

TESC7080 Series

Electrostatic chuck high-voltage power supply | ± 2 kV, 20 ms polarity switching response (C0021)



- +24V DC input
- Bipolar output with 20 ms polarity switching
- Smooth zero - crossing
- Analog control / RS232 control / USB control / Ethernet control
- In - situ capacitance detection range: 2 pF to 30 nF
- In - situ capacitance detection rate: 10 times per second (within 1 s)

Information:

Teslaman TESC7080 series is a high-voltage power supply specifically designed for electrostatic chucks. It delivers precise ± 2 kV output (accuracy: $\pm 1\%$, ripple: <100 mVp-p), with a leakage current monitoring protection value adjustable from 0 to 20 mA. It supports in-situ capacitance detection up to 30 nF. Featuring fast 20 ms zero-crossing switching capability, it integrates multiple protection functions and supports analog control, RS232, USB, Ethernet, and LCD display. It has been applied in semiconductor ion implantation and etching equipment, demonstrating stable and reliable performance. Its compact and lightweight package design makes it suitable for OEM integration.

Application:

E-Chuck (Electrostatic Chuck), also referred to as electrostatic chuck or electrostatic adsorption system.

Specifications:

Input	+24VDC $\pm 5\%$, 5A.
Number of channels	2 channels, each independently adjustable.
Adjustment range	Each channel continuously adjustable from -2 kV to $+2$ kV.
Voltage accuracy	$\pm 1\%$ of rated value.
Ripple	Typically <100 mVp-p (with 10 nF load, 0–1 MHz, flat-top ripple).
Zero-crossing capability	Supported.
Overshoot (over/undershoot)	Typically <2 V (with 10 nF load, from -2 kV to $+2$ kV).
Input-to-output delay	Better than 3 ms.
Slew rate (rise/fall)	Typically 20 ms (with 10 nF load, from -2 kV to $+2$ kV).
Cycle frequency	Typically 50 Hz (with 10 nF load, from -2 kV to $+2$ kV).
Output impedance	>20 k Ω (per channel).
Voltage display	Resolution = 1 V. Accuracy better than ± 50 V.
Current display	Resolution = 10 μ A. Accuracy = $\pm 2\%$ of actual output ± 100 μ A offset.
Stability	Less than 0.01% per 8 hours after 0.5-hour warm-up.
Line regulation	$<0.1\%$ for 10% input voltage change under any load condition.
Load regulation	$<1.3\%$ from zero to full load.

Protection	Input over-/under- voltage, overcurrent; output overvoltage, overcurrent, over- temperature.
Front panel control	LCD display; voltage adjustment, current setting, clamp, d- clamp, etc.
Communication	Analog control via DB15; RS-232 serial interface optional (other interfaces available upon request).
Control signal	0 V corresponds to -2 kV, 5 V corresponds to 0 kV, 10 V corresponds to +2 kV (other scaling available upon request).
Typical load capacitance	<30 nF (for other load capacitance values, please contact Teslaman).
In- situ capacitance detection range	Up to 30 nF.
Temperature coefficient	Better than 300 ppm/°C for voltage and current. <0.1% p- p at full load, maximum output.
Ambient temperature	Operating: 0 °C to 45 °C; Storage: -20 °C to 70 °C.
Humidity	0 to 85% RH, non-condensing.
Cooling	Natural convection.
Dimensions	482.6 mm (W) × 44 mm (H) × 457 mm (D).
Weight	3 kg.

Description of Model Code

The model code represents the performance and parameters of the power supply, which are:

Maximum output voltage in kV;

Maximum output power in W;

Output polarity, PN for bipolar

TESC7080 PN 5 - 40

Model
 Polarity
 Maximum Voltage
 Maximum power

TESC7080 Series model selection table

Rated output		Model
kV	mA	
2	20	TECS7080PN2-40
5	8	TECS7080PN5-40

DB25 interface signal description

PIN	Signal	Signal parameters
1	Clamp/Release Signal	High level (5–24 VDC) = clamp, low level = release.
2	Clamp/Release Return GND	GND
3	External Clamp Amplitude Input (kV set)	0–10 VDC input corresponds to 0 to ±2000 VDC output.
4	External Offset Input	0 to -10 VDC input corresponds to 0 to ±2000 VDC output; polarity depends on front panel setting.
5	Phase A Output Monitor (kV1-mon)	200:1 ratio (0 to ±10 VDC)
6	Fault Signal	Open = no fault; grounded = fault. Open- collector output.
7	Phase B Output Monitor (kV2- mon)	200:1 ratio (0 to ±10 VDC)
8	+Analog Input/Output Reference Ground (GND)	GND

9	Capacitance Monitor (Cap mon)	0–10 V
10	Wafer Status Indicator	Open = no wafer; 50% duty cycle = wafer present; closed = wafer clamped. Open-collector output.
11	Steady-State Voltage Leakage Current Monitor (SS- I1Leak Mon)	Phase A: 1 V = 100 μ A
12	Analog Input/Output Reference Ground (GND)	GND
13	Steady-State Voltage Leakage Current Monitor (SS- I2Leak Mon)	Phase B: 1 V = 100 μ A
14	Interlock Feed- Through	Cascade forwarding output. Passes the external control signal received from Pin 15 to the next device.
15	Interlock Status (Pull Low to Complete Interlock)	Interlock function: ground to enable interlock.

Dimensions:mm

