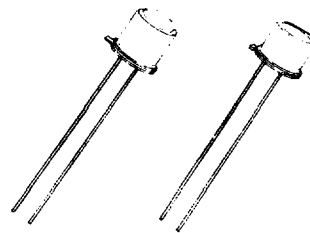


F5D1, F5D2, F5D3, F5E1, F5E2, F5E3

**Infrared Emitter
Gallium Aluminum Arsenide Infrared
Emitting Diode**

The F5D and F5E Series are infrared emitting diodes. They exhibit high power output and a typical peak wavelength of 880 nanometers and provide a significant increase in system efficiency, when used with silicon detectors, compared to GaAs infrared emitting diodes. The F5D Series has a lens which provides a narrow beam angle while the F5E Series has a flat window for a wide beam angle which is useful with external lensing.



F5D1, F5D2, F5D3 F5E1, F5E2, F5E3

absolute maximum ratings: (25°C, unless otherwise specified)

Voltage	SYMBOL		UNITS
Reverse Voltage	V_R	3	V
Current			
Forward Current (continuous)	I_F	100	mA
Forward Current (pw, 1 μ s; 200 Hz)	I_F	10	A
Forward Current (pw, 10 μ s; 100 Hz)	I_F	3	A
Dissipation			
Power Dissipation ($T_A = 25^\circ\text{C}$)*	P_T	170	mW
Power Dissipation ($T_C = 25^\circ\text{C}$ **)	P_T	1.3	W
Temperatures			
Junction Temperature	T_J	-65 to +150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$
Lead Soldering Time (1/16" [1.6mm] from case for 10 sec.)	T_L	+260	$^\circ\text{C}$

*Derate 1.36 mW/ $^\circ\text{C}$ above 25°C ambient.

**Derate 10.4 mW/ $^\circ\text{C}$ above 25°C case.

electrical characteristics: (25°C, unless otherwise specified)

	SYMBOL	MIN.	TYP.	MAX.	UNITS
Reverse Leakage Current ($V_R = 3\text{V}$)	I_R	—	—	10	μA
Forward Voltage ($I_F = 100\text{mA}$)	V_F	—	—	1.7	Volts
($I_F = 1\text{A}$)	V_F	—	—	3.5	Volts

optical characteristics: (25°C, unless otherwise specified)

		SYMBOL	MIN.	TYP.	MAX.	UNITS
Total Power Output ($I_F = 100\text{mA}$)(Note 1)	— F5D1, F5E1	P_o	12	—	—	mW
	— F5D2, F5E2		9	—	—	mW
	— F5D3, F5E3		10.5	—	—	mW
Peak Emission Wavelength ($I_F = 100\text{mA}$)		λ_p	—	880	—	nm

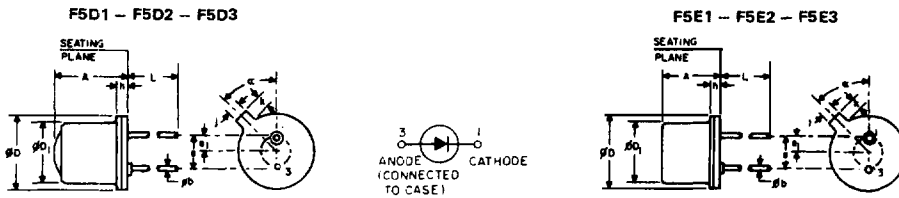
F5D1, F5D2, F5D3, F5E1, F5E2, F5E3

optical characteristics (continued): (25°C, unless otherwise specified)

	SYMBOL	MIN.	TYP.	MAX.	UNITS
Spectral Shift with Temperature		—	.3	—	nm/°C
Spectral Bandwidth — 50%	$\Delta\lambda$	—	80	—	nm
Half Intensity Beam Angle					
— F5D1, F5D2, F5D3	θ_{HI}	—	—	20	Deg.
— F5E1, F5E2, F5E3		—	—	80	Deg.
Rise Time					
0-90% of Output (Note 2)	t_r	—	1.5	—	μs
Fall Time					
100-10% of Output (Note 2)	t_f	—	1.5	—	μs

NOTES:

- Total power output, P_o , is the total power radiated by the device into a solid angle of 2π steradians.
- At $I_F = 100\text{ mA}$, $t_r \leq 10\text{ ns}$ input current pulse.



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	—	.255	—	6.47	
ϕb	.016	.021	.407	.533	
ϕD	.209	.230	5.31	5.84	
ϕD_1	.180	.188	4.57	4.77	
e	.100 NOM		2.54 NOM		2
e_1	.050 NOM		1.27 NOM		2
h	—	.030	—	.76	
j	.031	.044	.79	1.11	
k	.036	.046	.92	1.16	1
L	1.00	—	25.4	—	
α	45°	45°	45°	45°	3

NOTES:

- Measured from maximum diameter of device.
- Leads having maximum diameter .021" (.533mm) measured in gauging plane .054" + .001" - .000 (1.37 + .025 - .000mm) below the reference plane of the device shall be within .007" (.1778mm) their true position relative to a maximum width tab.
- From centerline tab.

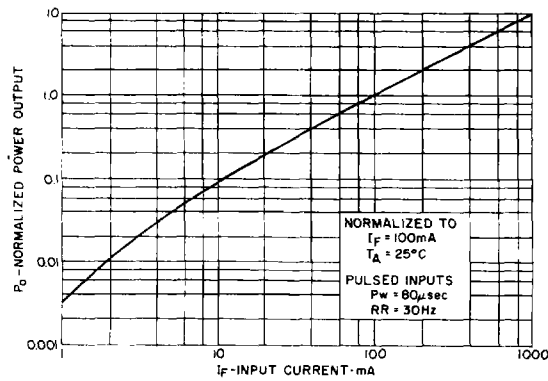
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	—	.155	—	3.93	
ϕb	.016	.021	.407	.533	
ϕD	.209	.230	5.31	5.84	
ϕD_1	.180	.188	4.57	4.77	
e	.100 NOM		2.54 NOM		2
e_1	.050 NOM		1.27 NOM		2
h	—	.030	—	.76	
j	.031	.044	.79	1.11	
k	.036	.046	.92	1.16	1
L	1.00	—	25.4	—	
α	45°	45°	45°	45°	3

NOTES:

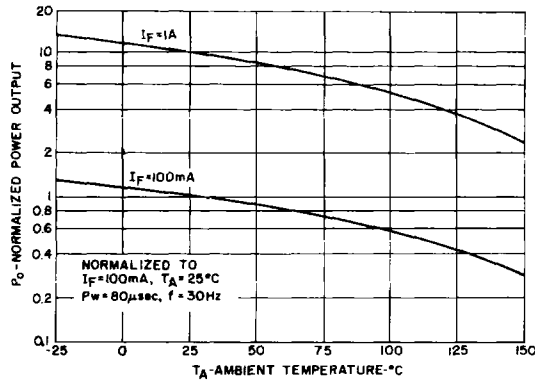
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- From centerline tab.

F5D1, F5D2, F5D3, F5E1, F5E2, F5E3

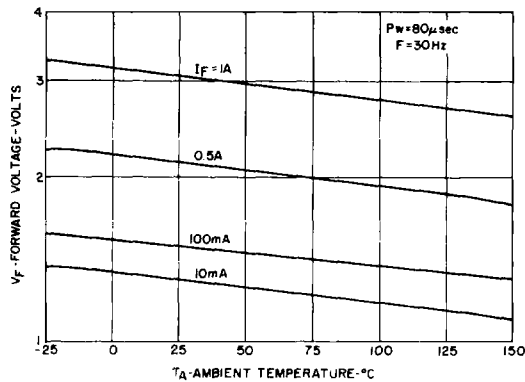
TYPICAL CHARACTERISTICS



1. POWER OUTPUT VS. INPUT CURRENT



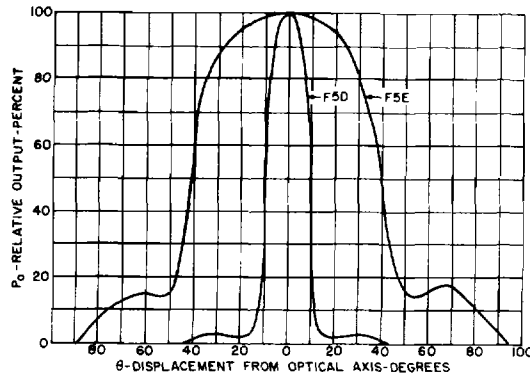
2. POWER OUTPUT VS. TEMPERATURE



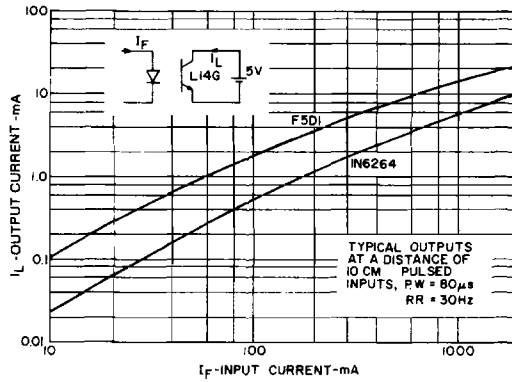
3. FORWARD VOLTAGE VS. TEMPERATURE

F5D1, F5D2, F5D3, F5E1, F5E2, F5E3

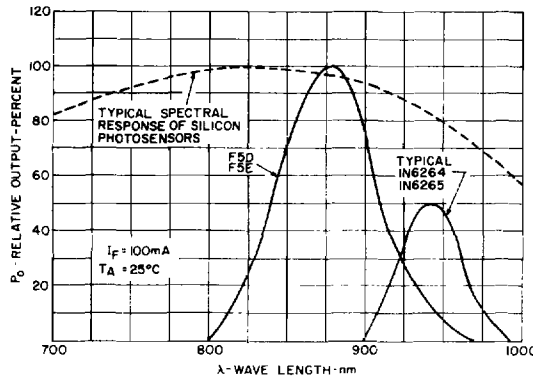
TYPICAL CHARACTERISTICS



4. TYPICAL RADIATION PATTERN



5. OUTPUT VS. INPUT WITH L14G DETECTOR



6. OUTPUT VS. WAVELENGTH