video signals.

Built-in 1 / 2 fH Killer Function circuit can make stabilization of the Horizontal signal oscillation output during the vertical period.

■ PACKAGE OUTLINE



NJM2257D



NJM2257M

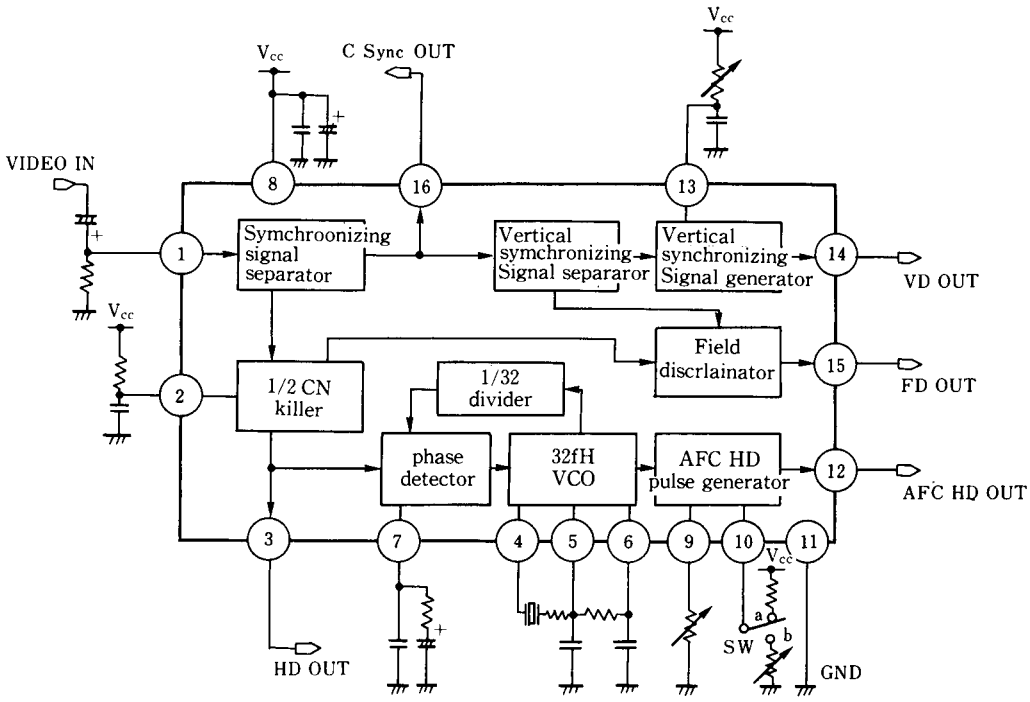
■ FEATURES

- Operating Voltage (+4.5 to +5.3V)
- Internal AFC circuit (Horizontal sync. signal.)
- Internal 1 / 2 fH Killer Function
- AFC output Pulse Delay time is Adjustable
- Vertical synchronous pulse width is Adjustable
- Internal Field Discrlainat Function
- Package Outline DIP16, DMP16
- Bipolar Technology

■ APPLICATION

- VTR, TV, AV components etc.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

(T_a= 25°C)

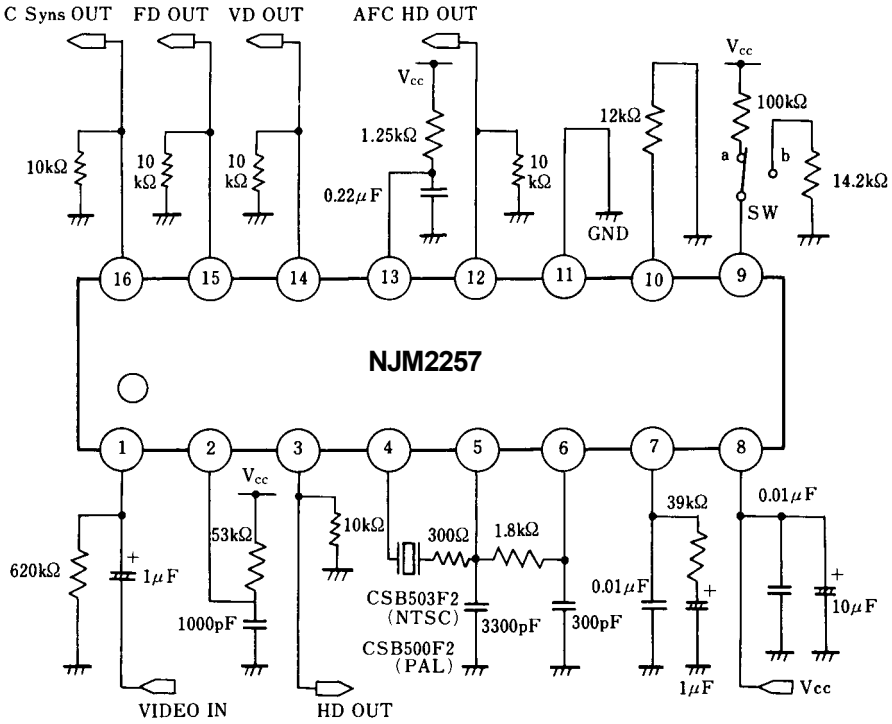
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	+7	V
Power Dissipation	P_D	(DIP16) 500 (DMP16) 350	mW mW
Operating Temperature Range	T_{opr}	-20 to +75	°C
Storage Temperature Range	T_{stg}	- 40 to +125	°C

■ ELECTRICAL CHARACTERISTICS

(V_{CC} = 5V, T_a = 25°C)

PARAMETER		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiessent Current		I_Q		-	23.0	30.0	mA
AFC Free Run Frequency		f_{OH}		15.54	15.74	15.94	KHz
AFC HD pulse width	none adjust	T_{AHW1}	SW=a	3.5	4.0	4.5	µS
	adjust	T_{AHW2}	SW=b	2.5	4.0	5.5	
AFC HD Delet Time		T_{AHD}		-1.0	0.5	2.0	µS
AFC Lock Range		Δf_{HL}		500	700	-	Hz
AFC Cap Charange		Δf_{HP}		400	600	-	Hz
AFC Output Voltage	H	V_{HAH}		4.0	4.2	-	V
	L	V_{HAL}		-	0	0.1	
Sync Sepa Sync. Separation Level		V_{HSR}		-	0.16	0.18	V
Sync Sepa Delay Time		T_{HCD}		0.05	0.20	0.35	µS
Sync Sepa Output Voltage	H	V_{HCH}		4.0	4.2	-	V
	L	V_{HCL}		-	0	0.1	
HD Output Palth Width		T_{HPW}		4.0	5.5	7.0	µS
HD Output Delay Time		T_{HPD}		0.35	0.6	0.8	µS
HD Output Voltage	H	V_{HfH}		4.0	4.2	-	V
	L	V_{HfL}		-	0	0.1	
V Sync Palth Width		V_{VW}		170	190	210	µS
V Sync Delay Time		T_{VD}		7.0	10.0	13.0	µS
V Sync Output Voltage	H	T_{VH}		4.0	4.2	-	V
	L	V_{VL}		-	0	0.1	
Field Distinction Delay Time	odd	T_{FOD}		246	256	266	µS
	even	T_{FED}		216	226	236	
Fideld Distinction Output Voltage	odd	V_{FOR}		4.0	4.2	-	V
	even	V_{FER}		-	0	0.1	

■ APPLICATION CIRCUIT



■ APPLICATION NOTES

It shows the characteristics by changing of the following resistor.

- The resistance between 9 Pin and GND
  - High resistance ——— AFC HD pulse is wide
  - Low resistance ——— AFC HD pulse is narrow
- The resistor between 9 Pin and V^+
  - At the resistor is 100Ω. AFC HD Delay adjustment is off, and AFC HD output width is 4μs (typ.)
- The resistor between 9 Pin and GND is fundamentally 14.2kΩ, because the purpose of this resistor is pulse width adjusts 4μs.

- The resistor between 10 Pin and GND
  - High resistance ——— AFC HD Delay time gains
  - Low resistance ——— AFC HD Delay time loses

- The resistor between 13 Pin and GND
  - High resistance ——— Vsync pulse is wide
  - Low resistance ——— Vsync pulse is narrow

- The resistor joind 2 Pin
  - Please adjust the wide of following W is from 33 μs to 37 μs (W = - (C·R)ln0.5)

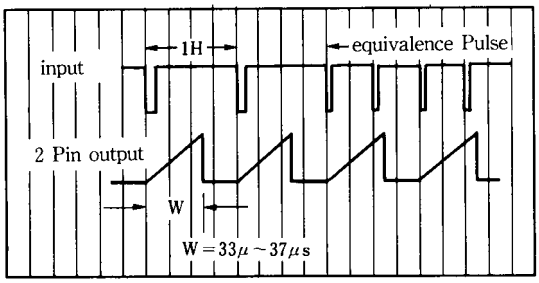
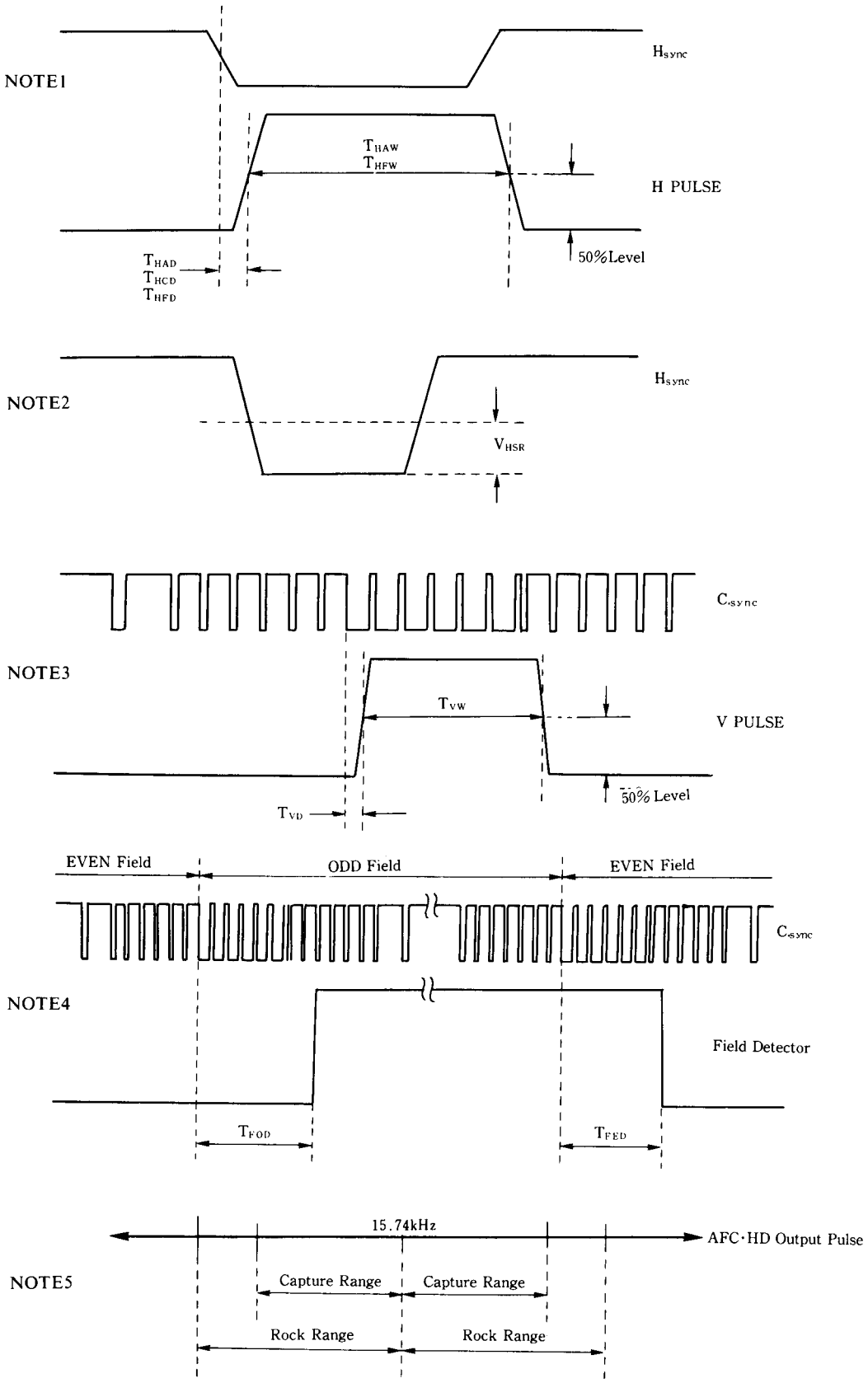
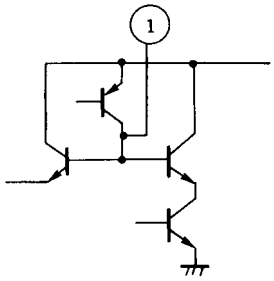
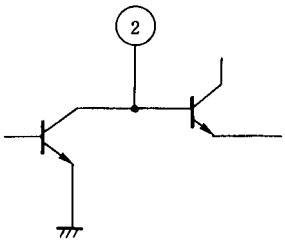
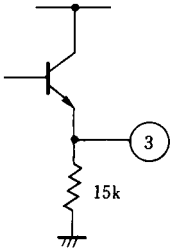
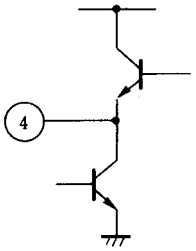
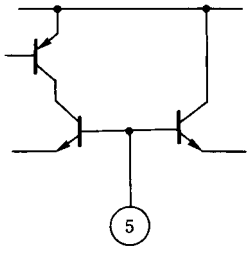


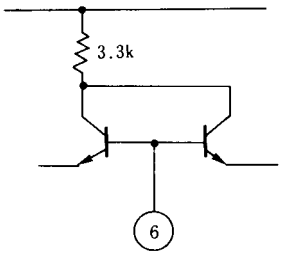
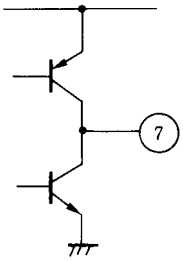
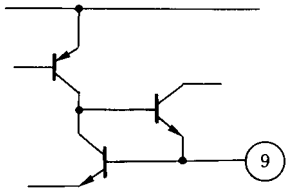
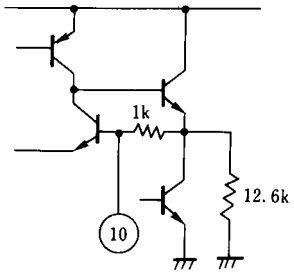
Fig 1 I / O PULSE


NOTE1
Hsync
THAW
THFW
H PULSE
50%Level
THAD
THCD
THFD
NOTE2
Hsync
VHSR
Csync
NOTE3
TVW
V PULSE
50% Level
TVD
EVEN Field
ODD Field
EVEN Field
Csync
NOTE4
Field Detector
TFOD
TFED
15.74kHz
AFC·HD Output Pulse
NOTE5
Capture Range
Capture Range
Rock Range
Rock Range

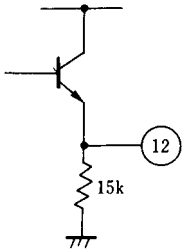
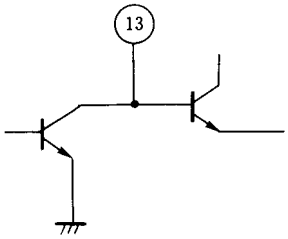
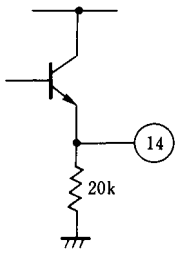
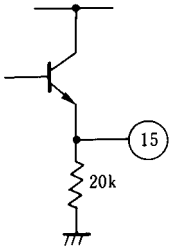
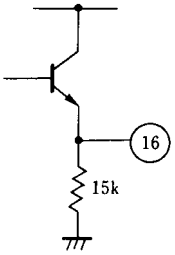
■ TERMINAL EXPLANATION

PIN NO.	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
1	VIDEO-IN	Composit Video Signal Input	
2	MM-HT	HD & FD puse are Controlled by setling mono multi	
3	HD-OUT	1 / 2 f_H Killer D Output	
4	VCO-OUT	VCO Output is to be given to Ceramic Oscillator	
5	VCO-FILTER 1	Decide the Volume to be transfered shall by decided of Ceramic Oscillator. (90°late)	

■ TERMINAL EXPLANATION

PIN NO.	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
6	VCO-FILTER 2	Decide the Volume to be transfered shall by decided of Cramic Oscillator. (90°late)	
7	L. P. F	L. P. F. of AFC	
8	V^+	Supply Voltage	
9	VR-1	AFC-HD Output Can be adjusted by putting resistor between 9 to GND (9 to V_{CC} no adjustment). The pulse width cam be adjusted by making changeable of resister (Adjusting mode)	
10	VR-2	AFC-HD Output delay adjustment by putting 10 pin resister changeable at 9 pin ajustment mode.	
11	GND	Ground	

■ TERMINAL EXPLANATION

PIN NO.	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
12	AFC, HD-OUT	AFC·HD Output	
13	MM-VT	Pulse Width of Vsync-OUT is adjusted by setting mono multi time constant.	
14	Vsync-OUT	Vertical Synchronous Signal Output.	
15	FD-OUT discrimination	Field Distiniction Signal Output.	
16	Csyne-OUT	Synchronous Separation Output	

■ PIN FUNCTION

PIN NO.	FUNCTION BLOCK	OPERATIONAL DESCRIPTION	NOTE
①Pin	Signal Input	Video Signal input	Sync tip clump
②Pin	HD pulse control	HD pulse and FD pulse control by time constant of CR	
③Pin	HD pulse output	1 / 2 f_H killer HD pulse output	In a period of vertical synchronizing, a f_H is converted to f_H
④Pin	AFC Oscillation	Oscillation of 503KHz by a ceramic oscillator, and divided by 32 to get down to 15.74KHz	
⑤Pin			
⑥Pin			
⑦Pin	AFC control	Leg Lead filter for phase detection	
⑧Pin	V_{CC}	V_{CC}	
⑨Pin	AFC HD output Switch (AFC HD pulse width adjustment)	The case that R is connected between 9pin and V_{CC}···Fixed output The case that R is connected between 9pin and GND···Adjustable AFC HD Delay Mode	High Resistance → Wide pulse width Low Resistance → Narrow pulse width
⑩ Pin	AFC HD Delay adjustment	The case that R is connected between 9pin and GND···Adjustable AFC HD Delay output	High Resistance → AFC HD Delay time gains Low Resistance → AFC HD Delay time loses
⑪ Pin	GND	GND	
⑫ Pin	AFC HD output	AFC HD pulse output	Positive polarity
⑬ Pin	VD pulse width adujstment	VD pulse width control by time constant of CR	
⑭ Pin	VD output	Vertical synchronizing signal output	Positive polarity
⑮ Pin	FD output	Field discriminating signal output	odd field → High Output even field → Low Output
⑯ Pin	C Sync. output	Composite Sync Signal output	Positive polarity