

**NATIONAL**

**NL10277 &  
NL10277-1**  
Pulse Power Tetrodes

## QUICK REFERENCE DATA

Radial beam tetrode for laser pulsing, pulsed r.f. amplifier, or oscillator service.

Anode dissipation .....	500	W max
Anode voltage .....	20	kV max
Frequency for full ratings .....	75	MHz max
Frequency at reduced ratings .....	120	MHz max
Typical pulse output power (laser service. 10Z duty cycle) .....	8.9	kW

### HEATING: DIRECT THORIATED TUNGSTEN FILAMENT

Filament voltage .....	5.0	V
Filament current .....	14.1	A

(The filament is designed to accept temporary Fluctuations of +/- 5%)

### CAPACITANCE

Grid I to all other elements except anode C <sub>gi</sub> .....	12.7	pF
Anode to all other elements except grid 1 C <sub>a</sub> .....	4.9	pF
Anode to Grid 1 C <sub>ag1</sub> .....	0.12	pF

### MECHANICAL

Overall length (NL10277) .....	161	mm max
Overall length (NL10277-1) .....	133	mm max
Overall diameter .....	87	mm max

**MAXIMUM RATINGS (Absolute value)**

Anode voltage .....	30	kVmax
Anode dissipation (see note 1) .....	500	W max
Screen voltage .....	2000	V max
Screen dielplaton .....	35	W max
Grid voltage (negative value) .....	1000	V max
Grid dissipation .....	10	W max
Cathode current (mean) .....	450	mA max

**TYPICAL OPERATING CONDITIONS-LASER SERIES REGULATOR**

Screen voltage 1,0 kV. duty cycle 100%

Anode voltage (laser off) .....	10	12	15	kV
Anode voltage (laser firing)				
(see note 1) .....	45	5.0	5.5	kV
Grid bias voltage .....	-375	-400	-430	V
Grid voltage (laser firing)				
(see note 2) .....	-95	-104	-110	V
Anode current .....	80	72	69	mA
Anode dissipation .....	360	360	380	W
Power to load .....	440	504	656	W

Screen voltage 1.0 kV. duty cycle 10%

Anode voltage (laser off ) .....	10	12	15	kV
Anode voltage (laser firing)				
(see note 1) .....	3.5	4.0	4.5	kV
Grid bias voltage .....	-375	-400	-430	V
Grid voltage (laser firing)				
(see note 2) .....	-68	-82	-100	V
Pulse duration .....	<0.5	<0.5	<0.5	s
Anode current (pulse) .....	971	863	778	mA
Anode dissipation (pulse) .....	3400	3450	3500	W
Power to load (pulse) .....	6300	6900	8944	W

Screen voltage 400 V. duty cycle 100%			
Anode voltage (laser off) .....	10	12	15 kV
Anode voltage (laser firing)			
(see note 1) .....	6.5	7.0	7.5 kV
Grid bias voltage .....	-200	-217	-243 V
Grid voltage (laser firing)			
(see note 2) .....	-103	-108	-113 V
Anode current.....	61	56	53 mA
Anode dissipation .....	395	395	395 W
Power to load .....	212	282	395 W
Screen voltage 400 V. duty cycle 10%			
Anode voltage (laser off) .....	10	12	15 kV
Anode voltage (laser firing)			
(see note 1) .....	5.5	6.0	6.5 kV
Grid bias voltage .....	-200	-217	-243 kV
Grid voltage (laser firing)			
(see note 2 ) .....	-18	-25	-30 V
Pulse duration .....	<0.5	<0.5	<0.5 s
Anode current (pulse) .....	618	567	523 W
Anode dissipation (pulse) .....	3400	3400	3400 W
Power to load (pulse) .....	2780	3400	4446 W

NOTES:

1. A range of voltages may appear across the tetrode, depending on the power supplied to the laser and the need to retain non-oscillating conditions in the circuit. This may make necessary the use of sophisticated averaging of anode dissipation, or alternatively the use of conservative ratings.

2. Grid Impulse amplitude= grid voltage - grid bias voltage.

**COOLING**

(Radiation and forced air)

At anode dissipations up to 250 W a low-velocity air flow directed on the anode seal and the base generally will provide sufficient cooling. At higher dissipations the glass chimney should be used for circulating forced air along the bulb. At 400 W anode dissipation at least 0.4 m<sup>3</sup>/min. air should be passed through the chimney. For this purpose the static pressure below the chassis should be min. 50 Pa if cooling as arranged in the recommended way.

**TEMPERATURE LIMITS**

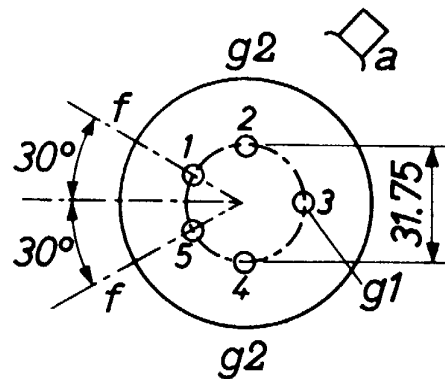
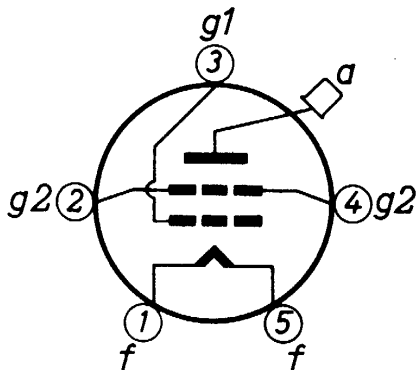
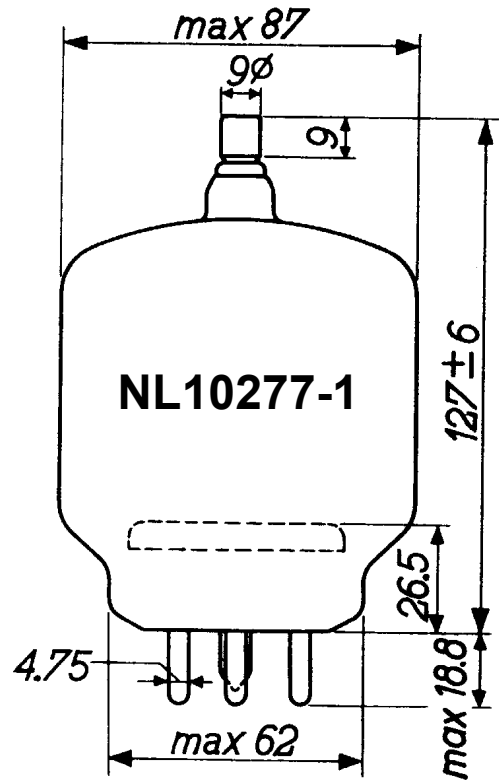
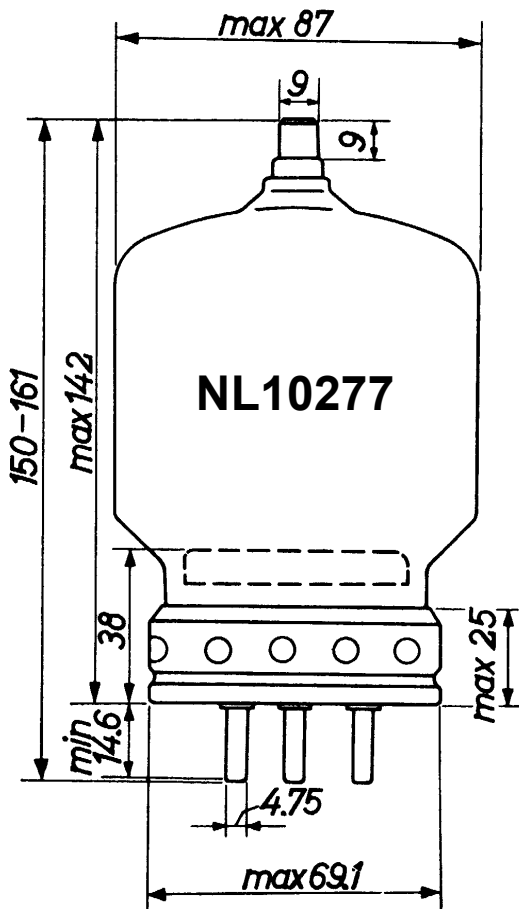
Absolute Maximum Rating System

Bulb Temperature	Max. 350 °C
Temperature of anode seal	Max. 220 °C
Temperature of Pin Seals	Max. 180 °C

**MECHANICAL DATA**

Base (NL10277-1)	giant 5 pin
Base metal-shell (NL10277)	giant 5 pin
Socket	40211-01, or SK410
Anode Connector	40624/S25671
Chimney	SK406
Net Mass (NL10277)	297 g
Net Mass (NL10277-1)	224 g

### OUTLINE DRAWINGS



### TYPICAL CONSTANT CURRENT CHARACTERISTICS

