

Component signal outputs of Y/B-Y/R-Y & GBR



Upon request



LT 416
NTSC/PAL/SECAM PATTERN GENERATOR

● GENERAL

Model LT 416 is a precision test-signal source which provides four color systems of NTSC, PAL, SECAM, and NTSC-4.43 for testing and adjusting all kind of video products such as TV, VTR etc.

In addition of a composite signal output, the generator provides a Y/C output and a component signal outputs (except SECAM) of Y/B-Y/R-Y and GBR so that it is suitable to a production line for video products of component system.

RF output is easily selected by setting channel number while the channels are pre-programmed by each countries. 15 test patterns including color bars, raster, convergence and circle satisfy the most desired applications.

■ LT 416 Rear Panel



● FEATURES

■ **Conforms to four standards (i.e., NTSC, PAL, SECAM, NTSC-4.43)**

This generator is ideal for adjusting and testing TVs, and AV equipments.

■ **S connector**

An S connector is provided to output Y and C signals for adjusting AV equipments with S connector.

■ **Component video signal output**

This generator output the composite video signal and component video signal.

Since Y/ B-Y/ R-Y or G/ B/ R is output, the generator allows test signals for component AV system adjustment and testing. (The SECAM color signals (B-Y, R-Y) are not output.)

■ **RF setting**

The channel plan based on the country system is provided for easier RF frequency setting

■ **Various test patterns**

This 15 patterns including color bar and circle are provided for various adjustment and test processes.

● SPECIFICATIONS

LT 416

Composite Video Signal Output

Color System: NTSC, PAL, SECAM, NTSC-4.43
Scanning Method
NTSC/ NTSC-4.43: 525-line interlace scanning
PAL/ SECAM: 625-line interlace scanning
(Progressive scanning can be performed for all color systems when the CIRCLE or CONVERGENCE pattern is selected.)

Field frequency
NTSC: 59.94 Hz ±30 ppm
(60.06 Hz ±30 ppm for progressive scanning)
PAL/ SECAM: 50 Hz ±30 ppm
(50.08 Hz ±30 ppm for progressive scanning)

NTSC-4.43: 59.94 Hz ±150 ppm
(60.06 Hz ±150 ppm for progressive scanning)

Line frequency
NTSC: 15.734 kHz ±30 ppm
PAL/ SECAM: 15.625 kHz ±30 ppm
NTSC-4.43: 15.734 kHz ±150 ppm

Subcarrier Frequency
NTSC: 3.579545 MHz ±30 ppm
PAL: 4.43361875 MHz ±30 ppm
NTSC-4.43: 4.43361875 MHz ±50 ppm

Video Generating System: Digital system using 4 fsc sampling (without SECAM)

Number of Quantitative Bits: 8 bits
Output Impedance: 75 Ω
Output Level: 1 V_{pp} ±50 mV_{pp} (Between sync tip and 100 % white)
Setup Level: NTSC: 0 % ("7.5 %" model optionally available)

Output connector
Fixed output: RCA jack 1
Variable output: BNC 1

Sync Signal
Amplitude: 286 mV_{pp} ±14 mV_{pp}(NTSC/ NTSC-4.43)
300 mV_{pp} ±15 mV_{pp}(PAL/ SECAM)
4.7 μs ±200 ns

Horizontal Sync Width: 3H
Vertical Sync Width
NTSC/ NTSC-4.43: 2.5H
PAL/ SECAM: 2.5H

Vertical Blanking Period
NTSC/ NTSC-4.43: 20H
PAL/ SECAM: 25H

Color Burst
Amplitude: 286 mV_{pp} ±23 mV_{pp} (NTSC/ NTSC-4.43)
300 mV_{pp} ±24 mV_{pp} (PAL/ SECAM)
Number of Cycles: NTSC: 9 cycles, PAL: 10 cycles,
NTSC-4.43: 11 cycles

SECAM Color Identification Signal

Amplitude
D'R Line: 540 mV_{pp} +40 mV_{pp}, -50 mV_{pp}
D'B Line: 500 mV_{pp} ±50 mV_{pp}

SECAM Color (Back porch on the horizontal blanking period)

Amplitude
D'R Line: 215 mV_{pp} ±25 mV_{pp}
D'B Line: 167 mV_{pp} ±20 mV_{pp}

Test Patterns

Color Bar: 100/ 0/ 75/ 0 Full-field Color Bar
Demodulator Pattern (Not output when the SECAM is selected)
PAL: Combination of normal and reversed B-Y and R-Y for each line

NTSC: Combination of normal and reversed B-Y, R-Y, I, and Q for each line
R-Y, -(R-Y), B-Y, -(B-Y), R-Y, -(R-Y), B-Y, -(B-Y)

line n: R-Y, -(R-Y), B-Y, -(B-Y), R-Y, -(R-Y), B-Y, -(B-Y)
line n+1: -(R-Y), R-Y, B-Y, -(B-Y), R-Y, -(R-Y), -(B-Y), B-Y
line n: I, -I, Q, -Q, I, -I, Q, -Q
line n+1: -I, I, Q, -Q, I, -I, -Q, Q

Multiburst
Frequency
NTSC/ NTSC-4.43: 0.5, 1.0, 2.0, 3.0, 3.58, 4.2 MHz
PAL/ SECAM: 0.5, 1.0, 2.0, 4.0, 4.8, 5.5 MHz
Amplitude: 100 % (*)

Raster
Output eight colors in combination with red, green and, blue
Color: 100 % white, yellow, cyan, green, magenta, red, blue, black
Amplitude: Same as color bars

Window
Window Amplitude: 100 % (*)

Step
10 equal steps from 0 mV to 700 mV white
Max. Luminance Amplitude: 100 %

Circle Pattern: White circle pattern (with black fringe) on the convergence pattern Color Burst on/ off
Interlace/ Progressive: Selectable (Flicker may occur on the border of convergence and circle patterns.)

Convergence
Luminance Amplitude: 75 %
Number of Vertical Lines
NTSC/ NTSC-4.43: 17
PAL/ SECAM: 19

Number of Horizontal Lines
NTSC/ NTSC-4.43: 14
PAL/ SECAM: 15

Horizontal Line Width: 2 lines
Number of Dots
NTSC/ NTSC-4.43: 16 x 13
PAL/ SECAM: 18 x 14

Dot Pulse Vertical Width: 2 lines
Color Burst: On/ off selectable
Interlace/ Progressive: Selectable

() Notes on pattern specifications**
Signal amplitude (100 %) is as follows.
PAL/ SECAM: 700 mV_{pp}
NTSC/ NTSC-4.43: 714 mV_{pp}

Accuracy: Same as the composite signal

Y/ C Separation Output
Specifications: Same as the composite signal
Output Impedance: 75 Ω
Connector: S type
Number of Outputs: 1

Y, B-Y, R-Y Output
Output Signal ():** Y, B-Y, R-Y
Y Output Amplitude
NTSC/ NTSC-4.43: 714 mV_{pp} ±36 mV
PAL: 700 mV_{pp} ±35 mV

Sync Signal Amplitude
NTSC/ NTSC-4.43: 286 mV_{pp} ±14 mV
PAL: 300 mV_{pp} ±15 mV

B-Y, R-Y Output Amplitude: 525 mV_{pp} ±26 mV
Output Impedance: 75 Ω
Connector: BNC
Number of Outputs: 1 each

() B-Y and R-Y are output when the SECAM is selected; Y is only output.**

R, G, B Output
Output Signal ():** R, G, B, C.SYNC
R, G, B Output Amplitude: 700 mV_{pp} ±35 mV (NTSC, PAL, NTSC-4.43)
C.SYNC Output Amplitude: C-MOS Level (NTSC, PAL, SECAM, NTSC-4.43)

Output Impedance: 75 Ω
Connector: BNC
Number of Outputs: 1 each
(Pulse noise may be superimposed on the leading and trailing edges of the R, G and B Sync signals.)

() R, G, B are output when the SECAM is selected; C.SYNC is only output.**

RF Output
System
NTSC: M
PAL: B, D, G, H, I, K
SECAM: B, D, G, H, K, L
(The RF is disabled when the NTSC-4.43 is selected)

Carrier Frequency Range: VHF and UHF
Carrier Frequency Setting Method: Direct setting using programmed country channel plan (Arbitrary frequency cannot be set)

Modulation Polarity: Negative or Positive
Modulation System: Double sideband
Sound Signal
Intercarrier Frequency: 4.5, 5.5, 6.0, 6.5 MHz
Modulation Signal: 1 kHz ±200 Hz

Output Voltage
VHF: At least 1 mVrms (into 75 Ω)
UHF: At least 0.5 mVrms (into 75 Ω)
Number of Output: 1 (75 Ω, BNC)

Sound Output
Output Signal: 1 kHz ±100 Hz, sine wave
Amplitude: 1.2 V_{pp} (into 600 Ω)
Number of Output: 1 (RCA jack)

Environmental Conditions
Operating Temperature: 0 to 40 °C
Operating Humidity: ≤ 90 % RH (without condensation)
Spec-Guaranteed Temperature: 10 to 30 °C
Spec-Guaranteed Humidity: ≤ 85 % RH (without condensation)

Operating Environment: Indoor use
Operating Altitude: Up to 2000 m
Overvoltage Category: II
Pollution Degree: 2

Power Requirements: 90 to 250 VAC, 50/ 60 Hz Max.15 W
Dimensions: 426 (W) x 88 (H) x 300 (D) mm
Weight: 4.6 kg

Accessories: Power cord 1
Instruction manual 1