

HAMAMATSU

DATA SHEET

Nov.12. 2003

PHOTOMULTIPLIER TUBE

R7081-02

for ICECUBE Experiment

For High Energy Physics Research, 252mm (10 inch) Diameter,
10-stage Hemispherical, Bialkali Photocathode Head-On Type

GENERAL

Parameter		Value	Unit
Spectral Response		300 to 650	nm
Wavelength of Maximum Response		420	nm
Photocathode Material		Bialkali	-
Window Material		Borosilicate glass	-
Effective Area		550	cm ²
Dynode	Structure	Box & Line	-
	Number of Stages	10	-
Capacitances	Anode to Last Dynode	approx. 3	pF
	Anode to All Other Dynodes	approx. 7	pF
Base		20-pin Base / JEDEC No.B20-102	-
Suitable Socket		E678-20A (not supplied)	-
Weight		approx. 1150	g

MAXIMUM RATINGS (Absolute Maximum Values)

Parameter		Value	Unit
Supply Voltage	Between Anode and Cathode	2200	Vdc
	Between Anode and Last Dynode	300	V
Average Anode Current		0.1	mA
Average Cathode Current		100	nA
Ambient Temperature		-60 to +50	deg C

CHARACTERISTICS (at 25 deg C)

Parameter		Min.	Typ.	Max.	Unit
Cathode Sensitivity	Luminous (2856K)	-	80	-	uA/lm
	Radiant at 420nm	-	80	-	mA/W
	Blue (CS-5-58 filter)	-	10.0	-	uA/lm-b
	Quantum efficiency at 390nm	-	25	-	%
Anode Sensitivity	Luminous (2856K)	-	800	-	A/lm
	Radiant at 420nm	-	8.0E+05	-	A/W
Gain		-	1.0E+07	-	-
Supply Voltage for Gain of 1.0E+07		-	1500	-	V
Supply Voltage for Gain of 5.0E+07		-	1700	2000	V
Anode Dark Current (after 30min.storage in darkness)		-	200	1000	nA
Dark Count (after dark condition for 15 hours) at +25 deg C		note-1	7,000	15,000	s ⁻¹
Dark Count (after dark condition for 15 hours) at -40 deg C		note-1 & 2	500	1000	s ⁻¹
Time Response	Anode Pulse Rise Time	-	4.2	-	ns
	Electron Transit Time	-	60	-	ns
	Transit Time Spread (T.T.S.)	note-1	3.2	-	ns
Pre Pulsing (at 50p.e.)	10nsec-100nsec before Main pulse	note-1	0.5	2	%
Late Pulsing	25nsec-100nsec before Main pulse	note-1	1.5	5	%
After Pulsing	100nsec-16usec before Main pulse	note-1	2.0	10	%
P/V (Peak to Valley Ratio) (at single p.e.)		2.0	2.5	note-1	-
Pulse Linearity	at ±2% Deviation	-	70	-	mA

Anode Sensitivity, Gain and Pulse Linearity are specified at 1500V, other anode characteristics are specified at supply voltage for Gain of 1.0E+07 with the divider shown in Table.1.

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Table 1 : DIVIDER RATIO AND SUPPLY VOLTAGE

Electrodes	K	Dy1	F2	F1	F3	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10	P
Ratio	16.8	0	0.6	0	3.4	5	3.33	1.67	1	1.2	1.5	2.2	3	2.4	
Capacitors in uF												0.01	0.01	0.01	

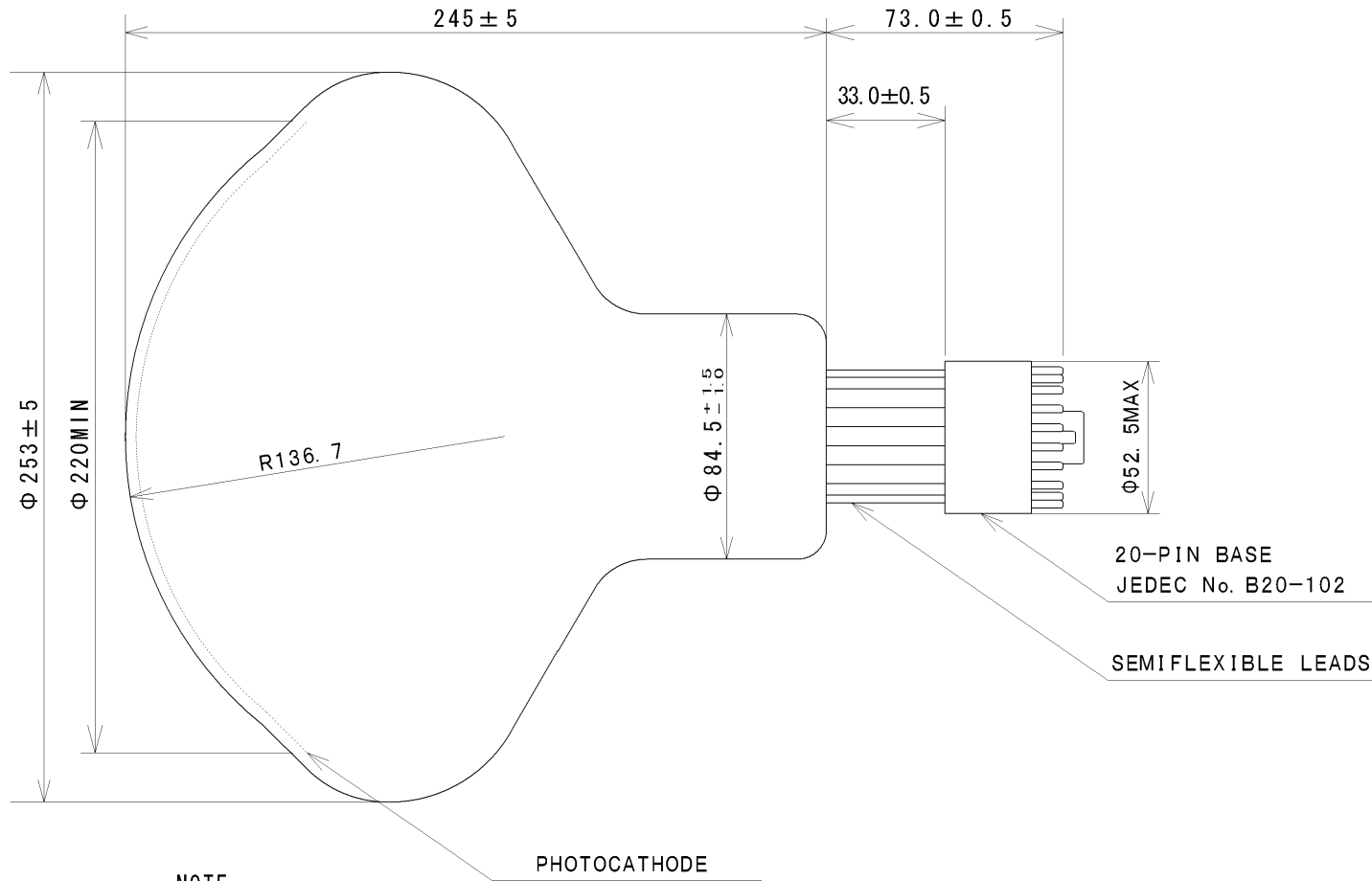
Supply Voltage : 1500V, K : Cathode, Dy : Dynode, P : Anode, F : Focus

note-1 : LLD is set at 0.25 p.e. in the test.

note-2 : Hamamatsu doesn't measure it, but guarantees the value.

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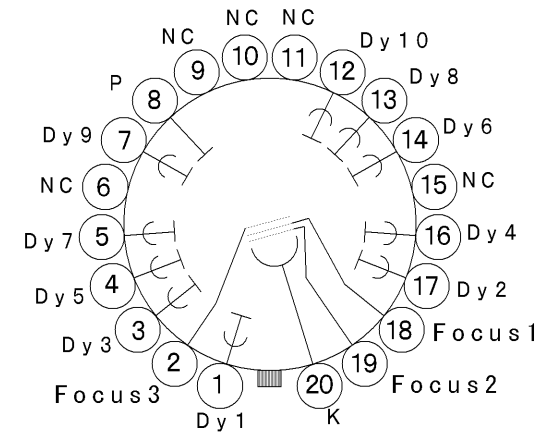
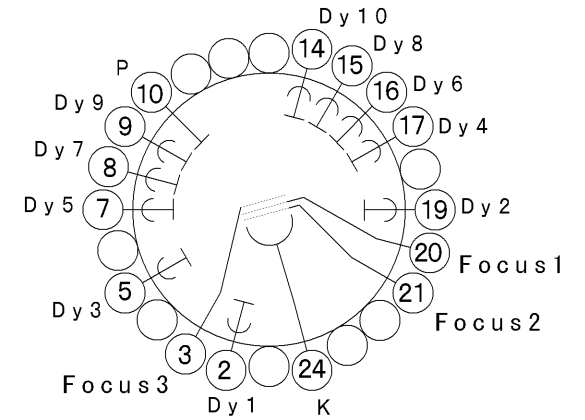
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NOTE

1. Semiflexible leads should be plated with Sn(100%).
2. A plastic base (JEDEC No. B20-102) should be attached without soldering

TEMPORARY BASE REMOVED



20-PIN BASE JEDEC No. B20-102