

DEXTER RESEARCH CENTER, INC.

Blackbody Spectral Radiance

1. Blackbody radiance for three spectral regions*

$$L = \int_{\lambda_1}^{\lambda_2} \frac{C_1}{\pi\lambda^5} \cdot [e^{(C_2/\lambda T)} - 1]^{-1} d\lambda \quad \text{W/cm}^2\text{sr}$$

L	-30	-20	-10	0	10	20	30	37	40	50	°C
8-13μm	1.58	1.98	2.44	2.96	3.55	4.21	4.93	5.49	5.73	6.60	$\frac{\text{mW}}{\text{cm}^2\text{sr}}$
7-15.5μm	2.6	3.2	3.9	4.7	5.6	6.6	7.7	8.6	8.9	10.3	
1.8-25μm	5	6	7	8	9	11	13	14	15	17	

2. Differential blackbody radiance for three spectral regions*

$$\frac{\partial L}{\partial T} = \int_{\lambda_1}^{\lambda_2} \frac{C_1 C_2}{\pi\lambda^6 T^2} \cdot e^{(C_2/\lambda T)} \cdot [e^{(C_2/\lambda T)} - 1]^{-2} d\lambda \quad \text{W/cm}^2\text{sr } ^\circ\text{C}$$

$\partial L/\partial T$	-30	-20	-10	0	10	20	30	37	40	50	°C
8-13μm	36.9	42.9	49.1	55.6	62.4	69.3	76.3	81.3	83.5	90.7	$\frac{\mu\text{W}}{\text{cm}^2\text{sr } ^\circ\text{C}}$
7-15.5μm	57	66	75	85	95	106	117	124	128	139	
1.8-25μm	90	103	116	131	148	165	184	198	204	226	

* $C_1 = 37,413 \text{ W}\mu\text{m}^4/\text{cm}^2$; $C_2 = 14,388 \mu\text{mK}$; $T = 237 + ^\circ\text{C}$

Postal Mail: 7300 Huron River Dr.
Dexter, MI 48130 U.S.A

Phone: 734-426-3921
Fax: 734-426-5090

Email: Sales@DexterResearch.com
Web: www.DexterResearch.com