2M229 Series

ABSOLUTE MAXIMUM RATING

	Minimum	Maximum	
Filament voltage (Note 1)	2.85	3.75	V
Cathode preheating time	0	-	s
Peak anode voltage	-	4.5	kV
Average anode current	-	350	mAdc
Peak anode current	-	1.2	A
Anode input power	-	1.4	kW
Load VSWR (Note 2)	-	4	
Anode temperature (Note 3)	-	300	℃
Antenna seal temperature (Note 4)	-	320	℃
Capacitor temperature (Note 5)	-	120	℃
Storage temperature	-30	60	℃

The maximum ratings in this table which are interrelated should not be exceeded either individually or in combination under any worst case.

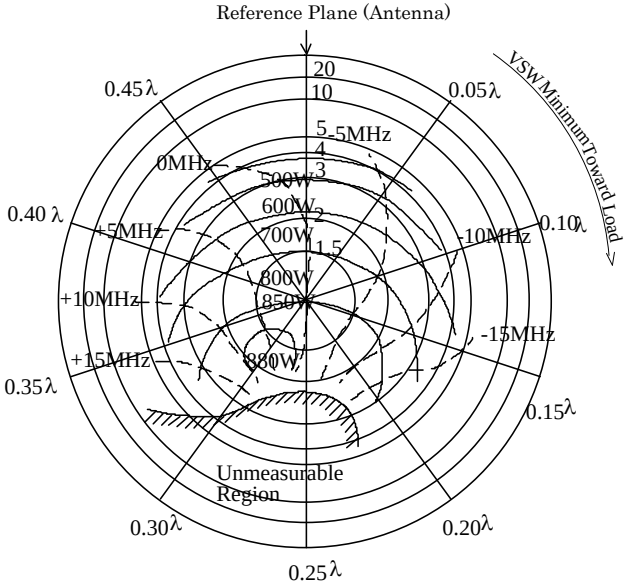
Even if the maximum ratings are not exceeded, reduced life can occur as the operating conditions approach to the maximum ratings.

TYPICAL OPERATION

Power supply : Single phase full wave rectified without filter		
Frequency	2460	MHz
Filament voltage	3.3	V
Peak anode voltage (Note 6)	4.0	kV
Average anode current	300	mAdc
Output power (matched load, Note 6)	850	W
Cooling air flow	800	ℓ/min
Pressure drop (Approx.)	80	Pa

RIEKE DIAGRAM

Power supply : Single phase full wave rectified without filter	
Filament voltage	: 3.3 V
Average anode current	: 300 mA (constant)
Peak anode voltage (Matched load)	: 4.0 kV
Oscillating frequency (matched load)	: 2460 MHz



2M231 Series

ABSOLUTE MAXIMUM RATING

	Minimum	Maximum	
Filament voltage (Note 1)	3.0	4.0	V
Cathode preheating time	0	-	s
Peak anode voltage	-	4.2	kV
Average anode current	-	250	mAdc
Peak anode current	-	1.0	A
Anode input power	-	1.0	kW
Load VSWR (Note 2)	-	4	
Anode temperature (Note 3)	-	300	℃
Antenna seal temperature (Note 4)	-	320	℃
Capacitor temperature (Note 5)	-	120	℃
Storage temperature	-30	60	℃

The maximum ratings in this table which are interrelated should not be exceeded either individually or in combination under any worst case.

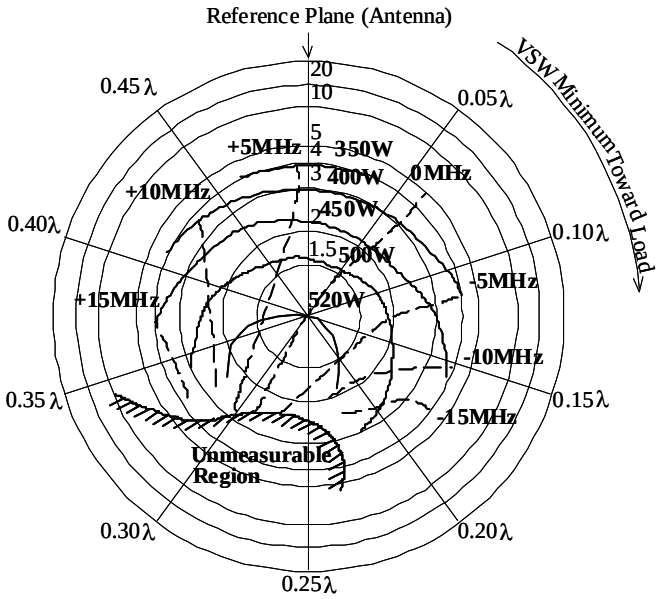
Even if the maximum ratings are not exceeded, reduced life can occur as the operating conditions approach to the maximum ratings.

TYPICAL OPERATION

Power supply : Single phase full wave rectified without filter		
Frequency	2460	MHz
Filament voltage	3.5	V
Peak anode voltage (Note 6)	3.7	kV
Average anode current	200	mAdc
Output power (matched load, Note 6)	520	W
Cooling air flow	800	?/min
Pressure drop (Approx.)	100	Pa

RIEKE DIAGRAM

Power supply : Single phase full wave rectified without filter	
Filament voltage	: 3.5 V
Average anode current	: 200 mA (constant)
Peak anode voltage (Matched load)	: 3.7 kV
Oscillating frequency (matched load)	: 2460 MHz



2M240 Series

ABSOLUTE MAXIMUM RATING

	Minimum	Maximum	
Filament voltage (Note 1)	2.85	3.75	V
Cathode preheating time	0	-	s
Peak anode voltage	-	4.5	kV
Average anode current	-	350	mAdc
Peak anode current	-	1.2	A
Anode input power	-	1.4	kW
Load VSWR (Note 2)	-	4	
Anode temperature (Note 3)	-	300	℃
Antenna seal temperature (Note 4)	-	320	℃
Capacitor temperature (Note 5)	-	120	℃
Storage temperature	-30	60	℃

The maximum ratings in this table which are interrelated should not be exceeded either individually or in combination under any worst case.

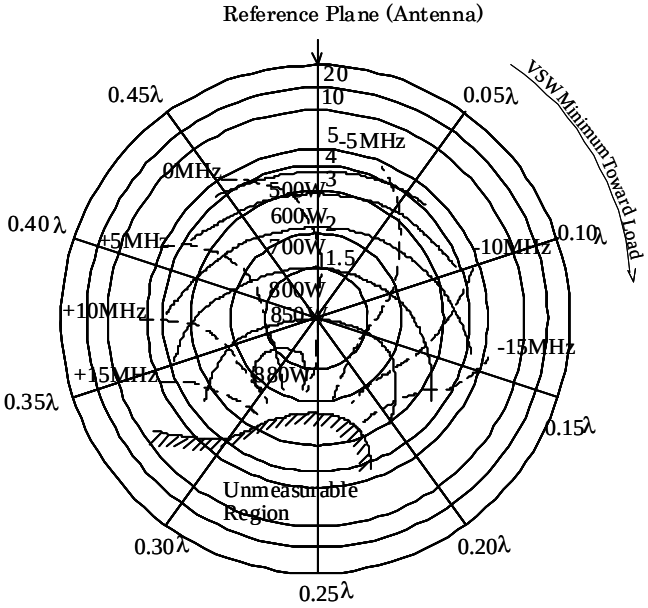
Even if the maximum ratings are not exceeded, reduced life can occur as the operating conditions approach to the maximum ratings.

TYPICAL OPERATION

Power supply : Single phase full wave rectified without filter		
Frequency	2460	MHz
Filament voltage	3.3	V
Peak anode voltage (Note 6)	4.0	kV
Average anode current	300	mAdc
Output power (matched load, Note 6)	850	W
Cooling air flow	800	?/min
Pressure drop (Approx.)	70	Pa

RIEKE DIAGRAM

Power supply : Single phase full wave rectified without filter	
Filament voltage	: 3.3 V
Average anode current	: 300 mA (constant)
Peak anode voltage (Matched load)	: 4.0 kV
Oscillating frequency (matched load)	: 2460 MHz



2M248 Series

ABSOLUTE MAXIMUM RATING

	Minimum	Maximum	
Filament voltage (Note 1)	2.7	3.6	V
Cathode preheating time	0	-	s
Peak anode voltage	-	4.85	kV
Average anode current	-	380	mAdc
Peak anode current	-	1.5	A
Anode input power	-	1.8	kW
Load VSWR (Note 2)	-	4	
Anode temperature (Note 3)	-	300	℃
Antenna seal temperature (Note 4)	-	320	℃
Capacitor temperature (Note 5)	-	120	℃
Storage temperature	-30	60	℃

The maximum ratings in this table which are interrelated should not be exceeded either individually or in combination under any worst case.

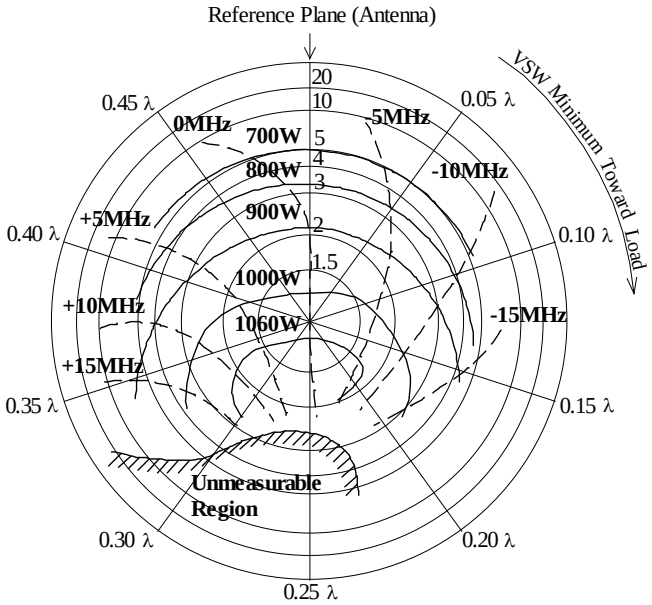
Even if the maximum ratings are not exceeded, reduced life can occur as the operating conditions approach to the maximum ratings.

TYPICAL OPERATION

Power supply : Single phase full wave rectified without filter		
Frequency	2460	MHz
Filament voltage	3.15	V
Peak anode voltage (Note 6)	4.35	kV
Average anode current	330	mAdc
Output power (matched load, Note 6)	1030	W
Cooling air flow	800	ℓ/min
Pressure drop (Approx.)	70	Pa

RIEKE DIAGRAM

Power supply : Single phase full wave rectified without filter	
Filament voltage	: 3.15 V
Average anode current	: 330 mA (constant)
Peak anode voltage (Matched load)	: 4.35 kV
Oscillating frequency (matched load)	: 2460 MHz



2M253 Series

ABSOLUTE MAXIMUM RATING

	Minimum	Maximum	
Filament voltage (Note 1)	2.85	3.75	V
Cathode preheating time	0	-	s
Peak anode voltage	-	4.5	kV
Average anode current	-	350	mAdc
Peak anode current	-	1.2	A
Anode input power	-	1.4	kW
Load VSWR (Note 2)	-	4	
Anode temperature (Note 3)	-	300	℃
Antenna seal temperature (Note 4)	-	320	℃
Capacitor temperature (Note 5)	-	120	℃
Storage temperature	-30	60	℃

The maximum ratings in this table which are interrelated should not be exceeded either individually or in combination under any worst case.

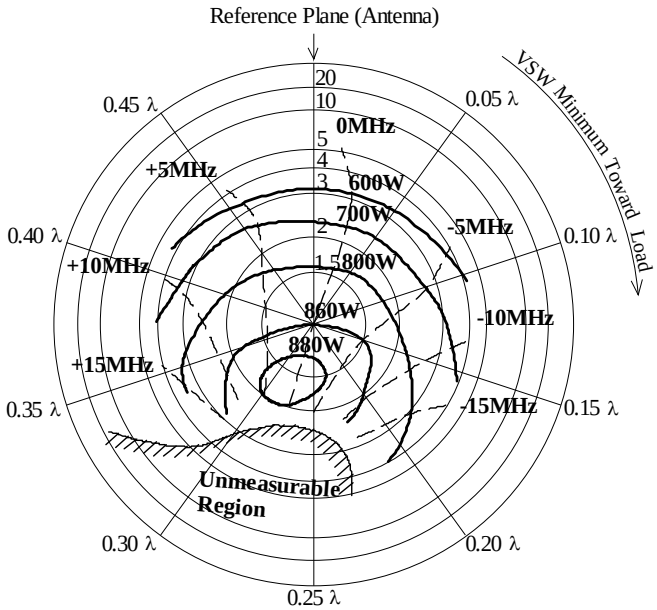
Even if the maximum ratings are not exceeded, reduced life can occur as the operating conditions approach to the maximum ratings.

TYPICAL OPERATION

Power supply : Single phase full wave rectified without filter		
Frequency	2460	MHz
Filament voltage	3.3	V
Peak anode voltage (Note 6)	4.0	kV
Average anode current	300	mAdc
Output power (matched load, Note 6)	860	W
Cooling air flow	800	ℓ/min
Pressure drop (Approx.)	70	Pa

RIEKE DIAGRAM

Power supply : Single phase full wave rectified without filter	
Filament voltage	: 3.3 V
Average anode current	: 300 mA (constant)
Peak anode voltage (Matched load)	: 4.0 kV
Oscillating frequency (matched load)	: 2460 MHz



2M300 Series

ABSOLUTE MAXIMUM RATING

	Minimum	Maximum	
Filament voltage (Note 1)	3.0	4.0	V
Cathode preheating time	0	-	s
Peak anode voltage	-	4.2	kV
Average anode current	-	250	mAdc
Peak anode current	-	1.0	A
Anode input power	-	1.0	kW
Load VSWR (Note 2)	-	4	
Anode temperature (Note 3)	-	300	℃
Antenna seal temperature (Note 4)	-	320	℃
Capacitor temperature (Note 5)	-	120	℃
Storage temperature	-30	60	℃

The maximum ratings in this table which are interrelated should not be exceeded either individually or in combination under any worst case.

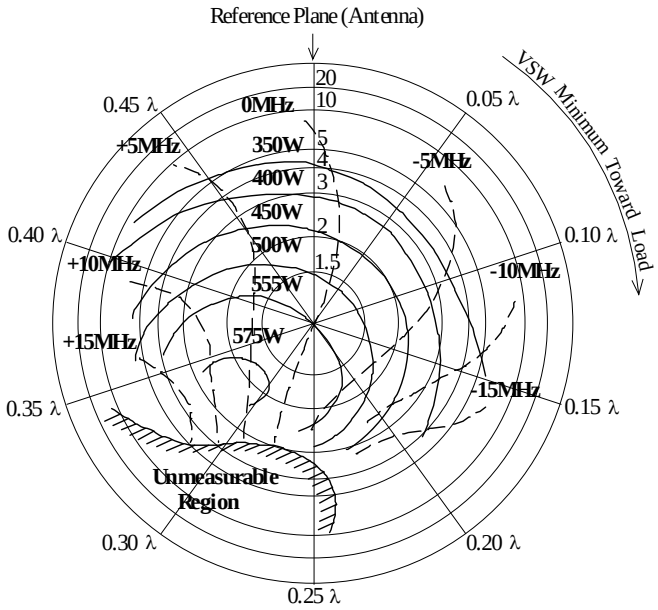
Even if the maximum ratings are not exceeded, reduced life can occur as the operating conditions approach to the maximum ratings.

TYPICAL OPERATION

Power supply : Single phase full wave rectified without filter		
Frequency	2465	MHz
Filament voltage	3.5	V
Peak anode voltage (Note 6)	3.85	kV
Average anode current	200	mAdc
Output power (matched load, Note 6)	550	W
Cooling air flow	800	ℓ/min
Pressure drop (Approx.)	100	Pa

RIEKE DIAGRAM

Power supply : Single phase full wave rectified without filter	
Filament voltage	: 3.5 V
Average anode current	: 200 mA (constant)
Peak anode voltage (Matched load)	: 3.85 kV
Oscillating frequency (matched load)	: 2465 MHz



2M301 Series

ABSOLUTE MAXIMUM RATING

	Minimum	Maximum	
Filament voltage (Note 1)	2.85	3.75	V
Cathode preheating time	0	-	s
Peak anode voltage	-	4.5	kV
Average anode current	-	350	mAdc
Peak anode current	-	1.2	A
Anode input power	-	1.4	kW
Load VSWR (Note 2)	-	4	
Anode temperature (Note 3)	-	300	℃
Antenna seal temperature (Note 4)	-	320	℃
Capacitor temperature (Note 5)	-	120	℃
Storage temperature	-30	60	℃

The maximum ratings in this table which are interrelated should not be exceeded either individually or in combination under any worst case.

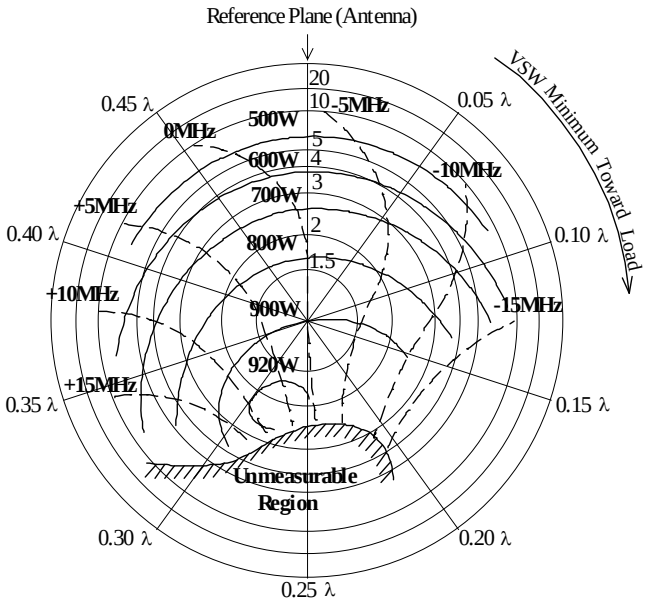
Even if the maximum ratings are not exceeded, reduced life can occur as the operating conditions approach to the maximum ratings.

TYPICAL OPERATION

Power supply : Single phase full wave rectified without filter		
Frequency	2465	MHz
Filament voltage	3.3	V
Peak anode voltage (Note 6)	4.1	kV
Average anode current	300	mAdc
Output power (matched load, Note 6)	900	W
Cooling air flow	800	ℓ/min
Pressure drop (Approx.)	80	Pa

RIEKE DIAGRAM

Power supply : Single phase full wave rectified without filter	
Filament voltage	: 3.3 V
Average anode current	: 300 mA (constant)
Peak anode voltage (Matched load)	: 4.1 kV
Oscillating frequency (matched load)	: 2465 MHz



2M302 Series

ABSOLUTE MAXIMUM RATING

	Minimum	Maximum	
Filament voltage (Note 1)	2.85	3.75	V
Cathode preheating time	0	-	s
Peak anode voltage	-	4.5	kV
Average anode current	-	350	mAdc
Peak anode current	-	1.2	A
Anode input power	-	1.4	kW
Load VSWR (Note 2)	-	4	
Anode temperature (Note 3)	-	300	℃
Antenna seal temperature (Note 4)	-	320	℃
Capacitor temperature (Note 5)	-	120	℃
Storage temperature	-30	60	℃

The maximum ratings in this table which are interrelated should not be exceeded either individually or in combination under any worst case.

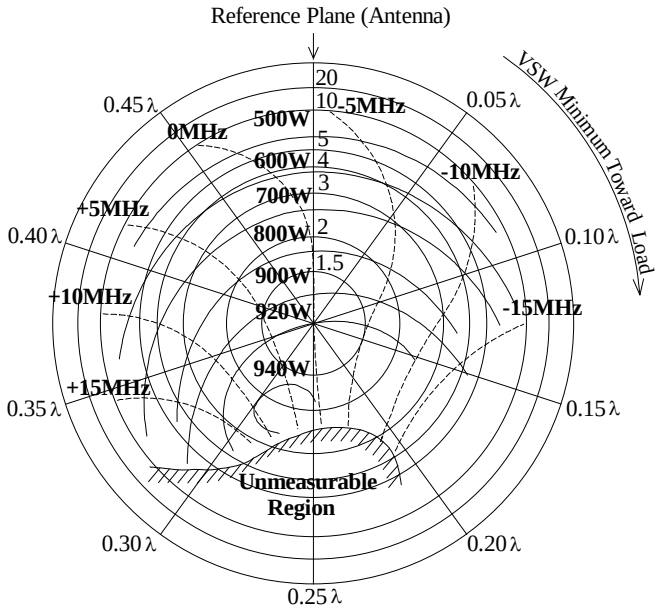
Even if the maximum ratings are not exceeded, reduced life can occur as the operating conditions approach to the maximum ratings.

TYPICAL OPERATION

Power supply : Single phase full wave rectified without filter		
Frequency	2465	MHz
Filament voltage	3.3	V
Peak anode voltage (Note 6)	4.2	kV
Average anode current	300	mAdc
Output power (matched load, Note 6)	920	W
Cooling air flow	800	ℓ/min
Pressure drop (Approx.)	70	Pa

RIEKE DIAGRAM

Power supply : Single phase full wave rectified without filter	
Filament voltage	: 3.3 V
Average anode current	: 300 mA (constant)
Peak anode voltage (Matched load)	: 4.2 kV
Oscillating frequency (matched load)	: 2465 MHz



2M303 Series

ABSOLUTE MAXIMUM RATING

	Minimum	Maximum	
Filament voltage (Note 1)	2.7	3.6	V
Cathode preheating time	0	-	s
Peak anode voltage	-	4.85	kV
Average anode current	-	380	mAdc
Peak anode current	-	1.3	A
Anode input power	-	1.7	kW
Load VSWR (Note 2)	-	4	
Anode temperature (Note 3)	-	300	℃
Antenna seal temperature (Note 4)	-	320	℃
Capacitor temperature (Note 5)	-	120	℃
Storage temperature	-30	60	℃

The maximum ratings in this table which are interrelated should not be exceeded either individually or in combination under any worst case.

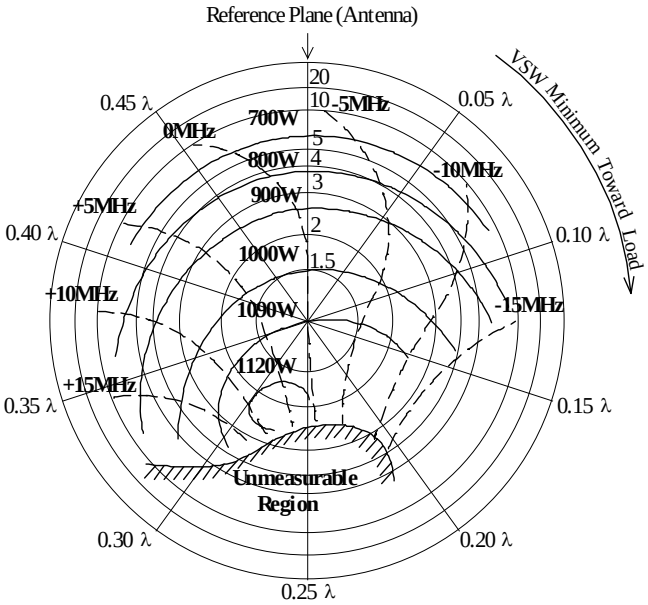
Even if the maximum ratings are not exceeded, reduced life can occur as the operating conditions approach to the maximum ratings.

TYPICAL OPERATION

Power supply : Single phase full wave rectified without filter		
Frequency	2465	MHz
Filament voltage	3.15	V
Peak anode voltage (Note 6)	4.4	kV
Average anode current	330	mAdc
Output power (matched load, Note 6)	1080	W
Cooling air flow	800	ℓ/min
Pressure drop (Approx.)	70	Pa

RIEKE DIAGRAM

Power supply : Single phase full wave rectified without filter	
Filament voltage	: 3.15 V
Average anode current	: 330 mA (constant)
Peak anode voltage (Matched load)	: 4.4 kV
Oscillating frequency (matched load)	: 2465 MHz



Note

Note1 : The filament transformer design center must be the following voltage for normal line voltage.

2M231, 2M300	: 3.5 ± 0.1 V
2M229, 2M240, 2M253, 2M301, 2M302	: 3.3 ± 0.1 V
2M248, 2M303	: 3.15 ± 0.1 V

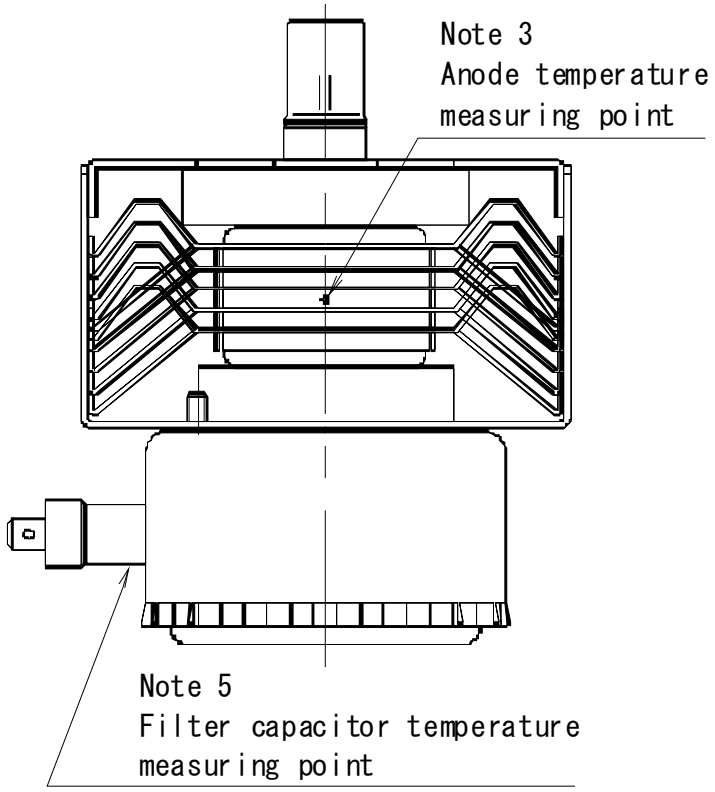
Note2 : The load VSWR larger than 4 may be allowable unless it is locked in such a condition.
It is required to consult with Toshiba Hokuto for the best design of peak anode current and impedance even if the VSWR is either less or larger than 4.

Note3 : See outline drawing for measuring point.
Maximum anode temperature for normal condition (with load in the cavity) should be 250oC.

Note4 : Temperature of metal to ceramic seal.
Maximum allowable built-up curves of seal temperature is shown in the application note 3-3-1.

Note5 : See outline drawing for measuring point.

Note6 : This is measured within 15 seconds after applying anode voltage.
The standard ambient temperature of the magnetron during this measurement is 25oC.
Peak anode voltage goes down with operating time from this value to a lower value due to the rather large temperature coefficient of ferrite magnet.

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