

RF Modulator
NTSC-M

TAMC-H410F

SPECIFICATION

TAMC-H410F
Mini size
NTSC RF Modulator

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1. INTRODUCTION

1.1 Features

Systems : NTSC-M (3.58MHz) US 3/4 Channel

True 5V device (Low power dissipation)

Software Control for channel 3/4

1.2 Revision History

Revision	DESCRIPTION
A	Initial Release

2. DESCRIPTION

The **TAMC-H410F** type are available with 75ohm input for loop through mode and 75ohm out . All connectors is available in standard F-type connectors.

The **TAMC-H410F** consists of a modulator section and loop-through section, which are all designed on a single PCB. Channel selecting is done with terminal No.2.

2.1 Pin Description

SYMBOL	PIN	DESCRIPTION
A-IN	1	Audio signal in (Input impedance : Higher than 350 kΩ)
CH	2	Channel Select HIGH for 3Ch. // LOW for 4Ch.
MB	3	Modulator B+
CTL	4	Control HIGH for Normal Mode LOW for P/Save Mode
V-IN	5	Video signal in (Input impedance : 1 kΩ)

2.2 Limiting Values

Limiting values under operational conditions

The modulator can be guaranteed to function properly under the following conditions.

SYMBOL	PARAMETER	PIN	MIN.	TYP.	MAX.	UNIT
A-IN	Input Impedance	1	350	—	—	kΩ
MB	Modulator B+	3	4.8	5.0	5.2	V
I(MB)	Modulator B+ supply current		—	60	70	mA
CTL	Control	4	—0.3	—	5.2	V
I(CTL)	Control supply current		—	8	15	mA
V-IN	Input Impedance	5	0.85	1.0	1.15	kΩ
B [Ripple]	Allowable Ripple Voltage	3, 4	—	—	10	mVp-p

Note : For detailed information about the address decoding, refer to chapter application information.

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2.3 Environmental Conditions

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Non-operational conditions						
Tamb	Ambient temperature		—10	—	+70	
RH	Relative humidity		—	—	90	%
Operational conditions						
Tamb	Ambient temperature		0	—	+60	
RH	Relative humidity		—	—	85	%

2.4 Overall Performance

Conditional data

Unless otherwise specified, all electrical values for Chapter overall performance apply at the following conditions.

SYMBOL	PARAMETER	VALUE	UNIT
Tamb	Ambient temperature	25 ± 5	
RH	Relative humidity	60 ± 15	%
MB	Supply voltage	5 ± 0.125	V
Zi	Aerial source impedance (unbalanced)	75	Ω

3 ELECTRICAL CHARACTERISTICS

Test Condition : Temperature: 25 ± 3 // Relative humidity : 45~65% (unless otherwise specified)

3.1 RF Out Characteristics

Parameter	Min.	Typ.	Max.	Unit	Note
RF Output Level	63	66	69	dBμV	Peak value level at standard Modulation.
RF Frequency	—90	—	90	kHz	Measure the difference from the desired frequency
P/S Ratio	13	16	19	dB	Measure the level difference Between video and audio.
Out-band Spurious	—	—	—30	dB	Measure the level difference against the Video at standard modulation. Measure range : 0~1GHz Except the range fP~fP+fS
In-band Spurious	—	—70	—60	dB	Measure between fv and fs (against fv level.)
Chroma Beat	—	—70	—58	dB	Based on standard-modulated fv (against fv level) Video signal: SC 3.58 MHz 0.4Vp-p

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3.2 Video Characteristics

Parameter	Min.	Typ.	Max.	Unit	Note
Input Signal Condition	1.0 Vp-p of negative sync.				82 Ω loaded
Video Modulation	75	80	85	%	Input level : 1.0Vp-p
White Clip	—	—	100	%	Input level : 1.5Vp-p
Video S/N	50	—	—	dB	Measure at the out of the standard Demodulator, video measurement set. H.P.F : 100 kHz, L.P.F : 4.5 MHz SC Trap : ON, weighted Video : 100% White signal Audio : non-modulation
DG	—5	2	5	%	Input signal 10 stair step case
DP	—5	2	5	deg	Input signal 10 stair step case
Video Frequency Characteristics	—1.5	—0.5	1.5	dB	0.5~4.1MHz
	—6.0	—0.5	1.5	dB	4.1~4.2MHz

Based on 1 MHz. Apply sweep signal or multi-burst signal into video input terminal

3.3 Audio Characteristics

Parameter	Min.	Typ.	Max.	Unit	Note
Input Signal Level	—	1.23	—	Vp-p	Sine wave @ 1kHz
Audio Modulation	64	80	96	%	100% = ± 25 kHz Dev.
Audio S/N	50	—	—	dB	Standard modulation. Video Signal : Color bar 1Vp-p Measured by HP8903B(Equivalent) LP Filter : ON De-emphasis : ON
Audio Distortion	—	—	1.0	%	Standard Modulation De-emphasis (75usec) : ON
Audio Frequency Characteristics	—2.0	0	1.5	dB	0.1kHz~10kHz, Based 1kHz, De-emphasis : ON
Audio Gain	2.25	3.0	3.75	dB	Measured by HP8903B(Equivalent)
Audio Carrier Frequency	—7	0	7	kHz	The measurement is taken after 30 sec. from the power on.

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3.4 Loop-through Section Characteristics

Parameter	Min.	Typ.	Max.	Unit	Note
Insertion Loss	—	—	4	dB	In=> Out, 54MHz ~ 806MHz
VSWR	—	—	3	—	In, 54MHz ~ 806MHz (MD : Off)
	—	—	3	—	Out, 54MHz ~ 806MHz (MD : Off)
	—	—	3	—	Out, 60MHz~72MHz (MD : ON)
Isolation	60	—	—	dB	In => Out, 60MHz ~ 72MHz (MD : ON)
Voltage Leakage Aerial In terminal	—	—	9.5	dB μ V	75 Ω terminate. Unused terminal shall be terminated at 75 Ω .
Inter-modulation	f1	f2	f IM	Input Level	Inter-modulation (In => Out)
	183	189	177	100	50 dB Min.
	183	189	195	100	50 dB Min.

3.5 Thermal Stabilities

Parameter	Min.	Typ.	Max.	Unit	Note
RF Output Level	—3	—	3	dB	Measure the difference of initial value and deviated value according to the temperature measurement order from 0 to 60
RF Frequency	—100	—	100	kHz	
Audio Carrier Frequency	—20	—	20	KHz	
P/S Ratio	—3	—	3	dB	
Video Modulation	—10	—	10	%	
Sync Level	—0.5	—	0.5	—	
DG	—12	—	12	%	
DP	—12	—	12	deg	
Audio Modulation	—10	—	10	%	

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4. MECHANICAL CHARACTERISTICS

Parameter	Standard Value	Measurement Method
Process	Normal condition applies.	Visual inspection
Stain or Damage	Neither stain nor damage shall be permitted.	Visual inspection
Electrical contact	Neither stain nor damage shall be permitted.	Visual inspection
Weight	60g maximum	Typ. 50g
Total Pullout Force for Coaxial Connector	Initial: between 1kg and 5kg After 100 times, 0.8 kg minimum	—
Connector	Neither bend nor play shall be permitted.	

5. OTHER TESTS**5.1 Vibration Test**

The rated performance shall be satisfied.

The unit is set to the fixture and then vibrated with total amplitude of 2 mm,

Frequency range 7 Hz to 30 Hz, once per minute consecutively for 10 minutes in each of three axes (X,Y,Z).

5.2 Tapping Test

The rated performance shall be satisfied.

Tap the modulator (except for input/output terminals and covers) with a Teflon rod (length: 200 mm, diameter: 8 mm).

5.3 Impact Test

The appearance and performance shall not have deteriorated.

Before measurement, the unpacked modulator is dropped from a height of 0.5 m on each of 3 axes:

connectors, terminals, and covers.

5.4 Electrostatic Proof Test

Electrostatic capacity : 100pF $\pm 10\%$ // Series resistance : 300 Ω $\pm 5\%$

± 10 kV (In)

After Impressing Voltage 5times in each connector, no abnormality should occur.

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5.5 Life Test

Item		Standard Value (Compare to initial value)	Measurement Method
Heat Test	Video Modulation	$\pm 10\%$	a) Temperature: $85^{\circ}\text{C} \pm 3^{\circ}\text{C}$ b) Humidity: 40% RH ~ 45% RH c) Power supply: ON d) Measuring time: 96 hrs e) Measure after leaving sample for 1 ½ hours at room temperature
	Audio Modulation	$\pm 25\%$	
	Video Carrier Frequency	$\pm 100\text{ kHz}$	
	Audio Carrier Frequency	$\pm 20\text{ kHz}$	
	Video Output Level	$\pm 4\text{ dB}$	
	Audio Output Level (fv-fa)	$\pm 4\text{ dB}$	
Humidity Test		Same as in item 1 above	a) Temperature: $40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ b) Humidity: 90% RH ~ 95% RH c) Power supply: ON same as b), c), d) in item 1 above
Cold Test		Same as in item 1 above	a) Temperature: $-20^{\circ}\text{C} \pm 3^{\circ}\text{C}$ same as b), c), d) in item 1 above

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