

I. APPLICATION

This specification applies to RF modulator for the VCP and the satellite receiver. its function is to modulate rf carrier with baseband signals consisting of audio and composite video in the NTSC format for reception by USA color television receiver, and consists of electronics switch for VHF and UHF signals.

II. TEST CONDITION

1. STANDARD TEST CONDITION

- (1) ambient temperature : $25 \pm 3^{\circ}\text{C}$
- (2) relative humidity : $65 \pm 5\%$
- (3) power supply voltage: $5.0 \pm 0.1\text{vdc}$
- (4) video input signal : 1.0 Vp-p stair step signal V/S RATIO : 7/3
- (5) audio input signal : 0.98 Vp-p sine wave signal 1KHz

III. AMBIENT CONDITION

1. OPERATING CONDITION

- (1) TEMPERATURE : $0 \sim 60^{\circ}\text{C}$
- (2) HUMIDITY : 85 % MAX

2. STORAGE CONDITION

- (1) TEMPERATURE : $-10 \sim 70^{\circ}\text{C}$
- (2) HUMIDITY : 90 % MAX

IV. ELECTRICAL CHARACTERISTICS

1. POWER SUPPLY

NO	ITEM	SPECIFICATION			UNIT	REMARKS
		MIN	TYP	MAX		
1. 1	SUPPLY VOLTAGE	4.8	5.0	5.2	VDC	ALLOWABLE RIPPLE VOLTAGE 10mVp-p MAX
1. 2	CURRENT CONSUMPTION	-	-	40	mA	
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2. VIDEO CHARACTERISTICS

NO	ITEM	SPECIFICATION			UNIT	REMARKS
		MIN	TYP	MAX		
2. 1	INPUT IMPEDANCE	0.7	1.0	1.3	K Ω	0.5 ~ 4.5 MHz
2. 2	MODULATION	72	77	82	%	VIDEO INPUT IS TERMINATED BY 82 Ω
2. 3	DIFFERENTIAL GAIN	-8	-	8	%	MEASURE AT 10% - 90% OF APL.
2. 4	DIFFERENTIAL PHASE	-10	-	10	deg	MEASURE AT 10% - 90% OF APL.
2. 5	S/N	45	-	-	dB	USE THE STANDARD DEMODULATOR
2. 6	VIDEO SYNC RATIO	6.7/3.3	7.0/3.0	7.3/2.7		VIDEO IN : 1V _{p-p} V/S RATIO : 7/3
2. 7	AMPLITUDE RESPONSE	-3	-	+3	dB	0 ~ 4.5 MHz WITH 1MHz
2. 8	SYNC LEVEL SHIFT	-	-	5	%	VIDEO SIGNAL CHANGE FROM B AND W

3. AUDIO CHARACTERISTICS

NO	ITEM	SPECIFICATION			UNIT	REMARKS
		MIN	TYP	MAX		
3. 1	INPUT IMPEDANCE	10	-	-	K Ω	0.1 ~ 10KHz
3. 2	MODULATION	65	80	95	%	± 25 KHz = 100%
3. 3	S/N	45	-	-	dB	VIDEO SIGNAL : 1V _{p-p} COLOR BAR

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NO	ITEM	SPECIFICATION			UNIT	REMARKS
		MIN	TYP	MAX		
3. 4	DISTORTION	-	-	2.5	%	STANDARD MODULATION.
3. 5	AMPLITUDE RESPONSE	-3	-	+3	dB	0.1 ~ 10 KHz WITH 1KHz. REF
4. OUTPUT CHARACTERISTICS						
NO	ITEM	SPECIFICATION			UNIT	REMARKS
		MIN	TYP	MAX		
4. 1	VIDEO CARRIER FREQUENCY (Fv)	61.18	61.25	61.32	MHz	US CH3
		67.18	67.25	67.32	MHz	US CH4
4. 2	SOUND CARRIER FREQUENCY (Fs)	4.490	4.500	4.510	MHz	
4. 3	VIDEO CARRIER LEVEL	63	66	69	dBu	when modulated at 75Ω loaded
4. 4	SOUND CARRIER LEVEL	13	16	19	dB	relative to video carrier
4. 5	OUTPUT IMPEDANCE	-	75	-	Ω	unbalance
4. 6	SPURIOUS (OUT BAND)	-	-	-30	dB	except Fv ± Fs
4. 7	SPURIOUS (IN BAND)	-	-	-60	dB	relative to video carrier
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5. RF WITH CHARACTERISTICS

NO	ITEM	SPECIFICATION			UNIT	REMARKS
		MIN	TYP	MAX		
5. 1	INSERTION LOSS ANT IN → ANT OUT	-	-	4 5.0	dB dB	54 - 600 MHz 600 - 890 MHz
5. 2	VSWR (+B OFF) - ANT OUT - ANT IN (+B ON) - ANT OUT	- - -	- - -	4.0 4.0 3.0	- - -	54 - 890 MHz 54 - 890 MHz 61 - 72 MHz
5. 3	ISOLATION	60	-	-	dB	ANT IN → ANT OUT +B : ON 61 - 72 MHz
5. 4	ANT IN LEAKAGE	-	-	9.5	dBu	ANT OUT 75Ω TER

inter modulation
ANT IN => ANT OUT

MD B+ : OFF

f1	f2	f(IM)	input level (75Ω)	inter modulation
MHz	MHz	MHz	dBuv	dB
183	189	177	100	50 MIN
183	189	195		

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6. TEMPERATURE STABILITY						
NO.	ITEM	SPECIFICATION			UNIT	REMARKS
		MIN	TYP	MAX		
6. 1	VIDEO CARRIERS FREQUENCY (Fv)	-80	fv	+80	KHz	0 ~ 60° C TEMPERATURE RANGE THE INITIAL VALUE IS MEASURED IN STANDARD TEST CONDITION
6. 2	SOUND CARRIER FREQUENCY (Fs)	-15	fs	+15	KHz	
6. 3	VIDEO MODULATION	-10	INITIAL VALUE	+10	%	
6. 4	SOUND MODULATION	-10	INITIAL VALUE	+10	%	
6. 5	VIDEO CARRIER LEVEL	-5	INITIAL VALUE	+5	dBu	
6. 6	SOUND CARRIER LEVEL	-5	INITIAL VALUE	+5	dB	
6. 7	V/S	6.5/3.5	7.0/3.0	7.5/2.5	-	
<p>V. DURABILITY TEST</p> <p>1. VIBRATION TEST Apply vibration of 2mm full amplitude , 1500 times/minute from three directions for 15 minutes each : all performances shall be satisfied.</p> <p>2. IMPACT TEST Before measurement, The unpacked modulator is dropped from a height of 0.5mm ON each of 3 modulator surfaces. acceptable surfaces are : connectors, Terminal and covers.</p>						
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3. MOISTURE RESISTANCE

Left test samples in environment(40 ± 5 °C RH 90 ±3 %)for 100 hours, Then left then at normal environment for 1.5 hour : all performance requirements be satisfied.

4. HIGH TEMPERATURE RESISTANCE

Test samples shall be left in 70± 2 °C chamber 100 hours, Then left then at normal environment for 1.5 hour : all performance shall not be remarkably affected.

5. LOW TEMPERATURE RESISTANCE

Left samples in -20 ±2 °C chamber for 100 hours, Then left then at normal environment for 1.5 HOUR : all performance requirements shall be satisfied.

6. THERMAL SHOCK RESISTANCE

After 10 test cycles (1 cycle 70 °C /30 minutes)left samples at normal environment for 1 hour : all performance requirements shall be satisfied.

7. STATIC PROOF TEST

15KV/200pF => ANT IN Terminal, 5kV/200pF => ANT OUT Terminal are 150Ω electrical discharge resistance.

After impressing voltage 5 times in each connector, no abnormality should be occurred.

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