MM5322 color bar generator chip

general description

The MM5322 Color Bar Generator Chip is a complete dot-bar and color hue generation system in a single monolithic P-channel MOS integrated circuit. The chip divides an internal oscillator (crystal controlled) frequency to provide the various timing, synchronization, and video information required in the alignment of color television receivers. A composite video output is provided for complete black and white dot-bar operation. It consists of all synchronization, blanking, and video information required for a fairly standard set of dot, bar, and cross hatch screen patterns. In addition a separate output for precise gating of 3.56 MHz color bursts is provided. For servicing ease an oscilloscope trigger is provided on either the horizontal blanking or vertical synchronization time slots.

features

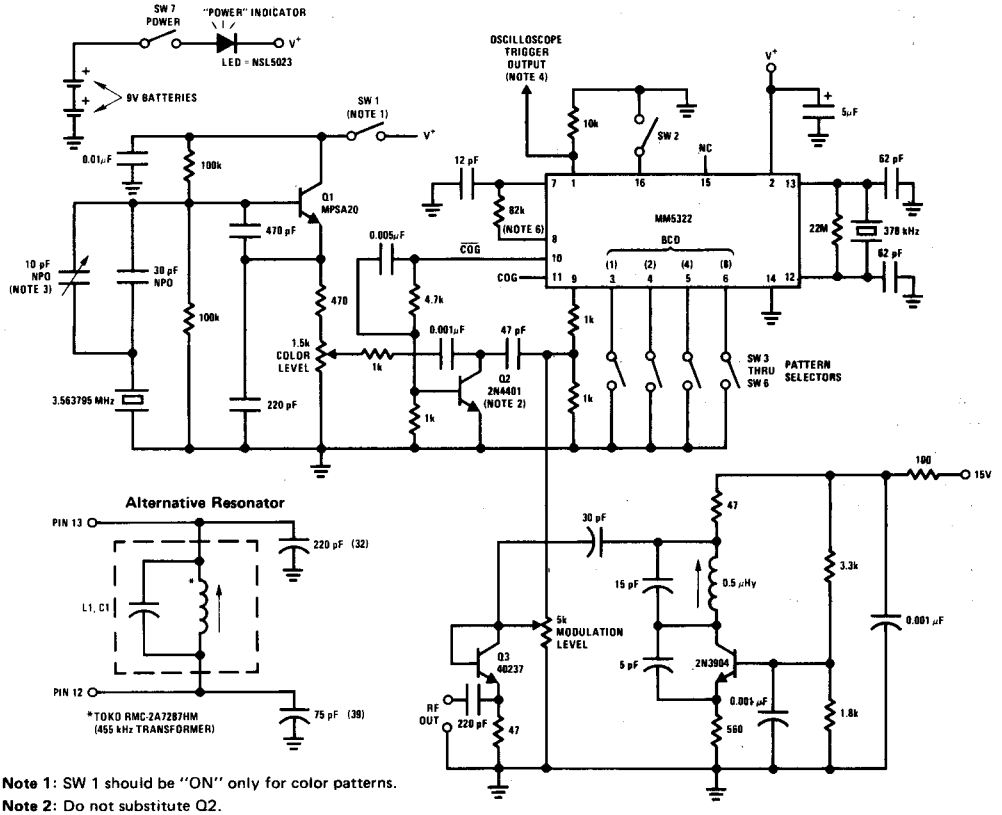
- Battery operation
- Oscilloscope trigger
- Composite video output signal
- Crystal controlled oscillator
- Multiple screen patterns
- Variable dot size

applications

- Battery or bench powered test instruments
- Manufacturing test sets
- Built in test capability

typical application

Typical Color Bar Generator Circuit



Note 1: SW 1 should be "ON" only for color patterns.
Note 2: Do not substitute Q2.
Note 3: Variable cap may be used to trim color crystal to exact frequency.
Note 4: SW 2 and 10k resistor on pins 16 and 1 are needed only if scope trigger pulse is desired.
Note 5: SW 2 selects "H" or "V" trigger output pulses.
Note 6: A 27k resistor in series with a 100k trimpot may be used in place of 82k resistor for variable vertical line width.
Note 7: Modulation level adjusted for best patterns as viewed on TV screen.

absolute maximum ratings

Voltage at Any Pin	V_{SS}+0.3V to V_{SS}−25V
Operating Temperatures	−25°C to +75°C
Storage Temperature	−65°C to +150°C
Lead Temperatures (Soldering, 10 seconds)	300°C

electrical characteristics T_A within operating range, V_{SS} = +12 to +19V, V_{GG} = 0V

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Power Supply Voltage (V_{SS})		12		19	V
Clock Input Frequency OSC 1 and 2	Crystal or External Drive (Note 1)		378		kHz
Clock Input Levels	For External Drive (Note 1)				
Logical High		V_{SS}−2		V_{SS}+0.3	V
Logical Low		V_{GG}		V_{GG}+2	V
Control Inputs BCD and Trigger	Internal Resistor To V_{SS}, 1M Ω Min.				
Logical High	(Note 2)	V_{SS}−2		V_{SS}+0.3	V
Logical Low		V_{GG}		V_{GG}+2	V
Control Output Currents Cog and $\overline{Cog}$					
Logical High	V_{SS} − 2.0V	2.5			mA
Logical Low	V_{GG} − V_{GG}/2 (Note 3)	0.25			mA
Trigger and Z					
Logical High	With 10k to V_{GG}, V_{GG} + 5.0V (Note 4)	0.5			mA
Logical High	With 1k to V_{GG}, V_{GG} + 1 (Note 4)	1.0			mA
Video Output					
Analog Highs	With 2k to V_{GG} (Note 5)		2.0 to 4.0		mA
Power Supply Current	T_A = 25°C, Freq = 378 kHz, V_{GG} = 0V, V_{SS} = +19V			30	mA

Note 1: The oscillator may be operated with external components to oscillate at 378 kHz or it may be driven by an external pulse source using OSC 2 (Pin 13) as an input.

Note 2: These inputs are driven by switches.

Note 3: The color gate outputs are push-pull buffers.

Note 4: The trigger output and Z output are open drain outputs and require a resistor to V_{GG} for operation. Two possible resistor values are shown with their associated voltage and current levels.

Note 5: The video output requires a resistor to V_{GG} for operation. This resistor must be trimmed externally to achieve the desired output levels. The minimum voltage swing is 4.0 volts with a 10% change with temperature and from unit to unit. The percentage magnitude change with supply voltage can approach one.

composite video output

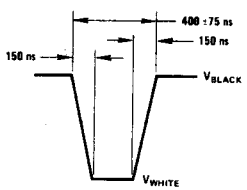


FIGURE 1. White Dot Video Information Pulse Width

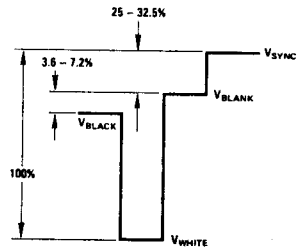


FIGURE 2. Composite Video Voltage Percentages

composite video output (con't)

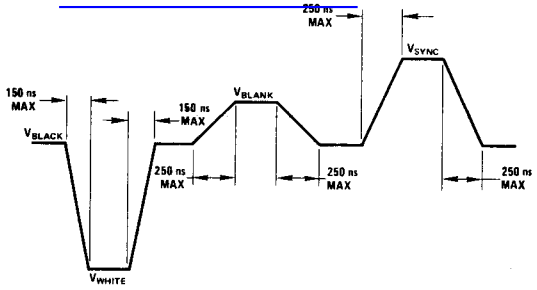
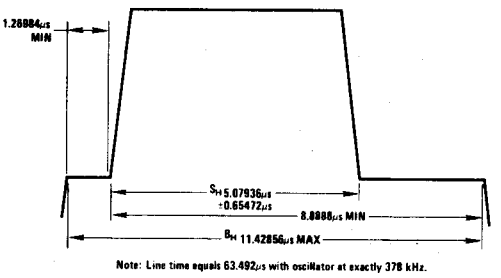
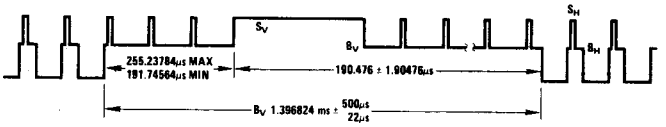


FIGURE 3. Composite Video Rise and Fall Times



Note: Line time equals 63.492µs with oscillator at exactly 378 kHz.

FIGURE 4. Composite Video Pulse Timing, Horizontal Sync



Note: Frame frequency equals 60.114665 Hz.

FIGURE 5. Composite Video Pulse Timing, Vertical Sync

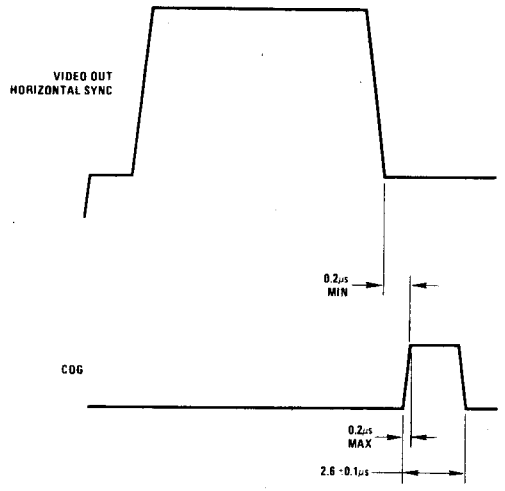


FIGURE 6. Color Gate Signal Timing

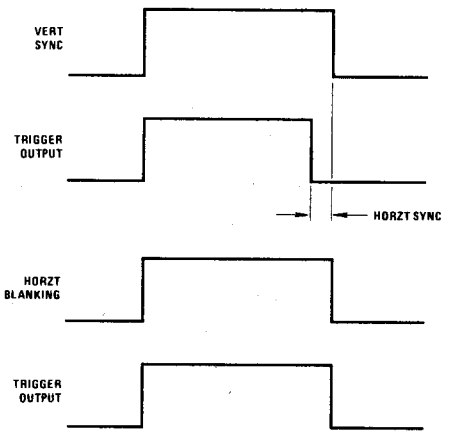
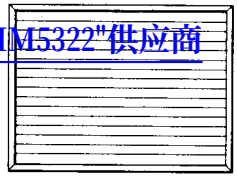
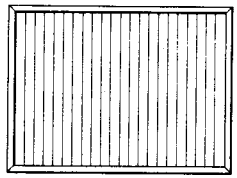


FIGURE 7. Trigger Output Timing Relationship

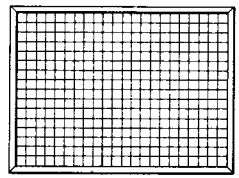
video output patterns



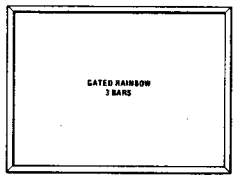
15 Horizontal Lines
0000



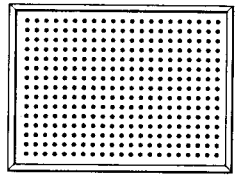
21 Vertical Lines
0001



15 x 21 Cross Hatch
0010



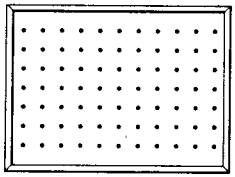
Gated Rainbow
0011



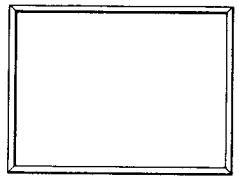
Dots 15 x 21
0100

Note: Pattern switch codes are BCD 1248 positive logic.

Purity
0101

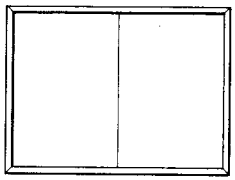


Dots 7 x 11
0110

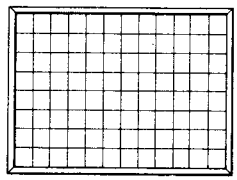


Single Dot
0111

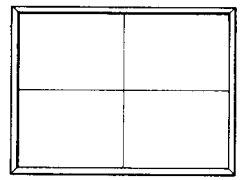
Gated Rainbow
1000



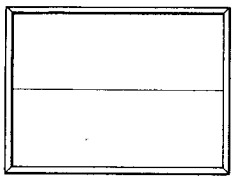
Single Vertical Line
1001



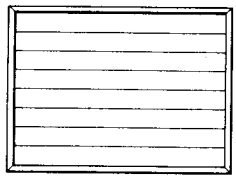
7 x 11 Cross Hatch
1010



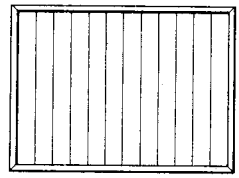
Single Crosshair
1011



Single Horizontal Line
1100



7 Horizontal Lines
1101

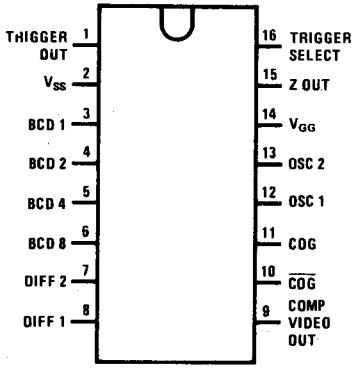


11 Vertical Lines
1110

Ungated Rainbow
1111

connection diagram

Dual-In-Line Package



TOP VIEW

Note. Z_{OUT} is an internal counter test point.

Order Number MM5322N
See Package 19