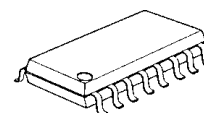


RF Modulator with TSG for UHF Band

DESCRIPTION

The NJW1502 is a RF modulator IC especially designed for UHF band RF modulator and consists of video clamp circuit, white clip circuit, video AM modulator, audio FM modulator and Test Signal Generator(TSG), built into one chip.

PACKAGE OUTLINE

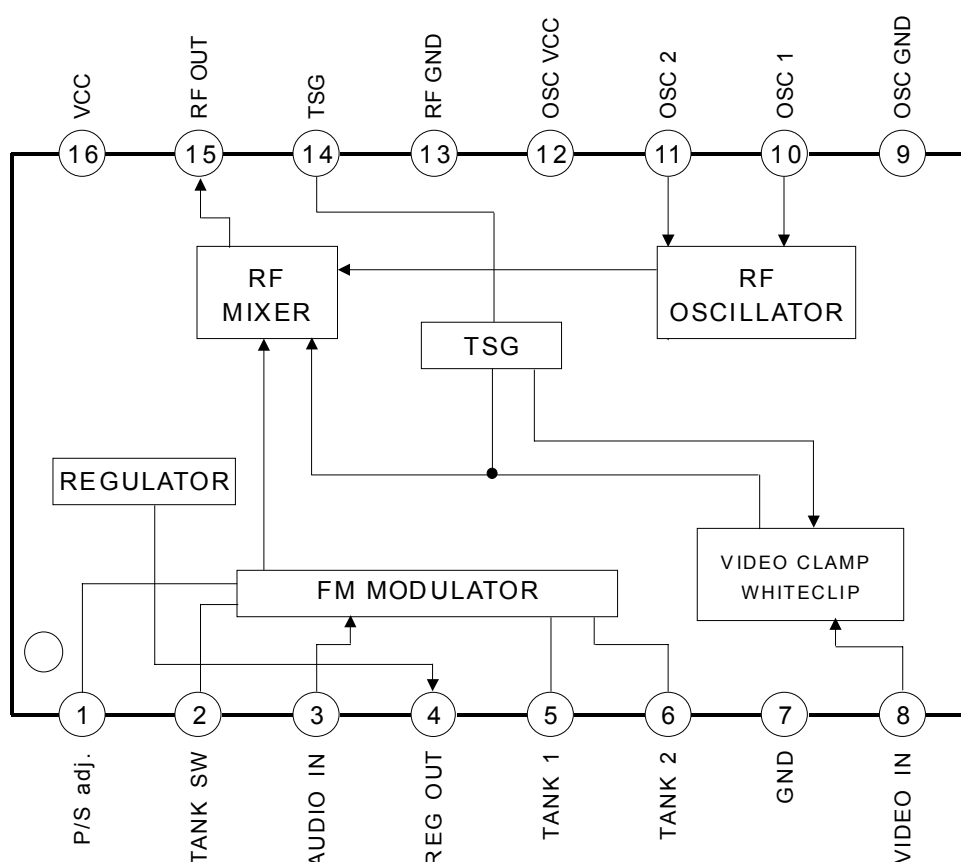


NJW1502M

FEATURES

- Operating Voltage 5V
- Picture-to-sound ratio is adjustable
- TSG on chip
- Regulator on chip
- Bi-CMOS Technology
- Package Outline: DMP16

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

(T_A=25°C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{CC}	7	V
Power Dissipation	P _D	300	mW
Input Voltage	V _I	-0.3 to V _{CC}	V
Operating Temperature Range	T _{opr}	-20 to +75	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

■ RECOMMENDED OPERATING VOLTAGE RANGE

(T_A=25°C)

Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit
Operating Voltage		V _{CC}	4.5	5.0	5.5	V

■ ELECTRICAL CHARACTERISTICS

(V_{CC}=5V, T_A=25°C)

Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit
Operating Current	TSG=ON	I _{CC}	18	26	35	mA
Video Output Level (Note 1)	Video input Signal (Pin8)=0.5V _{PP}	V _O	(78)	81	(84)	dBu
Video Modulation Depth (Note 1)	Video input Signal (Pin8)=0.5V _{PP}	mp	(70)	76	(82)	%
Video Limiter Modulation Depth (Note 1)	Video input Signal (Pin8)=1V _{PP}	mpmax	(85)	94	(98)	%
Differential Gain	Video input Signal (Pin8)=0.5V _{PP} Staircase	DG	—	±3	—	%
Differential Phase	Video input Signal (Pin8)=0.5V _{PP} Staircase	DP	—	±3	—	deg
Picture-to-sound Ratio (Note 1)	Video input Signal (Pin8)=0.5V _{PP}	PS	(11)	13	(15)	dB
Sound FM Modulation Sensitivity (Note 1)	Deviation of fs per 100mV	βb	(0.39)	0.51	(0.63)	KHz/mV
Audio Distortion	Audio input (Pin3)=50mV _{PP} 1kHz sine wave	THD	—	0.3	—	%
Audio Signal-to-noise Ratio	Sound Modulation 60kHz _{PP} 1kHz sine wave	ASN	—	60	—	dB
Maximum Sound FM Modulation	Audio input (Pin3)=1.0V _{PP} 1kHz sine wave	msmax	—	500	—	%
TSG Horizontal Sync Signal Cycle	TSG =ON	TSG	(62)	64	(66)	μS

(Note 1) Because AC characteristics largely depends on application circuit, these parameters are specified by the DC characteristics as shown in next page.

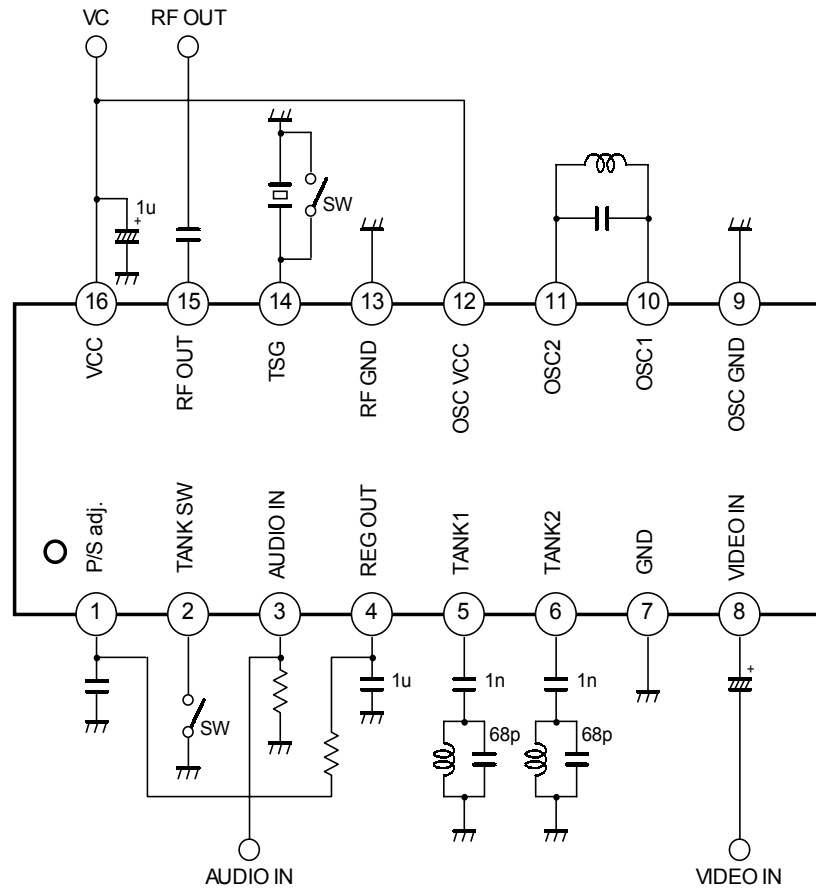
■ **DC ELECTRICAL CHARACTERISTICS** ($V_{CC}=5V, T_A=25^{\circ}C$, otherwise noted. All measurements performed in the DC test circuit are shown in next page)

Parameter	Condition (Note 2)	Symbol	Min.	Typ.	Max.	Unit
Video Output Signal Amplitude 1	RF OUT output voltage. P/S Adj. input level =Vv OSC1/2=0dBm(20MHz sine wave)	Vp1	5.9	-	9.6	mVrms
Video Output Signal Amplitude 2	RF OUT output voltage. P/S Adj. input level =Vv+0.44V OSC1/2=0dBm(20MHz sine wave)	Vp2	1.21	-	2.48	mVrms
Video Modulation Depth	$Mp = ((Vp1-Vp2 / Vp1) \times 100$	Mp	68	76	82	%
Picture-to-sound Ratio	$Psg = 20\log((Psg2-Psg1)/2 \times (Psg2+Psg1))$	Psg	11	13	15	dB
Sound FM Modulation Sensitivity	$Mg=(Fg1-Fg2)/200$	Mg	0.39	0.51	0.63	KHz/mV

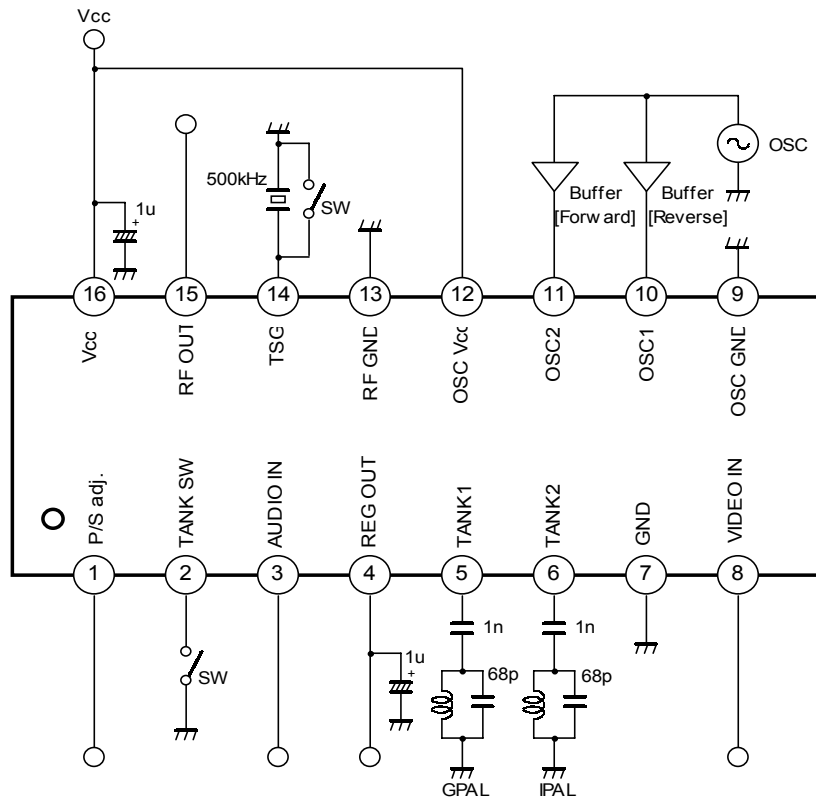
(Note 2) Explanation of symbols

- Vv : VIDEO IN output voltage at Pin8, Vcc=5V
- Vps : P/S Adj. output voltage at Pin1, Vcc=5V
- Psg1 : RF OUT output level at Pin15
OSC =0dBm(F=20MHz Sine Wave)
P/S Adj.(Pin1) input level=Vps-0.17V
- Psg2 : RF OUT output level at Pin15
OSC =0dBm(F=20MHz Sine Wave)
P/S Adj.(Pin1) input level=Vps+0.17V
- Fg1 : RF OUT output level at Pin15
AUDIO IN=0.1V,TANK SW selects TANK1.

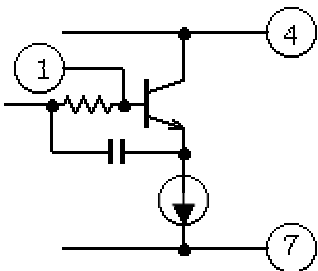
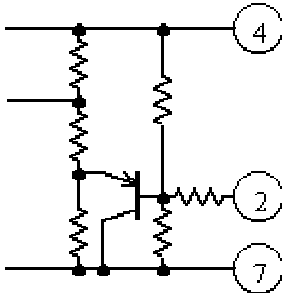
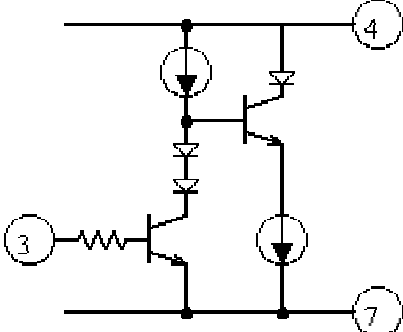
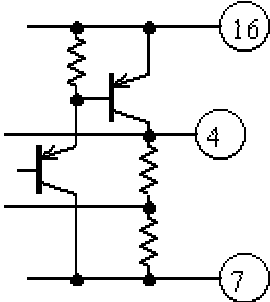
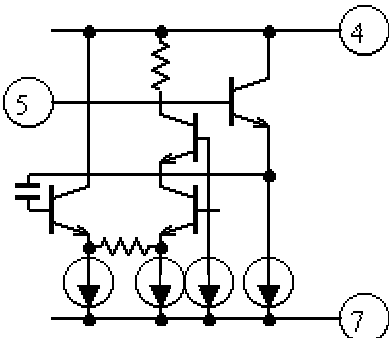
■ AC TEST CIRCUIT

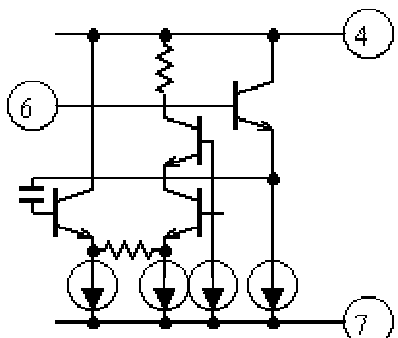
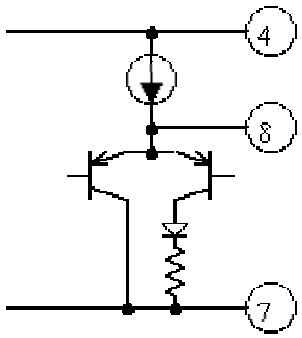
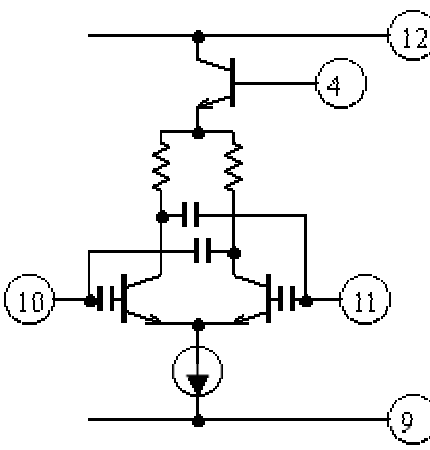


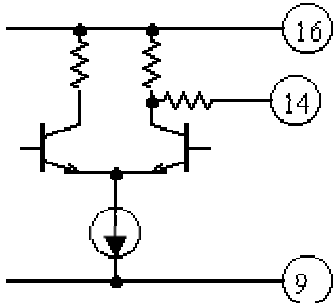
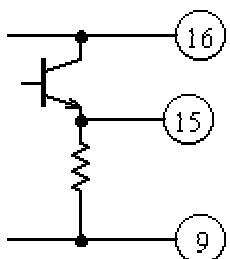
■ DC TEST CIRCUIT



■ TERMINAL CHARACTERISTICS

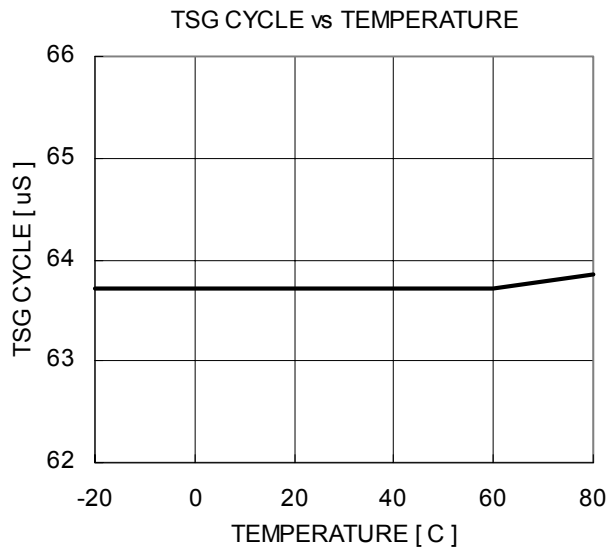
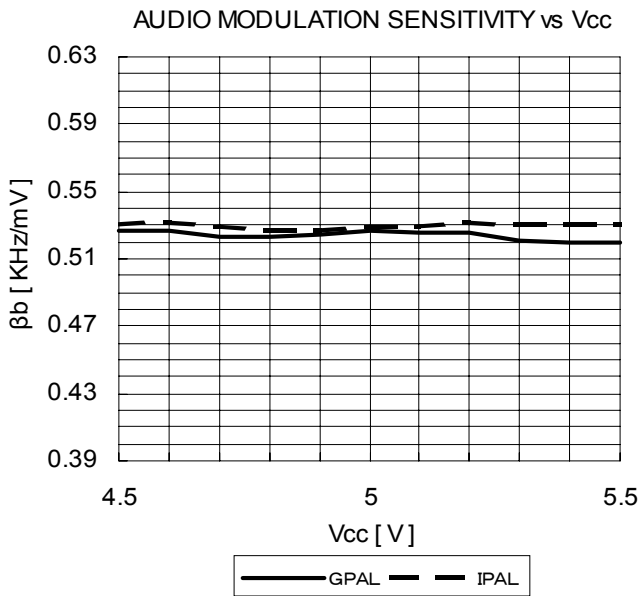
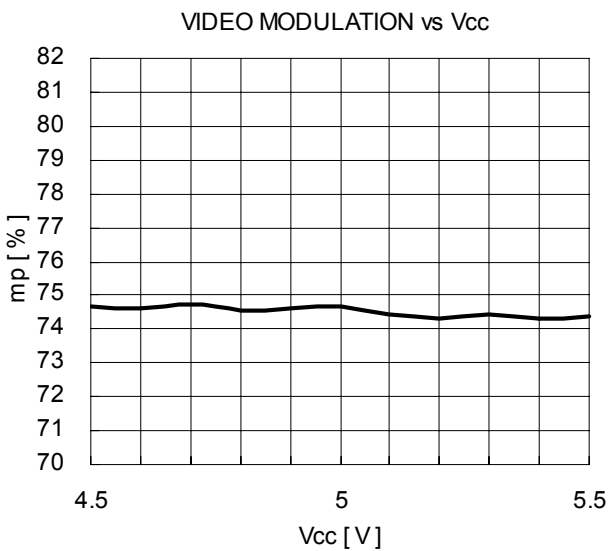
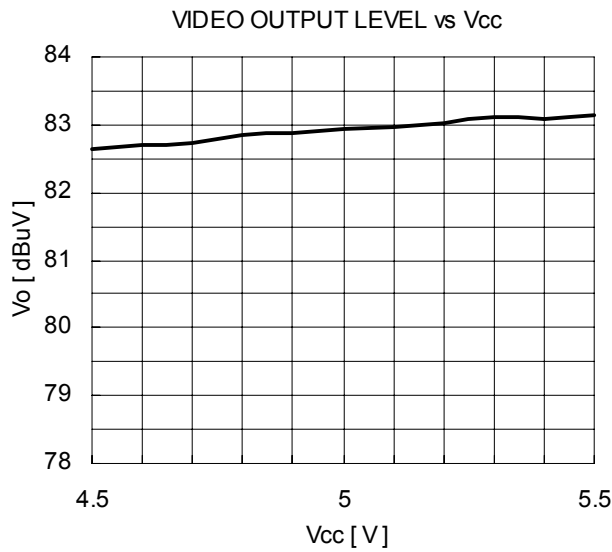
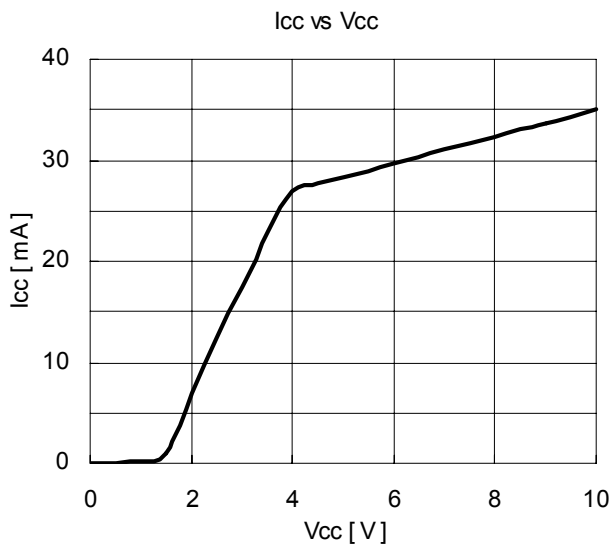
No.	Symbol	Typ.DC Voltage (V)	Equivalent Circuit	Function
1	P/S adj	3.0		Picture-to-sound Ratio Adjust
2	TANK SW	-		Tank 1/Tank 2 Select Switch
3	AUDIO IN	-		Audio Signal Input
4	REG OUT	4.0		Regulator Output
5	TANK 1	2.8		Tank Coil for Sound FM Modulation Circuit

No.	Symbol	Typ.DC Voltage (V)	Equivalent Circuit	Function
6	TANK 2	2.6		Tank Coil for Sound FM Modulation Circuit
7	GND	-		GND
8	VIDEO IN	2.6		Video Signal Input
9	OSC GND	-		GND
10 11	OSC1 OSC2	-		RF Oscillator
12	OSC Vcc	-		RF Oscillator Power Supply

No.	Symbol	Typ.DC Voltage (V)	Equivalent Circuit	Function
13	RF GND	-		GND
14	TSG	-		TSG ON/OFF Switch
15	RF OUT	3.9		RF Signal Output
16	Vcc	-		Power Supply

■ TYPICAL CHARACTERISTICS

$T_A=25^{\circ}\text{C}$



MEMO

[CAUTION]

The specifications on this databook are only given for information , without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.