

# MECHANICALLY-TUNED DIELECTRIC RESONATOR OSCILLATOR

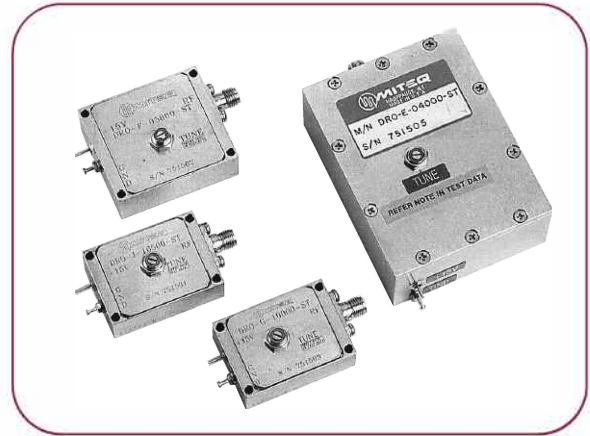
## DRO SERIES

### FEATURES

- Ultra-clean source ideal for low spur application
- Miniaturized designs
- High-reliability construction
- Low phase noise

### OPTIONS

- Standard (-ST)
- High power (-HP-ST)
- Voltage tuning (-VT-ST)



## ELECTRICAL SPECIFICATIONS

PARAMETERS	UNITS	SERIES												
		D	E	EF	F	G	H	J	K	L	M	N	P	R
		<b>ST (STANDARD)</b>												
Operating frequency range (Note 1)	GHz	2.4-3.7	3.7-4.8	4.8-6.5	6.5-8.8	8.8-12	12-16	16-18	18-20	20-22	22-24	24-26	26-33	33-40
Output power (Note 2)	dBm, min.	+13	+13	+13	+13	+13	+13	+11	+11	+11	+11	+11	+11	+11
Output power variation over temperature range	dB, max.	±2	±2	±2	±2	±2	±2	±2	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5
Fundamental	dBc, max.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-20	-20	-20	-20	-20	-20
Harmonics	dBc, max.	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
Spurious	dBc, max.	-80	-80	-80	-80	-80	-80	-80	-80	-80	-80	-80	-80	-80
Mechanical tuning	MHz, min.	±3	±5	±10	±10	±10	±10	±10	±10	±10	±10	±10	±10	±10
Frequency pushing	kHz/V, max.	10	10	15	15	15	20	25	30	30	30	30	40	50
Frequency pulling (1.5:1 VSWR)	MHz, P-P max.	2	2	3	5	5	5	5	1	1	1	1	1	1
Frequency drift temp. coefficient (Note 3)	ppm/°C, max.	5	5	5	5	5	5	5	5	5	5	5	5	5
Phase noise @ 10 kHz offset	dBc/Hz, typ.	105	105	95	90	85	80	80	80	80	80	75	75	70
DC power (Note 4)	Volts	15	15	15	15	15	15	15	15	15	15	15	15	15
Current	mA, max.	150	150	120	120	120	120	120	120	120	120	120	200	200
Outline drawing		184074		184075	184076	184077						184090		
Temperature range	°C	-20 to +70												

# MECHANICALLY-TUNED DIELECTRIC RESONATOR OSCILLATOR

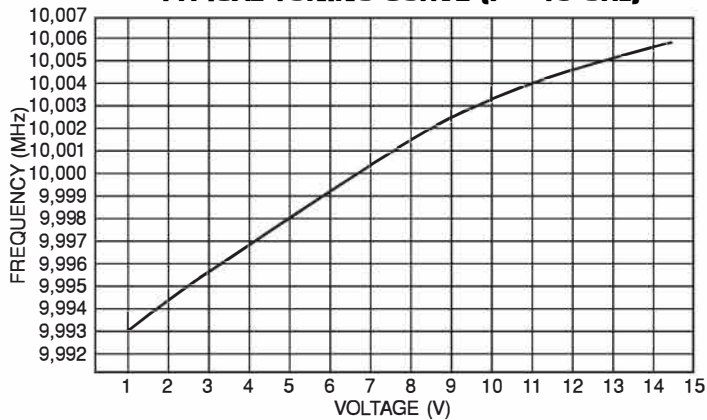
## ELECTRICAL SPECIFICATIONS (CONT.)

PARAMETERS	UNITS	SERIES												
		D	E	EF	F	G	H	J	K	L	M	N	P	R
<b>VOLTAGE TUNABLE OPTION (VT-ST)</b>														
Electrical tuning @ Vvar = 1–15 V	MHz, min.	N/A	N/A	N/A	8	12	16	20	25	25	25	25	32	40
Phase noise @ 10 kHz offset	dBc/Hz, typ.	N/A	N/A	N/A	85	80	75	75	75	75	75	70	70	65
<b>HIGH POWER OPTION (HP-ST)</b>														
Output power (Note 5)	dBm, min.	+17	+17	+17	+17	+17	+17	+17	+17	+17	+14	+14	+14	+14
Current	mA, max.	220	220	220	220	220	230	230	230	230	220	220	220	300
Frequency pulling (1.5:1 VSWR)	MHz, P-P max.	2	2	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	2
Outline drawing		184074			184075	184076	184077					184090		

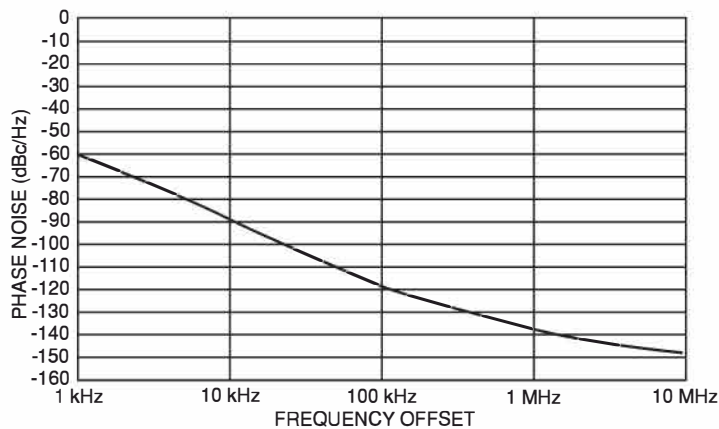
**Notes:**

1. Operating frequency must be specified.
2. Output power is guaranteed into 50 ohm load.
3. Averaged over the full temperature range.
4. Alternate DC voltage available.
5. For high power series R model, negative bias is required with 20 mA available current.
6. For all units that do not fall directly under one of the standard categories specified, please contact MITEQ.

**TYPICAL TUNING CURVE (F = 10 GHz)**

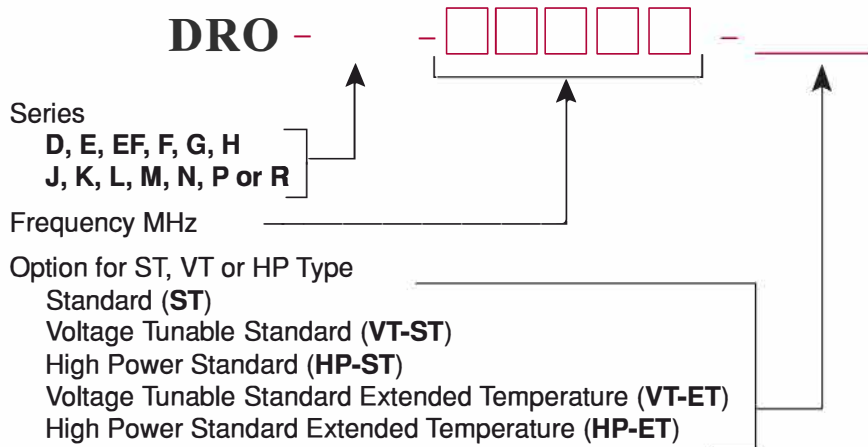


**TYPICAL PHASE NOISE CURVE (F = 10 GHz)**



# MECHANICALLY-TUNED DIELECTRIC RESONATOR OSCILLATOR

## ORDERING INFORMATION



Note: If unit is outside these standard options, please contact MITEQ.

Example 1: 12 GHz DRO standard: Part Number DRO-G-12000-ST.

Example 2: 4.5 GHz DRO with +17 dBm power: Part Number DRO-E-04500-HP-ST.

Example 3: 15 GHz DRO with voltage tuning: Part Number DRO-H-15000-VT-ST.

## MECHANICAL SPECIFICATIONS

Size per outline number

184074 .....	2.1" x 2.75" x 1.08"
184075 .....	1.75" x 2" x 0.85"
184076 .....	1.39" x 1.6" x 0.7"
184077 .....	1.05" x 1.45" x 0.63"
184090 .....	1.05" x 1.87" x 0.63"

Weight ..... Frequency dependent,  
please contact MITEQ.

RF connectors..... SMA female

DC connectors..... Feedthru filter

## ENVIRONMENTAL SPECIFICATIONS

Temperature

Operating ..... -20 to +70°C

-ET ..... -54 to +95°C

Storage..... -65 to +115°C

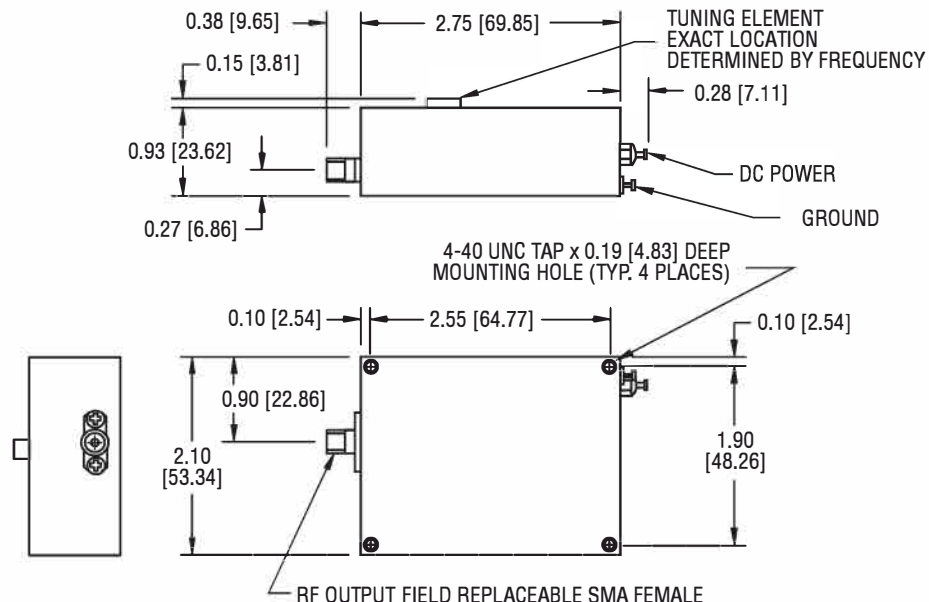
Humidity..... 95% at 40°C noncondensing

Shock (survival)..... 30 g's, 10 ms pulse

Vibration (survival)..... 20 to 2000 Hz random to 4 g's rms

## OUTLINE DRAWINGS

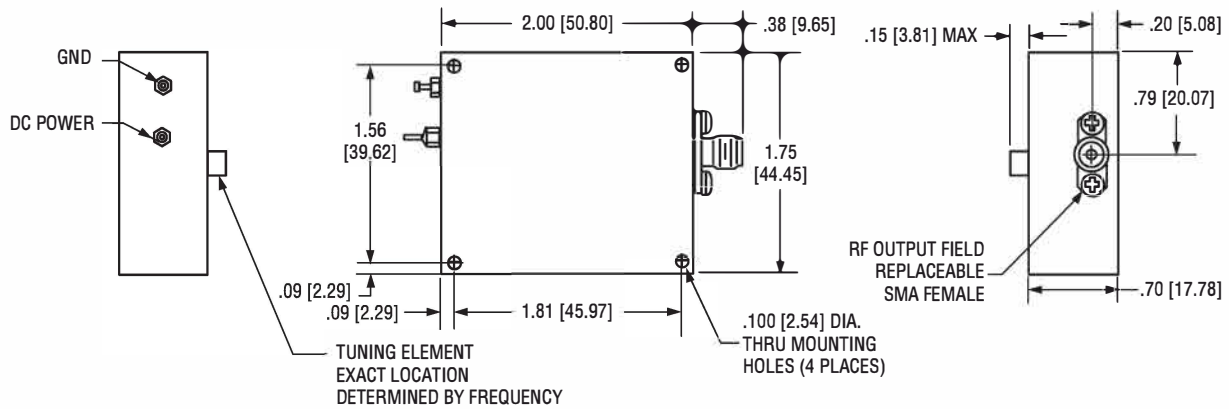
### 184074 D, E SERIES



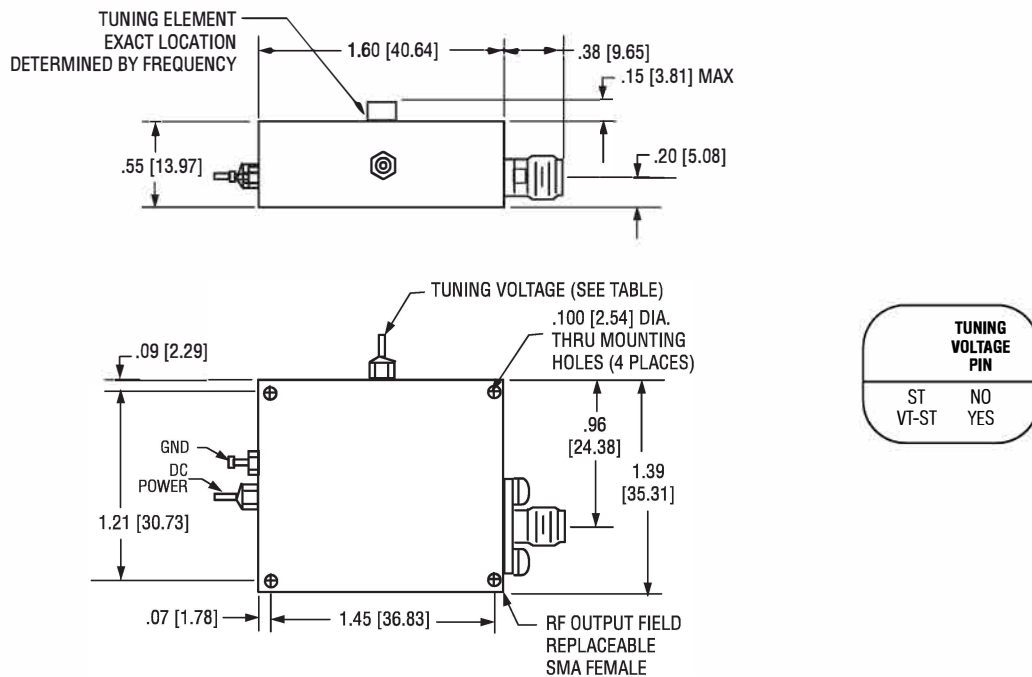
NOTE: DIMENSIONS SHOWN IN BRACKETS [ ] ARE IN MILLIMETERS.

# OUTLINE DRAWINGS (CONT.)

## 184075 EF SERIES



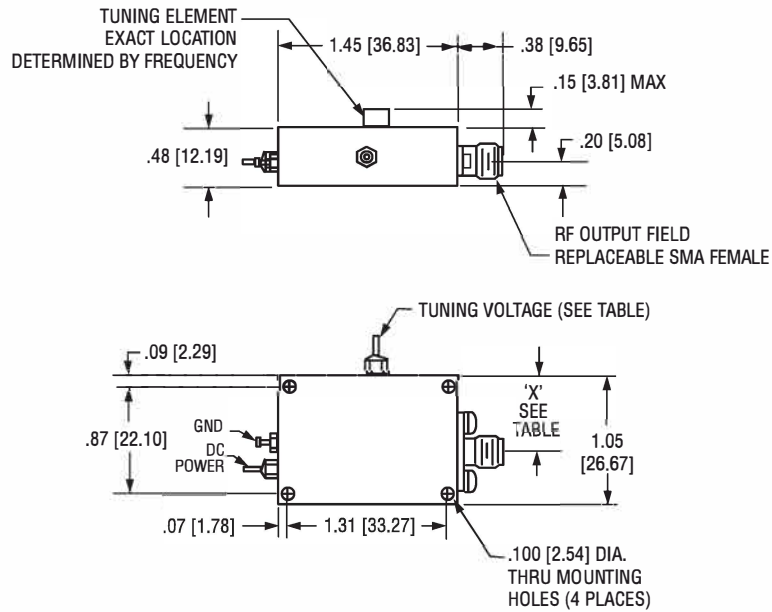
## 184076 F SERIES



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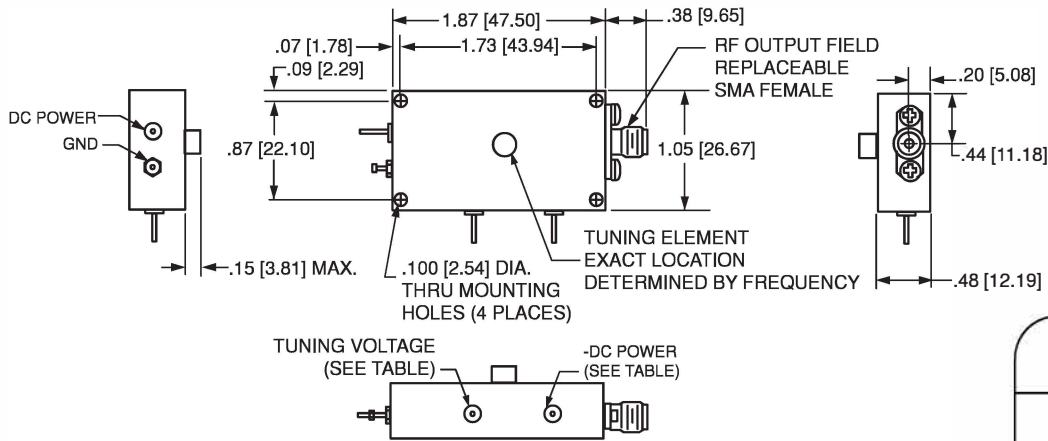
# OUTLINE DRAWINGS (CONT.)

## 184077 G, H, J, K, L M, N SERIES



TUNING VOLTAGE PIN		DIM. "X"
HP	NO	.50 (12.70)
ST	NO	.62 (15.74)
HP-VT	YES	.50 (12.70)
VT	YES	.62 (15.74)

## 184090 P, R SERIES



TUNING VOLTAGE PIN	DC POWER PIN
ST	NO
VT	YES
HP	NO
HP-VT	YES

NOTE: DIMENSIONS SHOWN IN BRACKETS [ ] ARE IN MILLIMETERS.

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# TEMPERATURE COMPENSATED DIELECTRIC RESONATOR OSCILLATORS

## TCDRO SERIES

### FEATURES

- Ultra-clean source ideal for low spur application
- High-reliability design
- Very low frequency drift over temperature
- Buffered output
- 100% burn-in



### ELECTRICAL SPECIFICATIONS

PARAMETERS	UNITS	SERIES									
		F	G	H	J	K	L	M	N	P	R
		<b>ST (STANDARD)</b>									
Operating frequency range (Note 1)	GHz	6.5–8.8	8.8–12	12–16	16–18	18–20	20–22	22–24	24–26	26–33	33–40
Output power (Note 2)	dBm, min.	+17	+17	+17	+17	+11	+11	+11	+11	+11	+11
Output power variation over temperature range	dB, max.	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5
Harmonics and fundamental	dBc, min.	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
Spurious	dBc, min.	-80	-80	-80	-80	-80	-80	-80	-80	-80	-80
Mechanical tuning	MHz, min.	±10	±10	±10	±10	±10	±10	±10	±10	±10	±10
Frequency pushing	kHz/V, max.	15	15	20	25	30	30	30	30	40	50
Frequency pulling (1.5:1 VSWR)	MHz, P-P max.	0.5	0.5	0.5	0.5	1	1	1	1	1	2
Frequency drift temp. coefficient (Note 3)	ppm/°C, max.	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Phase noise @ 10 kHz offset	dBc/Hz, typ.	85	80	75	75	75	75	75	70	70	65
DC power	Volts	15	15	15	15	15	15	15	15	15	15
Current	mA, max.	220	220	220	230	120	120	120	120	200	200
Outline drawing		184091	184092								
Temperature range	°C	-20 to +70									

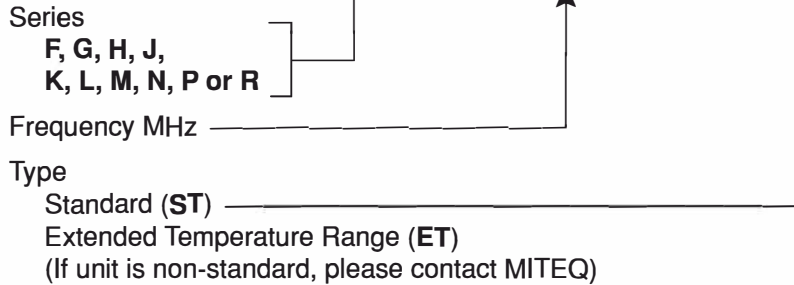
**Notes:**

1. Operating frequency must be specified.
2. Output power is guaranteed into 50 ohm load.
3. Averaged over the full temperature range.

# TEMPERATURE COMPENSATED DIELECTRIC RESONATOR OSCILLATOR

## ORDERING INFORMATION

**TCDRO** - [ ] [ ] [ ] [ ] -



Note: When specifying options, include applicable detailed information.  
 Example: 6.5 GHz TCDRO standard: Part Number TCDRO-F-06500-ST.

## MECHANICAL SPECIFICATIONS

Size per outline number

184091	2.5" x 2.34" x 0.8"
184092	1.8" x 2" x 0.65"

Weight..... Frequency dependent, please contact MITEQ where critical.

RF connectors ..... SMA female

DC connectors ..... Feedthru filter

## ENVIRONMENTAL SPECIFICATIONS

Temperature

Operating	-20 to +70°C
-ET	-54 to +85°C
Storage	-65 to +115°C

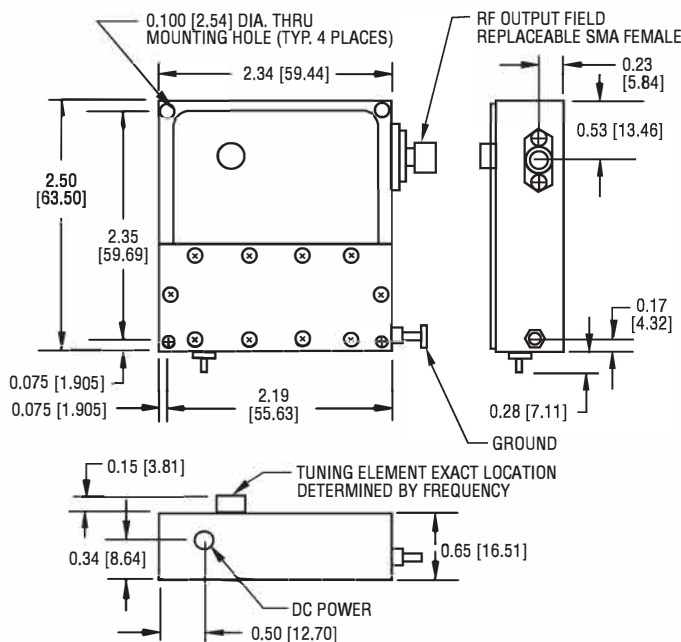
Humidity..... 95% at 40°C noncondensing

Shock (survival)..... 30 g's, 10 ms pulse

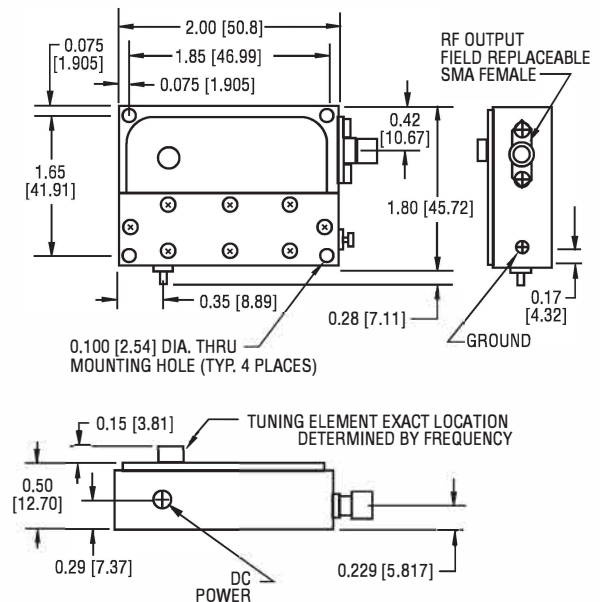
Vibration (survival)..... 20 to 2000 Hz random to 4 g's rms

## OUTLINE DRAWINGS

### 184091 F SERIES



### 184092 G, H, J, K, L, M, N, P, R SERIES



NOTE: DIMENSIONS SHOWN IN BRACKETS [ ] ARE IN MILLIMETERS.