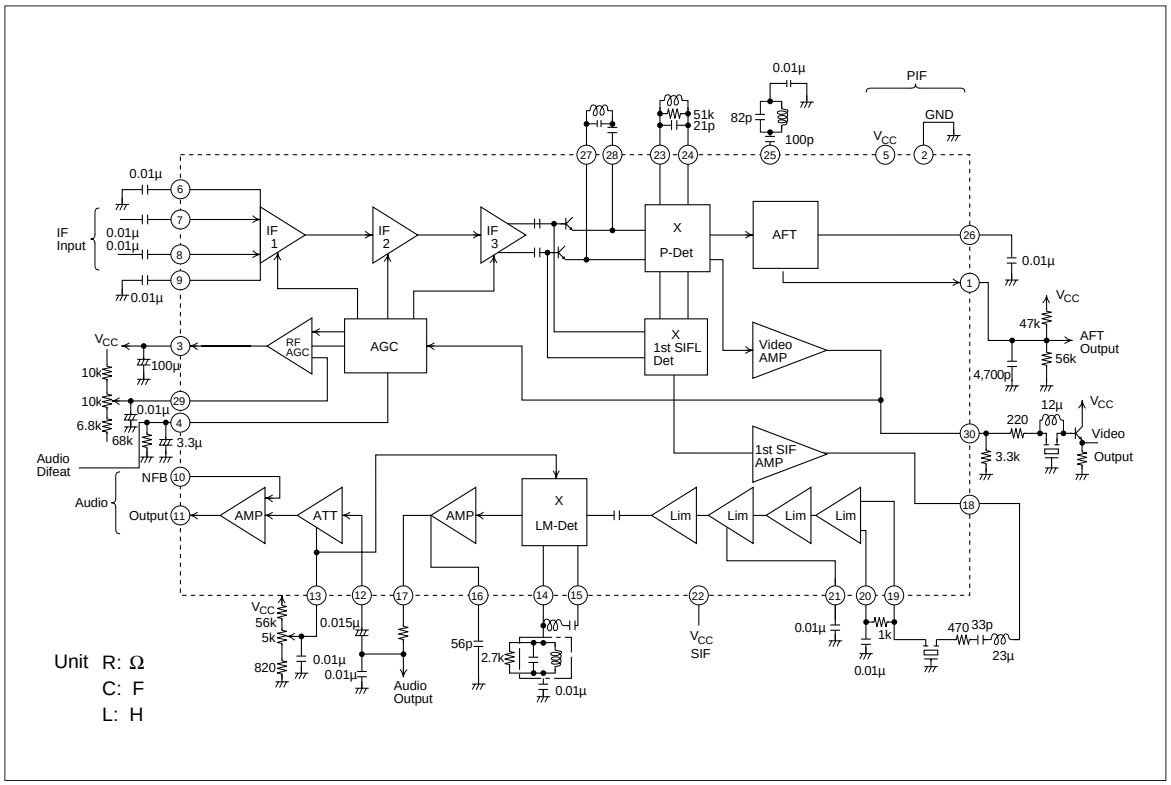
HA11485BNT

• Color TV /VCR Picture IF, Audio IF System

Features

- PIF amplifier, Video Detector, AGC Jungle, AFT
- 1st SIF Detector, FM limiter amplifier, FM Detector, Audio DC ATT

Block Diagram



Absolute Maximum Ratings (Ta = 25˚C)

Item	Symbol	Rating	Unit
Supply voltage	V_{CC}	15	V
Power dissipation*	P_T	900	mW
Operating temperature	Topr	– 20 to +65	°C
Storage temperature	Tstg	– 55 to +125	°C

* Rated value at Ta = 65°C

Electrical Characteristics (V_{SS} = 0V, Ta = 25˚C)

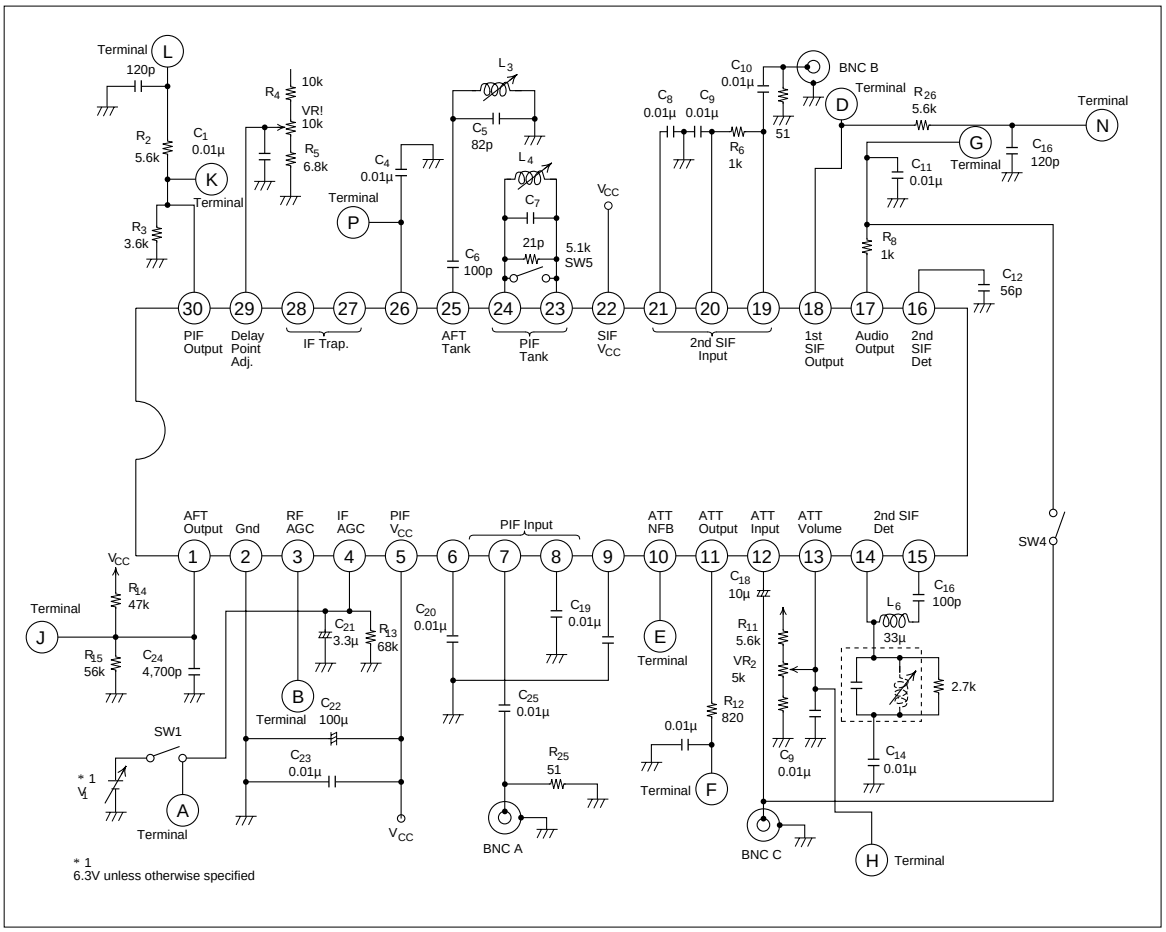
	Item		Symbol	Min	Typ	Max	Unit	Test Condition	Applicable Terminal	Test Circuit
Supply current			I_S	45	65	85	mA		5	1
PIF section	Input sensitivity		V_{IN}	—	40	46	dBμ		30	1
	Maximum allowable input		$V_{IN(max)}$	100	110	—	dBμ		30	1
	Video bandwidth		F_C	6	10	—	MHz		30	1
	Video amplitude		V_{out}	2.14	2.50	2.92	Vp-p		30	1
	Synchronization peak value		V_{SYNC}	4.8	5.2	5.5	V		30	1
	Noise blanking starting voltage		V_{NC}	0.4	0.7	1.1	V		30	1
	Differential gain		DG	—	5	—	%		30	1
	Differential phase		DP	—	3	—	deg		30	1
	Vertical periodic distortion		V_{VER}	—	50	100	mV		30	1
	Minimum RF AGC voltage		$V_{TR(min)}$	—	0.1	0.5	V		3	1
	Maximum RF AGC voltage		$V_{TR(max)}$	11.0	11.7	—	V		3	1
	Input resistance		R_{IN}	—	1.5	—	kΩ		7, 8	2
	Input capacitance		C_{IN}	—	3.0	—	pF		7, 8	2
	Video output resistance		R_{OUT}	—	30	—	Ω		30	1
	AFT midpoint voltage		V_{M1}	4.75	6.5	8.25	V	Quiescent	1	1
	AFT detection sensitivity		μ	150	280	350	kHz/10V		1	1
	AFT hold range	Upper	f_{AH}	1.2	2.0	—	MHz		1	1
		Lower	f_{AL}	—	–2.0	–1.2	MHz		1	1
	Maximum AFT voltage		$V_{A(max)}$	11.0	11.7	—	V		1	1
	Minimum AFT voltage		$V_{A(min)}$	—	0.5	1.0	V		1	1

Electrical Characteristics (V_{SS} = 0V, Ta = 25˚C) (cont)

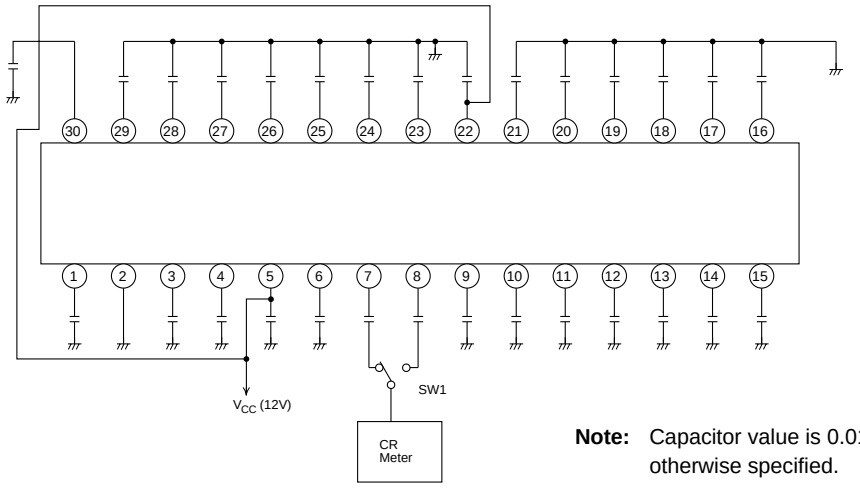
	Item	Symbol	Min	Typ	Max	Unit	Test Condition	Applicable Terminal	Test Circuit
PIF section (cont)	RF AGC additional attenuation amount	V_{AT}	—	1	5	dB		3	1
	Delay point decrease voltage	DDLV	—	1	6	dB		3	1
	S/N ratio	S/N	47	52	—	dB		30	1
1st SIF section	Frequency characteristics	f_S	6	10	—	MHz		18	1
	Detection output	S_{OUT}	1	2	3	Vp-p		18	1
	Differential phase	DP	—	3	—	deg		18	1
2nd SIF section	Limiting sensitivity	V_{lim}	—	46	52	dBμ		17	1
	Detection output	$L_{O(AF)}$	0.6	0.75	0.95	Vrms		17	1
	AM removal ratio	AMR_1	40	50	—	dB	V_{in} = 100dBμ	17	1
		AMR_2	40	50	—	dB	V_{in} = 80dBμ	17	1
	Total harmonic distortion	THD	—	1.0	2.0	%		17	1
	Detection output DC offset	ΔV_O	—	—	0.5	V		17	1
	Non-distortion maximum voltage	V_{MAX}	2.1	3.0	—	Vrms		11	1
	ATT maximum attenuation volume	ATT	65	—	—	dB	When ATT volume is 1V	11	1
	ATT temperature characteristics	DTATT	—	0	—	dB	When ATT volume is 4V	11	1
	ATT maximum gain	ATTG	17	20	—	dB		11	1
	ATT attenuation point	$ATTV_1$	4.2	4.5	5.0	V	ATT output: –1dB	13	1
		$ATTV_2$	2.5	2.8	3.0	V	ATT output: –65dB		

Test Circuit

(1)



(2)

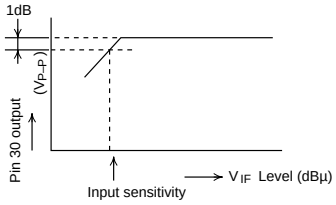


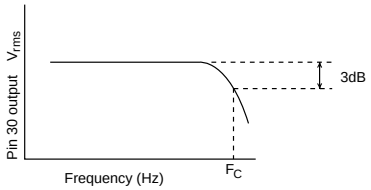
Note: Capacitor value is 0.01µF unless otherwise specified.

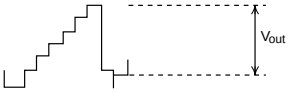
Home Print

Test Methods

	Item	Symbol	Test Diagram	Input Signal	Input Terminal	Test Method	Remarks
Supply current		I_S	1	Quiescent	BNC A	Measurement of current at pin 5	
	Input sensitivity	V_{IN}	1	1	BNC A	L terminal measured with synchroscope. Input sensitivity taken as input level when video input (pin 30) reduced by 1dB	SW2
PIF section	Maximum allowable input	$V_{in\ max}$	1	1	BNC A	V_{IF} level when video output (pin 30) fluctuated ±5%	SW2
	Video bandwidth	F_C	1	4	BNC A	With SW1 closed, V1 adjusted so that pin 30 input is approximately in the center between carrier level and synchronize peak value	SW1 SW2
				3	BNC A	With V1 fixed, voltage at K terminal measured as modulation wave frequency is varied and point noted at which frequency characteristic drops by 3dB	SW2
	Video amplitude	V_{out}	1	1 80dBm	BNC A	Measurement of K terminal output voltage p-p value	SW2

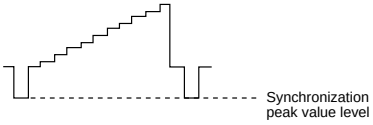


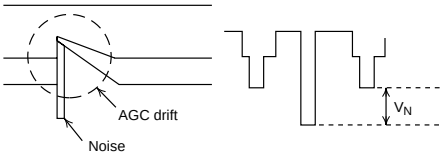


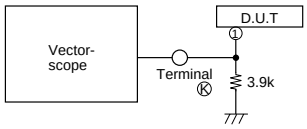


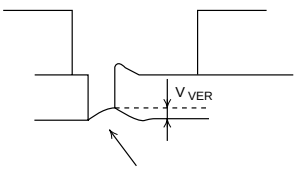
Test Methods (cont)

	Item	Symbol	Test Diagram	Input Signal	Input Terminal	Test Method	Remarks
PIF section (cont)	Synchro-nization peak value voltage	V_{SYNC}	1	1 80dBμ	BNC A	Synchronization peak value level of video output voltage at K terminal measured with synchroscope	SW2
	Noise blanking starting voltage	V_{NC}	1	1 80dBμ	BNC A	Output at terminal K when there is no AGC noise affecting terminal K waveform	SW2
	Differen-tial gain	DG	1	2	BNC A	Vectorscope connected to K terminal for measurement	SW2
	Differen-tial phase	DP		80dBμ			
	Vertical periodic distortion	V_{VER}	1	1 80dBμ	BNC A	Measurement of vertical periodic distortion at K terminal	



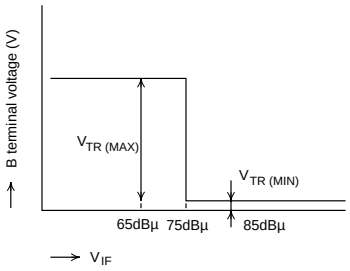




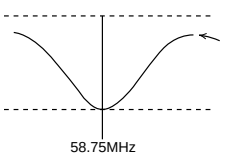
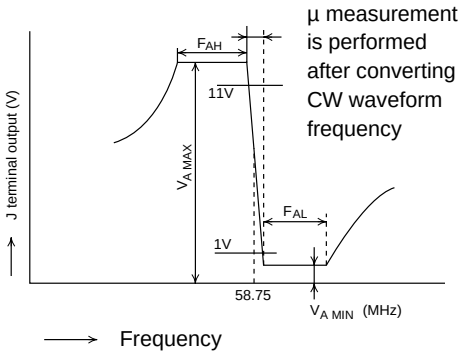
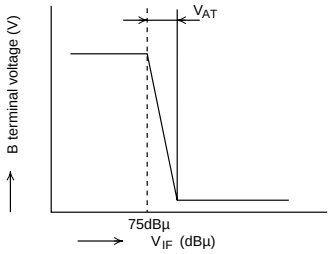


Vertical synchronizing signal

Test Methods (cont)

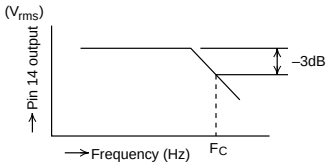
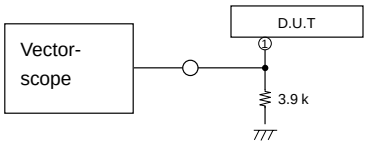
	Item	Symbol	Test Diagram	Input Signal	Input Terminal	Test Method	Remarks
	Minimum RF AGC voltage	$V_{TR\ min}$	1	1	BCN A	B terminal voltage measured when VR1 adjusted so delay point is 75dBµ	
	Maximum RF AGC voltage	$V_{TR\ max}$					
PIF section (cont)	PIF input resistance Pin 7	R_{i7}	2			Measured using R-X meter with measuring frequency of 58.75MHz	SW1
	PIF input resistance Pin 8	R_{i8}	2				
	PIF input capacitance Pin 7	C_{i7}	2				
	PIF input capacitance Pin 8	C_{i8}	2				
	Video output resistance	R_{out}	1	Quiescent		DC voltage measured at K terminal and used as value for variable A. Next, voltage at K terminal when current of 1mA is extracted from K terminal, and used as value for Variable B. Finally, following calculation is performed using measured values. $\frac{A - B\ (V)}{10^{-3}\ (A)}$	SW1 SW2
	AFT midpoint voltage (quiescent)	V_{M1}	1			Voltage measured at J terminal when SW1 and SW4 are ON, and V1 voltage is 7 V	SW1 SW4

Test Methods (cont)

	Item	Symbol	Test Diagram	Input Signal	Input Terminal	Test Method	Remarks
PIF section (cont)	AFT detection sensitivity	μ	1	4	BNC A	SW3 closed, and V1 adjusted so that the minimum point of K terminal output becomes the synchronizing peak value voltage	
	AFT hold area (upper)	F_{AH}	1	7			
	AFT hold area (lower)	F_{AL}	1	7			
	Max. AFT voltage	$V_{A\ max}$	1	7			
	Min. AFT voltage	$V_{A\ min}$	1	7			
						Next, J terminal output is measured 	
	RF AGC additional attenuation volume	V_{AT}	1	1	BNC A	VR1 adjusted to make delay point 75dBμ 	
	Delay point reduction voltage	DDLV	1	1	BNC A	Delay point change when delay point adjusted to 80dBμ by VR1 and supply. Voltage is varied ±15%.	

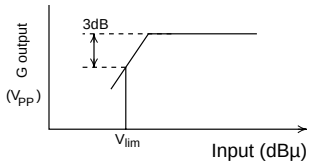
Home Print

Test Methods (cont)

	Item	Symbol	Test Diagram	Input Signal	Input Terminal	Test Method	Remarks
PIF section (cont)	S/N	SN	1	4 80dBµ	BNC A	K terminal output measured using IF volt meter when SW1 is closed and V1 voltage set so K terminal voltage is synchronous peak value and carrier zero level is at midpoint. Next, following calculation is performed: $20 \log \frac{\text{Video amplitude}}{0.875 \times \text{Measured value}} \times 0.75$	
1st SIF section	Frequency characteristic	F_C	1	4	BNC A	SW1 closed and V1 adjusted so Pin 30 output is at carrier zero level and synchronous peak value level is almost at midpoint.	SW2
				3	BNC A	V1 set and voltage at D terminal measured while modulated wave frequency is varied. Measurement is made when frequency characteristic is 3dB down. 	13Y
1st SIF section	Detection output	S_{out}	1	1 80dBµ	BNC A	 Synchroscope used to measure output p-p at D terminal.	SW2
	Differential phase	DP	1	2 80dBµ	BNC A	Measured by connecting vectorscope at D terminal. 	SW2

13Y

Test Methods (cont)

	Item	Symbol	Test Diagram	Input Signal	Input Terminal	Test Method	Remarks
2nd SIF section*1	Limiting sensitivity	V_{lim}	1	8	BNC B	f = 6.5MHz, Δf = ±50kHz/dev, fm = 400Hz signal input from BNC (B) terminal. G terminal output measured using synchroscope, and input level measured in dBμ units at 3dB down from maximum output. 	SW1
	Detection output	V_{OAF}	1	8	BNC B	Output measured at G terminal when f = 6.5MHz, Δf = ±50kHz/dev, fm = 400Hz, 100dBμ input from BNC (B) terminal	SW1
	AM elimination factor (1)	AMR(1)	1	8 10	BNC B	V_{OAF1} = G terminal output when SW1 and SW2 are ON, and f = 6.5MHz, Δf = ±50kHz/dev, fm = 400Hz, Vin = 100dBμ input from BNC (B) terminal. V_{OAF2} = G terminal output for f = 6.5MHz, fm = 400Hz, 30%, AM modulated input. Calculation performed using the following formula: $AMR(1) = 20 \log \frac{V_{OAF1}}{V_{OAF2}}$	SW1
	AM elimination factor (2)	AMR(2)	1	10	BNC B	Same as AM elimination factor (1), except Vin = 80dBμ	SW1
	Total harmonic distortion	THD	1	8	BNC B	L_7 adjusted to THD optimum point and measurement made at G terminal when f = 6.5MHz, Δf = ±50kHz/dev, fm = 400Hz, Vin = 100dBμ input	SW1
	Detection output DC offset	ΔV_O	1	11	BNC B	G terminal voltage measured using voltmeter when input signal varied in range of 100 to 60dBμ ΔVo = initial set value – G terminal voltage	SW1
	Maximum undistorted output	V_{max}	1	8	BNC B	VR2 varied while monitoring F terminal output with distortion meter. Output level at F terminal measured when THD is 5%.	SW1 SW2
	ATT max. attenuation volume	ATT	1	12	BNC C	F terminal output level measured for H terminal maximum output voltage and minimum output voltage $20 \log \frac{\text{F terminal output for H terminal minimum}}{\text{F terminal output for H terminal maximum}}$	SW1

Home Print

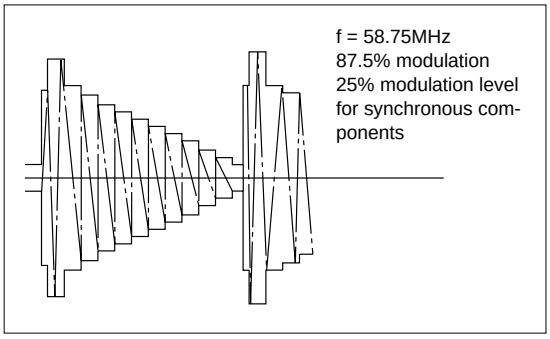
Test Methods (cont)

	Item	Symbol	Test Diagram	Input Signal	Input Terminal	Test Method	Remarks
2nd SIF section*1 (cont)	ATT temperature characteristic	ATT	1	8 100dBμ	BNC B	VR2 adjusted and H terminal D C voltage set to 4V. Change in F terminal output level when ambient temperature varied in range of ΔTa = +40 to –45.	SW1
	ATT max. gain	ATT G	1	12	BNC C	Calculation based on measurement of F terminal output when H terminal voltage is 5V $20 \log \frac{\text{Measured value}}{200\text{mVrms}}$	SW1 SW2
	ATT attenuatiuon point 1	ATT V_1	1	8	BNC B	Measurement of H terminal voltage when H terminal voltage is 5V and F terminal output level is – 1dB	SW4
	ATT attenuation point 2	ATT V_2	1	8	BNC B	Measurement of H terminal voltage when H terminal voltage is 5V and F terminal output level is – 65dB	SW4

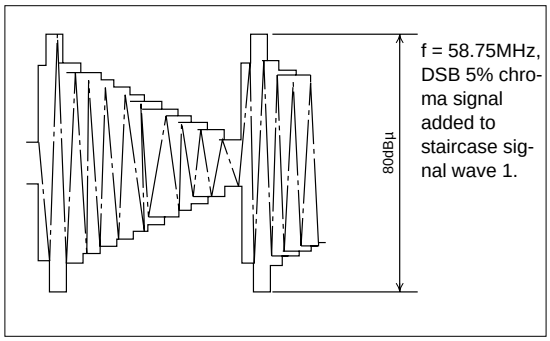
Note:1. Adjusted to synchronized point where output DC level is 5V.

Input Signals

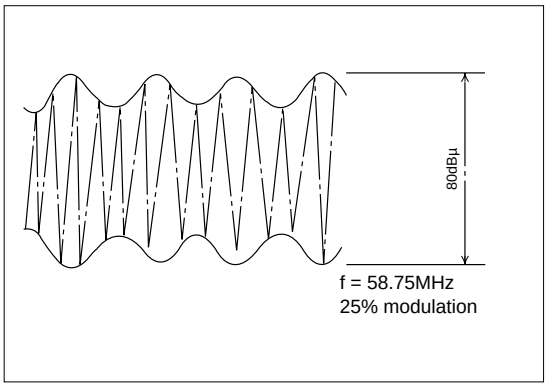
- **Staircase Signal Wave** (No Chroma Signal)



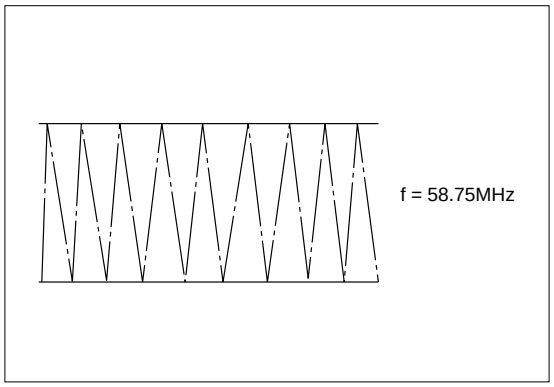
- **Staircase Signal Wave** (With Chroma Signal)



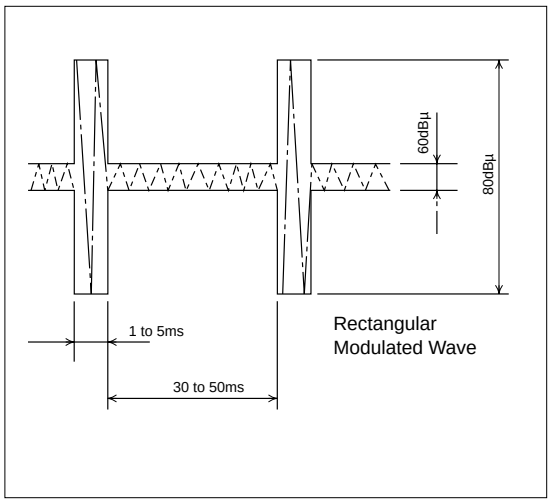
- **Sine Modulated Wave**



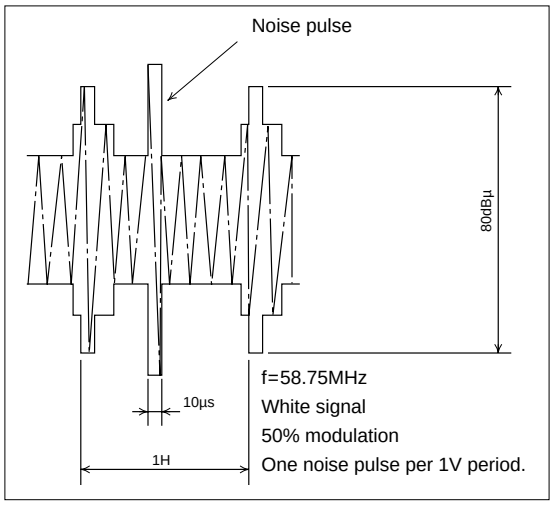
- **CW**



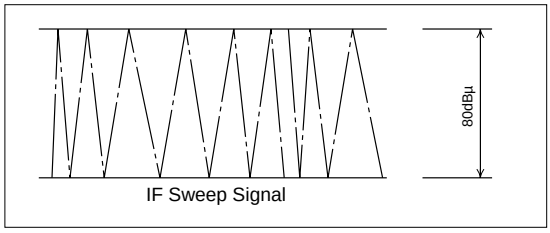
• **Rectangular Modulated Wave**



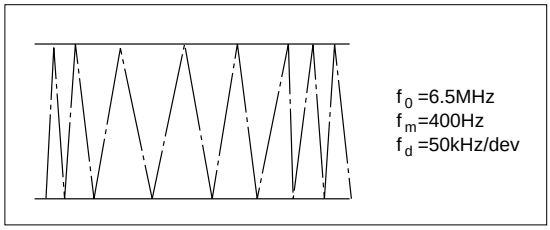
• **Noise Signal Waveform**



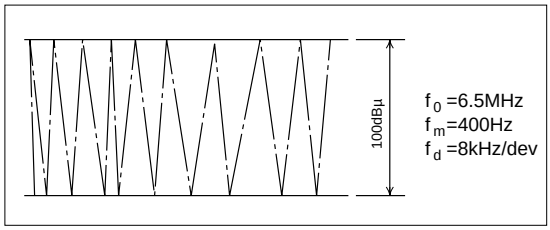
• **IF Sweep Signal**



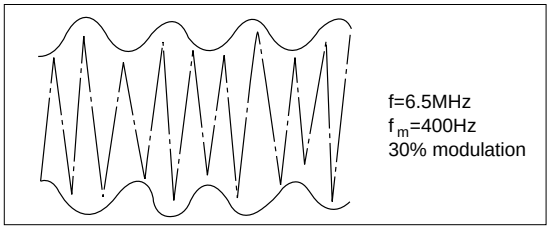
• **FM modulated wave**



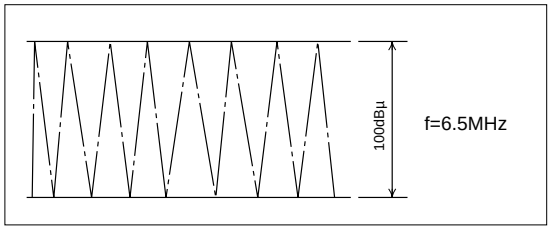
• **FM modulated wave**



• **AM modulated wave**



• **CW**



• **CW**