

SPECIFICATION	
MODULATOR	
1. SCOPE	<p>THIS SPECIFICATION OUTLINES THE PERTINENT ELECTRICAL REQUIREMENTS OF THE RF OUTPUT MODULATOR WHICH CONVERTS THE FM VIDEO AND FM AUDIO SIGNAL INTO THE RF SIGNAL FOR TELEVISION STANDARD TRANSMISSION SYSTEM</p>
2. GENERAL SPECIFICATIONS	<p>2-1. OUTPUT FREQUENCY 2300.0~2500.0MHz(I²C PLL CONTROLLER FROM OUTSIDE)</p> <p>2-2.</p> <p>2-3. SUPPLY VOLTAGE 12V+/-0.2V</p> <p>2-4. CONSUMPTION CURRENT 140+/-20mA</p> <p>2-5. OPERATION AND STORAGE TEMPERATURE 0-50° C</p> <p style="padding-left: 20px;">CONDITIONS FOR GUARANTEE HUMIDITY 85% OR LESS</p> <p>2-6.</p> <p>2-7.</p>
3. TEST CONDITIONS	<p>3-1. TESTING AMBIENT CONDITIONS</p> <p style="padding-left: 20px;">DEFINED AS TEMPERATURE OF 25+/-2° C AND HUMIDITY OF 65+/-5% RH.</p> <p style="padding-left: 20px;">NOTE : THAT TEMPERATURES OF 5-30° C AND HUMIDITY OF 45-85%RH MAY BE REGARDED AS STANDARD.</p> <p>3-2.</p> <p>3-3. UNIT SETTING CONDITIONS</p> <p style="padding-left: 20px;">(1) PICTURE-- 10 STEP WAVE SIGNAL 1.5Vp-p(82ΩLoad).</p> <p style="padding-left: 20px;">(2) AUDIO -- 1.0Vp-p OF SINE WAVE 1KHZ.</p>
<p>COMTECH TECHNOLOGY CO., LTD FM2400TSIM(1/4)</p>	

SPECIFICATION						
MODULATOR						
4. ELECTRICAL PERFORMANCE						
4-1. VIDEO SYSTEM CHARACTERISTICS						
	PARAMETER	SPECIFICATION			UNIT	REMARK
		MIN	TYP	MAX		
4-1-1	INPUT IMPEDANCE		1.3		K	MEASURE AT 0.5-5MHZ
4-1-2	INPUT SIGNAL LEVEL		1		V _{p-p}	LOAD OF 82Ω CONNECTED NEGATIVE SYNCHRONOUS
4-1-3	MODULATION F _p 2480MHz (SINE WAVE 300KHz 1VP-P)	2	3	4	MHz	SUPERIMPOSED SINUSOUS WAVE (3.58MHZ) IS 20% OF THE STEP INPUT LEVEL. MEASURE UNDER THE APL OF 10-90% DIFFERENTIAL GAIN OF DEMODULATOR UNIT IS TO BE COMPENSATED.
4-1-5	DIFFERENTIAL GAIN	-8		8	%	LEVEL. MEASURE UNDER THE APL OF 10-90% DIFFERENTIAL GAIN OF DEMODULATOR UNIT IS TO BE COMPENSATED.
4-1-6	DIFFERENTIAL PHASE	-8		8	DEG	-DITTO-
4-1-7	S/N	45			dB	MEASURE MITH RESPECT TO STANDARD DEMODULA- TOR OUTPUT.
4-1-8	OUT LEVEL TAPER		4	6	dB	F _p 2300~2400MHz
4-2. AUDIO SYSTEM CHARACTERISTICS						
4-2-1	INPUT IMPEDANCE		1.4		KΩ	MEASURE AT 0.1-10KHZ
4-2-2	MODULATION	35	40	45	KHZ	
4-2-3	DISTORTION FACTOR			3	%	AUDIO INPUT SIGNAL: 1.0V _{p-p} 1KHZ MODULA- TION 50% (SINE WAVE) VIDEO INPUT SIGNAL: ALL BLACK (SYNC.ONLY) USE STANDARD DEMODU- LATOR OF INTER-CARRIER SYSTEM. DE-EMPHASIS(50 usec) IS ON.
4-2-4	S/N	40			dB	THE SAME AS 4-2-3
COMTECH TECHNOLOGY CO., LTD FM2400TSIM (2/4)						

SPECIFICATION						
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4-3. OUTPUT SYSTEM CHARACTERISTICS						
	PARAMETER	SPECIFICATION			UNIT	REMARK
		MIN	TYP	MAX		
4-3-1	VIDEO CARRIER FREQUENCY	-50	fp	+50	KHZ	TEST AT 25°C TEMPERATURE AND 65%RH OF HUMIDITY. fp:2300~2500MHz fs1 6.0MHz fs2 6.5MHz *OUTPUT CHANNEL
4-3-2	VIDEO OUTPUT LEVEL	5	9	13	dBm	
4-3-3	AUDIO OUTPUT LEVEL DIFFERENCE(P/S RATIO)	22	27	32	dB	
4-3-4	AUDIO CARRIER FREQUENCY	-8	fs	+8	KHZ	INPUT SIGNAL : NONE THE MEASUREMENT IS TAKEN AFTER 30 sec. FROM THE POWER-ON.
4-3-5	AUDIO MODULATOR fs1 fs2	35 35	50 50	65 65	KHZ	MEASUREMENT DIFFERENCE VIDEO OF CARRIER
4-3-6	OUT-BAND SPURIOUS	50	55		dB	FREQUENCY OUTPUT LEVEL FOR 2.3~2.5GHz EXCEPT TO fp. fp+/-fs AGAINST VIDEO CARRIER OUTPUT LEVEL.
4-3-7	IN-BAND SPURIOUS WITHIN BANDWIDTH	60			dB	
4-3-8	OUTPUT IMPEDANCE		75		Ω	UNBALANCED.
5-1 PLL SECTION CHARACTERISTICS						
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NO.	ITEM	SPECIFICATION						NOTES																																																																																								
5-2.	IIC BUS (1) SDA,SCL INPUT VOLTAGE	UNDER STANDARD TEST CONDITION						V																																																																																								
		CONDITION	MIN.	TYP.	MAX.																																																																																											
		HIGH VOLTAGE	3		5																																																																																											
		LOW VOLTAGE	0		1.5																																																																																											
	(2) ADDRESS	C2 (ON WRITE DATA FORMAT)																																																																																														
	(3) SDA SCL INPUT IMPEDANCE	SDA/SCL ARE IN THE HIGH IMPEDANCE AND THERE SHOULD BE NO RELIABILITY PROBLEM WITH 5V CONTINUALLY ON THE SDA/SCL, IF POWER SUPPLY IS SWITCHED OFF.																																																																																														
	(4) DATA FORMAT	<table style="width:100%; border-collapse: collapse; margin-bottom: 5px;"> <tr> <td style="text-align: center;">MSB</td> <td colspan="5"></td> <td style="text-align: center;">LSB</td> </tr> <tr> <td style="text-align: center;">ADDRESS</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">MA1</td> <td style="text-align: center;">MA0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">A</td> <td style="text-align: center;">BYTE1</td> </tr> <tr> <td style="text-align: center;">PROGRAMMABLE DIVIDER</td> <td style="text-align: center;">0</td> <td style="text-align: center;">2</td> <td style="text-align: center;">14</td> <td style="text-align: center;">13</td> <td style="text-align: center;">12</td> <td style="text-align: center;">11</td> <td style="text-align: center;">10</td> <td style="text-align: center;">9</td> <td style="text-align: center;">8</td> <td style="text-align: center;">A</td> <td style="text-align: center;">BYTE2</td> </tr> <tr> <td style="text-align: center;">PROGRAMMABLE DIVIDER</td> <td style="text-align: center;">2</td> <td style="text-align: center;">7</td> <td style="text-align: center;">6</td> <td style="text-align: center;">5</td> <td style="text-align: center;">4</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">A</td> <td style="text-align: center;">BYTE3</td> </tr> <tr> <td style="text-align: center;">CHARGE PUMP AND TEST BITS</td> <td style="text-align: center;">1</td> <td style="text-align: center;">CP</td> <td style="text-align: center;">(0)</td> <td style="text-align: center;">T1</td> <td style="text-align: center;">T0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">(0)</td> <td style="text-align: center;">OS</td> <td style="text-align: center;">A</td> <td style="text-align: center;">BYTE4</td> </tr> <tr> <td style="text-align: center;">I/O PORT CONTROL BITS</td> <td style="text-align: center;">P7</td> <td style="text-align: center;">P6</td> <td style="text-align: center;">P5</td> <td style="text-align: center;">P4</td> <td style="text-align: center;">P3</td> <td style="text-align: center;">P2</td> <td style="text-align: center;">P1</td> <td style="text-align: center;">P0</td> <td style="text-align: center;">A</td> <td style="text-align: center;">BYTE5</td> </tr> </table> <p style="text-align: center; margin-bottom: 5px;">TABLE 1 WRITE DATA FORMAT (MSB IS TRANSMITTED FIRST)</p> <table style="width:100%; border-collapse: collapse; margin-bottom: 5px;"> <tr> <td style="text-align: center;">ADDRESS</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">MA1</td> <td style="text-align: center;">MA0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">A</td> <td style="text-align: center;">BYTE1</td> </tr> <tr> <td style="text-align: center;">STATUS BYTE</td> <td style="text-align: center;">POR</td> <td style="text-align: center;">FL</td> <td style="text-align: center;">I2</td> <td style="text-align: center;">I1</td> <td style="text-align: center;">I0</td> <td style="text-align: center;">A2</td> <td style="text-align: center;">A1</td> <td style="text-align: center;">A0</td> <td style="text-align: center;">A</td> <td style="text-align: center;">BYTE2</td> </tr> </table> <p style="text-align: center; margin-bottom: 5px;">TABLE 2 READ DATA FORMAT</p> <p style="margin-bottom: 5px;">A:ACKNOWLEDGE BIT. MA1,MA0:VOLTAGE ADDRESS BITS. CP:CHARGE PUMP CURRENT SELECT. T1:TEST MODE SELECTION. T0:CHARGE PUMP DISABLE. OS:VARACTOR DRIVE OUTPUT DISABLE SWITCH. P7,P6,P5,P4,P3,P2,P1,P0:CONTROL OUTPUT STATES. POR:POWER ON RESET INDICATOR FL:PHASE LOCK DETECT FLAG. I2,I1,I0:DIGITAL INFORMATION FROM PORTS P7,P5 AND P4. A2,A1,A0:5 LEVEL ADC DATA FROM P6.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="margin-bottom: 5px;">Write data format</p> </div> <div style="width: 45%;"> <p style="margin-bottom: 5px;">Read data format</p> </div> </div>						MSB						LSB	ADDRESS	1	1	0	0	0	MA1	MA0	0	A	BYTE1	PROGRAMMABLE DIVIDER	0	2	14	13	12	11	10	9	8	A	BYTE2	PROGRAMMABLE DIVIDER	2	7	6	5	4	3	2	1	0	A	BYTE3	CHARGE PUMP AND TEST BITS	1	CP	(0)	T1	T0	1	1	1	(0)	OS	A	BYTE4	I/O PORT CONTROL BITS	P7	P6	P5	P4	P3	P2	P1	P0	A	BYTE5	ADDRESS	1	1	0	0	0	MA1	MA0	1	A	BYTE1	STATUS BYTE	POR	FL	I2	I1	I0	A2	A1	A0	A	BYTE2	
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