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FEI COMPANY™
BEAM TECHNOLOGY DIVISION



Schottky Field Emission Electron Source

Schottky emission is the predominant electron source technology in today's focused electron beam equipment including SEM, TEM, Auger systems, and semiconductor inspection tools. Because of performance and reliability benefits, Schottky emission has largely replaced earlier source technologies based on either thermionic tungsten and LaB_6 emission or cold-field emission.

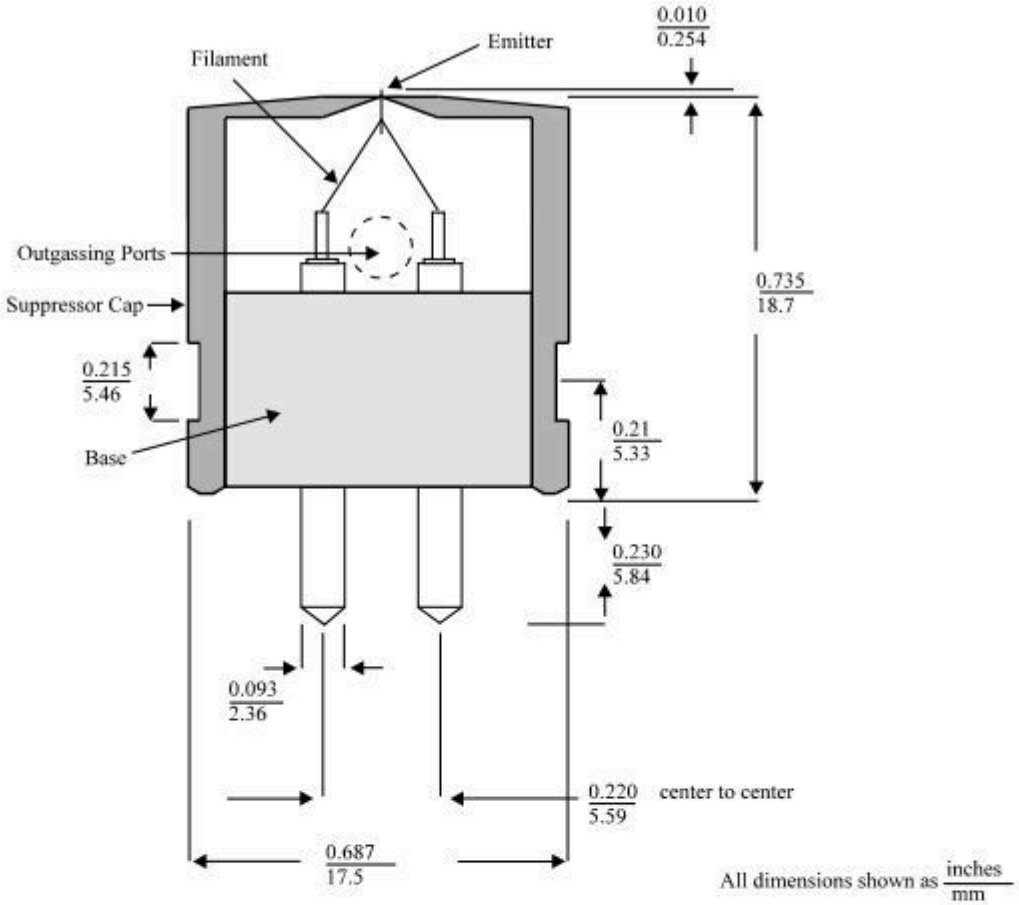
The Schottky emitter has the following ideal properties: Small source size, low electron emission energy spread, high brightness (beam current per solid angle), low short-term noise and long-term stability, simple and low-cost operation.

Schottky is superior to thermionic sources in terms of source size, brightness, and lifetime. It is up to 1000 times smaller and up to 100 times brighter than thermionic emitters.

Schottky emission (SE) is preferred over cold-field emission (CFE) because it provides higher stability, lower noise, and is easier to operate. Schottky emission vacuum requirements are less stringent than cold-field emission vaccum requirements, reducing equipment and maintenance costs.

	SCHOTTKY	COLD FIELD	LaB6	TUNGSTEN
Source Size (nm)	**15**	3	104	>104
Energy Spread (eV)	**0.3-1.0**	0.2-0.3	1.0	1.0
Brightness (A/cm2SR)	**5×10^8**	10^9	10^7	10^6
Short-term Beam Current Stability (%RMS)	**<1**	4-6	<1	<1
Operating Vacuum (Torr)	**10^{-9}**	10^{-10}	10^{-7}	10^{-5}
Typical Service Life (hrs)	**6000**	2000	1000	100

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Standard Suppressors

Part #	Description
12837	.3 micron tip radius
12838	.4 micron tip radius
12839	.5 micron tip radius
12840	.6 micron tip radius
12841	.7 micron tip radius
12842	.8 micron tip radius
12843	.9 micron tip radius
12844	1.0 micron tip radius
12845	1.1 micron tip radius

OEM Sources

Part #	Description
18210	Amray
19030	Leo
18550	FEI 2LE Column
15985	FEI SSEM Module
17362	Physical Electronics

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Local FEI Representative

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