

ROTANODE™
E7894X C E 0197

Rotating Anode X-ray Tube Assembly

- ◆ Rotating anode X-ray tube assembly for the purpose of general diagnostic X-ray procedures.
- ◆ Specially processed Rhenium-tungsten faced molybdenum target of 74 mm diameter.
- ◆ This tube has foci 1.2 and 0.6, and is available for a maximum tube voltage 150 kV.
- ◆ Accommodated with IEC60526 type high-voltage cable receptacles.

General Data

IEC Classification (IEC60601-1:2005) Class I ME EQUIPMENT

Electrical:

Circuit:

High Voltage Generator Constant potential high-voltage generator
Grounding Center-grounded

Nominal X-ray Tube Voltage (IEC60613:2010):

Radiographic 150 kV

Nominal Focal Spot Value (IEC60336:2005):

Large Focus 1.2
Small Focus 0.6

Nominal Anode Input Power (at 0.1s):

	50 Hz	60 Hz
Large Focus	29 kW	30 kW
Small Focus	14 kW	15 kW

Nominal Radiographic Anode Input Power (IEC60613:2010):

	50 Hz	60 Hz
Large Focus	29 kW	30 kW
Small Focus	14 kW	15 kW

★The information contained herein is presented only as a guide for the applications of our products.
No Responsibility is assumed by TOSHIBA ELECTRON TUBES & DEVICES CO.,LTD.(TETD) for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TETD or others.
★The information contained herein may be changed without prior notice. It is therefore advisable to contact TETD before proceeding with the design of equipment incorporating this product.

Motor Ratings:

Stator: XS-BF

Driven Frequency [Hz]	Starting		Running
	50/60		50/60
Input Power [W]	1050	270	43
Voltage ^{1) 3)} [V]	200	100	40
Current ²⁾ [A]	6.0	3.0	1.2
Min. Speed Up ⁴⁾ [s]	0.8	1.5	-
Capacitor [μ F]	24	24	24

Note: 1) Applied voltage between common and main terminal.

2) Common current.

3) The every applied voltage must be never exceeded 110% of the above specification.

4) The speed-up time is allowed up to 110% of the above specification.

Anode Speed:

50 Hz	Minimum 2700 min ⁻¹
60 Hz	Minimum 3200 min ⁻¹

Stator Resistance:

Common-Main Winding	27.5 Ω
Common-Auxiliary Winding	58.0 Ω
Resistance between Housing and Low Voltage Terminals	Minimum 2 M Ω
Normal Operating Range of the Housing Temperature	16 ~ 75 °C
Mode of Operation	Intermittent

Mechanical:

Dimensions	See dimensional outline
Overall Length	437 mm
Maximum Diameter	152.4 mm
Target:	
Anode Angle	12.5 degrees
Diameter	74 mm
Construction	Rhenium-Tungsten faced Molybdenum
Permanent Filtration	0.9 mm Al / 75 kV IEC60522:1999
Radiation Protection (In accordance with IEC60601-1-3:2008):	
Leakage Technique Factor	150 kV, 0.4 mA
X-ray Coverage	430 × 430 mm at SID 1000 mm
Weight (Approx.)	16.4 kg
High Voltage Receptacle	To meet the requirements of IEC60526 Corrigendum1:2010
Cooling Method	Natural or forced air
Tube Housing Model Number	XH-196

Absolute Maximum and Minimum Ratings (At any time, these values must not be exceeded.)

Maximum X-ray Tube Voltage (IEC60613:2010):	
Radiographic	150 kV
Between Anode (or Cathode) and Ground	75 kV
Minimum X-ray Tube Voltage	40 kV
Maximum X-ray Tube Current (IEC60613:2010) See rating charts	
Large Focus	500 mA
Small Focus	200 mA
Maximum Filament Current:	
Large Focus	5.8 A
Small Focus	5.2 A
Filament Voltage:	
Large Focus (At maximum filament current 5.8 A)	14.9 ~ 20.1 V
Small Focus (At maximum filament current 5.2 A)	10.2 ~ 13.8 V
Filament Frequency Limits	0 ~ 25 kHz
Continuous Anode Input Power (IEC60613:2010)	60 W (85 HU/s)
(Repeated radiographic exposure)	
Thermal Characteristics:	
Anode Heat Content	100 kJ (140 kHU)
Maximum Anode Heat Dissipation	475 W (667 HU/s)
X-ray Tube Assembly Heat Content	900 kJ (1260 kHU)
Nominal Continuous Input Power (IEC60613:2010):	
Without Air-circulator	170W (238 HU/s)

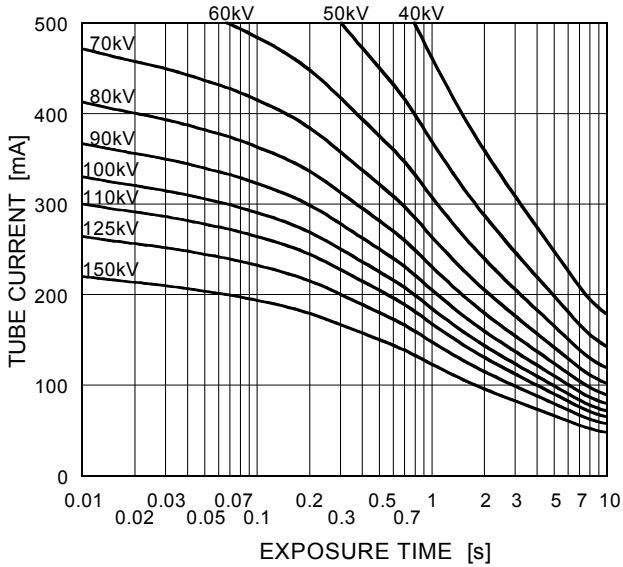
Environmental Limits

Operating Limits:	
Temperature	10 ~ 40 °C
Humidity	30 ~ 85 %
	(No Condensation)
Atmospheric Pressure	70 ~ 106 kPa
Shipping and Storage Limits:	
Temperature	-20 ~ 70 °C
Humidity	20 ~ 90 %
	(No Condensation)
Atmospheric Pressure	50 ~ 106 kPa

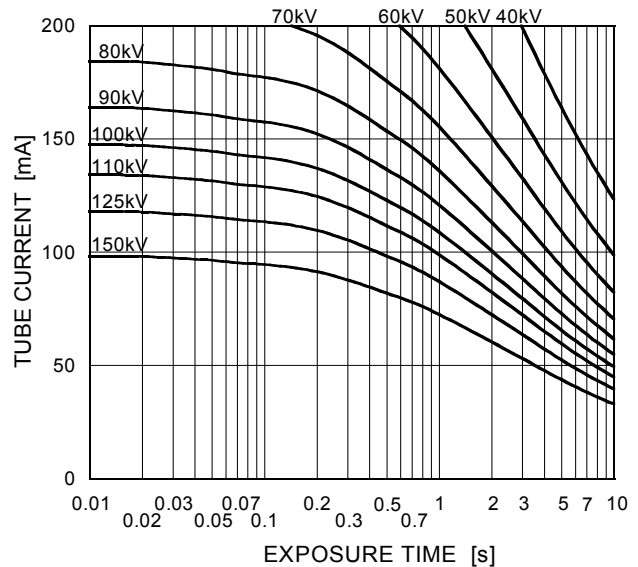
Maximum Rating Charts (Absolute Maximum Rating Charts)

Conditions: Tube Voltage
Constant potential high-voltage generator
Stator Power Frequency 50Hz

Nominal Focal Spot Value: 1.2 ■



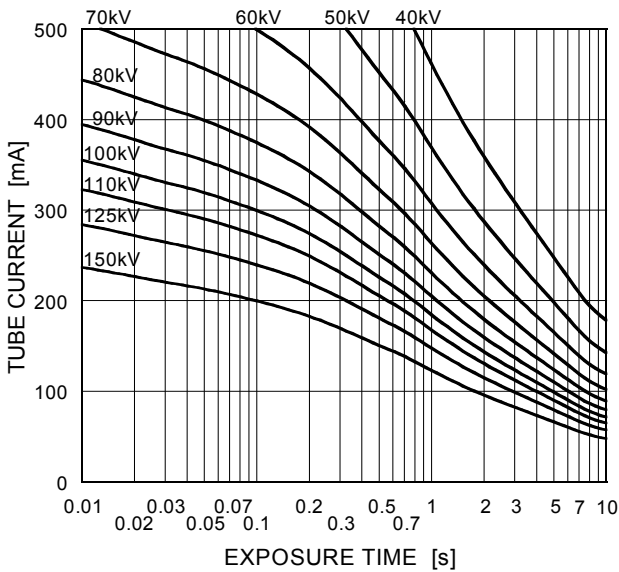
Nominal Focal Spot Value: 0.6 □



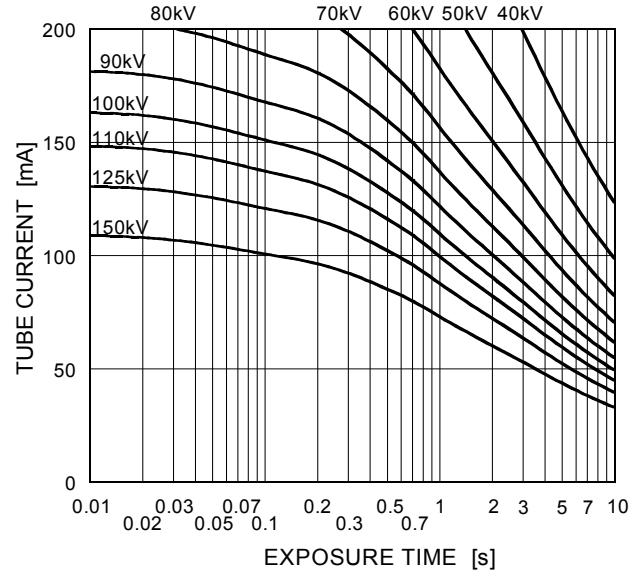
Refer to IEC60613:2010

Conditions: Tube Voltage
Constant potential high-voltage generator
Stator Power Frequency 60Hz

Nominal Focal Spot Value: 1.2 ■



Nominal Focal Spot Value: 0.6 □

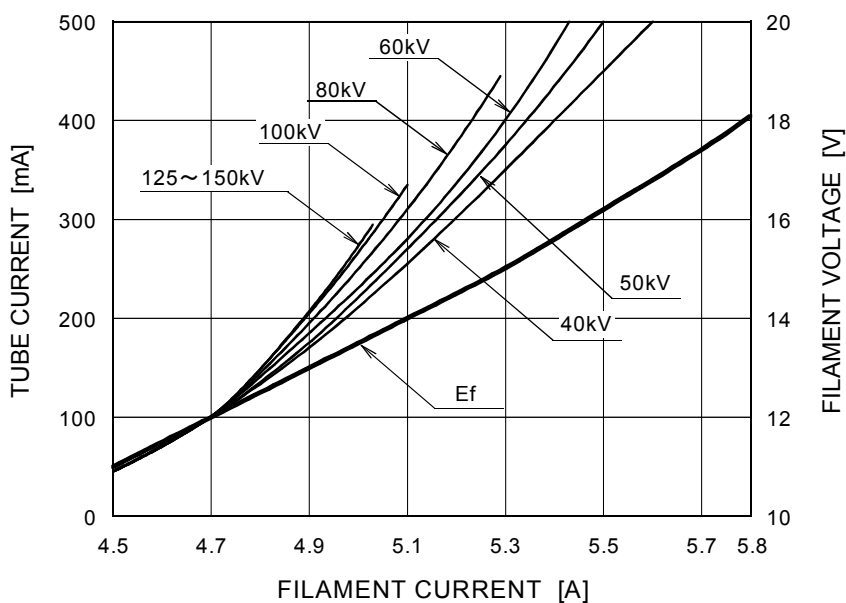


Refer to IEC60613:2010

Emission & Filament Characteristics

Constant potential high-voltage generator

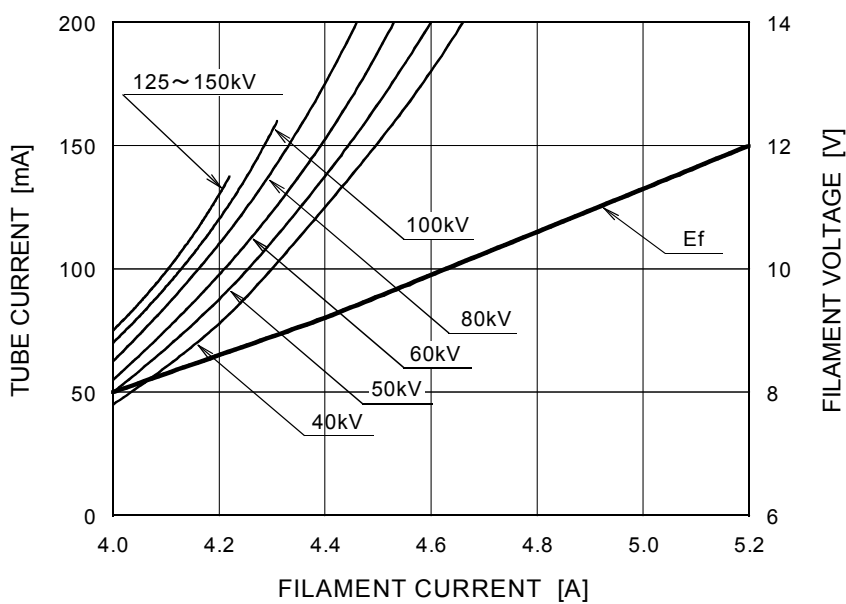
Nominal Focal Spot Value: 1.2 ■



Note1) For Reference Only

Note2) Refer to IEC60613:2010

Nominal Focal Spot Value: 0.6 □

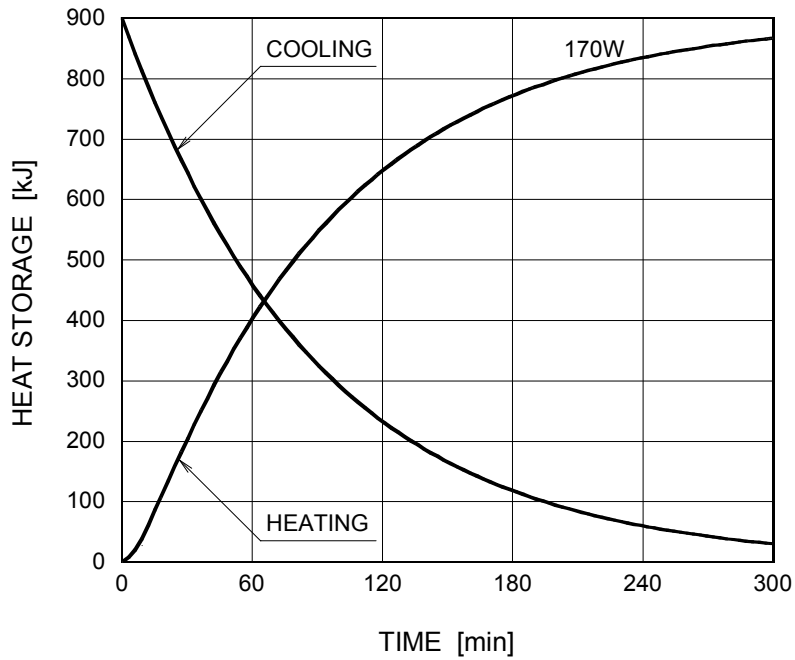


Note1) For Reference Only

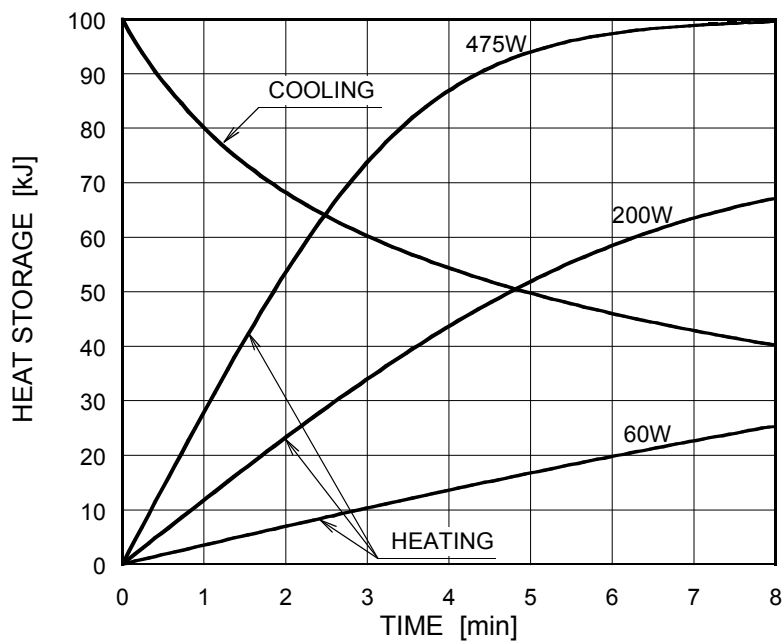
Note2) Refer to IEC60613:2010

Thermal Characteristics

X-ray Tube Assembly Heating / Cooling Curve



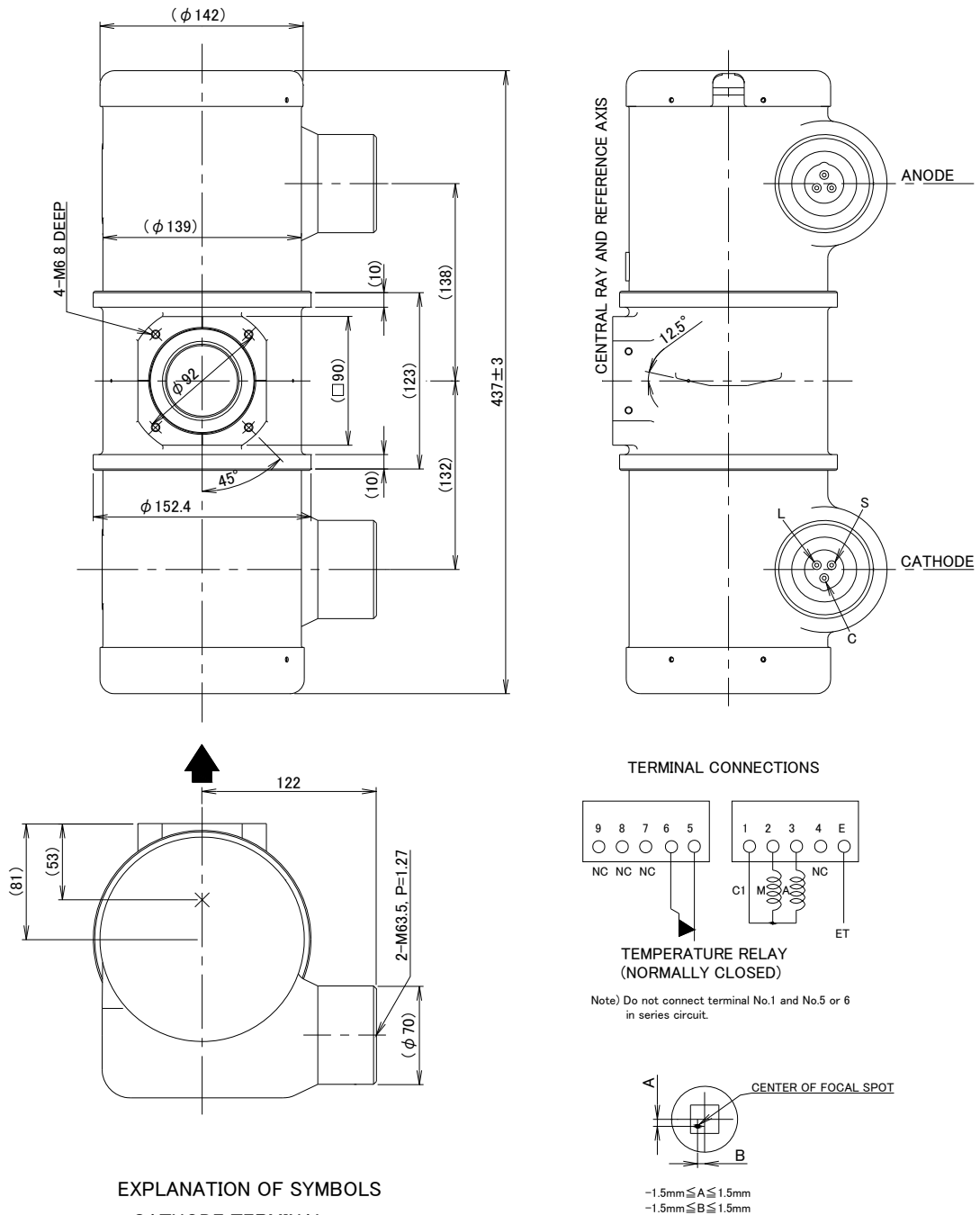
Anode Heating / Cooling Curve



The heating curves are showing examples of average input power to the anode in operation.

Dimensional Outline

Unit mm



EXPLANATION OF SYMBOLS

CATHODE TERMINAL

- C : COMMON
- L : LARGE FOCUS
- S : SMALL FOCUS

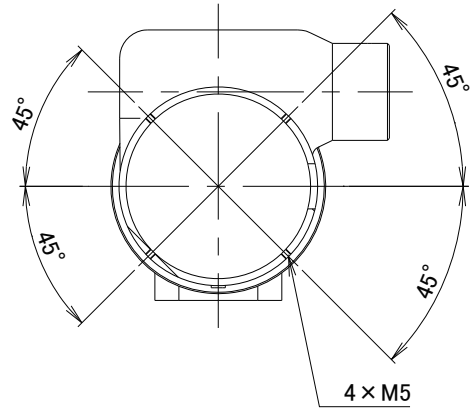
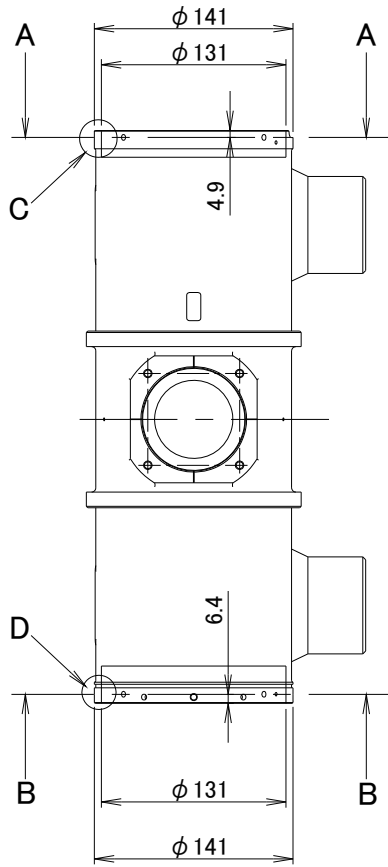
TERMINAL CONNECTIONS

- C1 : COMMON
- M : MAIN WINDING OF THE STATOR
- A : AUX. WINDING OF THE STATOR
- NC : NON-CONNECTION
- ET : EARTH TERMINAL

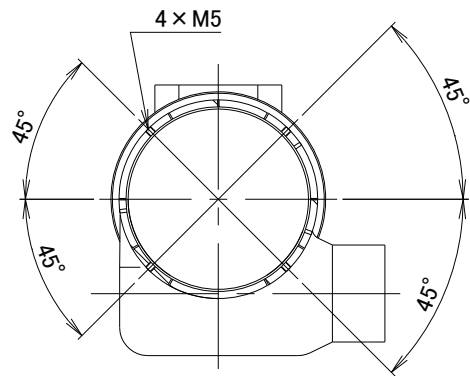
- ▲ : CENTRAL X-RAY ANODE & CATHODE TERMINAL : IEC60526 TYPE

Detail of inside of end cap

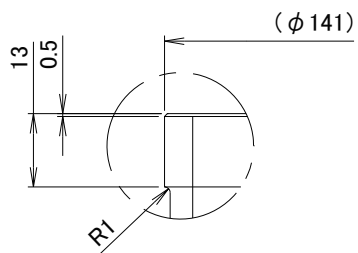
Unit: mm



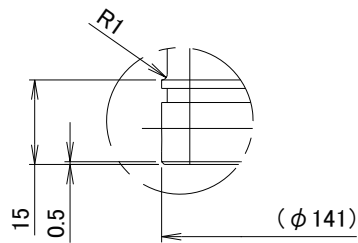
CROSS SECTION A-A



CROSS SECTION B-B

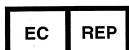


Detail drawing C



Detail drawing D

OVERSEAS SUBSIDIARIES AND AFFILIATES



EU REPRESENTATIVE

· **TOSHIBA ELECTRONICS EUROPE GMBH**

HANSAALLEE 181 40549 DÜSSELDORF, GERMANY

PHONE +49 (211) 5296-107 FAX +49 (211) 5296-402

For Sales & Technical Services, please contact the following representative:

· **TOSHIBA ELECTRONICS EUROPE GMBH**

HANSAALLEE 181 40549 DÜSSELDORF, GERMANY

PHONE +49 (211) 5296-107 FAX +49 (211) 5296-402

· **TOSHIBA AMERICA ELECTRONIC COMPONENTS, INC.**

2150 EAST LAKE COOK ROAD, SUITE 310

BUFFALO GROVE, ILLINOIS 60089 USA

PHONE +1 (847) 484-2400 FAX +1 (847) 541-7287

· **TOSHIBA ELECTRON DEVICES & MATERIALS (SHANGHAI) CO., LTD. (TEMS)**

RM1606, SH-PLAZA,

No.336, XIZANG ROAD (MIDDLE), SHANGHAI, 200001, CHINA

PHONE +86 (21) 6361-0077 FAX +86 (21) 6351-5760

 **TOSHIBA ELECTRON TUBES & DEVICES CO., LTD.**
(Product Development Engineering Department)

1385 SHIMOISHIGAMI, OTAWARA-SHI, TOCHIGI-KEN, 324-8550, JAPAN

PHONE: +81-287-26-6666 FAX: +81-287-26-6060

<http://www.toshiba-tetd.co.jp/>

·Toshiba Electron Tubes & Devices Co., Ltd. meets the Environmental Management System Standard, ISO14001.

·Toshiba Electron Tubes & Devices Co., Ltd. meets internationally recognized Standards for Quality Management System ISO9001, ISO13485.