Customer:

No. M970041 (1/17)

ALPS ELECTRIC EUROPA GMBH

Date: Mar. 31, 1997

Attention:

Your ref. No.:

Your Part No.: MDLP3W104A

401598

SPECIFICATIONS

ALPS: :

MODEL: MDLP3W104A

Spec. No.:

Sample No.:

RECEIPT STATUS

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By. Date

Signature

Name

Title

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This specification covers UHF output PLL modulator, booster and mixer, which conform to the television standard transmission system (NTSC-M, PAL-G/I/K, SECAM-L).

Model Applied: The specification conforms to the following model:

Cust Part No.	ALPS Model Name	Channel	Remarks
MDLP3W104A	MDLP3W104A	CH.21 to CH.69	

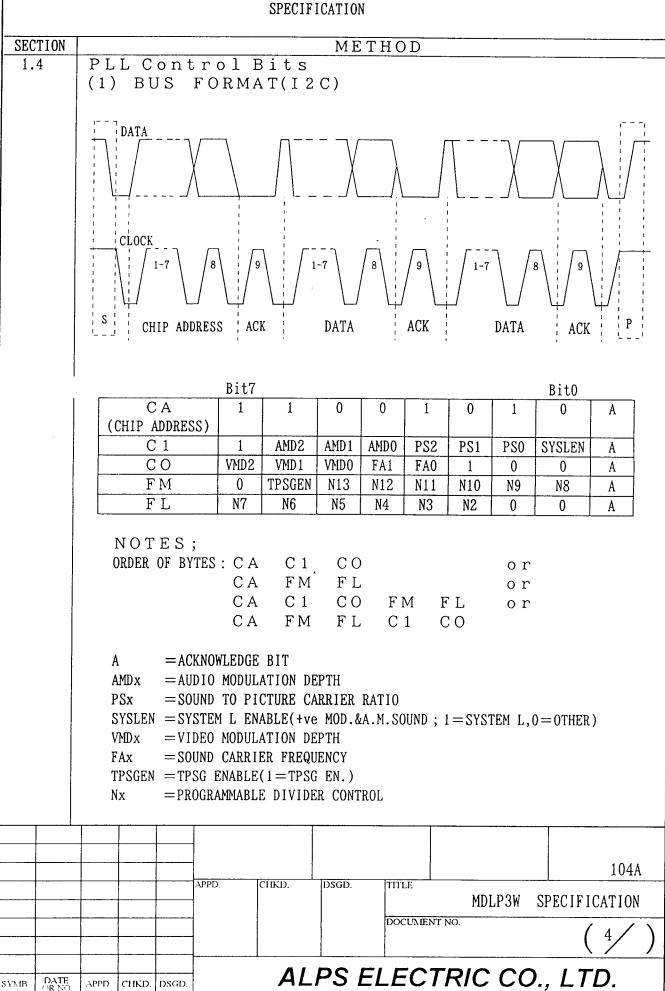
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	SECTION	DESCRIPTION MEASUREMENT METHOD
	1	General Specification
	1.1	Test Condition Standard Test Condition Standard test shall be conducted at a temperature of 25°C±3°C and a relative humidity of 65%±5%. However, test may be performed within a temperature range of 5°C to 30°C and relative humidity range of 45% to 85%, provided test results are not affected.
	1.1.2	Video Carrier Frequency The video carrier frequency shall conform to the specified value unless other specified by the customer.
	1.1.3	Modulation Input signal Condition a) Video Stair-Step signal: 1Vp-p · V/S=7/3 · APL=50% b) Audio Sine wave 1kHz, -5dBs(1.23Vp-p)
	1.1.4	Temperature Stability Within the humidity range 45%RH to 85%RH, the test shall be performed under the following conditions, unless otherwise specified: 0°C-2Hr, 10°C-1Hr, 25°C-1Hr 45°C-1Hr, 60°C-2Hr Initial value measure at a temperature 25°C, gradually increase temperature to 60°C after cool down temperature 0°C.
	1.1.5	Rule Safty and Radiation of Local Oscillation Should be certificate rule of CENELEC.
	1.2	Specify Performance This specification is the spec. at the state expressed in 1.4 PLL CONTROL BITS (2)STATE (page 5), the performance at the other state is not guaranteed.
		APPD CHKD. DSGD. TITLE MDLP3W SPECIFICATION DOCUMENT NO. (2/)
SYN	IB. DATE OR NO	APPD. CHKD. DSGD. ALPS ELECTRIC CO., LTD.

	SPEC	CIFICATION
SECTION	DESCRIPTION	MEASUREMENT METHOD
1.3	Remark	If there are any doubts regarding the Specification or the Products, it will be settled by consultation between ALPS and the Purchaser.
1.3.1	Booster & Mixer Pass Band	FULL BAND (47MHz to 862MHz)
1.3.2	Modulator Transmission System	NTSC-M, PAL-G/I/K, SECAM-L system
	APPD. CHKD.	DSGD. TITLE MDLP3W SPECIFICATION DOCUMENT NO. (3/)
SYMB DATE OR NO	APPD CHKD. DSGD.	LPS ELECTRIC CO., LTD.



SECTION

METHOD

(2) STATE

AMDx bits:

MIDA DICO.						
SYSTEM	AMD2	AMD1	AMD0			
DIDIDI	18102	111111	111111111111111111111111111111111111111			
М	1	0	1			
		<u> </u>	*			
G/I/K	1	1	0.			
U/ 1/ IL	1	1	- 0			
ī	l n	1 1	l n			
ער	U	1	U			

VMDx bits

TIDA DICS.			
SYSTEM	VMD2	VMD1	VMD0
M	0	1	1
G/I/K	0	1	1
L	1	0	1

PSx bits:

SYSTEM	PS2	PS1	PS0
M	1	0	1
G/I/K	1	0	1
L	1	1	0

FAx bits:

SOUND CARRIER FREQUENCY (MHz)	FA1	FA0
4.5	0	0
5.5	0	1
6.0	1	0
6.5	1	1

Nx bits; (N2···N13) UHF frequency programming bits, in step of 250kHz.

(3) BUS CHARACTERISTIC (CLOCK, DATA)

- HIGH-LEVEL INPUT VOLTAGE: 3.0 V MIN. 5.5 V MAX.

- LOW-LEVEL INPUT VOLTAGE : 0 V MIN. 1.0 V MAX.

• BUS CLOCK FREQUENCY : 500 kHz MAX.

(4) REMARK

If the RF Modulator is powerd off, the memory data in IC are put out. Therefore, when the RF Modulator is powered on again, the bus data have to be sent at the same time.

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					APPD.	СПКД.	DSGD.	TITLE		MDLP3W	SPECIFICATION
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SECTION	DESCRIPTION	STANDARD VALUE	MEASUREMENT METHOD			
2.	Electrical Specification					
2.1	Video Characteristics					
2.1.1	Input Impedance	$1k\Omega \pm 30 \%$ (Unbalance)	Measured from OMHz to 5.0MHz			
2.1.2	Input Signal Level	1Vp-p of Negative Sync.	82Ω loaded.			
2.1.3	Video Modulation	M/G/I/K: 80 ± 10 % L: 90 ± 10 %	82Ω loaded.			
2.1.4	White Clip (M/G/I/K)	99 % Max.	Input Voltage 1.2 Vp-p			
2.1.5	V/S Ratio	M/G/I/K: $7 \pm 0.3 / 3 \mp 0.3$ L: $7 \pm 0.4 / 3 \mp 0.4$	Input signal: Stair-Step signal, 1Vp-p Negative Sync, (V/S=7/3)			
2.1.6	Amplitude Frequency Characteristics	within ± 2 dB (0.5MHz to 5.0MHz)	Based on fv+1MHz. Apply sweep signal into video input terminal, then measure at RF-OUTPUT. Test Instrument: Spectrum Analyzer(300kHz)			
2.1.7	Modulation varies by change of APL	within ± 3 %	Based on 50% APL. The variance is measured between 10% and 90% of APL and final comparison is made.			
2.1.8	Differential Gain	within 10 %	Measure at 10% to 90%.			
2.1.9	Video S/N	45 dB Min.	Measure by Video Noise Meter at the output of standard De-Modulator Video Band Width M: 100kHz to 4.0MHz G/I/K/L: 100kHz to 5.0MHz Chroma Trap and Weight: ON 50% White signal input.			
2.1.10	TPSG	Fit for practical use.	(TPSG H.sync Cycle 64±1μsec.)			
			104A			
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SYMB DATE OR NO.	APPD. CHKD. DSGD.	ALPS ELEC	TRIC CO., LTD.			

SECTION	DESCRIPTION	STANDARD VALUE	MEASUREMENT METHOD				
2.2	Audio Characteristics						
2.2.1	Input Impedance	10 kΩ Min.	Measured between 0.1kHz and 10kHz.				
2.2.2	Input Signal Level	-5 dBs (1.23Vp-p)					
2.2.3	Amplitude Frequency Characteristics	± 3 dB (Except NTSC-M)	Based on 1kHz wthin the range from 0.1kHz to 10kHz, and measured theoretical value of pre-emphasis (The following notes) characteristics, the level difference is measured. 50 \(\mu \) Sec.				
2.2.4	Modulation	M : 80 ± 15 % G/I/K: 90 ± 15 % L : 60 ± 15 %	M : $100\% = \pm 25$ kHz Dev. G/I/K : $100\% = \pm 50$ kHz Dev.				
2.2.5	Distortion	M/G/I/K:3 % Max. L:4 % Max.	Standard Modulation				
2.2.6	Audio S/N	M/G/I/K: 40 dB Min. L: 38 dB Min.	Video input signal: Color bar 1Vp-p. Measured by HP 339A (Equivalent) & LPF (15kHz) at used demodulator (M/G/I/K: Sony Tektronix 1450-, L: NIHON TSUSHINKI 5210)				
2.2.7	TPSG	Through external Audio signal input and Audio signal at TPSG output.					
	APPD.	CHKD. DSGD. TITLE	104A				
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No.	ITEM	STANDARD VALUE	MEASUREMENT METHOD		
2.3	Output Characteristics	STINDING TIMOL	TILABUILDINI TILITIOD		
2.3.1	Video Carrier Frequency	CH.21 to CH.69 ± 100 kHz			
2.3.2	Audio Carrier Frequency	M: within 4500 ± 3 kHz G: within 5500 ± 3 kHz I: within 6000 ± 3 kHz K: within 6500 ± 3 kHz L: within 6500 ± 3 kHz			
2.3.3	Video Output Level	M/G/I/K: 71 ± 4 dBμV L: 70 ± 4 dBμV	75Ω term. Peak value level at Standard Modulation.		
2.3.4	Audio Output Level	16 ± 4 dB	Measure the level difference between the Video at standard modulation the Audio.		
2.3.5	Out-Band Spurious	-40 dB Max. Against fv' level.	Signal: Stair-Step signal. Use the Spectrum Analyzer to measure the Out-Band Spurious less than fv-3MHz and more than fa+3MHz except the 2fv and the lower sideband fsc and fa.		
2.3.6	In-Band Spurious	-60 dB Max. Against fv' level.	Measure between fv' and fv' + fa'.		
2.3.7	Chromabeat	M/G/I/K: -62 dB Max. L: -60 dB Max. Against fv' level.	Based on modulated fv' VIDEO IN: 4.43MHz(SC)0.4Vp-p		
2.3.8 Video Carrier Harmonic Level		46 dBμV Max. (75Ω Terminate)	Measured at 950MHz to 1750MHz. This applies to all the variable frequency ranges and standard modulation.		
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	APPD.	CHKD. DSGD. TITLE	MDLP3W SPECIFICATION		
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RF	BOOSTER/MODULATOR	PRODUCT
	SPECIFICATION	

No. 2.4	ITEM							
2 1		ST	ANDARD V	ALUE	ME	ASUREME	NT METH	OD
Δ. x	Characteristics of Booster & Mixer							
2.4.1	Power Gain	$\begin{vmatrix} 3+4\\-3 \end{vmatrix}$	dB		1	→ ANT to 8621		
	·							
					4	7		862 MHz
2.4.2	Noise Figure	9 dB Ma	ıx.		1	→ ANT to 862		
2.4.3	VSWR of each Terminal	ANT IN ANT OUT	: 3.5 M	ax.	(47MHz	to 862N	Hz)	
2.4.4	Voltage Leakage AERIAL IN Terminal	40 dB μ	V Max.		Unused termina This ap	erminate termina ated at oplies t	ıl shall 75Ω. to all t	the
2.4.5	Intermodulation ANT IN → ANT OUT	f1	f2	f(IM)	INPUT LEVEL (75Ω)	Inter Modul Level		
		MHz	MHz	MHz	dBμV	rever	В	
		500	700	200	85	- 	Min.	
		200	210	220	85		Min.	
		175	230 55	55	85	+	Min.	
		600	650	700	85 85		Min. Min.	
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RF	BOOSTER/MODULATOR	PRODUCT
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		SPECIFICATION	
No.	ITEM	STANDARD VALUE	MEASUREMENT METHOD
2.5	Power Supply		
2.5.1	Input Voltage	MD +B= 5.0 ± 0.3 V TUN +B= 30 ± 3 V BST +B= 5.0 ± 0.3 V	Allowable Ripple Voltage: 10 mVp-p Max.
2.5.2	Current Consumption	MD section: 90 mA Max TUN section: 3 mA Max BST section: 45 mA Max	Typical: 0.1mA
2.6	Temperature Characteristics		
2.6.1	Thermal Stability of Video Modulation	M/G/I/K: 80 ± 20 % L: 90 + 10 % - 20	Temperature ranging from 0°C to 60°C.
2.6.2	Thermal Stability of Video Carrier Frequency	within ± 100 kHz	Measure the deviated value according to the temperature measurement order from 0°C to 60°C.
2.6.3	Thermal Stability of Audio Carrier Frequency	within ± 3 kHz	Measure the deviated value according to the temperature measurement order from 0°C to 60°C.
2.6.4	Thermal Stability of Video Output Level	$M/G/I/K : 71 + 5 dB \mu V$ - 6 $L : 70 \pm 6 dB \mu V$	Temperature ranging from 0°C to 60°C.
2.6.5	Thermal Stability of Synchronous Level	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Measure the deviated Video Sync. level according to the temperature measurement order from 0°C to 60°C. (V/S=7/3)
2.6.6	Thermal Stability of Audio Output Level	16 ± 6 dB	Temperature ranging from 0°C to 60°C.
	APPD.	CHKD. DSGD. TITLE	104A
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RF	BOOSTER/MODULATOR	PRODUCT
	SPECIFICATION	

		SPECIFICATION	
SECTION	DESCRIPTION	STANDARD VALUE	MEASUREMENT METHOD
2.6.7	Thermal Stability of Audio Modulation	within ± 20 %	Measure the deviated value according to the temperature measurement order from 0°C to 60°C.
2.6.8	Thermal Stability of Differential Gain	within ± 15 %	Measure the deviated value according to the temperature measurement order from 0°C to 60°C. (APL 10% to 90%)
2.7	Total Video and Audio Quality	Fit for practical use.	The limit sample should be prepared because this item is relative test.
2.8	Environmental Test Condition		
2.8.1	Temperature and Humidity Test Conditions	1. Temperature Range 0°C to 60°C 2. Humidity Range 10%RH to 80%RH	
2.8.2	Storage Conditions	1. Temperature Range -10°C to 70°C 2. Humidity Range 45°C 95%RH or less.	
3.	Mechanical Specification		
3.1	Appearance		
3.1.1	Process	Normal condition applies	S.
3.1.2	Stain or Damage	Neither stain non damage shall be permitted.	,
3.1.3	Electrical Contact	Neither stain non damage shall be permitted.	
3.1.4	Weight	60 g Max.	Typical : 41 g
	APPD.	CHKD. DSGD. TITLE	104A
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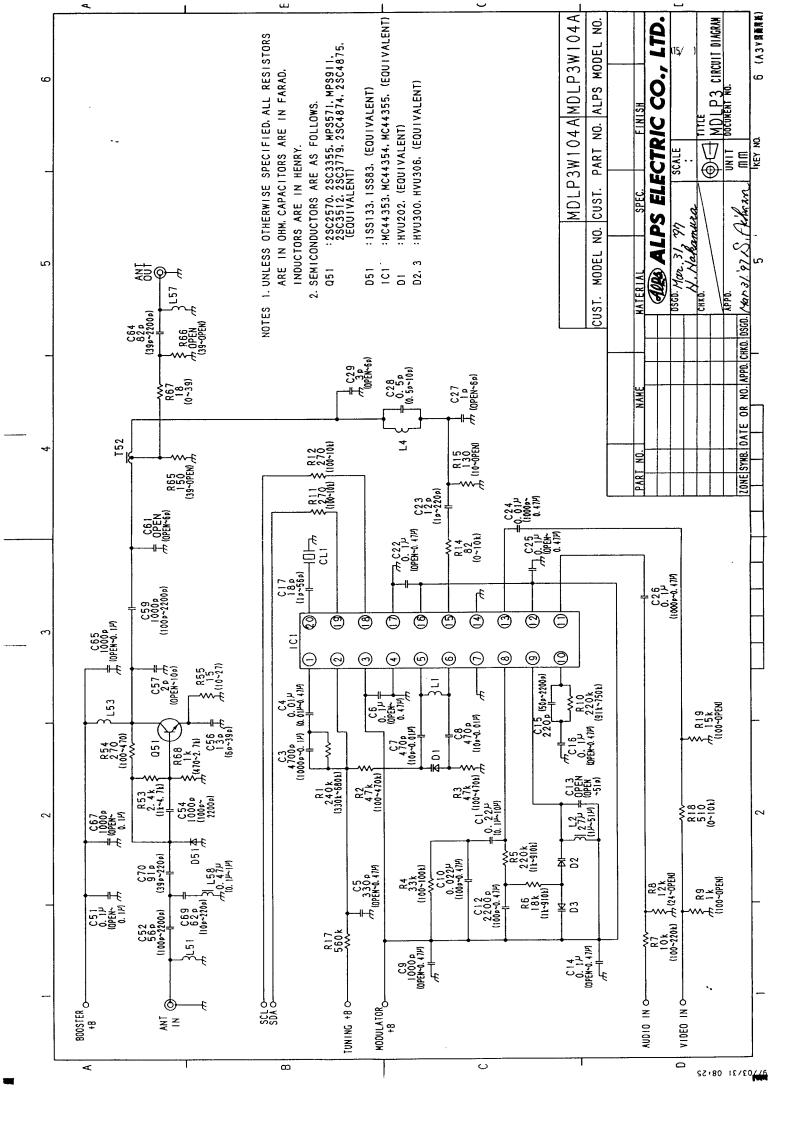
RF	BOOSTER/MODULATOR	PRODUCT
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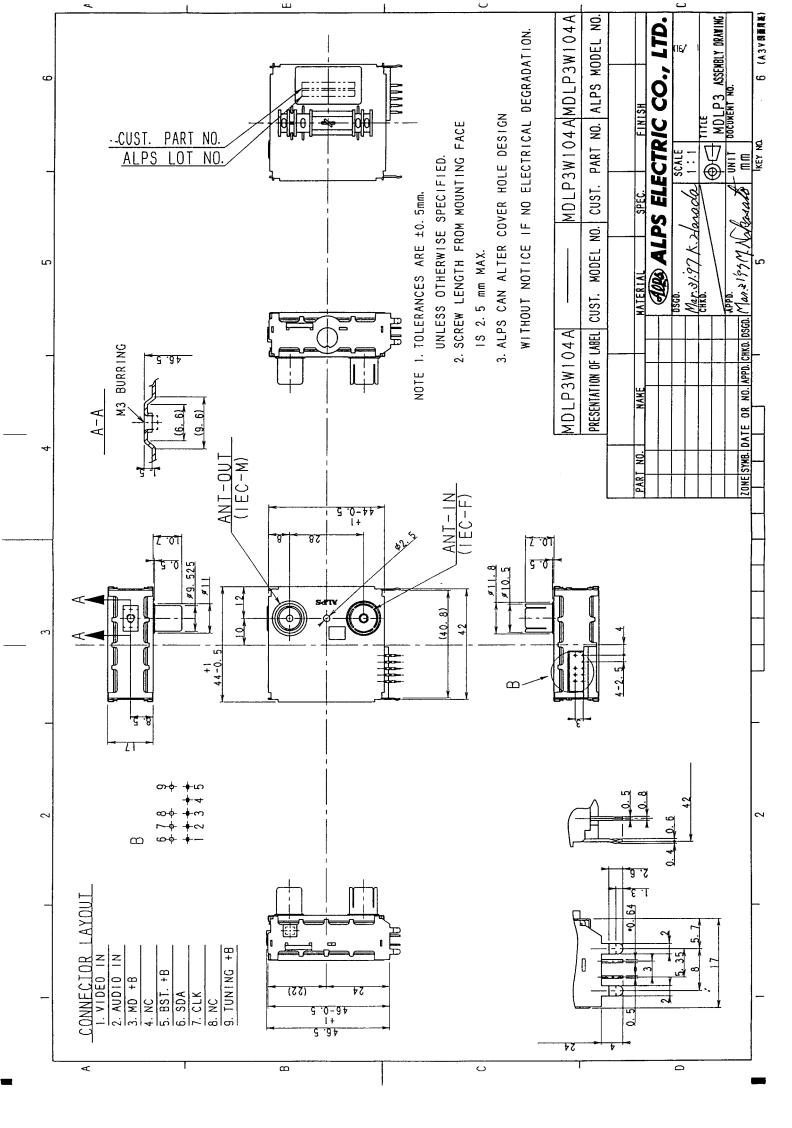
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SECTION	DESCRIPTION	STANDARD VALUE	MEASUREMENT METHOD
3.2	Structure & Dimensions	According to the assembly drawing.	
3.3	Operation Performance		1
3.3.1	Total Pulout force for Coaxial Connector	(1) Initial: between 9. (2) After 100 times, 7.8	
3.3.2	Connector	Neither bend nor play s	hall be permitted.
4.	Other Test		
4.1	Vibration Test	The rated performance shall be satisfied.	The Unit is set to the fixture and then vibrated with total amplitude of 2mm. frequency range 7Hz to 30Hz, once per minute consecutively for 10 minutes, in each of three directions (X,Y,Z).
4.2	Tapping Test	The rated performance shall be satisfied.	Tapped the Modulator except input/output terminal and covers. by Teflon rod.(Length:200mm, Diameter:8mm)
4.3	Impact Test	The appearance and performance shall not have deteriorated.	Before measurement, the unpacked modulator is dropped from a height of 0.5m on each of 3 Modulator surfaces. Acceptable surfaces are: connectors, terminals and covers.
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SYMB DATE OR NO.	APPD CHKD. DSGD.	ALPS ELEC	TRIC CO., LTD.

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RF	BOOSTER/MODULATOR	PRODUCT
	SPECIFICATION	

		SPECIFICATION		
SECTION	DESCRIPTION	STANDARD VALUE	MEASUREMENT METHOD	
4.4	Static Proof Test	± 15 kV / 200 pF After impressing voltage 5 times in each connector, no abnormality should occur.	ANT IN, ANT OUT Terminal Electrical discharge resistance: 150Ω	
4.5	Life Test			
4.5.1	Heat Test 1.Video Modulation 2.Audio Modulation 3.Video Carrier Frequency 4.Audio Carrier Frequency 5.Video Output Level 6.Audio Output Level (fv-fa)		a).Environmental conditions Temperature: 70°C±3°C Humidity: 40%RH to 45%RH b).Power Supply: OFF c).Measuring Time OHrs,100Hrs,250Hrs,500Hrs d).After using the above conditions, the tested modulator is left for one and a half hours at normal room temp.	
4.5.2	Humidity Test	Same as in item 4.5.1	a).Environmental conditions Temperature: 60°C±3°C Humidity: 90%RH to 95%RH Same as b),c),d)in item 4.5.1	
4.5.3	Cold Test	t Same as in item 4.5.1 a).Environmental condit Temperature: -20°C = Same as b),c),d)in item		
4.5.4 Heat Shock Test		Same as in item 4.5.1	a).Environmental conditions 80°C±3°C···1 H -20°C±3°C···1 H b).Power Supply: OFF c).Measurement: After 100 cycles. Same as d) in item 4.5.1	
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RECORD OF REVISIONS

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DATE	PRESENT	CONTENTS	NEW	CONTENTS	/ REASON	DSGN BY
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