Coaxial

Voltage Variable Attenuator

ZX73-123+

50Ω 0 to 20 dB 6 to 12 GHz Single Control Voltage

The Big Deal

- Full octave bandwidth, 6 to 12 GHz
- Low insertion loss, 0.8 dB

(@ 0 dB attenuation setting)

- Single control voltage
- Low DC current Consumption, 40mA max.

CASE STYLE: BY2911

Product Overview

Mini-Circuits' ZX73-123+ is a 50Ω reflective voltage variable attenuator which provides adjustable attenuation from 0 to 20 dB with continuous change. This model covers a wide frequency range from 6 to 12 GHz and operates on a single positive voltage with no extra supply voltage needed.

Key Features

Feature	Advantages
Wideband operation, specified from 6 to 12 GHz	Can be used in multiple applications such as communications, satellite and defense, reducing part count
Variable attenuation from 0 to 20 dB with continuous change	Compared to digital step attenuators with minimum, discrete attenuation steps, this product can provide an arbitrarily small change in attenuation by changing the control voltage, without introducing any phase perturbations.
Single positive control voltage	Many similar devices require both supply voltage and control voltage. ZX73-123+ only needs a single positive control voltage for operation. No additional supply voltage needed, greatly simplifying system design.

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ZX73-123+

50Ω 0 to 20 dB 6 to 12 GHz Single Control Voltage

Generic photo used for illustration purposes only

CASE STYLE: BY2911

Connectors	Model
SMA	ZX73-123+

+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Maximum Ratings

Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 85°C
Absolute Max. Control Voltage(Vcrtl)	1 V
Absolute Max.RF Input Level	+20dBm

Permanent damage may occur if any of these limits are exceeded

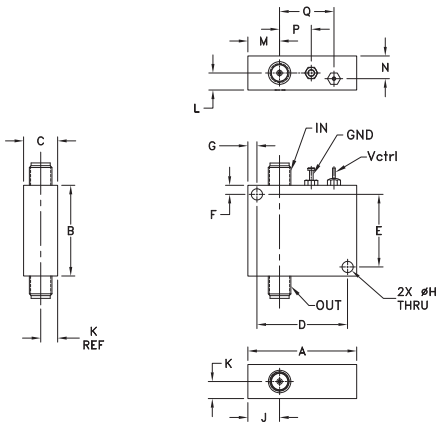
Features

- wideband, from 6 to 12 GHz
- adjustable attenuation from 0 to 20 dB
- low insertion loss, 0.8 dB typ.
- single control voltage
- low DC current consumption, 40mA max.

Applications

- variable gain amplifier
- power level control
- feed-forward amlifiers
- testing

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
1.20	1.00	.38	1.0	.800	.10	.10	.125
30.48	25.40	9.65	25.40	20.32	2.54	2.54	3.18

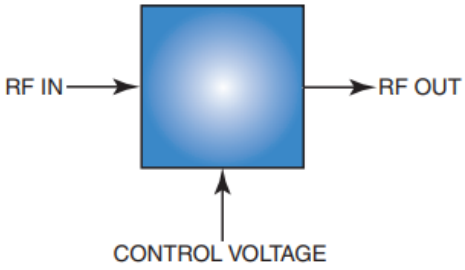
J	K	L	M	N	P	Q	wt
.35	.19	.19	.35	.25	.350	.600	grams
8.89	4.83	4.83	8.89	6.35	8.89	15.24	75

Electrical Specifications at 25°C

Parameter	Frequency (GHz)	Conditions	Min.	Typ.	Max.	Units
Frequency range			6	—	12	GHz
Insertion Loss	6 - 12	Vctrl = 0V	—	0.8	1.6	dB
Return Loss	6 - 12	Vctrl = 0V	8.5	15	—	dB
Attenuation Range (1)	6 - 12	Vctrl = 0 - 0.85V	—	20	—	dB
Control Voltage	6 - 12	@20dB attenuation	—	—	0.85	V
Control Current	6 - 12	@20dB attenuation	—	—	40	mA

1. Attenuation is the relative insertion loss with reference to the insertion loss at Vctrl=0V.

Electrical Schematic



Notes
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B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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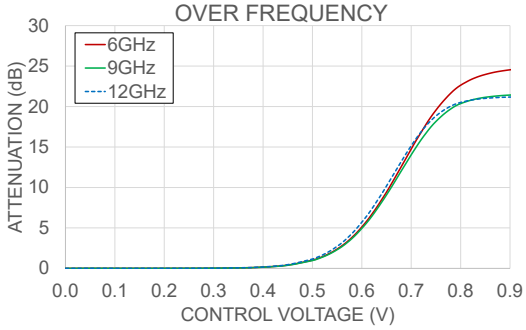
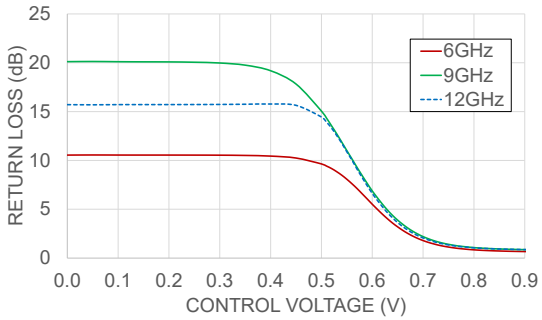
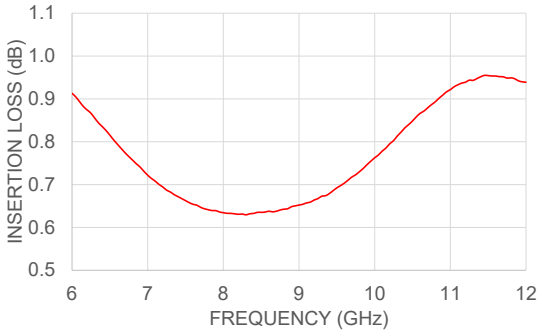
ZX73-123+
ATTENUATION vs. CONTROL VOLTAGE OVER FREQUENCY



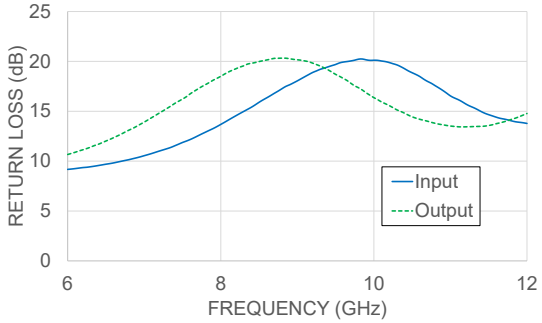
ZX73-123+
INPUT RETURN LOSS vs. CONTROL VOLTAGE OVER FREQUENCY



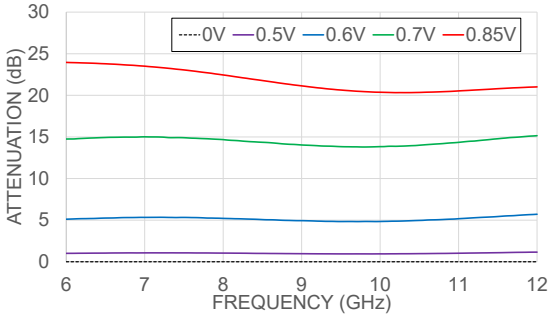
ZX73-123+
INSERTION LOSS @Vctrl = 0V



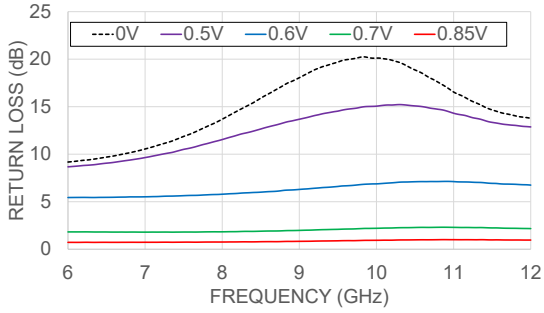
ZX73-123+
RETURN LOSS @Vctrl = 0V



ZX73-123+
ATTENUATION vs. FREQUENCY OVER CONTROL VOLTAGE



ZX73-123+
INPUT RETURN LOSS vs. FREQUENCY OVER CONTROL VOLTAGE



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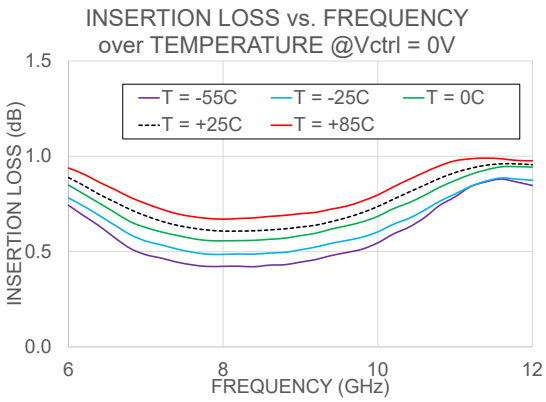

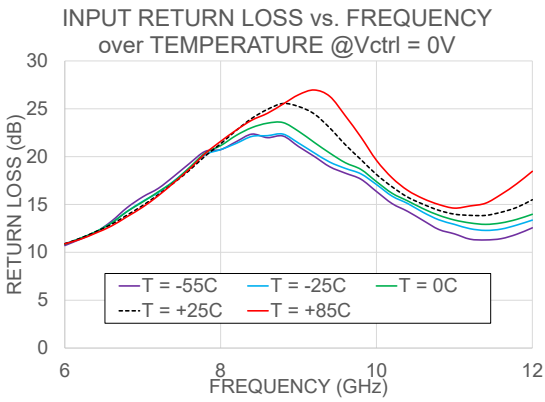

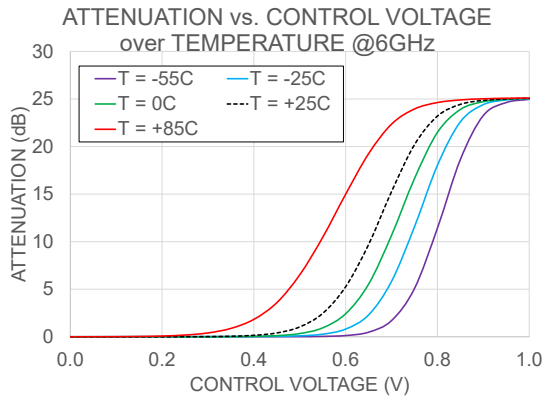

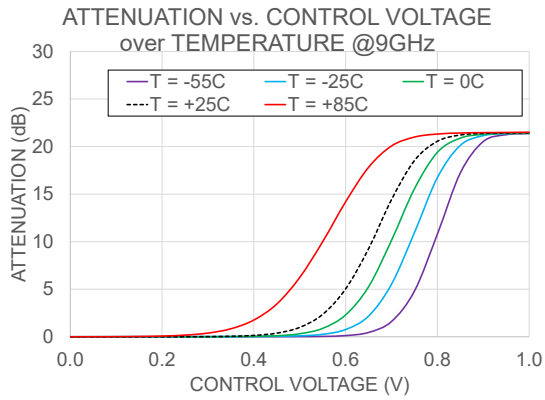

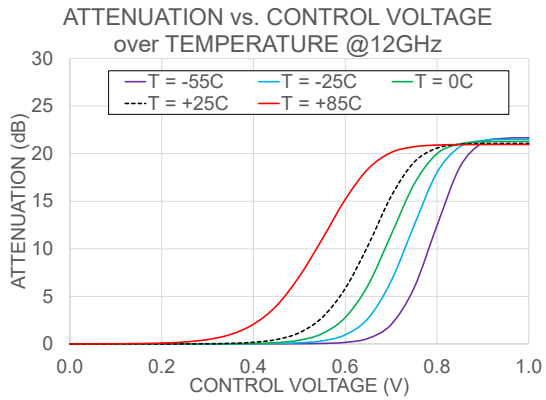

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Typical Performance Data

Frequency (MHz)	Attenuation (dB) vs Frequency over Vctrl				
	0V	0.5V	0.6V	0.7V	0.85V
6000	0.00	1.01	5.12	14.75	23.96
6100	0.00	1.01	5.15	14.76	23.93
6200	0.00	1.02	5.18	14.82	23.90
6300	0.00	1.03	5.20	14.87	23.87
6400	0.00	1.04	5.22	14.90	23.83
6500	0.00	1.04	5.25	14.93	23.79
6600	0.00	1.06	5.26	14.96	23.75
6700	0.00	1.06	5.30	14.97	23.69
6800	0.00	1.07	5.31	14.98	23.63
6900	0.00	1.06	5.32	14.98	23.57
7000	0.00	1.07	5.33	15.01	23.51
7100	0.00	1.07	5.34	15.00	23.42
7200	0.00	1.07	5.34	14.99	23.34
7300	0.00	1.07	5.33	14.92	23.25
7400	0.00	1.07	5.31	14.92	23.15
7500	0.00	1.07	5.33	14.91	23.05
7600	0.00	1.06	5.31	14.85	22.94
7700	0.00	1.06	5.30	14.82	22.82
7800	0.00	1.06	5.25	14.78	22.71
7900	0.00	1.05	5.24	14.73	22.57
8000	0.00	1.04	5.21	14.68	22.45
8100	0.00	1.04	5.19	14.59	22.32
8200	0.00	1.03	5.17	14.54	22.18
8300	0.00	1.02	5.14	14.46	22.05
8400	0.00	1.01	5.11	14.41	21.91
8500	0.00	1.00	5.07	14.36	21.78
8600	0.00	1.00	5.05	14.34	21.71
8700	0.00	0.99	5.04	14.27	21.58
8800	0.00	0.99	4.99	14.18	21.44
8900	0.00	0.98	4.97	14.11	21.32
9000	0.00	0.97	4.94	14.07	21.20
9100	0.00	0.97	4.93	14.01	21.08
9200	0.00	0.96	4.90	13.97	20.96
9300	0.00	0.96	4.88	13.91	20.86
9400	0.00	0.95	4.85	13.89	20.76
9500	0.00	0.95	4.84	13.85	20.67
9600	0.00	0.95	4.84	13.82	20.60
9700	0.00	0.95	4.84	13.81	20.53
9800	0.00	0.95	4.83	13.80	20.47
9900	0.00	0.94	4.84	13.80	20.42
10000	0.00	0.95	4.83	13.82	20.38
10100	0.00	0.95	4.85	13.84	20.36
10200	0.00	0.96	4.88	13.88	20.34
10300	0.00	0.96	4.89	13.89	20.33
10400	0.00	0.96	4.92	13.93	20.33
10500	0.00	0.97	4.95	13.97	20.34
10600	0.00	0.98	4.98	14.04	20.36
10700	0.00	0.99	5.03	14.11	20.39
10800	0.00	1.00	5.06	14.17	20.42
10900	0.00	1.00	5.10	14.25	20.46
11000	0.00	1.02	5.14	14.31	20.50
11100	0.00	1.03	5.20	14.40	20.56
11200	0.00	1.05	5.26	14.49	20.61
11300	0.00	1.06	5.31	14.56	20.66
11400	0.00	1.07	5.36	14.65	20.71
11500	0.00	1.08	5.40	14.74	20.77
11600	0.00	1.10	5.47	14.83	20.82
11700	0.00	1.11	5.52	14.92	20.87
11800	0.00	1.13	5.58	14.97	20.92
11900	0.00	1.14	5.64	15.05	20.96
12000	0.00	1.16	5.68	15.12	21.00

Typical Performance Data

Control Voltage	Attenuation (dB) vs Vctrl over Frequency		
(V)	Freq. = 6 GHz	Freq. = 9 GHz	Freq. = 12 GHz
0.00	0.00	0.00	0.00
0.05	0.01	0.01	0.01
0.10	0.01	0.01	0.01
0.15	0.01	0.01	0.01
0.20	0.01	0.01	0.01
0.25	0.01	0.01	0.01
0.30	0.03	0.02	0.03
0.35	0.06	0.06	0.07
0.40	0.16	0.15	0.18
0.45	0.40	0.39	0.46
0.50	1.01	0.97	1.16
0.51	1.21	1.16	1.38
0.52	1.44	1.39	1.64
0.53	1.71	1.64	1.96
0.54	2.02	1.95	2.31
0.55	2.39	2.31	2.73
0.56	2.81	2.70	3.17
0.57	3.28	3.17	3.72
0.58	3.83	3.69	4.30
0.59	4.43	4.28	4.98
0.60	5.12	4.94	5.71
0.61	5.85	5.64	6.48
0.62	6.66	6.42	7.33
0.63	7.54	7.27	8.26
0.64	8.47	8.16	9.18
0.65	9.43	9.09	10.19
0.66	10.46	10.05	11.19
0.67	11.52	11.05	12.21
0.68	12.59	12.05	13.22
0.69	13.67	13.04	14.21
0.70	14.75	14.04	15.15
0.71	15.81	14.98	16.05
0.72	16.81	15.89	16.87
0.73	17.80	16.72	17.62
0.74	18.72	17.49	18.27
0.75	19.55	18.15	18.83
0.76	20.32	18.74	19.30
0.77	21.01	19.26	19.70
0.78	21.64	19.70	20.05
0.79	22.20	20.09	20.31
0.80	22.63	20.36	20.51
0.81	22.98	20.58	20.65
0.82	23.30	20.77	20.78
0.83	23.56	20.92	20.88
0.84	23.78	21.04	20.95
0.85	23.96	21.14	21.01
0.86	24.12	21.22	21.06
0.87	24.25	21.28	21.10
0.88	24.36	21.34	21.13
0.89	24.45	21.38	21.15
0.90	24.54	21.42	21.17
0.91	24.61	21.45	21.18
0.92	24.66	21.48	21.20
0.93	24.72	21.50	21.21
0.94	24.76	21.52	21.21
0.95	24.80	21.53	21.22
0.96	24.83	21.54	21.22
0.97	24.86	21.55	21.23
0.98	24.90	21.57	21.24
0.99	24.92	21.58	21.24
1.00	24.95	21.59	21.24

Typical Performance Data

Control Voltage	Input Return Loss (dB) vs Vctrl over Frequency		
(V)	Freq = 6 GHz	Freq = 9 GHz	Freq = 12 GHz
0.00	10.55	20.11	15.71
0.05	10.56	20.13	15.70
0.10	10.55	20.11	15.71
0.15	10.55	20.09	15.72
0.20	10.55	20.09	15.72
0.25	10.55	20.05	15.72
0.30	10.54	19.98	15.73
0.35	10.51	19.76	15.75
0.40	10.44	19.18	15.78
0.45	10.25	17.82	15.64
0.50	9.64	15.05	14.45
0.51	9.42	14.33	13.92
0.52	9.17	13.54	13.30
0.53	8.85	12.73	12.56
0.54	8.49	11.87	11.76
0.55	8.07	11.00	10.88
0.56	7.61	10.16	10.03
0.57	7.12	9.29	9.11
0.58	6.59	8.46	8.25
0.59	6.06	7.65	7.41
0.60	5.51	6.87	6.62
0.61	5.00	6.18	5.91
0.62	4.49	5.52	5.25
0.63	4.02	4.91	4.64
0.64	3.58	4.37	4.12
0.65	3.20	3.88	3.63
0.66	2.84	3.46	3.23
0.67	2.52	3.07	2.86
0.68	2.25	2.74	2.56
0.69	2.00	2.45	2.29
0.70	1.80	2.20	2.06
0.71	1.62	1.99	1.87
0.72	1.47	1.80	1.70
0.73	1.33	1.65	1.56
0.74	1.22	1.52	1.44
0.75	1.13	1.41	1.35
0.76	1.05	1.32	1.26
0.77	0.99	1.24	1.19
0.78	0.94	1.18	1.15
0.79	0.89	1.12	1.10
0.80	0.85	1.08	1.05
0.81	0.81	1.04	1.02
0.82	0.79	1.01	0.99
0.83	0.77	0.98	0.97
0.84	0.75	0.96	0.95
0.85	0.73	0.94	0.93
0.86	0.71	0.92	0.92
0.87	0.70	0.90	0.90
0.88	0.69	0.89	0.89
0.89	0.68	0.88	0.88
0.90	0.67	0.87	0.87
0.91	0.66	0.86	0.86
0.92	0.66	0.85	0.86
0.93	0.65	0.84	0.85
0.94	0.65	0.84	0.84
0.95	0.64	0.83	0.84
0.96	0.64	0.83	0.83
0.97	0.63	0.82	0.83
0.98	0.63	0.82	0.83
0.99	0.63	0.81	0.82
1.00	0.62	0.81	0.82

Typical Performance Data

Frequency (MHz)	Input Return Loss (dB) vs Frequency over Vctrl				
	@VCtrl 0V	@VCtrl 0.5V	@VCtrl 0.6V	@VCtrl 0.7V	@VCtrl 0.85V
6000	9.17	8.67	5.44	1.82	0.72
6100	9.26	8.73	5.44	1.82	0.72
6200	9.36	8.81	5.45	1.82	0.72
6300	9.44	8.86	5.44	1.82	0.72
6400	9.56	8.96	5.45	1.81	0.72
6500	9.69	9.05	5.46	1.81	0.72
6600	9.82	9.14	5.47	1.80	0.72
6700	9.99	9.27	5.48	1.80	0.72
6800	10.15	9.38	5.50	1.80	0.73
6900	10.34	9.50	5.50	1.80	0.72
7000	10.55	9.64	5.51	1.80	0.73
7100	10.77	9.80	5.53	1.80	0.73
7200	11.02	9.96	5.56	1.80	0.73
7300	11.26	10.11	5.58	1.80	0.74
7400	11.54	10.29	5.60	1.80	0.73
7500	11.87	10.51	5.63	1.81	0.74
7600	12.17	10.67	5.66	1.81	0.74
7700	12.53	10.89	5.68	1.81	0.74
7800	12.91	11.11	5.72	1.82	0.75
7900	13.27	11.33	5.75	1.83	0.76
8000	13.68	11.54	5.79	1.83	0.76
8100	14.12	11.78	5.84	1.84	0.76
8200	14.56	12.01	5.87	1.85	0.77
8300	14.99	12.22	5.93	1.87	0.78
8400	15.41	12.42	5.97	1.87	0.77
8500	15.90	12.65	6.00	1.89	0.79
8600	16.35	12.88	6.06	1.91	0.79
8700	16.80	13.08	6.10	1.92	0.79
8800	17.27	13.31	6.19	1.94	0.81
8900	17.66	13.49	6.23	1.96	0.82
9000	18.05	13.68	6.29	1.98	0.83
9100	18.48	13.86	6.35	2.00	0.83
9200	18.89	14.07	6.42	2.03	0.85
9300	19.21	14.25	6.49	2.06	0.86
9400	19.45	14.40	6.53	2.07	0.87
9500	19.69	14.53	6.60	2.09	0.88
9600	19.93	14.70	6.67	2.12	0.90
9700	20.05	14.80	6.72	2.13	0.90
9800	20.22	14.94	6.80	2.17	0.92
9900	20.16	15.02	6.85	2.19	0.93
10000	20.11	15.05	6.87	2.20	0.94
10100	20.04	15.15	6.93	2.22	0.95
10200	19.89	15.17	6.99	2.23	0.95
10300	19.65	15.22	7.05	2.26	0.97
10400	19.27	15.16	7.07	2.27	0.97
10500	18.86	15.08	7.10	2.28	0.98
10600	18.48	15.00	7.11	2.30	0.99
10700	18.00	14.84	7.12	2.29	0.99
10800	17.57	14.72	7.12	2.30	1.00
10900	17.09	14.57	7.13	2.31	1.01
11000	16.54	14.31	7.11	2.30	1.00
11100	16.17	14.14	7.08	2.28	1.00
11200	15.73	13.95	7.07	2.28	1.00
11300	15.37	13.76	7.03	2.27	0.99
11400	14.98	13.55	6.99	2.27	1.00
11500	14.66	13.35	6.93	2.24	0.98
11600	14.40	13.21	6.88	2.23	0.98
11700	14.22	13.10	6.85	2.20	0.97
11800	14.04	13.03	6.83	2.20	0.97
11900	13.90	12.93	6.79	2.18	0.96
12000	13.78	12.87	6.75	2.17	0.96

Typical Performance Data

Frequency (MHz)	Insertion Loss (dB) vs Frequency @ 0V
6000	0.91
6100	0.89
6200	0.87
6300	0.86
6400	0.84
6500	0.82
6600	0.79
6700	0.77
6800	0.76
6900	0.74
7000	0.72
7100	0.71
7200	0.69
7300	0.68
7400	0.67
7500	0.66
7600	0.65
7700	0.65
7800	0.64
7900	0.64
8000	0.63
8100	0.63
8200	0.63
8300	0.63
8400	0.63
8500	0.64
8600	0.64
8700	0.64
8800	0.64
8900	0.65
9000	0.65
9100	0.66
9200	0.66
9300	0.67
9400	0.68
9500	0.69
9600	0.70
9700	0.72
9800	0.73
9900	0.75
10000	0.76
10100	0.78
10200	0.80
10300	0.81
10400	0.83
10500	0.85
10600	0.87
10700	0.88
10800	0.89
10900	0.91
11000	0.92
11100	0.93
11200	0.94
11300	0.94
11400	0.95
11500	0.95
11600	0.95
11700	0.95
11800	0.95
11900	0.94
12000	0.94

Typical Performance Data

Frequency (MHz)	Return Loss (dB) vs Frequency at 0V	
	Input	Output
6000	9.17	10.67
6100	9.26	10.89
6200	9.36	11.14
6300	9.44	11.41
6400	9.56	11.69
6500	9.69	12.02
6600	9.82	12.35
6700	9.99	12.71
6800	10.15	13.11
6900	10.34	13.49
7000	10.55	13.91
7100	10.77	14.37
7200	11.02	14.84
7300	11.26	15.30
7400	11.54	15.79
7500	11.87	16.23
7600	12.17	16.75
7700	12.53	17.23
7800	12.91	17.67
7900	13.27	18.11
8000	13.68	18.50
8100	14.12	18.94
8200	14.56	19.27
8300	14.99	19.56
8400	15.41	19.81
8500	15.90	19.99
8600	16.35	20.14
8700	16.80	20.31
8800	17.27	20.33
8900	17.66	20.27
9000	18.05	20.16
9100	18.48	20.04
9200	18.89	19.83
9300	19.21	19.53
9400	19.45	19.16
9500	19.69	18.70
9600	19.93	18.30
9700	20.05	17.80
9800	20.22	17.36
9900	20.16	16.85
10000	20.11	16.37
10100	20.04	15.93
10200	19.89	15.57
10300	19.65	15.14
10400	19.27	14.81
10500	18.86	14.44
10600	18.48	14.19
10700	18.00	14.00
10800	17.57	13.79
10900	17.09	13.65
11000	16.54	13.52
11100	16.17	13.45
11200	15.73	13.44
11300	15.37	13.47
11400	14.98	13.49
11500	14.66	13.57
11600	14.40	13.76
11700	14.22	13.95
11800	14.04	14.20
11900	13.90	14.46
12000	13.78	14.78

Typical Performance Data

Frequency (MHz)	Insertion Loss (dB) vs Freq over Temperature @ Vctrl=0V				
	T = -55°C	T = -25°C	T = 0°C	T = 25°C	T = 85°C
6000	0.74	0.78	0.85	0.89	0.94
6200	0.69	0.74	0.80	0.85	0.91
6400	0.63	0.69	0.75	0.80	0.86
6600	0.57	0.64	0.71	0.76	0.83
6800	0.52	0.59	0.66	0.72	0.78
7000	0.48	0.56	0.63	0.69	0.75
7200	0.47	0.54	0.60	0.66	0.72
7400	0.45	0.51	0.59	0.64	0.70
7600	0.43	0.50	0.57	0.62	0.68
7800	0.42	0.49	0.56	0.61	0.67
8000	0.42	0.49	0.56	0.61	0.67
8200	0.42	0.49	0.56	0.61	0.67
8400	0.42	0.49	0.56	0.61	0.68
8600	0.43	0.49	0.56	0.61	0.68
8800	0.43	0.50	0.57	0.62	0.69
9000	0.44	0.51	0.58	0.63	0.70
9200	0.46	0.52	0.60	0.64	0.71
9400	0.48	0.54	0.62	0.66	0.72
9600	0.50	0.56	0.64	0.68	0.74
9800	0.51	0.58	0.66	0.70	0.77
10000	0.55	0.60	0.68	0.74	0.80
10200	0.59	0.64	0.72	0.77	0.84
10400	0.63	0.67	0.76	0.81	0.88
10600	0.68	0.72	0.79	0.85	0.91
10800	0.74	0.76	0.84	0.88	0.95
11000	0.79	0.80	0.87	0.91	0.98
11200	0.84	0.84	0.90	0.94	0.99
11400	0.87	0.87	0.93	0.95	0.99
11600	0.88	0.89	0.94	0.96	0.99
11800	0.86	0.88	0.95	0.96	0.98
12000	0.85	0.87	0.94	0.96	0.98

Typical Performance Data

Frequency (MHz)	Input Return Loss (dB) vs Freq over Temperature @ Vctrl=0V				
	T = -55°C	T = -25°C	T = 0°C	T = 25°C	T = 85°C
6000	10.71	10.90	10.86	10.91	10.89
6200	11.38	11.46	11.48	11.47	11.37
6400	12.12	12.16	12.16	12.18	12.02
6600	13.26	13.07	13.08	12.93	12.76
6800	14.68	14.28	14.27	13.90	13.73
7000	15.80	15.33	15.27	14.90	14.73
7200	16.69	16.26	16.33	16.04	15.92
7400	17.95	17.45	17.42	17.27	17.28
7600	19.29	18.80	18.87	18.58	18.71
7800	20.55	20.20	20.38	20.06	20.32
8000	20.73	20.74	21.15	21.34	21.60
8200	21.56	21.39	22.22	22.75	22.77
8400	22.35	22.12	23.03	24.00	23.81
8600	21.99	22.19	23.50	24.94	24.53
8800	22.15	22.36	23.56	25.55	25.49
9000	21.05	21.42	22.65	25.24	26.47
9200	20.03	20.40	21.49	24.47	26.96
9400	18.94	19.43	20.37	23.00	26.30
9600	18.27	18.77	19.36	21.25	24.26
9800	17.64	18.20	18.67	19.69	22.04
10000	16.36	17.08	17.39	18.13	19.61
10200	15.09	15.87	16.17	16.85	17.78
10400	14.28	15.10	15.38	15.77	16.48
10600	13.32	14.17	14.55	15.02	15.61
10800	12.39	13.40	13.87	14.39	15.00
11000	11.93	12.92	13.38	13.99	14.62
11200	11.38	12.47	13.07	13.87	14.85
11400	11.30	12.29	12.92	13.86	15.13
11600	11.43	12.43	13.07	14.19	16.06
11800	11.89	12.85	13.45	14.70	17.17
12000	12.56	13.37	13.98	15.50	18.47

Typical Performance Data

Vctrl (V)	Attenuation (dB) vs Vctrl over Temperature @ 6 GHz				
	T = -55°C	T = -25°C	T = 0°C	T = 25°C	T = 85°C
0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.01
0.10	0.00	0.01	0.00	0.00	0.01
0.15	0.00	0.01	0.00	0.00	0.03
0.20	0.00	0.01	0.00	0.00	0.08
0.25	0.00	0.02	0.00	0.01	0.18
0.30	0.01	0.02	0.01	0.02	0.41
0.35	0.00	0.02	0.02	0.05	0.88
0.40	0.01	0.03	0.04	0.15	1.83
0.45	0.01	0.04	0.12	0.40	3.59
0.50	0.02	0.10	0.34	1.04	6.51
0.55	0.04	0.27	0.94	2.46	10.45
0.60	0.13	0.81	2.42	5.26	14.99
0.65	0.48	2.30	5.53	9.70	19.25
0.70	1.70	5.82	10.66	15.26	22.36
0.75	5.08	11.56	16.64	20.19	23.95
0.80	11.42	18.03	21.48	23.20	24.62
0.85	18.64	22.60	23.90	24.43	24.90
0.90	23.26	24.41	24.71	24.85	25.02
0.95	24.63	24.90	24.97	25.01	25.08
1.00	24.96	25.05	25.06	25.07	25.10

Typical Performance Data

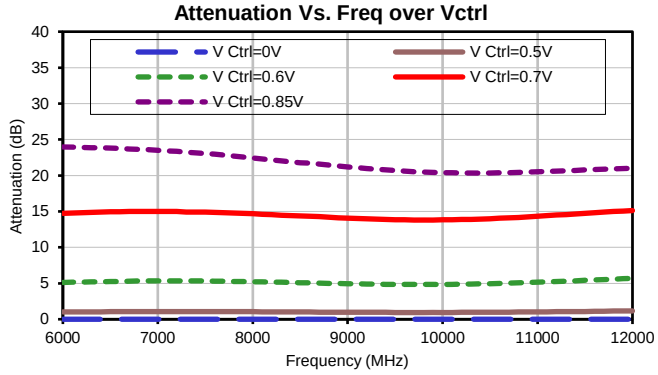
Vctrl (V)	Attenuation (dB) vs Vctrl over Temperature @ 9 GHz				
	T = -55°C	T = -25°C	T = 0°C	T = 25°C	T = 85°C
0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.01
0.10	0.00	0.01	0.00	0.00	0.01
0.15	0.00	0.01	0.00	0.00	0.03
0.20	0.00	0.02	0.00	0.00	0.08
0.25	0.01	0.02	0.00	0.00	0.18
0.30	0.01	0.02	0.01	0.01	0.39
0.35	0.01	0.02	0.01	0.05	0.84
0.40	0.01	0.03	0.04	0.14	1.76
0.45	0.01	0.05	0.11	0.38	3.45
0.50	0.02	0.10	0.32	0.99	6.24
0.55	0.04	0.26	0.89	2.36	10.00
0.60	0.12	0.77	2.30	5.04	14.19
0.65	0.46	2.18	5.26	9.26	17.82
0.70	1.61	5.53	10.15	14.42	20.06
0.75	4.81	10.96	15.57	18.53	21.00
0.80	10.80	16.74	19.40	20.56	21.31
0.85	17.23	20.13	20.89	21.22	21.42
0.90	20.53	21.15	21.28	21.39	21.46
0.95	21.25	21.36	21.37	21.44	21.48
1.00	21.37	21.40	21.40	21.45	21.50

Typical Performance Data

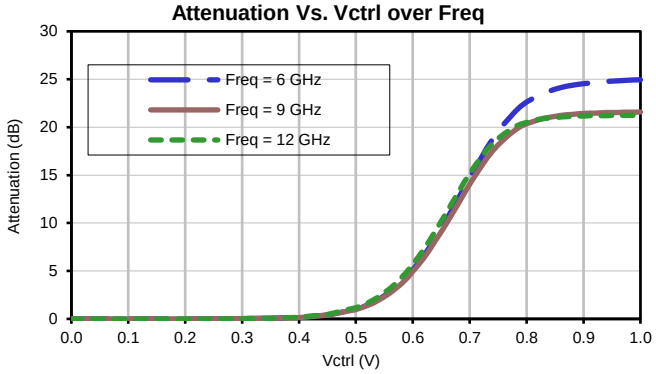
Vctrl (V)	Attenuation (dB) vs Vctrl over Temperature @ 12 GHz				
	T = -55°C	T = -25°C	T = 0°C	T = 25°C	T = 85°C
0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.01	0.00	0.00	0.00
0.10	0.00	0.01	0.00	0.00	0.02
0.15	0.00	0.02	0.00	0.00	0.04
0.20	0.00	0.02	0.00	0.00	0.09
0.25	0.01	0.02	0.00	0.00	0.21
0.30	0.01	0.02	0.01	0.02	0.46
0.35	0.01	0.03	0.02	0.06	1.00
0.40	0.01	0.03	0.05	0.17	2.07
0.45	0.01	0.05	0.13	0.46	4.00
0.50	0.02	0.12	0.39	1.18	7.09
0.55	0.05	0.33	1.09	2.79	11.04
0.60	0.16	0.96	2.79	5.83	15.19
0.65	0.59	2.70	6.20	10.38	18.41
0.70	2.04	6.61	11.48	15.52	20.13
0.75	5.89	12.46	16.79	19.10	20.73
0.80	12.45	18.03	20.01	20.59	20.91
0.85	18.61	20.73	21.03	20.98	20.95
0.90	21.18	21.39	21.24	21.06	20.96
0.95	21.61	21.49	21.28	21.08	20.97
1.00	21.67	21.50	21.29	21.08	20.97

Typical Performance Curves

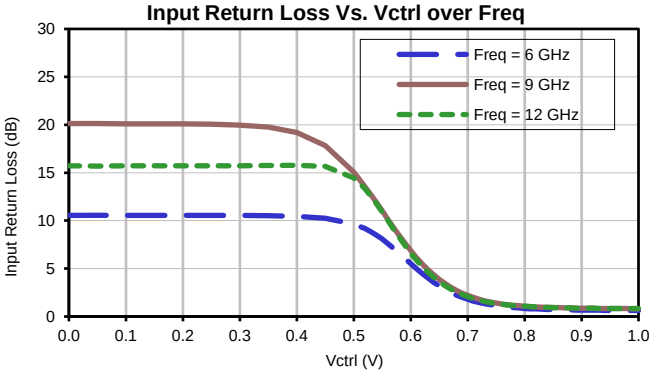
Attenuation Vs. Freq over Vctrl



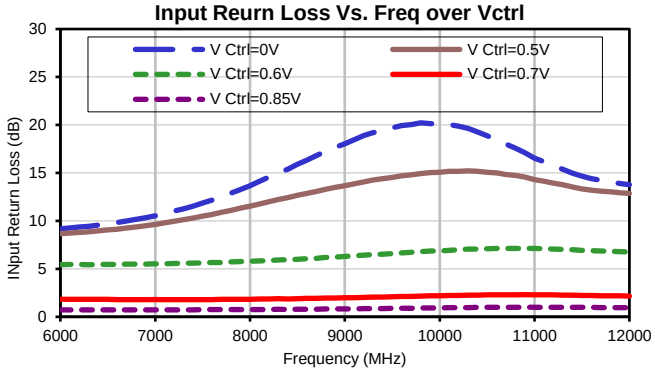
Attenuation Vs. Vctrl over Freq



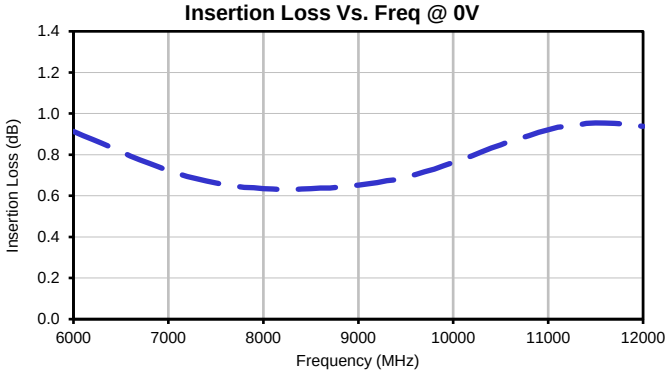
Input Return Loss Vs. Vctrl over Freq



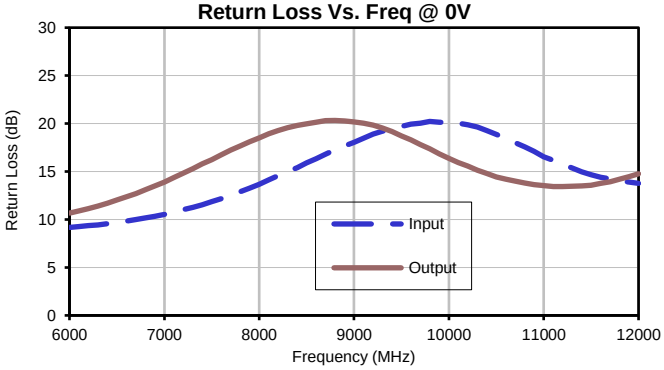
Input Reurn Loss Vs. Freq over Vctrl



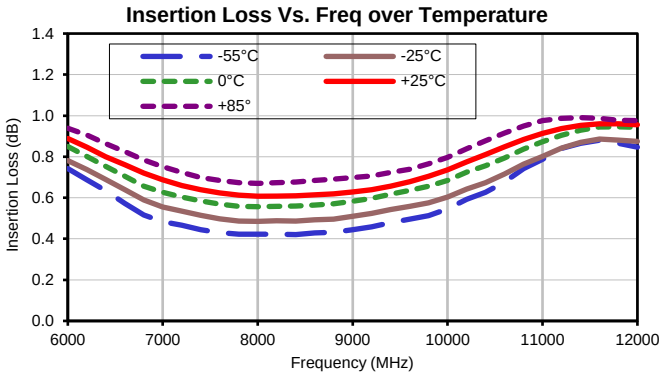
Insertion Loss Vs. Freq @ 0V

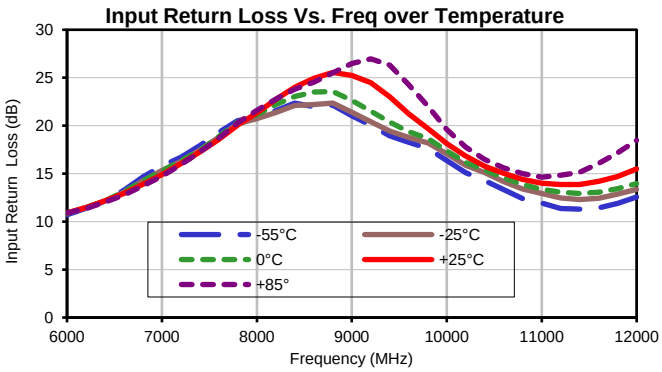


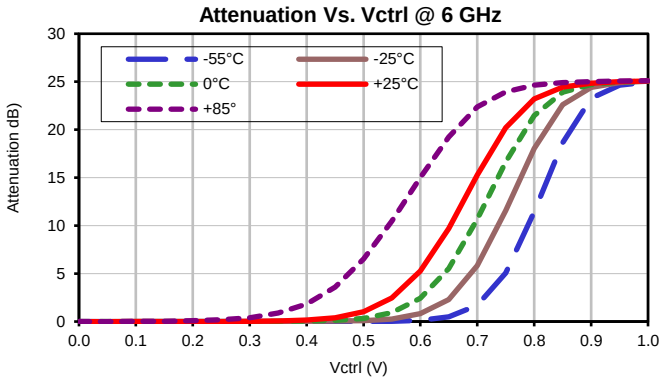
Return Loss Vs. Freq @ 0V

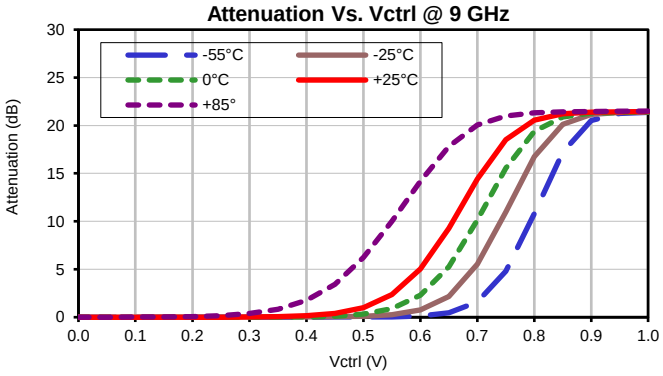


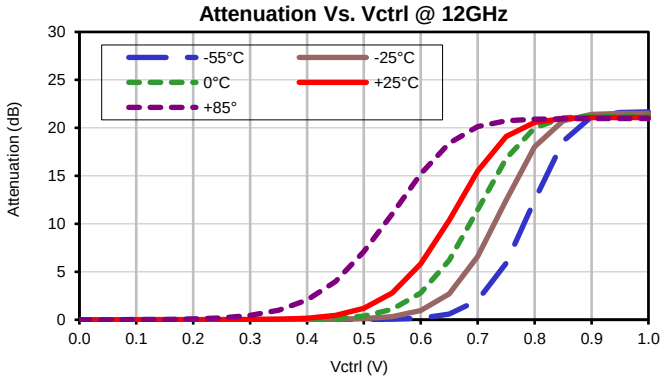
Typical Performance Curves







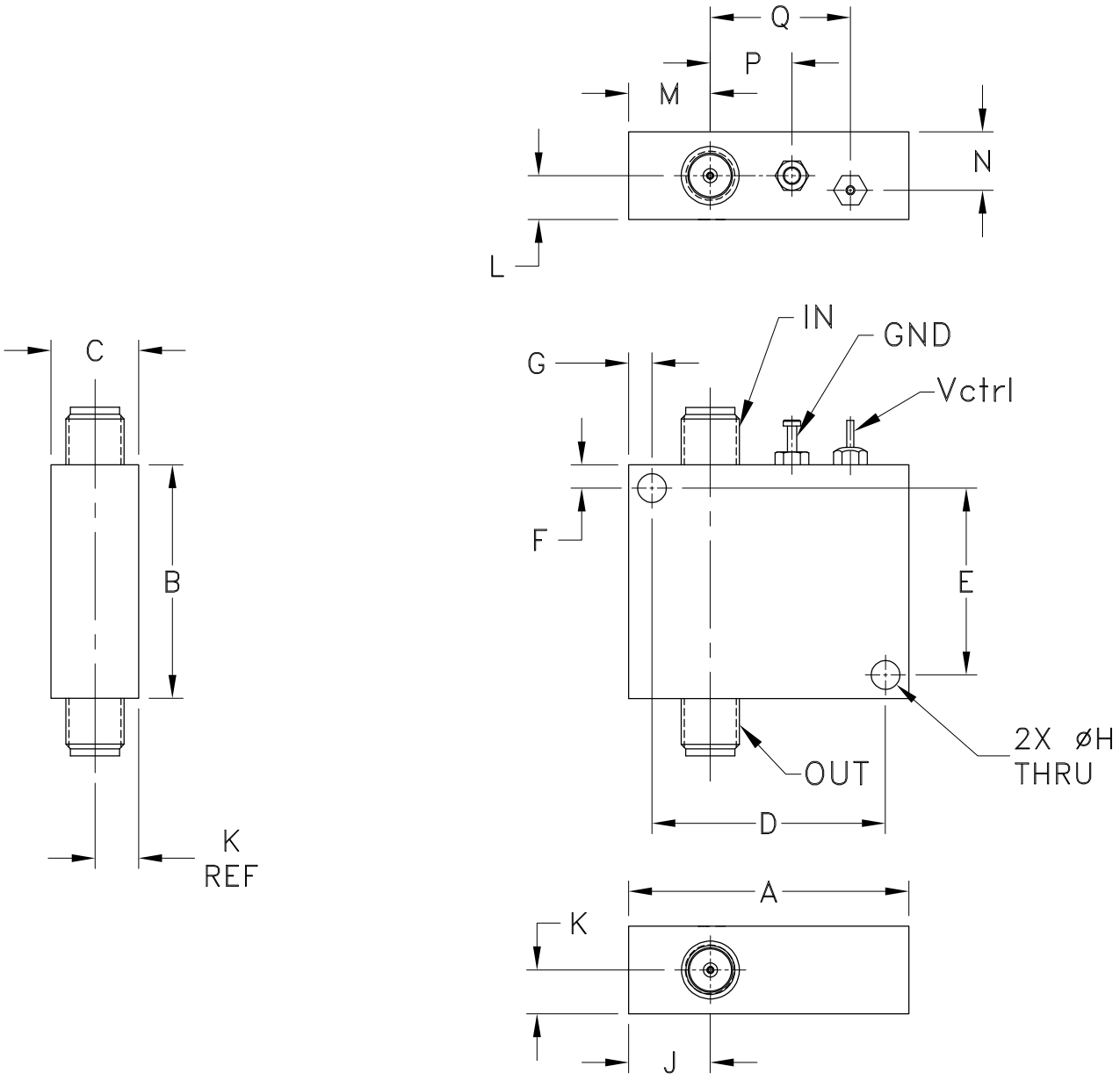




Case Style BY

Outline Dimensions

BY2911



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	WT. GRAMS
BY2911	1.20 (30.48)	1.00 (25.4)	.38 (9.53)	1.000 (25.40)	.800 (20.32)	.10 (2.54)	.10 (2.54)	.125 (3.17)	.35 (8.89)	.19 (4.78)	.19 (4.75)	.35 (8.89)	.25 (6.35)	.350 (8.89)	.600 (15.24)	75

Dimensions are in inches (mm). Tolerances: 2 Pl.±.03; 3 Pl. ±.015

Notes:

1. Case material: Aluminum Alloy.
2. Case finish: Clear chemical conversion coating, non-chrome or trivalent chrome based.

Mini-Circuits

Environmental Specifications **ENV28T7**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 85° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I