



ELECTRONIC TUBE REFERENCE

15LO3A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Cathode-ray display tube documented by Cintel; available extracted data primarily records electrode capacitance and does not support a more specific functional characterization.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	4 V / 1 A	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	12000 V
<i>Published ratings and characteristics promoted from the approved datasheet.</i>	

15LO3A Radar Tube

The **15LO3A** (also designated as **15L03A**) is a specialized cathode ray tube designed primarily for radar applications. It features a nominal 15-inch diameter screen, electrostatic focusing, and magnetic deflection. The tube is constructed with an aluminium-backed screen designed for long-persistence orange display output, making it highly suitable for radar PPI (Plan Position Indicator) or similar sweep presentations.

Design and Physical Construction

The 15LO3A is a physically large cathode ray tube with a robust envelope designed to support a wide viewing area. Its key physical dimensions and mechanical features include:

- **Overall Length:** 575 ± 10 mm
- **Greatest Bulb Diameter:** 385 mm (with the face diameter specified as 382 ± 3 mm)
- **Minimum Useful Screen Diameter:** 330 mm
- **Neck Diameter:** 35 +1/-0 mm
- **Mounting Position:** Any

Anode Cap and Base Alignment

The tube utilizes an **International Octal** base for its primary electrical connections, supplemented by a high-voltage **Cavity Cap (BSS448/CT8)** located on the side of the bulb cone for the final anode connection.

The physical alignment of the anode cap is indexed relative to the base. The anode cap is positioned on the same side of the tube as the base spigot key. The plane passing through the tube axis and the spigot key has an angular tolerance of 10° relative to the plane passing through the tube axis and the anode cap.

Reference Line

The reference line of the bulb cone is mechanically defined by the position where a standardized cylindrical gauge with an internal diameter (I.D.) of 36 mm and a length of 50 mm comes to rest on the bulb cone.

Heater and Inter-electrode Capacitances

The 15LO3A utilizes an indirectly heated cathode. The heater can be operated using either alternating current (AC) or direct current (DC).

Parameter	Value
Nominal Heater Voltage	4.0 V
Nominal Heater Current	1.0 A
Calculated Heater Power	4.0 W

Note: The heater power of 4.0 W is a direct calculation derived from the nominal voltage of 4.0 V and current of 1.0 A.

Direct Inter-electrode Capacitances

The electrostatic coupling between the internal electrodes is characterized by the following capacitance values:

- **Modulator to all other electrodes:** 15 µpF
- **Anode 1 to all other electrodes:** 15 µpF
- **Cathode to all other electrodes:** 12 µpF

Screen and Optical Characteristics

The screen of the 15LO3A is optimized for radar display systems where target retention is critical.

- **Screen Type:** Aluminium Backed
- **Fluorescence Color:** Orange
- **Afterglow Color:** Orange
- **Persistence of Afterglow:** Long

The aluminium backing enhances the light output efficiency toward the face of the tube and protects the phosphor screen from ion burn while maintaining stable potential across the screen surface.

Electrical Connections (Pinout)

The electrical connections are routed through an 8-pin International Octal base and a separate bulb cavity cap.

Pin Number	Connection
Pin 1	No connection
Pin 2	Anode 1
Pin 3	Anode 2
Pin 4	No connection
Pin 5	Modulator
Pin 6	Cathode
Pin 7	Heater
Pin 8	Heater
Side Cap	Final Anode

Maximum Ratings

These absolute limits represent the maximum safe operating thresholds for the 15LO3A. Exceeding these values may result in permanent damage to the tube or severe degradation of performance.

- **Final Anode Voltage:** 12,000 V
- **Anode 1 Voltage:** 2,200 V
- **Modulator Voltage (Negative bias value):** 145 V
- **Modulator Voltage (Positive bias value):** 0 V
- **Peak Heater-Cathode Voltage (Heater negative with respect to cathode):** 125 V
- **Peak Heater-Cathode Voltage (Heater positive with respect to cathode):** 125 V

Typical Operating Conditions

Under typical operating conditions, the electrostatic focusing system relies on a specific voltage relationship between Anode 1 and Anode 2 to achieve a sharp spot.

Parameter	Typical Value
Final Anode Voltage	10,000 V
Anode 2 Voltage	1,600 $\pm$ 100 V
Anode 1 Voltage	2,000 V
Modulator Voltage for Cut-off	-80 to -130 V

Operational Constraints and Spot Alignment

- **Anode Voltage Relationship:** To maintain proper electrostatic focusing and prevent electrode damage, Anode 1 must always be operated at a potential at least 50 volts positive relative to Anode 2.
- **Undelected Spot Position:** With no deflection signals applied, the center of the undelected focused spot is guaranteed to fall within a circle of 15 mm radius concentric with the physical center of the tube face.

Technical Summary

The **15LO3A** is a high-performance, 15-inch nominal diameter radar cathode ray tube utilizing **electrostatic focusing** and **magnetic deflection**. It features an **aluminium-backed orange phosphor screen** with **long afterglow persistence**, making it ideal for displaying slow-scan radar sweeps. Operating at a typical final anode potential of **10,000 V**, it requires a **4.0 V, 1.0 A** heater supply and utilizes a standard **International Octal** base combined with a high-voltage **BSS448/CT8 cavity cap**. Proper operation requires maintaining Anode 1 at least 50 V positive relative to Anode 2 to ensure stable electrostatic focusing.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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Published test conditions and operating points. Values on this page are preserved as reported by this source.

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Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode 1 to all other electrodes capacitance	15 pF	Published datasheet value

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