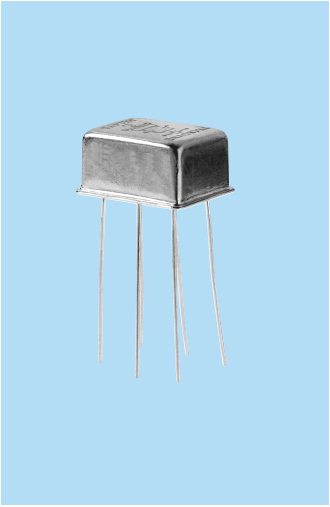


TELEDYNE RELAYS

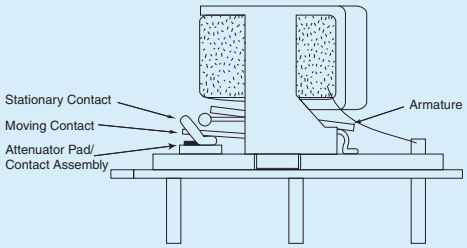
A Unit of Teledyne Electronics and Communications

ULTRAMINIATURE BROADBAND ATTENUATOR RELAYS

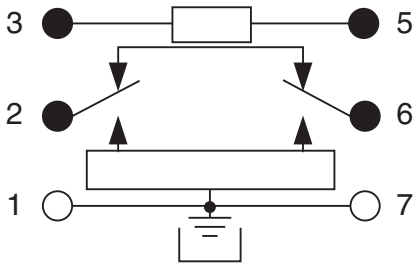
SERIES A150

SERIES DESIGNATION	RELAY TYPE
A150	Attenuator Relay series

INTERNAL CONSTRUCTION



SCHEMATIC DIAGRAM



Terminal view. Case ground.

DESCRIPTION

The Series A150 ultraminiature Attenuator Relays are designed for attenuating RF signals in 50-ohm systems over a frequency range from DC to 3 GHz. Their low profile and small grid spacing makes them ideal for use when packaging density is a prime consideration. The A150 relays eliminate the need for additional external resistors.

These single section, switchable attenuator relays have internal matched thin film attenuator pads in “L,” “T” or “Pi” configurations, as applicable. Relays are available in fixed increments of 1, 2, 3, 4, 5, 6, 8, 10, 16 and 20 dB, which can used singly or in combination to achieve the attenuation levels desired.

The A150 attenuator relay features:

- Unique uni-frame motor design which provides high magnetic efficiency and mechanical rigidity.
- Minimum mass components and welded construction for maximum resistance to shock and vibration.
- Advanced cleaning techniques which assures internal cleanliness.
- Gold plated, precious metal contacts, which provide excellent intermodulation performance.
- Flat amplitude vs. frequency response.
- High isolation between control and signal path.
- Stable attenuation vs. temperature.
- Excellent phase linearity.
- Highly resistant to ESD.

Patent No. 5,315,273

ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS		
Temperature (Ambient)	**Storage**	–65°C to +125°C
	Operating	–55°C to +85°C
Vibration (General Note 1)		10 g’s to 500 Hz
Shock (General Note 1)		30 g’s, 6 msec, half-sine
Enclosure		Hermetically sealed
Weight		0.11 oz. (3.12g) max.

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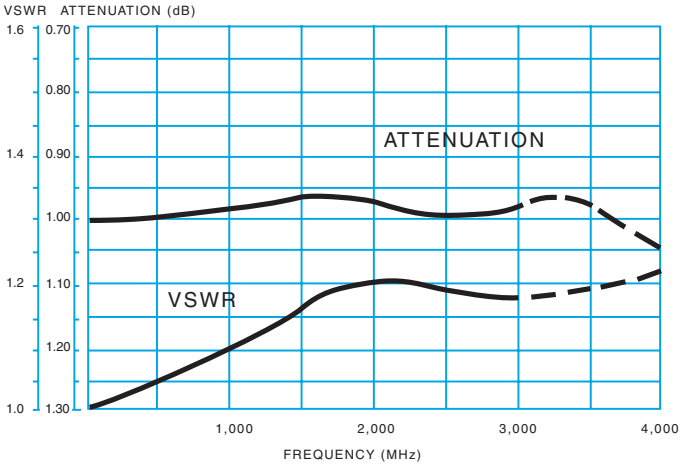
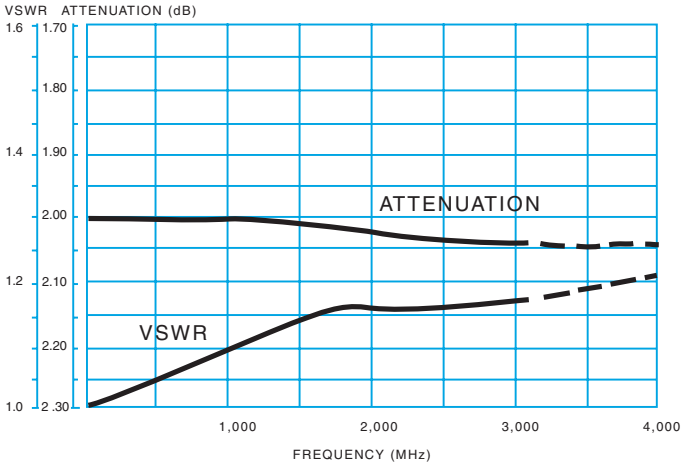
SERIES A150
TYPICAL RF PERFORMANCE (Notes 2, 3 and 4)

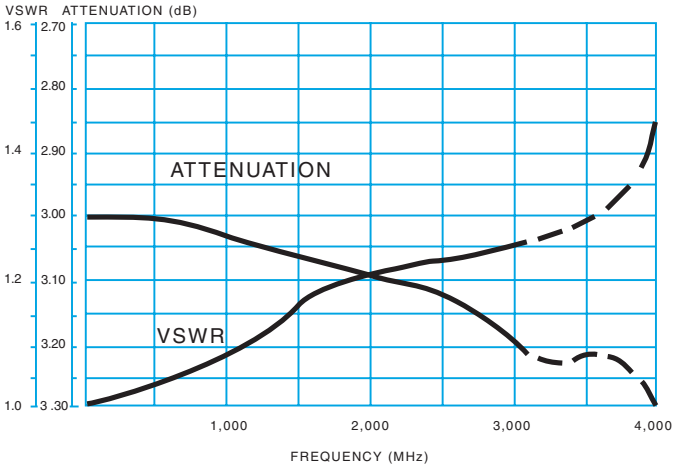
1 dB ATTENUATOR



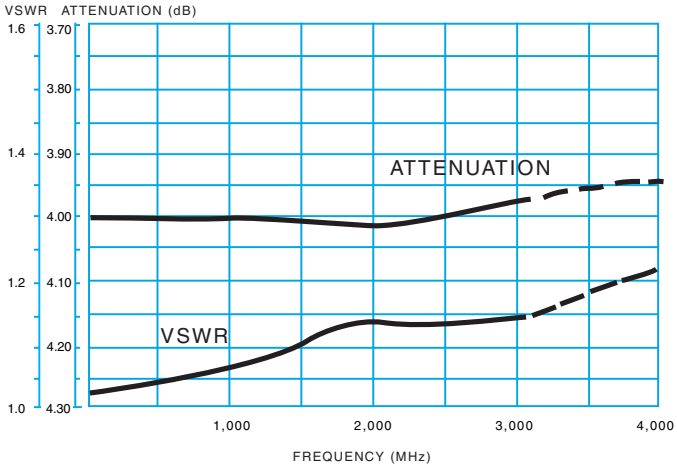
2 dB ATTENUATOR



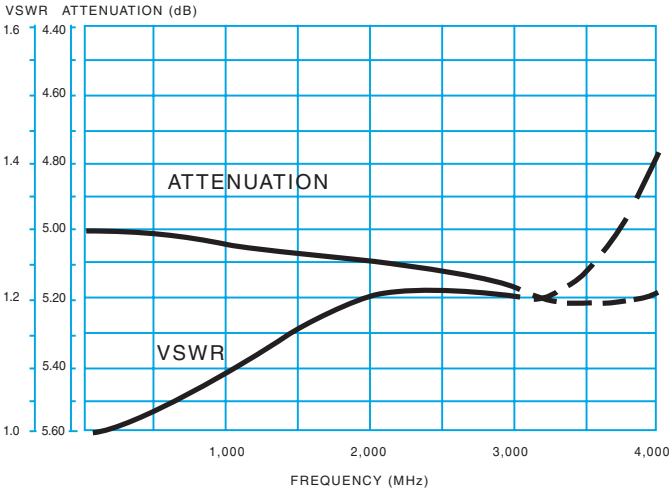
3 dB ATTENUATOR



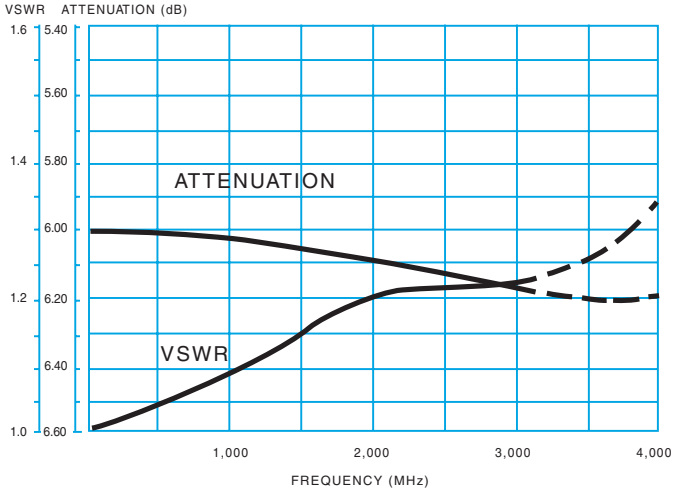
4 dB ATTENUATOR



5 dB ATTENUATOR

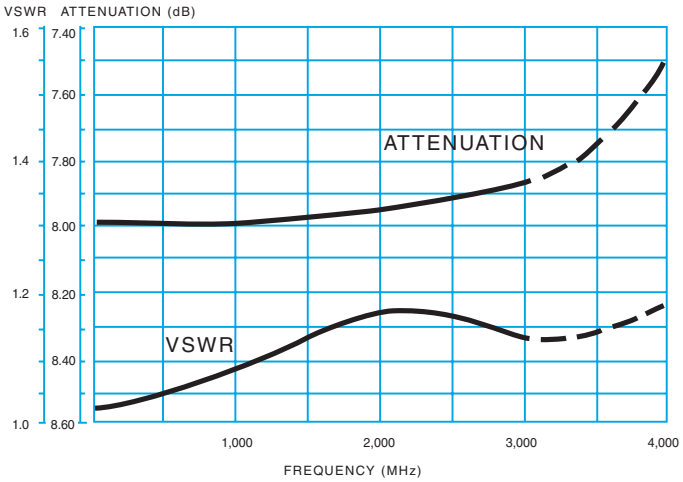


6 dB ATTENUATOR

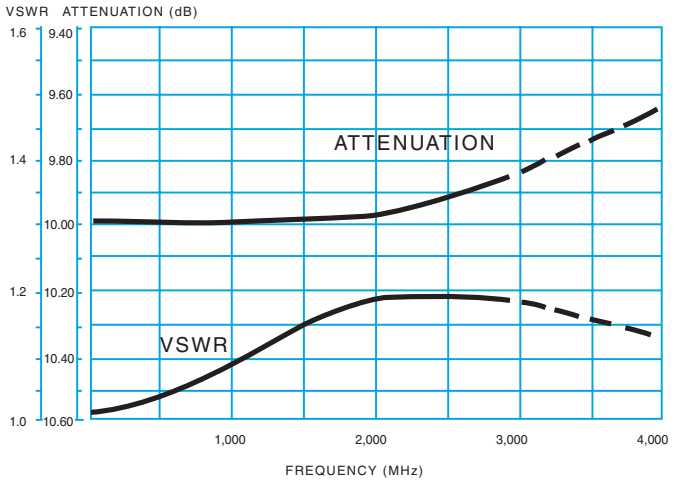


SERIES A150
TYPICAL RF PERFORMANCE (Notes 2, 3 and 4)

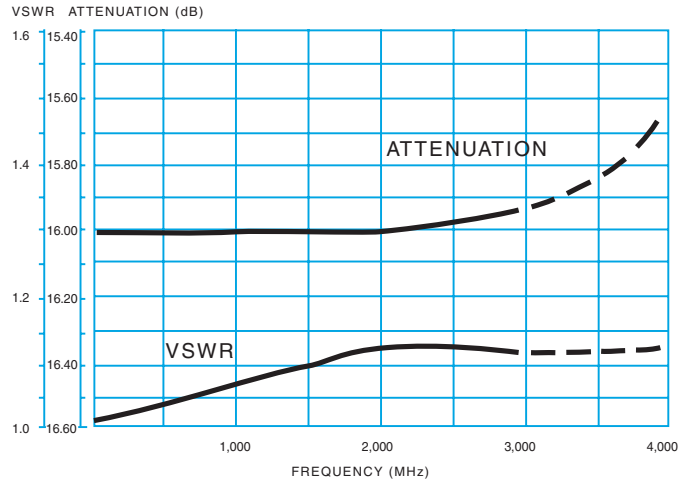
8 dB ATTENUATOR



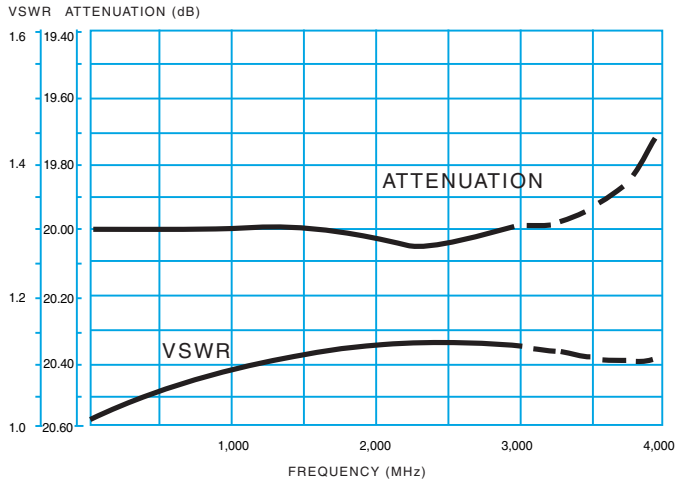
10 dB ATTENUATOR



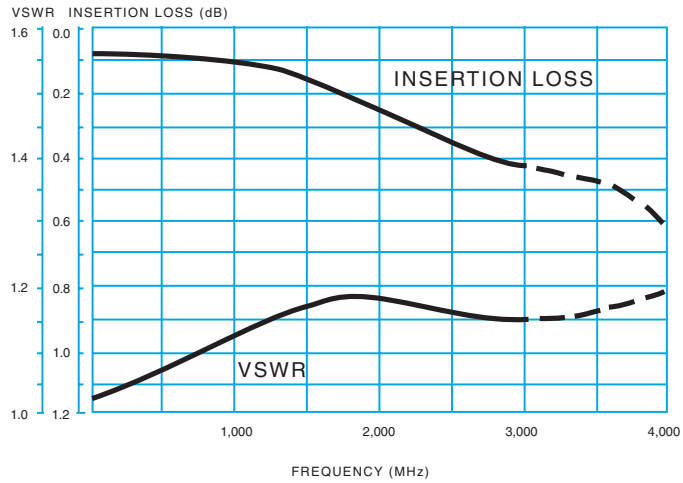
16 dB ATTENUATOR



20 dB ATTENUATOR



THROUGH PATH



SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE
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SERIES A150

RF PERFORMANCE (–55°C to +85°C) (Notes 2, 3 and 4)

PARAMETER	MINIMUM	TYPICAL	MAXIMUM	UNITS	CONDITION
Insertion Loss		0.1	0.25	dB	DC–1 GHz
		0.2	0.35	dB	1–2 GHz
		0.3	.055	dB	2–3 GHz
VSWR (Through path)		1.10	1.20		DC–1 GHz
		1.20	1.25		1–2 GHz
		1.25	1.30		2–3 GHz
VSWR (Attenuated path)		1.20	1.25		DC–1 GHz
		1.30	1.35		1–2 GHz
		1.40	1.45		2–3 GHz

ATTENUATION	MINIMUM	TYPICAL	MAXIMUM	UNITS	CONDITION
1	0.95	1.0	1.05	dB	DC–1 GHz
	0.925	1.0	1.075	dB	1–2 GHz
	0.875	1.0	1.125	dB	2–3 GHz
2	1.9	2.0	2.1	dB	DC–1 GHz
	1.85	2.0	2.15	dB	1–2 GHz
	1.75	2.0	2.25	dB	2–3 GHz
3	2.85	3.0	3.15	dB	DC–1 GHz
	2.77	3.0	3.23	dB	1–2 GHz
	2.62	3.0	3.38	dB	2–3 GHz
4	3.8	4.0	4.2	dB	DC–1 GHz
	3.7	4.0	4.3	dB	1–2 GHz
	3.5	4.0	4.5	dB	2–3 GHz
5	4.75	5.0	5.25	dB	DC–1 GHz
	4.62	5.0	5.38	dB	1–2 GHz
	4.37	5.0	5.63	dB	2–3 GHz
6	5.7	6.0	6.3	dB	DC–1 GHz
	5.55	6.0	6.45	dB	1–2 GHz
	5.25	6.0	6.75	dB	2–3 GHz
8	7.88	8.0	8.12	dB	DC–1 GHz
	7.76	8.0	8.24	dB	1–2 GHz
	7.52	8.0	8.48	dB	2–3 GHz
10	9.85	10.0	10.15	dB	DC–1 GHz
	9.7	10.0	10.3	dB	1–2 GHz
	9.4	10.0	10.6	dB	2–3 GHz
16	15.76	16.0	16.24	dB	DC–1 GHz
	15.52	16.0	16.48	dB	1–2 GHz
	15.04	16.0	16.96	dB	2–3 GHz
20	19.8	20.0	20.2	dB	DC–1 GHz
	19.6	20.0	20.4	dB	1–2 GHz
	19.0	20.0	21.0	dB	2–3 GHz

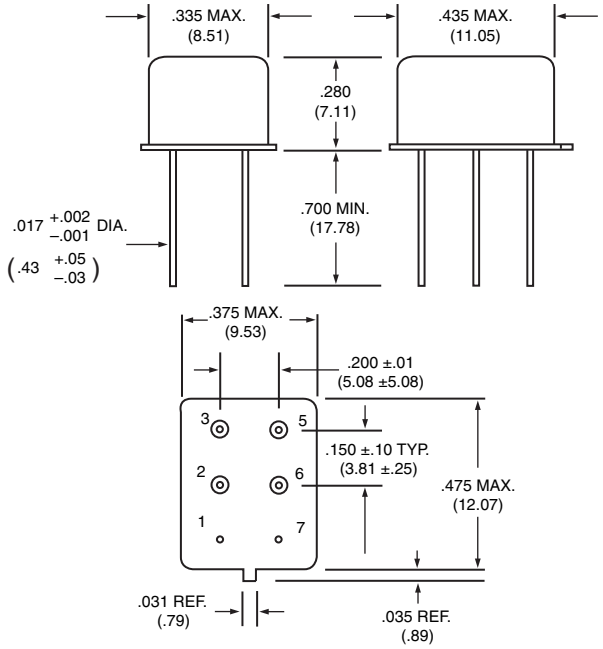
SERIES A150
GENERAL PERFORMANCE (–55°C TO +85°C)

PARAMETER	MINIMUM	TYPICAL	MAXIMUM	UNITS
Operating Frequency (Note 2)	0.0		3.0	GHz
Power (Notes 5 and 6)			1.0	Watt
Impedance		50		Ohms

ELECTRICAL SPECIFICATION (–55°C TO +85°C, unless otherwise specified)

PART NUMBER (Note 7)		A150-dB-5	A150-dB-12	A150-dB-15	A150-dB-26
Coil Voltage Vdc (Note 6)	Nom.	5	12	15	26.5
	Max.	5.8	16.0	20.0	32.0
Coil Resistance Ohms ±20%	@25°C	50	390	610	1,560
Pick-up Voltage Vdc Max.	@25°C	3.8	9.0	11.3	18.0
Switching Time ms (Note 8)	Max.	4.0			
	Typ.	2.0			
Insulation Resistance		1,000 MΩ typical (all mutually isolated points)			
Dielectric strength		300 VRMS / 60 Hz typical (at sea level)			

OUTLINE DIMENSIONS
CASE DETAIL



Dimensions are show in inches (millimeters).
Terminal numbers shown are for reference only.
Leads 1 and 7 are grounded to the case.

TELEDYNE RELAYS PART NUMBERING SYSTEM FOR A150 ATTENUATOR RELAYS

A150 – XX – XX / S Q

- A150 — Series designator
- XX — Attenuation value (dB)
- XX — Nominal coil voltage
- S — S=.187" leads See Note 9
- Q — Q=Solder-Coated Leads G=Gold-Plated Leads (Notes 9 & 10)

GENERAL NOTES:

1. Contacts will exhibit no contact chatter in excess of 10 µs or transfer in excess of 1 µs.
2. Relays may be operated at higher frequencies with reduced RF performance.
3. For optimal RF performance, solder case to RF ground plane.
4. Attenuation values shown are with reference to the through path (low loss state).
5. Power handling for case temperatures of –55°C to +55°C is 1 Watt. Derate power handling 25 mW/°C above +55°C. Case measurement point is adjacent to the relay tab.
6. Do not operate coil at maximum coil voltage continuously.
7. Insert attenuation value, see part numbering system.
8. Switching time includes bounce.
9. The slash and characters appearing after the slash are not marked on the relay.
10. Unless otherwise specified, relays will be supplied with either gold-plated or solder-coated leads.