

# RF BOOSTER/MODULATOR PRODUCT SPECIFICATION

This specification covers UHF output RF modulator, booster and mixer, which conform to the television standard transmission system (CCIR PAL-I).

Model Applied: The specification conforms to the following model:

Cust. Part No.	ALPS Model Name	Channel	Remarks
89-JU5-694-010	MDLK6B767A	CH.30 to CH.39	Product by Japan
(A1) 89-JU5-694-018	MDLK6B787A		Product by UK

Customer name: AIWA Co.,LTD

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No.	ITEM	STANDARD VALUE	MEASUREMENT METHOD
2.	Electrical Specifications		
2.1	Video Characteristics		
		+ 30 %	
2.1.1	Input Impedance	1 K $\Omega$ - 60 % (Unbalance)	Measure from 0MHz to 5.0MHz.
2.1.2	Input Signal Level	1 Vp-p of Negative Sync.	82 $\Omega$ loaded.
2.1.3	Video Modulation	75 $\pm$ 6 % (CH.36) 75 $\pm$ 10 % (Other CH.)	82 $\Omega$ loaded.
2.1.4	White Clip	Set Modulation +6 % ~ 99%	Input Voltage 1.5Vp-p
2.1.5	V/S Ratio	7 $\pm$ 0.3 / 3 $\mp$ 0.3	Input signal : Stair-Step signal, 1Vp-p Negative Sync. (V/S=7/3)
2.1.6	Amplitude Frequency Characteristics	within + 2 dB - 3 (0.5MHz~5.0MHz) Deviate between Min. and Max.	Based on 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 $\pm$ 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%~90%.
2.1.9	Differential Phase	within 10 °	Measure at 10%~90%.
2.1.10	Video S/N	45 dB Min.	<div>RF.MOD → Demodulator</div> <div>↑ 75<math>\Omega</math> term. ↓</div> <div>S.G. S/N Meter</div> <div>White 50% SHIBASOKU 925</div> <div>V/S=0.42Vp-p / 0.3Vp-p</div>

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No.	ITEM	STANDARD VALUE	MEASUREMENT METHOD
2.1.11	TPSG	Fit for practical use.	(TPSG H.sync Cycle $64 \pm 1 \mu\text{sec.}$ )
2.2	Audio Characteristics		
2.2.1	Input Impedance	10 K $\Omega$ Min. (Unbalance)	Measured between 0.1KHz and 10KHz.
2.2.2	Input Signal Level	-5 dBs (1.23Vp-p)	
2.2.3	Amplitude Frequency Characteristics	$\pm 3$ dB Difference between Min. and Max.	Measured between 0.1KHz and 10KHz. The value different from the theoretical curve of the pre-emphasis (50 $\mu\text{Sec.}$ ) is measured, based on the level of 1KHz.
2.2.4	Modulation	100 $\pm$ 24 %	100% = $\pm 50$ KHz Dev.
2.2.5	Distortion	3 % Max.	Standard Modulation
2.2.6	Audio S/N	40 dB Min.	Video signal : measured by HP 339A & LPF (15KHz) Inter-carrier system at input of colour bar 1Vp-p. SONY TEKTRONIX 1450-3
2.2.7	TPSG	Through input audio signal. (Do not output audio signal of TPSG.)	
2.3	Output Characteristics		
2.3.1	Video Carrier Frequency	CH.30 to CH.39	

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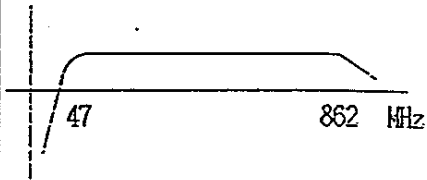
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No.	ITEM	STANDARD VALUE	MEASUREMENT METHOD
2.3.2	Guard Band	At CH.30 & CH.39 CH.30 - 0.2MHz Max. CH.39 + 0.2MHz Min.	
2.3.3	Audio Carrier Frequency	I : fv + (6000±7) KHz	Test Condition : Temperature : 25°C Relative Humidity : 65% The measurement is taken after 30 sec. from the Power-ON.
2.3.4	Video Output Level	75 ± 3 dBμV	75Ω term. Peak value level at Standard Modulation.
2.3.5	Audio Output Level	16 ± 4 dB	Measure the level difference between the Video and the Audio.
2.3.6	Out-Band Spurious	-40 dB Max.	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.
2.3.7	In-Band Spurious	-60 dB Max. Against fv level.	Measure between fv and fa.
2.3.8	Chromabeat	-58 dB Max. Against fv level.	Based on standard-modulated fv VIDEO IN : 4.43MHz(SC)0.4Vp-p
2.4	Preset Channel	CH.36 ± 500 KHz Set frequency clockwise so that fv frequency goes down.	Temperature : 25°C Video Carrier Frequency : 591.25MHz (CH.36)

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No.	ITEM	STANDARD VALUE			MEASUREMENT METHOD																				
2.5	Characteristics of Booster & Mixer				Pass Band : BAND I , III , IV , V																				
2.5.1	Power Gain	3 $\pm$ 3 dB  BAND I , III , IV , V			ANT IN $\rightarrow$ ANT OUT ANT IN $\rightarrow$ VTR TU  																				
2.5.2	Noise Figure	BAND I , III , IV , V 11 dB Max. 9 dB Max.			Post Amp. NF : 4dB or less. ANT IN $\rightarrow$ ANT OUT ANT IN $\rightarrow$ VTR TU																				
2.5.3	VSWR of each Terminal	ANT IN : 3.5 Max. ANT OUT : 3 Max. VTR TU : 3 Max.			BAND I , III , IV , V																				
2.5.4	Voltage Leakage AERIAL IN Terminal	20 dB $\mu$ V Max.			75 $\Omega$ terminate. Unused terminal shall be terminated at 75 $\Omega$ . This applies to all the variable frequency ranges.																				
2.5.5	Intermodulation ANT IN $\rightarrow$ ANT OUT ANT IN $\rightarrow$ VTR TU	<table><tr><td>f1</td><td>f2</td><td>f (IM)</td><td>INPUT LEVEL (75 <math>\Omega</math>)</td><td>Inter Modulation Level</td></tr><tr><td>MHz</td><td>MHz</td><td>MHz</td><td>dB <math>\mu</math>V</td><td>dB</td></tr><tr><td>200</td><td>500</td><td>700</td><td>85</td><td>45 Min.</td></tr><tr><td>600</td><td>650</td><td>700</td><td>85</td><td>55 Min.</td></tr></table>				f1	f2	f (IM)	INPUT LEVEL (75 $\Omega$ )	Inter Modulation Level	MHz	MHz	MHz	dB $\mu$ V	dB	200	500	700	85	45 Min.	600	650	700	85	55 Min.
f1	f2	f (IM)	INPUT LEVEL (75 $\Omega$ )	Inter Modulation Level																					
MHz	MHz	MHz	dB $\mu$ V	dB																					
200	500	700	85	45 Min.																					
600	650	700	85	55 Min.																					

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No.	ITEM	STANDARD VALUE	MEASUREMENT METHOD
2.7.7	Thermal Stability of Audio Modulation	within ± 10 %	Measure the deviated value according to the temperature measurement order from 0°C to 60°C.
2.7.8	Thermal Stability of Differential Gain	within ± 15 %	Measure the deviated value according to the temperature measurement order from 0°C to 60°C.
2.7.9	Thermal Stability of Differential Phase	within ± 15 °	Measure the deviated value according ti the temperature measurement order from 0°C to 60°C.
2.8	Total Video and Audio Quality	Fit for practical use.	The limit sample should be prepared because this item is relative test.
2.9	Environmental Test Conditions		
2.9.1	Temperature and Humidity Test Conditions	1. Temperature Range 0°C to 60°C 2. Humidity Range 10%RH to 85%RH	
2.9.2	Storage Conditions	1. Temperature Range -10°C to 70°C 2. Humidity Range · 95%RH or less.(45°C)	

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RF BOOSTER/MODULATOR PRODUCT SPECIFICATION						
No.	ITEM	STANDARD VALUE		MEASUREMENT METHOD		
3.	Mechanical Specification					
3.1	Appearance					
3.1.1	Process	Normal condition applies.				
3.1.2	Stain or Damage	Neither stain nor damage shall be permitted.				
3.1.3	Electrical Contact	Neither stain nor damage shall be permitted.				
3.1.4	Weight	60 g Max.		Typical : 50 g		
3.2	Structure & Dimensions	According to the assembly drawing.				
3.3	Operation Performance					
3.3.1	Output Terminal (phono jack) 1.Operation	Initial insertion/pullout force: within the range 4.9N and 44.1N (0.5Kg~4.5Kg.)				
3.3.2	Total Pullout force for Coaxial Connector	(1) Initial : between 9.8N and 49N (1Kg~5Kg) (2) After 100 times, 7.84N (0.8Kg) Min.				
3.3.3	Connector	Neither bend nor play shall be permitted.				
3.3.4	Channel Selector 1. Operation 2. Torque	Fit for practical use. (1) Initial torque : between 0.5N·cm and 6.9N·cm. (50~700g·cm) (2) After 50 revolutions normal condition applies.				
	3. Revolutions Degree	C.C.W.				
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No.	ITEM	STANDARD VALUE	MEASUREMENT METHOD
4.	Other Tests		
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 connectors 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.
4.4	Static Proof Test	20 KV / 200 pF 5 KV / 200 pF After impressing voltage 5 times in each connector, no abnormality should occur.	ANT IN Terminal ANT OUT Terminal Electric Discharge Resistance : 150 Ω






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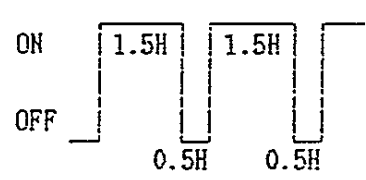
# RF BOOSTER/MODULATOR PRODUCT SPECIFICATION

No.	ITEM	STANDARD VALUE	MEASUREMENT METHOD
4.5	Life Tests		
4.5.1	Heat Test	(Against initial value.)	a). Temperature : $70^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Humidity : $40\% \text{RH} \sim 45\% \text{RH}$
	Video Modulation	$\pm 10 \%$	
	Audio Modulation	$\pm 25 \%$	
	Video Carrier	$\pm 1 \text{ MHz}$	b). Power Supply : OFF
	Frequency		
	Audio Carrier	$\pm 25 \text{ KHz}$	c). Measuring Time 0Hrs, 100Hrs, 250Hrs, 500Hrs
	Frequency		
	Video Output Level	$\pm 4 \text{ dB}$	d). After the test, leave the Unit at room temp. for one and a half hours.
	Audio Output Level (fv-fa)	$\pm 4 \text{ dB}$	
4.5.2	Humidity Test	Same as in item 4.5.1.	a). Temperature : $60^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Humidity : $90\% \text{RH} \sim 95\% \text{RH}$  Same as b), c), d) in item 4.5.1.
4.5.3	Cold Test	Same as in item 4.5.1.	a). Temperature : $-20^{\circ}\text{C} \pm 3^{\circ}\text{C}$  Same as b), c), d) in item 4.5.1.
4.5.4	Heat Shock Test	Same as in item 4.5.1.	a). Temperature : $80^{\circ}\text{C} \pm 3^{\circ}\text{C} \cdots 1\text{Hrs}$ $-20^{\circ}\text{C} \pm 3^{\circ}\text{C} \cdots 1\text{Hrs}$  b). Power Supply : OFF  c). Measurement : After 100 cycles.  d). After the test, leave the Unit at room temp. for one and a half hours.

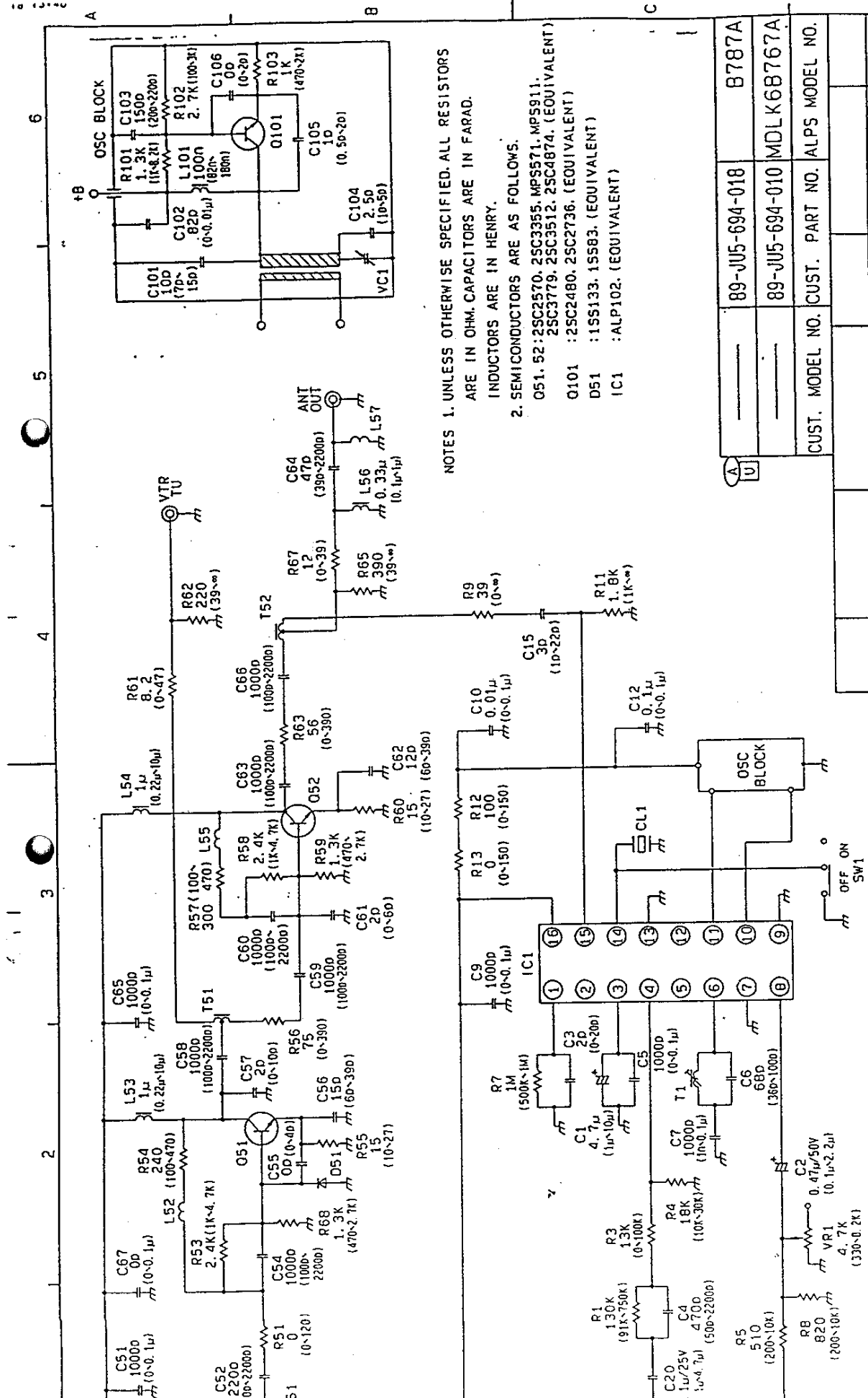
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No.	ITEM	STANDARD VALUE	MEASUREMENT METHOD
5.	Operation Life Tests		
5.1	Operational Test in a Heated Environment	Same as in item 4.5.1.	a). Temperature : $70^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Humidity : 40%RH~45%RH  b). Power Supply : ON  c). Measuring Time 0Hrs, 100Hrs, 250Hrs, 500Hrs  d). After the test, leave the Unit at room temp. for one and a half hours.
5.2	Operational Test in a Humidified Environment	Same as in item 4.5.1.	a). Temperature : $60^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Humidity : 90%RH~95%RH  b). Power Supply : The rating voltage cycle.   <p>ON 1.5H 1.5H OFF 0.5H 0.5H</p> <p>Same as c), d) in item 4.5.1.</p>

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NOTES 1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHM. CAPACITORS ARE IN FARAD. INDUCTORS ARE IN HENRY.

2. SEMICONDUCTORS ARE AS FOLLOWS.

Q51: 52: 2SC2570, 2SC3355, MPS571, MPS911.  
 2SC3779, 2SC3512, 2SC4874, (EQUIVALENT)  
 Q101 : 2SC2480, 2SC2736, (EQUIVALENT)  
 D51 : 1SS133, 1SS83, (EQUIVALENT)  
 IC1 : ALP102, (EQUIVALENT)

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## 2. SCREW LENGTH FROM MOUNTING FACE

15 2.5mm MAX.

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	89-JU5-694-0	—	89-JU5-694-010	MDL K6B767A
	PRESENTATION OF LABEL	CUST. MODEL NO.	CUST. PART NO.	ALPS MODEL NO.