

VOLTAGE CONTROLLED PIN-DIODE FREQUENCY TRANSLATORS

SERIES TA

GENERAL INFORMATION: KDI/Triangle's Series TA voltage-controlled frequency translators are designed for serrodyne applications. The devices have low amplitude modulation, high linearity, and fast fly-back time, which produces superior carrier and sideband suppression. Translation rates to 500 kHz can be accommodated in standard units.

Standard units are supplied with full-band coverage and one optimized (narrowband) frequency band. The optimized frequency is selected by applying TTL signals to the "band-select" pins on the unit's DB-25P connector. Up to eight optimized narrowband segments, single frequencies, wideband segments, or combinations of the three can be specified. All must fall within overall bandwidth of the unit.

FREQUENCY COVERAGE: 0.5 to 12.4 GHz, and 10-percent bandwidths from 12 to 18 GHz.

RF IMPEDANCE: 50 Ohms

DC REQUIREMENTS: +5 V at 175 mA, +15 V at 230 mA, and -15 V at 120 mA.

CONTROL: 0 to +5 V produces 0 to 360 deg. phase shift (specified frequency translation). Control input impedance is at least 1,000 ohms.

RF POWER: +20 dBm operating (+13 dBm for TA-52) and +30 dBm survival (+23 dBm for TA-52).

TEMPERATURE INFORMATION: -20°C to +70°C operating and -65 to +125°C non-operating. Carrier suppression, sideband suppression, and conversion loss are maintained over the full range of operating temperatures. At 70°C add 1 dB to the insertion loss specification. Units with an operating temperature range of -55 to +95°C are available for approximately 10 percent additional cost. The specifications are the same.

REPEATABILITY: ±0.5 dB suppression.

TRANSLATION RATE: 500 kHz standard. Units with higher translation rates but with a lower input power rating are available.

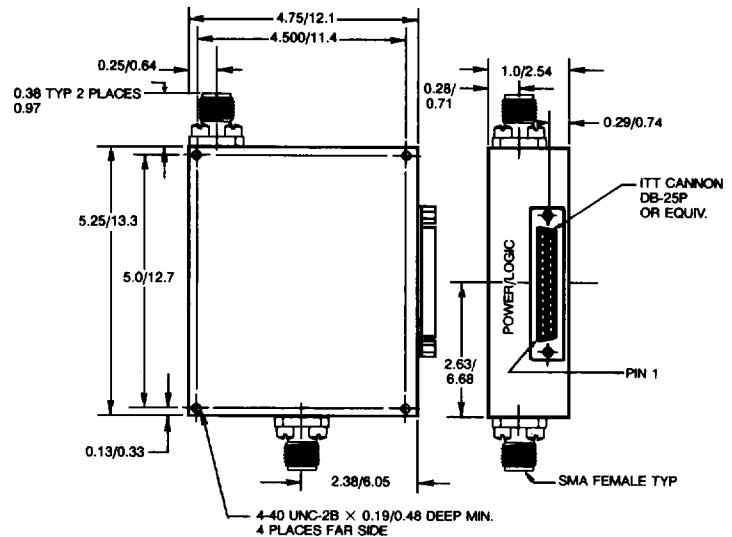
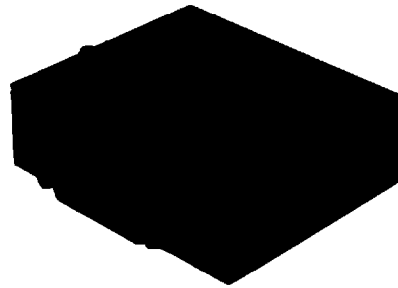
CONNECTORS: SMA female standard, others on request. Mating multipin connector is supplied with each unit (ITT Cannon DB-25S or equivalent).

ENVIRONMENT: MIL-E-5400.

NOTES:

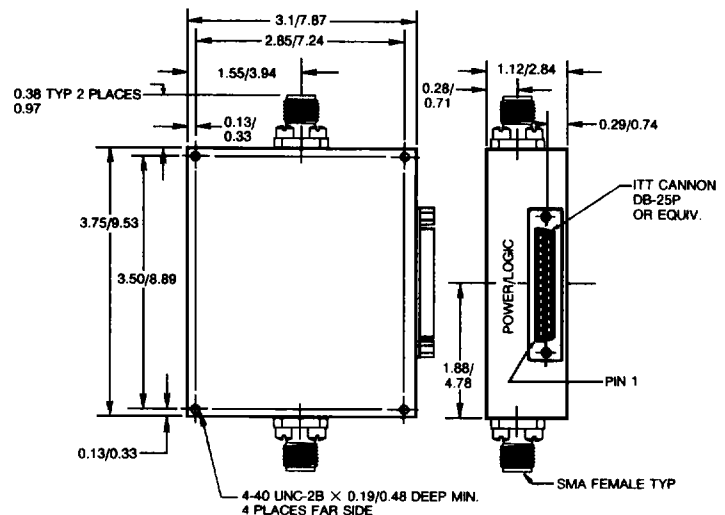
1. Standard units are supplied with full-band coverage and one optimized (narrowband) frequency band. Full-band coverage is obtained by applying a logic 0 to pins 11, 12, and 13 (See Table 3). Optimized-band coverage is obtained by applying a logic 1 to pin 11 and logic 0 to pins 12 and 13.

2. Special frequency band selection is optional. Selection is made via a 3-bit band-selection input using TTL binary logic, allowing up to eight possible bands or single frequencies or combinations to be accessed. These optimized frequencies must fall within the full bands of standard models. (See "Frequency Band Optimization", p. 1). There is an extra charge for this option. This charge depends on the number of bands selected.



OUTLINE 1

DIMENSIONS IN INCHES/CENTIMETERS



OUTLINE 2

DIMENSIONS IN INCHES/CENTIMETERS

**KDI/triangle
ELECTRONICS**

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TABLE 1

Model No.	Frequency Range GHz	Insertion Loss Max. (dB)		Carrier Suppression Min. (dB)		Sideband Suppression Min. (dB)		Translation Loss Max. (dB)		VSWR Max.	Optimized Bands Frequency Range GHz	Outline
		Band (Note A, C)		Band (Note D)		Band (Note D)		Translation Rate To 200 kHz	To 500 kHz			
TA-52	0.5-2.0	12.5	11.5	18	25	18	23	1	3	2.0:1 (Note B)	0.7- 1.6	1
TA-24	2.0-4.0	11.0	10.0	19	26	19	24	1	3	1.6:1	2.7- 3.7	2
TA-26	2.0-6.0	11.5	10.5	18	25	18	23	1	3	1.8:1	2.6- 5.2	2
TA-48	4.0-8.0	11.5	11.0	19	26	19	24	1	3	1.6:1	5.0- 7.2	2
TA-42	4.0-12.0	12.0	11.0	18	25	18	23	1	3	1.8:1	5.0-10.6	2
TA-81	8.0-12.4	11.75	11.0	19	26	19	24	1	3	1.7:1	9.2-10.2	2

Note A: Insertion loss slope is approximately linear, with maximum insertion loss occurring at the high frequency end of the band (Table 2). For example, the maximum insertion loss for the TA-24 is 11.0 dB at 4.0 GHz and the approximate insertion loss at 2.0 GHz is 9.0 dB.

Note B: The maximum VSWR for the TA-52 over the optimized band is 1.7:1.

Note C: Total loss is insertion loss plus translation loss.

Note D: For very narrow bandwidths, sideband and carrier suppression of 40 dB can be supplied.

TABLE 2 INSERTION LOSS FOR ALL UNITS

TA-52	12.5 dB at 2.0 GHz	9.5 dB at 0.5 GHz
TA-24	11.0 dB at 4.0 GHz	9.0 dB at 2.0 GHz
TA-26	11.5 dB at 6.0 GHz	9.0 dB at 2.0 GHz
TA-48	11.5 dB at 8.0 GHz	9.5 dB at 4.0 GHz
TA-42	12.0 dB at 12.0 GHz	9.0 dB at 4.0 GHz
TA-81	11.75 dB at 12.4 GHz	10.0 dB at 8.0 GHz

TABLE 3

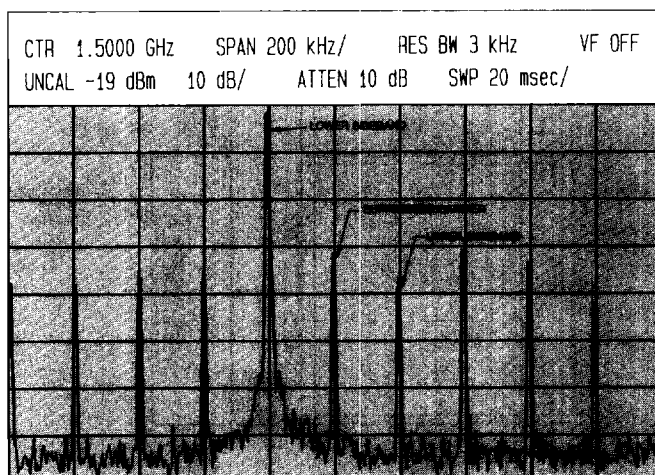
BAND SELECTION LOGIC			
	PIN 11	PIN 12	PIN 13
FULL	0	0	0
OPTIMIZED	1	0	0

POWER/CONTROL PIN CONNECTIONS

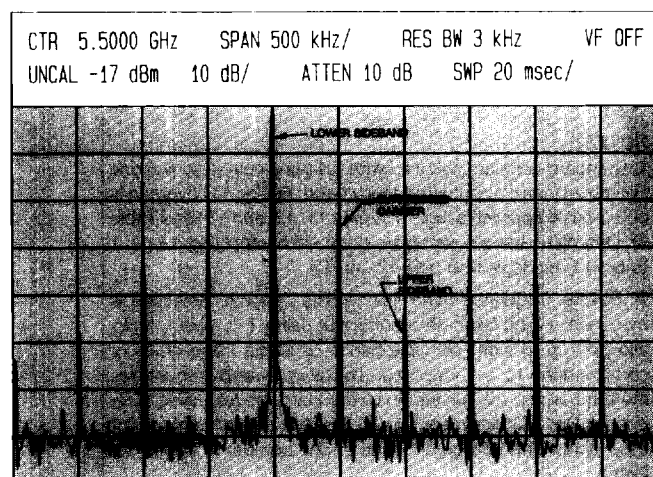
PIN	FUNCTION
1	Control voltage
2 to 10	No connection
11 to 13	Band select
14 to 19	No connection
20	Digital ground
21	Analog (chassis) ground
22	+5 VDC
23	-15 VDC
24	+15 VDC
25	No connection

The +15 VDC and -15 VDC supplies are returned directly to the chassis ground (pin 21). The +5 VDC supply has a separate ground return (digital ground, pin 20). Depending on the user's system performance requirements (switching speed, noise susceptibility, transients, etc.), all ground connections can be tied together to form a common ground.

TYPICAL CARRIER AND
SIDE BAND SUPPRESSION OF TA-52



TYPICAL CARRIER AND
SIDE BAND SUPPRESSION OF TA-48



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