

APPROVALS			REVISIONS			
	INITIALS	DATE	REV	DESCRIPTION	DATE	APPR
Drawn	JFG	30JUN03	1	Prototype Release	30JUN03	JFG
Engineering						
Manufacturing						
Marketing						

**1.0 General Description**

This document describes a variable output microwave generator designed for use in the Novellus "PEP" semiconductor wafer fabrication tools. It is fully compliant with the specifications defined in Novellus source control drawing 94-2618. This generator is also equivalent to MKS/ASTeX part number C13170.

Microwave power is delivered in pulses at a rate equal to twice the power line frequency (i.e. 120 pps using 60 Hz line power). High voltage is delivered to the magnetron by a full-wave bridge rectifier type power supply. Output power is controlled from zero to full by phase-fired SCR's.

The microwave generator is enclosed in a 19" rack mount chassis. Mounted to the waveguide output flange is a dual directional waveguide coupler for monitoring both forward and reflected microwave power. A crystal detector and cable deliver the reflected power signal to the generator for use in a power fold-back circuit which protects the magnetron from excess levels of reflected power.

**2.0 General Specifications****2.1 Electrical Specifications**

Frequency	2450 +20/-30 MHz
Frequency Stability	+/- 20 MHz at any fixed power level
Output Power	0-1250 Watt, continuously variable
Duty Cycle	900 Watts: 100% duty 1250 Watts: 50% max duty, 5 minutes max cycle on-time <i>NOTE: These duty ratings are consistent with the original design and performance of the 94-1104.</i>
Output Regulation	1% maximum change in output power for 10% change in line voltage
Output Waveform	Pulsed at rate equal to twice the power line frequency (100 pps at 50 Hz line power, 120 pps at 60 Hz line power)
Power Supply Type	Full wave bridge rectifier, unfiltered
Line Power Input	190/208/220/240 VAC, single phase, 50/60 Hz, 20A, 2-wire plus ground
Interlocks	Magnetron temp; Access cover; Waveguide flange; External

**2.2 Mechanical Specifications**

Magnetron	Water-cooled Hitachi 2M130
Waveguide	WR284
Waveguide Flange	UG584/U with taper for use with v-groove clamps

**OEM Microwave Generator, PEP**

Line Power Connection	6 foot type SO cord, #12 AWG, 3 conductor, with 20A NEMA L6-20P twist-lock plug
Ground Connection	1/4-20 UNC stud
Control I/O Connection	25-pin female subminiature "D"
Cooling Requirement	Water @ 1 gpm (0.5 gpm min.), 35°C max., 70 psig max.
Water Connections	3/8" female Swagelok
Enclosure	19" NEMA rack mount cabinet, 4U high, 16" deep (approx.)
Weight (approx.)	85 lbs

**2.3 Control Interface**

Microwave On/Off	Ground to enable MW power (24 VDC, 10 mA)
Mw Power Control Input	0-10 VDC, set for 10 VDC = 1200 Watts output, 1% linearity between 100 and 1200 Watts
Forward Power Signal Output	0-10 VDC, set for 10 VDC = 1200 Watts output, 1% linearity between 100 and 1200 Watts
Reflected Power Signal Output	0-10 VDC, adjustable from 100 W = 10 VDC to 1000 W = 10 VDC. Set for 0.5 VDC = 50 Watts (non-linear)
Power Fold-back	Automatically occurs when reverse power reaches set protection level. Set level is adjustable from 100 W to 600 W. Set for 200 W
Mw Power On Indicator	Isolated collector-emitter junction
Mw Full Power Indicator	Isolated collector-emitter junction
External Interlocks	Connections provided for external dry contacts (24 VAC, 0.5 Amps)
External Connectors	BNC jacks provided for input and output reflected power signals
Hibernate	0 VDC input signal turns off magnetron filament and plate voltage
System Ready	15 VDC output signal when in standby or operate mode

**3.0 Ordering Information**

<u>Description</u>	<u>Part No.</u>
OEM Mw Generator, PEP	911213
Replacement Magnetron Assy	910443-1

### 4.0 Outline Drawing

